

2020  
UPDATE



OKLAHOMA  
Transportation

# BRIDGES AND HIGHWAYS



# Table of Contents

Bridges- Condition and Needs Summary..... *Page 3*

Bridges- Structurally Deficient Defined..... *Page 5*

Highways & Safety- Condition and Needs Summary..... *Page 13*

Safety..... *Page 15*

Progress Summary..... *Page 21*

# Oklahoma Bridges & Highways

## Oklahoma's State Highway Transportation Infrastructure

The state-owned highway system in Oklahoma is comprised of the state numbered route highways, the U.S. numbered route highways and the interstate highway system, valued at \$60 billion making it Oklahoma's number one physical asset. The state system of highways encompasses 12,254 centerline miles as measured in one direction along the dividing stripe of two lane facilities and in one direction along the general median of multi-lane facilities. The system also consists of 30,445 lane miles. Transportation on our highways is also facilitated by more than 6,800 bridge structures that span major rivers and lakes, named and unnamed perennial streams and creeks, other roads, highways and railroads. On the average, passenger vehicles, buses and trucks traveled more than 73.7 million vehicle miles each day (daily vehicle miles traveled or DVMT) in 2019 on the state-owned highway system.

The Oklahoma Department of Transportation embarked in 2005 on a massive effort to improve the state's bridges and highways after decades of underfunding to transportation took a toll, causing a backlog of critically needed projects. At that time the highway pavements were deteriorating at a rate beyond the available funding to repair, let alone to reconstruct, and more than 1,500 of our highway bridges were deficient.

Understanding that a world-class transportation system is the cornerstone of a vibrant economy, a leading factor in growing and attracting new business, a targeted approach to fixing bridge and highway conditions began taking shape through a series of legislative funding mechanisms and identifying key funding opportunities by the congressional delegation.

Today, the department is afforded the opportunity to develop an investment strategy and direct a multi-faceted plan that transparently dedicates the available state transportation resources in a balanced manner. This strategy represents the monumental effort to return Oklahoma's bridges and highways to a safe system in a state of good repair and keep it that way for our citizens in the future.

Please enjoy the progress shared in this update, understand the challenges that lie ahead and most importantly, accept our deepest appreciation for your interest in and support for Oklahoma's transportation system.

# Oklahoma Bridges

## Condition and Needs Summary

Oklahoma's bridge problem is well recognized. The state was as low as 49th place in 2004 in national bridge condition rankings due to the number of structurally deficient bridges on the state highway system. Crumbling transportation infrastructure and deficient bridges have a detrimental impact on Oklahoma commerce, job creation and economic growth and can even endanger our citizens.

The department has accelerated bridge replacement efforts through a focused and concerted effort made possible by the consistent vision and support of our governors, legislators and congressional delegates. This effort has allowed for the replacement or rehabilitation of 1,651 bridges since January 2006. Oklahoma highway bridge conditions are making the grade by moving from among the worst in the nation to the head of the class, achieving Top Ten status for the first time by ranking ninth, according to the latest data from the Federal Highway Administration.

Today, only 86 highway bridges are now considered as structurally deficient. The majority of the identified structurally deficient bridges are included in either the 2021-2028 8-Year Construction Work Plan or the 2021-2024 Asset Preservation Plan. The 8-Year Construction Work Plan also includes the replacement or major rehabilitation of 609 bridges.



*Proposed Bridge Replacements/  
Major Rehabilitations in the 8-Year  
Construction Work Plan:*

**609 BRIDGES**

The department has instituted a bridge specific program designed to be flexible and reactive. This bridge rehabilitation program allows the department to stretch our scarce regular maintenance dollars further. At the same time, the program has proven effective in slowing or stemming further deterioration or functional decline of the bridge infrastructure and enhances the ability to manage these transportation assets in a manner that maximizes their life cycle.

*Since January 2006, the  
department has replaced or  
rehabilitated:*

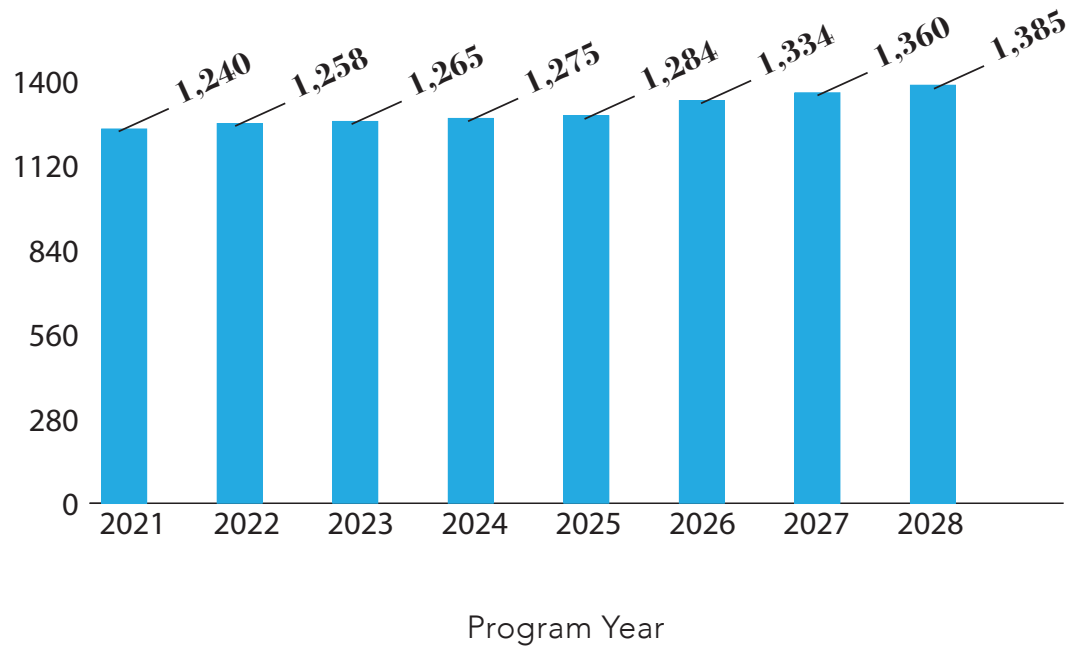
**1,651 BRIDGES**





Number of Bridges Over 80 Years Old.

Bridge Aging



Annual Investment in Bridge Rehabilitation:

**\$40 MILLION**

In order to keep pace with Oklahoma’s aging infrastructure, ODOT must replace or refurbish:

**90 BRIDGES ANNUALLY**

The continued goal is to have Oklahoma’s highway bridge inventory at a manageable level of less than 1 percent structurally deficient by the end of 2020 and keep it there into the future. This requires not only a continuing long term annual bridge replacement commitment but a major focus area shift, addressing “at risk” bridges to prevent them from becoming structurally deficient. An “at risk” bridge is one that has one or more critical components, such as the superstructure, substructure or deck, earning a rating after inspection of five out of a possible 10. Should the

rating, on any of these components, fall one more point the bridge would be determined to be structurally deficient. The continued long term commitment and focus area shift will allow the department to keep pace with the projected aging and deterioration rates of the current bridge inventory.





Before

## A Structurally Deficient Bridge:

Has key elements that need to be monitored and/or repaired. The condition of these key elements are rated on a scale of 0 to 9 (with 9 being “excellent” and zero being “failed”). A structurally deficient bridge is one for which the deck (driving surface), the superstructure (supports immediately beneath the driving surface) or the substructure (foundation and supporting posts and piers), or for culvert type bridges, is rated at 4 or less.





