



*“Moving Oklahoma Forward”*



PLAN DOCUMENT

**Oklahoma Department of Transportation**  
OKLAHOMA LONG RANGE TRANSPORTATION PLAN 2015-2040

AUGUST 2015



*2015-2040 OKLAHOMA LONG RANGE TRANSPORTATION PLAN*

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# ***MOVING OKLAHOMA FORWARD***

Prepared for:



***OKLAHOMA DEPARTMENT OF TRANSPORTATION***

Prepared by:



August 2015

The 2015-2040 Oklahoma Long Range Transportation Plan was approved by the  
Oklahoma Transportation Commission on August 10, 2015.

This Plan Document is available at:  
Oklahoma Department of Transportation  
Strategic Asset and Performance Management Division  
200 NE 21<sup>st</sup> Street  
Oklahoma City, OK 73105

and on the ODOT website at:

[http://www.ok.gov/odot/Programs\\_and\\_Projects/Transportation\\_Programs/LRTP\\_2015-2040.html](http://www.ok.gov/odot/Programs_and_Projects/Transportation_Programs/LRTP_2015-2040.html)



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## **1. INTRODUCTION**

The Oklahoma Department of Transportation (ODOT), with the help of many stakeholders, has developed the 2015-2040 Oklahoma Long Range Transportation Plan (2015-2040 LRTP), “Moving Oklahoma Forward.” The 2015-2040 LRTP is a policy document that will guide ODOT in the development, management, and operation of a safe and efficient transportation system for the next 25 years.

The 2015-2040 LRTP accomplishes the following:

- Updates ODOT’s planning goals and objectives;
- Develops performance measures that align Oklahoma values with national transportation goals;
- Describes the existing transportation system;
- Examines safety and security issues and current and future environmental impacts;
- Identifies current and future multimodal transportation system needs for the 25-year planning period;
- Anticipates future federal, state, and local transportation revenues; and
- Updates ODOT’s multimodal transportation policies.

ODOT updates the LRTP every five years, and the 2015-2040 LRTP is consistent with the Department’s mission “to provide a safe, economical, and effective transportation network for the people, commerce, and communities of Oklahoma.”

### **1.1. BACKGROUND**

Since the adoption of the 2010-2035 LRTP in 2010, great strides have been made in Oklahoma. The state has added over 100,000 new residents between 2010 and 2014; and Oklahoma’s population is expected to reach 3.9 million in 2015.

Employment is projected to reach a total of over 2.2 million jobs in 2015, an increase of 141,000 over the five year period. In 2013, Oklahoma’s jobless rate declined to the lowest level since the onset of the state’s last recession. Oklahoma’s Gross State Product was \$164 billion in 2013 representing an average annual growth of about 2 percent since 2010. This steady growth in population and the economy has had a significant impact on ODOT’s transportation facilities. Oklahoma’s State Highway System<sup>1</sup> continues to experience increased traffic, and ODOT forecasts the system to grow at an average annual rate of 1.24 percent<sup>2</sup> over the next 25 years.

In 2005, the Oklahoma State Legislature approved landmark transportation legislation (HB1078) that has introduced new state revenues to address State Highway System needs. From 1985 to 2005, state transportation funding was flat, which resulted in many years of deferred highway maintenance. By 2005, highway pavements were deteriorating at a rate at which repair costs exceeded available funding, and more than 1,500 state highway bridges were structurally deficient or functionally obsolete. In 2012, additional legislation was passed by the State governing body to provide the funding necessary to significantly reduce the number of structurally deficient bridges and deteriorating road conditions on the State Highway System.

Because of state funding increases, ODOT has dramatically improved bridge conditions on the State Highway and Bridge System. ODOT replaced or rehabilitated 823 bridges between 2006 and 2013. This is an important accomplishment and likely represents more bridge work performed than any other time period in the history of the Department.

Even with recent state funding increases, future needs are greater than projected revenue. ODOT has updated the LRTP to provide strategic guidance to preserve, maintain, and expand the multimodal transportation system to meet future mobility demands of people and goods.

## 1.2. ODOT’S RESPONSIBILITIES AND PARTNERS

ODOT is charged with the planning, design, construction, operation, and maintenance of Oklahoma’s highway system, comprised of 12,265 miles of non-toll interstate highways, U.S. highways, state highways, and 6,828 bridges. ODOT also maintains the 213 miles of state-owned railroads. ODOT administers and assists with a variety of other multi-modal programs including passenger rail, public transit, and

waterways. Additionally, ODOT oversees other state and federal programs directed to the county and city transportation systems.

ODOT is regionally organized with eight field divisions that correspond to the Transportation Commission Districts and a central office located in Oklahoma City. ODOT’s executive staff, field divisions and central office cooperatively interact to plan, construct, and maintain Oklahoma’s highway system.

ODOT is an active partner in additional transportation functions that involve various federal and state agencies, local jurisdictions, and private businesses. Many public and private sector organizations must both fulfill their roles, and cooperate with each other to address the state’s transportation needs.

**Table 1-1, Table 1-2, and Table 1-3** show the responsibilities of the various organizations. A majority of these entities and agencies were represented on three advisory committees that met at two milestones of the 2015-2040 LRTP planning process to provide input. The membership of these committees is described in greater detail in **Chapter 4**.

**Table 1-1. Federal Agency Partners**

Partner	Description
Federal Highway Administration (FHWA)	Provides support through financial and technical assistance to state and local governments for constructing and improving the National Highway System and various federally and tribal owned lands.
Federal Motor Carrier Safety Administration (FMCSA)	Enacts and enforces regulations to improve the safety of the commercial motor vehicle industry.
Federal Railroad Administration (FRA)	Performs duties, which include creating and enforcing rail safety regulations, administering railroad financial assistance programs, and conducting research and development towards improving railroad safety.
Federal Transit Administration (FTA)	Provides financial and technical assistance to urban, rural, and tribal public transportation systems.
U.S. Army Corps of Engineers (USACE)	Maintains waterway channels, locks and dams of the McClellan-Kerr Arkansas River Navigation System.

**Table 1-2. State Agency Partners**

Partner	Description
Oklahoma Aeronautics Commission	Responsible for seeing that the needs of commerce and communities are met by the state’s public airports.
Oklahoma Corporation Commission	Regulates, enforces laws and supervises activities associated with the exploration and production of oil and gas, the storage and dispensing of petroleum-based fuels, the establishment of rates and services of public utilities, and the operation of intrastate transportation.
Oklahoma Department of Commerce	Serves as the primary economic development entity in Oklahoma with the mission to create and deliver high-impact solutions that lead to prosperous lives and communities for all Oklahomans
Oklahoma Department of Human Services	Provides a wide arrange of public assistance programs to help individuals and families, which includes services for persons with development disabilities and persons who are aging.
Oklahoma Department of Rehabilitation Services	Expands opportunities for employment, independent life, and economic self-sufficiency by helping Oklahomans with disabilities bridge barriers to success in the workplace, school, and at home.
Oklahoma Highway Patrol	Provides law enforcement, including enforcement of laws regulating the use of highways and waterways in Oklahoma.
Oklahoma Highway Safety Office	Responsible for promoting highway safety by developing and supporting programs that reduce the number and severity of traffic crashes in Oklahoma.
Oklahoma Turnpike Authority	Responsible for turnpike construction, maintenance, repair, and operations authorized by the state legislature and approved by ODOT.

**Table 1-3. Other Agency and Organization Partners**

Partner	Description
Airports	Provide facilities primarily for the takeoff and landing of aircrafts to transport passengers and/or cargo. Oklahoma has 140 airports that include 113 public airports. These include three primary airports and seven regional airports.
Associations	Serve the common interest of an organized group of people or organizations. Involved associations included the Oklahoma Trucking Association, Oklahoma Railroad Association, Oklahoma Cattleman’s Association, and Oklahoma Aggregates Association.
Chambers of Commerce and Business or Community Organizations	Promote economic development and/or community development for a particular location. Involved organizations included the Asian Chamber of Oklahoma, Central Oklahoma Economic Development District, Greater Oklahoma City Chamber of Commerce, Tulsa Chamber of Commerce, Latino Community Development Agency, and Oklahoma State Chamber of Commerce.
County, City, Town, and Councils of Government	Responsible for major services that include building and maintaining transportation infrastructure such as public roads and bridges, bicycle and pedestrian pathways, and ports.
Intercity Passenger Travel Organizations	Operate and/or has interests in passenger travel between cities. These include AMTRAK, Greyhound, Jefferson Bus Lines, and the Heartland Flyer Passenger Rail Coalition.

**Table 1-3. Other Agency and Organization Partners (continued)**

Partner	Description
Metropolitan Planning Organizations (MPOs)	Work with local governments in an urbanized area to plan and implement transportation improvements for the region. Oklahoma has four MPOs for the following urbanized areas – Lawton, Oklahoma City, Tulsa, and Fort Smith (a bi-state entity in Arkansas and Oklahoma).
Oklahoma Native American Tribes	Oversee tribal transportation infrastructure policy, roads, and transit programs as a sovereign entity. There are 38 Oklahoma Native American Tribes.
Private-sector Companies	Operate trucking/transportation-related businesses for profit with control by private individuals or groups. Companies represented on the Advisory Committees included Chesapeake Energy, Dolese Brothers Company, and McCorkle Truck Lines.
Public Port Authorities	Operate one or more public terminals that provide a range of cargo transfers and storage along with land for industrial development. Oklahoma public ports include the Tulsa Port of Catoosa and Port of Muskogee that are located on the McClellan-Kerr Arkansas River Navigation System.
Public Transit Providers	Provide public transit service, which include 20 rural and five urban entities in Oklahoma. These may be under sponsorship of a Community Action Program, a local government, or regional agency.
Other Transit Entities	Operate and/or have interests in public transit. These include Airport Express and Oklahoma Alliance for Public Transportation.
Railroad Companies	Operate a railroad track or trains. Oklahoma has 3 Class I railroads and 19 Class III or short line railroads.
Urban Leagues	Serve as a nonpartisan civil rights organization. These include the Oklahoma City Urban League and the Tulsa Urban League.
U.S. Military Establishments	Responsible for the operation of national defense weapon system readiness, maintenance/repair/overhaul of Air Force and Navy components, and training of military personnel. These include Tinker Air Force Base and U.S. Army Field Artillery School at Ft. Sill.

The partnerships described in the associated text and tables have provided for a more robust transportation planning process. One purpose of the 2015-2040 LRTP is to identify multimodal needs under ODOT jurisdiction. The 2015-2040 LRTP also identifies transportation needs of its partners to the extent possible. ODOT’s experience has been that “the whole is greater than the sum of the parts” and partnering with other transportation providers has been a useful way to improve system efficiency and services for the people, commerce, and communities in Oklahoma.

**1.2.1. Coordination with Metropolitan Planning Organizations**

One group of partners, the MPOs, shoulders the task of developing Long Range Transportation Plans by following many of the same rules and regulations as the State DOTs. Preparation of the 2015-2040 LRTP was coordinated with Oklahoma’s MPOs through representation on the Plan’s Advisory Committees. Likewise, ODOT is involved in the development and review of the metropolitan area transportation plans to ensure that MPO long range plans are consistent with the State’s Plan. The 2015-2040 LRTP incorporates, by reference, the Long Range Transportation Plans for the Lawton, Oklahoma City, Tulsa, and

Ft. Smith areas. Separate plan documents will be available from each of these entities.

The metropolitan area plans will be available at the following addresses:

- Lawton Metropolitan Area Long Range Transportation Plan  
Lawton Metropolitan Planning Organization  
212 Southwest 9th Street  
Lawton, OK 73501  
[www.lawtonmpo.org](http://www.lawtonmpo.org)  
580-581-3375
- Oklahoma City Regional Transportation Study (OCARTS) Area Plan  
Association of Central Oklahoma Governments (ACOG)  
21 East Main Street, Suite 100  
Oklahoma City, OK 73104  
[www.acogok.org](http://www.acogok.org)  
405-234-2264
- Tulsa Metropolitan Area Long Range Transportation Plan  
Indian Nations Council of Government (INCOG)  
Two West 2nd Street, Suite 800  
Tulsa, OK 74103  
[www.incog.org](http://www.incog.org)  
918-584-7526
- Fort Smith/Frontier Long Range Transportation Plan  
Fort Smith/Frontier Metropolitan Planning Organization  
1109 South 16<sup>th</sup> Street  
Fort Smith, AR 72902  
[www.frontiermpo.org](http://www.frontiermpo.org)  
479-785-1964

These metropolitan areas have varied schedules for their plans, and plan forecast years range between 2040 and 2045. The Lawton MPO completed its 2040 LRTP in early 2015. Oklahoma City and Fort Smith have scheduled Plan updates for 2016. INCOG expects to release the Tulsa area updated plan in 2017.

In addition to embodying goals that are compatible with the State LRTP, the MPO long range plans share other common attributes and requirements:

- Multiple planning factors are addressed;
- State and regional transportation improvement programs must be consistent with long range plans;
- Long range plans are intermodal in scope; and
- Development of long range plans includes public involvement.

### 1.3. FEDERAL REQUIREMENTS

In 2012, the federal surface transportation bill entitled *Moving Ahead for Progress in the 21<sup>st</sup> Century* (MAP-21) was enacted into law. MAP-21 requires states to develop a performance-based long range statewide transportation plan. Each state's plan should include performance measures that will assist the state in making progress towards meeting the national performance goal areas identified in the legislation. These goal areas are safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery delays. The 2015-2040 LRTP goals correspond well with the national performance goal areas, and are further discussed in **Chapter 2**.

FHWA is currently in the process of issuing rules to guide the development of performance measures. Once established, the State DOTs and MPOs will use the performance measures as they carry out Federal-aid highway programs and assess system performance. The 2015-2040 LRTP has addressed MAP-21 requirements and, to the extent possible, subsequent rule-making.

### 1.4. ODOT’S 2015-2040 LONG RANGE TRANSPORTATION PLAN PROCESS

The 2015-2040 LRTP’s planning process depicted in **Figure 1-1** involved a number of steps occurring within a one year time period. Public involvement was incorporated throughout this process, and included development of and communication with a stakeholder group, convening three advisory committees (Tribal, Personal Travel, and Freight), hosting public meetings, and sponsoring a project website. The advisory committees met twice, agreeing on the 2015-2040 LRTP’s goals and objectives and providing input on the multimodal policies.

The initial step was the creation of the 2015-2040 LRTP vision, which is intended to guide ODOT’s decisions as it conducts the transportation planning, construction and delivery process in the state. Next, the goals provided more specific desired outcomes that reflect the vision, while the objectives specified actions and activities associated with achieving the goals. The objectives led directly to developing meaningful performance measures, which use quantitative data to assess ODOT’s effectiveness in meeting its goals.

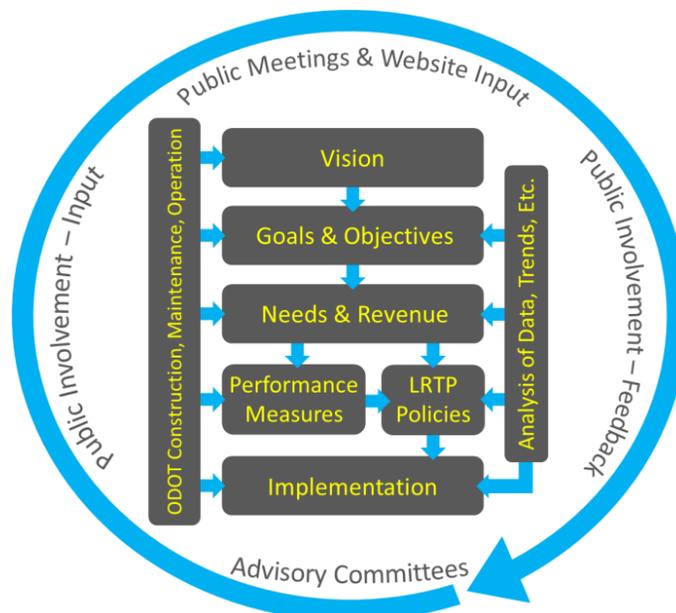
Following goals, objectives and performance measures, current and future needs were identified for Oklahoma’s multimodal transportation system based on analysis of data and trends. This analysis involved information relating to demographics, inventory of existing modes, freight, safety and security, and environment.

Then revenues were projected to illustrate the amount of funding forecasted in comparison to the future transportation needs identified in Oklahoma.

Next, multimodal policies were updated to address Oklahoma’s transportation needs by providing recommendations for the state’s multimodal transportation system.

Finally, implementation consists of incorporating Plan policies and performance measures into ongoing programs such as the State Transportation Improvement Program (STIP) and the Eight Year Construction Work Plan (CWP) to meet the LRTP’s goals and to support the Department’s mission.

**Figure 1-1. ODOT’s 2015-2040 Long Range Transportation Plan Process**



## 1.5. ORGANIZATION OF THE LONG RANGE TRANSPORTATION PLAN DOCUMENT

The 2015-2040 LRTP chapters are organized as follows:

### **Chapter 1 Introduction:**

Describes the 2015-2040 LRTP purpose and planning process. This chapter also discusses LRTP federal requirements, ODOT and partner roles and responsibilities, and LRTP document organization.

### **Chapter 2 Goals and Direction:**

Describes the process to develop the LRTP's vision, goals, and objectives and summarizes the review of relevant documents and policies. This chapter presents how the LRTP goals align with MAP-21 national performance goal areas and planning factors.

### **Chapter 3 Performance Measures:**

Defines 'performance measurement' and its importance under MAP-21. This chapter discusses the criteria for selecting performance measures, provides a summary of the development process, and outlines the recommended performance measures by LRTP goal area.

### **Chapter 4 Stakeholder Outreach:**

Describes the LRTP's public involvement plan, which meets federal participation requirements and encourages public involvement and input in the development of the LRTP. This chapter summarizes the public and stakeholder participation process and results of the various public outreach activities.

### **Chapter 5 Demographic, Socioeconomic, and Land Use Data:**

Summarizes demographic and socioeconomic characteristics and the relationship between transportation and land use. It discusses transportation implications for specific demographic and socioeconomic characteristics and land use.

### **Chapter 6 Existing Transportation System and Conditions:**

Provides an inventory of the transportation system by mode and discusses current conditions.

### **Chapter 7 Economic Conditions and Freight Transportation:**

Discusses the economic profile for Oklahoma. This chapter describes the relationship between the state's demographic and economic conditions and freight demand. It includes a discussion of Oklahoma's freight-related industries and summarizes the current and expected future commodity movements by mode.

### **Chapter 8 Safety, Security, and Environmental Issues :**

Discusses the importance of safety to ODOT including information on U.S. safety trends, and summarizes crash information for Oklahoma. This chapter also includes a discussion about securing critical assets in Oklahoma, and the current mitigation efforts and opportunities relating to the natural and human environment.

### **Chapter 9 Transportation System Needs:**

Summarizes the state's transportation needs by mode from the present to the year 2040.

### **Chapter 10 Estimated Costs and Forecasted Revenues:**

Summarizes 2015-2040 baseline revenue projections.

### **Chapter 11 Policies and Strategies:**

Provides modal policy recommendations, recent accomplishments and challenges, and implementation strategies.

### **Chapter 12 Conclusion:**

Discusses the next steps as a conclusion to the LRTP.

## 1.6. COORDINATION WITH SHORT TERM TRANSPORTATION PROGRAMS AND PLANS

### 1.6.1. State Transportation Improvement Program

Another part of MAP-21 requires states and MPOs to develop short range planning documents, called Transportation Improvement Programs, which are compatible with the long range transportation plan. These short range plans are used to identify all state and/or regional transportation capital expenditures expected during the following four years for projects involving federal funding. Transportation improvement programs prepared by the MPOs for the urban regions are included in the STIP.

### 1.6.2. State Eight Year Construction Work Plan

ODOT administers an Eight Year CWP program that assists the Department in scheduling and conducting the complex engineering, environmental, and right-of-way processes necessary to complete construction projects in a timely fashion. The first four years of the Eight Year CWP are represented in the STIP.

The 2015-2040 LRTP is a broad policy document, whereas the STIP and Eight Year CWP identify the program of specific projects. It is essential that the development of these various Plans and Programs be developed in harmony with each other so that ODOT can efficiently and effectively develop and maintain the transportation system.

## 1.7. ENDNOTES

<sup>1</sup> The State Highway System includes Interstate, U.S., and Oklahoma (State) highways within the State of Oklahoma.

<sup>2</sup> Historic Highway Performance Monitoring System (HPMS) data from Oklahoma and 2012-2032 growth forecasted by ODOT Strategic Asset and Performance Management Division were analyzed to develop planning level forecasts for the 2015-2040 LRTP. Forecasts indicate a compound annual growth rate of 1.08%, which equates to an average annual growth rate of 1.24%.

## 2. GOALS AND DIRECTION

### 2.1. VISION

The 2015-2040 LRTP vision, goals, and objectives were developed through consideration of a range of transportation guidance and documents. Such considerations included ODOT’s overall strategic direction, the goals from other Oklahoma state system plans, MPO plans, and Federal MAP-21 requirements. **Figure 2-1** displays the various inputs that assisted with development of the 2015-2040 LRTP.

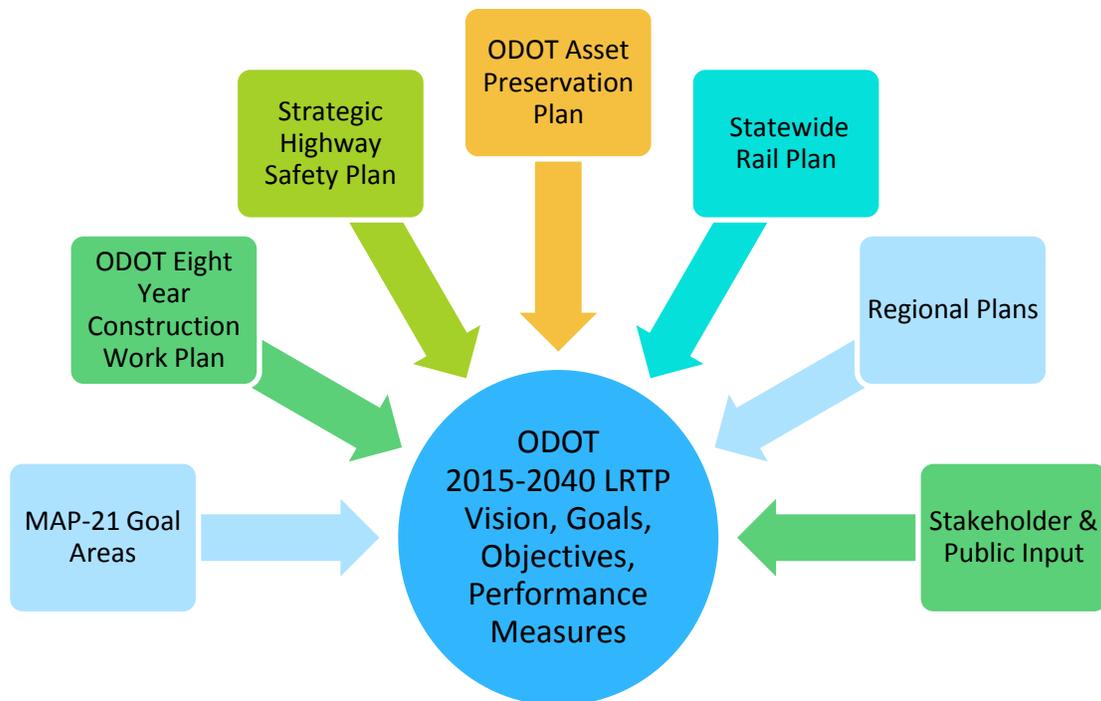
ODOT’s 2015-2040 LRTP vision is “to provide an intermodal transportation system that supports a thriving economy and improved quality of life for Oklahomans by providing safe and efficient movement of people and goods.” This vision was

slightly refined from the 2010-2035 LRTP vision, but continues to be the ODOT’s guiding principle.

### 2.2. GOALS

The 2015-2040 LRTP goals were developed through a thorough review of the 2010-2035 LRTP goals, ODOT strategic and modal plans, MPO Long Range Transportation Plans, and the Federal transportation law (MAP-21). While the 2010-2035 LRTP goals were closely aligned with the applicable federal transportation legislation at the time (SAFETEA-LU), the 2015-2040 LRTP goals were slightly revised MAP-21 goal areas and provide a clear strategic direction to support the efficient movement of people and goods. The goals were reviewed, revised, and accepted following stakeholder and public input.

**Figure 2-1. 2015-2040 LRTP Vision, Goals, Objectives and Performance Measures Inputs**



### 2.2.1. Plans Reviewed

The 2015-2040 LRTP vision, goals, and strategic direction were formed based on a range of transportation plans and documents. These plans and documents were reviewed to incorporate and enhance the development of the plan's vision, goals, and strategic direction. They included:

- ODOT's mission statement;
- ODOT's fiscal and organizational strategy;
- 2010-2035 LRTP goals;
- Other ODOT state system plans;
- MPO plans; and
- MAP-21 Federal requirements.

### 2.2.2. Goal Development

ODOT used a transparent collaborative approach to identify the 2015-2040 LRTP goals. In addition to a thorough review of existing plans and documents, ODOT used three advisory committees (Tribal, Personal Travel, and Freight) and public input to develop and refine the 2015-2040 LRTP goals. Each advisory committee met during the summer and again in the fall of 2014 to discuss existing conditions, planning issues, goals, objectives, and performance measures. Each committee agreed that the goals and objectives were acceptable to use for the 2015-2040 LRTP update.

Following each set of advisory committee meetings, ODOT held a series of public meetings to gather more input from Oklahomans regarding the goals, objectives, and many other aspects of the Plan development. More detailed public involvement discussion is in **Chapter 4**.

### 2.2.3. 2015-2040 LRTP Goals

The 2015-2040 LRTP goals serve as the overall guide for ODOT to work towards achieving their vision in order to provide a safe and efficient movement of people and goods in Oklahoma.

- **Safe and Secure Travel** – Improve infrastructure safety and security for system users.

- **Infrastructure Preservation** – Preserve and maintain Oklahoma's multimodal transportation system in a state of good repair.
- **Mobility Choice, Connectivity and Accessibility** – Facilitate the easy movement of people and goods, improve interconnectivity of regions and activity centers, and provide access to different modes of transportation.
- **Economic Vitality** – Provide an efficient and effective multimodal transportation system that is coordinated with land development patterns to strengthen communities and support economic development.
- **Environmental Responsibility** – Minimize environmental impacts related to transportation enhancing the natural environment.
- **Efficient Intermodal System Management and Operation** – Strengthen the data driven decision making approach in order to maximize intermodal system performance and operation.

The 2015-2040 LRTP goals align well with national goal areas set under MAP-21. A cornerstone of MAP-21 is the transition to developing performance-based LRTPs. States are being directed to invest resources into infrastructure improvements to achieve performance measure targets that collectively make progress toward national performance goal areas. **Figure 2-2** and **Table 2-1** show how 2015-2040 LRTP goals compare to MAP-21 required national performance goal areas. Federal regulations also identify eight planning factors that state LRTPs need to address. **Table 2-1** also shows how the 2015-2040 LRTP goals align with those planning factors.

The 2015-2040 LRTP development must also meet several MAP-21 requirements for State Long Range Transportation Plans. **Table 2-2** compares

the 2015-2040 LRTP structure with the MAP-21 state plan requirements.

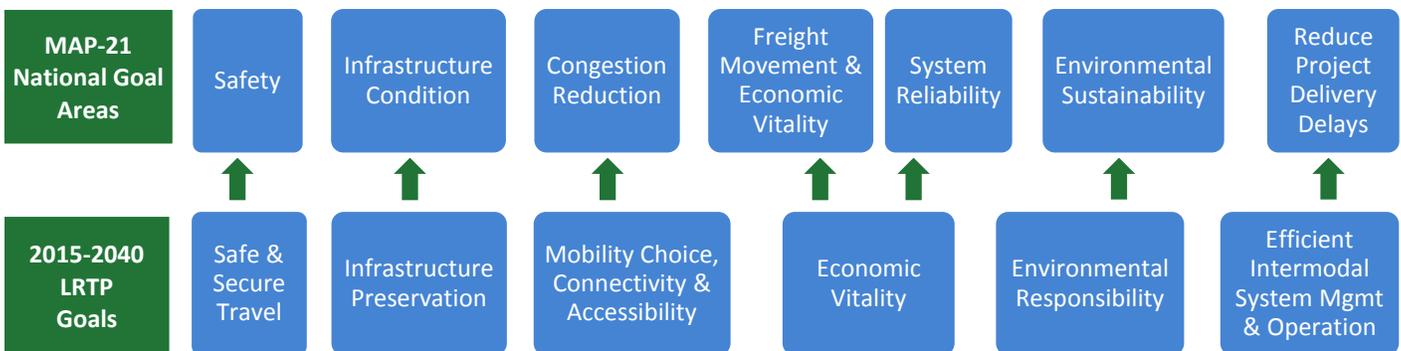
### 2.3. CONCLUSION

The 2015-2040 LRTP vision and goals serve as the overarching transportation planning guidance for the agency. Partner agencies such as counties,

Councils of Government and MPOs are encouraged to integrate their own transportation goals and objectives with ODOT's to provide for a coordinated transportation system in the state.

To measure the progress towards achieving these goals, ODOT has adopted performance measures outlined in **Chapter 3**.

**Figure 2-2. Alignment of 2015-2040 LRTP Goals with MAP-21 National Goals Areas**



**Table 2-1. Comparison of ODOT’s 2015-2040 LRTP Goals with MAP-21 State Planning Process and Performance Based Goals**

2015-2040 LRTP Goals	Federal Regulations: Planning Factors	MAP-21: National Goal Areas
<p><b>1. Safe and Secure Travel</b> – Improve infrastructure safety and security for system users.</p>	<p>Increase <b>safety and security</b> of the transportation system for users.</p>	<p><b>Safety</b> –To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.</p>
<p><b>2. Infrastructure Preservation</b> – Preserve and maintain Oklahoma’s multimodal transportation system in a state of good repair.</p>	<p>Emphasize <b>preservation of the existing transportation system</b>.</p>	<p><b>Infrastructure Condition</b> – To maintain transportation infrastructure assets in a state of good repair.</p>
<p><b>3. Mobility Choice, Connectivity and Accessibility</b> – Facilitate the easy movement of people and goods, improve connectivity between regions and activity centers, and provide access to different modes of transportation.</p>	<p>Increase <b>accessibility and mobility</b> of people and freight. Enhance integration and <b>connectivity of systems across modes for people and freight</b>.</p>	<p><b>Congestion Reduction</b> – To achieve a significant reduction in congestion on the NHS.</p>
<p><b>4. Economic Vitality</b> – Provide an efficient and effective multimodal transportation system that is coordinated with land development patterns to strengthen communities and support economic development.</p>	<p>Support <b>economic vitality</b> of U.S., States, metropolitan, and non-metropolitan areas by enabling global competitiveness, productivity, and efficiency. Promote consistency <b>between transportation improvement and economic development patterns</b>.</p>	<p><b>Freight Movement and Economic Vitality</b> – To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development. <b>System Reliability</b> – To improve the efficiency of the surface transportation system.</p>
<p><b>5. Environmental Responsibility</b> – Minimize environmental impacts related to transportation enhancing the natural environment.</p>	<p><b>Protect and enhance the environment</b>, promote energy conservation, enhance quality of life.</p>	<p><b>Environmental Sustainability</b> – To enhance the performance of the transportation system while protecting and enhancing the natural environment.</p>
<p><b>6. Efficient Intermodal System Management and Operation</b> – Strengthen the data driven decision making approach in order to maximize system performance and operation.</p>	<p>Promote <b>efficient system management and operation</b>.</p>	<p><b>Reduced Project Delivery Delays</b> – To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies’ work practices.</p>

Source: USDOT, FHWA.

**Table 2-2. Comparison of ODOT’s 2015-2040 LRTP Structure with MAP-21 State LRTP Requirements**

Oklahoma 2015-2040 LRTP Structure and Development	MAP-21 State Long Range Transportation Plans Requirements
The 2015-2040 LRTP spans <b>25 years</b> and addresses <b>various modes</b> including but not limited to: highways, transit, rail, port and airport access, and bicycle and pedestrian modes as detailed in Chapter 6.	<b>Development</b> – Each State shall develop a transportation plan with minimum 20 year forecast period that provides for development and implementation of the Statewide intermodal transportation system.
Development of the 2015-2040 LRTP includes <b>coordination and communication with the metropolitan planning organizations (MPOs), rural substate districts, and Indian tribal governments.</b> See Chapter 4 for more information.	<b>Consultation with governments</b> – Metropolitan areas, non-metropolitan areas, and Indian tribal governments
The 2015-2040 LRTP process includes an <b>extensive public involvement process</b> where interested parties can attend meetings, meet with staff, provide oral and written comments, communicate and receive communication in various languages, and/or subscribe to a stakeholder communication list. More information is available in Chapter 4.	<b>Participation by interested parties</b> – The State shall provide opportunities to participate in the development of the plan for non-metropolitan elected officials, citizens, affected public agencies, representatives of public transportation, representatives of users of pedestrian walkways and bicycle facilities, representatives of the disabled, providers of freight transportation service, and other interested parties. The state shall develop a process for public involvement, hold public meetings at convenient times and accessible locations, employ visualization techniques, and make public information easily available.
The 2015-2040 LRTP documents <b>existing and planned ODOT environmental mitigation activities</b> (see Goal #5) and they are discussed further in Chapter 11.	<b>Mitigation activities</b> – The LRTP shall include a discussion of potential environmental mitigation activities including activities that may have the greatest potential to restore and maintain the environmental functions affected by the Plan.
The 2015-2040 LRTP scope and process includes a <b>financial analysis</b> of expected revenues vs. estimated costs, as well as an alternative investment and asset management analysis (see Chapter 10).	<b>Financial Plan</b> – The LRTP may include a financial plan that demonstrates how the Plan can be implemented, indicate resources from the public and private sector that are reasonably expected to be available to carry out the plan, and recommend additional financial strategies.
The 2015-2040 LRTP is a <b>policy oriented Plan</b> and is not project specific as discussed in Chapter 11.	<b>Selection of Projects</b> – A State shall not be required to select projects from illustrative projects included in the financial plan described above.
The 2015-2040 LRTP includes a discussion of <b>performance measures and performance targets.</b> This is a work in progress at ODOT and the Department is proceeding with the information available, while awaiting final federal regulations. Additional information is available in Chapter 3.	<b>Performance Based Approach</b> – The LRTP should include a description of performance measures, and performance targets used in assessing the performance of the transportation system, and a system performance report evaluating the condition and performance of the transportation system.
The 2015-2040 LRTP includes a discussion of <b>strategies to maintain and preserve the existing transportation system.</b> See Goal #2. Chapter 6 describes the existing inventory and conditions and Chapter 11 discusses policy recommendations.	<b>Existing System</b> – The LRTP should include capital, operations and management strategies, procedures, etc. to ensure the preservation and most efficient use of the existing transportation system.
The 2015-2040 LRTP development is <b>publicized through print, broadcast, and electronic media.</b> The Final Plan will be available on ODOT’s web site. These activities are detailed in Chapter 4.	<b>Publication</b> – The LRTP shall be published or otherwise made available including to the maximum extent practicable in electronically accessible formats such as the world wide web.

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### 3. PERFORMANCE MEASURES

Performance management describes a wide framework in which leaders use measureable results to support decision-making, manage their organizations, and provide accountability. Performance measures use quantitative data to gauge ODOT’s effectiveness in fulfilling one or more major elements of its overall mission. For ODOT this includes focusing on the 2015-2040 LRTP goal topics:

- safe and secure travel;
- infrastructure preservation;
- mobility choice, connectivity, and accessibility;
- economic vitality;
- environmental responsibility; and
- efficient intermodal system management/operation.

Measuring performance at ODOT is being done in a manner that is consistent with MAP-21 requirements, the goals and objectives developed as part of the 2015-2040 LRTP, and the state’s performance management framework, which is described on OkStateStat.<sup>1</sup>

OkStateStat communicates the state’s progress in achieving strategic objectives within five statewide goal areas. It is a performance management approach that allows decision makers to better assess progress over time and to provide transparency to Oklahomans. The OkStateStat initiative emphasizes alignment of financial resources to state priorities and measurable objectives.

Regularly updated reports are a part of performance management and ODOT participates in providing information to the Infrastructure subset of the Safe and Secure Communities goal

area under the state’s performance management outline.

#### 3.1. PERFORMANCE MEASURES CONTEXT

ODOT developed performance measures, as part of the 2015-2040 LRTP, which were driven strongly by three overlapping factors:

1. **Existing State Performance Measures** and consistent reporting as part of that initiative.
2. **Federal Transportation Law Defines New State Planning Process and National Performance Measures Program Requirements** – MAP-21, the federal transportation law enacted in October of 2012, includes provisions that require FHWA to establish a performance-based planning process at the state level. The law indicates that State Long Range Transportation Plans should include a description of performance measures and targets used in assessing the transportation system, and a report on the condition and performance of the system in relation to meeting the targets.

MAP-21 also includes requirements for implementation of national transportation performance measures in the following areas:

- Pavement condition on the Interstate System and on the remainder of the National Highway System (NHS);
- Performance of the Interstate System and the remainder of the NHS;
- Bridge condition on the NHS;
- Fatalities and serious injuries --both number and rate per vehicle mile traveled--on all public roads;

- On-road mobile source emissions for locations using Congestion Mitigation and Air Quality funds;
- Traffic congestion on Interstate and non-Interstate NHS; and
- Freight movement on the Interstate System.

FHWA has issued two Notices of Proposed Rule Making (NPRMs) for safety (fatalities and serious injuries) and infrastructure condition (pavement and bridges). The third NPRM is scheduled for release later this year.

3. **Industry-wide Adoption of Performance Management Practices** – Over the last decade, state transportation agencies have increasingly incorporated performance measurement and management into their planning activities, seeking to improve performance in areas that matter to the public and stakeholders.

Together, these three factors have increased ODOT leadership's interest in initiating a set of agency-wide performance measures; however, ODOT's primary concern is to develop measures that are useful and support the transportation system development in Oklahoma.

### 3.2. PERFORMANCE MEASURE DEVELOPMENT

The performance measures were developed through the following multi-step process.

- **Initial ODOT Staff Consultations (March 2014)** – The 2015-2040 LRTP team and ODOT staff discussed the overall approach and expectations for developing performance measures as part of the 2015-2040 LRTP process. In addition, performance measures were discussed at a series of kick-off meetings with ODOT staff.
- **Public Outreach (May 2014)** – Public engagement meetings held around the state provided background information on the

purpose of the 2015-2040 LRTP, proposed goals, and the performance measure development process.

- **ODOT Managers Fact Finding (June/July 2014)** – ODOT Managers who were subject matter experts on specific topics assisted with defining performance measures.

Throughout the summer of 2014, ODOT provided perspectives on potential measures that aligned with each of the following goal areas: safe and secure travel; infrastructure preservation; mobility choice, connectivity, and accessibility; economic vitality; and environmental responsibility. A total of nine interviews were conducted with 15 staff related to the following disciplines:

- Pavement;
- Freight;
- Congestion/Traffic Operations;
- Environment;
- Bridges;
- Roadway Design;
- Safety;
- Transit and Rail;
- Project Management; and
- Clean Fuels.

### 3.3. PERFORMANCE MEASURE SELECTION CRITERIA

Selecting an effective set of measures constitutes the first phase for establishing a robust performance measurement program. The set of criteria used for choosing ODOT's effective measures included the following:

- **Measures are Easy to Understand** – Good measures should be easy to understand and intuitive both to practitioners in the field and to a wider audience of stakeholders.
- **Measures are Relevant to Decision-Makers** – Good measures should help provide decision-makers with information that supports the choices and trade-offs they make on behalf of the public. This means data should be

strongly connected with goals and objectives in which decision-makers are interested.

- **Measures Minimize Additional Staff Burden** – Good measures should draw on existing data collection practices where possible, not reinvent them. The measures should ensure that any burdens imposed on staff to collect and report performance data are manageable, and that assignments are made with due consideration given to available resources.
- **Results are within ODOT’s Influence** – Good measures should track data that ODOT can influence via the array of policy, budgeting and programmatic tools at its disposal.
- **MAP-21 Consistency** – Measures developed as part of the 2015-2040 LRTP should support compliance with measures that FHWA is scheduled to announce in relation to MAP-21 implementation.

### 3.4. PERFORMANCE MEASURES

ODOT proposed one or two measures for each 2015-2040 LRTP goal, except for the system management and operation goal. While this goal is of importance to the 2015-2040 LRTP, it is more explicitly discussed in the agency’s operations-oriented plans developed at the Executive Level.

ODOT is continuing with the process of developing performance measures. As such, the preliminary identification of individual measures, rather than advanced steps for creating a program of performance management is presented in **Table 3-1**.<sup>2</sup>

These performance measures will inform decision makers involved in assessing and setting ODOT’s priorities on how well the Department’s goals and objectives are being met.

**Table 3-1. Comparison of 2015-2040 LRTP Goals and Performance Measures**

2015-2040 LRTP Goals	Recommended Performance Measures
Safe and Secure Travel	<ul style="list-style-type: none"> <li>• Reduction in traffic related fatalities and serious injuries               <ul style="list-style-type: none"> <li>– Rate and number of traffic fatalities annually on all Oklahoma public roads</li> <li>– Rate and number of traffic-related serious injuries annually on all Oklahoma public roads</li> </ul> </li> </ul>
Infrastructure Preservation	<ul style="list-style-type: none"> <li>• Bridge Condition – Number of structurally deficient bridges</li> <li>• Preservation of Pavement – Good/fair/poor condition index for NHS highways</li> </ul>
Economic Vitality	<ul style="list-style-type: none"> <li>• Freight Movement               <ul style="list-style-type: none"> <li>– Annual freight tonnage/value for truck, rail, and barge modes</li> <li>– Measure of freight travel time reliability and/or speed</li> </ul> </li> <li>• Congestion               <ul style="list-style-type: none"> <li>– Travel time-based measure(s) of congestion</li> </ul> </li> </ul>
Mobility Choice, Connectivity and Accessibility	<ul style="list-style-type: none"> <li>• Public Transit- Annual rural transit vehicle revenue miles</li> <li>• Passenger Rail - Annual ridership and on-time performance for Amtrak Heartland Flyer</li> </ul>
Environmental Responsibility	<ul style="list-style-type: none"> <li>• Clean fuels and improved air quality - Clean fuels as a share of ODOT’s total fleet fuel use in gasoline gallon equivalents</li> <li>• Reduce roadway flooding and support improved water quality - Quantity of Litter/Debris (cubic yards or other measure of weight and volume) cleared from storm drains/culverts/roadsides</li> </ul>

Source: Oklahoma Department of Transportation

### 3.5. ALIGNMENT OF PERFORMANCE MEASURES AND OKSTATESTAT REPORTING

The OKStateStat initiative covers two performance measures that relate to ODOT performance measures, and are compatible with the 2015-2040 LRTP performance measures described above. Following are targets identified by ODOT for inclusion on the OKStateStat site:

- **Structurally Deficient Bridges**<sup>3</sup> – Decrease the number of structurally deficient bridges from 556 in 2013 to 280 by 2017.
- **Road Conditions**<sup>4</sup> – Decrease the number of road lane miles in critical or inadequate condition from 3,862 in 2013 to 3,841 by 2017. The number of critical or inadequate miles decreases with improvements to curves, shoulders, and pavements.

The principal differences between the OKStateStat performance measures and the 2015-2040 LRTP performance measure recommendations are that the OKStateStat performance measures are highly focused and are for a set five-year period, while the 2015-2040 LRTP performance measures consider broader time horizons in some cases and include additional categories.

### 3.6. NEXT STEPS

ODOT has identified and recommended various performance measures through the development of the 2015-2040 LRTP. There is much work left to be done. ODOT's next effort is to identify how to measure, gather the necessary data, and analyze the data to finalize the recommended performance measures under development in **Table 3-1**. This effort will require a collaborative effort across ODOT, throughout the field divisions, and with Metropolitan Planning Organization (MPO) and other planning partners. For some performance measures, the effort is straight forward while others will take a concerted effort. ODOT will also continue to stay apprised of the

federal rule-making process for performance measures.

Addressing the recommended performance measures was among the criteria considered in identifying transportation needs for Oklahoma's transportation system (as discussed in **Chapter 9**) and in developing policy recommendations discussed in **Chapter 11**.

### 3.7. ENDNOTES

<sup>1</sup> [http://www.ok.gov/okstatestat/Safe\\_Citizens\\_ & Secure\\_Communities/index.html](http://www.ok.gov/okstatestat/Safe_Citizens_ & Secure_Communities/index.html)

<sup>2</sup> 2015-2040 LRTP Technical Memorandum Performance Measures.

<sup>3</sup> Bridges are commonly classified into three key component groupings identified as the substructure (columns, footings, pier caps, abutments), the superstructure (beams, girders, trusses) and the deck (driving surfaces, shoulders, sidewalks). A bridge is rated as structurally deficient if engineers observe significant defects or deterioration in one or more of these key components. A bridge that is classified as structurally deficient is not necessarily considered a hazardous driving situation. Bridges carry traffic over features such as other roads, rivers, lakes, and railroads. Any bridge that is structurally deficient represents a part of the transportation network that may have a detrimental impact on Oklahoma commerce, job creation, economic growth, and the safety of the traveling public.

<sup>4</sup> Each segment of highway has data collected on the features of the roadway and analyzed so that it can be rated. Highways are rated as adequate, tolerable, inadequate, or critical by considering pavement condition, alignment and various safety aspects. Deficient highways are those with either inadequate or critical ratings. A road lane mile is defined as one mile of road per lane. Deficient highways have the potential to adversely impact the safety of the traveling public and increase operating costs. Improvements to these highways could prevent property damage, personal injuries and tragic loss of life.

## 4. STAKEHOLDER OUTREACH

Public involvement was an important component in the process of developing the 2015-2040 LRTP. At the outset of this process, ODOT created a detailed Public Participation Plan (PPP) specifically for the 2015-2040 LRTP. The PPP was used in conjunction with a robust stakeholder contact list. According to the U.S. Department of Transportation's publication, *The Transportation Planning Process: Key Issues*, stakeholders are defined as individuals and organizations involved in or affected by the transportation planning process. ODOT recognizes that stakeholder input is critical in order to understand the transportation needs of Oklahoma and to develop policy recommendations to guide future investment decisions.

### 4.1. PUBLIC PARTICIPATION PLAN

The PPP presents the process and communication methods/tools for encouraging citizens, affected organizations, and other interested parties to be involved in developing the 2015-2040 LRTP. In essence, this PPP is a roadmap with the overall goal of maximizing public engagement and information by creating opportunities for stakeholders to provide input.

Federal legislation and policies, which include the following, guided the development of the PPP:

- MAP-21 requires formal documentation of the public involvement process used for statewide planning. The Public Participation Plan is the formal documentation required by federal law, and it provides procedures that are inclusive, timely, and complete.
- Title VI of the 1964 Civil Rights Act provides that "no person shall on the grounds of race, color or national origin, be excluded from participation in, be denied the benefit of, or be subjected to discrimination under any program or activity receiving federal financial assistance."<sup>1</sup> ODOT complies with Title VI and provided open and inclusive access to transportation decision-making for all persons through the 2015-2040 LRTP public involvement process. Additionally, ODOT reached out to the Native American population by notifying representatives of the Tribal governments in Oklahoma of the Plan development process.
- The Executive Order on Environmental Justice states that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations."<sup>2</sup> ODOT complied with this executive order by providing opportunities for participation in the LRTP public involvement process for all people.
- The Americans with Disabilities Act of 1990 specifies sites for public participation activities and the information presented must be accessible to persons with disabilities. ODOT holds all public meetings at ADA-accessible locations; and with advance notice, the Department will make special provisions for hearing or vision impaired individuals. In addition, ODOT's 2015-2040 LRTP web site is ADA-compliant and ODOT will provide written materials in alternative formats upon request.
- The Executive Order on Limited English Proficiency requires that recipients of federal financial funds ensure that programs and activities normally provided in English are accessible to persons with limited English proficiency. If requested or needed by the public, all meeting materials, documents and other communications may be translated by ODOT into other languages. Arrangements may be made for provision of interpretation

services so that information is accessible to all people including non-English-speaking populations. A brochure explaining the purpose of state and regional Long Range Transportation Plans, the proposed 2015-2040 LRTP goals, and public involvement opportunities was made available at the public meetings and on the project web site. The brochure was prepared in English, Spanish, and Vietnamese in accordance with ODOT’s Limited English Proficiency language assistance plan.

