



# **OKLAHOMA** **Transportation**

## **2020 – 2045** **Oklahoma Long Range Transportation Plan**

**Chapter 8: Modal Needs**

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Prepared by



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## 1. INTRODUCTION

This chapter identifies how the multimodal transportation needs were developed for Oklahoma between 2020 and 2045. The estimated costs of the needs are presented in Chapter 9. The needs support achievement of the 2045 LRTP goals and objectives. Needs calculation is informed by existing trends, state performance targets, federal regulations, historical spending, and other known project needs. Responsibility for making the infrastructure improvements represented by these needs is shared among ODOT and other public-sector and private-sector partners. While infrastructure on the state highway system is primarily ODOT's responsibility, responsibility for roads that are not part of the state highway system and for other modes is shared with partners. ODOT collaborates with these partners to realize goals for the assets they own, which include safety on local roads, as well as rail, ports and waterways, public transportation, and provisions for active transportation.

The 25-year multimodal transportation system needs analyzed include the following modes and assets.

- State Highway System
  - Highway Pavement
  - Highway Expansion
  - Bridge Preservation and Expansion
  - Interchanges
  - Maintenance
  - Rest Areas
  - Weigh Stations
  - Intelligent Transportation Systems
  - Ports of Entry
  - Safety
- Assets Owned and Managed by Partners
  - Freight Rail
  - Passenger Rail
  - Active Transportation
  - Public Transportation
  - Ports and Waterways



## 2. STATE HIGHWAY SYSTEM NEEDS

### 2.1. HIGHWAY PAVEMENT NEEDS

Highway pavement needs encompass the costs to preserve the 12,254 centerline miles of the state highway system. Preserving the road surfaces of the highway system protects the public’s investment in highways and primarily supports the goal of “infrastructure preservation.” Highway pavement activities include regular road resurfacing and rebuilding roadways from their base for more severely deteriorated highways. Specifically, there are five activity types: preservation, minor rehabilitation, major rehabilitation, reconstruction, and shoulder treatments.

Highway pavement needs are derived from ODOT’s pavement management system (PMS). The PMS is used to project pavement condition according to the pavement quality index (PQI) at different annual budgets for every year between 2020 and 2045. These PQI scores are converted to federal performance measures to describe the share of state highway system lane-miles in “good,” “fair,” and “poor” condition. To identify 25-year pavement needs, different budgets were used in PMS and the condition results were compared to pavement performance targets. The lowest budget used in the analysis became the 25-year pavement needs. The performance targets are to keep the state highway system “at or near current condition levels,” which is consistent with the analysis conducted for Oklahoma’s Transportation Asset Management Plan (TAMP).<sup>1</sup> This goal is modified only insofar as required to achieve—

- State agency accountability set by the Governor, aims to increase the share of pavement in “good” condition by 10 percentage points over a four-year period and maintain this condition level afterwards.
- Existing performance targets for 2022<sup>2</sup> to keep the share of interstate highway lane-miles in “poor” condition below 3 percent and non-interstate NHS lane-miles below 7 percent.

Highway pavement needs are based on the lowest level of spending that achieve these performance standards.

The vast majority of the state highway system requires treatments at least once during the 25-year period. In fact, 95.8 percent of the state highway system as measured by centerline miles receives at least one treatment between 2020 and 2045 with spending

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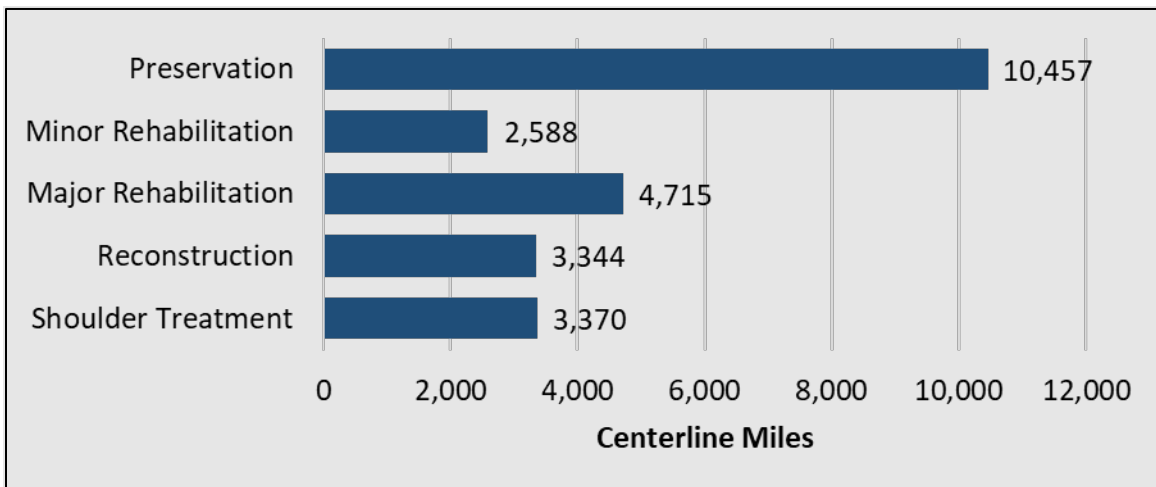
<sup>1</sup> ODOT (2019). Transportation Asset Management Plan: 2019-2028. Retrieved from [https://www.ok.gov/odot/Programs\\_and\\_Projects/Transportation\\_Programs/TAMP/](https://www.ok.gov/odot/Programs_and_Projects/Transportation_Programs/TAMP/).