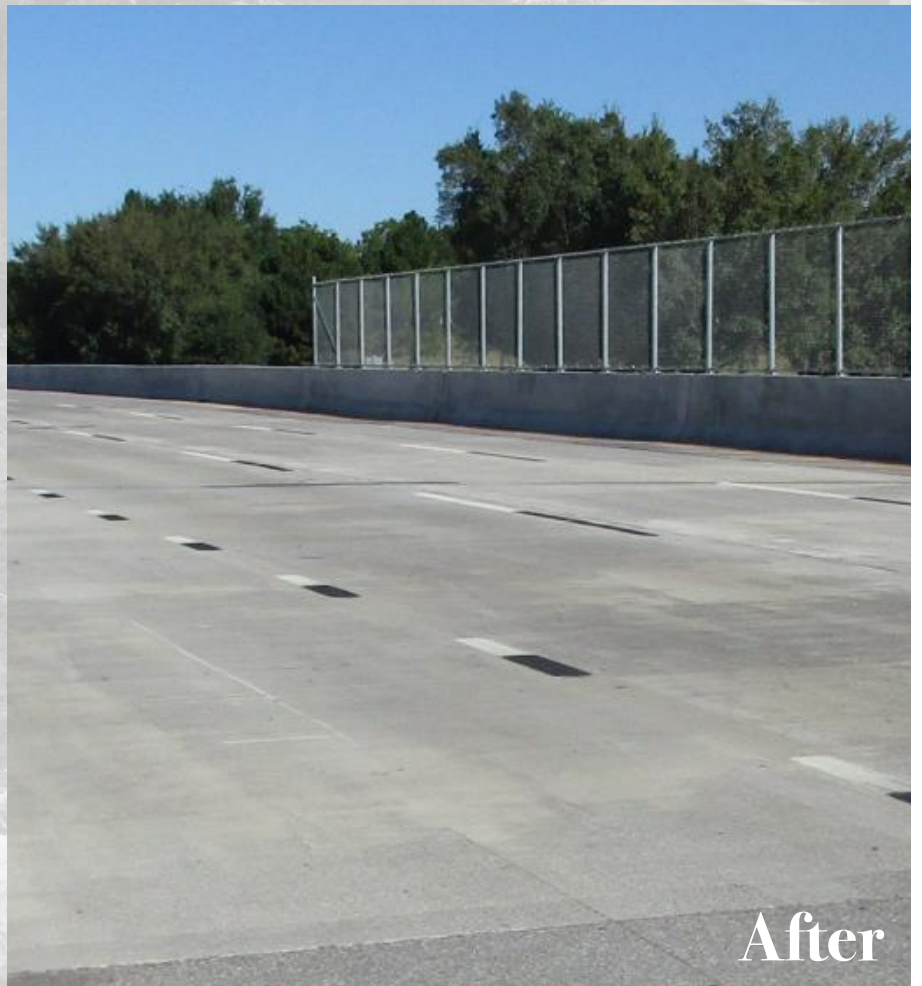


Before

**86**  
Structurally  
Deficient Bridges  
(as of 2019)

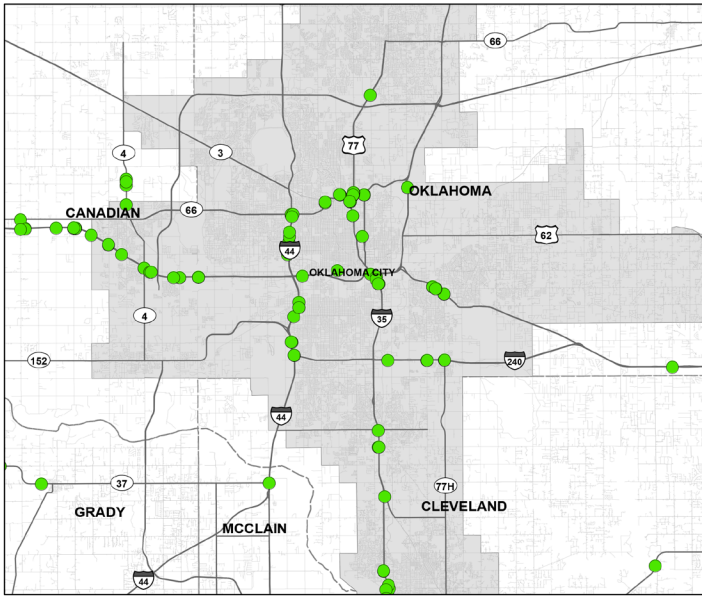
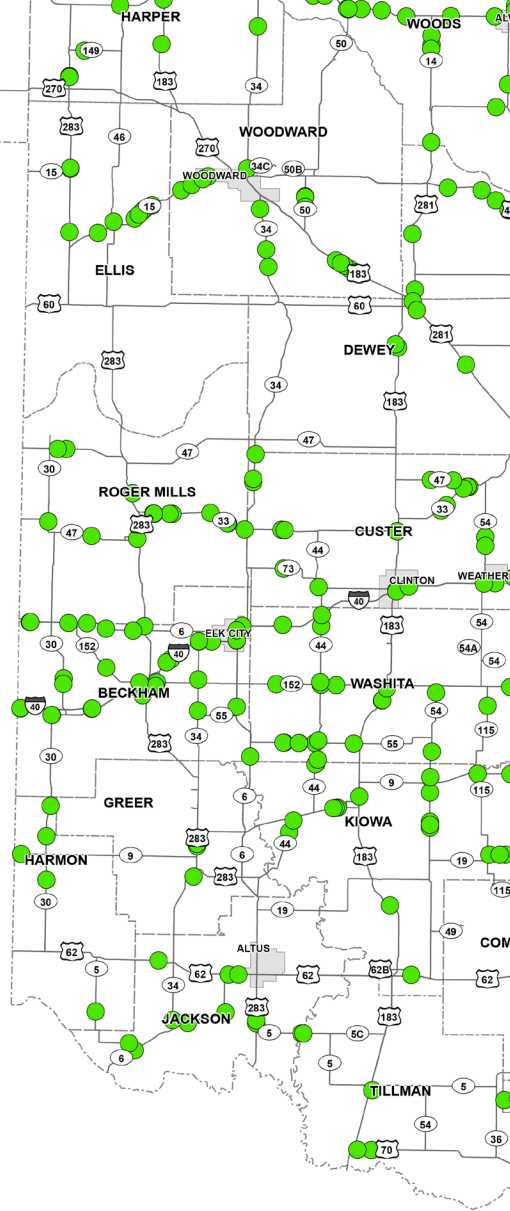
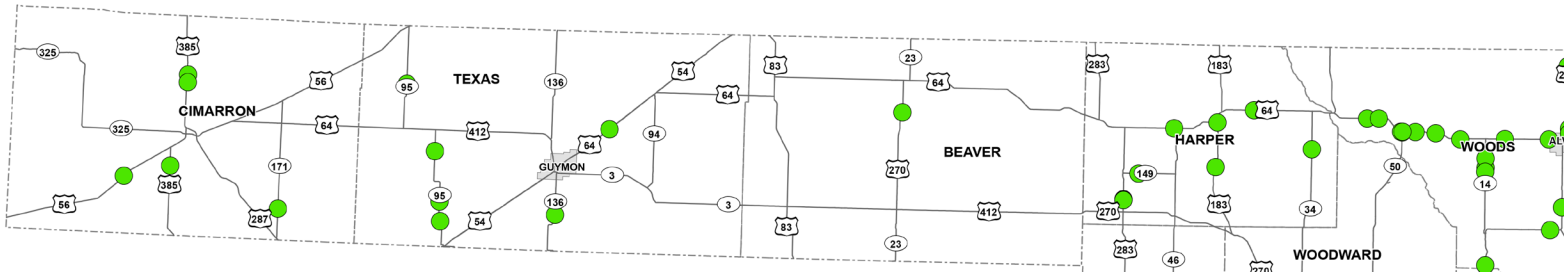