The 2015-2040 LRTP’s PPP is consistent with ODOT’s PPP, which meets the federal requirements for statewide planning as outlined in MAP-21.

## 4.2. COMMUNICATION METHODS/ TOOLS

ODOT conducted a variety of public engagement activities during the 2015-2040 LRTP process with the purpose of reaching a diverse audience of individual stakeholders and partner agencies. The public outreach methods used throughout the LRTP process, included convening three Advisory Committees, hosting public meetings, utilizing educational videos and social media feeds, and sponsoring the project web site.



#### 4.2.1. Stakeholder Identification

The public participation process involved early identification of stakeholders. ODOT developed and maintained an electronic database of contacts and a related email distribution list. The stakeholder list includes but is not limited to individuals in the following groups:

- state and federal agencies responsible for aviation, conservation, commerce, environmental quality, public safety, and transportation;
- state legislators;
- county commissioners;
- MPOs;
- rural councils of government;
- tribal transportation directors;
- city managers;
- transit providers;
- freight associations; and
- public libraries.

In addition, over 600 other persons are on the stakeholder list. The database can be appended with new names at any time at the request of an interested party. Approximately 140 people signed in during the 2015-2040 LRTP process.

#### 4.2.2. Planning Partners

At the outset of the 2015-2040 LRTP planning process, ODOT hosted a briefing meeting with local FHWA and MPO staff. At the time of goals development and needs identification, the MPOs were again contacted for their input. When interim products related to freight planning and congestion management were made available ODOT invited the MPOs to review and comment.

The MPOs are also in the process of developing their own long range transportation plans, and ODOT participates in their routine and special plan committee processes as well. Representatives of FHWA and the MPOs were also invited to participate in the 2015-2040 LRTP Advisory Committees.

#### 4.2.3. Advisory Committee Meetings

ODOT identified and invited participants to serve on three Advisory Committees, with each committee meeting twice to provide input toward the development of the 2015-2040 LRTP. The three committees were as follows: Tribal Advisory Committee, Personal Travel Advisory Committee, and Freight Advisory Committee. **Table 4-1** through **Table 4-3** show a list of the participants by committee.

**Table 4-1. Tribal Advisory Committee**

Advisory Committee Member	Company or Entity Name
Milton Sovo	Caddo Nation
Robert Endicott	Cherokee Nation
Angel Blind	Cheyenne & Arapaho
James Battese	Miami Tribe
Jennifer Ann Varao	Osage Nation
Richard McCulley	Seminole Nation
Denea White	Seminole Nation
Rhonda Fair	ODOT Environmental Programs, Cultural Resources
Jay Adams	ODOT Tribal Programs

**Table 4-2. Personal Travel Advisory Committee**

Advisory Committee Member	Company or Entity Name
David Batson	Airport Express
Chuck Mai	American Automobile Association - Oklahoma
Mark Magliari	AMTRAK
Lan Truong	Asian Chamber of Oklahoma
Holly Massie	Association of Central Oklahoma Governments (ACOG)
Peter Seikel	Central Oklahoma Economic Development District (COEDD)
Elizabeth Romero	Federal Highway Administration
Derek Sparks	Greater Oklahoma City Chamber of Commerce
Evan Burak	Greyhound
Don Hummer	Heartland Flyer Passenger Rail Coalition
Viplav Putta	Indian Nations Council of Governments (INCOG)
Bonnie Buchanan	Jefferson Bus Lines
Rubin Aragon	Latino Community Development Agency
Jeannie McMillan	Little Dixie Transit - Little Dixie Community Action Agency
Lauren Branch	Oklahoma Alliance for Public Transportation
Jason Ferbrache	Oklahoma City Transit - EMBARK
Valerie Thompson	Oklahoma City Urban League
Mark Jones	Oklahoma Department of Human Services
Bonnie Winslow	Oklahoma Department of Human Services
Jean Jones	Oklahoma Department of Rehabilitation Services
Garry Thomas	Oklahoma Highway Safety Office
Andy Huddleston	Oklahoma Motorcycle Riders Foundation
Bill Cartwright	(Metropolitan) Tulsa Transit Authority
Donald Tyler	Tulsa Urban League
Karleene Smith	University of Oklahoma - Norman Transit Services (CART)
Sharlotte Key	Washita Valley Transit-WV Community Action Council

**Table 4-3. Freight Advisory Committee**

Advisory Committee Member	Company or Entity Name
Darla Hugaboom	Association of Central Oklahoma Governments (ACOG)
French Thompson	BNSF
John Caldwell	Chesapeake Energy
Kermit Frank	Dolese Brothers Company
Richard Jurey	Federal Highway Administration
Larry Ramsey	Federal Motor Carrier Safety Association
Julie Miner	Indian Nations Council of Governments (INCOG)
David McCorkle	McCorkle Truck Lines
Jim Rodriguez	Oklahoma Aggregates Association
Michael Kelsey	Oklahoma Cattlemen's Association
Patricia Franz	Oklahoma Corporation Commission
Martin Roberts	Oklahoma Department of Commerce
Lt. Ron Jenkins	Oklahoma Highway Patrol
Lori Peterson	Oklahoma Railroad Association
Maressa Treat	Oklahoma State Chamber of Commerce
Dan Case	Oklahoma Trucking Association
Tim Stewart	Oklahoma Turnpike Authority
Scott Robinson	Port of Muskogee
Pat Foster	Stillwater Central (WATCO)
Cathy Scheirman	Tinker Air Force Base
Jeff Mulder	Tulsa International Airport
David Yarbrough	Tulsa Port of Catoosa
D. Shane Charlson	U.S. Army Corps of Engineers
John Westbrook	U.S. Army Field Artillery School, Ft. Sill
Scott Keith	Will Rogers World Airport

**First Round of Advisory Committees**

The Personal Travel Advisory Committee met on June 10, 2014 and the Freight Travel Advisory Committee met on June 11, 2014. The Tribal Transportation Advisory Committee met on July 17, 2014. The committees discussed existing conditions, planning issues, goals, objectives, and performance measures. Regarding planning issues, they participated in an exercise where they identified important transportation issues for the next 25 years in Oklahoma (see **Table 4-4**). In addition, each committee agreed that the proposed Plan goals were acceptable to use in the 2015-2040 LRTP.



**Table 4-4. Important Transportation Planning Issues to Address in 2015-2040 LRTP**

Topic	Transportation Planning Issue
Accessibility	<ul style="list-style-type: none"> <li>• Bridge access for bikes</li> <li>• Improving access to secondary roads and State Highway System</li> <li>• Safer pedestrian facilities – on cross streets for community accessibility</li> <li>• Wheel chair accessible ramps</li> </ul>
Commerce/Economy	<ul style="list-style-type: none"> <li>• Freight Impact on communities</li> <li>• Increased demand for Fulfillment (warehouse and shipping) Centers</li> <li>• International trade impact – imports and exports</li> <li>• Panama Canal expansion</li> </ul>
Congestion	<ul style="list-style-type: none"> <li>• Congestion of freight rail and truck transport at/near ports</li> <li>• Address congestion/too many cars by increasing passenger rail service</li> <li>• Urbanization of population</li> </ul>
Environmental Concern	<ul style="list-style-type: none"> <li>• Encourage use of more environmentally friendly transportation options</li> </ul>
Equity	<ul style="list-style-type: none"> <li>• What’s (transportation improvement) important to whom?</li> </ul>
Freight	<ul style="list-style-type: none"> <li>• Lack of truck drivers, truck weight restrictions</li> <li>• Get more trucks off the road by implementing a better freight rail system</li> </ul>
Funding and Finance	<ul style="list-style-type: none"> <li>• Less fuel tax revenue due to efficient vehicles</li> </ul>
Governance	<ul style="list-style-type: none"> <li>• Federal vs. local infrastructure</li> <li>• Leadership and local issues</li> </ul>
Maintenance and Preservation of the System	<ul style="list-style-type: none"> <li>• Better maintenance of existing transportation facilities – longer lasting, more durable repairs</li> <li>• Bridges – structurally deficient</li> <li>• Deteriorating infrastructure</li> <li>• Maintenance of right-of-way</li> </ul>
Modal Choice/Mode Connections	<ul style="list-style-type: none"> <li>• High speed passenger rail</li> <li>• Intermodal service in Oklahoma</li> <li>• More adequate transportation hubs</li> <li>• Safe connections between modes</li> </ul>
Public Transit	<ul style="list-style-type: none"> <li>• Difficult for rural transit to move to alternative fuels, inadequate stations and/or infrastructure</li> <li>• Reliability of public transit for rural areas</li> </ul>
Research, Technology and Innovation	<ul style="list-style-type: none"> <li>• Deployment of technology</li> </ul>
Safety	<ul style="list-style-type: none"> <li>• Distracted driving</li> <li>• Ease transitions between highway segments and bridges for motorcycle safety</li> <li>• Increase in injuries due to congestion</li> <li>• Pedestrian safety</li> <li>• Safe access to entry points to transit, sidewalks</li> <li>• Safety - texting while driving</li> </ul>

## Second Round of Advisory Committees

The Personal Travel, Freight and Tribal Transportation Advisory Committees met again in November 2014. The committees were provided with a status report on public comments, performance measures, demographics, congestion analysis, modal needs, and baseline revenue projections. The committees gave input on policy considerations relating to the various modes of travel.

### 4.2.4. Public Meetings

Two rounds of open house public meetings were conducted during the development of the 2015-2040 LRTP. These meetings served to provide information to the public about the study through display boards and other materials, and through opportunities for dialogue with ODOT staff and consultants. Feedback was received through verbal comments, comment cards, or via the project web site.



Both rounds of public meetings were promoted through placing a legal notice in statewide newspapers and providing a press release to over 400 media contacts including industry partners, transportation groups, and federal state and local agencies. The media coverage is provided to weekly and daily newspapers, radio and television stations. Stakeholders received a “save the date” email and meeting notice. Additionally, social media outlets such as Twitter were used to promote public meetings.

### June 2014 Open Houses

The first round of meetings was held in Muskogee, Moore, and Clinton, Oklahoma on June 10, 11, and 12, 2014, respectively. Each public meeting was set up with five stations describing project background and introduction, draft goals and objectives, performance measures, an inventory of the existing transportation, and options for public involvement. A total of 44 people attended these meetings, and 20 comment cards were received.

A total of 53 comments were received through the project web site. One letter and five comments were received by email. Each attendee was asked to identify his/her top five transportation issues looking toward the year 2040. An exhibit board with several issues listed was used to record their choices. The top three transportation issues selected, in order, were:

1. Highway Safety;
2. Shoulders on Rural Roads; and
3. Passenger Rail.

The comment cards revealed that there was a high level of agreement with the proposed 2015-2040 LRTP goals. The following goals were identified as *most important*:

- Infrastructure Preservation;
- Mobility Choice, Connectivity and Accessibility; and
- Economic Vitality

The remaining goals were rated as *important* to the 2015-2040 LRTP planning process, as follows.

- Safe and Secure Travel;
- Environmental Responsibility; and
- Efficient Intermodal System Management and Operation.

Additionally, attendees identified numerous other issues as important to consider while developing the 2015-2040 LRTP.

### November 2014 Open Houses

The second round of meetings was held again in Muskogee, Clinton, and Moore, Oklahoma on November 17, 18, and 19, 2014, respectively. Each public meeting was set up with five stations where the following information was available: 2015-2040 LRTP progress report, goals and performance measures, modal needs, baseline revenue forecast, and options for public engagement. A total of 34 people attended these meetings, and 24 comment cards were received at the meetings along with eight more through the project web site.

The comments cards provided feedback on the following questions, with the top three answers listed in hierarchy from highest to lowest preference.

- *Why is transportation important to you?*
  - Helps economic development
  - Moves people and goods safely
  - Supports existing businesses
- *Think of yourself and where you might be in 25 years. What transportation functions will be most important to you when you are 25 years older than you are today?*
  - Transportation that gets me to work and/or vital services
  - Transportation that moves people and goods safely
  - Transportation that helps economic development
- *Given the current reality of funding, what revenue strategies would best support Oklahoma's transportation needs?*
  - Reduce other government expenditures to generate additional transportation funding
  - Increase state transportation taxes
  - Increase federal transportation taxes

- *Based on the review of the needs described on the boards, what are your priorities for the next 25 years?*
  - Highway and bridge improvements
  - Bicycle and pedestrian ways
  - Rural transit services

### 4.2.5. Project Web Site

ODOT set up a project web site to provide access to current project information for 24 hours a day, 7 days a week (**Figure 4-1**). The web site was activated on June 1, 2014. The web site address is [www.oklongrangeplan.org](http://www.oklongrangeplan.org), and it is linked to ODOT's main web site. The web site content consisted of background information, project goals and objectives, project status reports, project schedule information, FAQs, contact information, information regarding future public meetings, and public meeting summaries and materials.

The project web site was promoted through press releases to the media, as well as online through social media releases (Twitter only) that pushed the news out to appropriate internet and social media outlets. Other promotional efforts included eBlasts to stakeholders at several interim points during the Plan development process, and providing informational materials at other transportation-related events being conducted throughout the state.

The web site provided users with an opportunity to add their names to the notification list or submit comments to the project team. More than one hundred users requested notifications regarding the 2015-2040 LRTP. From the launch of the web site to date, more than 13,000 page views were recorded. By the end of March 2015, a total of 66 online comments were recorded (web site and email).

Figure 4-1. 2015-2040 Long Range Transportation Plan Web Site



#### 4.2.6. Draft Plan and Document Distribution

ODOT held a public comment period following the availability of the Draft 2015-2040 LRTP document in early Summer 2015. During this time period, the 2015-2040 LRTP document was available on the project web site. Stakeholders, including all public libraries in the state, were advised of its availability. Following the public comment period, ODOT summarized the comments and provided the summary along with the document to the Oklahoma Transportation Commission for approval. The 2015-2040 LRTP document is available on the Department’s web site, at the State Library, and at ODOT.

#### 4.3. ENDNOTES

- <sup>1</sup> *United States Congress, 1964.*
- <sup>2</sup> *United States Executive Office, 1994.*

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## 5. DEMOGRAPHICS, SOCIOECONOMIC, AND LAND USE DATA

Information on demographics, socioeconomics, and land use was important in building the foundation for the 2015-2040 LRTP.

Understanding the users of the transportation system and their mobility needs can help inform public policy as it relates to the delivery of transportation projects and services.

Oklahoma’s communities are dynamic places, constantly changing and evolving to meet the needs of our 21<sup>st</sup> century economy. This chapter

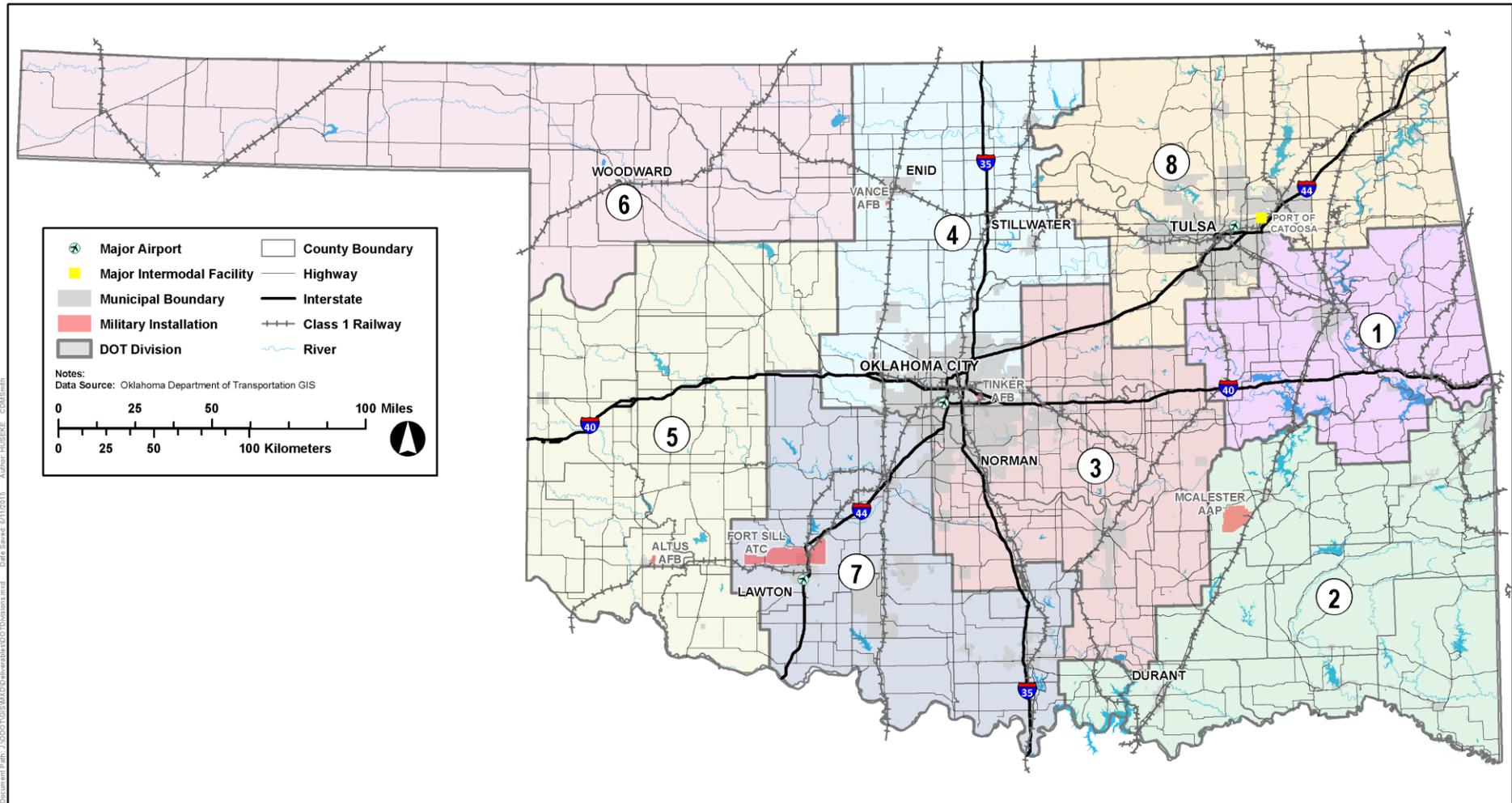
identifies and examines demographic, socioeconomic, and land use trends and implications to inform the transportation planning process.

Oklahoma is organized into 77 counties (**Figure 5-1**) and eight ODOT field divisions (**Figure 5-2**). Demographic and socioeconomic characteristics, trends, and analysis are organized into these geographic units.

**Figure 5-1. Oklahoma Counties by ODOT Division**

<b>Division 1</b>	•Adair, Cherokee, Haskell, McIntosh, Muskogee, Okmulgee, Sequoyah, Wagoner
<b>Division 2</b>	•Atoka, Bryan, Choctaw, Latimer, Le Flore, McCurtain, Marshall, Pittsburgh, Pushmataha
<b>Division 3</b>	•Cleveland, Coal, Garvin, Hughes, Johnston, Lincoln, McClain, Okfuskee, Pontotoc, Pottawatomie, Seminole
<b>Division 4</b>	•Canadian, Garfield, Grant, Kay, Kingfisher, Logan, Noble, Oklahoma, Payne
<b>Division 5</b>	•Beckham, Blaine, Custer, Dewey, Greer, Harmon, Jackson, Kiowa, Roger Mills, Tillman, Washita
<b>Division 6</b>	•Alfalfa, Beaver, Cimarron, Ellis, Harper, Major, Texas, Woods, Woodward
<b>Division 7</b>	•Caddo, Carter, Comanche, Cotton, Grady, Jefferson, Love, Murray, Stephens
<b>Division 8</b>	•Craig, Creek, Delaware, Mayes, Nowata, Osage, Ottawa, Pawnee, Rogers, Tulsa, Washington

Figure 5-2. ODOT Divisions



Source: CDM Smith Inc. and Oklahoma Department of Transportation

## 5.1. DEMOGRAPHICS

This section summarizes trends in Oklahoma’s population, as well as specific demographic trends that directly affect travel demand.

### 5.1.1. Population Trends

According to the 2010 Census, Oklahoma had just over 3.7 million residents. Annual estimates from the Census indicate that the state’s total population is continuing to grow, to a 2015 total of over 3.9 million.

**Table 5-1** depicts estimates of Oklahoma’s resident population for several years since the 2010 decennial census. The state has experienced moderate growth each year, with an increase averaging over 33,000 annually. Oklahoma is the 28<sup>th</sup> most populous state in the nation, a ranking it has maintained since the 1990 decennial census. **Figure 5-3** illustrates the population change by county between the 2000 and 2010 decennial census. Rogers and Wagoner Counties located to the east of Tulsa have grown the fastest in Oklahoma with a population change of greater than 10,000 people. Payne, Logan, McClain, Grady, and Comanche Counties, which surround Oklahoma City, have experienced a population increase between 5,000 and 10,000 people. This is related to shifts of population from rural to urban counties.

Data from the long-term county economic and demographic projections firm of Woods and Poole Inc. (2014) projects the state’s future

population as reaching 4.5 million persons in 2040. This represents an increase of 813,482 (21.7 percent) from the 2010 Census. A 2012 study conducted by the Oklahoma Department of Commerce indicated that the state’s total population is expected to exceed 5 million by the time the state celebrates its 150<sup>th</sup> year of statehood in 2057.

**Figure 5-4** illustrates historical population from 1990 and projections through 2040.

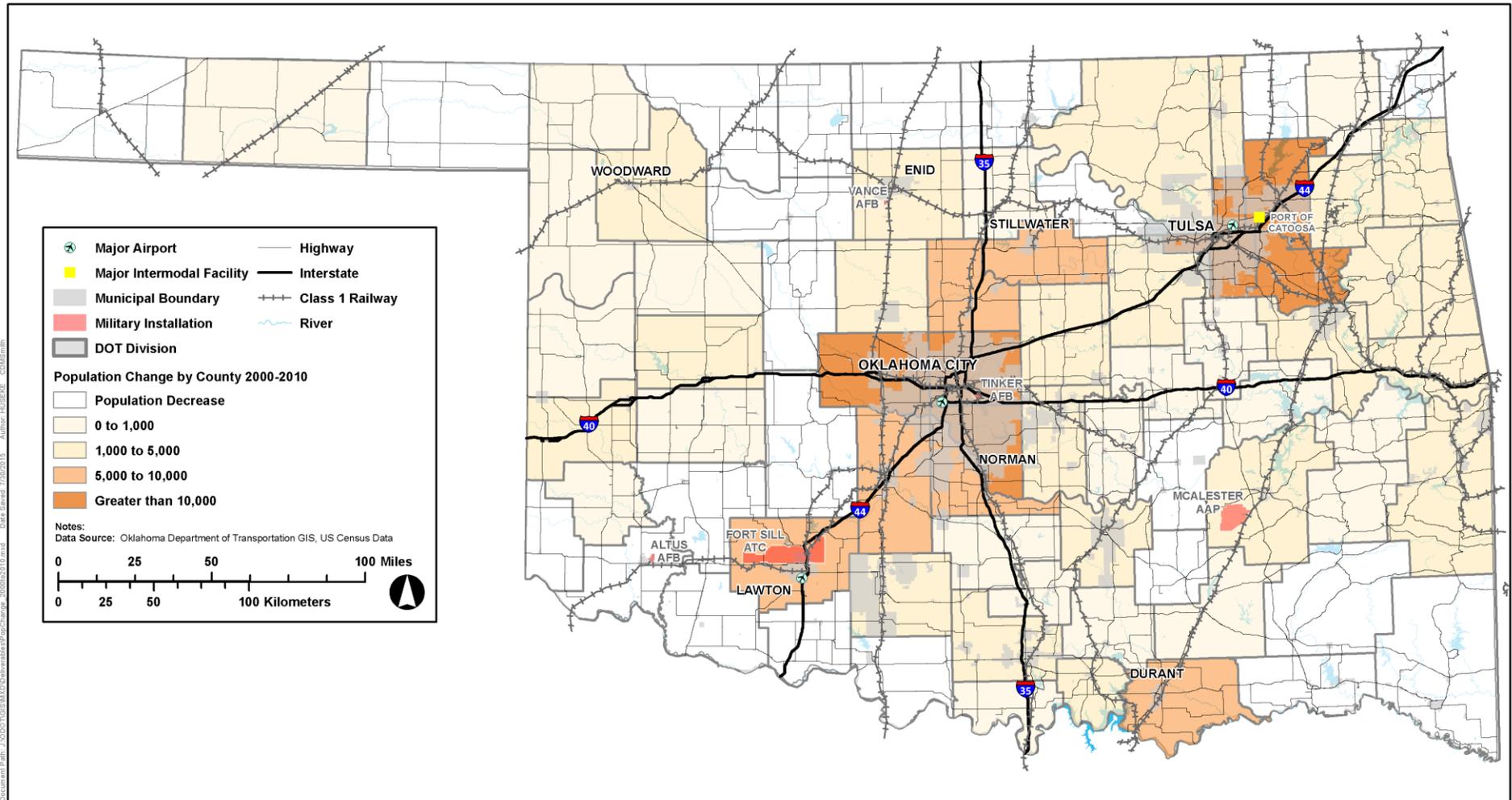
Population trends were also compared for each ODOT Division. Total population varies widely across the state and by ODOT Division. Over half of the state’s population resides in Divisions 4 and 8, which include the two heavily populated Metropolitan Statistical Areas (MSAs), Oklahoma City and Tulsa, respectively. However, the fastest-growing ODOT Divisions include Division 1 (east central Oklahoma) and Division 4 (north central Oklahoma). Division 6 (northwest Oklahoma) is expected to exhibit slow growth, while Division 5 (west central Oklahoma) is the only ODOT division expected to lose population through the plan horizon year. The major reason for population loss in the area that has been documented is the 2010 closure of a private correctional facility with a capacity of 2,000 inmates.<sup>1</sup> **Table 5-2** and **Figure 5-5** provide additional ODOT Division population change information.

**Table 5-1. Oklahoma Population Count, 2010 and Population Estimates, 2011-2015**

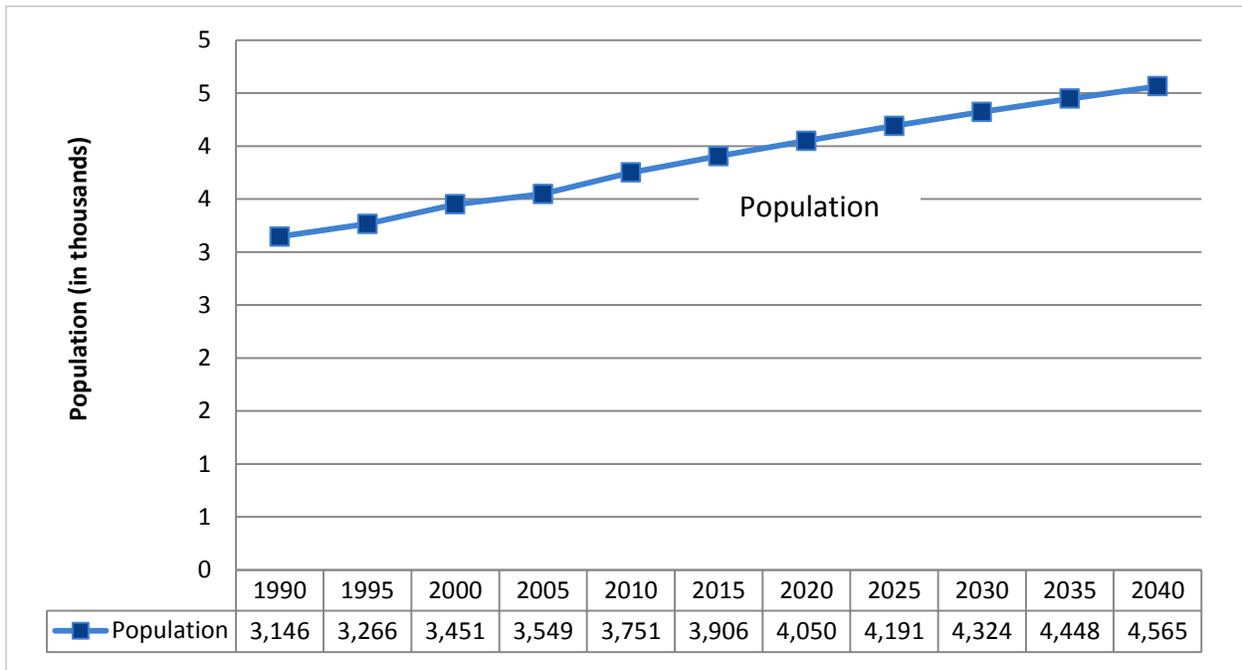
	Census 2010	July 1 Estimates		
		2011	2012	2015
Oklahoma	3,751,351	3,785,534	3,815,780	3,906,010

Source: U.S. Census Bureau

Figure 5-3. Population Change by County, 2000 to 2010



Source: U.S. Census Bureau

**Figure 5-4. Historic and Projected Oklahoma Population, 1990 to 2040**


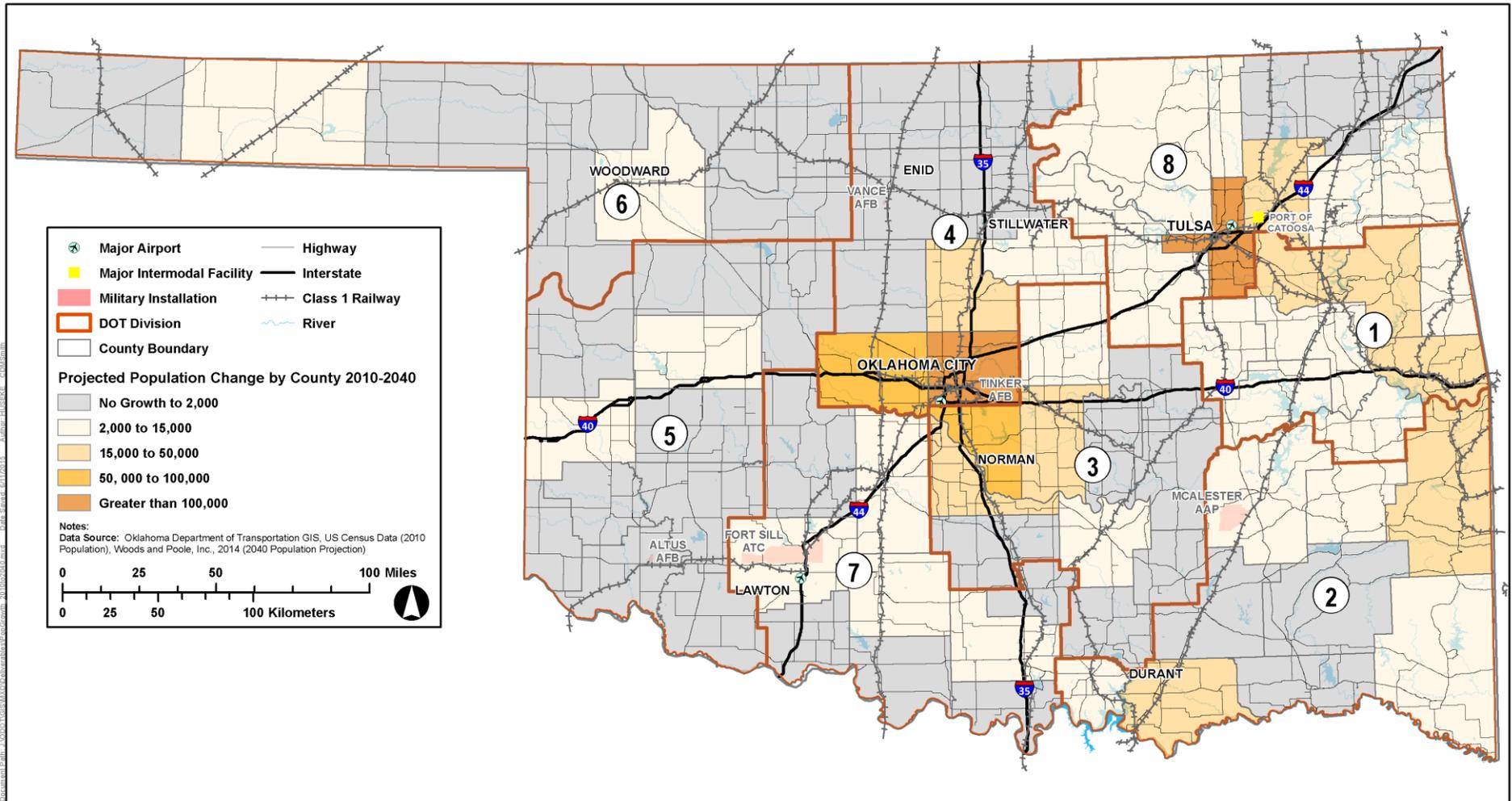
Source: Year 1990 – 2010, Census counts or estimates, U.S. Census Bureau; Year 2015-2040 projections, Woods and Poole Inc., 2014

**Table 5-2. Historic and Projected Population by ODOT Division, 2000 to 2040**

ODOT Division	Total Population					Change, 2010-2040
	2000	2010	2012	2015	2040	
Division 1	300,406	329,226	330,318	342,830	415,071	26.1%
Division 2	227,762	239,741	238,966	247,780	287,611	20.0%
Division 3	463,116	527,602	539,943	555,090	678,669	22.3%
Division 4	986,633	1,091,636	1,125,127	1,147,960	1,372,273	25.7%
Division 5	134,901	134,662	134,038	133,340	131,467	(2.4%)
Division 6	77,974	78,715	80,174	80,330	83,950	6.7%
Division 7	314,351	334,310	337,939	343,170	368,444	10.2%
Division 8	945,511	1,015,459	1,029,275	1,055,510	1,227,348	20.9%
<b>State</b>	<b>3,450,654</b>	<b>3,751,351</b>	<b>3,815,780</b>	<b>3,906,010</b>	<b>4,564,833</b>	<b>21.7%</b>

Source: Year 2000, 2010, 2012 historic counts or estimates, U.S. Census Bureau; Year 2015-2040 projections, Woods and Poole, Inc., 2014

Figure 5-5. Forecasted Population Change by County/ODOT Division, 2010-2040



Source: U.S. Census Bureau and Woods and Poole Inc., 2014

### 5.1.2. Race and Ethnicity

Oklahoma remains largely a homogeneous state, with 72.2 percent of its total population registered as White. It has been diversifying in recent years, as minority populations are growing as a share of total population. For example, since the turn of the century, Oklahoma's total Hispanic population has soared, increasing by 85 percent to 332,007 persons. This growth increased Hispanics' state population share from 5.2 percent in 2000 to 8.9 percent in 2010. American Indian is the state's third-largest demographic group, at 8.6 percent, followed closely by African Americans, at 7.4 percent.

Environmental Justice is an important part of the state's planning program in ensuring that the benefits and burdens of proposed transportation projects are equally distributed.<sup>2</sup> While the 2015-2040 L RTP identifies environmental justice populations at a programmatic level, it acknowledges that the transportation needs of all population groups must be considered on a project-by-project basis.

### 5.1.3. Age Distribution

Even as Oklahoma continues to grow and add to its total population, the composition of its population is also changing. This has significant implications for the delivery of transportation services. According to estimates from Woods and Poole Inc., the state's senior population (those aged 65+) is expected to increase by 266,000 persons – or just over 52 percent – from 2010 to 2040. This demographic change will affect the state's transportation system, as seniors rarely perform the basic home-to-work travel patterns and often have mobility restrictions that make travel more complicated. Some of the more common restrictions seniors encounter that affect their mobility include increased reaction time, loss of visual and hearing abilities, and decreased cognitive function.

The state's share of senior population is expected to grow from 13.5 percent currently, to approximately 17 percent in 2040. In 2010, the first of the baby boomer generation turned 65. While age 65 is an accepted marker for more physiological changes affecting vision, hearing, reaction times, and other functions critical to driving ability, for some people the decline of important functions can begin at an even earlier age as noted in a number of recent studies.

With more than one in six Oklahomans forecasted to be over the age of 65 by 2040, the state needs to begin preparing now for providing a transportation system that is more responsive to the needs of this growing demographic group. Such changes will require a transportation system that is more user-friendly, intuitive, and safe. Transportation improvements that benefit the state's senior population will benefit all users of the system. Transportation is the link between home and community. It connects people of all ages and socioeconomic status to the places where they can work, go to school, shop, or get medical attention -- their most basic needs.

The share of the state's "dependent population" (i.e., those age 18 or less, and those over age 65) is 38.2 percent. This demographic group is expected to increase to 42.2 percent of the state's total population by 2040. These individuals, for example, are more dependent on forms of transportation, such as bicycling, walking, and public transit.

## 5.2. EMPLOYMENT, INCOME, AND COMMUTING

This subsection documents the historic and projected employment trends for Oklahoma as a whole as well as by ODOT Division. Statewide employment has been trending upward at a steady rate. Employment is projected to reach over 2.2 million jobs in 2015, an increase of 12 percent (or 245,000 jobs) over the last ten years. In 2013, Oklahoma’s jobless rate was the 11<sup>th</sup> lowest in the nation. This section also documents additional socioeconomic factors such as income and commuting trends.

### 5.2.1. Historic and Projected Statewide Employment

**Figure 5-6** illustrates the historic and projected employment from 2000 to 2040. Overall employment in Oklahoma in 2010 was approximately 2.1 million. From 2000 to 2010, the state saw a total increase in jobs of 6.6

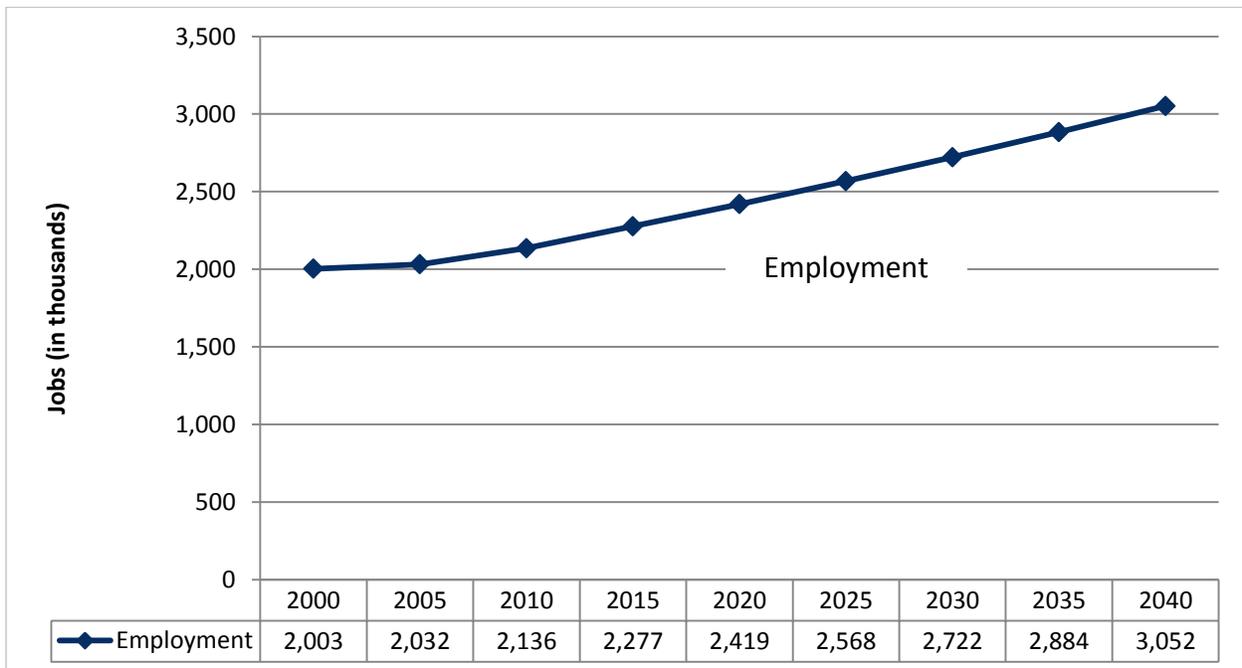
percent, or approximately 0.6 percent growth annually. By 2040, employment is projected to be over 3 million, which is 42.8 percent higher than 2010.

Total employment varies widely across the state and by ODOT Division. Over half of the state’s employment is located in Divisions 4 and 8, which include the largest two metropolitan areas, Oklahoma City and Tulsa, respectively.

By 2040, the fastest-growing employment by ODOT Division is projected to be Division 4 at 48.3 percent. Projections for the second and third fastest-growing employment by ODOT Division are Division 2 (southeast Oklahoma) at 43.1 percent and Division 8 at 42.5 percent.

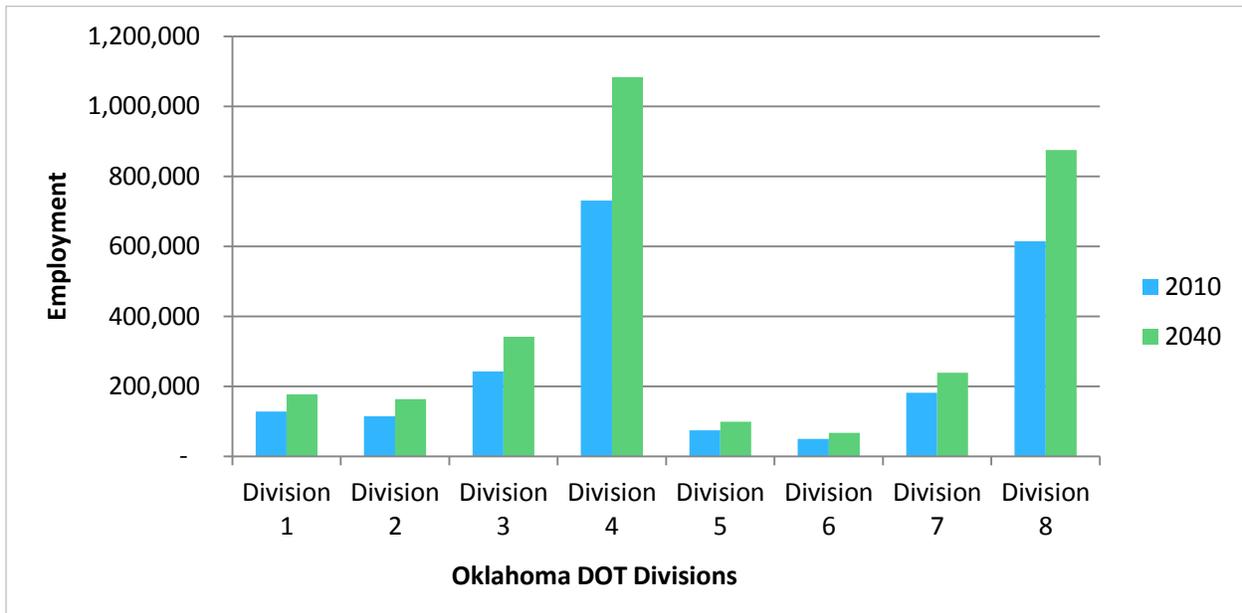
**Figure 5-7** illustrates the projected employment change by ODOT Division. Areas with higher employment provide an indicator of where transportation improvements may be most needed in the future.

**Figure 5-6. Historic and Projected Employment in Oklahoma, 2000 to 2040**



Year 2000, 2005, 2010 historic employment; Year 2015-2040 projected employment  
 Source: Woods and Poole Inc., 2014

Figure 5-7. Change in Employment by Oklahoma DOT Division, 2010 and 2040



Source: Woods and Poole Inc., 2014

### 5.2.2. Unemployment Rate

The unemployment rate measures the percentage of people who are without work and is calculated by dividing the estimated number of unemployed people by the civilian labor force. The result expresses unemployment as a percentage of the labor force.

Oklahoma’s annual average unemployment rate decreased to 4.5 percent in 2014. This rate tied with Kansas for the 11th-lowest employment rate among all states. Oklahoma’s jobless rate declined in December 2014 to the lowest level since the onset of the state’s last recession in 2008-2009.

Figure 5-8 illustrates the U.S. unemployment rate compared to that of Oklahoma from January 2005 to January 2015. Throughout this 10-year period, Oklahoma’s rate has been lower than the U.S. rate.

### 5.2.3. Industry Employment Projections, 2012 to 2022

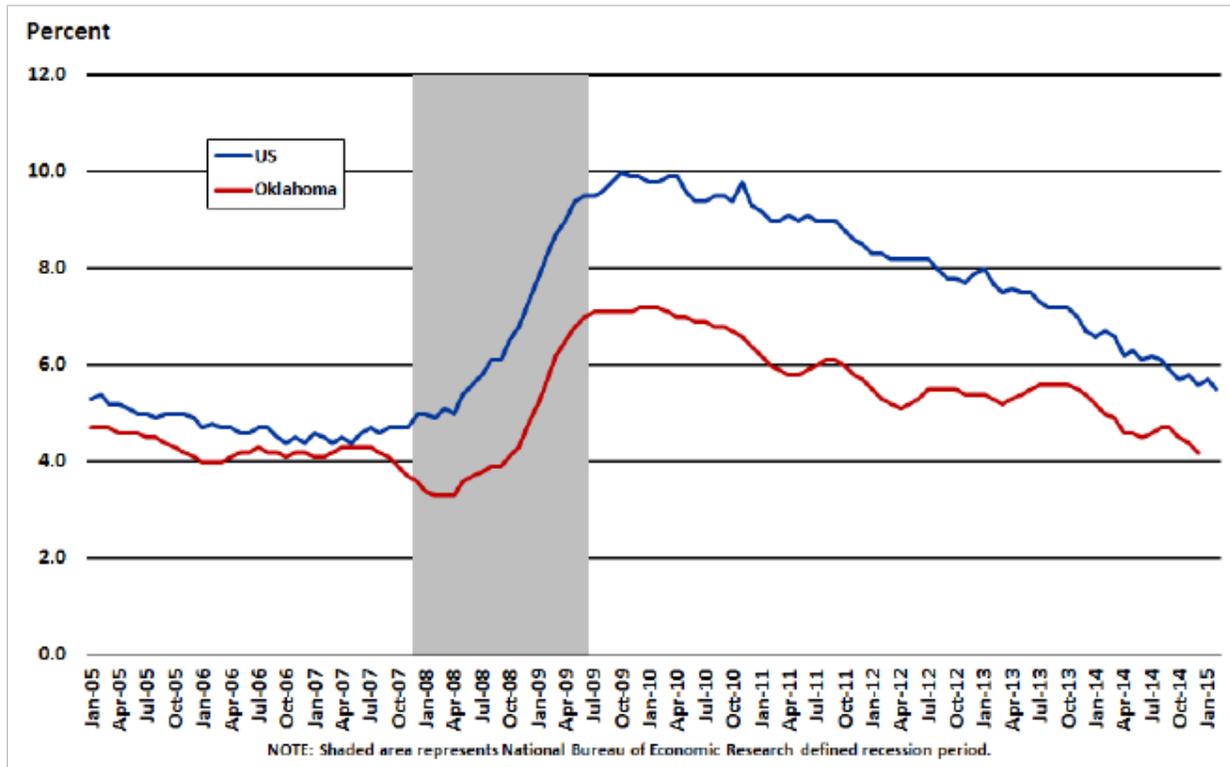
Industry employment projections are produced by the Oklahoma Employment Security

Commission every other year. Long-term industry employment projections help transportation decision-makers understand the types of industry that are depending on the transportation system, and how those industry needs may impact future transportation demand. Figure 5-9 illustrates forecasted industry employment projections from 2012 to 2022.