<sup>2</sup> ODOT (2019). Target Book. Provided by email by ODOT’s Strategic Asset and Performance Management Division on November 19, 2019.



corresponding with the state highway system’s needs. The largest activity is “preservation”; 85.2 percent of the state highway system receives at least one preservation treatment, and many receive multiple over the 25-year period. “Major rehabilitation” is the second most common treatment, with 38.5 percent of the state highway system receiving major rehabilitation work. The remaining treatments of “minor rehabilitation,” “reconstruction,” and “shoulder treatments” affect between 20 and 29 percent of the state highway system each. These numbers sum to more than 100 percent because many road segments require more than one treatment type during the 25-year period. **Figure 2-1** shows the number of centerline miles that will need some type of pavement treatment by 2045.

**Figure 2-1. Pavement Treatments (Centerline Miles of State Highway System)**



Source: Output from ODOT’s Pavement Management System associated with needs.

## 2.2. HIGHWAY EXPANSION NEEDS

Highway expansion accounts for the need to add capacity in the form of new lanes to the state highway system to maintain an acceptable level of service (LOS) as traffic volumes grow. Acceptable LOS’s conform with ODOT’s draft 2019 *Roadway Design Manual*, with a LOS of C or above as the standard for rural freeways, and a LOS of D or above for all other roads. Highway expansion needs account for the state highway system, but do not include interchanges or bridges. Highway expansion needs for both of these aspects of the state highway system are accounted for in their dedicated sections. Many factors are likely to affect the level of travel demand that the state highway system experiences. The presence of connected and autonomous vehicles, which may improve traveling convenience, could initially be slow due to the high cost of purchasing a connected and autonomous vehicle. Connected and autonomous vehicles’



effects on cost and mobility may be especially large in urban areas.<sup>3</sup> Additionally, other factors such as transit and ITS increase highways' effective capacity by either allowing them to move more people aboard buses than they would be able to move with automobiles alone or informing travelers of incidents to allow them to adjust their travel routes. All of these factors are considered in the highway expansion needs assessment.

Highway expansion needs are estimated by comparing forecasted LOS in 2045 based on peak-period forecasted Average Annual Daily Traffic (AADT) with existing capacity and adding one or more lanes in each direction to achieve the LOS standard where required. Peak-period 2045 ADT is forecasted by applying geometric growth rates to historic traffic counts, and roadway capacity considers the capacity enhancing effects related to ITS digital message signs and overlap with public transportation bus routes. Unit costs are applied for lanes that are added.

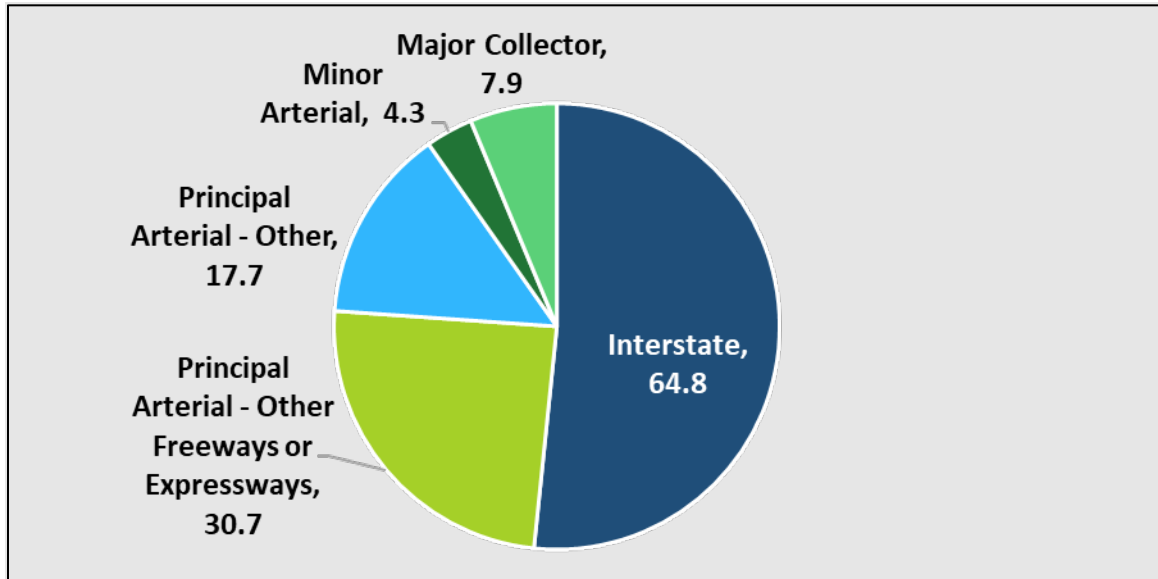
Highway expansion needs involve the construction of 125 lane-miles of road, of which the vast majority is in urban areas. Just over half of these lane-miles will be added to interstate highways (64.8 lane-miles), while 42.2 percent are associated with principal arterials (either "other freeways or expressways," or "other"). The remaining 9.7 percent of new lane-miles are to be added to minor arterials (4.3 lane-miles) or major collectors (7.9 lane-miles). **Figure 2-2** shows the number of lane-miles expected to be added to roads of each functional system to achieve the LOS standards associated with the needs.

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<sup>3</sup> Litman, T. October 27, 2019. *Autonomous Vehicle Implementation Predictions: Implications for Transport Planning*. Victoria Transport Policy Institute. <https://vtpi.org/avip.pdf>.