After

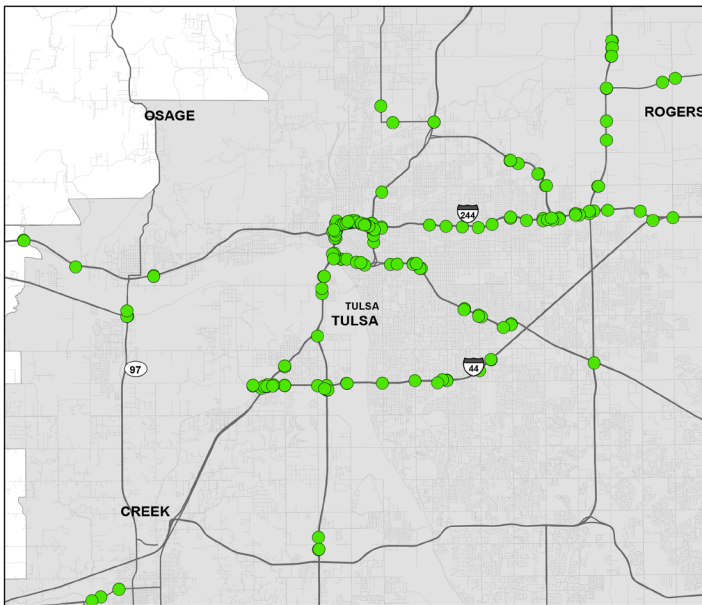


After





Oklahoma City Metro Area

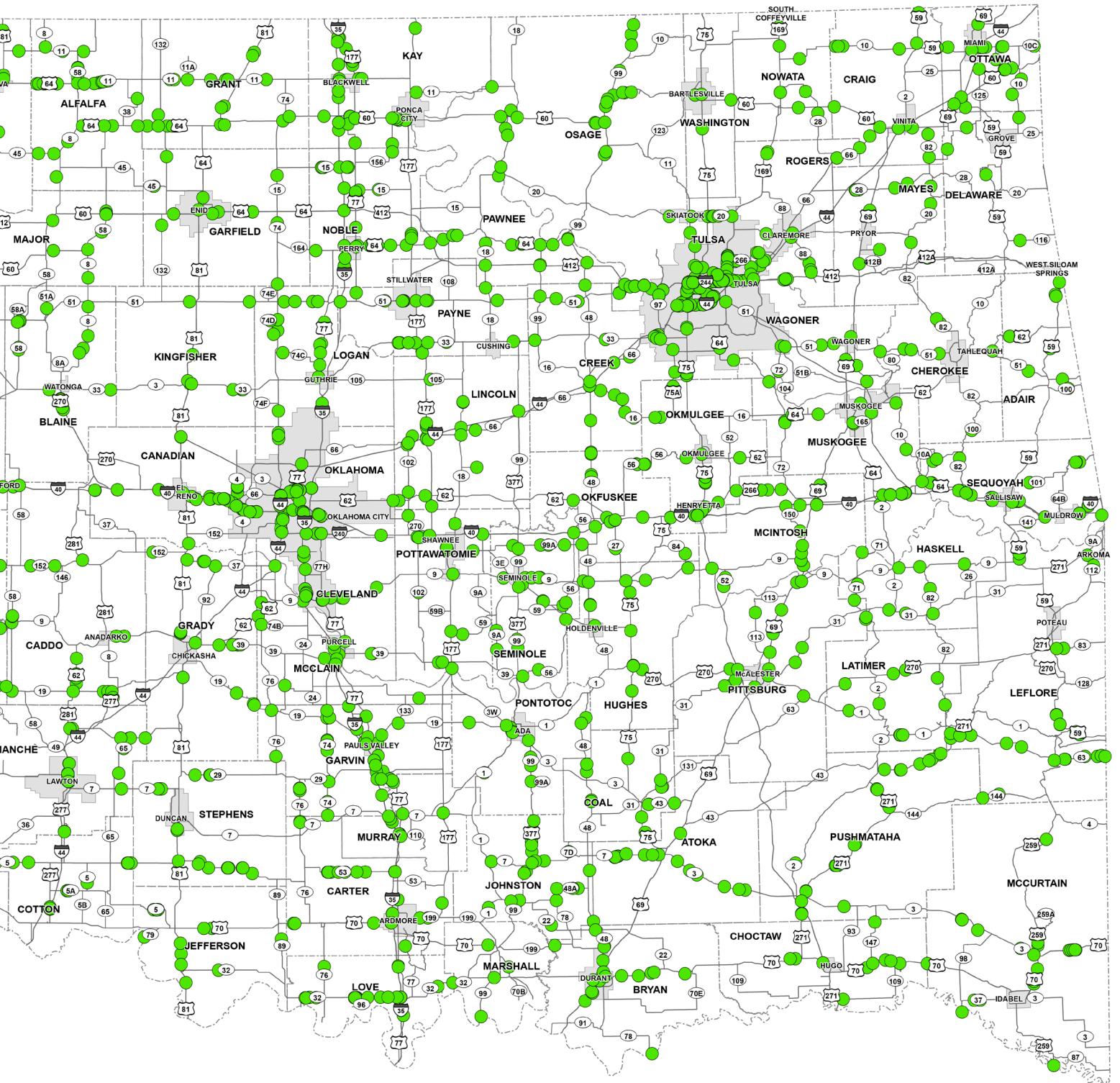


Tulsa Metro Area

**Completed or  
Under Construction  
Between January 2006  
and October 2020**

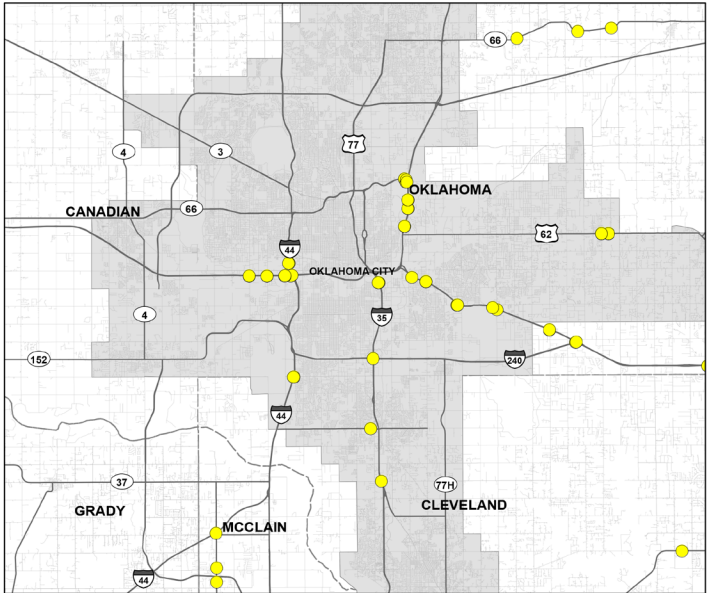
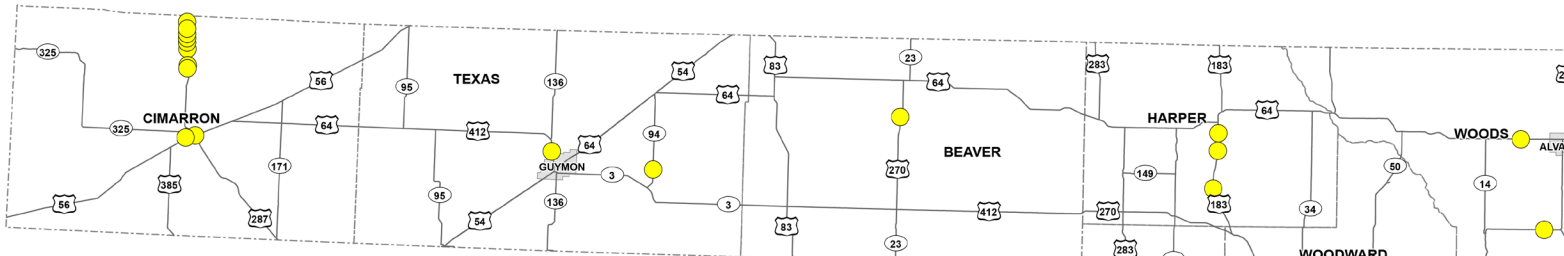
- Replacements / Major Rehabilitation (1,651)
- Highways
- ▒ Urban Areas
- Counties



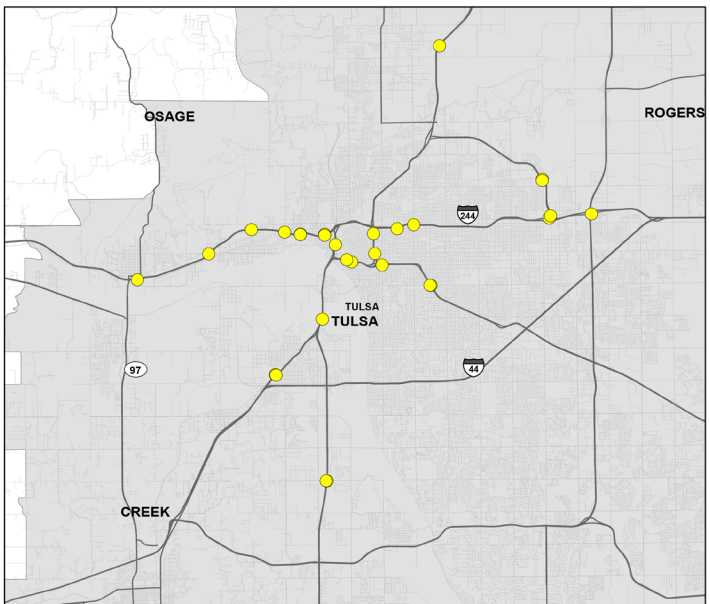


# Bridge Replacements/ Major Rehabilitation Projects

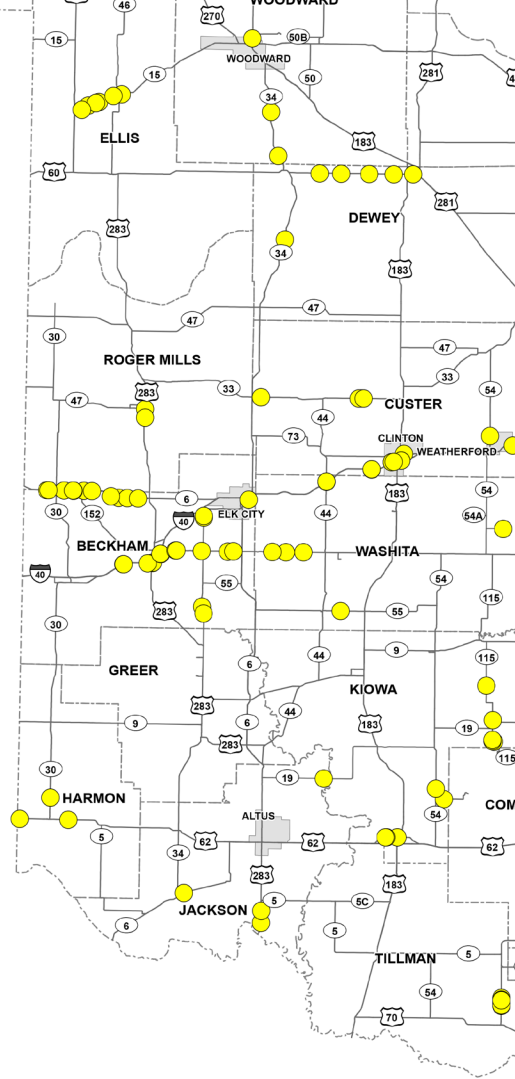
**State Highway System Bridges Only**  
 NOTE: The information provided is generated from the National Bridge Inventory system. Some of the identified bridges are either under construction or have been recently constructed.