According to the Oklahoma Economics Indicator report, employment in Oklahoma is expected to grow by 10 percent by 2022 and add 175,070 jobs to the state's economy. All but one of Oklahoma's major industry sectors (information) are projected to grow by 2022.

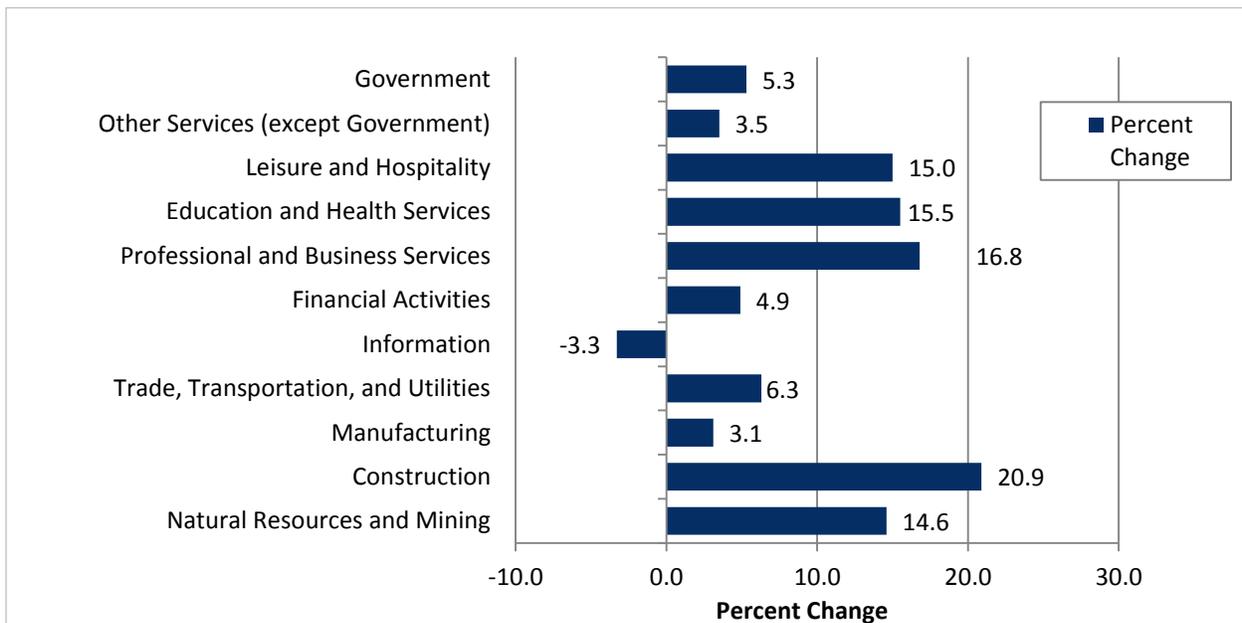
The construction industry is forecasted to have the largest increase in employment by 2022, at almost 21 percent. Employment growth in the natural resources and mining sector follows closely adding 11,010 jobs from 2012 to 2022. Manufacturing employment is expected to grow more slowly, at a rate of 3.1 percent, adding 4,150 jobs. The information sector is forecasted to lose jobs at a rate of 3.3 percent by 2022.

Figure 5-8. U.S. and Oklahoma Unemployment Rate (Seasonally Adjusted)



Source: U.S. Department of Labor, Bureau of Labor Statistics; Oklahoma Economic Indicators, Oklahoma Employment Security Commission and Economic Research and Analysis Division.

Figure 5-9. Oklahoma Long-Term Industry Employment Projections, 2012 to 2022



Source: Current Employment Statistics (CES); U.S. Department of Labor, Bureau of Labor Statistics; Oklahoma Economic Indicators report.

### 5.2.4. Commuting Patterns

The average travel time to work for Oklahoma workers is 21 minutes. Over 80 percent of the population that commutes to work drives alone, according to recent Census data. Those who drive alone to work average 20 minutes per commute; those who carpool average 24.5 minutes per commute, and those who use public transportation average 36.4 minutes per commute. **Table 5-3** shows that over 14.3 percent of all workers use an alternative mode of transportation to work: carpooling, public transit, walking, biking, telecommuting or another means. Those with a disability are more likely to use an alternative mode of travel than to drive alone, as compared to the overall population. Travel to work characteristics naturally vary by county and

by ODOT Division. A useful view of travel time involves the percentage of workers commuting less than 20 minutes and the percentage commuting more than 60 minutes. These capture the nominal, as well as the more arduous (or “extreme”) commutes.

Approximately 54 percent of the state’s workers arrive at work in less than 20 minutes. However, the number of what has been termed as “extreme commutes” constitutes over 4.4 percent of Oklahoma work trips. Divisions 1 and 5 (eastern and southwest Oklahoma) have the highest share of journey to work trips that are over an hour in length, while Division 2 in far southeast Oklahoma has the state’s highest share of workers leaving the state for employment, as shown in **Table 5-4**.

**Table 5-3. Oklahoma Worker Commute by Mode and Travel Time, 2012**

Commuting To Work	Total Population	With a Disability
<b>Workers 16 years and over</b>	1,682,277	122,517
Car, truck, or van - drove alone	82.3%	75.7%
Car, truck, or van - carpooled	10.4%	13.1%
Public transportation (excluding taxicab)	0.4%	0.8%
Walked	2.0%	3.0%
Other means	1.5%	2.7%
Worked at home	3.3%	4.7%
<b>Mean travel time to work (minutes)</b>	21.1	
Car, truck, or van - drove alone*	20.0	
Car, truck, or van – carpooled*	24.5	
Public transportation (excluding taxicab)*	36.4	

Source: U.S. Census Bureau, 2012 American Community Survey, Table S0201, S1811

\*2009 American Community Survey, Table S0802

**Table 5-4. Oklahoma Division Travel to Work Characteristics, 2008-2012**

ODOT Division	Percent Commuting Less than 20 Minutes	Percent Commuting 60+ Minutes	Percent Employed Out of State
Division 1	47.8%	7.0%	7.1%
Division 2	56.7%	6.2%	11.3%
Division 3	49.7%	5.7%	1.0%
Division 4	53.9%	3.1%	1.1%
Division 5	67.7%	7.2%	2.4%
Division 6	69.6%	5.0%	7.7%
Division 7	60.9%	4.3%	1.9%
Division 8	51.4%	3.7%	2.4%
State	53.7%	4.4%	2.7%

Source: U.S. Census Bureau, 2012 American Community Survey, Table B08130

According to the U.S. Census, 2012 American Community Survey, a majority of Oklahoma’s resident workers (nearly three-quarters) are employed within their county of residence. Conversely, over a quarter travel to destinations outside of their home county for employment, underscoring the importance of transportation to sustaining the state’s economy. A few of the state’s counties (Canadian, McClain, Logan, Osage, Pawnee, Rogers, and Wagner) export over half their resident workforce to destinations outside of the home county for employment. The Oklahoma City and Tulsa metro employment centers attract people who live in other counties.

**Figure 5-10** illustrates the census tract locations in Oklahoma that are likely to have a transit need. The transit need index is based on the percentage of households without access to a vehicle; percentage of mobility limited population; percentage of older population; and percentage of persons living below poverty.<sup>3</sup>

**5.2.5. Vehicle Ownership**

According to the U.S. Census 2012 American Community Survey, approximately 77 percent of state households have access to two or more vehicles (**Figure 5-11**). Compared to 2000, multiple vehicle ownership per household increased by 19 percent in 2012. The percentage of households with no vehicle available decreased over the same time period from 7 percent in 2000 to 2.1 percent in 2012.

**5.2.6. Income and Poverty Status**

In 2012, Oklahoma’s median household income was \$44,312, about 18 percent less than the U.S. median income of \$53,046 (**Table 5-5**).

**Table 5-5. Oklahoma Median Earnings, 2012 Estimates**

Median Income	Earnings
Median Household Income	\$44,312
Median Family Income	\$54,988
Married-couple family	\$66,096
Male head of household, no spouse present	\$39,600
Female head of household, no spouse present	\$26,661

Source: U.S. Census Bureau, 2012 American Community Survey Table S0201

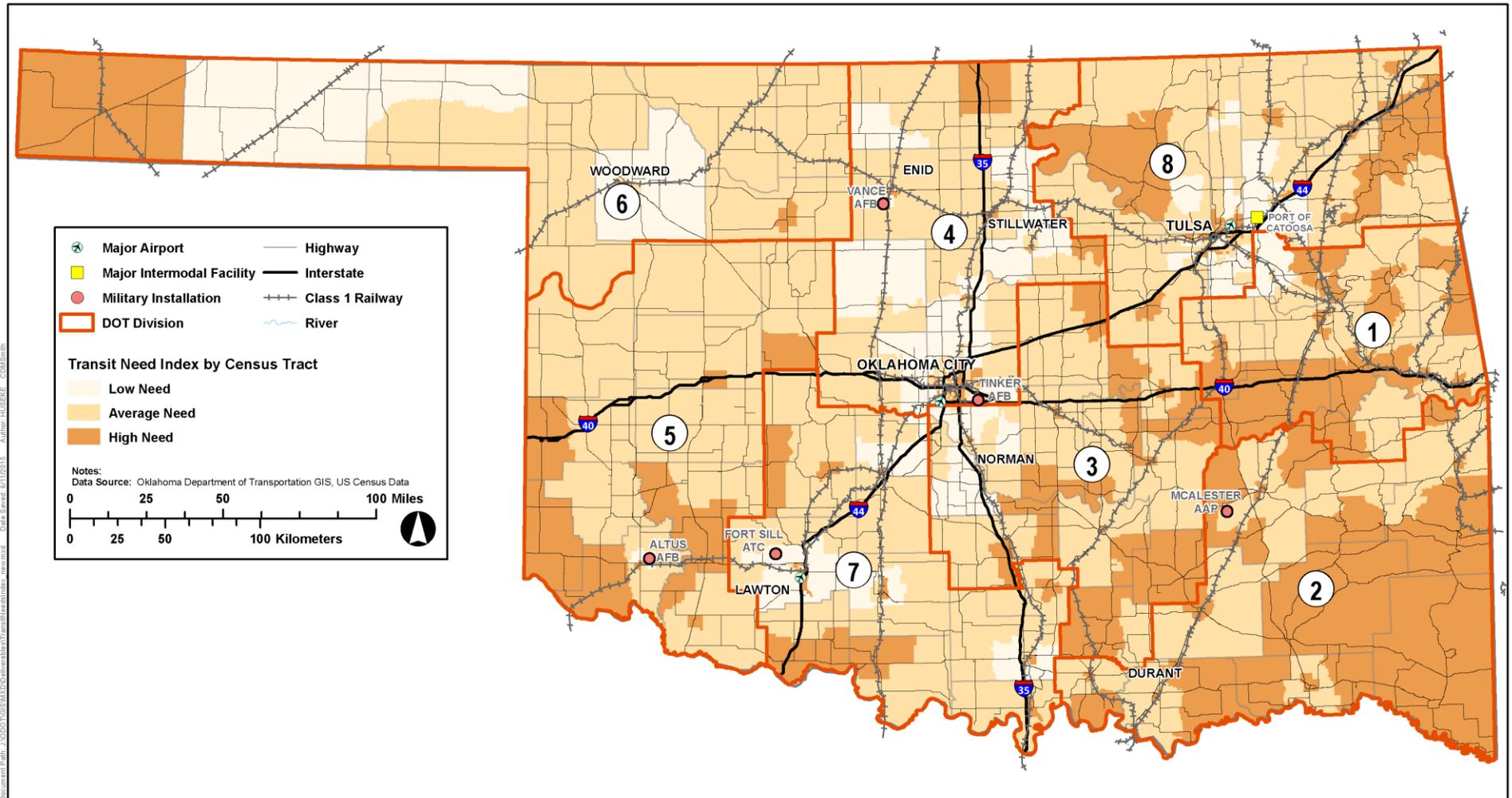
Approximately 13 percent of all families and nearly 35 percent of all families with a single female head of household are living in poverty. Seventeen percent of all people within the state are living below the poverty line; and 24 percent of all children are living in poverty, as shown in **Table 5-6**. Persons living below poverty and households without access to a vehicle are likely to have a greater dependence on public transportation.

**Table 5-6. Oklahoma Poverty Rates for Families, 2012 Estimates**

Poverty Rate	Percent
All families	13.1%
Married-couple family	6.7%
Female head of household, no husband present, family	35.4%
All people	17.2%
Under 18 years	24.1%
18 to 64 years	16.1%
65 years and over	9.9%

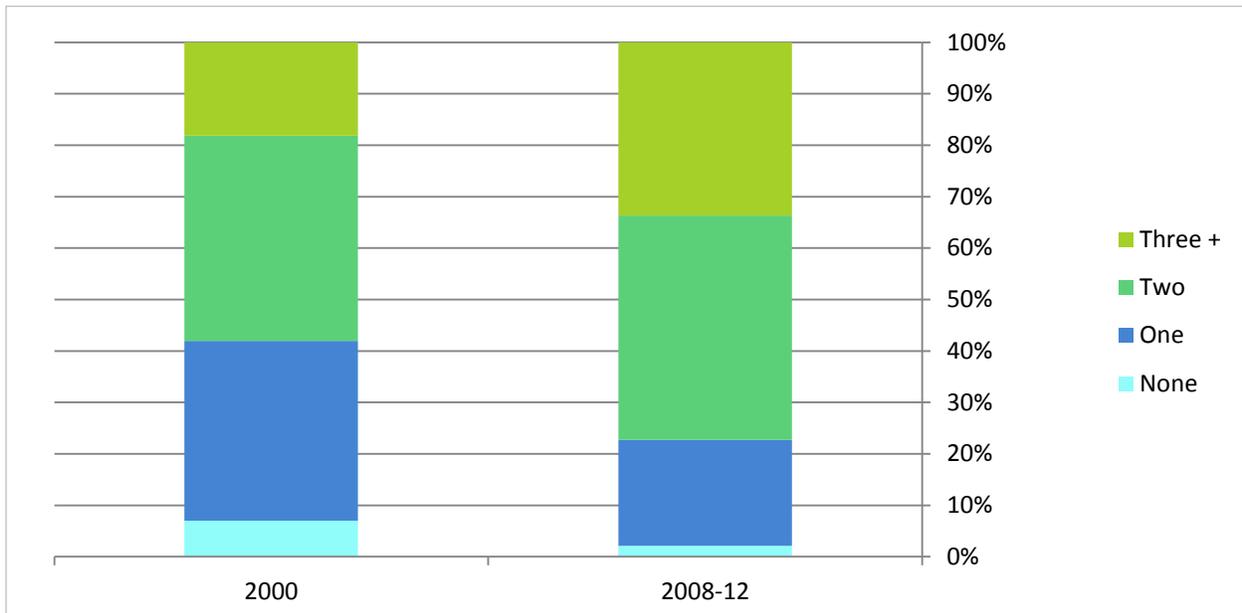
Source: U.S. Census Bureau, 2012 American Community Survey Table S0201

Figure 5-10. Oklahoma Transit Needs Index, 2010



Source: U.S. Census Bureau; CDM Smith Inc. analysis

Figure 5-11. Vehicles Available Per Household, Oklahoma, 2000; 2008-2012



Source: 2000 U.S. Census Bureau, 2008-2012 American Community Survey

### 5.3. LAND USE TRENDS

Transportation and land use are closely linked. Everything that happens to land use has transportation implications, and every transportation action affects land use. State departments of transportation often influence land development by providing infrastructure to improve accessibility and mobility, as well as through transportation-related regulations.

In Oklahoma, there are no statewide mandates that require land use planning. However in 1923, the Oklahoma Legislature enacted Section 401-425 of Title 11 of the Oklahoma Statutes that established the scope, procedures, and limitations for planning for cities and towns in the state. This legislation authorized the establishment of a city planning commission and a zoning commission, as well as granted authority to hire staff and conduct planning within the municipalities. Section 865.51 of Title 19 of the Oklahoma Statutes gave similar authority to county planning commissions and boards of adjustment. While ODOT does not have authority over land use, the projects it administers must be coordinated with local land use considerations as they move forward.

### 5.4. TRANSPORTATION IMPLICATIONS

*The state’s total population is increasing, affecting future demand for travel statewide.*

Total population is expected to increase by 16 percent between 2015 and 2040. All ODOT Divisions except Division 5 (west central Oklahoma) are expected to register increases in total population. A trend that Oklahoma is experiencing is rural outmigration to the urban counties located near Tulsa and Oklahoma City. This trend is likely related to access to jobs and training and educational opportunities.

*In terms of race and ethnicity, the state largely remains homogeneous, but has been diversifying in recent years.*

Total Hispanic population has climbed sharply since the turn of the century, increasing by 85 percent to over 330,000 persons. Changes in the composition of the state’s population suggest that ODOT will need to adopt a customized strategy for communicating with its constituents.

**The total number of senior users of the state's transportation system is expected to increase by over 50 percent through 2040.** Seniors' share of the state's total population will grow from 13.5 percent in 2012, to approximately 17 percent by 2040. The state will need to respond to this demographic group in how it provides transportation services and designs its projects.

**Oklahoma workers overwhelmingly rely on the private automobile for their journey to work trips.** More than four in five Oklahomans currently drive alone, while an additional 10 percent carpool.<sup>4</sup> Also, a significant number of Oklahoma workers travel outside their county of residence for employment. The number of Oklahoma households that now have access to a vehicle has grown from 93 percent in 2000 to 97.9 percent in 2012. These three facts alone underscore the importance that transportation, particularly, the state's highways and bridges, has in facilitating the movement of workers to jobs and powering the state's economy. Additionally, as more senior workers (the baby boom generation) decide to remain in the workforce, more attention will need to be given to other modes, such as carpooling and public transportation, as these worker groups tend to shift away from single occupant vehicle (SOV) travel over time.

**The state's total employment by industry is also evolving, with increases in construction, natural resources and mining, and other industries that are particularly dependent on transportation.** High-level employment trends from the state's employment projections program indicate that the industries that are growing in importance to the state's economy are generally more reliant on transportation and the movement of people and goods.

**The authority to manage land use remains with the state's cities, towns, and counties.** ODOT needs to continue to coordinate project planning with local government land use planning processes, as it makes decisions regarding the state's transportation infrastructure.

Transportation policy should be in harmony with local land use decisions in order to ensure the safety and capacity of transportation projects that are being designed and constructed.

## 5.5. CONCLUSION

Oklahoma is experiencing a steady rise in population and economic growth, resulting in an increase in demand on Oklahoma's transportation system. Income and poverty can create a greater dependence on public transportation. With these socioeconomic characteristics, the transportation system will experience more use, leading to issues such as deterioration, congestion, and potential safety concerns. Understanding the users of the transportation system and their mobility needs can help inform public policy as it relates to the delivery of transportation projects and services. These transportation needs are further discussed in **Chapter 8**. ODOT's proposed policies are discussed in **Chapter 11**.

## 5.6. ENDNOTES

<sup>1</sup> *Diamondback Correctional Facility. Watonga, Okla. -- The Diamondback Correctional Facility has a capacity of 2,100 prisoners. Facility closed in 2010.* <http://oklahomawatch.org/2013/09/19/vacant-private-prisons-in-oklahoma-may-re-open/>

<sup>2</sup> *Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 1994. Poverty thresholds are the dollar amounts used by the U.S. Census Bureau to determine poverty status. The thresholds vary according to the size of the family and the ages of the members. For example, the poverty threshold for a family of four was \$23,492 in 2012.*

<sup>3</sup> *The transit need index is designed to assess the relative need for public transportation services across the State of Oklahoma. It entails an analysis of households and populations that may have limited mobility options. Data is from the U.S. Census Bureau. See endnote two on definition for poverty thresholds.*

<sup>4</sup> *U.S. Census Bureau, 2012 American Community Survey, Tables S0201 and S1811.*

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## 6. EXISTING TRANSPORTATION SYSTEM AND CONDITIONS

This section describes Oklahoma’s multimodal transportation infrastructure inventory based on system data and attributes for the year 2013 for highways, bridges, freight rail, ports and waterways, public transportation, passenger rail, and airports.

Understanding that a world class transportation system is the cornerstone of a vibrant economy and a leading factor in growing and attracting business and industry, the Oklahoma legislature decided that strengthening the investment for transportation infrastructure should be a priority of state government. As described in Chapter 1, in 2005 the Legislature and Governor reversed the previous 20 years of flat funding by passing and signing legislation to fund bridge and roadway improvements. These initiatives introduced new state funding resources reserved solely for constructing, preserving, and maintaining state highways and bridges.

### 6.1. HIGHWAYS

Oklahoma has an extensive highway network, which provides connections between the east and west coasts of the U.S., and which links northbound movements from Texas to the central U.S.

Oklahoma has approximately 112,800 miles of public roads, a number that has remained relatively constant over the last decade. ODOT is responsible for the 12,265 mile State Highway System, which is mostly rural in nature with urban highways and expressways in the major

metropolitan areas. The State Highway System includes nearly 3,400 miles of the NHS,<sup>1</sup> which consists of roadways deemed important to the nation’s economy, defense, and mobility.

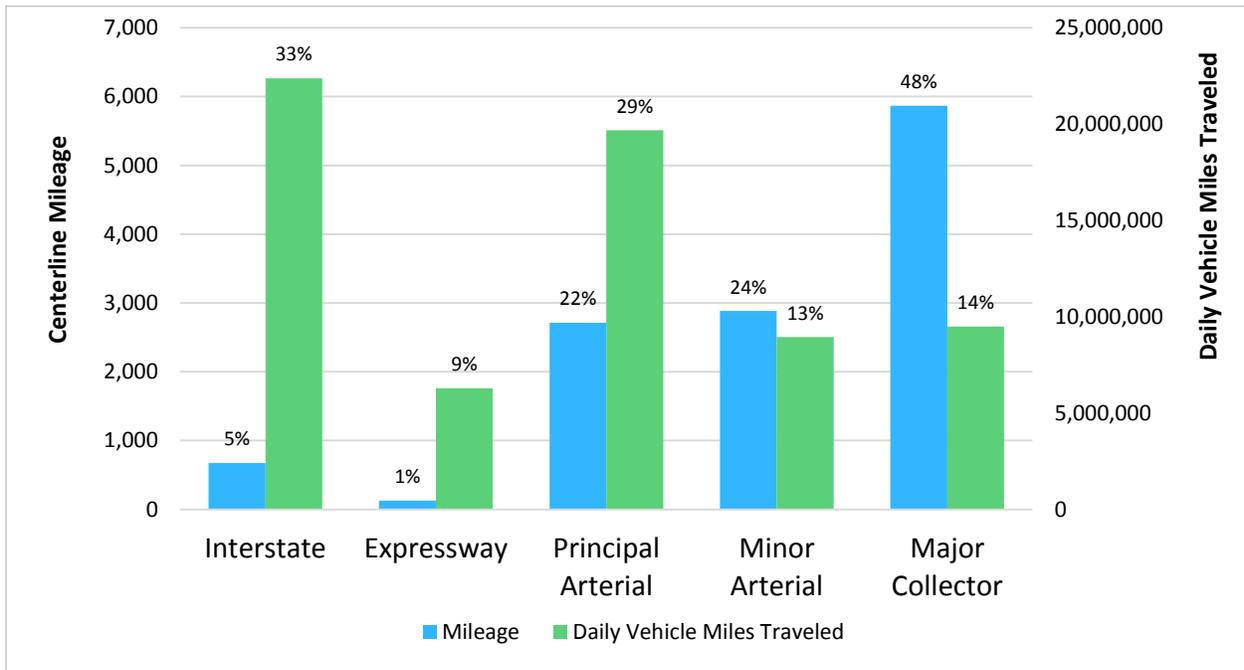
Major interstates in Oklahoma include I-35, I-40, and I-44, for a total of 673 miles.<sup>2</sup> As both a portion of and a complement to the interstate system, Oklahoma has 10 turnpikes totaling 606 miles. These toll roads are maintained by the Oklahoma Turnpike Authority and approximately 40 percent of the toll revenues are collected from out-of-state motorists.

A breakdown of the State Highway System in **Figure 6-1** displays the road miles and daily vehicle miles traveled (VMT).

#### 6.1.1. Rural Two Lane Highways

Oklahoma rural highways have a rich history of serving the state’s energy and agricultural based economy, and many of these highways have been converted from farm to market roads over time. While these rural roads were intended for transporting livestock and crops to market 70 years ago, today these roads are unable to accommodate the quantity and weight of increased legally loaded trucks, increased traffic demands, and higher speed limits. Of the over 9,500 miles of rural two-lane highways on the State Highway System, approximately 4,600 miles of these are two-lane facilities without paved shoulders.

Figure 6-1. State Highway System Mileage and VMT by Functional Class



Source: U.S. DOT, Federal Highway Administration, 2013 Summary of Highway Statistics

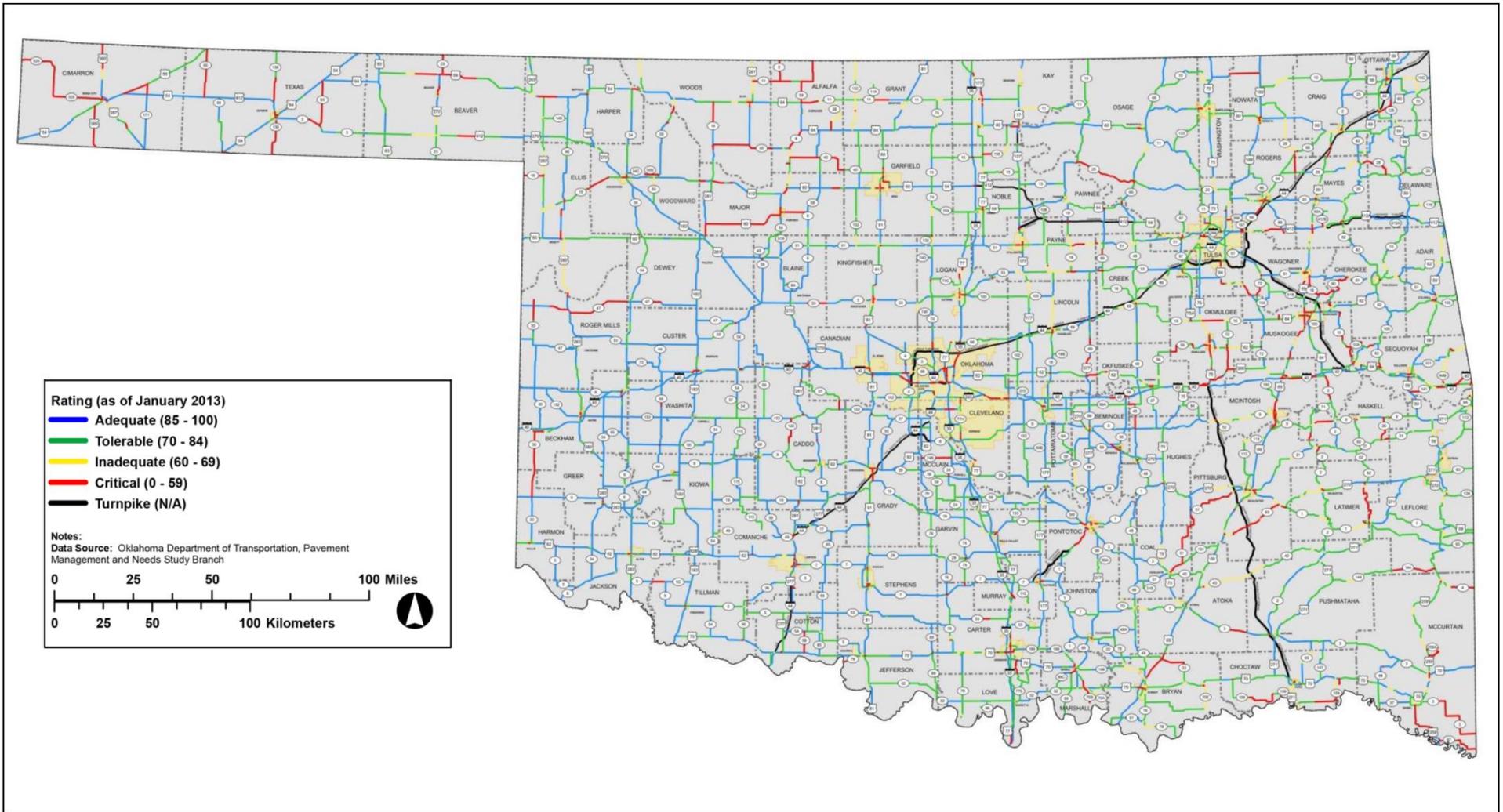
Figure 6-2 illustrates that pavement deterioration is a statewide issue on all types of highways. The pavement surfaces require systematic preservation treatments to maximize useful highway design life. With past funding constraints, it has been impossible for ODOT to consider such systematic preservation approaches and programs to extend the pavement design life.

As of January 2013, 3,862 miles (31 percent) of the State Highway System are rated as critical or inadequate,<sup>3</sup> this includes 3,364 miles of two-lane highways. Over 3,680 miles of inadequate highway will remain unaddressed with the scheduled improvements identified in the 2015-2022 Eight Year CWP.

### 6.1.2. Major State Highways

Traffic on the major state highways has increased dramatically over the past 20 years with the exception of the recession years of 2008 and 2009. Freight traffic has experienced this same dramatic growth and is expected to continue to grow for the foreseeable future. The daily vehicle miles travelled on highways with four-lanes or more (includes both major state highways and interstates) was over 48 million miles in 2013. This represents over 73 percent of the total vehicle miles travelled every day on the State Highway System.

Figure 6-2. Pavement Surface Condition Ratings



Source: Oklahoma Department of Transportation, Pavement Management & Needs Study Branch.

### 6.1.3. Interstate Highways

The Interstate Highway System is the highest class of highway and is designed to be the national defense and national commerce system that moves large volumes of people and goods across the U.S. While Oklahoma's 673 miles of interstate highways account for only 5 percent of the centerline miles of the State Highway System, they carry 33 percent of the daily vehicle miles travelled.

The conditions of the highway system are continuously assessed in order to program appropriate reconstruction, rehabilitation, and maintenance improvements in a fully integrated and systematic manner; and regular maintenance extends the design life of the facilities. The combination of these integrated programs is the lifeblood of the continuous operation of the State Highway System. Approximately 300 of the 673 miles of interstate pavement have experienced significant rehabilitation or reconstruction since 2003, and 178 miles are scheduled for improvement in the current CWP.

### 6.1.4. Congestion Analysis

During the development of the 2015-2040 LRTP, ODOT conducted a pilot study that explored the use of travel time data as a tool to measure and manage congestion.<sup>4</sup> This pilot study analyzed National Performance Measure Research Data Set (NPMRDS) vehicle probe data (travel time data along NHS) provided by FHWA<sup>5</sup> for the time period of July 2013 to May 2014. Two corridors, I-40 and US-69, were elected by ODOT for analysis to gain increased insight about congestion as it affects freight and commuter travel on the State Highway System and develop congestion measures.

The study reviewed and summarized some of the federal, state, and local agency practices in the areas of data collection and congestion measurement for the operational effectiveness of highway segments and systems as they pertain to highway congestion. Utilizing this research and maintaining consistency with the performance measures framework identified for 2015-2040

LRTP, this study recommended travel time-based congestion measures. The NPMRDS data along with volume data from ODOT's Traffic Characteristics Report were utilized to calculate the five recommended congestion measures for I-40 and US-69. The study developed these measures for passenger only traffic, freight traffic and all traffic. The results showed that US-69 in northeast Oklahoma experiences medium to high congestion during the day time, which can be attributed to passenger and freight traffic.

Additionally, I-40 within Oklahoma City limits experiences medium congestion during day time, which can be attributed to passenger only traffic. The study also analyzed the impact of different thresholds for identifying congestion. Two threshold speeds were used to identify congestion and it was observed that with a lower threshold speed, more roadway segments would be classified as congested. Understanding this impact will be very useful to ODOT in determining a threshold for the congestion measures.

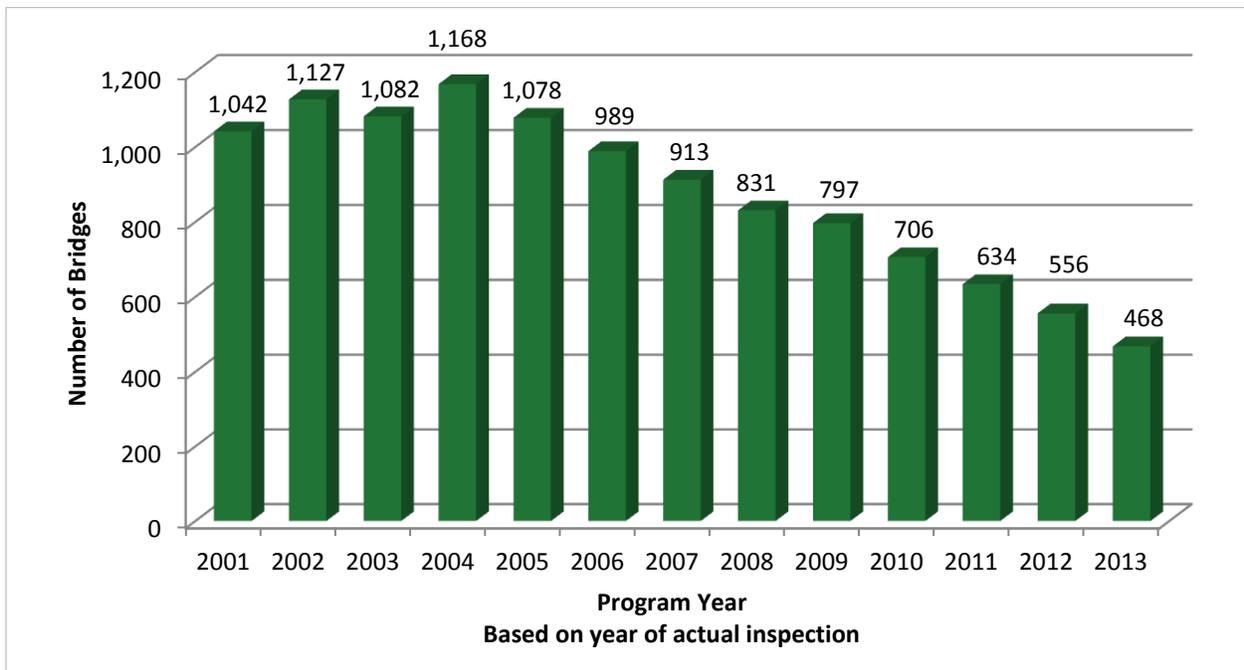
This study proposed an innovative methodology to use the latest vehicle probe data to develop an understanding of congestion along Oklahoma's roadways. This methodology can be used to understand and address roadway congestion using the latest vehicle probe data. (ODOT may apply this or similar methodologies to address anticipated MAP-21 regulations on travel time performance measures.) This methodology used routinely over time allows the identification of new congested roadway segments and monitoring of existing ones to discern congestion trends. This methodology is also helpful to develop meaningful criteria and communicate complex ideas related to congestion and reliability.

## 6.2. BRIDGES

After decades with little investment in the state's 6,828 bridges, increased state funding enabled ODOT to replace or rehabilitate 823 bridges between 2006 and 2013. Since the year 2000, when Oklahoma was ranked as one of the worst states on the national list of structurally deficient bridges<sup>6</sup>, ODOT's priority has been a focus on eliminating structurally deficient bridges. In 2004, Oklahoma peaked with 1,168 bridges (17 percent)

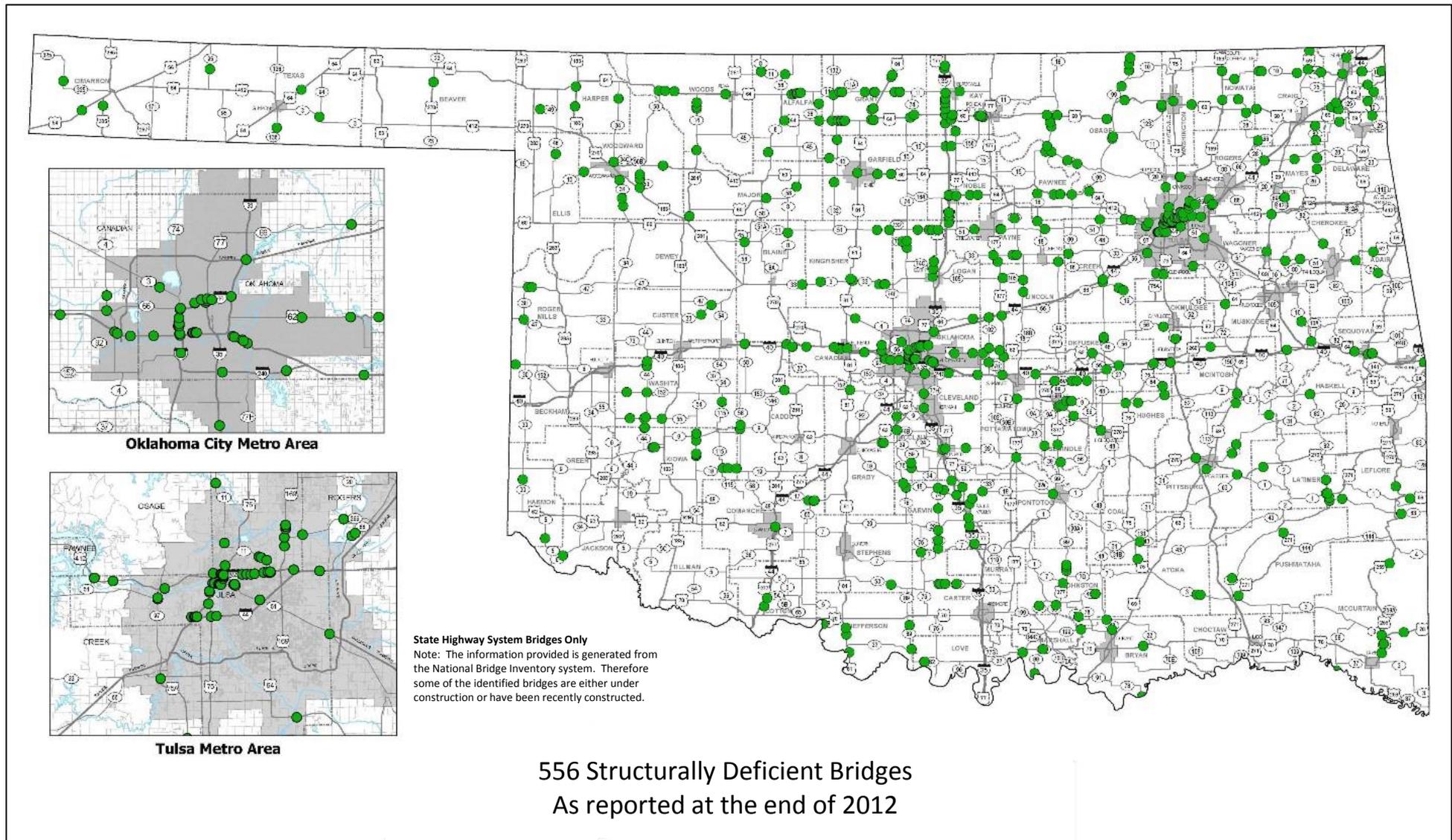
on the State Highway System that were classified as structurally deficient. **Figure 6-3** and **Figure 6-4** illustrate that the bridge problem is truly a statewide issue and not specific to any region or locale within the state. **Figure 6-4** also illustrates ODOT's success with the dedicated bridge funding and strategic focus on state maintained bridges. The number of structurally deficient bridges on the State Highway System has shown a steady decline from 1,168 in 2004 to 468 in 2012.

**Figure 6-3. Oklahoma's Structurally Deficient Bridges, 2001-2013 on Interstate, U.S., and State Highways**



Source: Oklahoma Department of Transportation, Bridge Division.

Figure 6-4. Structurally Deficient Bridges



Source: Oklahoma Department of Transportation, Bridge Division.

### 6.3. HIGHWAY SAFETY

The safety of the traveling public is of paramount importance to ODOT. Oklahoma's first Strategic Highway Safety Plan (SHSP) was completed in 2007 and it outlined five focus areas: unsafe driving behavior, intersection crashes, young drivers, lane departure crashes, and crosscutting strategies. Unsafe driving behavior includes impaired drivers, aggressive drivers, speeding drivers, fatigued drivers, distracted drivers, and drivers not using seatbelts.

The SHSP strategies include: reducing overall fatalities and injuries, improving crash data and its availability, and developing a safer overall vehicle fleet. These safety strategies were developed based on an analysis of several data sources and highway inventories. When undesirable highway safety patterns are evident, ODOT works to identify and evaluate potential counter measures.

State highways without paved shoulders are a significant safety concern to ODOT and the traveling public. Of the over 9,500 miles of rural two-lane highways on the State Highway System, approximately 4,600 miles of these are two-lane facilities without paved shoulders. ODOT has 583 miles of roadway scheduled for shoulder improvements in the 2015-2022 Eight Year Construction Work Plan.

Oklahoma, like many other states, has experienced a significant increase in motorcycle fatalities. Motorcycle fatalities have increased from 75 in 2006, to an average of 98 per year between 2008 and 2012.

Additional information about Safety and Security issues are discussed in **Chapter 8**.

### 6.4. FREIGHT ON THE HIGHWAY SYSTEM

As ODOT looks to the future, a major focal point is to assess and project freight growth and its impacts. **Chapter 7** highlights the current and future freight movements in Oklahoma. Major Oklahoma trucking corridors are highways with

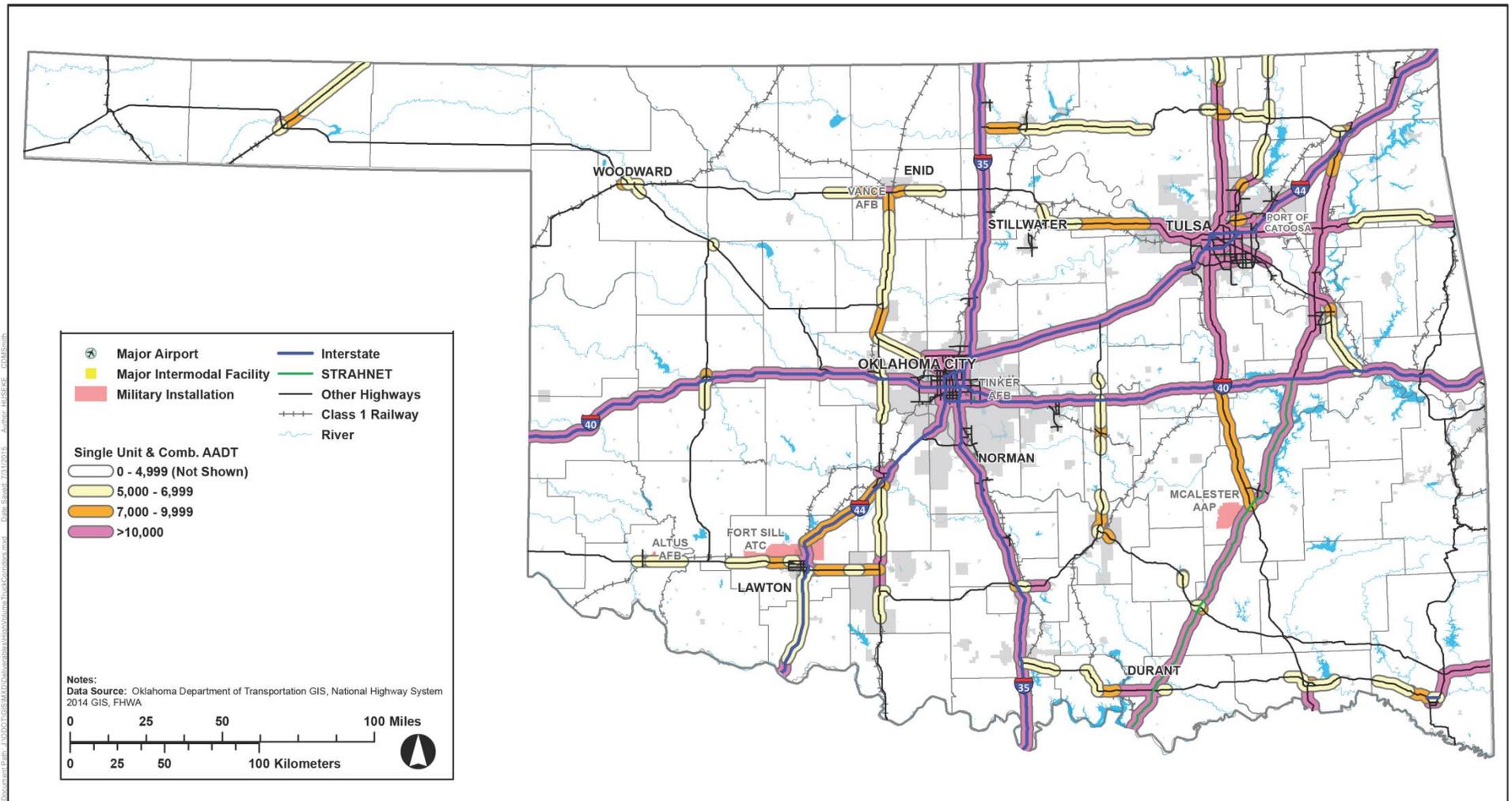
5,000 or more trucks daily, or where a highway's average daily traffic consists of more than 40 percent trucks. While I-40 in central Oklahoma carries the highest daily truck volumes, there are other truck corridors that carry a significant level of truck traffic. Other highways that carry high levels of truck traffic include US-69 in southeast Oklahoma, I-35 south of Oklahoma City to the Texas state line, and US-287 in the Oklahoma panhandle, all of which carry over 50 percent trucks daily. **Figure 6-5** illustrates the daily traffic and the truck traffic associated with the freight corridors.

Analyzing truck volumes allows ODOT to identify the most important statewide freight corridors. **Table 6-1** shows truck traffic on selected segments of the National Highway System. Each highway serves as an important link for goods movement. Oklahoma City's position as a major freight generator and attractor is shown by the high volumes along I-40, I-35, and I-44. Coupled with this is US-69, providing a critical and more direct link from Dallas to the eastern and northern portions of the country beyond Oklahoma.

Illegally loaded or operated trucks have an adverse impact on the condition of the transportation system and the safety of the traveling public. Overweight trucks significantly reduce the intended design life of a highway, and result in extra costs to maintain the highways in a serviceable condition. To more comprehensively address these issues, the Port of Entry program was developed in 2008 in partnership between the Oklahoma Corporation Commission, Oklahoma Turnpike Authority, and ODOT. This partnership was an effort to upgrade Oklahoma's port of entry facilities and a goal was set to develop eight new Port of Entry facilities at strategic locations at the Oklahoma borders (**Figure 6-6**).