**Figure 2-2. New Lane-Miles Associated with Highway Expansion**



### 2.3. BRIDGE PRESERVATION AND EXPANSION NEEDS

The bridge preservation and expansion needs include the 6,794 bridges on the state highway system. Preserving these bridges and expanding them to accommodate expected growth in travel activity is the basis for identifying 25-year bridge needs. The bridge needs do not include the 16,372 bridges that are on local roads, or that are owned by counties, cities, and private companies.<sup>4</sup>

Needs are the investment required to reach the goals of achieving and maintaining a share of 1 percent or fewer bridges in “poor” condition (which is equivalent to the term “structurally deficient”) while also keeping bridges that are defined as being in “good” condition as defined by federal performance measures at least as high as in 2020. These goals continue the progress that ODOT has made in decreasing the number of “poor” bridges on the state highway system from 1,168 in 2004 to 86 in 2019. In addition to these preservation functions, the needs also account for costs to widen bridges to account for project ADT and for the costs to raise bridges that are candidates for replacement to rectify vertical clearance limitations.

The needs are developed by applying a custom asset management tool to ODOT-owned bridges. Deterioration models are developed for bridges as distinguished by structure type, materials, climate zones, NHS status, and year of construction based on 25 years

<sup>4</sup> ODOT (2019). Deficient Bridges: Replacement and Rehabilitation Progress. Retrieved from <https://www.ok.gov/odot/Bridges.html>.



of historical condition data. Using costs and standards that are tailored to Oklahoma, the tool identifies the optimal sets of activities over the 25-year forecast period. It simultaneously accounts for necessary widenings and bridge raisings. Conditions are predicted for multiple budget levels for a nine-year initial forecast period, and these conditions are projected for the remaining 16 years. The lowest level of spending that reaches the condition targets while also accounting for bridge widenings and raisings is the needs associated with bridges on the state highway system.

The asset management tool considers two activity types: rehabilitation and replacement. Replacement entails the construction of a new bridge structure in the place of an existing one. Replaced structures tend to swell in size for multiple reasons, including shoulder improvements to highways whose shoulders are absent or below standard.

Oklahoma is on path to achieve the target of having no more than 1 percent of state highway system bridges in “poor” condition. Annual spending needs associated with bridge preservation are highest in the first few years of the needs assessment to help achieve this target. Afterwards, annual spending needs decrease substantially since less spending is required to maintain the improvements that ODOT has made in bridge condition.

## **2.4. INTERCHANGE NEEDS**

An interchange is a system of interconnecting roadways with one or more grade separations providing for traffic movement between two or more roadways of highways on different levels. As part of the analysis, needs for complex and simple interchanges were identified. A complex interchange connects two or more high-volume roads, such as freeways, while a simple interchange is connected to no more than one high-volume road. Interchange needs are the cost of necessary improvements at interchanges. Interchange improvements may be conducted for purposes of safety, capacity expansion, or travel time reliability, among others.

Needs are the costs to complete interchange projects that are expected during the 25-year period based on current plans, programs, and other information. Unit costs are applied to each simple and complex interchange to estimate costs, and a multiplier is applied to account for utility costs and expenditures to acquire necessary right-of-way. The state highway system is expected to require 10 complex and 50 simple interchange projects between 2020 and 2045. Complex interchange projects are generally over 13 times more expensive than simple interchange projects, meaning that monetized interchange needs are higher for the 10 complex interchanges than for the 50 simple interchanges.

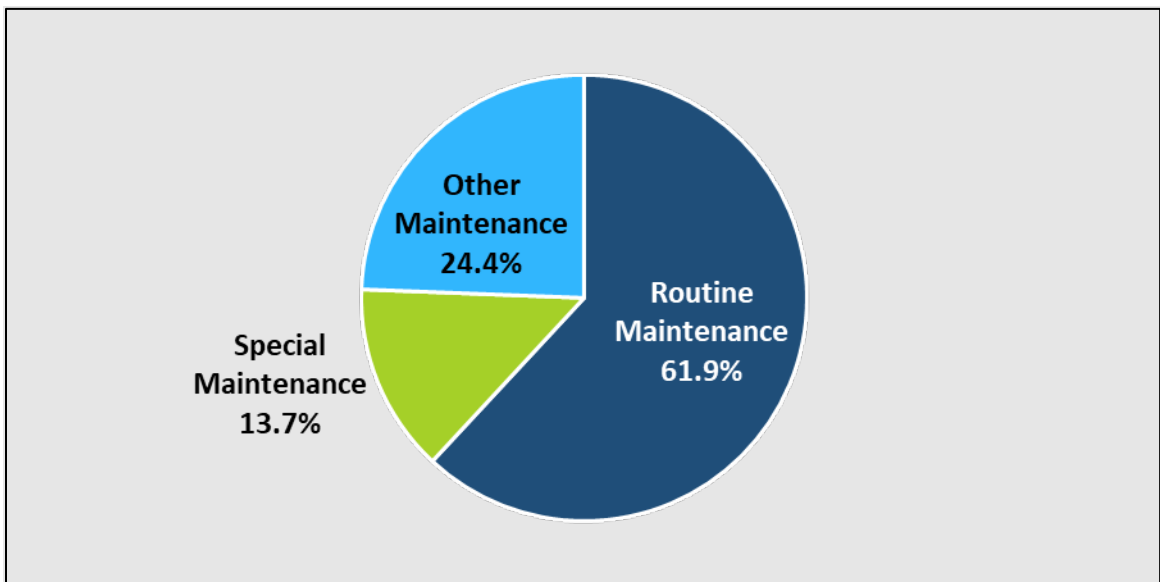


## 2.5. MAINTENANCE NEEDS

Maintenance activities includes routine maintenance (e.g., mowing, snow removal, pothole repair, litter control), special maintenance (e.g., construction overlays), and other maintenance activities (i.e., operating shops and equipment, and warehouses). These activities support several of the 2045 LRTP goals, including safety and security, infrastructure preservation, and efficient intermodal system management and operations.