Oklahoma City Metro Area



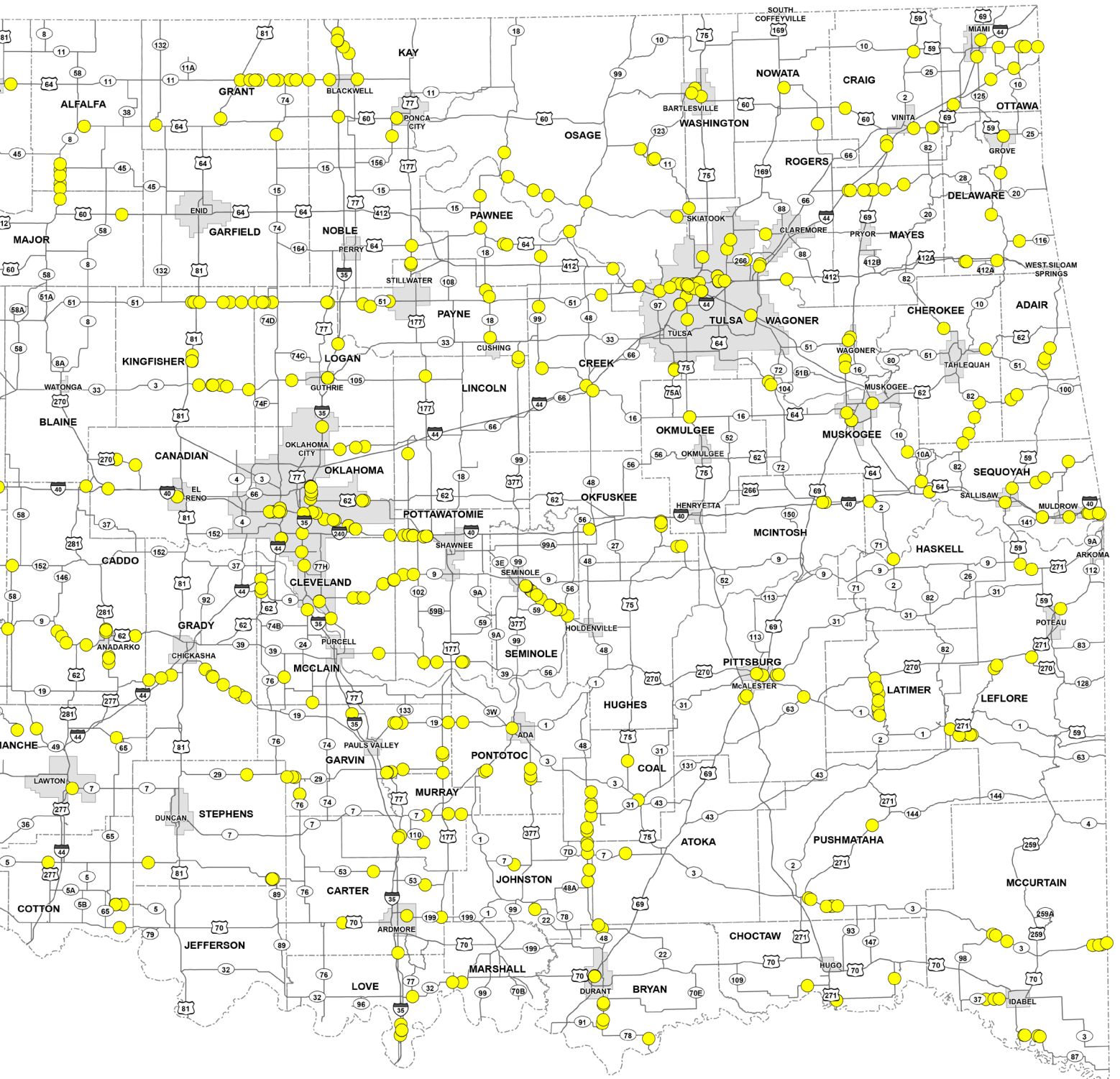
Tulsa Metro Area



**8-Year Construction Work Plan within the fiscal years of 2021-2028**

- Replacements/Major Rehab. (609)
- Highways
- Urban Areas
- Counties

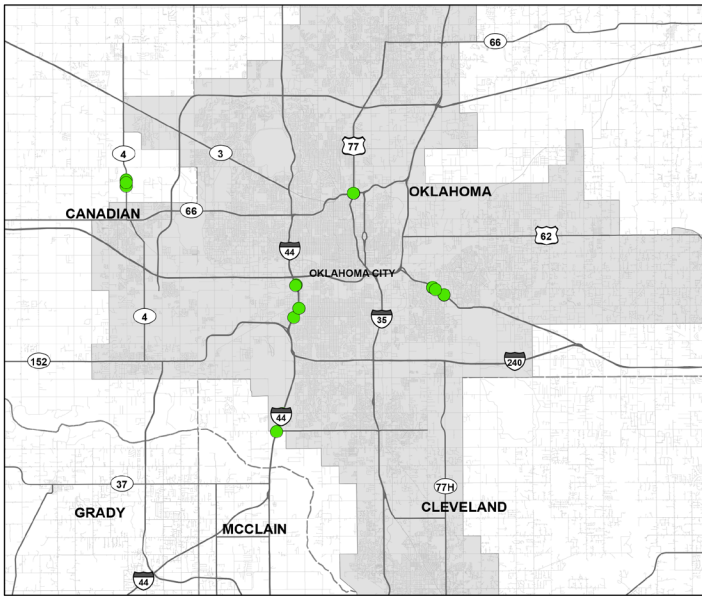
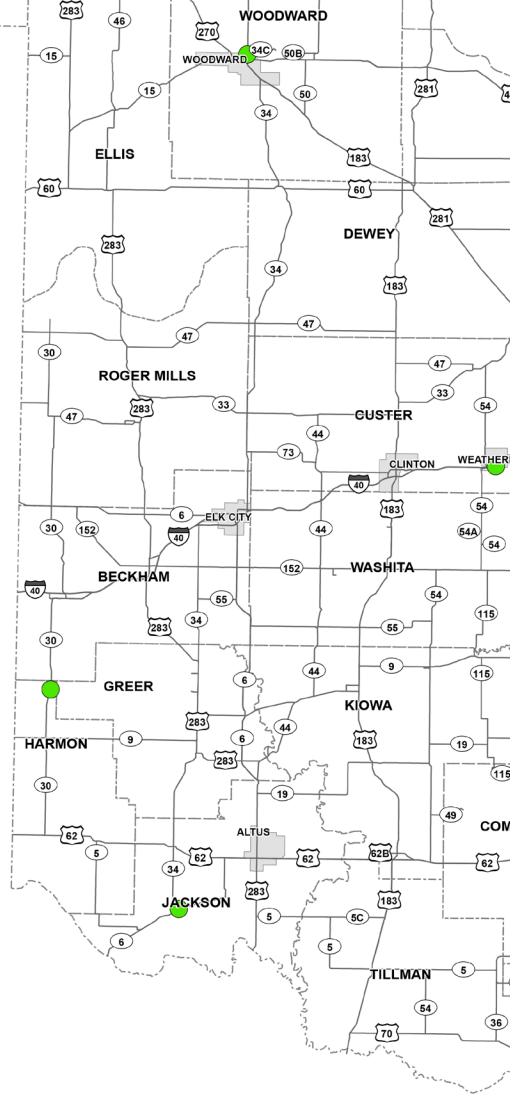
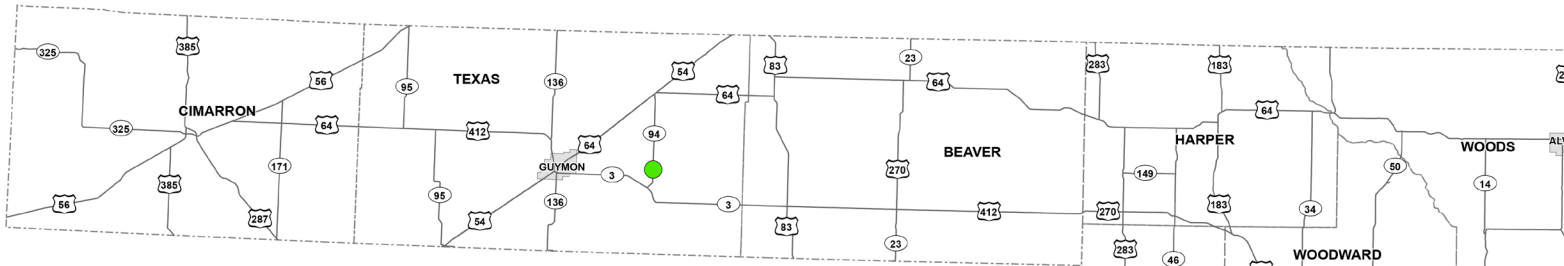




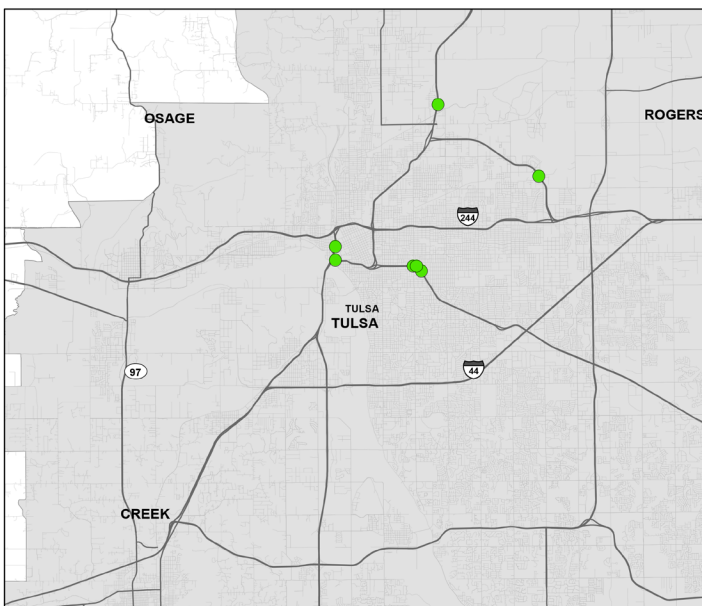
# Bridge Replacements/ Major Rehabilitation Projects

## State Highway System Bridges Only

NOTE: The information provided is generated from the National Bridge Inventory system. Some of the identified bridges are either under construction or have been recently constructed.