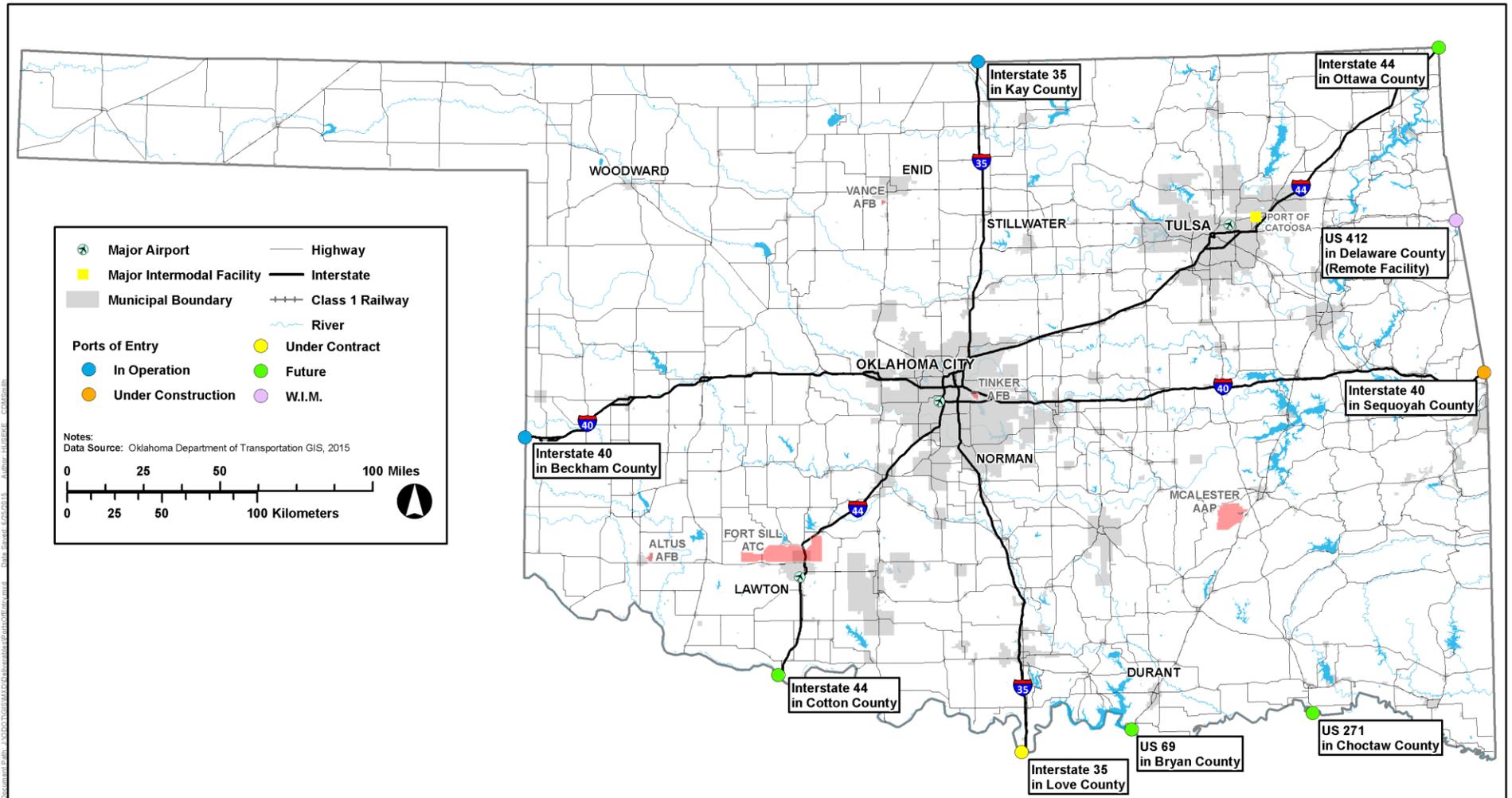
Ports of Entry are locations at the state border where commercial vehicles undergo electronic processing for a number of items, including but not limited to driver credentials, weight, tax and fee status, and safety inspections.

Figure 6-5. 2012 High Truck Volumes on NHS



Source: Oklahoma Department of Transportation, Engineering Services Branch.

Figure 6-6. Ports of Entry



Source: Oklahoma Department of Transportation, Strategic Asset & Performance Management Division.

**Table 6-1. Highest Truck Volume Highways, Oklahoma, 2013**

Roadway	County	Single Unit Truck Volume	Combination Truck Volume	Total Truck Volume	AADT
I-35	Oklahoma	5,830	9,400	15,230	123,100
I-40	Oklahoma	6,380	8,150	14,530	108,100
I-44	Rogers	3,880	8,030	11,910	67,600
US-69	Pittsburg	1,670	5,450	7,120	19,800
US-169	Tulsa	5,030	2,490	7,520	116,000
US-259	McCurtain	150	460	610	9,500
US-281	Canadian	740	1,240	1,980	7,100
US-287	Cimarron	300	1,310	1,610	3,200

*Source: Oklahoma Department of Transportation, National Highway System, 2013.*

Another integral part of Oklahoma’s commitment to closely monitor the truck traffic on the highway system is the recent implementation of the Oklahoma Permitting and Routing Optimization System (Okie PROS) for oversize/overweight trucks. The new automated permitting system processed and approved 251,161 permits in 2011, its first full year of operation. Over half of these permits took less than 10 minutes to obtain. Prior to the new automated system, permits took an average of 24 hours to obtain.

The current statewide focus on improving structurally deficient bridge infrastructure also has a targeted effect on both legal and permitted loads. The focus on these bridges ensures that these structures are in a condition to support the safe and efficient travel of a growing economy without unnecessary delays or detours.

Additional information about Freight Transportation is discussed in **Chapter 7**.

## 6.5. FREIGHT RAIL

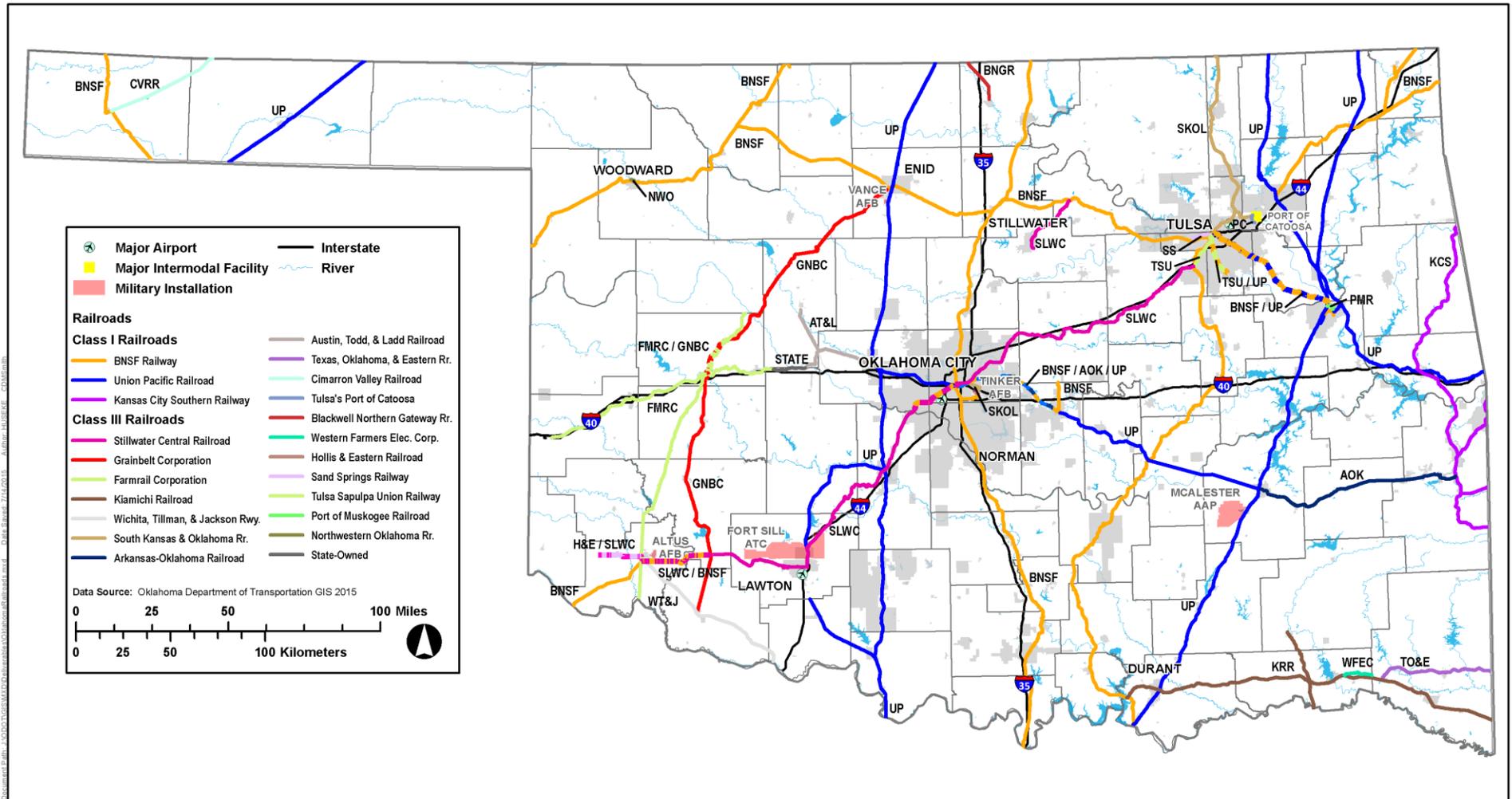
The railroad system plays an important part in Oklahoma’s freight network. A single train replaces several hundred trucks on the roadways and thus alleviates congestion and deterioration throughout the state. Based on data from the Association of American Railroads (AAR), cargo volumes handled by train in 2011 would have required an additional 17.1 million trucks had they moved by roadways.

Currently, three Class I railroads operate in Oklahoma, which include Burlington Northern Santa Fe (BNSF), Union Pacific (UP), and Kansas City Southern Railway (KCS). Oklahoma also has 19 Class III or short line railroads that provide regional service and connections to the Class I railroads. Approximately 68 percent of the state’s rail lines are operated by Class I railroads, and the remaining by short line railroads. The Class I and Class III railroad mileage is provided in **Table 6-2**.

Oklahoma is one of the few states in the country that owns rail lines. In the past, ODOT purchased abandoned or soon to be abandoned rail lines with the intent of preserving the connected rail network for the future benefit of Oklahoma. At its peak, the State of Oklahoma held title to 882 miles of rail line. Most of these miles of state owned rail have been returned to private ownership; and as of midyear 2015, ODOT owns 213 operating miles of rail line, 70 miles of which are under a lease purchase option that will mature in 2016 (**Figure 6-7**).

In addition to being a safety factor, at-grade crossings also contribute to congestion and traffic issues. The trend of railroads utilizing longer “unit trains” places pressure on facilities/communities they serve, such as increasing congestion at railroad crossings.

Figure 6-7. Oklahoma State Railroad Map



Source: Oklahoma Department of Transportation, Rail Programs Division.

Table 6-2. Railroad Lines

Railroad	Acronym	STB Classification	Total Mileage	State-owned Mileage
BNSF Railway	BNSF	I	1,475	
Kansas City Southern Railway	KCS	I	139	
Union Pacific Railroad	UP	I	921	
AOK Railroad Company	AOK	III	69.9	69.9
Austin Todd & Ladd Railroad	AT&L	III	46	9.0
Blackwell Northern Gateway Railroad	BNG	III	17	17.0
Cimarron Valley Railroad	CVR	III	35	
Farmrail Corporation	FMRC	III	179	89.9
Grainbelt Corporation	GNBC	III	186	
Hollis and Eastern	H&E	III	14	
Kiamichi Railroad	KRR	III	157	
Northwestern Oklahoma	NOW	III	7	
Port of Catoosa	PC	III	20	
Port of Muskogee	PMR	III	9	
Public Service of Oklahoma	PSO	III	11	
Sand Springs Railway	SS	III	10	
South Kansas & Oklahoma Railroad	SK&O	III	79	5.0
Stillwater Central Railroad	SLWC	III	240	22.0
Texas, Oklahoma & Eastern Railroad	TO&E	III	40	
Tulsa Sapulpa Union Railway	TS	III	10	
WFEC Railroad Company	WFEC	III	14	
Wichita, Tillman & Jackson Railway	WT&J	III	61	
<b>Total Miles</b>			<b>3,740</b>	<b>212.8</b>

Source: Oklahoma State Department of Transportation.

ODOT's rail program monitors FHWA's grade crossing safety program for the 3,800 at-grade rail/highway crossings, manages the state owned rail property and track, and oversees coordination with railroad companies.

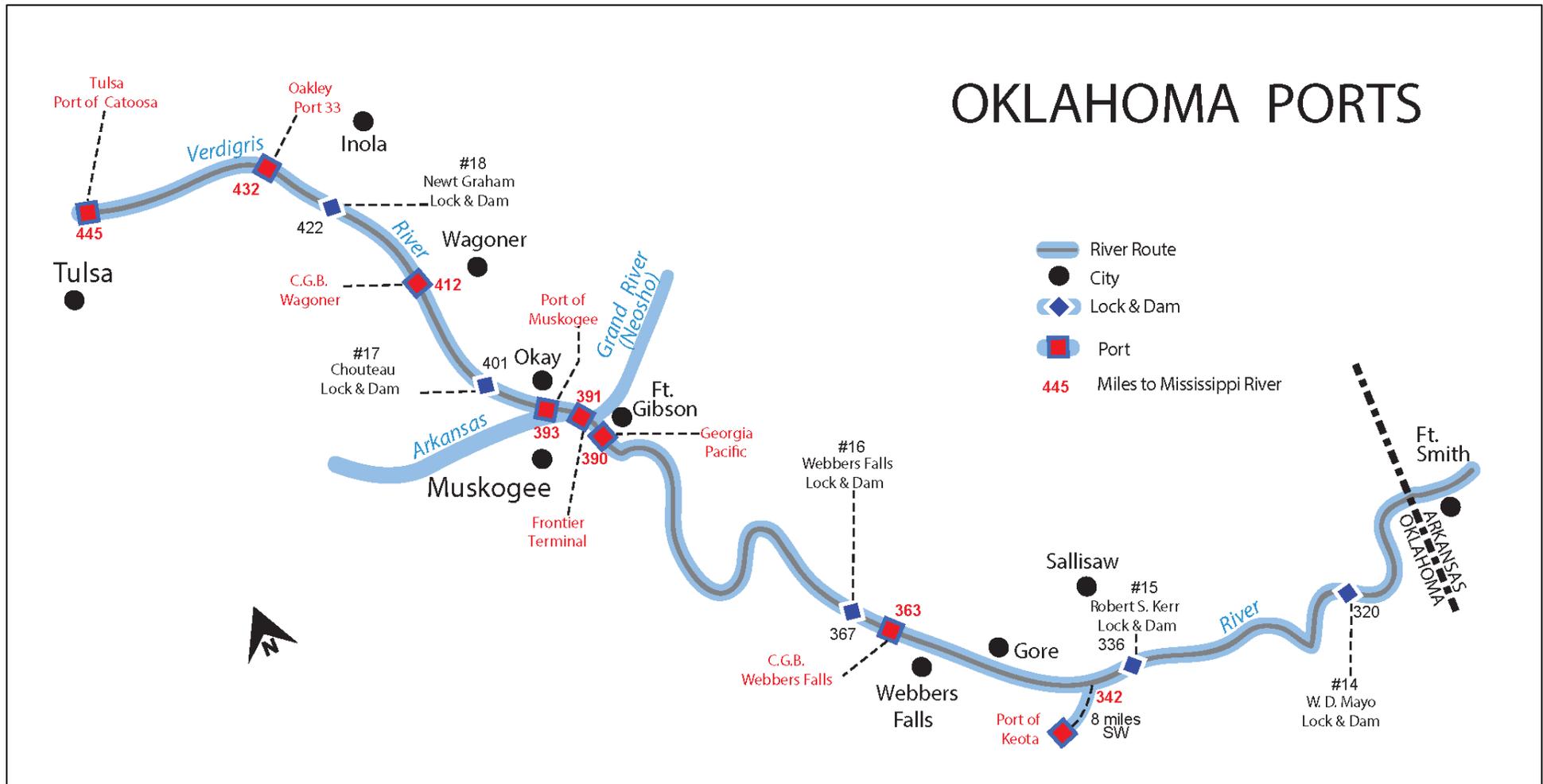
## 6.6. PORTS AND WATERWAYS

The McClellan-Kerr Arkansas River Navigation System (MKARNS) is Oklahoma's primary navigable waterway originating from the Tulsa Port of Catoosa and flowing southeast through Arkansas to the Mississippi River. The waterway contains five dams in Oklahoma that provide numerous benefits, such as preventing flood damage, hydropower generation, recreation, fish and wildlife conservation and most importantly navigation. Transporting products by barge is the most economical, safe and environmentally

friendly way of shipping bulk and oversize cargo with low time sensitivity.<sup>7</sup>

The Ports of Muskogee and Catoosa are the state's two public ports, and both are designated as Foreign Trade Zones.<sup>8</sup> In addition, there are several other private port operations along the MKARNS as shown in **Figure 6-8**. Oakley's Port 33 (formerly Johnston's Port) is a large privately owned port facility located south of the Port of Catoosa adjacent to US-412 near Inola. There are 31 terminal facilities along the MKARNS waterway and most facilities are located near the Ports of Catoosa and Muskogee. Both public ports provide rail access in and out of its industrial parks. Local industries manufacture bulk commodities in the industrial parks and this provides direct access to global markets.

Figure 6-8. Oklahoma Portion of the McClellan-Kerr Arkansas River Navigation System, 2015



Source: Oklahoma Department of Transportation, Waterways Program.

MKARNS is managed by the United States Army Corps of Engineers (USACE). USACE is responsible for the operation and the maintenance of the system and defines "critical maintenance" as projects needed to avoid a likely system failure (defined as a greater than 50 percent probability) within the next five years. The available federal funding has not kept pace with the demand over the years, and wear and tear continues on the locks that are now over 40 years old.

ODOT is committed to providing safe and efficient access to the ports. Since 2000, ODOT has awarded 226 contracts in excess of \$644 million within a 10 mile radius of the Port of Catoosa, Port of Muskogee, and Oakley's Port 33. Looking forward, over the next seven years, ODOT has 96 projects totalling \$150 million within a 10 mile radius of these ports.

## 6.7. PUBLIC TRANSPORTATION AND PASSENGER RAIL

### 6.7.1. Rural, Urban, and Tribal Public Transportation

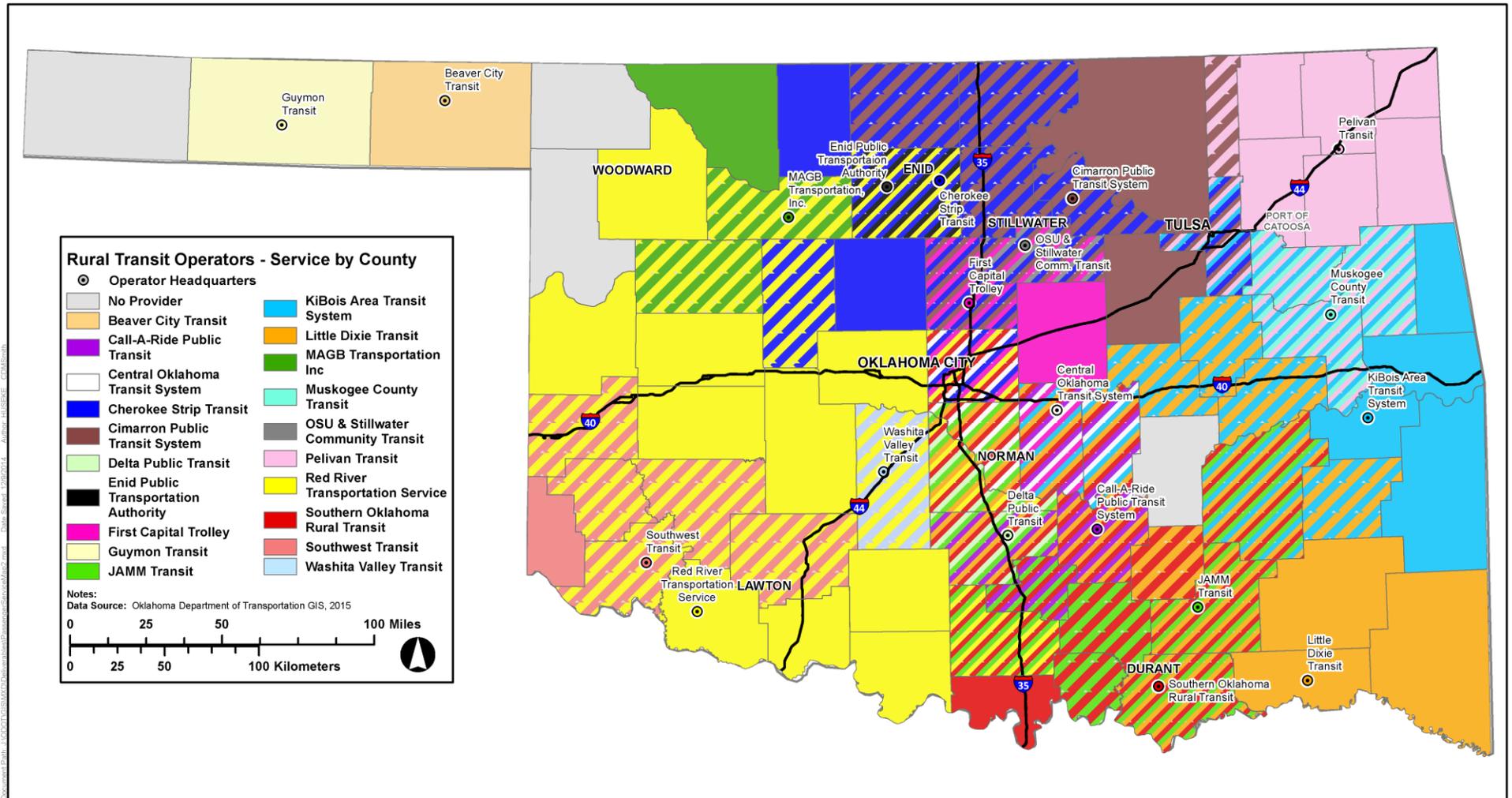
Oklahoma has twenty rural public transportation providers that operate in 73 of the 77 counties geographically spread across the entire state (**Figure 6-9**). These rural transit systems provide more than 3 million trips annually with approximately 25 percent of the trips made by the elderly and persons with disabilities. The rural transit agencies provide transport for various journeys – a ride to work, a medical appointment, or to shop for necessary items. ODOT receives FTA funds and distributes them on a formula basis to the rural transit agencies.

Urban public transportation systems serve communities with populations of 50,000 or more. Oklahoma has five urban transit systems that include Citylink in Edmond, Cleveland Area Rapid Transit which serves the City of Norman and the University of Oklahoma, EMBARK in Oklahoma City (formerly Metro Transit), Lawton Area Transit System, and Tulsa Transit System.

- Citylink in Edmond, runs five local routes serving the University of Central Oklahoma (UCO) campus and a large portion of the City of Edmond, as well as an express route to and from downtown Oklahoma City.
- The Cleveland Area Rapid Transit (CART) was founded in 1986 and serves the City of Norman and the University of Oklahoma. In 2007, CART's service area and hours of operation were increased substantially. This increase required an additional local investment of nearly \$7 million in capital and operating costs.
- EMBARK is the largest transit agency in the state and has at least 20 interconnecting bus routes as well as the "Oklahoma Spirit Trolleys" covering the Oklahoma City Metropolitan Area. EMBARK also includes paratransit ADA bus service and specialized transit services.
- The Lawton Area Transit System (LATS) operates fixed route and paratransit services for the City of Lawton and the Fort Sill area. Two buses operate the fixed routes and five vehicles are used for paratransit services. These vehicles provide an average of approximately 160 passenger trips each weekday.
- The Metropolitan Tulsa Transit Authority (Tulsa Transit) was established in 1968. Tulsa Transit transports approximately 10,000 passenger trips each weekday utilizing 21 routes.

ODOT provides state transit revolving funds to urban transit agencies that are direct recipients of FTA funds. Each urban transit agency participates with its respective MPO for the purposes of long range planning efforts. Greater detail on current and future public transportation services is closely examined and addressed during the MPO LRTP process, which occurs every five years.

Figure 6-9. Oklahoma Passenger Service Map



Source: Oklahoma Department of Transportation, Transit Programs.

Oklahoma has seen a substantial growth in the Tribal Transit Programs in the last five years. Oklahoma has 38 recognized tribes and there are 14 tribal transit providers. These tribal transit agencies provided 231,123 regular trips in 2012. Similar to rural transit, the federal tribal transit program is instrumental in providing needed transportation to tribe members to access work, medical appointments, or shopping.

Even though the tribal transit agencies are direct recipients of FTA funds, ODOT's Transit Program Division reaches out to the tribal transit agencies to identify opportunities to coordinate with rural transit services.

### **6.7.2. Passenger Rail Service**

Passenger rail returned to Oklahoma in 1999 after a 20 year absence. The Amtrak Heartland Flyer operates round trip daily service between the Santa Fe Depot in downtown Oklahoma City and the Fort Worth, Texas Intermodal Transfer Center. Currently, ODOT provides \$2.8 million annually to operate the Heartland Flyer. Ridership has steadily increased and the Heartland Flyer transports approximately 82,000 passengers per year. The Heartland Flyer trip is 206 miles with intermediate Oklahoma stops in Norman, Purcell, Pauls Valley, Ardmore and then Gainesville, Texas before arriving in Fort Worth.

## **6.8. AVIATION**

Oklahoma is home to a large number of airports supplementing local, regional, and national needs. The three primary airports in Oklahoma are the Tulsa International (TUL), Will Rogers World (OKC), and Lawton-Fort Sill Regional (LAW) airports. In addition to being identified as primary airports because of the number of passengers boarding each year, both Tulsa International and Will Rogers World are cargo service airports (facilities with aircraft providing cargo transportation with a total annual landed weight of more than 100 million pounds). Based on FAA data, Tulsa International consistently has a landed weight of over 300 million pounds and Will Rogers World consistently has over 200

million pounds. Lawton-Fort Sill Airport maintains significant use by military personnel.

Each airport is independently operated and is not under ODOT responsibility. ODOT provides safe and efficient access to airports; however the agency does not provide funding to airports.

There are 113 general aviation airports and seven regional airports in Oklahoma. Oklahoma's regional airports are: Bartlesville Airport, Woodring in Enid, McAlester Airport, University of Oklahoma Westheimer Airport in Norman, Wiley Post Airport in Oklahoma City, Ponca City Airport, and Richard Jones Jr. Airport in Tulsa.

These airports support regional economies by connecting communities to regional and national markets. Regional airports also have higher levels of general aviation activity with some jets and multi-engine propeller aircraft that support corporate and personal travel.

## **6.9. BICYCLE AND PEDESTRIAN**

Bicycle and pedestrian facilities throughout Oklahoma consist of multi-use trails, bicycle routes, and sidewalks. The planning and implementation of bicycle and pedestrian improvements are typically completed at the local government level, and/or through a MPO. Funding for these bicycle and pedestrian improvements is almost always from a combination of federal, local, and private and/or non-profit sources.

## **6.10. SUMMARY**

Oklahoma's transportation system is a system that requires all parts to function well in order to provide safe and efficient movement of people and goods into, out of, within, and through the state. Each transportation mode has a special and important role to play and yet is interwoven with the other modes of the system. Whether people and goods travel by car, bicycle, sidewalks, bus, truck, rail, plane, barge, or multiple modes, ODOT works to provide a safe, economical and effective network so that they can reach their destination safely and efficiently.

## 6.11. ENDNOTES

<sup>1</sup> The National Highway System (NHS) is a network of strategic highways within the United States, including the Interstate Highway System and other roads serving major airports, ports, rail or truck terminals, railway stations, pipeline terminals and other strategic transport facilities. This mileage reflects the NHS as of January 2012.

<sup>2</sup> The U.S. DOT tracks highway statistics by year. See Public Road Miles.  
<http://www.fhwa.dot.gov/policyinformation/statistics/2011/hm10.cfm>

<sup>3</sup> Pavement Rating Categories:  
All indexes are on a scale of 0 to 100, where 100 is the best.

0 - 59	Critical
60 - 69	Inadequate
70 - 84	Tolerable
85 - 100	Adequate

For more information on distress ratings, see the Distress Rating Guide produced by ODOT's Pavement Management Branch.

<sup>4</sup> Additional information about the Travel Time Based Oklahoma Congestion Analysis: Pilot Study is documented in the 2015-2040 LRTP Technical Memorandum Travel Time and Congestion.

<sup>5</sup> In 2013, the Office of Freight Management and Operations (HOFM), on behalf of both HOFM and Office of Transportation Management (HOTM), contracted with HERE North America, LLC (formerly known as Nokia/NAVTEQ) to acquire the National Performance Measure Research Data Set (NPMRDS) vehicle probe data.

<sup>6</sup> The Oklahoma Department of Transportation Bridge Division is tracking the replacement and rehabilitation progress of deficient bridges.  
<http://www.ok.gov/odot/Bridges.html>

<sup>7</sup> For additional information of the benefits of using rail for the movement of bulk freight, please see Chapter 7, Section 7.4.2.

<sup>8</sup> A foreign trade zone is a secure area in or adjacent to a U.S. Port of Entry that is under U.S. Customs and Border Protection (CBP) supervision, but not required to follow the formal CBP entry procedures and payments of duties required on foreign merchandise (until it enters territories under CBP protection for domestic consumption). While in the foreign trade zone, merchandise is not subject to U.S. duty or excise tax and goods can be exported from the zone free of duty and excise tax.

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## 7. FREIGHT TRANSPORTATION AND ECONOMIC CONDITIONS

Oklahoma's economy has become more diverse over the past few decades. Since the oil price collapse in the mid-1980s and the subsequent U.S. recessions, Oklahoma has become less dependent on energy and agriculture. Although energy and agriculture remain important parts of the state's economy, other sectors, such as service and manufacturing, have grown over time. This diversity is a critical factor in growing and sustaining Oklahoma's economy, which in turn increases freight movement and demand on the transportation system.

### 7.1. CONSUMER AND ECONOMIC CONDITIONS

As discussed in **Chapter 5**, a strong population base is crucial for growing and sustaining industries such as manufacturing, retail, and other freight-related businesses. The transportation system is critical for responding to people's demands for goods and services, and for providing a means of travel to respective businesses and places of work. Since 2010, Oklahoma's population has increased by an approximate average of 33,000 per year. As population grows, the need for transportation services and freight also increases.

In Oklahoma, per capita personal income has increased by nearly 50 percent since 2003, from \$27,724 to \$40,620 in 2012. The state per-capita income is higher in metropolitan regions, along major corridors, and in northwest Oklahoma. Growth in per capita income is highest in the rural areas of the state. This growth in income has consistently outpaced that of all other neighboring states; and as per capita income has risen, people have consumed more goods and services.

The low cost of living in Oklahoma is one factor that has helped Oklahoma attract and develop industry and businesses. Low cost of living means

employees can obtain household needs at a lower overall cost. Oklahoma's urban areas, in particular, have a cost of living that is below the national average, and below similar municipalities in neighboring states. The overall cost of living index is about 10 percent less in Oklahoma City and Tulsa than in urban areas nationally.<sup>1</sup> This makes Oklahoma attractive to both businesses and future employees, which means more freight will be produced and consumed within the state.

The cost of doing business affects freight demand through the businesses that choose to work in Oklahoma. The Oklahoma State Chamber reports that Oklahoma has the fourth lowest nationwide state cost of doing business.<sup>2</sup> When the cost of doing business is lower, it attracts new businesses to the state, and encourages existing businesses to stay. With more businesses in the state, this increases freight and personal travel demand on the transportation system.

### 7.2. GROSS DOMESTIC PRODUCT

Gross Domestic Product (GDP) is the output of goods and services produced by labor and property located in the U.S. and is the broadest measure of economic activity. According to the Bureau of Economic Analysis (BEA), the GDP increased in 49 states in 2013, including Oklahoma.

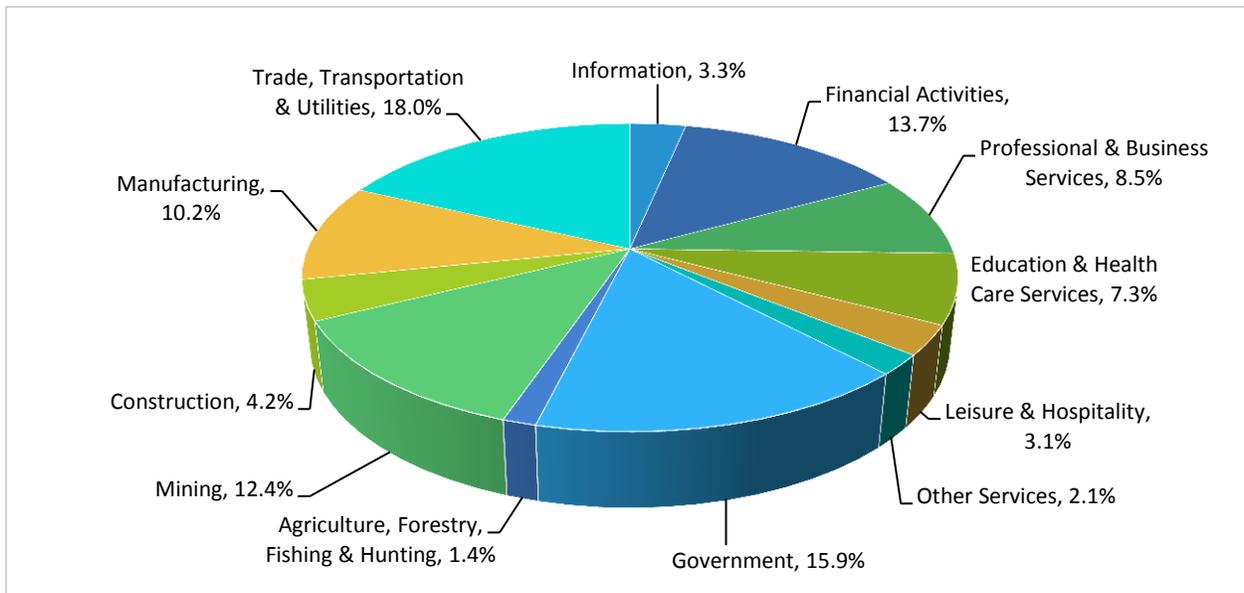
In 2013, Oklahoma's GDP was \$164.3 billion, up from \$157.7 billion in 2012. The state's real (adjusted for inflation) GDP increased by \$6.56 billion, or 4.2 percent in 2013, with the mining sector accounting for the majority of the growth. Oklahoma's 4.2 percent growth rate was the 4<sup>th</sup> highest in the U.S.

As shown in **Figure 7-1**, 16 Oklahoma industry sectors contributed to GDP growth in 2013, with the trade, transportation and utilities sector as the largest contributor at 18 percent. The government sector, financial activities sector, and

mining sector were the next largest contributors, combining to produce 42 percent of Oklahoma’s GDP in 2013. The oil and gas industry is included within the government sector and mining sector.

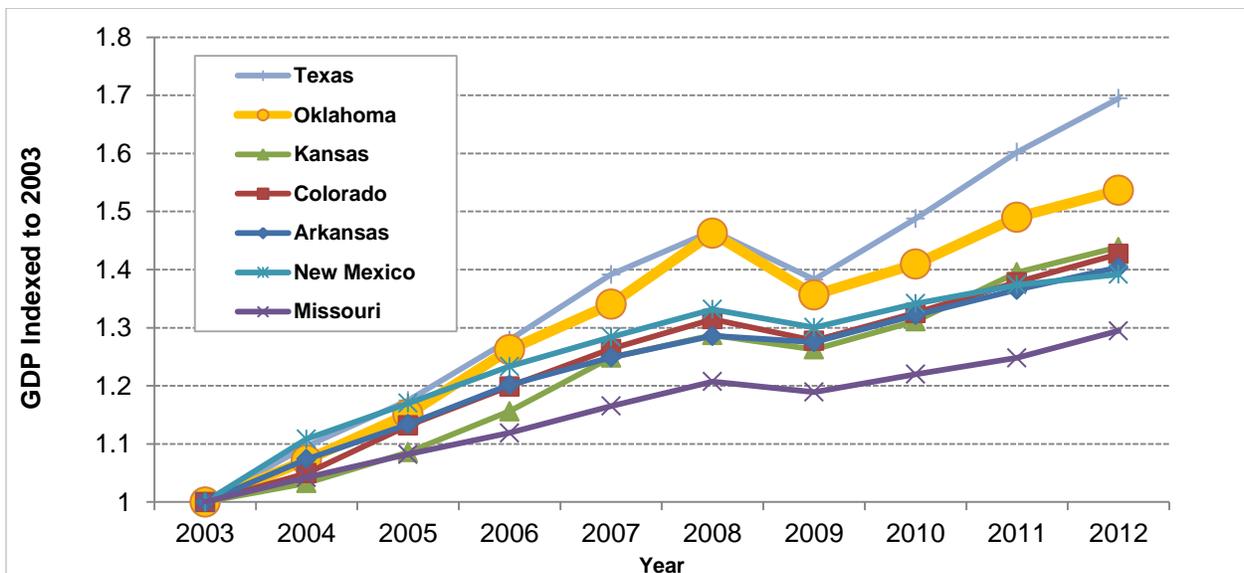
Figure 7-2 compares the change in Oklahoma’s GDP to neighboring states. For the decade ending 2012, Oklahoma GDP growth has outpaced neighboring states, with the exception of Texas.<sup>3</sup>

**Figure 7-1. Industry Share of Oklahoma’s Economy in 2013 (by percentage of Gross Domestic Product)**



Source: U.S. Department of Commerce, Bureau of Economic Analysis, Oklahoma Economic Indicators Report

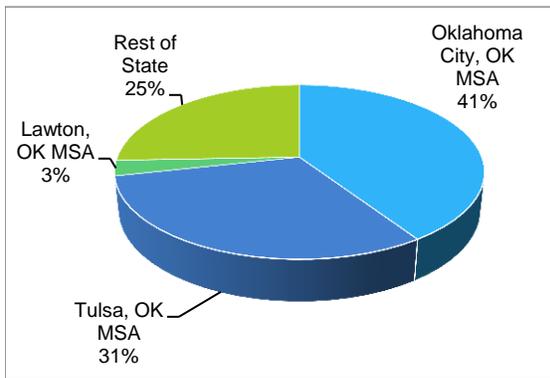
**Figure 7-2. Change in Gross Domestic Product in Oklahoma and Neighboring States, 2003-2012**



Source: Bureau of Economic Analysis

**Figure 7-3** illustrates the 2013 state real GDP percent contribution by three MSAs in Oklahoma. An MSA is a geographic area consisting of a large population nucleus together with adjacent communities having a high degree of economic and social integration with the nucleus.<sup>4</sup> The three MSAs in Oklahoma accounted for nearly 75 percent of the total state GDP. The Oklahoma City MSA had the highest contribution at 41 percent followed by the Tulsa MSA (31 percent) and Lawton MSA (3 percent).

**Figure 7-3. Metropolitan Area Contribution to State Gross Domestic Product, 2013**



Source: U.S. Department of Commerce, Bureau of Economic Analysis, Oklahoma Economic Indicators Report

Agriculture produces about one percent of Oklahoma’s GDP, and has been identified as a critical user of the transportation system. The state ranks in the top ten of the United States for production levels of rye, canola, wheat, sorghum, and other crops as shown in **Table 7-1**.

Several Oklahoma top industry sectors contributing to the GDP are reliant on the freight transportation system. A safe and efficient transportation system is important for the continued growth of Oklahoma’s economy.

**Table 7-1. 2013 Selected Oklahoma Crops Totals and U.S. Rank**

Crop Production			
Commodity	Unit	Total	U.S. Rank
Rye	Bushels	1,600,000	1
Canola	Pounds	208,600,000	2
Winter Wheat	Bushels	105,400,000	3
Sorghum, Grain	Bushels	14,850,000	4
Pecans	Pounds	20,000,000	5
Hay	Tons	4,350,000	6
Sorghum, Silage	Tons	200,000	8
Peanuts	Pounds	59,200,000	9
Sunflower	Pounds	5,180,000	9

Source: [http://www.nass.usda.gov/Statistics\\_by\\_State/Oklahoma/Publications/Annual\\_Statistical\\_Bulletin/ok\\_pocket\\_facts\\_2014.pdf](http://www.nass.usda.gov/Statistics_by_State/Oklahoma/Publications/Annual_Statistical_Bulletin/ok_pocket_facts_2014.pdf)

### 7.3. OKLAHOMA INDUSTRIES

As mentioned in **Chapter 5**, Oklahoma’s employment is expected to grow by 10 percent from 2012 to 2022. This would add approximately 175,000 jobs to the state’s economy, with growth anticipated in all major industry sectors but one.

Employment growth by industry identifies the types of jobs being created in the state. Conversely, industries with a declining employment trend indicate those which are becoming less important in the state’s economy. There may also be industries that act more cyclically, growing during expansion and decreasing in times of economic slowdown or

contraction. The industry sectors projected to show the highest employment growth from 2012 to 2022, along with their percentages, are as follows:

- Construction, 20.9 percent;
- Professional and Business Services, 16.8 percent;
- Education and Health Services, 15.5 percent;
- Leisure and Hospitality, 15.0 percent; and
- Natural Resources and Mining, 14.6 percent.

All industry sectors contributing to the GDP are projected to show employment growth, with the exception of the information sector, which is anticipated to decrease employment by 3.3

percent. More jobs result in an increase in the movement of goods and people on the transportation system.

With favorable trends in population and other demographics, a rising GDP, and employment growth, freight demand on the transportation system will continue to increase. Therefore, freight transportation plays an important role in Oklahoma's economy. The movement of goods is essential to business success and meeting consumer needs.

## 7.4. FREIGHT TRANSPORTATION

Oklahoma's multimodal freight transportation system consists of highways, freight rail, ports and waterways, and airports, and is discussed in detail in **Chapter 6**. This transportation system is essential for the movement of freight into and out of, within and through the state. Freight related industries, the direction of freight movement, and trends that impact future freight movement all influence Oklahoma's economy.

### 7.4.1. Oklahoma's Freight Related Industries

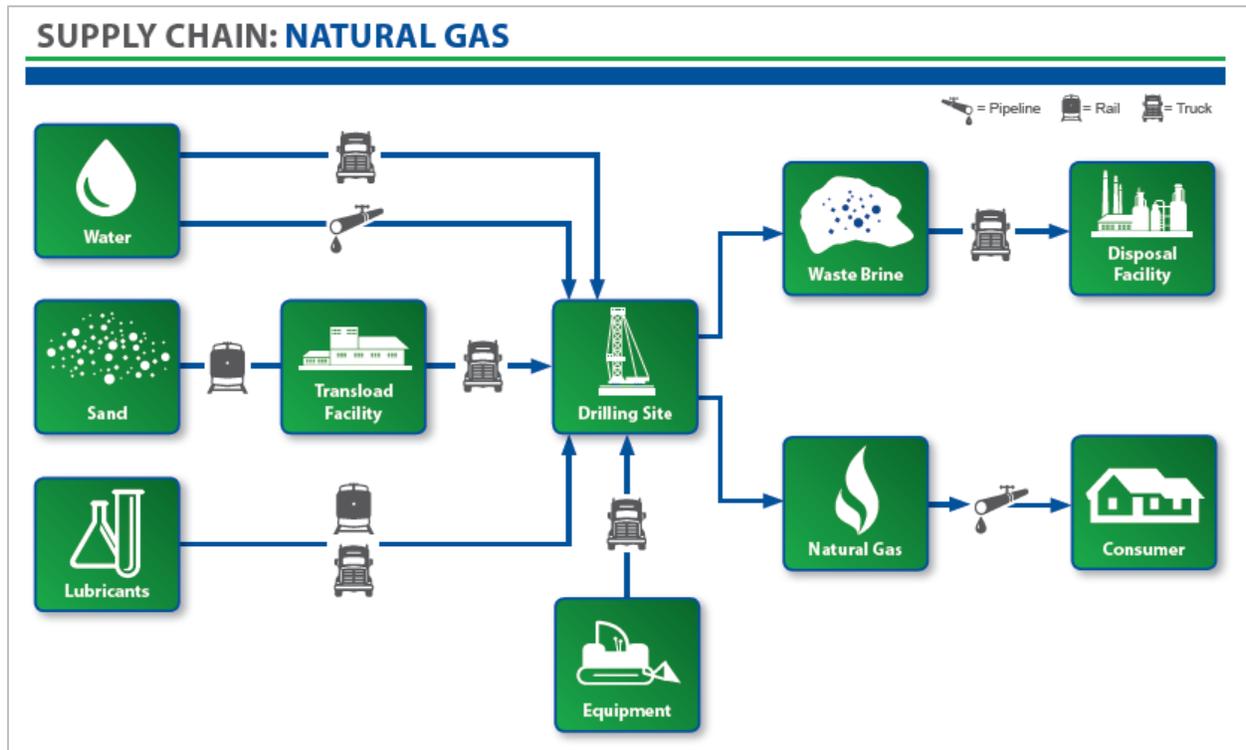
Industries that depend on the movement of goods, referred to in this chapter as "freight-related industries," are a key component of Oklahoma's economy. Five industry groups in Oklahoma have been identified as critical users of the freight transportation system, and several of these are among the major contributors to Oklahoma's GDP<sup>5</sup>. They accounted for more than half of the state's GDP in 2013. Below are the five industry groups.

- **Agriculture** – Agricultural production and agricultural support activities, including farm and ranch operations.
- **Energy and Mining** – Extraction of minerals and gases and supporting activities; utilities providing power or other services, excluding waste management.
- **Manufacturing** – Plants, factories, or mills that characteristically use power-driven machines and materials-handling equipment, but may also include other establishments that process or transform materials into new products.
- **Transportation and Distribution** – Industries providing transportation of passengers and cargo, warehousing and storage for goods, scenic and sightseeing transportation, and support activities, wholesaling of agriculture, mining, manufacturing, and other products.
- **Other Industry (including retail and construction)** – Establishments primarily engaged in the construction of buildings or engineering projects, and entities selling merchandise through a store or non-store location to the general public.

The future competitiveness of these major and emerging industries in the global marketplace require an integrated freight transportation system with strengths in all modes – airports for moving light weight, time-sensitive products; waterways and railroads for handling bulk shipments or intermodal containers; and highways for serving distribution centers and warehouses. Each industry relies on at least one, or often multiple modes within its supply chain network (see **Figure 7-4** for an example supply chain for natural gas); and each mode serves more than one function for Oklahoma's freight system.

Rail and waterways serve commodities traveling over long distances, but also serve for specialized goods transport and link to major export markets. Airports respond not only to high value freight needs with tight delivery timeframes, but also serve to link businesses and industry with global partners and supply chains. The highway system provides not only connections to and from origins and destinations, but also serves as the "last and first mile" connector to users of rail, water, and air transport.

Figure 7-4. Natural Gas Supply Chain  
(For Example Purposes Only)



Source: CDM Smith Inc.

### 7.4.2. Oklahoma’s Freight Movements by Mode and Direction<sup>6</sup>

#### Current Freight Flows

In 2015, more than one billion tons of freight is expected to move by highway, rail, and waterway in Oklahoma. **Table 7-2** shows Oklahoma’s freight flows in estimated tonnage by transportation mode and direction.

Highways account for the majority of tonnage at 66 percent, and the dominant movement is freight moving *through* Oklahoma.

Rail typically moves bulk commodities, as it is the most efficient transport method for long

distances. As such, internal rail movements in Oklahoma are few. Instead, rail accounts for a greater portion of inbound, outbound, and through movements in Oklahoma. Overall, about a third of all freight tonnage is moved by rail in Oklahoma.

Waterway movements in Oklahoma transport bulk commodities, which are not as time-sensitive as rail and highway commodities. However, there is also a growing trend where large energy sector equipment is transported to Oklahoma ports via the MKARNS waterway, which is then transloaded to trucks for final delivery within Oklahoma or to nearby states.

**Table 7-2. Oklahoma Freight Tonnage Flow, by Mode and Direction (2015 estimate)**

Mode	MILLION TONS OF FREIGHT, 2015					Percent by Mode
	Inbound	Outbound	Internal	Through	Total	
Truck	45.8	59.0	149.8	407.1	661.7	65.7%
Rail	31.0	18.9	3.8	285.0	338.7	33.6%
Waterway	3.1	3.3	0.0	0.0	6.4	0.6%
<b>Total</b>	<b>79.9</b>	<b>81.2</b>	<b>153.6</b>	<b>692.1</b>	<b>1,006.8</b>	<b>100.0%</b>

Note: Numbers may not add due to rounding.

Sources: Freight Analysis Framework, FHWA (FAF3), 2013; Class1 Railroad Annual Reports, 2013; Commerce on the Oklahoma Segment, MKARNS, 2013; Tulsa District, U.S. Army Corps of Engineers.