Maintenance needs are estimated by extrapolating historical spending for maintenance categories. These maintenance needs based on historical spending are the “met” maintenance need that can be funded under a business-as-usual funding scenario. Adjustments are made to account for deficits in historical spending. Adjustments to account for deficits in historical spending result in an “unmet” maintenance need corresponding with necessary activities for which funding has historically been inadequate. The met need makes up over two thirds of the total and is primarily composed of routine maintenance activities, as shown in **Figure 2-3**. If maintenance spending were increased to fund the unmet need, approximately 70 percent of the new spending would be associated with routine maintenance, 20 percent would be associated with special maintenance, and the remaining 10 percent with other maintenance activities.

**Figure 2-3: Spending Shares Associated with Met Maintenance Need**



## 2.6. REST AREAS

ODOT maintains 8 open Rest Areas and 4 closed Rest Areas, as shown in **Table 2-1**. ODOT is currently evaluating the condition and necessity of the existing open Rest Areas. Rest Area needs account for spending required to maintain Oklahoma’s 8 open Rest Areas and potential removal of the 4 closed Rest Areas. ODOT expects that the Rest Areas that are still open will potentially be closed and removed. In the meantime, the open Rest Areas will incur costs for operations, pavement improvements, and maintenance. Needs do not account for welcome centers, which are maintained under contract with the Oklahoma Department of Tourism. Rest Area needs are estimated by applying unit costs for demolition of all 12 Rest Areas and unit costs for pavement improvements, operations, and maintenance to the Rest Areas that remain open. Demolition costs are based on studies conducted by states in the same region, and the costs related with pavement improvements, operations, and maintenance are based on ODOT’s historical spending.

**Table 2-1. Status of ODOT Rest Areas**

Highway	Direction	Mile Marker	Status
I-35	Southbound	59	Open
I-35	Southbound	3	Closed
I-35	Northbound	59	Open
I-40	Eastbound	111	Open
I-40	Eastbound	197	Closed
I-40	Eastbound	251	Open
I-40	Eastbound	283	Open
I-40	Eastbound	316	Open
I-40	Westbound	283	Open
I-41	Westbound	251	Open
I-42	Westbound	197	Closed
I-43	Westbound	10	Closed

## 2.7. WEIGH STATIONS

ODOT currently operates 11 weigh stations, which allow for the inspection and identification of overweight vehicles to reduce pavement degradation associated with their travel. Weigh station needs account for annual maintenance costs for these 11 weigh stations, and for the costs to renovate six weigh stations between 2023 and 2024



based on average costs of previously renovated weigh stations. Two weigh stations will be closed between 2023 and 2027 and replaced with Ports of Entry (POE). Costs associated with the closure and repurposing of these two weigh stations are included in the POE needs.

## **2.8. INTELLIGENT TRANSPORTATION SYSTEMS**

ITS needs include fiber optic cable for operating variable message signs, road weather information dissemination, collection and storage of ITS data, and software required to operated traffic management centers (TMCs). Innovative approaches to vehicle communication and traffic management also influence the 25-year ITS needs in Oklahoma. There are two primary categories of needs which together make up statewide ITS needs. The first category the Oklahoma Statewide ITS Implementation Plan,<sup>5</sup> which ODOT ITS engineers reviewed to ensure consistency with current needs and cost assumptions. The second category is ITS equipment and system management needs, which accounts for current trends influencing ITS and technology implementation. Estimated costs for this category were developed using reference project costs from other ITS deployments and project estimates from ODOT ITS engineers.

## **2.9. PORTS OF ENTRY**

POEs are locations at the state border where commercial vehicles undergo electronic processing for items that include driver credentials, weight, tax and fee status, and safety inspections. ODOT is responsible for seven POEs. Needs for these POE account for annual maintenance, renovation costs for the three POEs that have not already been updated, and portable equipment. Renovation needs for each POE are based on the costs from previously renovated POE. Annual maintenance needs are based on the costs incurred after renovation for the four POE that have been renovated. Portable equipment is expected to be purchased between 2023 and 2045 and include Optical Character Reading (OCR) technologies, a trailer to house the plate and U.S. Department of Transportation readers, and OCR-based e-screening system, and Tire Anomaly and Classification System.

## **2.10. SAFETY**

Safety needs include costs associated with necessary programs, initiatives, and countermeasures to improve safety on the state highway system. Responsibility for improving statewide traffic safety is shared with local governments. ODOT's Local

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<sup>5</sup> ODOT (2004). Oklahoma Statewide Intelligent Transportation Systems (ITS) Implementation Plan. <https://www.odot.org/hqdiv/p-r-div/itscvo/pdfs/statewideeval.pdf>.



Government Division specializes in collaborative efforts with cities, towns, and counties to address the local system's unique characteristics. Safety needs for the state highway system include the following five categories of safety improvements. ODOT safety engineers developed long term safety need estimates in each of the categories. The safety needs were identified by estimating the types, quantity, and costs of countermeasures in each category needed over the next 25-years.