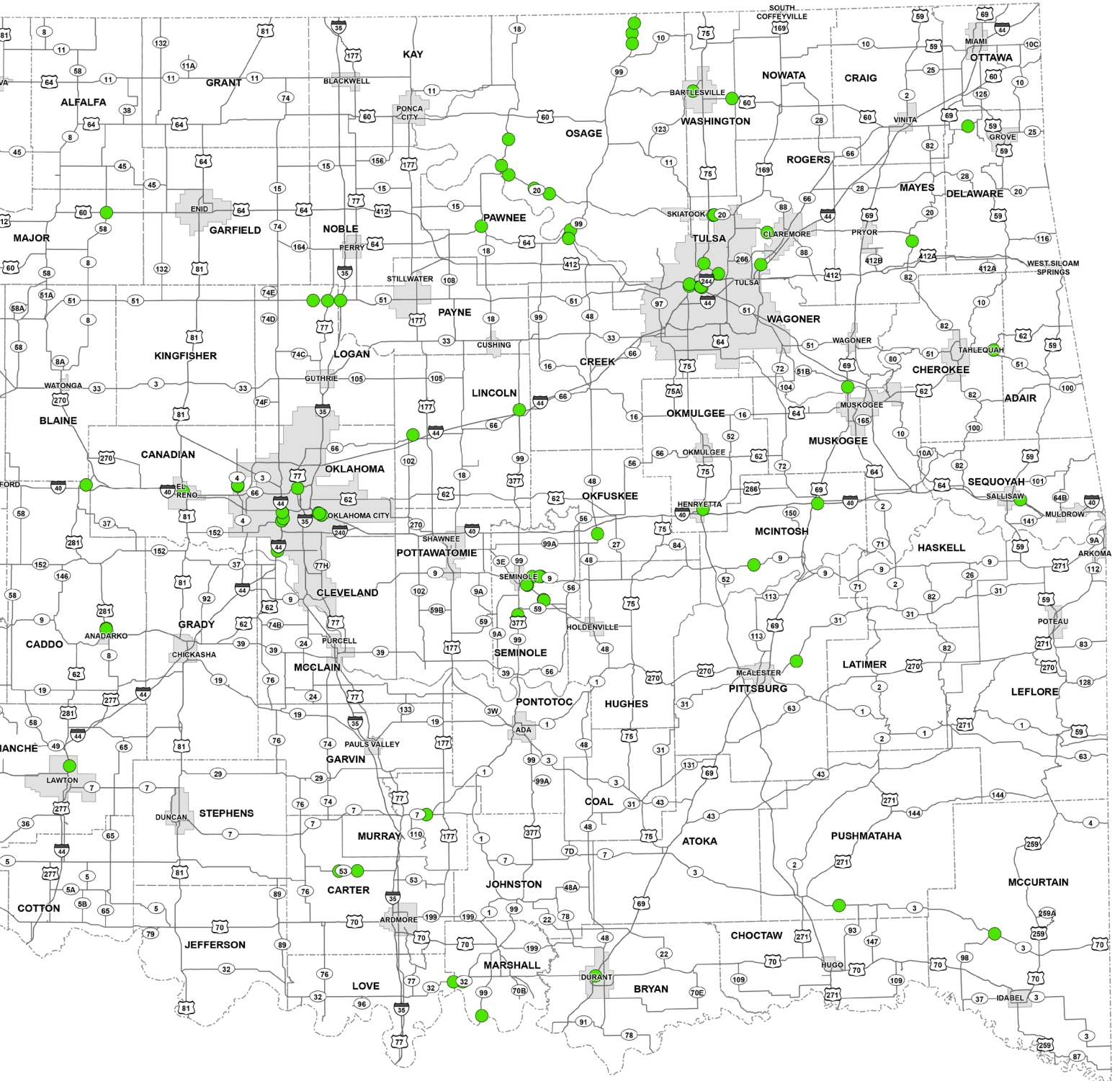
Oklahoma City Metro Area



Tulsa Metro Area

- Structurally Deficient (86)
- Highways
- ▒ Urban Areas
- Counties





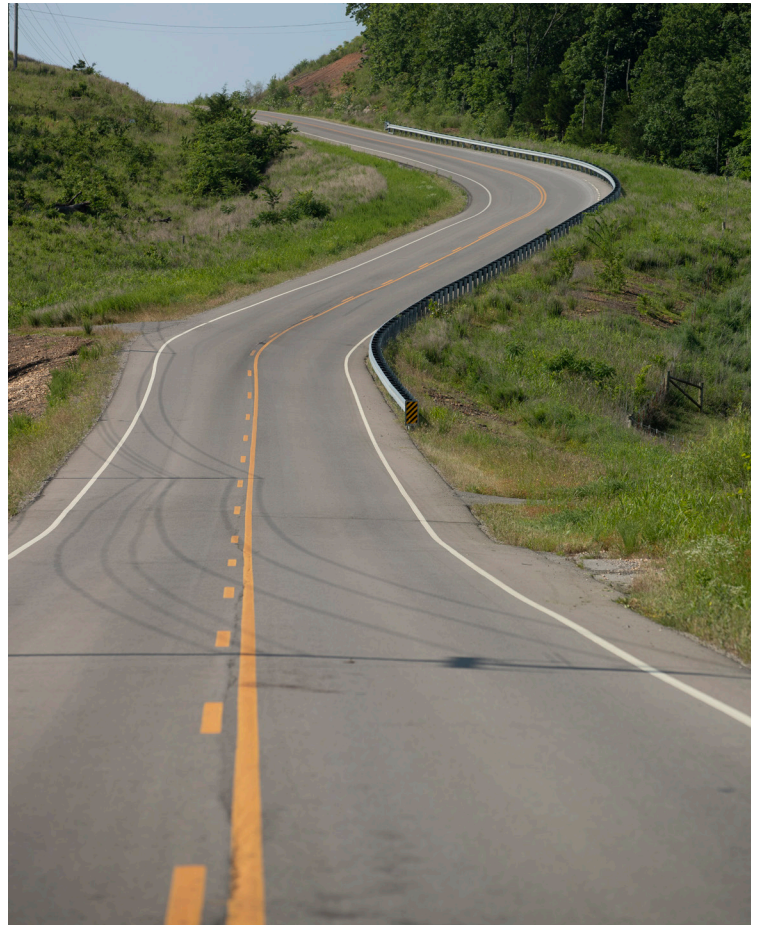
# Structurally Deficient Bridges as reported at the end of 2019

**State Highway System Bridges Only**  
 NOTE: The information provided is generated from the National Bridge Inventory system. Some of the identified bridges are either under construction or have been recently constructed.

# Highways & Safety

## Condition and Needs Summary

Oklahoma's rural nature and historically agricultural and energy-based economy has witnessed the conversion of many farm-to-market roads and bridges into highways. While these roads were ideal for transporting livestock and crops to market 70 years ago, they are less than adequate when supporting today's heavier trucks, increased traffic demands and higher operating speeds. About 5,299 miles of Oklahoma highways are two-lane facilities with deficient shoulders.



*Shoulders and roadway improvements to two-lane highways with deficient shoulders in the 8-Year Construction Work Plan:*

**804 MILES**



*Surface, operational and capacity improvements to high-volume major highways in the 8-Year Construction Work Plan (estimated total investment):*

**\$3.04 BILLION**

*Current freight plan targeted investment in highway freight mobility projects:*

**\$428.93 MILLION**

*Annual investment in surface preservation:*

**\$75 MILLION**

*Remaining inadequate highways with no improvements scheduled:*

**5,350 MILES**

Traffic on our major highways has increased dramatically in the past two decades and freight traffic is expected to continue to compound for the foreseeable future. The daily vehicle miles traveled on facilities with more than two lanes in 2019 was 52.93 million miles (71 percent of total miles traveled). Improvements to these facilities are often the most expensive and resource-consuming projects, but also yield high returns and have an immediate impact on regional traffic patterns. Over 537 miles of our 673 miles of interstate pavement have had significant rehabilitation or reconstruction since 2003 and an additional 190 miles are included in the Federal Fiscal Year 2021 through 2028 8-Year Construction Work Plan.

In order to provide a safe, reliable and productive freight transportation system that will support the growing economy and population of the state, an increased focus on freight needs and opportunities is paramount. The current freight plan within the 8-Year Construction Work Plan contains a little more than 38 miles of improvements that are expected to have a significant impact on freight mobility.

Much like our bridges, our pavement surfaces require systematic preservation in order to maximize the life cycle of our highways. Until recently, it has been impossible for the department to afford the consideration of such initiatives. As budgetary conditions improve we can invest in and develop a timely surface preservation program with a focus on extending the life of our pavements.

Based on an evaluation of the pavement conditions, about 4.85% or 1,589 lane miles of the 30,445 lane miles of highways rate poor. The goal to improve the amount of good condition pavement miles by 10 percent by 2023 will be met by projects in the 8-Year Construction Work Plan and the 4-Year Asset Preservation Plan upgrading and extending the pavement life to change its rating from fair or poor to good.

Additional evaluations of safety features such as the existence of paved shoulder and recovery areas for errant vehicles reveals 5,299 miles of two-lane highways with deficient shoulders. These deficient areas account for about 56% of our 9,497 miles of two-lane highways. The refined goal on two-lane highways includes decreasing the total miles with deficient shoulders by 10 percent by 2023, which will significantly reduce severe accidents and fatalities from vehicle roadway departures and the resulting over corrections.