### Future Freight Flows

Total freight tonnage (inbound, outbound, through and within the state) is forecasted to grow to 1.4 billion tons by 2040, an increase of 42 percent from the 2015 estimate. The 2015-2040 growth is characterized by a 52 percent increase in truck tonnage, followed by a 22 percent

increase in rail tonnage, and 30 percent increase in waterway tonnage. By 2040, trucks are forecasted to carry 71 percent of all freight tonnage, while rail is projected to transport 29 percent. Waterborne freight is expected to carry less than one percent of the total tonnage. (See **Table 7-3.**)

**Table 7-3. Oklahoma Forecasted Freight Tonnage Flow, by Mode (2015 and 2040)**

Mode	MILLION TONS OF FREIGHT, 2015-2040							2015-2040 Change
	2015 Total Estimated	2040						
		Inbound	Outbound	Internal	Through	Total Forecast	% by Mode	
Truck	661.7	79.8	76.2	222.6	629.9	1,008.4	70.6%	52.4%
Rail	338.7	47.7	17.3	5.0	341.7	411.7	28.8%	21.6%
Waterway	6.4	4.0	4.3	0.0	0.0	8.3	0.6%	29.7%
<b>Total</b>	<b>1,006.8</b>	<b>131.5</b>	<b>97.7</b>	<b>227.6</b>	<b>971.7</b>	<b>1,428.5</b>	<b>100.0%</b>	<b>41.9%</b>

Note: Numbers may not add due to rounding.

Sources: FHWA Freight Analysis Framework, version 3; ODOT Traffic Analysis Branch; Class One Rail data; 2012 ODOT Freight Flows Study; 2035 Oklahoma Long Range Transportation Plan; ODOT Waterways Program; U.S. Army Corps of Engineers, Tulsa District.

Directional freight patterns are expected to stay largely similar to 2015, with through freight still capturing 68 percent of all freight tonnage. Overall, the increased freight demand on the transportation system will require maintenance and operational improvements, particularly to the highways.

### Through Freight

Through tonnage is forecasted to grow 40 percent between 2015 and 2040 in Oklahoma. This increase will continue to place a large demand on highways and rail as shown in **Table 7-4.**

**Table 7-4. Oklahoma Forecasted Through Tonnage, by Mode (2015 and 2040)**

Mode	Million Tons		2015-2040 % Change
	2015 Total Estimate	2040 Total Forecast	
Truck	407.1	629.9	54.7%
Rail	285.0	341.7	19.9%
Waterway	0.0	0.0	NA
<b>Total</b>	<b>692.1</b>	<b>971.6</b>	<b>40.4%</b>

Sources: FHWA Freight Analysis Framework, version 3; ODOT Traffic Analysis Branch; Class One Rail data; 2012 ODOT Freight Flows Study; 2035 Oklahoma Long Range Transportation Plan; ODOT Waterways Program; US Army Corps of Engineers, Tulsa District.

### Inbound Freight

**Table 7-5** shows the Oklahoma inbound 2015 and 2040 freight tonnage by mode and it is expected to increase by 65 percent over the next 25 years. Trucks will continue to be the dominant freight mode, and truck tonnage is projected to increase 74 percent, followed by rail at 54 percent.

**Table 7-5. Oklahoma Forecasted Inbound Tonnage, by Mode (2015 and 2040)**

Mode	Million Tons		2015-2040 % Change
	2015 Total Estimate	2040 Total Forecast	
Truck	45.8	79.8	74.5%
Rail	31.0	47.7	53.9%
Waterway	3.1	4.0	29.0%
<b>Total</b>	<b>79.9</b>	<b>131.5</b>	<b>64.6%</b>

Sources: FHWA Freight Analysis Framework, version 3; ODOT Traffic Analysis Branch; Class One Rail data; 2012 ODOT Freight Flows Study; 2035 Oklahoma Long Range Transportation Plan; ODOT Waterways Program; U.S. Army Corps of Engineers, Tulsa District.

### Outbound Freight

Outbound freight tonnage is projected to grow at the slowest rate (20 percent) over the next 25 years as compared to other directional movements. Similar to the other directional movements, trucks will continue to be the dominant mode. (See **Table 7-6**.)

**Table 7-6. Oklahoma Forecasted Outbound Tonnage, by Mode (2015 and 2040)**

Mode	Million Tons		2015-2040 % Change
	2015 Total Estimate	2040 Total Forecast	
Truck	59.0	76.2	29.2%
Rail	18.9	17.3	-8.5%
Waterway	3.3	4.3	30.3%
<b>Total</b>	<b>81.2</b>	<b>97.7</b>	<b>20.3%</b>

Note: Numbers may not add due to rounding.  
Sources: FHWA Freight Analysis Framework, version 3; ODOT Traffic Analysis Branch; Class One Rail data; 2012 ODOT Freight Flows Study; 2035 Oklahoma Long Range Transportation Plan; ODOT Waterways Program; US Army Corps of Engineers, Tulsa District.

### Internal Freight

Internal freight tonnage movement is projected to grow by 48 percent and all modes, except for waterways, will experience some internal freight tonnage growth over the next 25 years. (Waterway movements are either inbound or outbound.) Trucks will continue to be the dominant freight mode and truck tonnage is projected to increase 49 percent, followed by rail at 32 percent. (See **Table 7-7**.)

**Table 7-7. Oklahoma Forecasted Internal Tonnage, by Mode (2015 and 2040)**

Mode	Million Tons		2015-2040 % Change
	2015 Total Estimate	2040 Total Forecast	
Truck	149.8	222.6	48.6%
Rail	3.8	5.0	31.6%
Waterway	0.0	0.0	NA
<b>Total</b>	<b>153.6</b>	<b>227.6</b>	<b>48.2%</b>

Sources: FHWA Freight Analysis Framework, version 3; ODOT Traffic Analysis Branch; Class One Rail data; 2012 ODOT Freight Flows Study; 2035 Oklahoma Long Range Transportation Plan; ODOT Waterways Program; U.S. Army Corps of Engineers, Tulsa District.

### 7.4.3. Freight Trends: Oklahoma and Beyond

Understanding current and future trends and the issues influencing how businesses move their products is critical to maintaining and improving Oklahoma's freight transportation system, as well as ensuring it remains an asset to the citizens and supports the state's economic competitiveness. The following are critical freight trends that impact Oklahoma's transportation system.

#### Energy Sector

Oklahoma's energy industry includes the core components of raw materials extraction, machinery and manufacturing, natural gas products, distribution, and engineering services. Oklahoma is a national energy leader, and it has recently seen increasing focus on technological and manufacturing solutions for the energy market. One such example is General Electric's construction of a \$110 million research center in Oklahoma that will focus on researching new

ways to improve oil and gas extraction. This facility is expected to be completed in 2016.<sup>7</sup>

Weight limitations are an issue for the energy industry. Oklahoma is experiencing growth in oversize-overweight (OS/OW) cargo volume, due in part to the increase in the wind turbine industry and cargo associated with transporting large-scale wind energy components, such as blades and other turbine components, as well as oil and gas extraction equipment. Transporting OS/OW equipment safely and efficiently through Oklahoma requires coordination between the energy sector and state agencies responsible for enforcement, safety, and transportation policy.

There are various potential negative impacts associated with OS/OW trucks. Oversize/overweight trucks and high truck volumes accelerate pavement deterioration and the overall pavement service life. This results in the need for more frequent preservation, reconstruction, and maintenance activities. In addition, OS/OW trucks can impact highway safety in general, and pedestrian and bicyclist safety in particular. For example, highways with no shoulders or safe passing areas are problematic when cars and other vehicles pass slower moving OS/OW trucks. The Oklahoma Department of Transportation (ODOT) understands these issues and trends and is especially aware of the need to improve shoulder conditions on rural roadways.

Additionally, oil and gas companies are increasingly transporting petroleum products via rail since it is more accessible than pipelines in certain areas of Oklahoma. For example, pipelines are not available between Oklahoma and North Dakota, so petroleum is transported inbound by rail from North Dakota to Stroud, Oklahoma, and then pipelined to Cushing, Oklahoma. According to the AAR in 2008, Class I railroads originated 9,500 carloads of crude oil nationally compared to 234,000 in 2012.<sup>8</sup> Although costs to transport petroleum by rail are higher than pipeline, rail offers competitive advantages and it is expected to grow in volume

and market share. Rail serves all major refineries in the U.S., as well as the inland waterway and Gulf markets. This provides energy companies a viable and efficient way to transport petroleum products.

### **Shipping and the Panama Canal Expansion**

Since 1914, the Panama Canal has played an instrumental role in moving freight globally. Today, the Panama Canal serves over 140 maritime trade routes to over 80 countries; an estimated five percent of global maritime cargo transits the Panama Canal every year.<sup>9</sup> The Panama Canal is undergoing a \$5.25 billion expansion to accommodate more and larger ships. Currently expected to be completed in 2016, the expansion will have an impact on demand for U.S. ports, rail service, and highways.

Oklahoma is connected to ocean shipping through the inland waterway system and the road and rail connections to the Port of New Orleans, Houston, and other Gulf ports. The MKARNS is a Marine Highway Corridor, which leads to the Mississippi River and the Gulf of Mexico. Oklahoma commodities including but not limited to grain, petroleum products, gravel, and oversize energy and agricultural equipment depend on the inland waterway system.

According to Panama Canal executives, some of the biggest growth cargoes in Panama after the expansion project is completed will be dry and liquid bulk cargoes,<sup>10</sup> which may lead to the potential for increased export traffic from Oklahoma, among others. According to the Panama Canal Phase I Report,<sup>11</sup> reductions in transportation costs out of Gulf ports may lead to a reduction of costs to export bulk commodities, particularly grain, by the Mississippi River System, and could help increase overall demand for exports. However, as noted by the USACE, increases in congestion on the inland waterway system may offset some of these cost reductions.

While the full impacts to the Oklahoma transportation system are unknown at this time, rail and water infrastructure serving the Panama Canal trade routes will be monitored to

determine if shippers and carriers will shift their supply chains to take advantage of this improved international routing option.

### **Inter-American Trade and Nearshoring**

Trade between the U.S. and its southern neighbors in Mexico and Central and Latin America is an important part of the U.S. economy. Increasing trends in Inter-American trade, as well as potential new trade agreements<sup>12</sup> between these countries, increase the potential for increased import and export trade for Oklahoma's businesses. According to the U.S. Census Bureau Foreign Trade Statistics, Oklahoma exported \$6.9 billion worth of products in 2013, up 5.2 percent from 2012.<sup>13</sup> Manufactured exports support 21 percent of manufacturing jobs, and since 2003 export manufacturing has risen more than twice as fast as the state's overall economy. A total of 90 percent of Oklahoma's exports are manufactured goods, and 50 percent of Oklahoma's total exported manufactured goods went to Free Trade Agreement partner countries in 2010.<sup>14</sup>

In addition to increased trade opportunities, U.S. businesses are increasingly moving overseas operations to locations in the U.S. or Mexico, potentially increasing the supply chain and manufactured goods traffic that will flow through the southern border of the U.S. This "reshoring" or "nearshoring" trend is the result of many factors influencing manufacturing costs, such as labor and production costs, quality control, and transportation costs and transit times.

### **Other Logistics Trends**

Changing demand for when and how goods are shipped and delivered has led to changes in the logistics sector and growth in the warehousing and distribution sector of the economy. With the rise of e-commerce, consumers can order directly from a company or online retailer, and receive the products without visiting a retail store. Companies are competing to provide the most timely delivery services, including same-day service to consumers.

Distribution centers are also being located closer to rail lines in order to take advantage of the reduced rates and environmental factors of shipping via rail versus truck. Growth in and around urban areas, especially those with access to highway and rail, is expected to continue as e-commerce trends increase. Consequently, there are opportunities to capture growth in the warehousing and distribution sector, especially due to Oklahoma's geographic location and proximity to major markets. However, for companies preferring to locate adjacent to major dense urban areas to meet consumer demand, location options should be monitored closely to ensure the transportation system can support its operations.

Both Class I and Class III railroads<sup>15</sup> are making large infrastructure investments in Oklahoma to improve rail capacity to support customer requirements. Regional intermodal facilities, such as the BNSF Logistics Park Kansas City Intermodal Facility outside of Kansas City, Missouri, provide a hub for intermodal traffic to be delivered in a 300 mile radius to and from a single location, which includes most of Oklahoma.

Transload and multimodal facilities are also being built by railroads, private operators, and public agencies to facilitate industry and distribution center growth by providing rail and/or water access, and to offset supply chain volatility by allowing customers to utilize multimodal shipping options.

With trends in technology, reduced transportation costs, growth in the energy sector and in U.S. manufacturing, there is great potential for Oklahoma's economy to continue to grow and thrive.

## **7.5. CONCLUSION**

Oklahoma is experiencing a steady rise in population and economic growth, resulting in an increase of freight movement on the transportation system. This demand, along with an established multimodal transportation system, generates an increase in freight movement.

With increased demand and activity, the transportation system will experience more use, leading to issues such as deterioration, congestion, and potential safety concerns. The modal transportation needs are further discussed in **Chapter 9**; and **Chapter 11** identifies freight policies that address the trends and issues discussed in this chapter.

## 7.6. ENDNOTES

<sup>1</sup> Cambridge Systematics, *Oklahoma Freight Study: Task 3 - Description of the Current Oklahoma Economy, Key Industries, and Critical Trends, and Task 4 - System Inventory and Demand*, 2014.

<sup>2</sup> *Ibid*

<sup>3</sup> Bureau of Economic Analysis.  
<http://www.bea.gov/regional/index.htm>

<sup>4</sup> Oklahoma Employment Security Commission, *Oklahoma Economic Indicators*, February 2015.

<sup>5</sup> Oklahoma Department of Commerce.  
<http://commerce.gov/location-or-expansion/oklahomas-business-ecosystems/energy>

<sup>6</sup> The primary source for the rail and truck data was the FHWA Freight Analysis Framework, version 3. The FAF3 information (2012 and 2040) was available for inbound, outbound and internal traffic. This was supplemented with historical truck AADT information available through the ODOT Traffic Analysis Branch, Class One Rail information provided through ODOT Rail Programs, and truck and rail information provided through the 2012 ODOT Freight Flows Study, and the 2035 Oklahoma Long Range Transportation Plan. The rail and truck data for 2015 was forecast based on a 0.9 percent growth rate. Waterways data for 2013 were provided through ODOT Waterways Program and the U.S. Army Corps of Engineers, Tulsa District. The Waterway 2040 forecast was calculated based on a 0.9 percent growth rate, and was developed in consultation with staff from ODOT Waterways Program and the U.S. Army Corps of Engineers, Tulsa District. Regarding through tonnage, the 2015 through estimate was derived based on updating the 2009 and 2010 data from the 2012 Oklahoma Freight Flows Study and the 2035 Oklahoma Long Range Transportation Plan. This was supplemented with truck AADT data available through the ODOT Traffic Analysis Branch, and Class One Rail information provided through ODOT Rail Program. Through truck volumes were calculated based on an assumed average annual growth rate of 1.6 percent, consistent with national freight trends. Through rail tonnage was calculated based on consultation with ODOT Rail Programs staff and data from

*Class One Railroads, and used an assumed average annual growth rate of 0.9 percent.*

<sup>7</sup> Bailey, Brianna. "Oklahoma's manufacturing sector sees growth." *The Oklahoman*, October 10, 2013.  
<http://newsok.com/oklahomas-manufacturing-sector-sees-growth/article/3891821>

<sup>8</sup> Association of American Railroads.  
<https://www.aar.org/keyissues/Documents/Background-Papers/Crude-oil-by-rail.pdf>

<sup>9</sup> Panama Canal Authority, *2009 Annual Report*.  
<https://www.panacanal.com/eng/general/reporteannual/2009/pdf/InformePDFingles.pdf>

<sup>10</sup> Mongelluzzo, Bill. "Panama Canal's Sabongé: Canal to Recapture Much Suez Traffic." *Journal of Commerce*, September 11, 2013.  
[https://www.joc.com/port-news/panama-canal-news/panama-canal-sabonge-canal-recapture-much-suez-traffic\\_20130911.html](https://www.joc.com/port-news/panama-canal-news/panama-canal-sabonge-canal-recapture-much-suez-traffic_20130911.html)

<sup>11</sup> U.S. DOT Maritime Administration. *Panama Canal Expansion Study Phase I Report*, November, 2013.  
[http://www.marad.dot.gov/documents/Panama\\_Canal\\_Phase\\_I\\_Report\\_-\\_20Nov2013.pdf](http://www.marad.dot.gov/documents/Panama_Canal_Phase_I_Report_-_20Nov2013.pdf)

<sup>12</sup> Miami Herald. "U.S. Considering Deal to Expand Trade in the Americas." December 14, 2013.  
<http://www.miamiherald.com/2013/12/14/3819165/andres-oppenheimer-us-considering.html>

<sup>13</sup> <https://www.census.gov/foreign-trade/statistics/state/data/ok.html>

<sup>14</sup> National Association of Manufacturers,  
<http://www.nam.org/~media/A11D3C9D16F14B16BE10DE3117E15310.ashx>

<sup>15</sup> Class I railroads operating in Oklahoma in 2015 are BNSF, UP, and KCS. There are 20 Class III railroads operating in Oklahoma in 2015. In the United States, the Surface Transportation Boards defines a class of railroad based on revenue thresholds adjusted for inflation. For the most recent year of classification (2013), Class I railroad is defined as a carrier having operating revenues of \$467.0 million or more. Class III railroad is a carrier with yearly operating revenues under \$37.4 million. (Source: Federal Railroad Administration, *Summary of Class II and Class III Railroad Capital Needs and Funding Sources – A Report to Congress*, October 2014).

## 8. SAFETY, SECURITY, AND ENVIRONMENTAL ISSUES

This chapter addresses three key issues for the ODOT – safety, security, and environmental activities. The State of Oklahoma has witnessed how safety and security concerns can impact transportation and mobility. In recent years, flooding, tornados, and incident-related congestion have accentuated the importance of a safe and secure transportation system. Because of these types of events, as well as driver behavior, and the potential for other system interruptions, safety, security, and environmental responsibility are important issues for Oklahoma.

### 8.1. SAFETY

Improved transportation system safety is a primary goal in Oklahoma and for the 2015-2040 LRTP. ODOT values life, and strives to minimize traffic fatalities and serious injury crashes. This section discusses ODOT’s update of the Strategic Highway Safety Plan and safety trends.

#### 8.1.1. ODOT’s Strategic Highway Safety Plan

Oklahoma takes a systemic<sup>1</sup> approach to safety. This technique utilizes analysis of high-risk roadway features and correlates them with particular crash types; then follows up with addressing and mitigating high risk features. Oklahoma has utilized systemic solutions as well; particularly those that are low cost and result in high benefits.

ODOT incorporates a broad multimodal, integrated approach to safety that touches all Department levels and functions. Guidance for this type of integration is provided in the reference manual *Statewide Opportunities for Integrating Operations, Safety, and Multimodal Planning*, published by the U.S. DOT, FHWA.

This manual documents safety and operation strategies at the following five levels:

- Overall DOT environment;
- Statewide opportunities;

- Regional opportunities;
- Corridor and sub-level opportunities; and
- Project opportunities.

Integration of safety and operations, as envisioned by FHWA, spans across all travel modes and includes all of the state DOTs primary organizational units - planning, design, and operation.

Oklahoma’s first SHSP was published in 2007. It included a primary goal with measureable subgoals related to fatalities and injuries, and outlined five focus areas. The primary safety goal was to “reverse the increasing trend of traffic related fatalities and injuries...” and the subgoals were:

- Achieve a 20 percent reduction in the 2004 Oklahoma fatality rate from 1.71 lives lost per 100 million vehicle miles of travel (HMVMT) to 1.37 per HMVMT by 2015 (see Table 8-2), and
- Achieve a 20 percent reduction in the 2004 Oklahoma serious injury rate from 40.46 serious injuries per HMVMT to 32.37 per HMVMT by 2015 (see Table 8-3).

The five focus areas were:

- (1) Unsafe driving behavior (impaired drivers, aggressive drivers, speeding drivers, fatigued drivers, distracted drivers, and drivers not using seatbelts);
- (2) Intersection crashes;
- (3) Crashes involving young drivers;
- (4) Lane departure crashes; and
- (5) Crosscutting strategies (Actions that improve safety in several focus areas - Reduction in overall fatalities and injuries, improvement

of crash data and its availability, and development of a safer overall vehicle fleet).

### 8.1.2. Safety Plan Implementation Results

Several success stories from the 2007 SHSP indicate that ODOT is on the right path. For example, the total number of crashes between 2007 and 2012 has declined by six percent.

Overall, motor vehicle crashes declined between 2007 and 2012 in Oklahoma. **Table 8-1** presents the total number of crashes from the date of the first Oklahoma SHSP in 2007 through the last complete year for which data are available in 2012. Despite some year-to-year increases in

crashes, the total crashes were lower than the initial year. Overall, 2012 concluded with a 5.9 percent decrease in crashes as compared to 2007.

Both Oklahoma’s fatality rate (number of fatalities per HMVMT) and the number of traffic related fatalities declined between 2007 and 2012. The fatality rate decreased 7.5 percent and the number of fatalities declined 7.6 percent.

**Table 8-2** depicts Oklahoma’s fatality rate, the national fatality rate, and the raw number of traffic related fatalities in Oklahoma crash data for the six-year period from 2007 to 2012.

**Table 8-1. Number of Crashes in Oklahoma, 2007-2012**

Year	Total Crashes	
	Number	Annual Percent Reduction
2007	75,059	---
2008	72,667	3.2
2009	71,218	2.0
2010	69,807	2.0
2011	68,967	1.2
2012	70,669	-2.5
<b>% Reduction 2007-2012</b>	<b>5.9%</b>	

*Note: This chart displays total crashes, not total vehicles involved in crashes or total individuals involved in crashes.*

*Source: CDM Smith analysis based on data from the Oklahoma Highway Safety Office.*

**Table 8-2. Fatality Rate per HMVMT, 2007-2012**

Year	Oklahoma Five Year Fatality Rate Trend	Oklahoma Actual Annual Fatality Rate	National Fatality Rate	Oklahoma Fatalities
2007	1.7	1.6	1.4	766
2008	1.7	1.6	1.3	750
2009	1.6	1.6	1.1	737
2010	1.5	1.4	1.1	668
2011	1.4	1.5	1.1	696
2012	1.4	1.5	1.1	708
<b>% Reduction 2007-2012</b>	<b>15.1%</b>	<b>7.5%</b>	<b>16.8%</b>	<b>7.6%</b>

*Source: National Highway traffic Safety Administration, December 2014. <http://www-nrd.nhtsa.dot.gov>. ODOT Collision Analysis and Safety Branch, December 2014.*

*Historical trend based on statistical analysis of crash data from 1997 to 2011.<sup>2</sup>*

Oklahoma’s fatality rate decreased between 2007 and 2012, but at a slower rate than the national rate, which also declined during this period. Raw numbers for fatalities for the six-year period also show an overall decrease, from 766 in the year 2007 to 708 in 2012; with each year lower than 2007.

The traffic related serious injury rate in Oklahoma (number of serious injuries per HMVMT) and the number of traffic related serious injuries declined

between 2007 and 2012. The serious injury rate decreased 9.8 percent, while the total number of serious injuries declined 7.6 percent.

**Table 8-3** depicts Oklahoma’s serious injury rate and the raw number of traffic related serious injuries in Oklahoma collisions for the six-year period from 2007 to 2012. Because there is variation in the way each state calculates serious injuries, a national comparison is not included.

**Table 8-3. Serious Injury Rate per HMVMT, 2007-2012**

Year	Oklahoma Serious Annual Injury Rate	Oklahoma Serious Injury Number
2007	37.9	17,663
2008	35.0	16,398
2009	34.2	16,077
2010	34.7	16,557
2011	34.1	16,190
2012	34.2	16,314
<b>% Reduction 2007-2012</b>	<b>9.8%</b>	<b>7.6%</b>

Source: ODOT Collision Analysis and Safety Branch, December 2014.

Oklahoma’s serious injury rate decreased between 2007 and 2012, as did the number of serious injuries. The general trend is toward reducing serious injuries, despite some interim year increases. Again, the historical trend analysis suggests ODOT is on track to achieve the 2007 Oklahoma SHSP goal to reduce serious injury rate per HMVMT to 32.37 by 2015.

Traffic safety issues that focus on the following topics are discussed on subsequent pages: pedestrians, bicyclists, highway freight, hazardous materials highway safety, railway-highway crossing safety, and railroad safety for hazardous materials.

#### **Pedestrian and Bicycle Safety**

Pedestrian and bicyclists are vulnerable travelers on roads and highways, and those non-motorized forms of travel are becoming more popular each

year. As shown in **Table 8-4**, pedestrian crashes on Oklahoma’s road system have remained relatively constant between 2007 and 2012. Fatal pedestrian crashes declined in 2008 and 2009 (which correlates with a period of fewer vehicle miles of travel), but are at the same level in 2012 as 2007.

The report on bicycle crashes from the 2007-2012 period presents a mixture of encouraging results and challenges. Total bicycle crashes are down 19.8 percent when comparing 2007 to 2012, as shown in **Table 8-5**. Injury and property damage only bicycle crashes show a slight reduction between 2007 and 2012. Eleven fatal crashes were reported in 2009, which was a six-year high; however, there were less fatal crashes in the next three years with a six-year low of only one fatal crash in 2011.

**Table 8-4. Pedestrian Involved Crashes, 2007-2012**

Year	Fatal		Injury <sub>1</sub>		PDO <sub>2</sub>		Unknown		Total Pedestrian Involved Crashes
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number
2007	67	10.01	398	59.49	165	24.66	39	5.83	669
2008	49	7.62	396	61.59	184	28.62	14	2.18	643
2009	32	5.35	392	65.55	162	27.09	12	2.01	598
2010	68	10.15	376	56.12	212	31.64	14	2.09	670
2011	47	6.86	403	58.83	181	26.42	54	7.88	685
2012	67	9.50	393	55.74	194	27.52	51	7.23	705
<b>Average Annual</b>	<b>55</b>		<b>393</b>		<b>183</b>		<b>31</b>		<b>662</b>
<b>% Reduction 2007-2012</b>	<b>0.0%</b>		<b>1.3%</b>		<b>-17.6%</b>		<b>-30.8%</b>		<b>-5.4%</b>

Notes:

1. Includes all incapacitating and non-incapacitating injuries.
2. Possible crash injury included with Property Damage Only (PDO) data.

Source: CDM Smith analysis based on data from the Oklahoma Highway Safety Office.

**Table 8-5. Bicyclist Involved Crashes, 2007-2012**

Year	Fatal		Injury <sub>1</sub>		PDO <sub>2</sub>		Unknown		Total Bicyclist Involved Crashes
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number
2007	3	0.63	219	46.20	143	30.17	109	23.00	474
2008	4	1.12	213	59.66	127	35.57	13	3.64	357
2009	11	3.61	175	57.38	106	34.75	13	4.26	305
2010	8	2.45	182	55.83	127	38.96	9	2.76	326
2011	1	0.33	177	57.65	120	39.09	9	2.93	307
2012	5	1.32	201	52.89	133	35.00	41	10.79	380
<b>Average Annual</b>	<b>5</b>		<b>195</b>		<b>126</b>		<b>32</b>		<b>358</b>
<b>% Reduction 2007-2012</b>	<b>-66.7%</b>		<b>8.2%</b>		<b>7.0%</b>		<b>62.4%</b>		<b>19.8%</b>

Notes:

1. Includes all incapacitating and non-incapacitating injuries.
2. Possible crash injury included with Property Damage Only (PDO) data.

Source: CDM Smith analysis based on data from the Oklahoma Highway Safety Office.

### Freight Highway Safety

Data on freight highway safety are available through the Oklahoma Highway Safety Office in the form of large truck<sup>3</sup> crashes. Between 2007 and 2012, the total number of large trucks involved in crashes has declined by 14.6 percent

as shown in **Table 8-6**. The number of large truck injury crashes has also been on a relatively steady decline from 890 in 2007, to 741 in 2012. Fatal crashes involving large trucks, on the other hand, have remained fairly constant since 2007.

**Table 8-6. Large Truck Involved Crashes, 2007-2012**

Year	Fatal		Injury <sub>1</sub>		PDO <sub>2</sub>		Total Large Truck Crashes
	Number	Percent	Number	Percent	Number	Percent	Number
2007	85	1.49	890	15.59	4,735	82.92	5,710
2008	102	2.00	775	15.20	4,221	82.80	5,098
2009	76	1.76	639	14.83	3,594	83.41	4,309
2010	80	1.77	721	15.99	3,707	82.23	4,508
2011	76	1.61	757	16.00	3,898	82.39	4,731
2012	94	1.93	741	15.20	4,041	82.88	4,876
<b>Average Annual</b>	<b>86</b>		<b>754</b>		<b>4,033</b>		<b>4,872</b>
<b>% Reduction 2007-2012</b>	<b>-10.6%</b>		<b>16.7%</b>		<b>14.7%</b>		<b>14.6%</b>

Notes:

1. Includes all incapacitating and non-incapacitating injuries.

2. Possible crash injury included with Property Damage Only (PDO) data.

Source: CDM Smith analysis based on data from the Oklahoma Highway Safety Office.

### Hazardous Material Highway Crashes

Hazardous material highway crashes have increased from 114 in 2009 to 178 in 2012. The vast majority of these crashes do not involve a serious injury or fatality, but the increase in crashes presents a challenge to traffic safety engineers in Oklahoma. **Table 8-7** summarizes hazardous material crashes on Oklahoma roads

between 2009 and 2012, as no data were available for years 2007-2008. No ODOT data are available on the length of time a road is closed due to a hazardous material crash. Fatal highway crashes involving hazardous material have fluctuated between 2009 and 2012 with the highest number, nine, recorded in 2012.

**Table 8-7. Hazardous Material Highway Crashes, 2009-2012**

Year	Fatal		Injury <sub>1</sub>		Other		Total Hazardous Material Involved Crashes
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number
2009	6	5.26	20	17.54	88	77.19	114
2010	7	5.88	24	20.17	88	73.95	119
2011	4	2.67	38	25.33	108	72.00	150
2012	9	5.06	40	22.47	129	72.47	178
<b>Average Annual</b>	<b>7</b>		<b>31</b>		<b>103</b>		<b>140</b>
<b>% Reduction 2009-2012</b>	<b>-50.0%</b>		<b>-100.0%</b>		<b>-46.6%</b>		<b>-56.1%</b>

Note: 1. Includes all incapacitating and non-incapacitating injuries.

Source: CDM Smith analysis based on data from the Oklahoma Highway Safety Office.

### Freight Rail Safety – Grade Crossing Crashes

An at-grade railroad crossing is a location where a public highway, road, street, or private roadway (including an associated sidewalk or pathway), crosses railroad tracks at street level. Currently, there are approximately 3,800 at-grade railroad crossings in Oklahoma. Data on railway highway crossing crashes are presented in **Table 8-8**. In 2007, there were six highway railroad crossing related fatal crashes reported, and the number

declined to one in 2012, which is an 83.3 percent reduction. On average, each fatal crash caused two deaths (not shown in table). During the same six-year period, railroad crossing crashes resulting in injuries were reduced by 40 percent. Even though the trend of railway highway crashes shows a decline, between 2007 and 2012 total crashes averaged about 43 per year, nearly 4 per month.

**Table 8-8. Railway Highway Crossing Crashes, 2007-2012**

Year	Fatal	Injury <sub>1</sub>	Other	Total Crashes
2007	6	15	29	50
2008	8	18	29	55
2009	3	15	21	39
2010	4	16	17	37
2011	3	9	28	40
2012	1	9	26	36
<b>Average Annual</b>	<b>4</b>	<b>14</b>	<b>25</b>	<b>43</b>
<b>% Reduction 2007-2012</b>	<b>83.3%</b>	<b>40.0%</b>	<b>10.3%</b>	<b>28.0%</b>

Note: 1. Includes all incapacitating and non-incapacitating injuries.

Source: Railway Highway Crossing Crashes 2007-2012; ODOT Collision Analysis and Safety Branch- February 2015

### Hazardous Material Railroad Incidents

The number of hazardous material railroad incidents was relatively low in Oklahoma between 2007 and 2012, with 25 total incidents occurring during the six-year time period.<sup>4</sup> Of the 25 incidents, seven were considered serious<sup>5</sup> by the Pipeline and Hazardous Materials Safety Administration (PHMSA) and two required

evacuations. However, none of the hazardous material railroad crashes resulted in a serious injury or fatality. **Table 8-9** summarizes the Oklahoma hazardous material railroad incidents by type during the six-year time period. The total number of hazardous material railroad incidents was lower in 2012 than in 2007, with the annual average being four.

**Table 8-9. Hazardous Material Railroad Incidents, 2007-2012**

Year	Derailment	Serious Gas Released	Flammable Material Released	Fire	Other	Total
2007	0	1	2	0	2	5
2008	2 <sub>1</sub>	1	3	1	0	7
2009	0	1	0	0	2	3
2010	1	2 <sub>2</sub>	3	0	0	6
2011	0	3	0	0	0	3
2012	1	0	0	0	0	1
<b>Average Annual 2007-2012</b>	<b>0.6</b>	<b>1.3</b>	<b>1.3</b>	<b>0.2</b>	<b>0.7</b>	<b>4.2</b>

Notes:

1. One incident had a derailment and fire occur. Recorded as derailment to avoid duplication.

2. One incident released a flammable gas. Recorded as serious gas released to avoid duplication.

Source: CDM Smith analysis based on data from the US DOT Pipeline and Hazardous Materials Safety Administration.

### 8.1.3. SHSP Update

The ODOT is in the process of updating the 2007 SHSP with the intent of completing it in 2015. The Draft 2014 SHSP retained the 2007 SHSP vision statement: Provide and promote the safest roadway transportation system for all travelers—zero deaths, zero injuries.

The Draft 2014 SHSP also retained the 2007 SHSP's Mission Statement: Develop, implement, and evaluate a data driven multidisciplinary process to maximize road safety through widespread collaboration, integrating engineering, enforcement, education, and emergency response (the 4E approach).

The development of the Draft 2014 SHSP was guided by a Working Group that is comprised of ODOT, Oklahoma Highway Safety Office (OHSO), FHWA, the Federal Motor Carrier Safety Administration (FMCSA), and the Oklahoma Department of Public Safety/Highway Patrol (ODPS/OHP).

The Working Group identified the following statewide safety goal areas to reduce:

- Fatalities;
- Fatality rate;
- Serious injury;
- Serious injury rate;
- Unrestrained occupant fatalities;
- Fatalities involving drivers or motorcycle operators with high (0.08 or greater) blood alcohol content; and
- Commercial motor vehicle collisions.

The first four statewide safety goals are consistent with MAP-21's Safety Performance Measures and the 2015-2040 LRTP Safety Performance Measures. The 2014 SHSP discusses three types of safety improvements strategies.

- **Hot Spots** – Analyze high crash locations. This is the traditional approach to analyze crash location, type, and frequency.
- **Systemic** – Use a particular solution to address roadway issues associated to a particular crash type, meeting certain criteria. For example, lane departure crashes could be reduced if rumble strips were installed system-wide, where roadway conditions correlate with the crash type.
- **Policy** – Utilize a policy guideline to guide implementation of improvements. In this case, there has typically been sufficient research and successful implementation of a given strategy that a policy can be utilized to address the issue. For example, ODOT has a statewide striping policy.

The Draft 2014 SHSP also includes four emphasis areas:

- Unsafe driver behavior (addressing impaired, aggressive, fatigued/distracted drivers, and occupant protection);
- Intersection crashes;
- Crashes involving young drivers; and
- Lane departure crashes.

A growing trend in many states is to emphasize pedestrian and bicycle safety through planning and program initiatives. ODOT recognized the importance of pedestrian safety in the Draft 2014 SHSP where it discusses two programs: the Tulsa Pedestrian Action Plan<sup>6</sup> and installation of Pedestrian Hybrid Beacons<sup>7</sup> (PHBs).

### 8.1.4. National Safety Trends

According to the National Transportation Safety Board (NHTSA), annual road deaths in the U.S. rose 3.7 percent in 2012 to 33,561. This rise breaks a trend dating back to 2005 when roadway fatalities had steadily decreased from 43,510 to 43,510 in 2011. More Americans were traveling in 2012 as compared to previous years so the rise in fatalities was not unexpected. Moreover, road

fatalities per million vehicle miles of travel rose from 1.10 in 2011, to 1.16 in 2012. In working towards improved safety, states throughout the U.S., including Oklahoma, continue to employ the 4E strategies of engineering, enforcement, education, and emergency response.

## 8.2. SECURITY

Security is an issue that all states must proactively address as a result of terrorist attacks, natural disasters, and the potential for other system failures. As with most challenges, providing appropriate security on Oklahoma's transportation system requires teamwork. The security objectives in Oklahoma related to transportation should:

- Provide for safer travel for all modes of travel;
- Improve the security of the entire transportation system; and
- Improve the ability of the transportation system to support emergency management response and recovery.

There are hundreds of critical assets in Oklahoma that require protection. Listed in the next three subsections are a sampling of assets and events that should be made secure, to the extent possible, and that should have an evaluation and transportation response plan. This is not an exhaustive list but is intended to be illustrative of the types of assets and events that need special security attention and to identify where the transportation system can support the security of the facility or event.

### 8.2.1. Military Bases

Listed below are the principal Air Force, Army, and Coast Guard critical assets in Oklahoma.

- Altus Air Force Base;
- Tinker Air Force Base;
- Vance Air Force Base;
- Fort Still Army Base;
- McAlester Army Ammunition Base;
- U.S. Coast Guard Institute Base; and
- U.S. Coast Guard Container Inspection Training Unit.

### 8.2.2. Universities

There are numerous colleges, universities, and technical schools in Oklahoma that may need attention in terms of how transportation can support its security.

### 8.2.3. Other Buildings, Sites, Events

A sampling of infrastructure, buildings, and events that should be included in transportation security measures in Oklahoma includes:

- Major Bridges and Dams;
- Public Transportation;
- Rail Lines;
- Interstates;
- Major Airports;
- City Halls in all Major Cities;
- Federal Buildings;
- Hospitals;
- Sport Arenas and Stadiums; and
- Nuclear Power Plants.

### 8.2.4. ODOT Role in Emergency Management

ODOT has a significant role with regard to the state's emergency management system. According to the Oklahoma Emergency Operations Plan, ODOT serves as the primary state coordinating agency in relation to transportation and public works procedures. Under the transportation function, ODOT is responsible for coordinating with the federal government for assistance in areas such as allocation of civil transportation capacity, processing transportation requests, air and marine traffic control, disaster airlift operation management, hazardous materials action, and damage assessment.

The public works function calls for ODOT to coordinate with the federal government for assistance in the areas of debris removal, engineering and construction, and utilities restoration. Additionally ODOT is currently updating its Intelligent Transportation System (ITS) plan – a vital component of managing emergencies and major incidents. ITS equipment plays a critical role in supporting safety and

security during man-made and natural disasters. During a crisis, accurate information is invaluable and can help protect the public and minimize inconvenience to travelers. When a security incident occurs, ODOT's ITS capabilities should be used to the maximum extent possible to inform the public of traveling options for all modes.

The Oklahoma Department of Emergency Management (OEM) is the state agency designated to coordinate the response to a natural disaster that occurs in the state. This is achieved primarily through the development and maintenance of a comprehensive statewide emergency operations plan.

### 8.3. ENVIRONMENTAL ISSUES

ODOT is responsible for the design, construction, operation, and maintenance of highways, bridges, and railroads that are part of the statewide transportation system. Environmental regulations require FHWA and other transportation agencies to consider potential environmental impacts to the social, cultural, and natural environment, while taking into account the public's need for safe and efficient transportation. ODOT works with the FHWA to comply with National Environmental Policy Act of 1969 (NEPA) and other environmental regulations and requirements.

This section will discuss in more detail state level environmental issues including: environmental policy actions and potential mitigation activities related to transportation investments, Oklahoma's current air quality status in relation to transportation; the growing quantity of seismic events in Oklahoma and the potential impact to transportation infrastructure, and extreme weather events and possible transportation-related adaptation strategies to prepare for such events.

#### 8.3.1. Environmental Policy Actions Including Mitigation Activities

In the development and operation of the transportation system, ODOT considers social and human environmental issues including but not

limited to communities, parks and recreation areas, underground storage tanks, socioeconomic impacts, and environmental justice. ODOT's cultural resources program reviews proposed transportation projects and programs in relation to historic and archeological properties and locations. The ODOT cultural resources staff also reviews and consults with tribes regarding areas of traditional religious and cultural significance. Natural environmental resources such as water, air, noise, and threatened or endangered species of animals and plants are considered in the project development process.

Many of Oklahoma's highway improvement projects involve bridge replacement or highway widening. ODOT has a committed, reliable Eight Year CWP and four year STIP, and related scoping and environmental review processes are utilized to streamline project development and to provide a more efficient project delivery.

Better planning and coordination provides a collaborative approach to decision making, which can reduce unexpected complications and project delays through effective communication with the natural, cultural and historic resource agencies. One of the most valuable tools that ODOT uses is an early reconnaissance data collection process. This provides vital data early in the project planning process.<sup>8</sup> When transportation impacts to the natural environment cannot be avoided, mitigation is often required.

#### Threatened and Endangered Species

Oklahoma is home to 25 threatened or endangered species (three plants and 19 animals) under protection of the Endangered Species Act (ESA) of 1973. Some of the more frequently encountered endangered species include the Arkansas River Shiner, Neosho Mucket Mussel, Interior Least Tern, Leopard Darter, Lesser Prairie Chicken, the American Burying Beetle and the critical habitat for these species.

#### Habitat Disruption Mitigation Activities

As an example of mitigating environmental impacts, ODOT has an approved process related to addressing the American Burying Beetle (ABB)

whose habitat is found in 31 counties in the eastern portion of the state.<sup>9</sup> The use of the Conservation Banks has offered an efficient and effective means of minimizing disruptions to beetle habitats and also providing a tool for maintaining environmental functions of the ABB in the state.<sup>10</sup>

In addition to Threatened and Endangered Species, Oklahoma is home to Cliff and Barn Swallows, which are small nesting birds protected by the federal Migratory Bird Treaty Act (MBTA) of 1918. These migratory birds have come to the forefront of recent conversations due to ODOT's intensive bridge replacement program. ODOT will continue to develop coordination activities with regulatory agencies that will improve project scheduling and the timing of project letting to comply with the MBTA and reduce any project delays.

### **Storm Water**

Storm water runoff occurs when precipitation or snow melt runs over the ground. Impervious surfaces prevent storm water runoff from filtering back into the earth, which naturally filters the pollutants from the water. Polluted storm water can have negative effects on the human and natural environments. ODOT's goal is to detect and eliminate illegal discharges.

ODOT uses best management practices (BMPs) to control and manage storm water. These include structural devices, maintenance procedures, and management practices that prevent or reduce the harmful effects of storm water runoff; such as pollution, erosion and flooding. BMPs may include the following:

- Detention and infiltration ponds, wide grass ditches, catch basins, and culverts;
- Maintenance operations that keep highways clear of sand, litter and debris that could make its way into streams and rivers;
- Increasing the monitoring and maintenance frequency of structural BMPs; and

- Pollution prevention practices on road construction projects.<sup>11</sup>

### **Wetlands**

ODOT works closely with the USACE when dredged or fill material is placed into waters of the United States. In Oklahoma, intrastate lakes, rivers, streams (including intermittent streams), wetlands, sloughs, playa lakes, or natural ponds are all considered waters of the United States.

As part of this process, ODOT complies with 404 permit requirements of the Clean Water Act. In doing so, ODOT must demonstrate first avoidance, then minimization, and finally mitigation measures to compensate for unavoidable aquatic resource impacts.

Restoration and protection of wetlands are particularly important because close to 67 percent of Oklahoma's wetland acres were lost to development between 1780 and 1980. In Oklahoma, there is currently no formal monitoring and assessment program for wetlands. However, over the last five years a great deal of work has been done to better characterize the wetland resources throughout the state.

The Oklahoma Wetlands Program was formally created in 1990 when the Oklahoma Legislature directed the Oklahoma Conservation Commission to prepare a wetlands management strategy. The most recent update was completed and accepted in 2013 and is now called Oklahoma's Wetland Program Plan (WPP). The WPP includes specific activities and timelines to guide Oklahoma wetlands management from 2013 to 2018. The WPP is organized into actions and activities that fall under the core elements for a wetland program outlined by the EPA.

### **Wetland Mitigation Opportunities**

A wetland mitigation bank contains wetlands that have already been created or restored. Over the past few years, interest in developing long-term mitigation opportunities and solutions has increased in Oklahoma; both a mitigation bank and an In-Lieu-Fee program have been proposed

to the USACE. In-Lieu-Fee mitigation is a type of mitigation in which the permittee pays a fee to a third party to replace the wetland functions impacted as a result of the permittee's project (instead of conducting project-specific mitigation or buying credits from a wetland mitigation bank).

ODOT is also seeking to collaborate with the Nature Conservancy on permittee-responsible mitigation, and is working with the Oklahoma Conversation Commission on opportunities to develop mitigation strategies for ODOT projects.

The USACE Tulsa District Mitigation and Monitoring Guidelines are designed to improve predictability of mitigation requirements for permit applicants and to increase the likelihood of success of the mitigation plan (USACE, 2004).

A 700-acre tract of land was purchased in Nowata County in northeast Oklahoma with the intent of using acreage from this area for multiple ODOT projects. Use of parcels of land from this tract can provide wetland mitigation for transportation projects located in the Oologah watershed.

A mitigation center (slightly different than a mitigation bank) has been established in Oklahoma by Excel Mitigation. The wetlands in the 206-acre Excel Mitigation Center are created or restored as participants sign-up for mitigation. The 206-acre service area was created along the Deep Fork of the Canadian River and includes all or portions of the following 12 counties: Logan, Lincoln, Oklahoma, Cleveland, Pottawatomie, Seminole, Hughes, Okfuskee, Creek, Okmulgee, McIntosh and Haskell.

### 8.3.2. Air Quality

The Clean Air Act requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants. Oklahoma is in attainment for all six pollutants which are: particulate matter, ozone, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead. Of the six pollutants, particulate matter pollution and ground-level ozone are the most widespread health threats.<sup>12</sup>

All three MPOs in Oklahoma (Lawton, Oklahoma City - ACOG, Tulsa - INCOG) have ozone monitoring stations and work with the Oklahoma Department of Environmental Quality (ODEQ) to maintain air quality standards, with particular attention to the mobile-source pollutants ozone,<sup>13</sup> carbon monoxide, and nitrogen oxides. Although all three Oklahoma metropolitan areas have had annual ozone violations in recent years, all regions remain in attainment status.

Additionally, a monitor is located in Sequoyah County, a part of the Ft. Smith bi-state MPO covering parts of four counties in eastern Oklahoma and western Arkansas. A review of Sequoyah County monitoring data shows that it has not experienced ozone violations.

The metropolitan areas faced a particular challenge to improving air quality levels when the state experienced two record breaking hot summers (2011 and 2012) and design values of all ozone monitors throughout Oklahoma were in violation of the ozone standard, making the regions eligible for non-attainment designation. A non-attainment area is an area considered to have air quality worse than the NAAQS as defined in the Clean Air Act Amendments of 1990 (P.L. 91-604, Sec. 109).

Non-attainment areas must develop and implement a plan to meet the current standard, or risk losing some forms of federal financial assistance. ODOT and ODEQ have been working closely with MPOs to curb mobile source emissions and thus avoid a related non-attainment designation. However, the two following summers of 2013 and 2014 were milder, bringing lower ozone levels and all three metropolitan areas back into compliance with ozone standards.

Both INCOG and ACOG plan to continue to work with ODEQ and the EPA through their Ozone Advance Programs to minimize metro area ozone exceedances and maintain compliance with the ozone standard. The Lawton MPO also sponsors a Clean Air program and works closely with local,

state, and federal agencies to proactively address air quality issues.

On November 25, 2014, the EPA proposed to strengthen the NAAQS for ground-level ozone, based on extensive scientific evidence about ozone's effects.<sup>14</sup> If the proposed stronger standard is approved, it likely will push all four MPOs and several rural counties into non-attainment.