- **Intersection safety:** Intersection safety improvements include redesigning the intersection geometry to implement innovative intersection designs and improve intersection signage and traffic signals.
- **Roadway departures:** Roadway departure improvements are enhancements made to the highway to keep vehicles from leaving the travel lane or address the potential hazards adjacent to the roadway when vehicles leave the travel lane.
- **Active transportation safety:** These enhancements protect bicyclists and pedestrians by improving roadway crossings and making crossing more visible to vehicles.
- **Data and analysis:** Data and analysis needs account for the measurement and analytical foundation necessary to monitor performance measures required by federal regulations and estimate effects of countermeasures under consideration.
- **Human behavior:** The primary method to improve driver behavior is to continuously update driver education to ensure new information and safety practices are included in driver education.

Needs account for a total of 1,290 unique intersection-related countermeasures split between innovative and conventional intersections, which include installation of innovative intersections including roundabouts, advanced signage, traffic signals, and wrong-way driving technologies among others. Over 31,000 miles of roadway departure countermeasures that keep vehicles on the road through such measures as rumble strips, paved shoulders, and nighttime visibility improvements, or provide for safe recovery with guardrails, median barriers, and clear zone reclamation are included in the safety needs. The safety needs also include 175 units of active transportation countermeasures, which include pedestrian hybrid beacons, pedestrian crossings, and leading pedestrian change intervals. Safety needs associated with data and analysis include both existing activities such as road safety audit and network screening, and well as new activities related to database management, integration, and advancement. Safety needs related to human behavior include an initiative to include new information and safety practices in driver education.



## 3. ASSETS OWNED AND MANAGED BY PARTNERS

### 3.1. FREIGHT RAIL

The privately owned rail network in Oklahoma consists of 3,244 route-miles, excluding leases and trackage rights. Currently there are three Class I rail operators in Oklahoma – the Burlington Northern Santa Fe Railway (BNSF), the Union Pacific Railroad (UP) and Kansas City Southern Railway (KCS) - along with 18 shortline (Class III) railroads. While some publicly financed programs<sup>6</sup> are available to railroads to help fund rail network improvement projects and targeted job creation projects, the private sector supplies the majority of financial support for railroads.

The State of Oklahoma owns 136 operational rail miles as a result of the Railroad Revitalization Act, HB 1623, which created a fund to help maintain rail operations in the state as of January 2019. The needs assessment estimates monetary needs for the freight rail system in Oklahoma associated with three needs categories: Class I rail, Class III rail, and safety.

#### 3.1.1. CLASS I RAIL

The three Class I railroads in Oklahoma own over 2,000 railroad miles in the state. Each Class I railroad has undertaken system investment. For instance, in 2019 BNSF announced a 2019 capital expenditure program of approximately \$110 million to replace and upgrade rail, rail ties, and ballast, and it has spent more than \$570 million over the previous five years in maintenance and new construction. Similarly, KCS initiated a \$24.6 million investment<sup>7</sup> in construction and improvement projects in a multi-state commitment in 2017. Between 2012 and 2016, UP has invested more than

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<sup>6</sup> Public-private economic development or Industrial authorities (e.g. Blackwell Oklahoma industrial Authority) sometimes own and/or operate railroads. (Source: Blackwell Northern Gateway Railroad. Retrieved from <https://www.blackwellrr.com/>.) Better Utilizing Investments to Leverage Development (BUILD) Transportation Discretionary grants are for investments in surface transportation infrastructure and are awarded on a competitive basis to projects with a significant impact in their communities. BUILD funding supports roads, bridges, transit, rail, ports or intermodal transportation. (Source: U.S. Department of Transportation. BUILD Discretionary Grants. Retrieved from <https://www.transportation.gov/BUILDgrants>.)

<sup>7</sup> *Transport Topics* (2017). Kansas City Southern Invests Money to Improve Railroad Tracks. Retrieved from <https://www.ttnews.com/articles/kansas-city-southern-invests-money-improve-railroad-tracks>.



\$236 million in capital improvements in Oklahoma<sup>8 9</sup> and has completed installation of required Positive Train Control (PTC) infrastructure.

Needs associated with Class I rail are derived from known projects for the three Class I railroads, with recognition that railroads' planning and development timeframe is much shorter than for the public sector. Projects include such activities as siding additions, bridge replacements, and double-tracking.

### **3.1.2. CLASS III RAIL**

Movement of freight using shortline rail is critical in providing the "first and last mile" of rail services to connect rural areas to the national rail network. There are approximately 1,234 miles of Class III railroad in Oklahoma; a total of 1,041 miles is under private ownership.

Needs associated with Class III rail are derived from known projects for these railroads to preserve and grow shortline railroads. These projects include needs associated with 286,000 lbs. compliant track and bridges, and other projects like storage yard capacity expansion, development of transload facilities, and switch upgrades.

### **3.1.3. SAFETY AT HIGHWAY-RAIL GRADE CROSSINGS**

Safety issues continue to be of utmost importance, with rail crossings specifically holding a high priority. The state's initiative that was announced in 2014 to accelerate safety projects at railroad crossings statewide has resulted in safety features such as flashing light signals and crossing gate arms to be approved for more than 231 crossings. Federal funding, as well as funds provided by railroad companies and local governments, enabled ODOT to advance nearly ten years of improvements in about two years. Despite the success of the program, there is a continued need to improve rail crossings over the next quarter century.