Even given the improvements scheduled in the 8-Year Work Construction Work Plan and the 4-Year Asset Preservation Plan, more than 4,495 miles of two-lane highways with deficient shoulders and 855 lane miles of highways with poor pavement will remain unaddressed. The safety of our transportation system and the traveling public is paramount to our mission and always has our full attention, but many highway safety improvements that could prevent property damage, personal injuries, and the tragic loss of life remain.

# Safety

While there are many indicators that provide insight into the safety of the transportation system, year-to-date fatalities is the most commonly referenced. Motor vehicle crashes are the number one cause of death and disabling injuries for young Americans under the age of 21. Although there are many variables that affect fatality trends such as winter weather or as complex as increasing motorcycle usage and driver behaviors such as distracted driving, the simplest choice a driver or passenger can make is to buckle their seatbelt. Data for 2019 shows that we had 641 fatalities statewide with 338, or 52.7 percent, of those fatalities listed as not having a seatbelt in use. Oklahoma ranks 43rd in seat belt usage. The department will soon embark on a seatbelt usage campaign to help educate and encourage Oklahomans to buckle up. Through the use of continuing and new safety features, including public education, the department seeks to reduce the loss of life on state highways.



Although Oklahoma highways offer many different safety features, the results of the device effectiveness may take years to materialize. One safety feature that the department has utilized is cable median barriers. These barriers have assisted in the dramatic reduction of fatalities caused by cross-over type crashes. In 2007 the department recorded 39 fatalities which have been reduced to 5 in 2019. More than 800 miles of cable median barrier has been installed on Oklahoma's divided highways.

Another safety feature in use are centerline rumble strips, rectangular depressed areas of pavement along highway centerlines that generate a physical vibration in a vehicle cabin when tires drive over them. The vibration and noise is intended to alert inattentive drivers that their vehicle is leaving the travel lane. This particular safety feature aids in the reduction of head-on and opposite direction sideswipe collisions as well as serves as an effective means of locating the travel lane during inclement weather, which can obscure pavement markings. There were 244 fatalities on undivided rural Oklahoma highways due to centerline crossover crashes from 2013-2015. More than 450 miles of centerline rumble strips have been installed on undivided rural Oklahoma highways since 2017, resulting in a reduced fatality number of 200 from 2017-2019. The department has more than 800 miles scheduled to be installed by the end of SFY 2021.



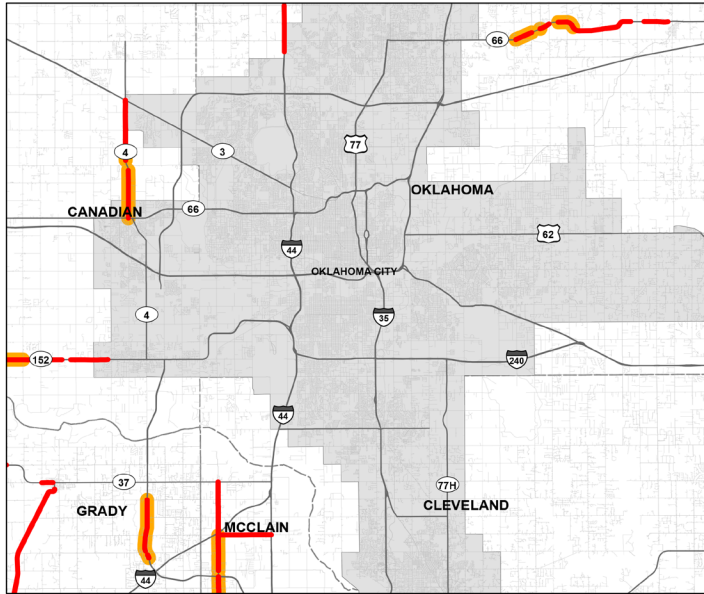
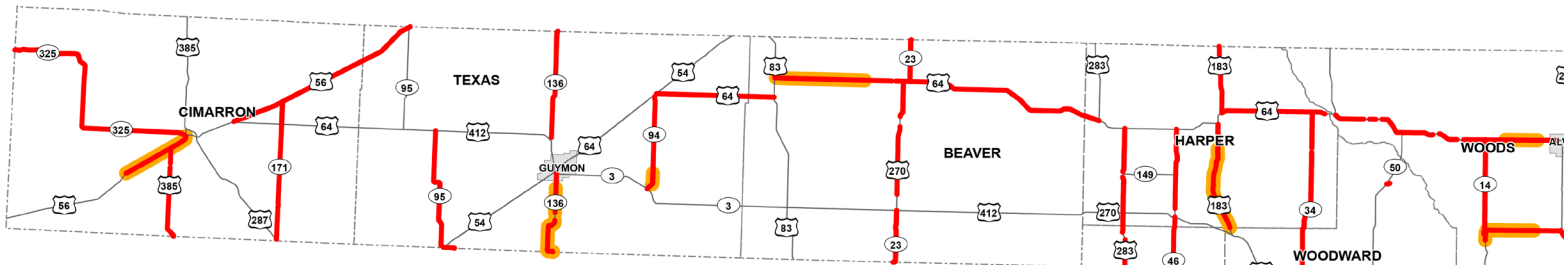


# Motorcycle Safety Education

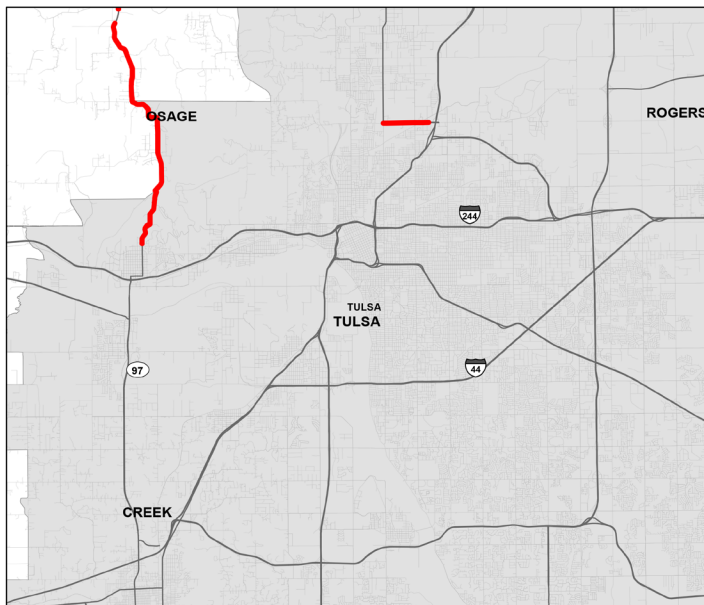
Oklahoma experienced an average of 78 motorcycle fatalities annually from 2004-2008, which peaked in 2009 with a total of 106. In response to the increase of motorcycle related accidents and fatalities, the department along with the Oklahoma Highway Patrol partnered in 2011 to promote motorcycle safety education through the Saferider program. Curve negotiation, emergency braking and evasive maneuvering are just a few out of the many topics covered in the Saferider classes. From 2012-2019 the Saferider program has held 79 classes with 1,381 students completing the course. These classes continue to be offered free of charge to the public statewide. Increased motorcycle rider education may play a role in addressing this fatality trend. In 2019, motorcycle fatalities were down to 66.