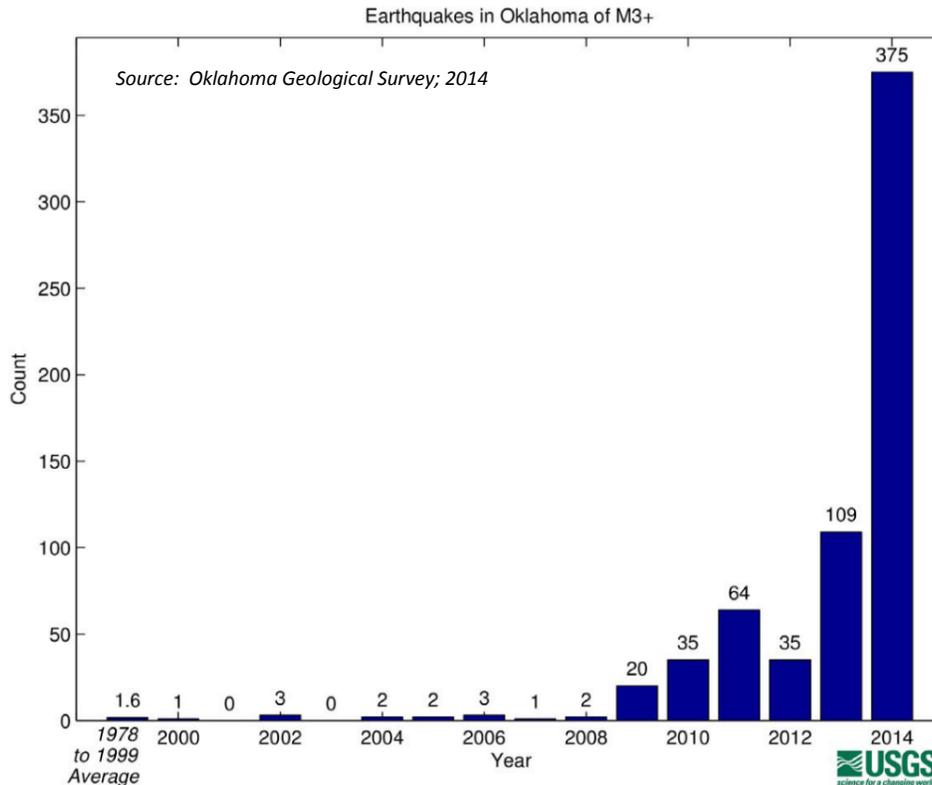
In an effort to help improve air quality, the State of Oklahoma plans to replace 90 percent of current state agency fleet vehicles with compressed natural gas (CNG) vehicles in the next three years.<sup>15</sup> Natural gas is produced both worldwide and domestically at relatively low cost and is cleaner burning than gasoline or diesel fuel.

Natural gas vehicles show an average reduction in ozone-forming emissions of 80 percent compared to gasoline vehicles.<sup>16</sup>

**8.3.3. Seismic Events**

Since October 2013, Oklahoma has seen a dramatic increase (approximately 50 percent) in seismic events, with the majority of recent seismic events occurring between Oklahoma City and Tulsa. **Figure 8-1** shows the number of 3.0 magnitude or greater earthquakes between 1978 and 2014. In 2013, the greatest number of magnitude 3.0 or higher earthquakes totaled 109. As of May 2014, the U.S. Geological Survey and Oklahoma Geological Survey analysis reported that 375 earthquakes of magnitude 3.0 or greater have occurred during the first five months of 2014.

**Figure 8-1. Number of Earthquakes, Magnitude 3.0 or Greater, in Oklahoma from 1978 - 2014**



The USGS statistically examined the recent earthquake rate changes and concluded that the quakes do not seem to be due to typical, random fluctuations in natural seismicity rates.<sup>17</sup> After every magnitude 4.0 or greater earthquake, ODOT dispatches crews to inspect key bridge structures within a five-mile radius of the earthquake's epicenter. During these inspections, the crews document any new cracks, settling, or displaced debris and improvements are scheduled as needed to ensure the structure is safe and can accommodate proper loads.

#### 8.3.4. Extreme Weather Events

In recent years, Oklahoma has experienced some of the most extreme weather in the U.S., including extremely hot summers, high intensity rain, and devastating tornadoes. These extreme weather events impact Oklahoma's intermodal transportation system. Since 2000, 37 presidential emergency declarations have been issued in response to the state's extreme weather events. Oklahoma's extreme weather is a byproduct of its location – moisture coming from the Gulf of Mexico from the south and dry air from the Rocky Mountains in the west.

Oklahoma also experiences the east-to-west storms that cross the Great Plains and also receives the occasional blast of arctic air from Canada. Projected changes in long-term climate and more frequent extreme events such as heat waves, droughts, and heavy rainfall will affect many aspects of life in the Great Plains.<sup>18</sup>

Flood events have catastrophic impacts to surface transportation infrastructure because they interrupt the movement of people and goods on Oklahoma highways, railroads, and waterways. These floods, both localized and large river system, demonstrate how extreme precipitation events are creating new impacts to the transportation system, and how potential impacts need to be addressed in the design, construction and rehabilitation of the transportation network. Urban areas typically have less storage capacity for water and more rapid runoff, thus urban

streams rise more quickly during storms and have higher peak discharge rates than do rural streams.

Tornadoes have the potential to cause catastrophic damage to any infrastructure in its path, including road, bridges, and rail lines. According to the National Weather Service, Oklahoma has experienced eight violent tornadoes (reaching EF-4 or EF-5 on the Enhanced Fujita scale) from 2007-2012. When provided sufficient advance warning, ODOT closes key roads that are located in the projected tornado's path to help reduce the number cars and trucks that may be impacted.

Long periods of extreme heat in summer damage roads in several ways, including softening of asphalt (which leads to rutting) and expansion of bridge joints, affecting bridge operations. Intense heat can also cause deformities in rail tracks, resulting in speed restrictions. In 2014, every county in Oklahoma saw over 30 days with temperatures over 90 degrees. Six counties experienced 100 days or more with above 90 degree temperatures.

## 8.4. CONCLUSION

Providing appropriate safety and security on Oklahoma's transportation system is critically important and requires collaboration between numerous federal, state, and local agencies. Oklahoma's extreme weather events, such as extremely hot summers, high intensity rain, and devastating tornadoes, impact Oklahoma's intermodal transportation system. The state transportation safety and security resources help to provide safe travel, maintain the functions of critical assets, and support emergency management in a time of crisis. ODOT has a significant role in the state's emergency operations plan that is maintained by the OEM.

Preservation of the environment and efforts to meet the mobility needs of a growing population, sometimes leads to unavoidable impacts to the human and natural environment. ODOT works with the public and project stakeholders, as well as resource agencies, to ensure that environmental issues are identified and

addressed early in the transportation planning and project development process. The identification of potential mitigation strategies should occur early in the transportation planning and project development process, so viable solutions to mobility and connectivity needs can be identified and implemented in a timely manner.

In addition to design and mitigation activities, ODOT should continue its efforts to improve air quality through the use of CNG vehicles, as well as maintaining a working relationship with ODEQ and EPA in order to proactively address air quality issues.

## 8.5. ENDNOTES

<sup>1</sup> *Systemic approach to safety: The systemic approach to safety involves widely implemented improvements based on high-risk roadway features correlated with specific crash types. The approach provided a more comprehensive method for safety planning and implementation that supplements and complements traditional site analysis. It helps agencies broaden their traffic safety efforts and consider risk as well as crash history when identifying where to make low cost safety improvements.*

<sup>2</sup> *The University of Central Oklahoma Math Department served as a data consultant for the group that developed the Draft 2014 SHSP. That group included: the Oklahoma Department of Transportation (ODOT), the Oklahoma Highway Safety Office (OHSO), the Federal Highway Administration (FHWA), the Federal Motor Carrier Safety Administration (FMCSA), and the Oklahoma Department of Public Safety / Highway Patrol (ODPS/OHP). The consultant conducted an analysis of traffic collision and safety data to assist with the development of the Draft 2014 SHSP and related recommendations. Using statistical techniques, the data consultant analyzed data from 1997 to 2012 to determine historical trends. The data used to calculate the trends and confidence bands go back to year 1997.*

<sup>3</sup> *The classification of large trucks does not include personal pickup trucks, buses, and single unit trucks. Commercial vehicle trucks are another way to define the large truck classification. The large trucks include vehicle configurations as follows: Single Trailer Trucks with 3-4 axles, Single Trailers with 5 axles, Single Trailers with 6 or more axles, Multi Trailers with 5 or fewer axles, Multi Trailers with 6 axles, Multi Trailers with 7 or more axles.*

<sup>4</sup> *By comparison, the State of Kansas experienced 47 incidents during the same time period.*

<sup>5</sup> *PHMSA defines “serious incidents” as incidents that involve: a fatality or major injury caused by the release of a*

*hazardous material, the evacuation of 25 or more persons as a result of release of a hazardous material or exposure to fire, a release or exposure to fire which results in the closure of a major transportation artery, the alteration of an aircraft flight plan or operation, the release of radioactive materials from Type B packaging, the release of over 11.9 gallons or 88.2 pounds of a severe marine pollutant, or the release of a bulk quantity (over 119 gallons or 882 pounds) of a hazardous material. <https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/Search.aspx>*

<sup>6</sup> *A Pedestrian Safety Action Plan helps local officials identify pedestrian safety problems, analyze information, select optimal solutions, and enhance pedestrian safety programs. [http://safety.fhwa.dot.gov/ped\\_bike/ped\\_focus/docs/fhwas0512.pdf](http://safety.fhwa.dot.gov/ped_bike/ped_focus/docs/fhwas0512.pdf)*

<sup>7</sup> *A pedestrian hybrid beacon (PHB) is a traffic control device similar to a European pedestrian signal that was imported to the US and adapted by engineers in Arizona to increase motorists' awareness of pedestrian crossings at uncontrolled marked crosswalk locations. A PHB is distinct from pre-timed traffic signals and constant flash warning beacons because it is only activated by pedestrians when needed. [http://safety.fhwa.dot.gov/ped\\_bike/tools\\_solve/fhwasa14014/](http://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa14014/)*

<sup>8</sup> *See Attachment A of the 2015-2040 LRTP Technical Memorandum Environmental Issues and Mitigation Activities.*

<sup>9</sup> *<http://ecos.fws.gov/speciesProfile/profile/countiesByState?entityId=440&state=Oklahoma>, last accessed 11/24/2014*

<sup>10</sup> *[http://www.fws.gov/midwest/endangered/insects/ambb/abb\\_fact.html](http://www.fws.gov/midwest/endangered/insects/ambb/abb_fact.html)*

<sup>11</sup> *<http://www.okladot.state.ok.us/env-programs/stormwater/index.htm>, last accessed 11/24/2014*

<sup>12</sup> *<http://www.epa.gov/airquality/urbanair/>*

<sup>13</sup> *Ozone is a gas made up of three oxygen atoms (O<sub>3</sub>). In the lower atmosphere, near the earth's surface, ozone is created by chemical reactions between air pollutants from vehicle exhaust, motor gasoline vapors, and other emissions.*

<sup>14</sup> *<http://www.epa.gov/glo/actions.html#nov2014>*

<sup>15</sup> *Secretary of Transportation, Gary Ridley November, 2012. <http://www.government-fleet.com/news/story/2012/11/oklahoma-dot-adds-160-cng-vehicles-to-fleet.aspx>*

<sup>16</sup> *<http://www.consumerenergycenter.org/transportation/afvs/cng.html>*

<sup>17</sup> *New Insight on Ground Shaking from Man-Made Earthquakes. Released: 4/23/2015. U.S. Department of the Interior, U.S. Geological Survey, Reston, VA. <http://www.usgs.gov/newsroom/article.asp?ID=4202>*

<sup>18</sup> *USDOT, Federal Highway Administration (FHWA), Regional Climate Change Effects: Useful Information for Transportation Agencies. (May 10, 2010), p 123.*

## 9. TRANSPORTATION SYSTEM NEEDS

This chapter identifies Oklahoma’s multimodal transportation needs in light of 2015-2040 L RTP goals, existing trends, and desired future performance. The needs were identified for transportation assets/functions that are not only under ODOT’s responsibility but also under the jurisdiction of partner entities or governmental agencies.

The transportation assets and functions that are under ODOT’s responsibility are:

- State Highway System – span bridge and bridge box structures;
- State Highway System – highways;
- State Highway System – interchanges; and,
- Transportation appurtenances
  - Safety,
  - Maintenance,
  - Ports of Entry,
  - Weigh stations and rest areas,
  - ITS, and
  - State owned freight rail.

The transportation assets and functions that are under the jurisdiction of partner entities or governmental agencies:

- Ports and waterways;
- Passenger rail;
- Public transportation;
  - Urban;
  - Rural;
  - Tribal;
- Intermodal facilities;
- Bicycle and pedestrian facilities; and,
- Locally owned federal aid system<sup>1</sup> and congestion management.

Additional information on the condition of the various modes in the existing transportation system is presented in **Chapter 6**.

### 9.1. BRIDGES

The needs for improvement to span bridges on Oklahoma’s State Highway System were assessed using the FHWA’s National Bridge Investment Analysis System (NBIAS) software tool. Span bridge improvement needs are identified based on criteria that are specific to Oklahoma and contain the standards for each bridge type, as defined by roadway functional class, NHS status, and annual average daily traffic (AADT).

The needs for bridge boxes on Oklahoma’s State Highway System were estimated using life-cycle analysis and input from ODOT Bridge Division engineers.

Several comments received from the public indicated a preference that higher priority be given for funding and replacing rural bridges that have been closed to traffic.

#### 9.1.1. Types of Bridge Needs

Bridge needs are presented in terms of three improvement categories in this report:

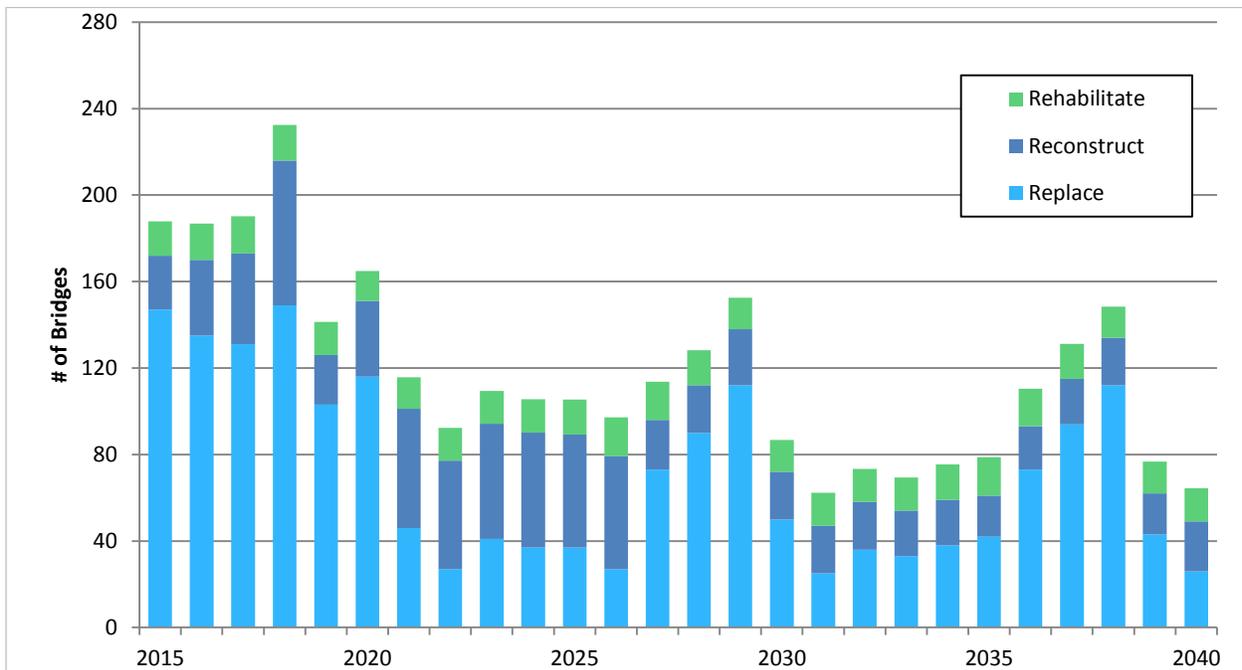
- **Rehabilitation** – involves work required to restore the structural integrity of a bridge as well as work necessary to correct major safety defects. Most rehabilitation projects include repairs to several bridge components, but rehabilitation can be limited to bridge deck replacement.
- **Reconstruction** – widening existing bridge lanes, raising bridges to increase vertical clearances, and strengthening bridges to increase load carrying capacity.
- **Replacement** – If needed functional improvement or reconstruction is infeasible because of the bridge design, or impractical because of its inferior structural condition, then the bridge is designated for replacement.

### 9.1.2. Bridge Needs

The 2015-2040 L RTP identified 3,101 bridges that will require some type of improvement which includes 1,843 bridge replacements, 846 bridge reconstructions, and 412 bridge rehabilitations. **Figure 9-1** illustrates an example of an annual bridge improvement schedule identifying the number of bridges that will require replacement, reconstruction, or rehabilitation.<sup>2</sup>

As shown in **Figure 9-1**, the number of bridges replacements between 2015 and 2020 is a high percentage of all bridge improvement projects. This suggested improvement schedule is consistent with the adopted Eight Year Construction Work Plan, and ensures meeting the ODOT performance target of less than 1 percent of structurally deficient bridges on the State Highway System by 2020. Most structurally deficient bridges are identified for replacement to meet the ODOT performance target.

**Figure 9-1. Proposed Number and Type of Bridge Improvements by Year**



Source: CDM Smith Bridge Needs Analysis using NBIAS

## 9.2. HIGHWAYS

State highway needs were analyzed using the Federal Highway Administration’s (FHWA) Highway Economics Requirements System, State Version (HERS-ST). The highway needs were identified based on criteria that were specific to Oklahoma which contain conditions for acceptable lane width, shoulder conditions, etc. for each functional class of roadway based on traffic volume and location (terrain type and rural/urban).

Comments at Open House meetings, advisory committee meetings, and through the web indicated that the commenters were aware of highway system issues such as the depleted state of the federal highway trust fund, increase in crashes due to congestion, deteriorating infrastructure, and the need for durable and longer lasting repairs.

### 9.2.1. Types of Highway Needs

The highway needs are presented in terms of three categories:

- **Preservation** refers to regular resurfacing of a road. When a road has pavement deteriorating to unacceptable levels, resurfacing is the improvement choice to maintain the integrity of the roadway. Resurfacing preserves the highway, and it is the most common type of improvement.
- **Reconstruction** is the improvement of an existing roadway by upgrading the geometrics and functionality of the segment. Improvements such as widening lanes and shoulders, and straightening curves, are examples of reconstruction. In addition, when roadways are so structurally deficient that they cannot be repaired by resurfacing

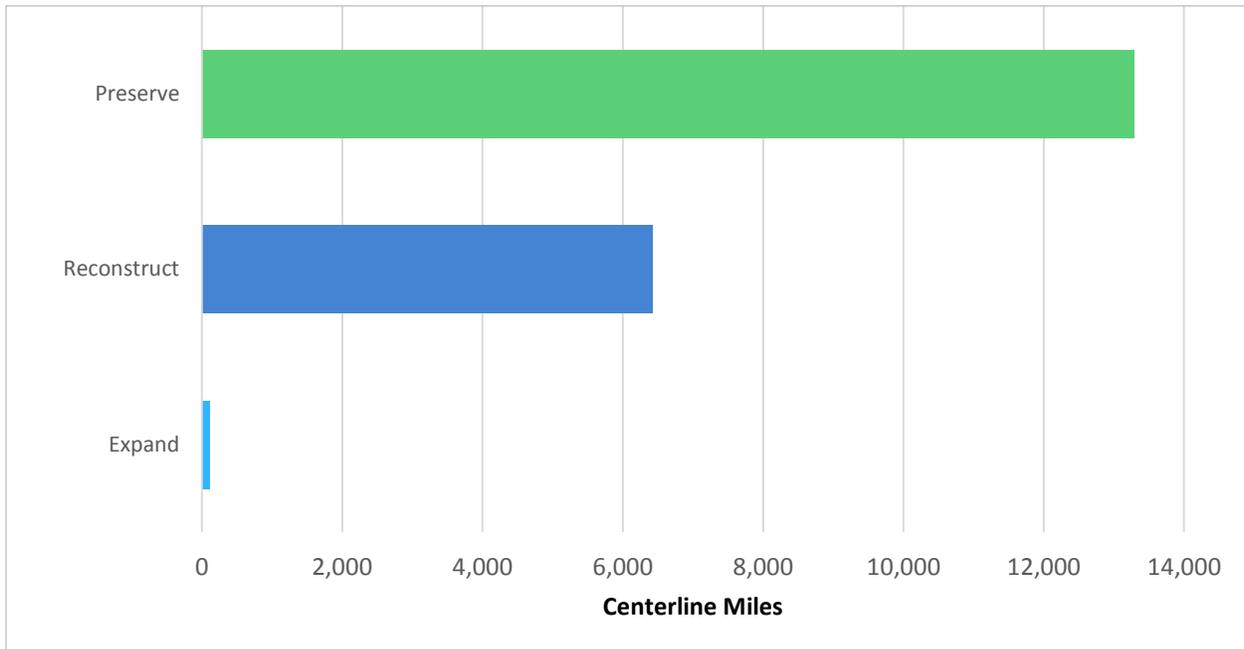
alone and must be rebuilt from the base, they are slated for reconstruction.

- **Expansion** deals with the need to provide additional capacity by adding lanes in order to alleviate congestion and maintain an acceptable level of service. Expansion is the most costly improvement type on average.

### 9.2.2. Highway Needs

The 2015-2040 LRTP identified that approximately 13,300 centerline miles of the State Highway System will require preservation (over the 25-year period some segments will require several treatments); 6,400 centerlines miles of the State Highway System will need reconstruction; and approximately 120 miles of expansion will be needed on the State Highway System.<sup>3</sup> **Figure 9-2** illustrates the 25-year highway needs by improvement type and centerline miles.

**Figure 9-2. State Highway System Needs by Centerline Miles**



Source: CDM Smith Highway Needs Analysis using HERS-ST

### 9.3. INTERCHANGES

Interchanges are another major category of highway needs which were considered for the 2015-2040 LRTP. The 25-year interchange needs were estimated by ODOT staff based on historical records of ODOT’s programming of such improvements.<sup>4</sup> Approximately 50 minor and seven major interchanges will require an improvement by 2040.

An interchange is defined as a system of interconnecting roadways in conjunction with one or more grade separations that provides for the movement of traffic between two or more roadways or highways on different levels.<sup>5</sup>

- A simple or minor interchange as an interchange where traffic is very light, and connection is between a high volume and a local or land service access road. Diamond interchanges are the simplest type of interchange.
- A major or complex interchange is an interchange with another freeway or expressway, or an interchange with a high-volume multi-lane highway, principal urban arterial, or major rural route where the interchanging traffic is heavy. Full cloverleaf, or directional interchanges are typically considered as complex or major interchanges.<sup>6</sup>

### 9.4. TRANSPORTATION APPURTENANCES

In addition to the highway, bridge and interchange needs, transportation appurtenances (accessory items or items associated with the transportation system) require improvement. These include safety, maintenance, Ports of Entry, weigh stations, rest areas, ITS, and state rail including at-grade highway railroad crossings.<sup>7</sup>

Public comments received during the 2015-2040 LRTP development indicated concerns with safety, ITS, and Ports of Entry. Individuals provided input indicating they were concerned about the safety

impacts of distracted and drunk/impaired driving, and the safety needs of motorcycle and bicycle users and pedestrians. Additionally, commenters indicated the need to improve the usage of ITS and sharing of Ports of Entry information with adjacent states.

#### 9.4.1. Safety

The 25-year safety needs were developed by ODOT safety engineers and are consistent with the Oklahoma Strategic Highway Safety Plan.<sup>8</sup> Safety improvement examples include the following:

- Median cable barriers;
- Centerline rumble strips;
- Clear zones;
- Guardrail;
- J-Turns;<sup>9</sup>
- Roundabouts; and,
- Selected safety improvements at freeway ramps.

**Table 9-1. State Highway System Safety Needs, 2015 – 2040**

Category	Quantity Estimate
Median Cable Barrier	545 mi
Centerline Rumble Strip	5,000 mi
Clear Zones	250 mi
Guardrail	2,200 mi
J-Turns	20
Roundabouts at intersections	150
Selected safety improvements at freeway ramps	35

#### 9.4.2. Maintenance

The 25-year maintenance needs were developed by analyzing the ODOT maintenance budget from 2009 to 2013, and trend analysis to forecast maintenance needs and related costs for 2015-2040. Maintenance needs were defined for routine maintenance as well as special maintenance. Routine maintenance encompasses all aspects of maintenance including mowing,

snow removal, striping, painting, pothole repair, routine armor coats, etc. Special maintenance includes heavier construction overlays, etc.

### 9.4.3. Ports of Entry

The 25-year Ports of Entry needs were developed based on a collaborative analysis completed in the last few years by ODOT, the Oklahoma Corporation Commission, and the Oklahoma Turnpike Authority. ODOT Facilities Management is in charge of construction and maintenance and has completed two of the eight planned facilities in Beckham and Kay Counties. The six remaining Ports of Entry are identified for construction between 2015 and 2040.

### 9.4.4. Weigh Stations and Rest Areas

The 25-year weigh station and rest area needs were developed in coordination with ODOT Facilities Management staff. Oklahoma has 22 weigh stations and truck scale areas; and of these, four weigh stations are planned for renovation.

Oklahoma has eight rest areas – four along I-40, three along I-35, and one along US-69. Two of these rest areas were renovated in 2006-2007; and the remaining six rest areas are anticipated to need renovation in the next 25 years.

### 9.4.5. Intelligent Transportation System (ITS)

ODOT's Statewide ITS Implementation Plan (2004) identified short-term and long-term ITS needs and related costs. The needs include statewide fiber optic cable expansion, implementation/expansion of a regional traffic management center (RTMC) field devices, statewide transportation information center implementation, ITS central software purchase, ITS data archiving, statewide road weather information system (RWIS) deployment, and 5-1-1 traveler information system development. Of the above needs, work has been initiated on the following items in recent years – statewide fiber optic cable expansion, implementation/expansion of RTMC field devices, and statewide transportation information center implementation.

### 9.4.6. State Freight Rail

ODOT preserves and maintains state-owned rail infrastructure. At this time, the primary focus of the state's efforts has been to maintain the safety and condition of the existing system.

The State of Oklahoma also maintains approximately 3,800 railroad crossings. Rail crossing safety affects passenger and freight rail, highway vehicles, school buses, and bicyclists and pedestrians. The ODOT Rail Programs Division works to minimize risks to this mode through three primary focuses: single high-priority rail crossing locations, statewide minimum rail safety standards projects, and rail corridor safety improvements.

ODOT expects to implement about 750 rail crossing safety improvements over the next 25 years. Additionally, other needed improvements include items such as switching repairs, siding expansion or additions, and replacement of rail infrastructure.

## 9.5. PRIVATE FREIGHT RAIL

The State of Oklahoma has approximately 3,600 miles of rail line with over 90 percent of this being privately owned. Freight rail traffic is projected to experience significant growth and the number of trains on some corridors is expected to double over the next 25 years.<sup>10</sup> The largest growth in freight rail traffic per day is projected on the BNSF line in northern Oklahoma. Class I and Class III privately owned railroads are typically responsible for improvements associated with its railroads; and ODOT Rail Programs Division works with the private sector and affected local governments to facilitate this process. The Oklahoma Freight Study (2014) and stakeholders involved in the 2015-2040 LRTP process identified the following private freight rail issues and needs throughout Oklahoma.

### 9.5.1. Rail Capacity Improvements

In Oklahoma, expansion and growth in the energy sector along with other expected agricultural, industrial and manufacturing activities will

increase freight rail demand over the next 20 years. The Oklahoma State Rail Plan discussed several capacity improvements identified by the BNSF and Union Pacific Class I railroads.<sup>11</sup> Capacity improvements include yard expansion, siding expansion, double tracking of certain sections, and corridor extensions.

The Class III railroad<sup>12</sup> industry in Oklahoma has a significant portion of its rail system that is unable to accommodate industry-standard 286,000 pound gross weight railcars. Railroads that are not capable of these loads put shippers at a disadvantage by removing some of the efficiencies and advantages of rail freight shipments. According to *the 2012 Oklahoma Freight and Passenger Rail Plan*, approximately 130 miles of track and at least 230 structures need to be upgraded in order to handle 286,000 pound loads.

### 9.5.2. Modal Connections to Rail

Oklahoma's freight rail system includes access to grain elevators, industrial park locations, and connections to the inland waterway system. Oklahoma businesses have continually expressed interest in transload facilities and their effectiveness in the movement of freight.

Transloading is a term describing product transportation that typically involves transfer of non-containerized freight from one mode to another. Transload facilities are concentrated in the eastern and central part of the state; and the need for this type of facility to allow interaction between freight modes is present in the western part of the state as well. One very unique facility is the Port of Catoosa on the MKARNS where goods can be transferred from both water and truck to rail. Development of industrial parks or transload facilities could provide assistance to customers that do not have the volume to support a unit train facility (110+ cars).

Current Class I rail business practices require short line<sup>13</sup> railroads and other customers to provide longer trains, i.e. 110+ cars, which is difficult for shortline railroads that do not have

adequate volumes of storage facilities. As a result, the most common type of connection is where customers utilize trucks to send goods directly to a railroad facility.

### 9.5.3. Railroad Crossing Safety

ODOT and its state, local and private sector partners have made progress through cooperative efforts to improve signage and safety at railroad crossings, but the needs continue to far outweigh the resources available.

At-grade railroad crossings (discussed earlier under the State Freight Rail section 9.4.6), apart from being a safety factor, also contribute to traffic congestion and traffic issues. The current trend of railroads utilizing longer "unit trains" places pressure on facilities/communities served, such as increasing bottlenecks at railroad crossings.

### 9.5.4. Other Rail Safety Issues

The increased use of rail tank cars for carrying crude oil has heightened attention to the need to strengthen rules regarding labeling of hazardous material, tank car specifications, and potential route and/or speed restrictions. Other concerns include derailment and release of hazardous materials. Positive train control (PTC), a technology improvement designed to automatically stop or slow a train before certain types of accidents occur will assist greatly with addressing train-to-train collisions, derailments caused by excessive speed, and movement of a train through a track switch left in the wrong position. All the Class I railroads are required to implement PTC systems by the federally mandated deadline of December 31, 2015.

## 9.6. PASSENGER RAIL

Passenger rail returned to Oklahoma in 1999 after a 20-year absence. Amtrak, the national passenger rail company, operates the Heartland Flyer which is a daily passenger service that follows a 206 mile route between Oklahoma City and Ft. Worth, Texas. AMTRAK is currently the sole provider of intercity passenger rail service in

Oklahoma, although private railroad companies have expressed interest in entering this market.

Ridership on the Heartland Flyer has steadily increased annually to the point of counting the one millionth rider in 2013; the Heartland Flyer averages approximately 82,000 riders per year. The historic ridership is presented in **Figure 9-3**.

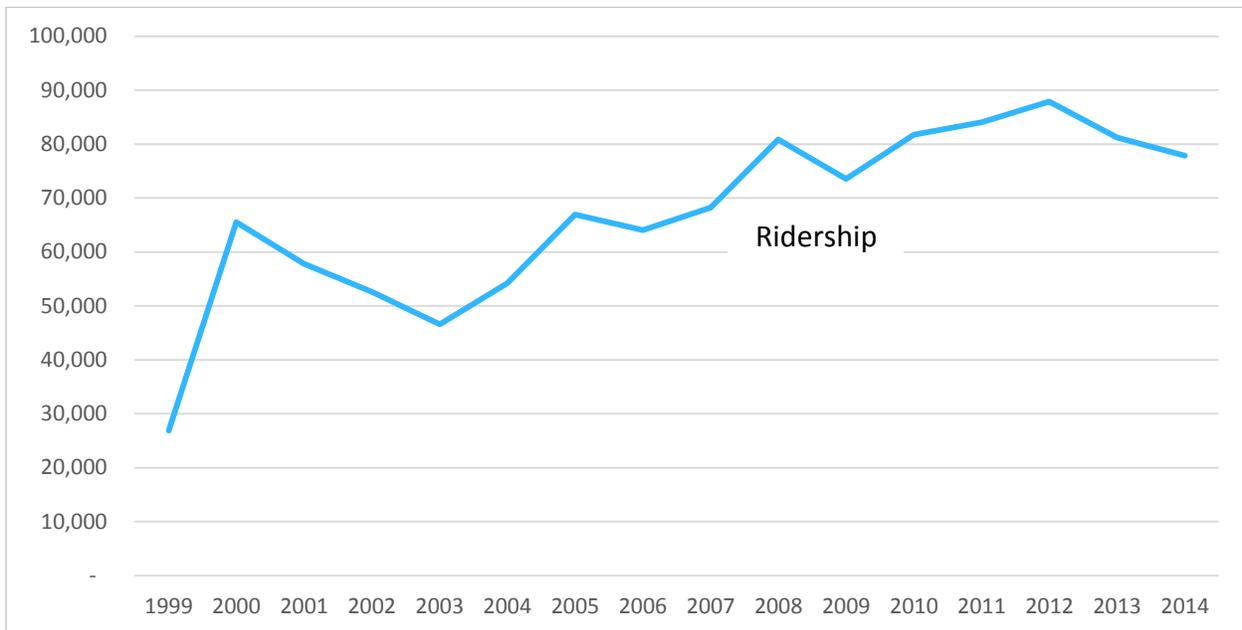
Public sentiment about the existing passenger rail service in Oklahoma is positive. The Amtrak Heartland Flyer from Oklahoma City to Ft. Worth is popular, and stakeholders expressed a desire for more than the current one-trip-per-day frequency between the two cities.

There is interest in expanding passenger rail service to include Oklahoma City to Tulsa, and

between Oklahoma City and Newton, Kansas. Some residents expressed the desire for high speed rail service to be set as a goal, particularly routes to connect major metropolitan areas, by the year 2040. Oklahoma leaders and ODOT continue to consider how it can maximize the efficiency of the Heartland Flyer Amtrak service, and to evaluate the possibilities for extension of passenger rail service into new markets.

The FRA is initiating work on software that will aid in the development of ridership estimates and performance information, but this is still in the early phases of development. This Plan document recognizes that there is an interest in passenger rail service in Oklahoma, but the level of need cannot be quantified at this time.

**Figure 9-3. Historic Heartland Flyer Ridership**



Source: AMTRAK, Oklahoma Department of Transportation Rail Programs Division

Following are the other rail routes that are undergoing evaluation, and that may be more suitable for implementation beyond the scope of this Plan period.<sup>14</sup>

- Extend Heartland Flyer to Newton, Kansas;
- New Daytime Service between Kansas City – Oklahoma City – Fort Worth;
- Intercity Passenger Rail between Tulsa and Oklahoma City; and,
- Passenger Rail from South Texas to Oklahoma.

Other local projects such as the ACOG sponsored Oklahoma City–Edmond, Oklahoma City–Norman and Oklahoma City–Midwest City corridor studies are also in the evaluation phase.

## 9.7. PUBLIC TRANSPORTATION

The past decade has seen increased growth in national transit ridership and the same trend also occurred in Oklahoma. Urban transit ridership grew at a rate of 4.4 percent between 2009 and 2013. In that same time frame, rural transit ridership increased by 8.7 percent.

Oklahoma has 20 rural public transportation providers, five urban public transit providers and 14 tribal transit providers.<sup>15</sup> The type of public transportation service (fixed route, demand response, and paratransit) that each agency provides varies, but most agencies provide some combination of the three types of service.

- Fixed route transit offers service on a fixed schedule on a specific route with vehicles stopping at specific locations along the route.
- Demand response transit is a service provided on an as-needed (or demand) basis, where the user calls the transit operator to dispatch a vehicle or pick up a passenger. Small buses and vans are frequently used to transport passengers.
- Paratransit is a flexible means of passenger transportation with wheelchair accessible

vehicles that can include demand response, shared ride taxis, and carpooling.

Additionally, Oklahoma is served by two intercity private bus companies, Greyhound Lines and Jefferson Bus Lines.

The 2015-2040 LRTP public transportation needs include capital and operational improvements, for rural, urban, and tribal transit systems in Oklahoma. The needs identified are based on existing services and future needs identified by public input, information from individual transit providers, feedback from the local Council of Governments (COGs), and needs identified in the following:

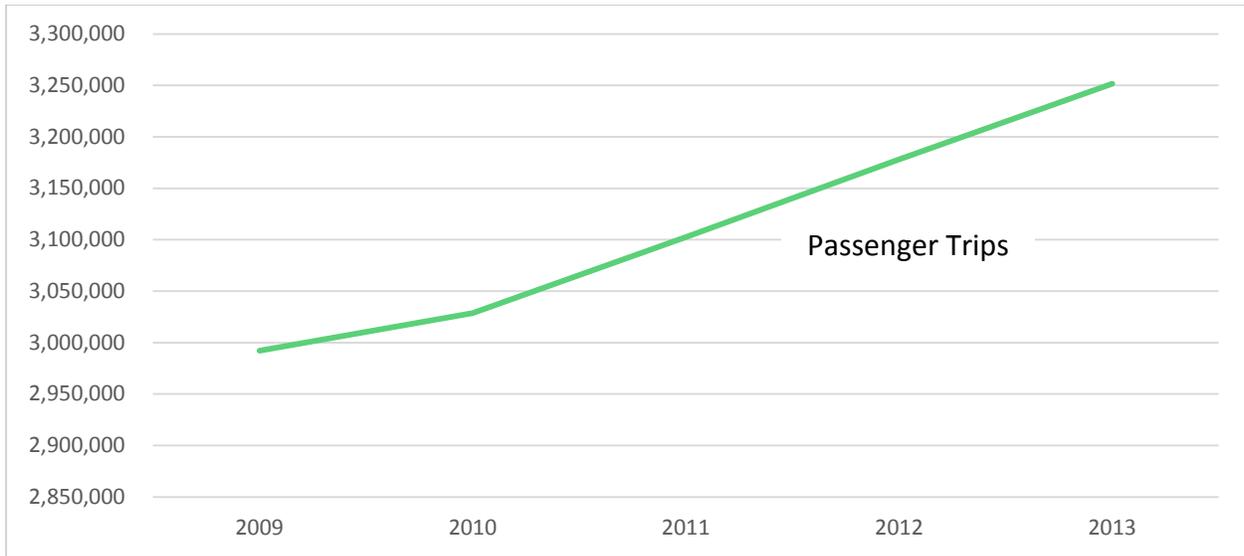
- Rural Transit 5311 Data 2009-2013, ODOT Transit Programs Division;
- Lawton MPO 2035 Long Range Transportation Plan;
- ACOG (Oklahoma City Area) MPO Long Range Transportation Plan 2035; and,
- INCOG (Tulsa Area) 2035 Regional Transportation Plan.

### 9.7.1. Rural Public Transit Needs

The rural transit program is instrumental in providing needed transportation to Oklahoma citizens all across the state. The rural transit providers operate in 73 of the 77 counties geographically spread across the entire state. **Figure 9-4** illustrates the ridership level for the past five years.

Rural residents in Oklahoma need transit services to assist them in reaching vital services such as health care, education, employment, and social and recreational services. Over the past five years, the revenue miles increased by 18 percent and passenger trips increased by 8.7 percent. Over one-quarter of the trips in the last five years were made by elderly and disabled persons, and this group of patrons is growing three times the rate of passengers as a whole.

**Figure 9-4. Historic Rural Transit Ridership**

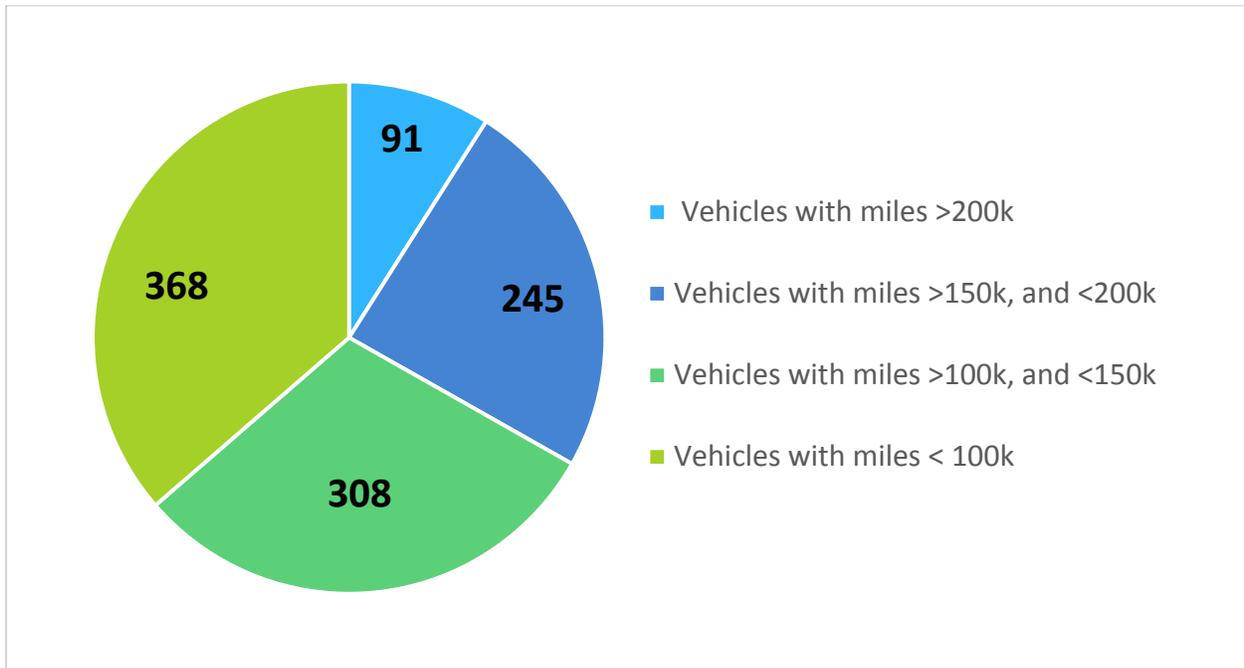


Source: Oklahoma Department of Transportation Transit Program

An analysis of the rural transit fleet data revealed that 64 percent (644 vehicles) of the system’s current fleet (1,012 vehicles) has more than 100,000 miles. The remaining 36 percent (368 vehicles) of the system’s current fleet has less

than 100,000 miles (**Figure 9-5**). The entire fleet will need to be replaced over the next 25-years, and some vehicles likely need two or more upgrades.

**Figure 9-5. Rural Transit Fleet Condition**



Source: Oklahoma Department of Transportation Transit Program

Comments received through the public involvement process indicated a strong concern for unmet rural transit needs. People noted that public transit in rural areas is a vital service for people who cannot drive or do not own a car.

Stakeholders pointed out that transit (trends) will only increase with the growing number of baby boomers who no longer want to drive or are able to drive. Previous routes tailored to provide journey-to-work rides have ended and/or service hours have been reduced. The declining investment in public transportation over the previous decade directly affects the ability of people to remain healthy, age in place, and seek employment across town or in another community where there are employment opportunities.

The 2015-2040 LRTP Personal Travel Advisory Committee raised the issue of the need for better communication, coordination, and connections between rural, urban, tribal, and intercity bus and train services.

### 9.7.2. Urban Public Transit Needs

Urban public transportation systems serve communities with populations of 50,000 or more. In Oklahoma, urban transit providers serve the Lawton region, the Oklahoma City metropolitan area in Central Oklahoma, and the Tulsa metropolitan area. Providers in all three areas offer transport for the general public and specialized services for the elderly and persons with disabilities. The future demand for transit service is evident from the increase in ridership from 7.4 million in 2009 to 7.8 million passengers in 2013.

Residents of urban areas identified needs for greater service frequency and longer hours of service, weekend service, as well as more routes to serve employment and retail hubs. Urban transit needs are largely planned and met within the context of metropolitan area transit services and metropolitan planning areas through the metropolitan area long range transportation plans.

### 9.7.3. Tribal Public Transit Needs

The tribal transit services have been initiated since 2006 using federal funds from the FTA Tribal Transit Program, Section 5311(c), which helps promote public transportation in tribal communities. Tribal transit in rural areas is a vital service to people who cannot drive or do not own a car. Transit service is needed to reach employment and educational, medical, and social services.

The tribal transit programs are the newest participants in the transit service process. While tribal participation in the transit process has grown in the last five years, further growth and refinement of the needs assessment and planning process is anticipated in the future.

## 9.8. INTERMODAL FACILITIES

An intermodal transportation hub or facility is a place where passengers and/or cargo are exchanged between vehicles or between transport modes. Intermodal public transport hubs include passenger rail stations, transit stations, bus stops, airports and ferry slips. Intermodal freight transportation centers include airports, rail classification yards, rail and waterway connection infrastructure and truck terminals, or combinations of these. Intermodal freight facilities typically handle containerized traffic that moves on the road, rail, or waterway systems.

The need for intermodal transportation hubs has been expressed by various governmental and private entities, along with stakeholders within the State of Oklahoma.<sup>16</sup> The Oklahoma City area intermodal passenger transportation hub, which is planned to be situated at the Santa Fe Depot on E.K. Gaylord Boulevard in downtown Oklahoma City, is expected to serve as the centerpiece of the future regional transit system and accomplish multiple goals for multiple client groups.

The State of Oklahoma is in the early stages of exploring intermodal facilities. Capitalizing on Oklahoma's central location, intermodal freight

facilities could be developed to benefit the different industrial sectors. These sectors include agricultural commodity processing, industrial livestock production, aerospace and electronics manufacturing, and warehouse and distribution. Intermodal and inter-state coordination should be considered as part of the process of developing and advancing viable options for intermodal facilities. The 2015-2040 LRTP recognizes that there is an interest in creating intermodal facilities in Oklahoma, but the level of need cannot be quantified at this time.

### 9.9. PORTS AND WATERWAYS

The MKARNS is the nation’s most inland waterway and Oklahoma’s primary navigable waterway originating from the Tulsa Port of Catoosa and flowing southeast through Arkansas to the Mississippi River. The Ports of Muskogee and Catoosa are the state’s two public ports, and both are designated as Foreign Trade Zones. In addition, there are several other private port operations along the MKARNS.

There are a number of initiatives that would be helpful in advancing the capabilities of the Oklahoma waterways. The primary needs for the MKARNS are:<sup>17</sup> proceeding with critical maintenance, deepening the channel to 12 feet, addressing the navigation channel overflow issue at the confluence of the Arkansas, White, and Mississippi Rivers, and adding tow haulage to the locks. The USACE is responsible for the operation and maintenance of the system and defines “critical maintenance” projects as having a 50 percent or greater probability of failure within the next five years.

The deepening of the MKARNS channel to 12 feet draft (current navigable draft is 9 feet) would allow barges to carry increased weights, thereby saving shipper costs and making the system more competitive with similar waterway systems and other modes of transportation. Increased tonnage on the system would decrease the burden placed on railroads and highways, thereby reducing pavement deterioration and potentially improving air quality.

### 9.10. BICYCLE AND PEDESTRIAN FACILITIES

Bicycle and pedestrian facilities throughout Oklahoma consist of multi-use trails, bicycle routes, and sidewalks. The planning and implementation of bicycle and pedestrian improvements are typically completed at the local government level, in cooperation with a regional COG, and/or through a MPO.

The public’s appetite for bicycle and pedestrian facilities has sharpened in Oklahoma and elsewhere. Bicycle and pedestrian facilities are important for commuting, public health and safety, and environmental reasons. A need for incorporating design guidelines for bicycle and pedestrian facilities in the ODOT roadway design manual was also identified by bicycle advocates and citizen commenters.