ODOT identified crossings likely to require improvements over the next 25 years. ODOT anticipates improving 600 crossings over the next 25 years to improve safety for the traveling public. Typically, ODOT pays for 90 percent of the cost through use of federal

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<sup>8</sup> Union Pacific (2017). Union Pacific Plans to Invest \$41 Million in its Oklahoma Rail Infrastructure. Retrieved from <https://www.up.com/media/releases/170512-oklahoma-investment.htm>.

<sup>9</sup> Union Pacific (n.d.). 2019 Fast Facts. Retrieved from [https://www.up.com/cs/groups/public/@uprr/@corprel/documents/up\\_pdf\\_natedocs/pdf\\_oklahoma\\_usguide.pdf](https://www.up.com/cs/groups/public/@uprr/@corprel/documents/up_pdf_natedocs/pdf_oklahoma_usguide.pdf).



funds,<sup>10</sup> and the remaining 10 percent is covered by the railroad owner and/or the affected local governments.

### 3.2. PASSENGER RAIL

Oklahoma is presently served by one intercity Amtrak train, known as the Heartland Flyer, which operates between Oklahoma City and Fort Worth, Texas and carried 67,218 passengers in federal fiscal year 2018. The service is jointly funded by the states of Oklahoma and Texas. Additionally, Amtrak inaugurated a Thruway bus service in 2016 for rail passengers in Oklahoma and Kansas that connects Oklahoma City to Newton, Kansas, where travelers can connect to Amtrak's Southwest Chief operating between Chicago and Los Angeles. Oklahoma continues to work with Amtrak and neighboring states on initiatives that could lead to expanded intercity and long-distance passenger service options within the state.

The needs assessment identifies the following five categories of passenger rail needs in Oklahoma and provides monetary costs estimates for each.

- **Continuation of operations of the Heartland Flyer between Oklahoma City and Fort Worth:** Oklahoma subsidizes the existing Heartland Flyer service. The majority of the corridor used by the Heartland Flyer from Oklahoma City to Fort Worth has double tracks installed for the BNSF operations, and PTC has been established for this facility. These features ensure the flow of both freight and passenger trains can be accomplished efficiently and effectively.
- **Addition of a second daily roundtrip between Oklahoma City and Fort Worth:** Amtrak continues to work with state DOTs in both Oklahoma and Texas to explore options for adding dual frequencies to the Heartland Flyer service. Oklahoma will support a share of the total costs.
- **Construction of a Heartland Flyer station near Thackerville:** Amtrak is working with the BNSF Railway, the Chickasaw Nation, and ODOT regarding consideration of a new stop for the Heartland Flyer near the I-35 Thackerville exit, which is close to the Texas border. Thackerville is the site of the WinStar World Casino and Resort, the largest casino in Oklahoma. Early projections from Amtrak indicated that the stop could potentially increase Heartland Flyer ridership by 12 percent based on the anticipated economic boost to the area.
- **Extension of Heartland Flyer service to Newton, Kansas:** Extending the Heartland Flyer to Newton, Kansas would provide connections to the national passenger rail network at both ends of the Heartland Flyer through the Texas Eagle at Fort Worth,

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<sup>10</sup> The Railway-Highway Crossings (Section 130) Program provides funds for the elimination of hazards at railway-highway crossings. <https://safety.fhwa.dot.gov/hsip/xings/>



Texas and the Southwest Chief in Newton, Kansas. The Southwest Chief in turn serves destinations between Los Angeles, California and Chicago, Illinois.

- **Intermodal passenger transportation:** Intermodal transportation allows linkages between two or more modes to reduce automobile dependence and congestion in metropolitan areas. Oklahoma is exploring several options for intermodal connections that include passenger rail in both Oklahoma City and Tulsa. In Oklahoma City, attention has focused on Santa Fe station to link passenger rail, transit, bike sharing, and the Oklahoma City Streetcar in addition to other rail or transit services in the future. As a large metropolitan area, Tulsa represents an unrealized opportunity for passenger rail service expansion. However, the appetite for establishing the service has not reached a point to make this a viable option for Amtrak to pursue at this time despite its long-term goal to connect Tulsa to Kansas City, Missouri. As an alternative consideration, Amtrak may, at some point, consider establishing a Thruway bus service similar to what is currently in operation from Oklahoma City to Newton, Kansas. The level of utilization of this bus service would provide data to assist Amtrak in determining the demand for a more substantial investment of establishing a rail component.