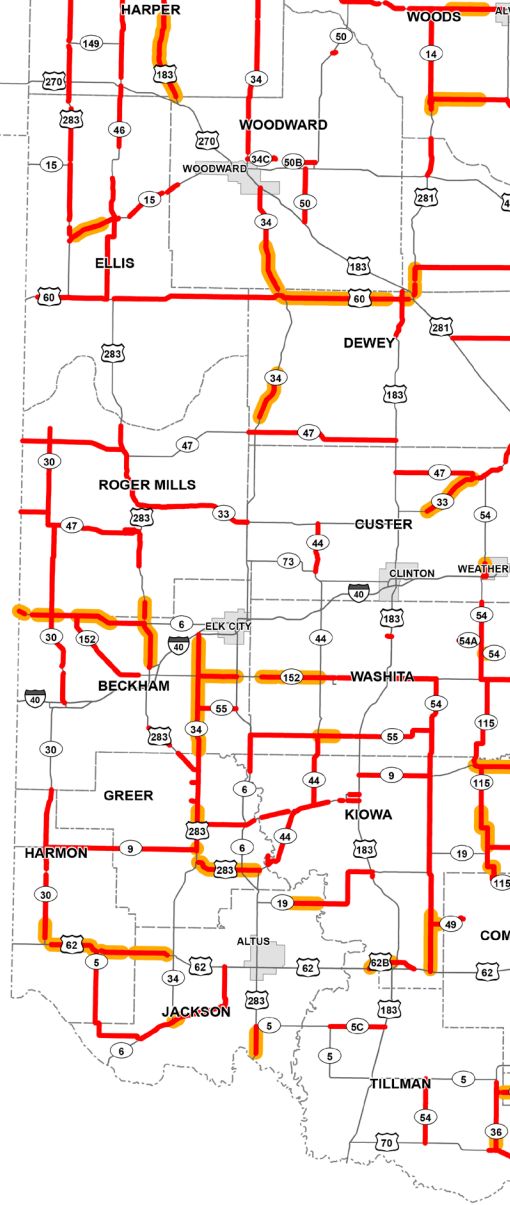
*-One Fatality  
is One Too Many.*



Oklahoma City Metro Area

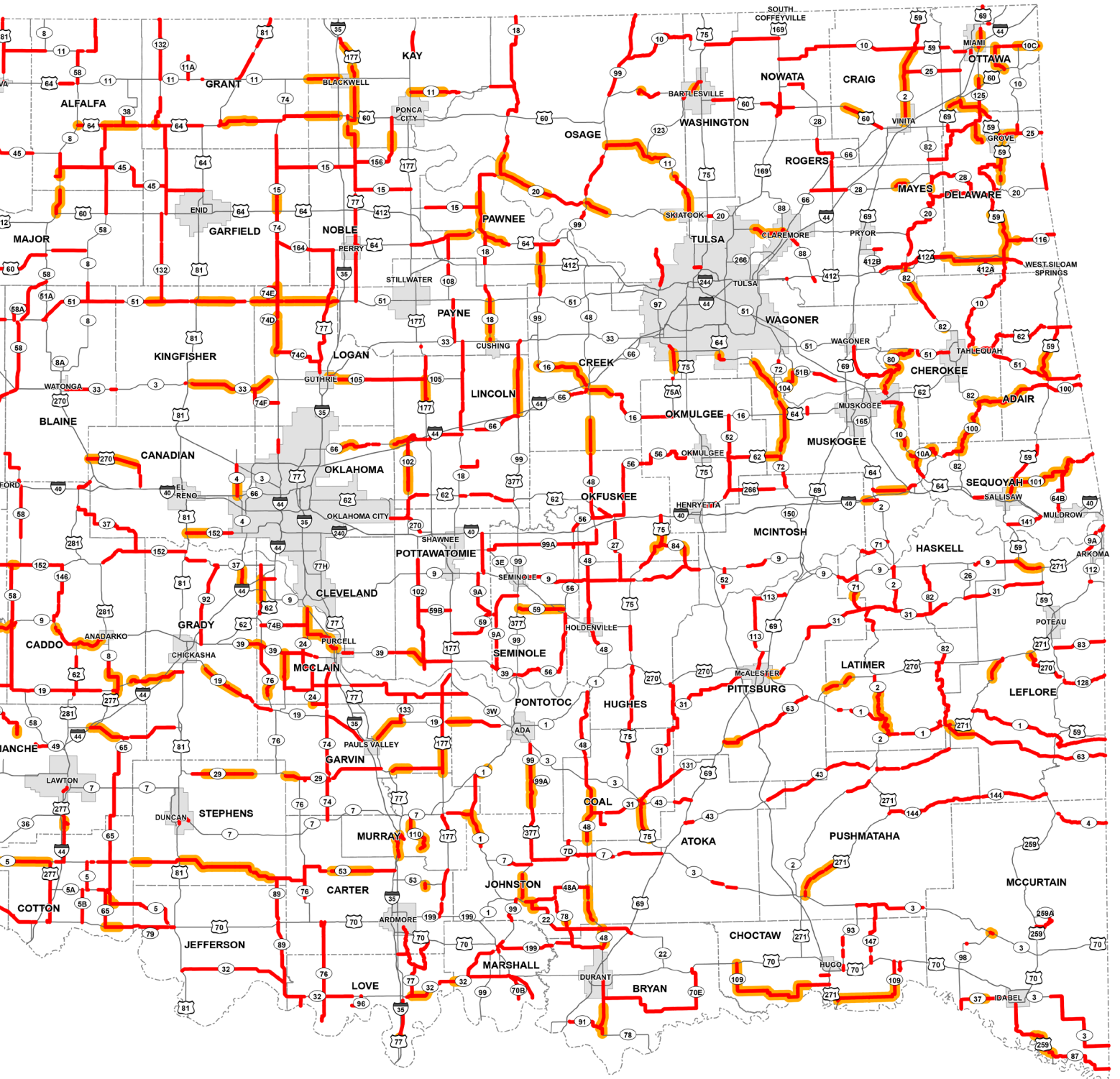


Tulsa Metro Area

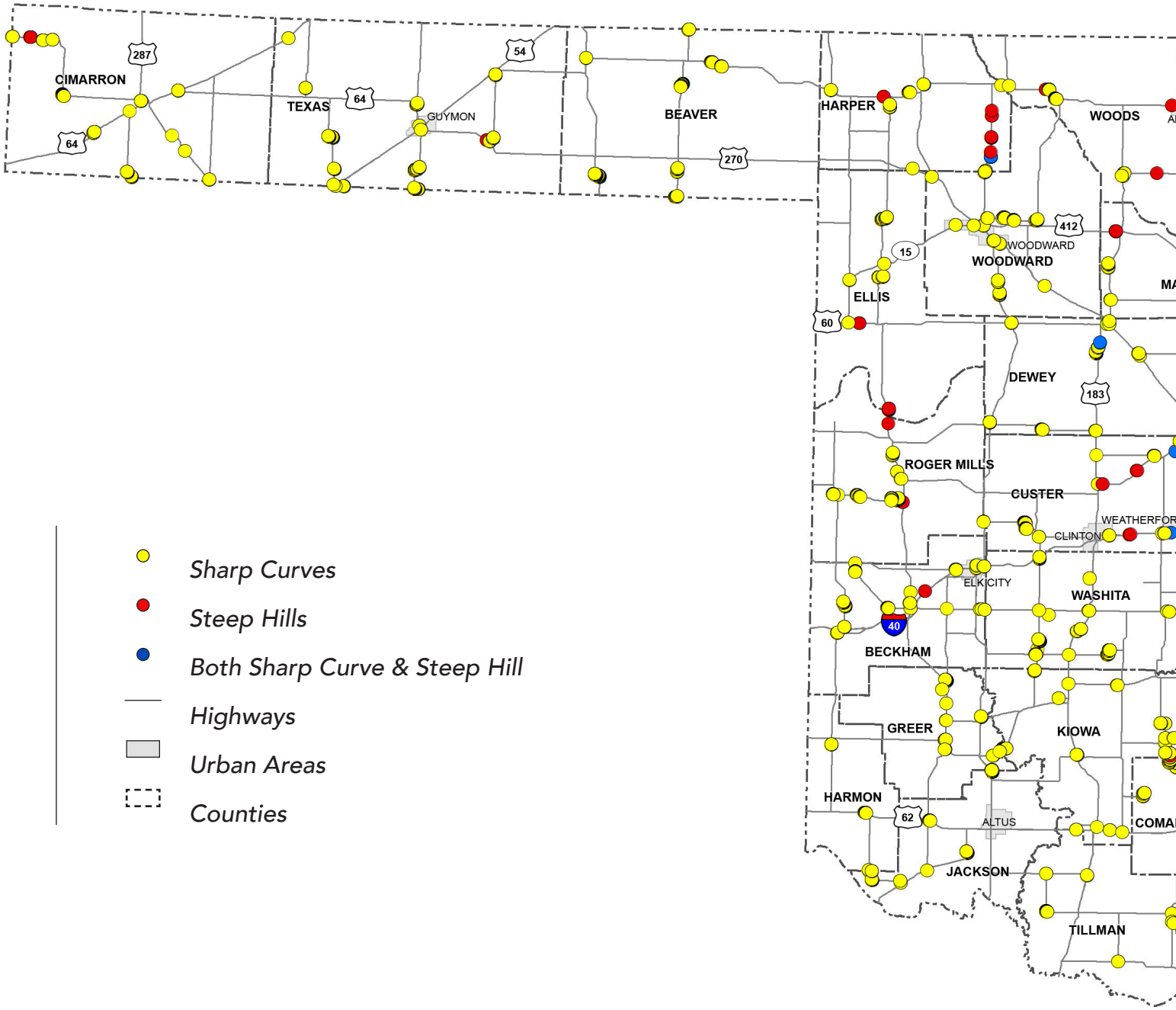


- 2 Lane Highways With Deficient Shoulder (5299 mi)
- Work Plan Construction (804mi)
- Highways
- Urban Areas
- Counties