The bicycle and pedestrian needs were examined for each metropolitan area by reviewing the regional bicycle plans and/or bicycle-pedestrian elements of the latest MPO Long Range Transportation Plans. Bicycle and pedestrian needs for rural communities were assessed based on public input, communication with the rural Councils of Government, and on historical needs and implemented projects.<sup>18</sup> **Table 9-2** summarizes the total bicycle and pedestrian estimated improvements needed/planned for the next 25 years by lane miles.

**Table 9-2. Planned Bicycle and Pedestrian Improvements, 2015-2040**

Facility Type	Lane Miles
Multi-Use Trails	1,035
Signed Bike Routes/Lanes	989
Sidewalks	1,100

## 9.11. AIRPORT ACCESS

Air transportation plays an important role in economic competitiveness and the access to airports and surrounding infrastructure is important for quality of life, tourism, and commerce. The various cities, town, and counties in Oklahoma that have public airports within their political boundaries work with the Oklahoma Aeronautics Commission and the Federal Aviation Administration to ensure that the aviation needs of commerce and communities across Oklahoma are met.

As the manufacturing base shifts to high value and high tech products, the importance of efficiency and reliability in transportation has increased to support just-in-time supply chains. Airport services are integral to this component of the freight supply chain. Convenient airport access is also important to local residents and businesses.

The public expressed the importance of providing access to the airport by transit. It was understood that good surrounding infrastructure and network connectivity<sup>19</sup> is vital for personal and business travel.

## 9.12. LOCALLY OWNED FEDERAL AID HIGHWAY SYSTEM

The State Highway System does not include all federal aid miles in Oklahoma. In addition to the State Highway System, arterial streets and roads, and some collector facilities locally owned by counties, cities and towns, are eligible for federal aid. The federal aid miles under the jurisdiction of cities, towns, and counties in Oklahoma total nearly 19,000 miles.<sup>20</sup> To help address local government owned federal aid system improvement needs,<sup>21</sup> ODOT provides annual funding to counties, cities, and to the ACOG and INCOG MPOs.

## 9.13. CONGESTION MANAGEMENT

The Congestion Mitigation and Air Quality Improvement (CMAQ) Program was implemented by FHWA and FTA to support surface transportation projects and other related efforts that contribute air quality improvements and provide congestion relief.<sup>22</sup> ODOT uses these funds to improve air quality levels by passing through funds to ACOG, INCOG, and Lawton MPOs for use in promoting carpools, transit ridership, bicycle and pedestrian transportation, and the use of clean fuels.

## 9.14 SUMMARY

Oklahoma's 25-year multimodal transportation needs includes improvements that are ODOT's responsibility as well as improvements addressed by private railroads, and federal and local governments or partner agencies. The estimated cost of the improvements identified and the anticipated revenue to address those improvements are presented in **Chapter 10**.

Oklahoma's federal, state, and local partners must coordinate and collaborate to ensure the transportation challenges of today and tomorrow are addressed through strategic policies and adequate funding levels. The process of developing the 2015-2040 LRTP needs resulted from considerable coordination among a variety of statewide stakeholders.

## 9.15. ENDNOTES

<sup>1</sup> An example of a Locally Owned Federal Aid System facility is Davis Avenue on the west side of the City of Weatherford. This street, splits off of I-40 as the Interstate veers southwest in the center of town. Another example would be NW 50<sup>th</sup> Street in Oklahoma City. Typically the streets on the federal aid system that are locally owned are important streets within the community, but do not extend throughout the county or state.

<sup>2</sup> Additional information about bridge needs is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>3</sup> Additional information about highway needs is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>4</sup> Additional information about interchange needs is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>5</sup> Interchange definition developed by American Association of State Highway and Transportation Officials (AASHTO).

<sup>6</sup> Definitions of simple and complex interchanges are based on information from the 2009 Oklahoma Manual of Uniform Traffic Control Devices (MUTCD) Supplement.

<sup>7</sup> Additional information about appurtenance needs is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>8</sup> The first Oklahoma Strategic Highway Safety Plan (SHSP) was developed in 2007. An update is slated for publication in 2015.

<sup>9</sup> A J-Turn requires side road movements to be made indirectly by making a right turn, traveling about a quarter-mile (pending speed and curves) on the divided main road, and then making a U-turn to proceed in the opposite direction on the main road toward the intended destination.

<sup>10</sup> Additional information about private freight rail needs is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>11</sup> Class I railroads- The Surface Transportation Board defines Class I railroads as having annual revenues of \$467 million nationwide and provide a majority of the freight movement through the country.

<sup>12</sup> Class III railroads- The Surface Transportation Board defines Class III railroads as those that have total national yearly revenues below \$37.4 million, and that make up most of the local, switching, and terminal railroads. Generally, Class III carriers are referred to as short lines.

<sup>13</sup> Short line railroads, also as defined by the American Association of Railroads (AAR), fall into two categories: local railroads and switching & terminal railroads are railroads that are either jointly owned by two railroads for the purpose of transferring cars between railroads or operate solely within a facility or group of facilities. Generally, Class III carriers are referred to as short lines.

<sup>14</sup> Additional information about passenger rail needs is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>15</sup> Additional information about public transportation needs is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>16</sup> Additional information about intermodal facility needs is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>17</sup> Additional information about ports and waterway needs is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>18</sup> Additional information about bicycle and pedestrian facility needs is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>19</sup> Additional information about airport access needs is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>20</sup> According to the 2013 “Federal Aid Highway, Miles by Ownership” publication, cities, towns, and counties in Oklahoma own 18,989 miles in the aggregate.  
<http://www.fhwa.dot.gov/policyinformation/statistics/2013/pdf/hm14.pdf>

<sup>21</sup> Additional information about needs on the local government owned federal aid system is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

<sup>22</sup> Additional information about needs related to congestion management and improved air quality is contained in the Modal Needs Technical Memorandum. 2015-2040 LRTP Tech Memo Modal Needs.

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## 10. ESTIMATED COSTS AND FORECASTED REVENUES

Understanding the anticipated costs of Oklahoma’s transportation needs identified in **Chapter 9** and the potential available revenue to ODOT and its partners to address these needs is an important part of planning for Oklahoma’s transportation future.

This chapter provides discussion of the following:

- **Costs** – The estimated costs of meeting the 2015-2040 LRTP multimodal transportation needs over the next 25 years (in constant 2013 dollars), organized by mode and by investment categories.
- **Revenue** – An anticipated 2015-2040 LRTP baseline revenue forecast (federal, state, and local) for the 25-year (2015-2040) planning period (in constant 2013 dollars) to fund transportation.
- **Funding Gap** – The amount that the estimated costs exceed the anticipated baseline revenue forecast over the 25-year planning period (in constant 2013 dollars).
- **Potential Additional Revenue Sources** – A brief discussion of additional revenue sources that decision makers could consider addressing the funding gap.

### 10.1. FUNDING JURISDICTION AND RESPONSIBILITIES

As discussed in **Chapter 9**, ODOT is responsible for certain parts of the transportation system and works with other entities and the private sector to address several transportation needs. The various transportation assets/functions and related needs are described in this report as being “owned” or addressed by ODOT and/or other entities. There are various institutional mechanisms and funding arrangements.

**ODOT has responsibility for funding state transportation improvements:** The needs for State Highway System<sup>1</sup> bridges, roadways, interchanges, and transportation appurtenances are addressed by ODOT using federal and state funds. Transportation appurtenances include safety improvements, maintenance, Ports of Entry, weigh stations and rest areas, ITS technology, and maintenance of the state rail lines (including rail-highway grade crossings). These are essential components of an effective transportation system in the State of Oklahoma.

**Partner entities, private sector finance some transportation improvements:** The partner owned assets and functions (sometimes described as modal programs) are vitally important to providing an efficient transportation system. For the purposes of the 2015-2040 LRTP, these include: bicycle and pedestrian facilities; intermodal facilities; passenger rail; public transportation - urban, rural, and tribal; ports and waterways; congestion management; and, the locally owned federal aid system.

Partner entities include: ACOG, INCOG and Lawton MPOs; Oklahoma cities, towns and counties; Oklahoma rural, urban and tribal transit providers; and the USACE. Public-private or private bodies, such as Amtrak, private rail operators, private rail corporations, and private port and terminal operators also participate in the development and delivery of transportation in the state, but only public costs and revenues are itemized in the final analysis of this report.

ODOT, as well as the partner entities, provide funding for the partner owned assets.

**Collaboration is required to address multimodal transportation needs:** ODOT is not responsible for addressing the entire range of multimodal transportation needs in Oklahoma. However, ODOT and numerous federal, state, local partners work collaboratively to preserve, maintain, operate, and expand Oklahoma’s multimodal transportation system.

## 10.2. COST ESTIMATES (NEEDS)

**Chapter 9** described the multimodal needs for the transportation system with a description of the responsibilities of ODOT and its partner entities. This section discusses the costs that are associated with addressing 2015-2040 LRTP needs.

### 10.2.1. ODOT-Owned Assets and Functions and Related ODOT Costs

Cost estimates for State Highway System bridge and highway needs were determined using analytical models such as FHWA’s Highway Economics Requirements System – State Version (HERS-ST), and NBIAS, as well as input from ODOT staff and the public.

The cost estimates for State Highway System interchange needs were estimated by ODOT staff based on historical records of ODOT’s programming of such projects. Interchange improvement needs were identified and then a unit cost was applied to estimate the cost. An approximate unit cost for right-of-way and utilities for the interchange improvements was also taken into account.

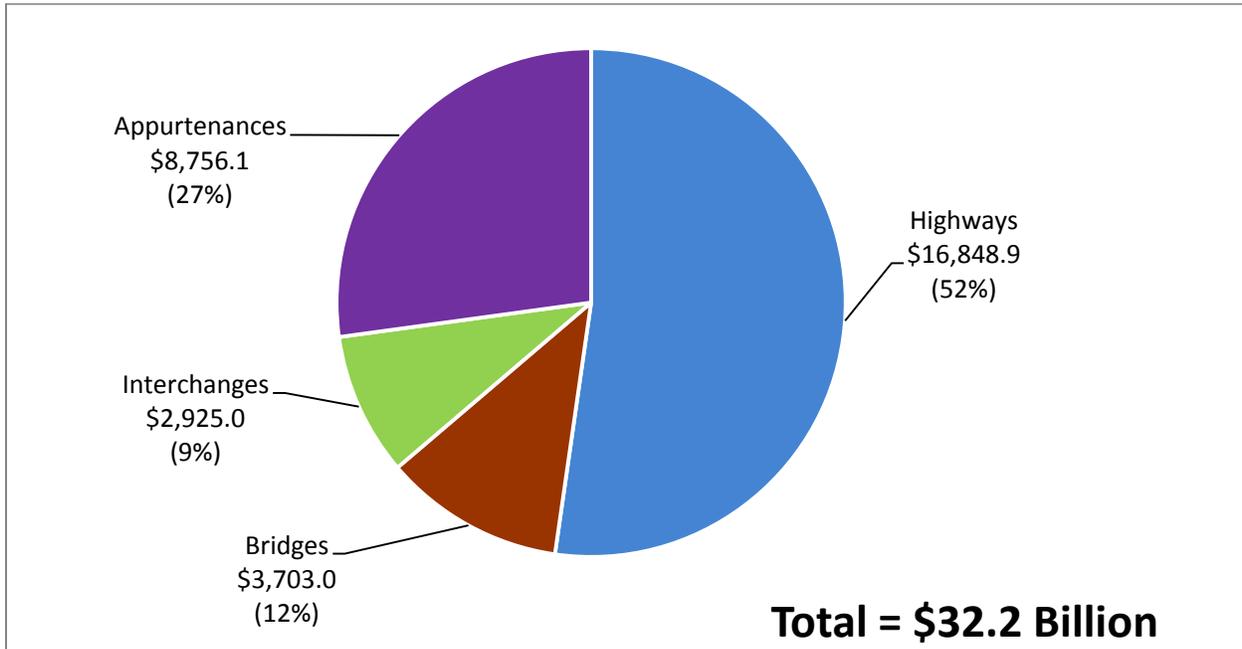
There are several transportation appurtenances that support the State Highway System and the state-owned rail system and its ongoing operation. The costs of these needs were estimated based on historical records and information from ODOT staff.

As shown in **Table 10-1** and **Figure 10-1**, the 2015-2040 LRTP estimated costs associated with ODOT owned assets and functions total **\$32.2 billion**.<sup>2</sup> The table also provides more detail of the estimated costs for individual categories.

**Table 10-1. Estimated ODOT Costs of ODOT-Owned Assets and Functions (2015 – 2040)**

Category		2015 – 2040 ODOT Costs (millions of 2013\$)	Notes
Highway	Preserve	\$9,055.6	\$3 billion of rural roadway shoulder costs (4,900 miles) included in reconstruction estimate.
	Reconstruct	\$6,512.1	
	Expand	\$1,281.2	
	<b>Total Highway</b>	<b>\$16,848.9</b>	
Bridge	Rehabilitate	\$847.8	
	Reconstruct	\$217.6	
	Replace	\$2,637.6	
	<b>Total Bridge</b>	<b>\$3,703.0</b>	
Interchanges	<b>Total Interchanges</b>	<b>\$2,925.0</b>	
Transportation Appurtenances	Safety	\$874.2	The 2015-2040 LRTP annual maintenance costs are double (\$296 million annually) the 2014 annual maintenance budget of \$144 million.
	Maintenance, Field Divisions	\$7,417.9	
	Ports of Entry	\$72.0	
	Weigh Stations, Rest Areas	\$110.0	
	ITS	\$52.1	
	State Freight Rail	230.0	
	<b>Total Appurtenances</b>	<b>\$8,756.2</b>	
<b>Total</b>		<b>\$32,233.1</b>	

**Figure 10-1. Estimated ODOT Costs of ODOT-Owned Assets and Functions (2015 – 2040)**  
(millions of 2013\$)



**10.2.2. Partner-Owned Assets and Functions and Related ODOT Costs**

ODOT is a cooperative partner and over the next 25 years, estimates indicate the agency is expected to provide **\$2.4 billion**<sup>3</sup> to address needs associated with the following transportation assets or functions led by partner agencies or government entities:

- Passenger rail;
- Bicycle and pedestrian facilities;
- Public transportation, urban and rural;
- Congestion management; and
- Locally-owned federal aid system.

**Table 10-2** shows the partner owned asset and functions costs by category as estimated by ODOT. The table also provides an estimated breakdown of the anticipated ODOT and partner costs for maintaining and improving these facilities and functions over the next 25 years.

The 2015-2040 LRTP passenger rail cost estimates were developed based on information provided by the ODOT Rail Programs Division, previous studies, and the *Oklahoma Statewide Freight and Passenger Rail Plan*. Quantifying the magnitude of need and costs is difficult not only in Oklahoma, but also in other states. The Federal Rail Administration is creating software that will aid in development of ridership estimates and performance information, but this is still in the early phases of development.

**Table 10-2** shows total passenger rail operating costs at \$93.3, and an ODOT cost of \$53.5 million, which indicates the level of state subsidy forecasted to be available for the next 25 years.<sup>4</sup> Thus, it is expected that there will be unmet costs in the amount of \$39.8 million, reflecting demand greater than what is affordable. (It is anticipated that private companies will invest \$415.7 million in passenger rail infrastructure but this in not included in the total estimated LRTP costs.)

**Table 10-2. Partner-Owned Assets & Functions and Related Estimated Costs (2015 – 2040)**

Category	2015 – 2040 Costs (millions of 2013\$)				Notes
	Total Costs	ODOT Cost	Partner Cost	Unmet Costs	
<b>Passenger Rail</b>					
<ul style="list-style-type: none"> <li>Preserve - Heartland Flyer (HF) to Ft. Worth</li> </ul>	\$80.3	\$53.5	\$0.0	\$26.8	Forecasted state subsidy for passenger rail is \$53.5 million. Shortfall is \$26.8
<ul style="list-style-type: none"> <li>Expand - Extend HF from OKC to Newton KS, active 2035</li> <li>(private sector capital: \$60.0 M)</li> </ul>	\$13.0	NA	\$0.0	\$13.0	\$60.0 million of private investments. \$13.0 million is operation subsidy shortfall from 2035 to 2040.
<ul style="list-style-type: none"> <li>Expand – Improved service Newton KS to Ft. Worth TX</li> </ul>	\$0.0	\$0.0	\$0.0	\$0.0	\$107.0 million of private investments (after 2040)
<ul style="list-style-type: none"> <li>Tulsa-OKC (private sector capital: \$355.7 M)</li> </ul>	\$0.0	\$0.0	\$0.0	\$0.0	\$355.7 million of private investments
<b>Passenger Rail Subtotal</b>	<b>\$93.3</b>	<b>\$53.5</b>	<b>\$0.0</b>	<b>\$39.8</b>	Private investments of \$107.0 million after 2040. Total private investment 2015-2040 = \$415.7 million
<b>Public Transit</b>					
<ul style="list-style-type: none"> <li>Rural Transit</li> </ul>	\$909.0	\$583.3	\$222.7	\$103.0	\$103.0 million shortfall
<ul style="list-style-type: none"> <li>Urban Transit</li> </ul>	\$1,349.0	\$43.2	\$1,305.8	\$0.0	
<ul style="list-style-type: none"> <li>Tribal Transit</li> </ul>	\$162.7	\$0.0	\$162.7	\$0.0	
<b>Public Transit Subtotal</b>	<b>\$2,420.7</b>	<b>\$626.5</b>	<b>\$1,691.2</b>	<b>\$103.0</b>	
Bicycle and Pedestrian	\$851.0	\$189.7	\$113.5	\$547.8	\$547.8 million shortfall
Intermodal Facilities	\$94.5	\$0.0	NA	\$94.5	City of Oklahoma City, \$94.5 million gap
Ports and Waterways	\$191.0	\$0.0	\$72.4	\$118.6	USACE, \$118.6 million gap
Locally owned federal aid system	\$1,521.2	\$1,521.2	\$0.0*	\$0.0	ODOT provides funding directly to counties, cities, ACOG & INCOG.
Congestion Mitigation	\$30.5	\$30.5	\$0.0	\$0.0	
<b>Total Partner Programs</b>	<b>\$5,202.2</b>	<b>\$2,421.0</b>	<b>\$1,877.1</b>	<b>\$903.6</b>	Total ODOT and Partner cost = \$5.2 billion.

Note: Rural Transit is administered by ODOT. Local entities provide service and secure (approx.60%) local match. Typical required match for federal transit operating funds is 50%; capital funds typically require 10% to 20% match. Bicycle & pedestrian needs are funded by a variety of sources. This is an estimate of needs based on history and adopted Plans. ODOT acknowledges that it is not a statement of all Oklahoma bicycle & pedestrian needs.

\*ODOT acknowledges there is significant local funding of local streets and roadways not included.

NA: Information is not available or unknown.

The bicycle and pedestrian needs were examined for each metropolitan area by reviewing the regional bicycle plans and/or bicycle-pedestrian elements of the latest Long Range Transportation Plans of the state's metropolitan organizations, and by analyzing historic needs/costs as identified through the ODOT Transportation Alternatives Program<sup>5</sup> (formerly Enhancement). As shown in **Table 10-2**, ODOT will provide \$189.7 million to support bicycle and pedestrian facility improvements.<sup>6</sup>

To estimate the long term rural transit cost, components of actual (vs. budgeted) costs for the years 2009 through 2013 were averaged and then projected over the next 25 years. As shown in **Table 10-2**, ODOT is expected to provide \$583.3 million to support rural transit in Oklahoma between 2015 and 2040.<sup>7</sup>

The long term urban transit needs and estimated cost were examined for each of the metropolitan areas by reviewing their LRTPs. As shown in **Table 10-2**, ODOT plans to provide \$43.2 million in state funds to support urban transit in Oklahoma over the next 25 years.

The State Highway System does not include all federal aid highway miles in Oklahoma; local streets and roads on the federal aid system are owned by counties, cities and towns, or occasionally another public agency. To help address the 19,000 miles<sup>8</sup> of local government owned federal aid system improvement needs, ODOT provides annual funding to counties, cities, and the ACOG and INCOG MPOs. As shown in **Table 10-2**, the 25-year funding that ODOT is expected to pass through to local governments to address locally-owned federal aid highways totals over \$1.5 billion. This funding is used as an *indicator* of local needs/costs; however ODOT is aware that the need is greater than what is represented by this investment. Other state, and local funds help to meet many of the city, town, and county road needs, and some needs remain unmet.

The Congestion Mitigation and Air Quality Improvement (CMAQ) Program was implemented by FHWA and FTA to support surface transportation projects and other related efforts that contribute air quality improvements and provide congestion relief. Federal CMAQ funding is provided to areas in nonattainment or maintenance for ozone, carbon monoxide, and/or particulate matter. Even though Oklahoma does not have any nonattainment areas, ODOT receives an apportionment of CMAQ funding for congestion mitigation, either air quality improvement projects, or other elements of flexible spending. ODOT provides a pass through of CMAQ funds to the MPOs to assist with congestion reduction/air quality improvement efforts. Estimated costs related to congestion management, \$30.5 million over the next 25 years, are based on a continuation of ODOT expenditures at current levels.

ODOT's share of partner-owned program costs such as passenger rail, public transit, bicycle and pedestrian facilities, etc. is estimated at **\$2.4 billion**.

### 10.2.3. Partner Asset/Functions Cost Assumed by Partner Entities

ODOT is involved in multiple aspects of planning and developing the transportation system; yet there are many occasions where the Department works in cooperation with partner agencies to address transportation problems and/or fund improvements. Additionally, ODOT recognizes that there are institutional and jurisdictional issues, for example with counties or MPOs, where ODOT may serve as the second tier rather than the lead agency.

The cost estimates for other modal transportation assets/functions (modal programs) were determined using data from the sponsoring entity/agency, local COGs, ODOT publications, and input from ODOT staff. These cost estimates may not be as finely tuned by virtue of the fact that ODOT is not the lead entity. Nevertheless, these partner programs

are important to the picture of freight and passenger transportation in the State of Oklahoma.

Several of the items mentioned in the previous section involve costs, as shown in **Table 10-2** that are shared by partner entities, namely:

- Bicycle and pedestrian facilities; and
- Rural and urban public transportation.

As explained above, estimated costs for bicycle and pedestrian improvements were developed based on an analysis of state and local government historical costs. Assuming that local government funding trends continue, local partner entities are expected to absorb \$113.5 million of bicycle and pedestrian improvement costs over the next 25 years. An additional number of bicycle and pedestrian facility needs, costing an estimated \$547.8 million, do not have an identified funding source.

Rural transit costs, as described earlier, have been estimated based on an analysis of historical costs. In addition to required match, local governments or sponsor agencies are expected to face rural transit costs of \$222.7 million between 2015 and 2040. Additionally, a shortfall of over one hundred million dollars is expected.

As shown in **Table 10-2**, the urban transit cost for partner entities (based on financially constrained metropolitan LRTPs) is estimated at \$1,305.8 million. About one-third of this cost is covered through FTA funds provided directly to the metropolitan transit agencies. The remainder of the cost is the responsibility of the local governments and related transit agencies.<sup>9</sup>

In addition to the transportation system components mentioned above, this group of partner assets/functions includes tribal transit, intermodal facilities, and ports and waterways.

Funding from FTA's Tribal Transit program for years 2009 through 2014 was used as the basis for estimating tribal funding needs for the life of

this plan. Extrapolating from the past five year's transit use and costs, estimated cost of the 25-year tribal transit needs is estimated at \$162.7 million. Tribal transit receives direct funding through FTA. ODOT provides coordination and assistance as needed.<sup>10</sup>

The need for intermodal transportation hubs has been expressed by various governmental and private entities, along with stakeholders within the State of Oklahoma. The only definite facility being proposed at the time of this Plan development is the Oklahoma City Intermodal Transportation Hub. The proposed transportation hub will provide connectivity between existing and future transit modes, and will provide passengers with amenities such as enclosed waiting and ticketing, restrooms and access to mixed use development. The total project cost of the transit hub is estimated at \$123 million.<sup>11</sup>

Phase I of the Hub is funded by a Transportation Investment Generating Economic Recovery (TIGER) grant, City of Oklahoma City designated sales tax revenue, and ODOT. The City of Oklahoma City is the project sponsor and approximately \$94.5 million is needed to complete the improvements recommended by the Hub Study. A revenue source has not been identified.

The estimated cost of meeting the 25-year ports and waterway needs for critical maintenance and capacity expansion totals \$191.0 million. These costs were developed based on information provided by the ODOT Waterways Program and the USACE.<sup>12</sup> These improvement costs are under the fiscal responsibility of the USACE.

As shown in **Table 10-2**, cost estimates for partner agency assets and functions total nearly **\$1.9 billion** to address intermodal facilities; bicycle and pedestrian facilities; ports and waterways; and rural, urban, and tribal public transportation needs over the next 25 years. After estimated ODOT and partner entity contributions are considered for the needs

listed in **Table 10-2**, there remains approximately **\$900 million** in unmet costs that would require further investment on the part of participating entities.

**10.2.4. Total Estimated Costs for 2015-2040 L RTP**

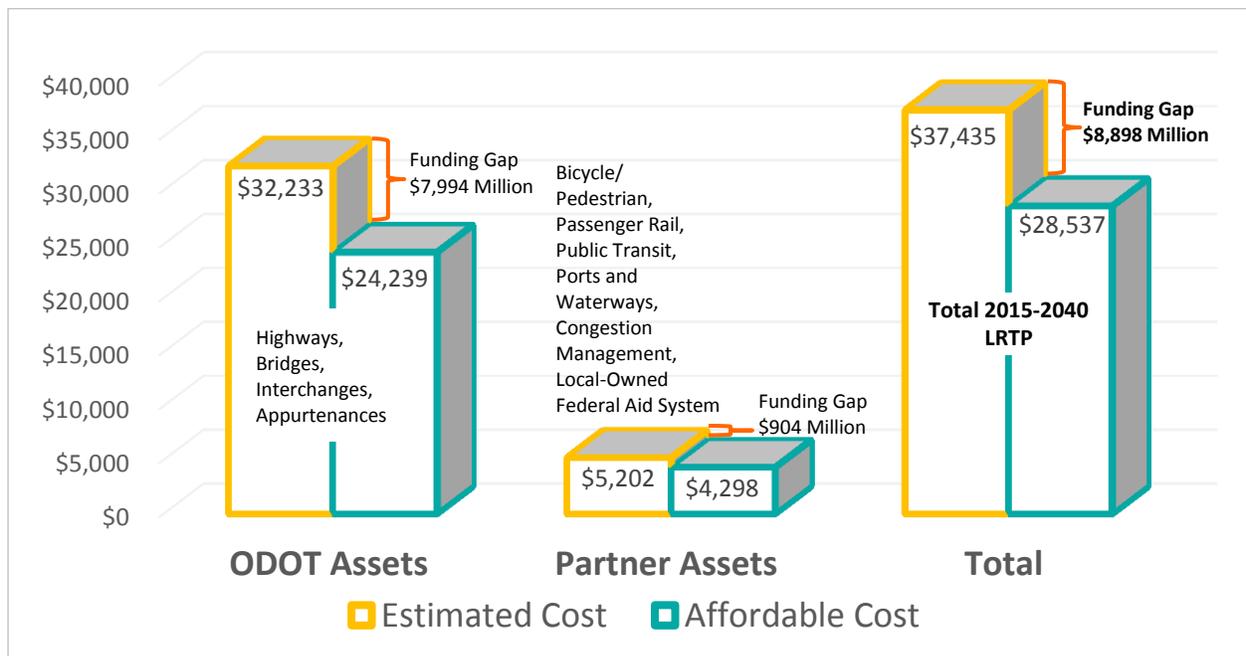
Based on the 2015-2040 needs analysis conducted for the 2015-2040 L RTP, **Figure 10-2** illustrates the estimated costs of ODOT-owned assets and functions (highways, bridges, interchanges, and appurtenances) plus partner-owned assets and functions at a total of **\$37.4 billion**.

Of the \$37.4 billion in total estimated costs, ODOT is responsible for \$32.2 billion in state highway, bridge, interchange and appurtenance needs costs. **Figure 10-2** shows this cost level is not affordable. The affordable cost for ODOT for these state owned assets is **\$24.2 billion**. (This value is detailed in Section 10.3.1.) Thus, \$8.0 billion of this price tag is identified as an unmet cost. ODOT will need to decide which needed improvements will not be funded.

Of the \$37.4 billion in total estimated costs, partner agency costs total **\$5.2 billion**. Assigning cost responsibilities shows partner entities are responsible for nearly \$1.9 billion. ODOT is expected to provide pass through and other designated funds in the amount of \$2.4 billion; and \$0.9 billion are unmet costs.

- In conclusion, for the 2015-2040 L RTP -
- Total *Estimated Costs* are .....\$37.4 billion
  - Total *Affordable Costs* are .....\$28.5 billion
  - ODOT .....\$26.6 billion
  - Partner entities .....\$1.9 billion
- Total *Unmet Needs* are: .....\$8.9 billion
- State highway, bridge, interchange, appurtenances (combined total): .....\$8.0 billion
  - Passenger rail, bicycle and pedestrian facilities, public transportation, intermodal facilities, locally owned federal aid system, congestion management, ports and waterways (combined total): .....\$0.9 billion

**Figure 10-2. 2015-2040 L RTP Total Estimated Cost (millions of 2013 dollars)**



### 10.3. REVENUE FORECAST

The 2015-2040 LRTP revenue forecast projects ODOT's state revenues, federal funds and required match, and local funds for state-owned surface transportation infrastructure investments<sup>13</sup> (highways, bridges, interchanges, transportation appurtenances) over the next 25 years. The ODOT revenue forecast also projects ODOT funds that are passed through and/or designated to partners for partner-owned transportation assets and functions.

Additionally, revenue estimates for partner agencies and other government entities responsible for transportation assets and functions were projected. While ODOT funds may be shared, passed through, and/or designated for these transportation assets and functions, the responsibility for these assets and functions are outside the ODOT's control.

#### 10.3.1. ODOT Revenue Forecast

##### ODOT Funds for ODOT-owned Infrastructure

To develop the ODOT forecast, historic ODOT revenues and funding streams were documented;<sup>14</sup> and then, for each revenue and funding line item, growth rate assumptions for the forecast period were developed in collaboration with ODOT staff.

In brief, the following ODOT funds are included in the forecast:

- State and federal (FHWA) highway and bridge funds;
- State and federal (FTA) transit funds;
- State and federal highway assistance to local governments, including counties, cities, and towns;
- State transit funds to urban transit systems;
- State and federal funds to rural and tribal transit systems;<sup>15</sup>
- State funds for passenger rail operations and railroad improvements; and

- Required local matching funds.

In the following pages of this report, the term "ODOT funds" represents the sum of resources from the above mentioned sources. The ODOT funds include approximately 42 percent federal, 56 percent state, and 2 percent local money.

The ODOT revenue forecast does not include the following:

- Local transportation revenues such as city transit subsidies;
- Federal or state transportation (non-transit) funds for which local or tribal governments are direct recipients;
- City, town and county funds for sidewalks and bicycle facilities;
- Private company funding of ports or railroads;
- AMTRAK or private passenger rail funds;
- Airport or aeronautics funding; and
- Funding for the Oklahoma Turnpike Authority system.

The primary revenue growth rate assumptions are described below.

- **Federal Funding.** All sources of federal funding remain at FY2014 funding levels, i.e., 0 percent growth in federal funding is assumed. This assumption is based on the future federal transportation funding uncertainty related to solvency issues of the Federal Highway Trust Fund and the lack of a long term funding act for surface transportation.
- **State Revenues.** State revenues are projected according to specific growth rates for each revenue source. Growth rate assumptions for the primary state revenue sources include the following:

- Motor fuel tax revenue growth is based on the Energy Information Administration’s (EIA) annual projected growth rates in motor fuel consumption in the United States’ West South Central region.
- Annual growth in motor fuel tax revenue over the forecast period is flat.
- Income tax revenue growth through FY2018 is based on dollar amounts set forth in state statute; and tax revenue is projected to remain at the FY2018 level (i.e., 0 percent growth) thereafter and through the duration of the forecast period.
- Motor vehicle registration fee revenue growth is 0.69 percent annually based on the FY2004 to FY2013 compound annual growth rate (CAGR) of motor vehicle registrations in Oklahoma. No change in the fee rates is assumed.
- **Deductions.** Deductions from the revenue forecast are made to account for required debt service payments on currently outstanding debt and an estimate of projected funds that will pay for non-infrastructure related costs such as the administration of ODOT, research, and planning.
- **Direct Pass Through.** ODOT provides federal revenue directly to the Association of Central Oklahoma Governments (ACOG), the Indian Nations Council of Government (INCOG),<sup>16</sup> as well as counties and cities. The two MPOs use this funding to address needs on the federal-aid highway system. Typically, if improvements are made to the State Highway System, within the ACOG or INCOG regions, this cost is ODOT’s responsibility. Counties and cities use the funding to address locally owned streets, roads, and bridges that are not included in the State Highway System.

The baseline revenue forecast does *not* assume the following:

- Any changes to state or federal legislation which stipulate the amount of revenues ODOT receives after FY2015;
- Any changes in tax rates, fee levels, or existing revenues;
- Receipt of any new revenue sources; and
- Receipt of any proceeds from newly issued debt, general revenue appropriations from the State, or other special one-time funding.

Over the 25-year forecast period, it is projected that ODOT’s transportation revenue available to address needs total **\$26.7 billion** in 2013 dollars.<sup>17</sup> However, when you reduce the direct pass through revenue provided to ACOG, INCOG, counties, and cities to address the locally owned federal aid system, **Figure 10-3** shows the revenue available to address the following needs and estimated costs on the State Highway System totals **\$24.2 billion** in 2013 dollars.

#### **ODOT Funds for Partner-Owned Assets and Functions**

As noted earlier, ODOT works in cooperation with, and provides funding to, partner agencies or government entities to address needed improvements for transportation assets under the jurisdiction of these other entities. During the 25-year forecast period, **Table 10-2 and Figure 10-3** show the projected ODOT transportation revenue available to address needs and estimated costs for the following locally-owned transportation assets and functions total **\$2.4 billion** in 2013 dollars:

- Passenger rail- operations (the Oklahoma City to Fort Worth Heartland Flyer 2015-2040; Newton, Kansas to Oklahoma City 2035-2040);

- Public transportation;
  - Urban
  - Rural
- Bicycle and pedestrian facilities;
- Congestion mitigation; and
- Locally owned federal aid system.

This revenue is in addition to the \$2.4 billion in ODOT funds identified for partner-owned functions as described above.

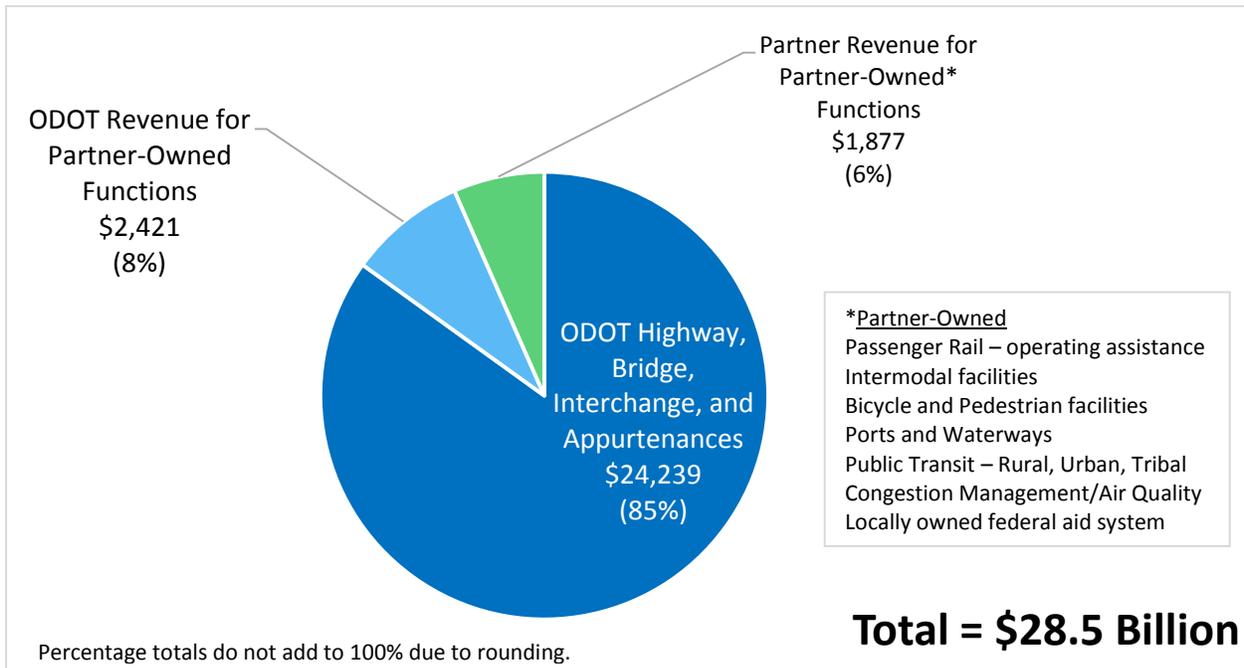
This discussion of described needs, estimated costs, and anticipated revenues for partner-owned transportation programs and functions should be viewed as a beginning point. The transportation programs and infrastructure discussed in this section are under the sponsorship of other entities, which have been helpful in creating this analysis for the plan. However, many of these entities are engaged in further efforts to expand or update their planning documents, and those partner agencies should be considered the most knowledgeable source about the programs and related budget.

**10.3.2. Partner Funds for Partner-Owned Programs and Functions**

Based on available information, **Figure 10-3** shows the partner and other government revenue available to address needs and estimated costs for the following programs during the 25-year forecast period, totals nearly **\$1.9 billion** in 2013 dollars<sup>18</sup>, including:

- Bicycle and pedestrian facilities;
- Ports and waterways; and
- Public transportation.
  - Urban
  - Rural
  - Tribal

**Figure 10-3. 2015-2040 LRTP Total Revenue Forecast (millions of 2013\$)**



## 10.4. FUNDING GAP AND IMPLICATIONS

### 10.4.1. ODOT Gap for ODOT Owned Functions

Oklahoma faces a challenge to meet ever increasing transportation needs, a common problem facing states across the United States. Based on the needs analysis conducted for the 2015-2040 LRTP and shown in **Table 10-3**, the estimated costs of ODOT-owned functions (highways, bridges, interchanges, and transportation appurtenances) totals \$32.233 billion and the projected 25-year revenue totals \$24.239 billion. This results in an \$8.0 billion funding gap.

### 10.4.2. Partner-Owned Functions Funding Gap

As shown in **Table 10-3**, the estimated 25-year costs of partner-owned functions total \$5.2 billion.

The projected ODOT 25-year revenue to support partner-owned programs is \$2.4 billion; and the projected partner-owned revenue totals \$1.9 billion. The available revenue total (\$2.4 billion + \$1.9 billion) of \$4.3 billion leaves an approximate \$900 million funding gap.

### 10.4.3. Total LRTP Funding Gap = Total LRTP Cost Estimate minus Total LRTP Revenue Forecast

Based on the 2015-2040 needs analysis conducted for the 2015-2040 LRTP, as shown in **Figure 10-2** the ODOT and partner estimated cost totals \$37.4 billion and the projected 25-year revenue totals \$28.5 billion. This results in an \$8.9 billion funding gap and equates to a \$356 million average annual funding gap. (**Table 10-3**)

**Table 10-3. Estimated Costs and Forecasted Revenues for the 2015-2040 LRTP**

Category	Estimated Costs	Projected Revenues	Difference
	(Millions of 2013 Dollars)		
<b>State Owned Assets/Functions</b>			
Bridges	\$3,703.0		
Highways	\$16,848.9		
Interchanges	\$2,925.0		
Appurtenances <sup>1</sup>	\$8,756.2		
<b>State Subtotal</b>	<b>\$32,233.1</b>	<b>\$24,239.0</b>	<b>\$7,994.0</b>
<b>Partner Owned Assets/Functions<sup>2</sup></b>			
State participation		\$2,421.0	
Local, federal, other		\$1,877.2	
<b>Partner Subtotal</b>	<b>\$5,202.2</b>	<b>\$4,298.2</b>	<b>\$904.0</b>
<b>2015-2040 LRTP TOTAL</b>	<b>\$37,435.3</b>	<b>\$28,537.2</b>	<b>\$8,898.0</b>

<sup>1</sup> Transportation appurtenances include the following functions and improvements within the ODOT ROW: intelligent transportation systems, maintenance, ports of entry, rest areas, safety, state owned railroads, at grade highway-railroad crossings, and weigh stations.

<sup>2</sup> Partner entities include: Amtrak Heartland Flyer and private passenger rail operators; ACOG, INCOG and Lawton MPOs; Oklahoma cities, towns and counties; Oklahoma rural, urban and tribal transit providers; and the US Army Corps of Engineers.

## 10.5. POTENTIAL EXAMPLES TO ADDRESS THE FUNDING GAP

As discussed above, the 2015-2040 LRTP projects that the estimated cost of transportation needs will exceed available revenue. For illustrative purposes, this section discusses the following select examples of potential additional revenue sources for transportation investment:

- **Example 1: Secure Increased Percentage of Motor Vehicle Revenue.** The State of Oklahoma currently charges various fees and taxes on motor vehicles. These include charges for the registration of automobiles, farm trucks, and commercial vehicles, personalized license plates, house trailer licenses, rental taxes, bus mileage taxes, vehicle title fees, and overweight truck permits, among others.

To generate additional revenues for transportation investments, the State of Oklahoma would allocate a larger percentage of the revenues collected from these motor vehicle fees to transportation. Current fee levels and tax rates would not be increased under this example. Increasing the percentage of these revenues allocated to transportation investments, therefore, would result in a smaller percentage allocated to non-transportation uses.

- **Example 2: Increase Diesel Tax.** The State of Oklahoma currently taxes gasoline at a rate of 17 cents per gallon (cpg) and diesel at a rate of 14 cpg.<sup>19</sup> This example for additional transportation revenue would increase the state diesel tax rate by 3 cpg to 17 cpg, the same rate as imposed on gasoline. The revenues derived from the 3 cpg incremental tax on diesel fuel could be dedicated to improving critical freight routes.
- **Example 3: Freight Fees.** Various revenue examples that specifically target freight-related activities are possible revenue generating candidates. Freight fee and tax

examples that Oklahoma could consider include the following:

- **Container Fee.** A fee could be established on some or all containers that move through Oklahoma.
- **Freight Waybill Tax.** A sales tax could be imposed on freight shipping costs.
- **Weight and Distance Tax.** An excise tax could be imposed on either the weight of freight moved (a ton-based tax) or as a function of both weight and distance (a ton-mile tax).

- **Example 4: Vehicle Miles Traveled (VMT) Fee.** A VMT fee would charge drivers for the total number of miles traveled. As opposed to tolls, which are facility specific and not necessarily levied strictly on a per-mile basis, VMT fees are based on the distance driven on a defined network of roadways.
- **Example 5: Additional Tolling.** Oklahoma could potentially toll additional facilities—existing or new—as a means to generate additional revenues for transportation. Oklahoma also could potentially toll its interstates; however, such authority is limited by the federal government.

The discussion of these examples is intended to facilitate further discussion as ODOT looks to address future transportation investment needs. None of these examples are recommended as part of this plan. To fully address long-term transportation investment costs in a financial sustainable manner, it is likely that ODOT would draw on a combination of increments to existing revenues, new revenue initiatives, and cost savings. Detailed analysis, stakeholder vetting, and thorough discussions would be undertaken prior to implementation of any new revenue option. In addition, each of these options would require specific legislative and potentially voter action prior to implementation.

## 10.6. ENDNOTES

<sup>1</sup> The State Highway System includes Interstate, U.S., and Oklahoma (State) highways within the State of Oklahoma.

<sup>2</sup> Further information on the breakdown of Costs for ODOT-Owned Assets and Functions can be found in Sections 2 and 8 of the 2015 2040 LRTP Tech Memo Multimodal Needs.

<sup>3</sup> Additional information about the ODOT revenue forecast is available in the 2015-2040 LRTP Tech Memo Revenue Forecast.

<sup>4</sup> Further information on the breakdown of estimated costs and anticipated revenues for passenger rail can be found in Sections 2 and 8 of the 2015 2040 LRTP Tech Memo Multimodal Needs.

<sup>5</sup> Further information on the Transportation Alternatives Program is available at the sites below.  
[http://ok.gov/odot/About\\_ODOT/Contact\\_ODOT\\_Divisions/Local\\_Government\\_Division.html](http://ok.gov/odot/About_ODOT/Contact_ODOT_Divisions/Local_Government_Division.html);  
<http://www.fhwa.dot.gov/map21/factsheets/tap.cfm>

<sup>6</sup> Further information on the breakdown of estimated costs and anticipated revenues for bicycle/pedestrian facilities can be found in Section 12 of the 2015 2040 LRTP Tech Memo Multimodal Needs.

<sup>7</sup> Further information on the breakdown of costs and anticipated revenues for rural transit can be found in Section 9.2.1 of the 2015 2040 LRTP Tech Memo Multimodal Needs.

<sup>8</sup> According to the 2013 “Federal Aid Highway, Miles by Ownership” publication, cities, towns, and counties in Oklahoma own 18,989 miles in the aggregate.  
<http://www.fhwa.dot.gov/policyinformation/statistics/2013/pdf/hm14.pdf>

<sup>9</sup> Further information on the breakdown of costs and anticipated revenues for urban transit can be found in Section 9.2.2 of 2015 2040 LRTP Tech Memo Multimodal Needs.

<sup>10</sup> Further information on the estimated costs and anticipated revenues for tribal transit can be found in Section 9.2.3 of the 2015 2040 LRTP Tech Memo Multimodal Needs.

<sup>11</sup> Further information on needs, estimated costs, and available revenue for intermodal transportation facilities can be found in Section 10 of the 2015 2040 LRTP Tech Memo Multimodal Needs.

<sup>12</sup> Further information on estimated costs and anticipated revenues for ports and waterways can be found in Section 11 of the 2015 2040 LRTP Tech Memo Multimodal Needs.

<sup>13</sup> 2015-2040 LRTP Revenue Forecast Scenarios Technical Memorandum.

<sup>14</sup> Historic revenues and funding sources are documented in the spreadsheet tool that is a supplement to this technical memorandum.

<sup>15</sup> FTA Section 5311 funds are requested by tribal entities through state DOTs. Once grants have been authorized, tribes may elect to have direct FTA or state oversight. Additionally, there are other federal tribal transportation funds that are provided directly to the tribes.

<sup>16</sup> Federal transportation law requires that state DOTs provide a suballocation to large metropolitan planning organizations (MPOs) like ACOG and INCOG.

<sup>17</sup> The 25-year projected transportation revenue totals \$35.6 billion in current year dollars which equates to \$26.7 billion in 2013 dollars (inflation-adjusted dollars). The adjustment for inflation assumes a 2 percent annual inflation factor (beginning with the FY2013 base year) based on recent trends and a review of inflation factors used in other state long range transportation plans.

<sup>18</sup> Further information on the estimates of Partner Funds for Partner Owned Programs and Functions can be found in Section 2.2 of the 2015 2040 LRTP Tech Memo Multimodal Needs.

<sup>19</sup> The gasoline and diesel fuel tax rates each include a 1 cpg underground storage tank fee.

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## **11. POLICIES AND STRATEGIES**

The purpose of the 2015-2040 LRTP policies and strategies is to synthesize the Plan, which provides guidance for the development, management, and operation of the intermodal transportation system of the State of Oklahoma. The number or magnitude of policies and strategies in one mode does not reflect on the degree of importance of a particular mode. The policies and strategies, also described as Plan recommendations, are intended to guide the use of a performance based approach to transportation decision-making. They demonstrate the state's commitment to partnering with the private sector in promoting economic development through strong transportation planning and infrastructure development. Recommendations have been developed for each mode and these recognize the connections between the various modes. The strategies herein are described in the context of a policy framework, in which strategies flow from a specific recommendation. Multimodal policy recommendations and strategies address topics that encompass several or all modes.