### 3.3. ACTIVE TRANSPORTATION

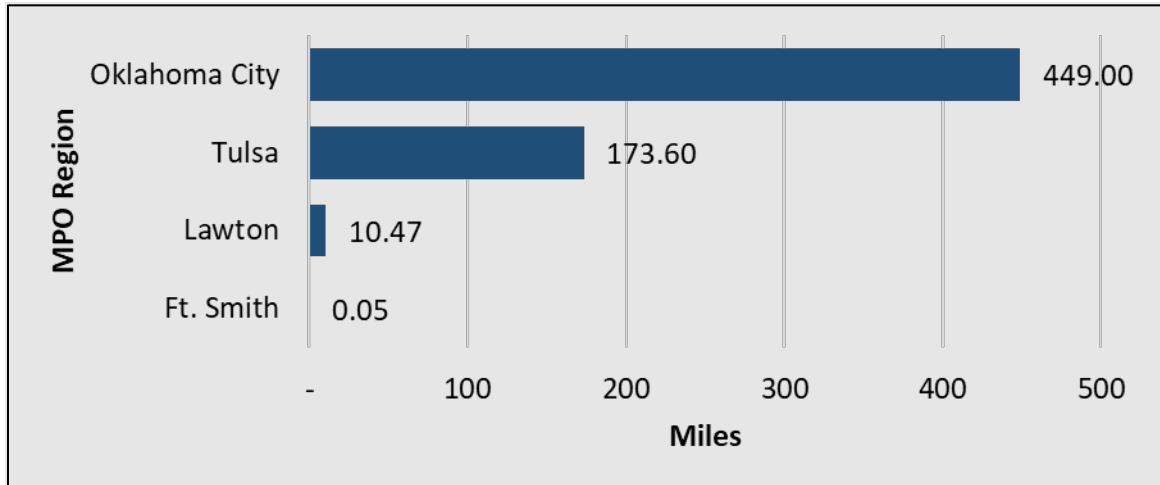
Oklahoma’s bicycle and pedestrian facilities consist of bike routes, lanes, and shared use paths and trails. Funding for bicycle and pedestrian facilities is derived mainly from a combination of local, nonprofit, private, and/or federal sources. The planning, development, and maintenance of the facilities are coordinated by MPOs and local governments. Bicycle and pedestrian facilities have been implemented through statewide initiatives, including the federal TAP fund. ODOT receives applications for TAP funds as the funds are made available.

ODOT’s bicycle and pedestrian needs were estimated by examining regional long range plans bicycle/pedestrian plans, prior TAP funding requests, and conferring with ODOT and MPO staff directly. In MPO regions, each MPO’s planned mileage of bike routes, bike lanes, and shared use paths or trails from 2020-2045 is gathered. **Figure 3-1** shows the existing mileage of bike routes, bike lanes, and shared-use paths or trails in Oklahoma’s four MPO regions. These regions are planning to expand the mileage, often by large amounts. For instance, the Ft. Smith region plans an additional 15.60 miles, and the Lawton MPO plans an additional 64.26 miles. The MPOs consider bicycle and pedestrian needs as a part of their long range planning and identify costs for these non-motorized modes of travel in the regional transportation plans. MPOs are required to develop financially constrained MTPs, thus estimated costs cannot exceed reasonably expected revenue.





**Figure 3-1. Existing Mileage of Bike Routes, Bike Lanes, and Shared-Use Paths or Trails**



To estimate bicycle and pedestrian needs for small towns and counties outside of MPO regions, the average funds requested from TAP between 2016 and 2019 are calculated. The average funds requested are typically two to three times larger than the funds available, and this is assumed to be a reasonable expectation of bicycle and pedestrian needs for small town and county governmental entities.<sup>11</sup> The average amount requested is applied biennially over the 25-year planning horizon beginning with 2021, the next request year, and extending to 2045 and summed to determine total needs.

### 3.4. PUBLIC TRANSPORTATION

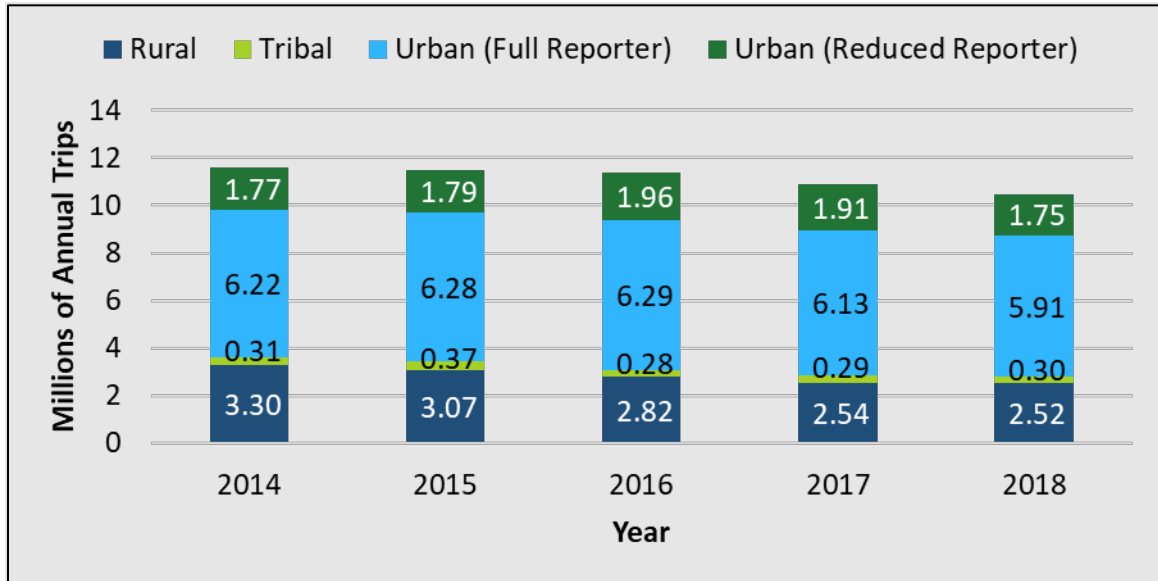
This needs assessment identifies 25-year needs for public transit in the state associated with rural, tribal, and urban operations, as described in the following subsections.

**Figure 3-2** shows annual transit ridership for rural, tribal, and urban transit agencies in Oklahoma. The estimates in the 2045 LRTP largely stem from three sources: agency reports to ODOT, agency reports to the Federal Transit Administration’s (FTA’s) National Transit Database (NTD), and the Metropolitan Transportation Plans (MTPs) for the three associated metropolitan planning organizations (MPOs).

<sup>11</sup> ODOT (2019). Strategic Asset and Performance Management Division. Planning and Performance Branch.