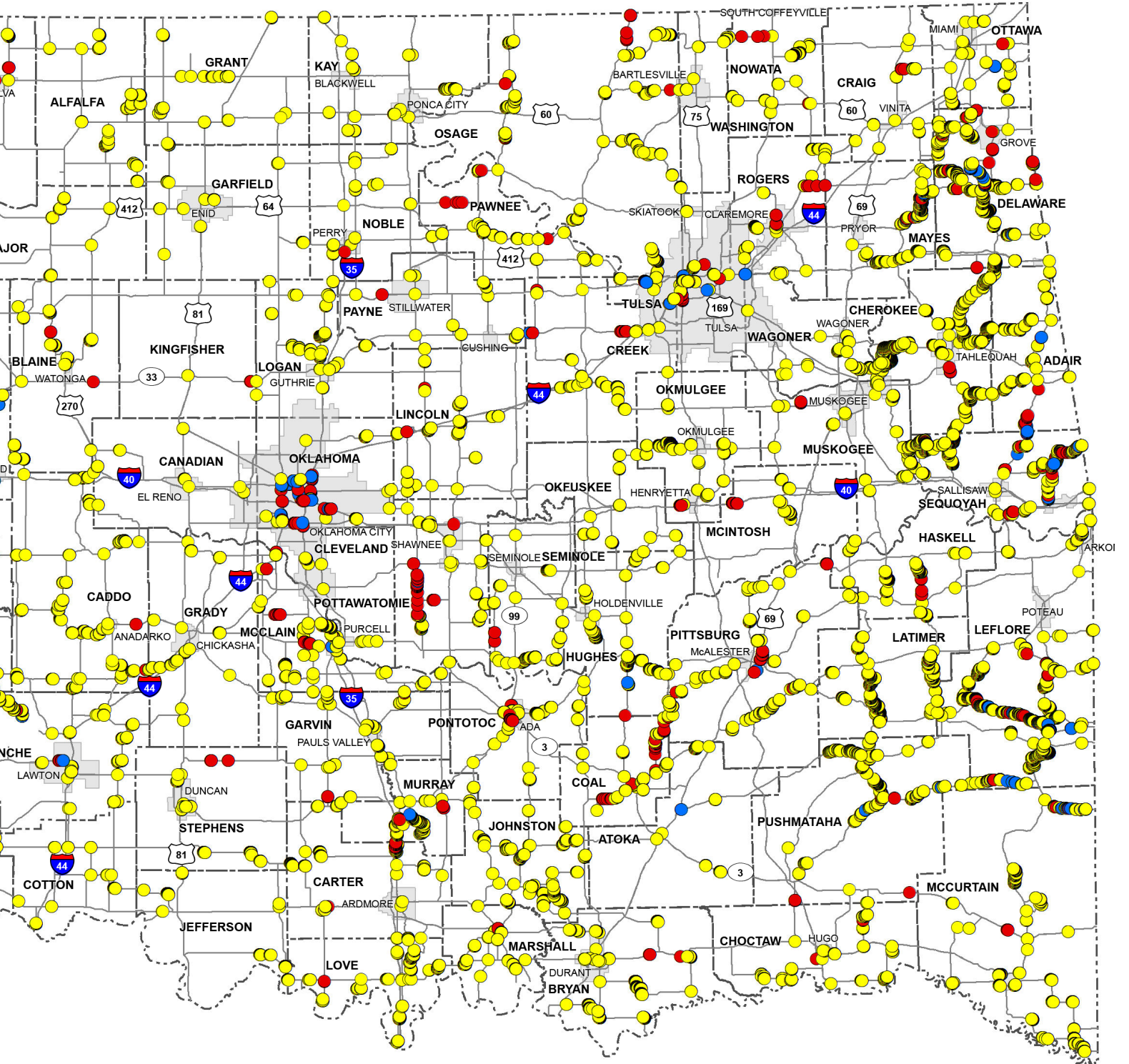


Two-Lane Highways  
With Deficient  
Shoulders



- Sharp Curves
- Steep Hills
- Both Sharp Curve & Steep Hill
- Highways
- ▭ Urban Areas
- - - Counties





Steep Hills  
& Sharp Curves

# Progress Summary

Performance management, asset management, investment strategy, system analysis and transparent reporting are primary terms often used in developing and managing business. Today, these primary terms are becoming more and more ingrained in government agencies and their operations. The intent is to better understand and measure the outcomes associated with the expenditure and investment of public funds. However, identifying the right measures to consistently and accurately collect the necessary data and then communicate the progress of government to the public in an understandable and meaningful manner can be quite difficult. Equally, when good measures are established and widely accepted, the nature of quantifying any gains or losses can be highly complex and difficult to concisely explain.

The Oklahoma Department of Transportation understands the needs of our transportation assets and monitors the effectiveness of our investment strategies on a daily basis. The data collection and analysis necessary to manage the transportation system is indeed extensive, complex, voluminous and sometimes inconsistent due to changing collection and reporting criterion. With thoughtful consideration of these complexities, the department has selected important and meaningful measures for the purpose of providing a brief progress summary in the context of Oklahoma's bridges and highways. It is anticipated that in the coming years this progress summary will evolve to become a concise snapshot of the progress of the highway and bridge investment strategy.

## Interstate System

The Interstate System in Oklahoma is the highest class of highway and is designed to be the critical transportation network that is the link of national commerce which facilitates the movement of goods and services within the state, across the nation and abroad. While the 673 miles of interstate account for only 5.5 percent on the centerline miles of our state system, it carries 33.6 percent of daily miles traveled. Since 2003 more than \$4.2 billion has been invested resurfacing, rehabilitating or reconstructing the non-toll interstate system including pavements, bridges, interchanges and necessary property acquisitions and utility relocations. These improvements represent the scheduled work accomplished as part of our Asset Preservation Plan and 8-Year Construction Work Plan.

## Non-Interstate Highways

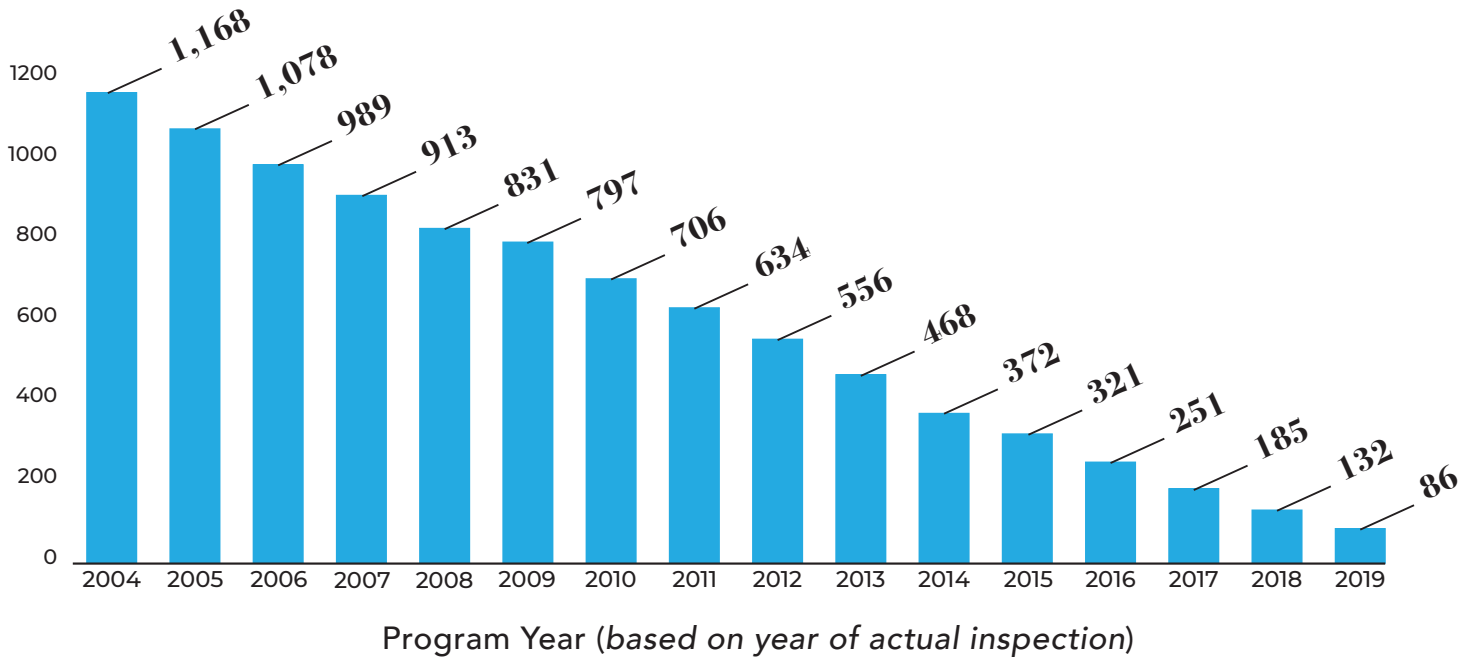
The needs of the state transportation infrastructure are constantly assessed and appropriate maintenance, rehabilitation and reconstruction activities are planned and implemented in a fully integrated and systematic manner. Regular maintenance extends the life-cycle of the transportation facilities and timely rehabilitation and reconstruction activities as encompassed in the 8-Year Construction Work Plan and Asset Preservation Plan are necessary to leverage those maintenance resources so the efforts are restorative and preventative in nature. The timing of these investments is critical, as resources being directed to infrastructure and facilities that are beyond useful repair does not constitute effective maintenance and will not prevent the eventual, inevitable and costly failure of those elements.

In the context of the 2003 to current Asset Preservation and 8-Year Construction Work Plan investment strategies, the department has resurfaced, rehabilitated, constructed or reconstructed non-interstate highway pavements and bridges totaling an infrastructure investment value of more than \$8.6 billion including necessary property acquisitions and utility relocations.



Number of Bridges

On-System Structurally Deficient Bridges



## Structurally Deficient Bridges

Since 2000 Oklahoma has consistently ranked as one of the worst states on the national list of structurally deficient bridges. At the most recent peak as reported in December of 2004, 1,168 bridges or a full 17 percent of all highway system bridges were classified as structurally deficient. By comparison, that same year Texas ranked near the best in the nation with less than 2 percent of their more than 32,000 bridges classified as structurally deficient.

The department has placed a priority and focused available resources on this chronic problem in earnest since 2003. As a result, our structurally deficient bridge numbers are expected to drop to less than one percent by the end of 2020. Oklahoma’s focus and progress is evident with the December 2019 annual bridge inspection reports revealing that the 706 structurally deficient bridges recorded in 2010 have been reduced to 86, marking an 87.8 percent reduction in structurally deficient bridges.





## **OKLAHOMA** **Transportation**

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