Recommendations from the 2010-2035 Oklahoma Long Range Transportation Plan were used as a starting point for development of the 2015-2040 LRTP recommendations. The existing plan recommendations were reviewed by advisory committees and compared with the identified transportation needs. Then preliminary recommendations were refined based on input from transportation providers, users, the public, and other interested parties.

The recommendations in this chapter are organized primarily according to modes, although a multimodal group is included as well; the multimodal policies and strategies cover several modes or topics that apply to all modes.

### 11.1. HIGHWAY AND BRIDGE

Oklahoma's 12,265 mile State Highway System is mostly rural in nature with two major metropolitan areas (Oklahoma City and Tulsa) accounting for urbanized area highways and expressways. Traffic on the major state highways has increased dramatically over the past 20 years with the exception of the recession years of 2008 and 2009. Freight traffic has experienced this same dramatic growth and is expected to continue to grow for the foreseeable future. The daily vehicle miles travelled on highways with four-lanes or more was over 42 million miles in 2012. This represents over 72 percent of the total vehicle miles travelled every day on Oklahoma's State Highway System.

The needs of the highway system are continuously assessed in order to program appropriate reconstruction, rehabilitation, and maintenance improvements in a fully integrated and systematic manner; and regular maintenance extends the life cycle of the facilities. The critical conditions of Oklahoma's bridges have been well documented for over a decade and the commitment to greatly reduce the number of structurally deficient bridges has been steadfast.

The following policies and strategies/action items (**Table 11-1**) continue to focus on strengthening the state's highway system, recognizing the key national, regional, and state role it plays in economic competitiveness and safety.

**Table 11-1. Highway and Bridge Policies and Strategies**

1. Improve safety and bridge conditions by replacing or rehabilitating structurally deficient bridges on the State Highway System. <i>(Existing Policy)</i>
<ul style="list-style-type: none"> <li>a. Implement adopted schedule for replacing or rehabilitating structurally deficient bridges on the State Highway System. <i>(Updated)</i></li> <li>b. Pursue methods of rehabilitating and replacing fracture-critical bridges. <i>(Updated)</i></li> <li>c. Develop a programmatic approach to identify and address potential preservation issues on noteworthy historic bridges, including, but not limited to, truss-style bridges, working collaboratively with community partners. <i>(Existing)</i></li> </ul>
2. Preserve and improve the condition of highways and bridges by implementing asset management systems. <i>(Updated Policy)</i>
<ul style="list-style-type: none"> <li>a. Further develop the state's Bridge Management System (PONTIS). Utilize data from the Bridge Management System to highlight specific areas requiring action in relation to safety, rehabilitation, reconstruction, and replacement. <i>(Updated)</i></li> <li>b. Continue to utilize the bridge rating system as a tool to identify "at risk" structures, and incorporate them into the Bridge Maintenance Program. <i>(Updated)</i></li> <li>c. Utilize the Pavement Management System as a tool to enhance pavement condition on the State Highway System. <i>(Updated)</i></li> <li>d. Assess the impact that increased truck size, weight, and axle configurations will have on the State Highway System. <i>(Updated)</i></li> <li>e. Implement the regulations outlined in MAP-21 as they pertain to performance measures and asset management for bridges and pavements. <i>(New)</i></li> </ul>

Table 11-1. Highway and Bridge Policies and Strategies (continued)

<p>3. Reduce fatalities and serious injuries on Oklahoma highways through appropriate engineering solutions and systemic improvements. <i>(Updated Policy)</i></p>
<p>a. Improve safety of roadway infrastructure by taking the following actions: <i>(Updated)</i></p> <ul style="list-style-type: none"><li>i. Continue to add shoulders on two-lane rural highways where high collision rates have been identified.</li><li>ii. Continue to install cable median barriers on high volume divided highways with high crossover collision history or appropriate geometric characteristics.</li><li>iii. Continue to implement approaches outlined in the Oklahoma Strategic Highway Safety Plan to address four emphasis areas: unsafe driver behavior, intersection crashes, crashes involving young drivers, and lane departure crashes.</li></ul>
<p>4. Improve operational performance of highways through increased use of traveler information systems. <i>(Existing Policy)</i></p>
<p>a. Utilize operational strategies to reduce the impact of congestion-causing incidents on transportation systems. These include effective traffic incident management, traveler information systems, and technologies to manage safety in work zones, among others: <i>(Updated)</i></p> <ul style="list-style-type: none"><li>i. Consider utilization of internet-based systems and emerging technologies for managing traveler information and user notifications.</li><li>ii. Improve Intelligent Transportation System (ITS) communications and the use of variable highway message signs to inform motorists of congestion, bottlenecks, and work zones.</li></ul> <p>b. Investigate the use of emerging technologies such as autonomous vehicles and explore their impact on operational and safety performance on highways. <i>(New)</i></p>
<p>5. Provide for a safe, efficient, and effective National Highway System (NHS) to improve commercial motor vehicle mobility and connectivity. <i>(Updated Policy)</i></p>
<p>a. Continue the use of Oklahoma Permitting and Routing Optimization System (OKie PROS) to provide assistance to oversize, overweight commercial motor vehicle users for making safe and efficient route choices. <i>(Updated)</i></p> <p>b. Continue development of Ports of Entry—technology-based commercial motor vehicle weigh and credential screening stations located at major highway entry points to the state. <i>(Existing)</i></p> <p>c. Implement an Intelligent Transportation System (ITS) program to monitor and manage congestion in cooperation with commercial vehicle industry and other stakeholders. <i>(New)</i></p> <p>d. Make targeted investments on the National Highway System to accommodate traffic growth on truck routes and strengthen system safety and efficiency for truck operations. <i>(Updated)</i></p> <p>e. Pursue opportunities to partner with the private sector to enhance truck stops/rest areas by providing overnight parking availability information, identifying locations, etc. <i>(New)</i></p> <p>f. Analyze freight truck travel time data to assist in decision-making about freight related system improvements on the National Highway System. <i>(New)</i></p>

## 11.2. FREIGHT RAIL

Freight rail has proven to be vital in maintaining and improving both the state and national economies. Nearly three-quarters of all of the rail traffic in Oklahoma is through traffic, without an Oklahoma destination. The majority of this freight rail movement is for the transportation of coal from Wyoming to Texas. Freight rail brings finished goods and raw materials to and from Oklahoma businesses, and moves material through and across the state. This system has proven valuable to the agricultural and energy industries, as well as to Oklahoma military bases.

Freight rail safety will continue to be a priority with the Oklahoma Department of Transportation (ODOT). Improvements to at-grade railroad crossings in Oklahoma will continue to be included in the annual work program. The following policies and strategies/action items (**Table 11-2**) focus on strengthening the state’s rail system, recognizing the key national, regional, and state role it plays in economic competitiveness and safety.

**Table 11-2. Freight Rail Policies and Strategies**

<p>1. Improve rail operations and operational effectiveness by encouraging public-private partnerships. <i>(Updated Policy)</i></p> <p>a. Support identification and elimination of bottlenecks both on main lines and classification yards (the multi-track facilities where freight cars are transferred from one engine to another based on their destination) by the use of Class I railroads. <i>(Updated)</i></p> <p>b. Support double tracking and signal/operations improvements to mitigate freight rail congestion and to meet projected increase in rail traffic. <i>(Existing)</i></p> <p>c. Maintain coordination between government agencies and Class I railroads. <i>(Updated)</i></p> <p>d. Support upgrades to state-owned Class III track and structures to permit use of 286,000 pound standard rail cars and larger, which in turn will support Class I service and improve service efficiency. <i>(Existing)</i></p> <p>e. Develop options for statewide programs to target preservation and upgrading of Class III lines. <i>(Updated)</i></p>
<p>2. Improve rail conditions, operations, and safety through continued support and refinement of the Oklahoma Statewide Freight and Passenger Rail Plan. <i>(Updated Policy)</i></p> <p>a. 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. <i>(Updated)</i></p> <p>b. Update the existing rail crossing inventory with current rail and highway traffic data and review accident exposure ratings using the Federal Railroad Administration (FRA) safety program. (see Passenger Rail #2c) <i>(Existing)</i></p> <p>c. Provide technical assistance to local communities planning to improve rail-highway crossing facilities, including crossing surfaces and signal devices. (see Passenger Rail #2d) <i>(Existing)</i></p> <p>d. Continue efforts to evaluate the consolidation of at-grade crossings to further improve safety. (see Passenger Rail #2e) <i>(Existing)</i></p>
<p>3. Improve rail-highway-port connections to facilitate intermodal freight movement. <i>(Existing Policy)</i></p> <p>a. Monitor and promote opportunities for development of intermodal and transmodal facilities in Oklahoma. <i>(Updated)</i></p> <p>b. Support the development of intermodal freight corridors that connect major population centers with freight generators and international gateways. <i>(Existing)</i></p> <p>c. Encourage industrial development near rail corridors to enhance intermodal freight movement. <i>(New)</i></p>

### 11.3. PASSENGER RAIL

Passenger rail is a very efficient transport mode, but because of its high capital cost, dense corridors are often required to justify the investment. By connecting the largest of Oklahoma’s cities with rail connections to major population centers in adjacent states, the efficiencies of rail can be put to work. To gain the travel densities needed, local connections and

other collector systems can be developed to serve less dense corridors and form a cohesive regional transportation system. Public sentiment about the existing passenger rail service in Oklahoma is positive and there is interest in expanding the passenger rail service. The following policies and strategies/action items (**Table 11-3**) endorse the continuation of passenger rail system and improving the intermodal connections in the state.

**Table 11-3. Passenger Rail Policies and Strategies**

<p>1. Preserve and maintain existing service to provide people with multimodal options for intercity travel. <i>(Existing Policy)</i></p>
<p>a. Cooperate and coordinate with Amtrak, BNSF, and the State of Kansas in evaluating potential passenger rail service by means of an Oklahoma City to Newton or Wichita, Kansas, Amtrak route. <i>(Updated)</i></p> <p>b. Evaluate current ridership trends and train frequencies to improve the existing Amtrak passenger rail service. <i>(Updated)</i></p>
<p>2. Improve passenger rail as a modal choice by improving travel time, safety and reliability of the service. <i>(Updated Policy)</i></p>
<p>a. Proceed with planning activities to determine feasibility of passenger rail service between Oklahoma City and Tulsa. <i>(Updated)</i></p> <p>b. Identify, develop, and secure funding that promotes and enhances passenger rail system investment. <i>(New)</i></p> <p>c. Update the existing rail crossing inventory with current rail and highway traffic data and review incident exposure ratings using the FRA safety program. (see Freight Rail #2b) <i>(Updated)</i></p> <p>d. Provide technical assistance to local communities planning to improve rail-highway crossing facilities, including crossing surfaces and signal devices. (see Freight Rail #2c) <i>(Existing)</i></p> <p>e. Continue efforts to evaluate the consolidation of at-grade crossings to further improve safety. (see Freight Rail #2d) <i>(Existing)</i></p>
<p>3. Increase intermodal passenger travel choices by improved connections at passenger rail stations with intercity bus services, public transportation, and park- and-ride facilities. <i>(Updated Policy)</i></p>
<p>a. Encourage expanded and improved connections to passenger rail stations from rural, tribal, and urban public transit, intercity buses, and airport terminals. (see Public Transportation #1a) <i>(Existing)</i></p> <p>b. Coordinate schedules to provide better connections between local and regional public transportation systems and to provide seamless and convenient transportation throughout the state and region. <i>(Updated)</i></p>

## 11.4. PUBLIC TRANSPORTATION

The past decade has seen an increased growth in national transit ridership and the same trend also occurred in Oklahoma. During the 2015-2040 LRTP planning process, the public indicated a strong concern for unmet transit needs in the state and the need for better communication, coordination and connections between rural, urban, tribal transit and intercity bus and train

services. The following policies and strategies/action items (**Table 11-4**) focus on increasing public transportation options and bringing the systems’ assets to a state of good repair. These policies also aim to fortify Oklahoma’s existing transit services, while advancing service improvements and efficiencies in locations where current demands are unmet or underserved.

**Table 11-4. Public Transportation Policies and Strategies**

1. Improve public transportation system operations and performance by promoting coordination and connections statewide among rural, urban, tribal, and intercity bus services. <i>(Updated Policy)</i>
<ul style="list-style-type: none"> <li>a. Expand and improve connections between rural transit systems and tribal systems, intercity bus stops/terminals, urban transit system transfer points, airports, and Amtrak Heartland Flyer stops. (See Passenger Rail#3a) <i>(Updated)</i></li> <li>b. Continue collaboration with stakeholders in development of an electronic database and mobility management system regarding the state’s transit service routes and locations. <i>(Updated)</i></li> </ul>
2. Support multiple modes of transportation connecting residential areas and employment locations, health services, and other activity centers. <i>(Existing Policy)</i>
<ul style="list-style-type: none"> <li>a. Encourage improved coordination between land use and transit planning, including pedestrian and bicycle connections to transit routes, practical transit stop locations, transit shelters, park-and-ride lots, access for elderly and disabled, and transit oriented development. <i>(New)</i></li> <li>b. Investigate potential for agreements between rural transit systems and health and hospital systems, social service providers, and major employers to expand transit service options. <i>(Existing)</i></li> <li>c. Coordinate with health and human service agencies and others to expand paratransit services for special needs populations and individuals with disabilities. <i>(Existing)</i></li> <li>d. Conduct a study to identify demand for off-peak intercity transit service. Include consideration of need for transport between rural transit areas, and between rural and urban parts of the state. <i>(Updated)</i></li> </ul>
3. Protect Oklahoma’s investment in the public transportation system by seeking additional/dedicated funding. <i>(Updated Policy)</i>
<ul style="list-style-type: none"> <li>a. Encourage continued cooperation and collaboration among ODOT, the tribal transit agencies, and the urban transit systems and appear as one voice to the Oklahoma legislative delegation on Federal Transit Administration (FTA) funding requests. <i>(Existing)</i></li> <li>b. Promote development of dedicated transit funding sources beyond the existing Public Transportation Revolving Fund. <i>(Existing)</i></li> <li>c. Support metropolitan area transit, including passenger rail initiatives, and dedicated transit funding. <i>(New)</i></li> </ul>
4. Develop a Statewide Public Transportation Plan that identifies and targets opportunities for strategic improvements to services. <i>(Existing Policy)</i>
<ul style="list-style-type: none"> <li>a. Develop Statewide Public Transportation Plan to analyze statewide transit network with recommendations for improvements to existing services as well as locations for new services. <i>(Existing)</i></li> <li>b. Prepare a statewide program of FTA-eligible capital projects and operational needs every five years. Identify non-Federal match for FTA-eligible projects. <i>(Existing)</i></li> </ul>

### 11.5. MULTIMODAL

Since the early 1990s, the U.S. Department of Transportation has focused on efforts to encourage communication and coordination among various transportation modes. Thus, use of the words intermodal and multimodal have become a larger part of the transportation planning vocabulary.

This multimodal section addresses issues that overlap or affect several modes, as well as themes

that are important to many modes. The following policies and strategies/action items (**Table 11-5**) reinforce the important role that Oklahoma’s transportation system plays with state and national economic competitiveness. The multimodal concepts acknowledge the importance of developing a diverse transportation system that offers the traveling public and businesses competitive, safe, convenient, affordable, and environmentally responsible transportation choices.

**Table 11-5. Multimodal Policies and Strategies**

1. Protect Oklahoma’s investment in transportation by seeking to preserve and enhance current and/or new funding mechanisms for all modal systems. <i>(Updated Policy)</i>
<ul style="list-style-type: none"> <li>a. Develop and maintain information on historical trends and provide this information to state government leaders and the Oklahoma Congressional Delegation to support their search for new funding sources for the transportation system. Continue to assist government leaders in determining appropriate transportation funding and improvement priorities. <i>(Existing)</i></li> <li>b. Explore various alternatives for funding the state’s surface transportation program, such as: securing increased percentage of state motor vehicle revenue, increasing diesel tax, increasing freight fees, considering vehicle miles traveled fee and innovative tolling. <i>(Updated)</i></li> <li>c. Provide information to state government leaders and Oklahoma’s Congressional Delegation to assist them in finding additional sources of funding for rural, urban, and tribal transit, passenger and freight rail service improvements, aviation improvements, and waterways improvements. <i>(Existing)</i></li> <li>d. Continue to work with sovereign Native American Tribes and Nations to leverage resources for transportation improvements. <i>(Existing)</i></li> <li>e. Cooperate and coordinate with local governments to research possible new funding partnerships for transportation projects of mutual interest. <i>(Existing)</i></li> </ul>
2. Improve efficiency, economic vitality, and intermodal connectivity by developing a comprehensive State Freight Plan. <i>(Updated Policy)</i>
<ul style="list-style-type: none"> <li>a. Develop a comprehensive State Freight Plan by expanding and continuing meetings with freight stakeholders from various modes and industries and incorporating highlights of recently conducted freight studies. <i>(New)</i></li> <li>b. Collaborate with freight stakeholders and utilize latest technologies and data to identify freight bottlenecks and prioritize investments to eliminate the bottlenecks. <i>(Updated)</i></li> <li>c. Support investments to improve linkages between the airports, highway, railway, and water systems. <i>(Updated)</i></li> </ul>
3. Enhance modal choice for people and provide favorable conditions for transit ridership growth by identifying and improving intermodal connection points for travel by public transportation, intercity bus, passenger rail, airport, walking, bicycling, and automobile. <i>(Updated Policy)</i>
<ul style="list-style-type: none"> <li>a. Identify gaps and opportunities in urban, tribal, and rural public transportation, intercity bus, passenger rail, airports, automobiles, and bicycle and pedestrian facilities and operations. <i>(Updated)</i></li> </ul>

**Table 11-5. Multimodal Policies and Strategies (continued)**

<p>4. Protect the environment by promoting clean fuel and energy conservation practices within ODOT and to the traveling public. <i>(Existing Policy)</i></p>
<p>a. Assess current ODOT practices in construction, maintenance, and agency operations to identify areas for potential energy conservation. (This could include installing light emitting diode traffic signals, reducing roadside mowing, using warm-mix asphalt, etc.). <i>(Existing)</i></p> <p>b. Focus efforts to assist the traveling public in conserving fuel, such as developing efficient traffic operations, traffic signal optimization, and work zone design to minimize idling time, etc. <i>(Updated)</i></p> <p>c. Improve air quality by reducing traffic congestion and bottlenecks that result in increased emissions. <i>(Existing)</i></p> <p>d. Support the use of clean fuels by ODOT, other state agencies, and the public. <i>(Updated)</i></p>
<p>5. Improve and promote security across all transportation modes through adoption of emergency preparedness protocols for managing natural and man-made threats to human resources, transportation capital assets, and information. <i>(Updated Policy)</i></p>
<p>a. Contribute to the public’s safety by coordinating with the Oklahoma Department of Emergency Management, U.S. Departments of Homeland Security and Defense, and the U.S. Department of Transportation to plan for the restoration, and ensure the availability, of transportation services after a disaster and during times of national emergencies. <i>(Updated)</i></p> <p>b. Improve the security and resilience of the transportation system, including highways, transit, rail, ports and marine, air cargo, and passenger aviation, through identification of “safety-critical” assets. <i>(Existing)</i></p> <p>c. Develop alternate routes and transportation system redundancy to maintain mobility during emergencies or natural disasters. <i>(Existing)</i></p> <p>d. Maintain and improve urban area programs to remove debris and litter from drains, culverts, and roadsides to minimize roadway flooding. <i>(New)</i></p>
<p>6. Develop a comprehensive performance management framework for ODOT to align with State and Federal partners. <i>(New Policy)</i></p>
<p>a. Strengthen working relationships with Oklahoma’s Metropolitan Planning Organizations (MPOs) in relation to performance measures. <i>(New)</i></p> <p>b. Monitor national rules for pavement condition and bridge performance, and begin to develop appropriate capability to report data for the national pavement condition and bridge performance measures. (see Highway and Bridge #2b and 2c). <i>(New)</i></p> <p>c. Monitor federal rulemaking for freight planning, system performance, and congestion reduction; and begin to develop appropriate capability to report freight, system performance, and congestion measures. <i>(New)</i></p> <p>d. Create an electronic performance measures dashboard as part of ODOT’s website and update regularly. <i>(New)</i></p>

## 11.6. BICYCLE AND PEDESTRIAN

Bicycle and pedestrian facilities throughout Oklahoma consist of multi-use trails, bicycle routes, and sidewalks. The planning and implementation of bicycle and pedestrian improvements are typically completed at the local government level, and/or through a MPO. ODOT continues to work in cooperation with local

governments to enhance bicycle and pedestrian facilities. Funding for these bicycle and pedestrian improvements is almost always from a combination of federal, local, and private and/or non-profit sources. The following policies and strategies/action items (**Table 11-6**) seek to enhance the bicycle and pedestrian facilities and improve modal choices in the State of Oklahoma.

**Table 11-6. Bicycle and Pedestrian Policies and Strategies**

1. Establish a vision to support bicycle and pedestrian modal choices and promote healthy affordable modes of transportation. <i>(Updated Policy)</i>
<ul style="list-style-type: none"> <li>a. Continue to pursue opportunities to bring state highways in small communities into compliance with the Americans with Disabilities Act. <i>(Existing)</i></li> <li>b. Incorporate bicycle facility design standards into the next version of the ODOT Roadway Design Manual. <i>(Existing)</i></li> <li>c. Develop a statewide bicycle plan that emphasizes safety and builds and expands upon the work of the Metropolitan Planning Organizations. <i>(Updated)</i></li> </ul>
2. Improve modal choices and safety by incorporating pedestrian and bicyclist facilities in accordance with approved design standards. <i>(Updated Policy)</i>
<ul style="list-style-type: none"> <li>a. Continue to provide pedestrian signals, warning beacons, signage, striping, and lighting at intersections of state routes with high-volume pedestrian crossings. <i>(Updated)</i></li> <li>b. Support inclusion of bicycle and pedestrian facilities into new and renovated intermodal facilities and connection points, such as train depots, bus terminals, etc. <i>(Existing)</i></li> <li>c. Support efforts by local governments, public transit providers, passenger rail systems, and others to expand and improve bicycle ways and walkway connections. <i>(Updated)</i></li> <li>d. Assess and respond to needs for pedestrian and bicycle infrastructure on or adjacent to state highways concurrent with related highway improvements, and as a part of the project development process. <i>(Updated)</i></li> <li>e. Inform bicycle/pedestrian community about coordinating with the state’s bicycle and pedestrian coordinator and about the public involvement process. <i>(New)</i></li> </ul>
3. Promote and support public information outreach and education regarding safe and accessible transportation routes for bicyclists and pedestrians. <i>(New Policy)</i>
<ul style="list-style-type: none"> <li>a. Continue to educate communities about sidewalk and trail requirements associated with the Americans with Disabilities Act. <i>(New)</i></li> <li>b. Promote statewide and local-area education programs to make transportation users aware of pedestrian and bicyclist rights and responsibilities. <i>(Existing)</i></li> <li>c. Support efforts by health departments, educational facilities, and public safety agencies to provide bicycle and pedestrian safety lessons/workshops. <i>(New)</i></li> <li>d. Encourage local communities that are planning or constructing new facilities for pedestrians and bicyclists to seek technical support from the state’s bicycle and pedestrian coordinator. <i>(Existing)</i></li> </ul>

### 11.7. WATERWAYS AND PORTS

The McClellan-Kerr Arkansas River Navigation System (MKARNS) is the nation’s most inland waterway and Oklahoma’s primary navigable waterway originating from the Tulsa Port of Catoosa and flowing southeast through Arkansas to the Mississippi River. The strength of Oklahoma’s waterways sets the state apart from other areas by providing greater options for the shipping and distribution of goods. However, waterways often do not receive the necessary

funding to maximize their use. The available funding has not kept pace with the demand over the years, and wear and tear continues on the locks that are now over 40 years old. Faced with decreased federal funding, there have been discussions regarding contributions from the stakeholders, not only with funds, but other shared resources including equipment, labor, and materials. The following policies and strategies/action items (**Table 11-7**) seek to strengthen MKARNS economic competitiveness and security.

**Table 11-7. Waterways and Ports Policies and Strategies**

1.	Protect the investment in the McClellan-Kerr Arkansas River Navigation System (MKARNS) by seeking increased federal funding. <i>(Updated Policy)</i>
a.	Continue to work with federal and state officials to obtain funding for the maintenance of existing locks and dams. <i>(New)</i>
b.	Continue to work with federal and state officials from Oklahoma and Arkansas to protect the confluence of the White and Arkansas Rivers. <i>(Updated)</i>
c.	Continue to work with federal and state officials to authorize the deepening of the MKARNS channel. <i>(Updated)</i>
2.	Enhance intermodal connectivity by targeting improvements to truck corridors and railroads that provide access to MKARNS ports. <i>(Existing Policy)</i>
a.	Work collaboratively with the Ports and other stakeholders to address issues related to transporting “super” loads from the Ports. This could include improvement to bridge structures and pavement on routes to accommodate the “super” loads. <i>(Updated)</i>
3.	Facilitate modal choices for goods movement and provide a sustainable budget for marketing and development of Oklahoma ports and waterways. <i>(Existing Policy)</i>
a.	Seek partnerships with private sector user groups, economic development associations, and other stakeholders to support promotion of the MKARNS channel. <i>(Updated)</i>

## 11.8. AIRPORT ACCESS

Air transportation plays an important role in economic competitiveness and the access to airports and surrounding infrastructure is important for quality of life, tourism, and commerce. ODOT is not responsible for funding specific airport improvements, such as runway extensions, hangars, etc.; however, the

2015 - 2040 LRTP acknowledges airport access needs. The following policies and strategies/action items (**Table 11-8**) support development of airport access to provide passenger and freight aviation linkages. They address the intermodal and transshipment opportunities within the state and illustrate the need for and importance of reliable airport access in Oklahoma.

**Table 11-8. Airport Access and Aviation Policies and Strategies**

1. Improve intermodal freight connectivity through maintenance and improvement of access to air cargo hub facilities. <i>(Updated Policy)</i>
a. Coordinate with MPOs, chambers of commerce, the Oklahoma Trucking Association, defense installations, Oklahoma airport operators, and other stakeholders to support access to new and existing air cargo hubs and related transmodal center(s) in Oklahoma. <i>(Updated)</i>
2. Improve intermodal choices for people through improved connection to airports via car, truck, bus, and passenger rail. <i>(Updated Policy)</i>
a. Coordinate with local stakeholders and public transportation providers to expand and improve connections to airports from rural, tribal, and urban public transit, buses, and passenger rail stations. <i>(Updated)</i>
b. Support efforts to obtain regional air service for strategically located rural communities that would benefit from and sustain such airport facilities. <i>(New)</i>

## 11.9. CONCLUSION

ODOT will use the 2015-2040 LRTP to guide development of, and improvements to, the state's transportation system. This system will provide the traveling public and businesses competitive, safe, convenient, affordable, and environmentally

responsible transportation choices. ODOT will work with the elected officials, public, and private stakeholders to ensure the state's transportation network is a high-performing system ensuring economic competitiveness for the next 25 years.

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## 12. CONCLUSION AND NEXT STEPS

The 2015-2040 LRTP is a policy document that guides ODOT in the development, management, and operation of a safe and efficient transportation system for the next 25 years. Since 2010, many changes have occurred in Oklahoma. The state has added over 100,000 new residents between 2010 and 2014; and Oklahoma's population is expected to reach 3.9 million in 2015.

Employment is projected to reach a total of over 2.2 million jobs in 2015, an increase of 141,000 since 2010. This steady growth in population and the economy has had a significant impact on ODOT's transportation facilities. Oklahoma's State Highway System continues to experience increased traffic.

Even with recent state funding increases, future needs are greater than projected revenue. ODOT has updated the LRTP to provide strategic guidance to preserve and maintain the multimodal transportation system to meet future mobility demands of people and goods.

The 2015-2040 LRTP includes several items that will help move improvements to Oklahoma's transportation system forward. These include:

- **Goals** that are consistent with federal law;
- **Performance measures** to gauge ODOT's effectiveness in fulfilling its mission and to

provide measurable results to help state and federal decision makers;

- **Identification of Oklahoma surface transportation improvement needs** between 2015 and 2040;
- **Estimate of costs and forecast of revenues** associated with Oklahoma's transportation needs over the next 25 years; and
- **Policies and strategies** that have been developed for all modes of transportation to assist with addressing the goals, performance measures and needs.

ODOT will now move into an implementation phase following the adoption of the 2015-2040 LRTP by:

- Updating and implementing ODOT's Eight Year Construction Work Plan;
- Refining performance measures and tracking ODOT's progress in achieving performance targets; and
- Developing activities to implement the policies and strategies identified.

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**GLOSSARY****A****American Association of State Highway and Transportation Officials (AASHTO)**

AASHTO is a nonprofit, nonpartisan association representing highway and transportation departments. Its guides and specifications are used to describe many standards for highway design including loading requirements for highway (vehicular) bridges.

**Annual Average Daily Traffic (AADT)**

The total volume passing a point or segment of a highway facility in both directions for one year, divided by the number of days in the year.

**Asset Management**

Asset management is a systematic process of operating, maintaining, and improving physical assets, with a focus on data driven analysis, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair of the State's transportation assets at minimum practicable cost. (Reference: 23 U.S.C. 101(a)(2), MAP-21 § 1103). For example, ODOT has seen strong performance in bridge asset management in recent years, such as decline in number of structurally deficient bridges.

**Attainment Area**

Any geographic area in which levels of a given criteria air pollutant (e.g., ozone, carbon monoxide, PM10, PM2.5, and nitrogen oxide) meet the health-based National Ambient Air Quality Standards (NAAQS) for that pollutant. An area may be an attainment area for one pollutant and a nonattainment area for others. A "maintenance area" (see definition below) is not considered an attainment area for transportation planning purposes.

**B****Bridge Abutment**

A retaining wall supporting the ends of a bridge or viaduct.

**Bridge Approach**

The part of the bridge that carries traffic from the land to the main parts of the bridge.

**Bridge Beam**

A horizontal bridge structure member supporting vertical loads by resisting bending. A girder is a larger beam, especially when made of multiple plates.

**Bridge Box**

A reinforced concrete box greater than or equal to 20 feet wide measured along the center of the roadway.

**Bridge Condition Ratings**

Through periodic safety inspections, data is collected on the condition of the primary components of a structure.

- The bridge deck, including the wearing surface
- The superstructure, including all primary load-carrying members and connections
- The substructure, considering the abutments and all piers

**Bridge Deck**

The roadway portion of a bridge, including shoulders. Most bridge decks are constructed as reinforced concrete slabs, but timber decks are still seen in rural areas and open-grid steel decks are used in some movable bridge designs.

In the deck-type bridge, a steel or reinforced concrete bridge deck is supported on top of two or more plate girders, and may act compositely with them. Additional beams may span across between the main girders, for example in the form of bridge known as ladder-deck construction. Also, further elements may be attached to provide cross-bracing and prevent the girders from buckling.

### Bridge Fatigue

Cause of bridge structural deficiencies, usually due to repetitive loading over time.

### Bridge Girder

A horizontal structure member supporting vertical loads by resisting bending. A girder is a larger beam, especially when made of multiple metal plates. The plates are usually riveted or welded together.

### Bridge Gusset Plate

A metal plate used to unite multiple structural members of a truss.

### Bridge Joint

A device connecting two or more adjacent parts of a bridge structure.

### Bridge Load

Weight distribution throughout a bridge structure; loads caused by wind, earthquakes and gravity affect how weight is distributed throughout a structure.

### Bridge Member

An individual angle, beam plate or built piece intended to become an integral part of an assembled frame or structure.

### Bridge Pier

A vertical structure that supports the ends of a multi-span superstructure at a location between bridge abutments.

### Bridge Reconstruction

Reconstruction consists of widening existing bridge lanes, raising bridges to increase vertical

clearances, or strengthening bridges to increase load carrying capacity.

### Bridge Rehabilitation

Bridge rehabilitation involves major work required to restore the structural integrity of a bridge as well as work necessary to correct major safety defects. Most rehabilitation projects include repairs to several bridge components, but rehabilitation can be limited to bridge deck replacement.

### Bridge Replacement

Replacement occurs when a functional improvement or reconstruction is infeasible because of the bridge design, or impractical because of its inferior structural condition.

### Bridge Span

The horizontal space between two supports of a bridge structure. Also refers to the structure itself. May be used as a noun or a verb.

### Bridge Substructure

The substructure of a bridge consists of all parts that support the superstructure. The main components are: abutments, piers, footings and pilings.

### Bridge Superstructure

The superstructure consists of the components that actually span the obstacle the bridge is intended to cross. It includes: bridge deck, structural members, parapets, handrails, sidewalk, lighting, and drainage features.

### Bridge Truss

Any of various structural frames based on the geometric rigidity of the triangle and composed of straight members subject only to longitudinal compression, tension, or both: functions as a beam or cantilever to support bridges, roofs, etc.

## C

### Capacity

A transportation facility's ability to accommodate a moving stream of people or vehicles in a given time period.

### **Class I Railroad**

In the United States, the Surface Transportation Boards defines a class of railroad based on revenue thresholds adjusted for inflation. For the most recent year of classification (2013), Class I railroad is defined as a carrier having operating revenues of \$467.0 million or more.

### **Class III Railroad**

In the United States, the Surface Transportation Boards defines a class of railroad based on revenue thresholds adjusted for inflation. For the most recent year of classification (2013), Class III railroad is a carrier with yearly operating revenues under \$37.4 million.

### **Clean Air Act (CAA)**

The original Clean Air Act was passed in 1963, but the national air pollution control program is actually based on the 1970 revision of the law. The Clean Air Act as amended in 1990 made major changes and contains the most far reaching revisions of the 1970 law.

### **Conformity (Air Quality)**

A CAA (42 U.S.C. 7506[c]) requirement that ensures that federal funding and approval are given to transportation plans, programs and projects that are consistent with the air quality goals established by a State Implementation Plan (SIP). Conformity, to the purpose of the SIP, means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the National Ambient Air Quality Standards (NAAQS). The transportation conformity rule (40 CFR part 93) sets forth policy, criteria, and procedures for demonstrating and assuring conformity of transportation activities.

### **Congestion Mitigation and Air Quality Improvement (CMAQ) Program**

A federal-aid funding program that directs funding to projects that contribute to meeting national air quality standards. CMAQ funds generally may not be used for projects that result in the construction of new capacity available to SOVs (single-occupancy vehicles).

### **Councils of Governments (COG)**

Councils of governments or regional councils are multipurpose, multijurisdictional public organizations. Created by local governments to respond to federal and state programs, regional councils bring together participants at multiple levels of government to foster regional cooperation, planning and service delivery. They may also be called regional planning commissions, substate planning districts, economic development districts, or other names, and may or may not include the structure and functions of Metropolitan Planning Organizations (MPOs). (see below for definition of MPO).

## **D**

### **Deck Truss**

A bridge whose roadway is supported from beneath by a truss.

### **Department of Transportation (DOT)**

When used alone, indicates the U.S. Department of Transportation. In conjunction with a place name, indicates state, city, or county transportation agency (e.g., Oklahoma DOT).

## **E**

### **Eight-Year Construction Work Plan**

ODOT administers an eight-year construction work plan program which assists the Department in scheduling and conducting the complex engineering, environmental, and right-of-way processes 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 (STIP). The 2015-2040 LRTP is a broad policy document, whereas the STIP and Construction Work Plan discuss the program of specific projects.

The document is sometimes referred to as the Construction Work Plan or CWP.

**Embankment**

A bank, mound, dike, or the like, raised to hold back water, carry a roadway, etc.

**Environmental Protection Agency (EPA)**

The federal regulatory agency responsible for administering and enforcing federal environmental laws, including the Clean Air Act, the Clean Water Act, the Endangered Species Act, and others.

**F****Federal Fiscal Year**

October 1 through September 30 of the following year.

**Federal Highway Administration (FHWA)**

The mission of FHWA is to administer the Federal-Aid Highway Program to create the best transportation system in the world for the American people through proactive leadership, innovation, and excellence in service. The FHWA is a part of the U.S. Department of Transportation and is headquartered in Washington, D.C., with field offices located across the United States.

**Federal Trade Zone**

A secure area in or adjacent to a U.S. Port of Entry under U.S. Customs and Border Protection (CBP) supervision, but not required to follow the formal CBP entry procedures and payments of duties required on foreign merchandise (until it enters territories under CBP protection for domestic consumption). While in the foreign trade zone, merchandise is not subject to U.S. duty or excise tax and goods can be exported from the zone free of duty and excise tax.

**Federal Transit Administration (FTA)**

A branch of the U.S. Department of Transportation that administers federal funding to transportation authorities, local governments, and states to support a variety of locally planned, constructed, and operated public transportation systems throughout the U.S., including buses, subways, light rail, commuter rail, streetcars,

monorail, passenger ferry boats, inclined railways, and people movers.

**Functionally Obsolete Bridge**

A functionally obsolete bridge is one that was built to standards that are not used today. These bridges are not automatically rated as structurally deficient, nor are they inherently unsafe. Functionally obsolete bridges are those that do not have adequate lane widths, shoulder widths, or vertical clearances to serve current traffic demand, or those that may be occasionally flooded.

A functionally obsolete bridge is similar to an older house. A house built in 1950 might be perfectly acceptable to live in, but it does not meet all of today's building codes. Yet, when it comes time to consider upgrading that house or making improvements, the owner must look at ways to bring the structure up to current standards.

**FTA Capital Program Funds**

Financial assistance from the transit major capital programs of 49 U.S.C. Section 5309. This program enables the Secretary of Transportation to make discretionary capital grants and loans to finance public transportation projects including fixed guideway transit systems; replacement, rehabilitation, and purchase of buses and rented equipment, and construction of bus-related facilities.

**G****Geographic Information System (GIS)**

Computerized data management system designed to capture, store, retrieve, analyze, and display geographically referenced information, e.g., mapping.

**Gross Domestic Product (GDP)**

The output of goods and services produced by labor and property located in the United States and is the broadest measure of economic activity.

**H****Highway Expansion**

Expansion deals with the need to provide additional capacity by adding lanes in order to alleviate congestion and maintain an acceptable level of service. Expansion is the most costly highway improvement type on average.

**Highway Preservation**

Preservation refers to regular resurfacing of a road. When a road has pavement deteriorating to unacceptable levels, resurfacing is the improvement choice to maintain the integrity of the roadway. Resurfacing preserves the highway, and it is the most common type of improvement. Over the next 25-years, there are some highway asphalt segments that will require two treatments because of the traffic they carry.

**Highway Reconstruction**

Reconstruction is the improvement of an existing roadway by upgrading the geometrics and functionality of the segment. Improvements such as widening lanes and shoulders are examples of reconstruction. Reconstruction identifies roadways that are so structurally deficient that they cannot be repaired by resurfacing alone, and must be rebuilt from the base.

**Highway Trust Fund**

A fund credited with receipts that are held in trust by the government and earmarked by law for use in carrying out specific purposes and programs in accordance with an agreement or a statute.

**I****Intelligent Transportation Systems (ITS)**

Electronics, photonics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system. The National ITS architecture is a blueprint for the coordinated development of ITS technologies in the United States, providing a systems framework to guide the planning and deployment of ITS infrastructure.

**Intermodal Freight Facility**

An intermodal freight facility handles containerized traffic that moves on the road, rail, or waterway systems.

**Intermodal Transportation**

Intermodal transportation is the movement of passengers or goods from origin to destination through the use of one or more transportation modes – automobile, bicycle, pedestrian, transit, air, water, or freight – sequentially. Locations where passengers or goods switch from one mode to another are typically called intermodal facilities, terminals, or centers. Some intermodal connections are as simple as a bus stop or a parking lot.

**Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)**

Legislative initiative by the U.S. Congress that restructured and authorized federal funding for transportation programs; provided for an increased role for regional planning commissions/ MPOs in funding decisions; and required comprehensive regional and statewide long term transportation plans.

**Interstate Highway System (IHS)**

The specially designated system of highways, begun in 1956, which connects the principal metropolitan areas, cities, and industrial centers of the United States. Also connects the United States to internationally significant routes in Canada and Mexico.

**J**

None

**K**

None

**L****Let or Letting Date**

The date that construction bids are scheduled to be opened by the transportation agency.

### Load Posted Bridge

Any bridge or structure restricted to carrying loads less than the legal load limit. Load posting a bridge is required by National Bridge Inspection Standards when a bridge is not capable of safely carrying a legal load.

### Long Range Transportation Plan (LRTP)

A document resulting from statewide collaboration on a state's transportation system, and serving as the defining vision for the state's transportation systems and services. The 2015-2040 LRTP is Oklahoma's LRTP, and it is policy document that guides ODOT in the development, management, and operation of a safe and efficient transportation system for the next 25 years.

## M

### Main Span (of bridge)

The longest span in a multi-span bridge and located between the bridge's main piers or towers (supports). Bridges are typically compared using main-span lengths, which do not account for the length of the entire bridge or its approaches.

### MAP-21

The Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21). In 2012, MAP-21 authorized over \$105 billion in federal funding for surface transportation programs for fiscal years (FY) 2013 and 2014. It has been extended by Congress and still serves as the latest comprehensive transportation funding act.

### McClellan-Kerr Arkansas River Navigation System (MKARNS)

Oklahoma's primary navigable waterway originating from the Tulsa Port of Catoosa and flowing southeast through Arkansas to the Mississippi River.

### Metropolitan Planning Organization (MPO)

The policy board of an organization created and designed to carry out the metropolitan transportation planning process for urbanized areas with populations greater than 50,000, and

designated by local officials and the Governor of the state.

### Metropolitan Statistical Area (MSA)

A geographic area consisting of a large population nucleus together with adjacent communities having a high degree of economic and social integration with the nucleus. A metropolitan statistical area must have at least one urbanized area of 50,000 or more inhabitants.

### Mode

A specific form of transportation, such as automobile, water, bus, rail, air, bicycle, or foot.

### Multimodal Transportation

Multimodal refers to the availability of transportation options within a system or part of the system. The modes discussed in the 2015-2040 LRTP are highway and bridge, freight rail, passenger rail, public transportation, bicycle and pedestrian, waterways, and air.

## N

### National Environmental Policy Act of 1969 (NEPA)

Legislation requiring that any project using federal funding or requiring federal approval (including transportation projects) examine the effects of alternative choices on the environment before a decision is made.

### National Highway System (NHS)

The National Highway System (NHS) consists of roadways important to the nation's economy, defense, and mobility. The NHS includes the following subsystems of roadways: Interstates, Other Principal Arterials, the Strategic Highway Network, major Strategic Highway Network Connectors, and Intermodal Connectors.

The NHS includes the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility. The NHS was developed by the Department of Transportation (DOT) in cooperation with the states, local officials, and metropolitan planning organizations.

### Nonattainment Area (NAA)

A geographic region of the United States that has been designated by the EPA as a nonattainment area under Section 107 of the CAA for any pollutants for which an National Ambient Air Quality Standards (NAAQS) exists, meaning that federal air quality standards are not being met.

## O

### Obligation Authority

The maximum amount of federal formula funds that can be authorized in a federal fiscal year. The use of obligation authority does not affect the apportionment or allocation of federal funds a state receives. It only controls the rate of expenditure.

### Ozone

A gas composed of three oxygen atoms (O<sub>3</sub>). In the lower atmosphere, near the earth's surface, ozone is created by chemical reactions between air pollutants from vehicle exhaust, motor gasoline vapors, and other emissions.

## P

### Performance Measures

Performance measures use quantitative data to gauge ODOT's effectiveness in fulfilling one or more major elements of its overall mission. For ODOT this includes focusing on the 2015-2040 LRTP's goal topics.

### Poverty Thresholds

The dollar amounts used by the U.S. Census Bureau to determine poverty status. The thresholds vary according to the size of the family and the ages of the members.

### Public Hearing

Meeting held with purpose of receiving public comments on proposed projects or plans.

### Public Participation/Public Involvement

The active and meaningful involvement of the public in the development of transportation plans and programs.

## Q

None

## R

### Reinforced Concrete Bridge (RCB)

Bridges longer than 20 feet in length.

### Reinforced Concrete

Concrete with steel bars or mesh embedded in it for increased strength in tension.

## S

### SAFETEA-LU

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). SAFETEA-LU authorized the federal surface transportation programs for highways, highway safety, and transit for the 5-year period 2005-2009. It was extended several times until 2012.

### Silt

Sediment particles ranging from 0.00016 to 0.0024 inches in diameter.

### Simple Span Bridge

A bridge span in which the effective length is the same as the length of the spanning structure.

### Stakeholders

Individuals and organizations involved in or affected by the transportation planning process. Includes federal/state/local officials, MPOs, transit operators, freight companies, shippers, users of the transportation infrastructure, and the general public.

### State Highway System

The State Highway System includes Interstate, U.S., and Oklahoma (State) highways within the State of Oklahoma.

### State of Good Repair (SGR)

An asset or system is in a state of good repair when no backlog of capital needs exists – hence all asset life cycle investment needs (e.g.,

preventive maintenance and rehabilitation) have been addressed and no capital asset exceeds its useful life.

### Statewide Transportation Improvement Program (STIP)

A statewide prioritized listing/program of transportation projects covering a period of four years that is consistent with the long-range statewide transportation plan (LRSTP), metropolitan transportation plans (MTPs), and transportation improvement plans (TIPs), and is required for projects to be eligible for funding under Title 23 U.S.C. and Title 49 U.S.C. Chapter 53.

### Strategic Highway Network (STRAHNET)

This is a network of highways which are important to the United States' strategic defense policy and which provide defense access, continuity and emergency capabilities for defense purposes. These highways are part of the NHS.

### Structurally Deficient Bridge and Bridge Sufficiency Rating

A bridge sufficiency rating includes a multitude of factors: inspection results of the structural condition of the bridge, traffic volumes, number of lanes, road widths, clearances, and importance for national security and public use, to name just a few.

The bridge's sufficiency rating provides an overall measure of the bridge's condition and is used to determine eligibility for federal funds. Bridges are considered structurally deficient if significant load carrying elements are found to be in poor condition due to deterioration, or the adequacy of the waterway opening provided by the bridge is determined to be extremely insufficient to point of causing intolerable traffic interruptions.

The fact that a bridge is classified under the federal definition as "structurally deficient" does not imply that it is unsafe. A structurally deficient bridge, when left open to traffic, typically requires significant maintenance and repair to remain in

service and eventual rehabilitation or replacement to address deficiencies.

### "Super" loads

"Super" loads are the extremely oversize or overweight commercial vehicle loads that require independent analysis for review and route approval prior to transporting on the highway system.

### Systemic Approach

A comprehensive approach that evaluates the statewide system using a variety of metrics to determine policies, strategies, and recommendations to address overall statewide needs. For example, the systemic approach to safety is widely implemented improvements based on high-risk roadway features correlated with specific crash types.

## T

### TEA-21

The Transportation Equity Act for the 21st Century (TEA-21). In 1998, TEA-21 authorized approximately \$217 billion in federal funding for transportation investment for FYs 1998-2003. This funding was used for highway, transit, and other surface transportation programs.

### Transportation Appurtenances

In addition to the highway, bridge and interchange needs, transportation appurtenances (accessory items or items associated with the transportation system) require improvement. These include safety, maintenance, Ports of Entry, weigh stations, rest areas, Intelligent Transportation System (ITS), and state freight rail including at-grade highway railroad crossings.

## U

### Underpass

The lowest feature of a grade separated crossing.

### Urbanized Area (UA)

A geographic area with a population of 50,000 or more, as designated by the U.S. Bureau of the Census.

**V****Vertical Curve**

A sag or crest in the profile of a roadway.

**Visualization Techniques**

Methods used by states and MPOs in the development of transportation plans and programs with the public, elected and appointed officials, and other stakeholders in a clear and easily accessible format such as maps, pictures, and/or other displays to promote improved understanding of existing or proposed transportation plans and programs.

**W****Waterway**

The available width for the passage of water beneath a bridge. Waterways are considered a mode for freight transportation in Oklahoma.

**Weigh in Motion (WIM)**

Equipment that measures the weight of moving trucks. Is used by state highway agencies for monitoring pavement loadings.

**X**

None

**Y**

None

**Z**

None



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