**Figure 3-2. Annual Transit Ridership in Oklahoma**



Source: National Transit Database. The three transit agencies in Norman, Lawton, and Edmond operate 30 or fewer vehicles and do not operate fixed guideway service. As a result, they are considered Reduced Reporters by the FTA.

### 3.4.1. RURAL TRANSIT

Rural public transportation systems serve communities outside of urban areas. Types of rural public transportation include demand–response public transportation (e.g., “dial-a-ride”), traditional and deviated fixed route services (e.g., shuttles, circulators), vanpool, or reimbursement programs. Oklahoma has 20 rural transit operators located in small communities throughout the state that are supported, in part, by designated state and federal funds in addition to fares collected by the providers and local government matching monies. The 2019 data show that four of the rural transit systems provide fixed-route service, while all provide demand-response service, as well as services for the elderly and persons with disabilities.

Rural transit needs are calculated for administrative, operating, and capital costs, including vehicle replacement. Administrative, operating, and capital costs are estimated by averaging historical costs for these functions by rural transit agencies and extrapolating spending to 2045. Vehicle replacement costs are added to capital costs using data from the NTD because the revenue vehicle fleet represents a large portion of capital expenditures. Rural transit agencies currently maintain 1,111 revenue vehicles. These vehicles must be replaced as they reach and exceed the useful life of the asset.



### 3.4.2. TRIBAL TRANSIT

Ten tribal agencies in Oklahoma directly provide transit service as designated recipients of FTA Section 5311c funds. In addition to those ten tribal transit providers, two tribal entities elect to contract for service provision by other transit operators. Thus, tribal transit needs are met through several locally designed arrangements.

Tribal operating costs are estimated using average costs provided by the NTD between 2013 and 2018, and these operating costs are extrapolated to 2045. Capital costs including those for vehicle replacement are added. As of 2018, the tribal entities that provide service maintain 144 fleet vehicles. As with rural agencies, these vehicles must be replaced as they reach and exceed recommended life spans.

### 3.4.3. URBAN TRANSIT

Urban transit systems operate in urbanized areas with a population of more than fifty thousand people. Five urban transit systems serve Oklahoma. Located in Oklahoma City, Tulsa, Norman, Lawton, and Edmond, all five of these entities are recipients of 5307 Urbanized Area Formula Program funding but their sizes and service levels differ. The five urban systems provide demand response service, vanpool, commuter bus, fixed route bus and, from Oklahoma City's EMBARK, streetcar and ferryboat service.

Future urban transit needs are identified and integrated into the MTPs of the related MPO. The five urban transit systems in Oklahoma are represented by three MPOs: ACOG, INCOG, and LMPO. Needs include operating, maintenance, capital, and construction costs associated with maintaining existing service and adding select new services.

## 3.5. PORTS AND WATERWAYS

Marine Highway M40, also known as MKARNS is a 445-mile-long waterway linked to the Mississippi River that provides waterborne transportation for Oklahoma. Barge transportation is an economical means of transporting bulk and oversized cargo with minimal adverse impacts to the roadway transportation infrastructure of the State or to the environment. The 51 miles of the MKARNS in Oklahoma consist of eight ports interspersed with five locks and dams. The five dams in Oklahoma not only assist in transporting freight, but also provide other benefits such as flood control, hydropower generation, recreation, and conservation of fish and wildlife. Additionally, key public facilities within the system are the Port of Catoosa and the Port of Muskogee, both of which are designated Foreign Trade Zones. Located at the head of the MKARNS, the Port of Catoosa is one of the largest inland river-ports in the country.

There are three categories of needs related to Oklahoma's ports and waterways, of which the first two are monetized in the needs assessment.



- **Critical maintenance:** There is a backlog in critical maintenance on the 100 percent federally funded navigation features of the MKARNS since funding has not kept pace with the deterioration of the system through continuous use of the nearly 50-year-old locks. Critical maintenance projects are those that are defined as having a 50 percent chance or greater at failing over the course of the next 5 years. The Three Rivers structure (at confluence of Arkansas, Mississippi, and White Rivers in southeast Arkansas) located on the Arkansas portion of the MKARNS is a top priority on the system, as its failure would be detrimental to the entire system. A 2018 Study recommended a new containment structure to reduce the risk of a cutoff forming near the entrance channel of the MKARNS between the Arkansas and White Rivers.
- **Capacity expansion:** MKARNS system capacity is greatly constrained because the current draft depth is nine feet. Congress authorized the expansion through deepening the channel to 12 feet in the Energy and Water Development Act of 2004, but funds have not yet been appropriated to deepen the waterway channel depth. Additional depth would allow for increased weight and higher volumes to be efficiently moved through the system.
- **Waterway ports access:** This need category supports groundside access to the ports via roads and bridges. Since 2000, ODOT has awarded 186 contracts for projects within a 10-mile radius of the Port of Catoosa and Oakley's Port 33. These contracts, ranging from right-of-way acquisition and utility relocation, begin the processes necessary to construct roads and bridges and totaled \$621.4 million. For the period from federal fiscal year 2019 through 2026, ODOT anticipates an additional 40 projects totaling approximately \$266 million to be awarded within that same 10-mile radius. Similarly, in a 10-mile radius of the Port of Muskogee, ODOT has awarded 53 contracts totaling \$100.7 million since 2000, and anticipates awarding 22 contracts for \$147.3 million from FFY 2019 through FFY 2026. The needs assessment does not estimate 25-year needs for waterway ports access.