

May 2022

SAFETY IMPROVEMENTS ON OKLAHOMA RURAL ROADWAYS

Multimodal Project Discretionary Grant Program Application



OKLAHOMA
Transportation

What is the Project Name?	Safety Improvements on Oklahoma Rural Roadways
Who is the Project Sponsor?	Oklahoma DOT
Was an application for USDOT discretionary grant funding for this project submitted previously?	No
A Project will be evaluated for eligibility for consideration for all three programs, unless the applicant wishes to opt-out of being evaluated for one or more of the grant programs.	<input checked="" type="checkbox"/> Opt-out of INFRA <input checked="" type="checkbox"/> Opt-out of Mega
<u>Project Costs</u>	
MPDG Request	\$58,303,835
Estimated Other Federal Funding	\$0
Estimated Other Federal Funding further detail	N/A
Estimated non-Federal Funding	\$58,303,835
Future Eligible Project Cost	\$116,607,670
Previously Incurred Project Cost	\$20,257,996
Total Project Cost (Sum of the two previous rows)	\$136,865,666
Rural: Amount of Future Eligible Costs by Project Type	A highway safety improvement project: \$116,607,670
<u>Project Location</u>	
State(s) in which project is located.	Oklahoma
INFRA: Small or large project	N/A
Urbanized Area in which project is located, if applicable.	N/A
Population of Urbanized Area.	N/A
Is the project located in an Area of Persistent Poverty or Historically Disadvantaged Community?	Yes, Census Tracts 5877, 5878, 9526, 3882, and 9665
Is the project located in Federal or USDOT designated areas?	Yes. Atoka County Opportunity Zone. Tri-County Indian Nations Empowerment Zone. Choctaw Nation Promise Zone.
Is the project currently programmed in the:	
TIP?	N/A
STIP?	Yes
MPO Long Range Transportation Plan?	N/A
State Long Range Transportation Plan?	Yes*
State Freight Plan?	Yes*

*Improvements consistent with Plan goals

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1 Project Description

The Oklahoma Department of Transportation (ODOT) is pleased to submit this application for Safety Improvements on Oklahoma Rural Roadways, which will create a safer roadway environment and reduce crashes for roadway users as they travel along the state’s rural roadway network. These safety improvements are a critical component of ODOT’s Rural 2-lane Advancement and Management Program (RAAMP) to deliver safety benefits on rural two-lane roads quicker and at a lower cost. Safety improvements on Oklahoma’s rural roadways are necessary as 65% of fatal crashes occur on rural roadways in spite of only 34% of the population residing in rural areas, well above the national average for rural fatalities.

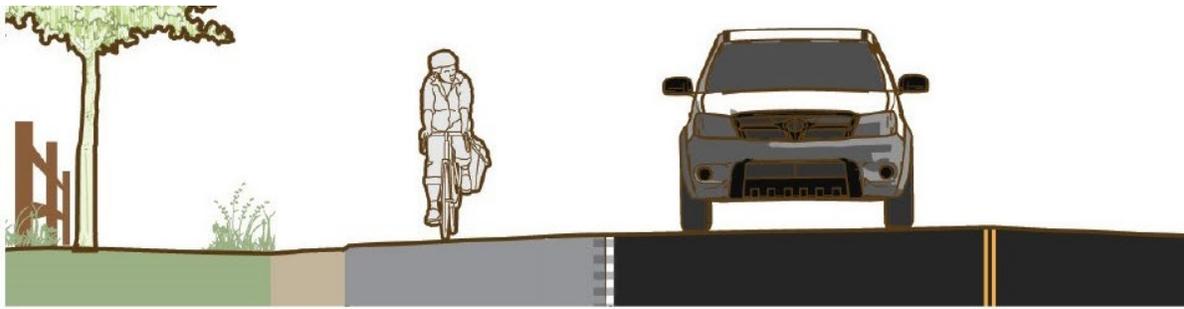
This application is a network of projects, as described in the Notice of Funding Opportunity (NOFO). It will improve nearly 40 miles of non-contiguous rural two-lane roadways with inadequate shoulders, deteriorating pavement condition, and outdated safety treatments, which will cumulatively make progress toward ODOT’s goal of updating rural two-lane roadways to modern standards. ODOT is requesting \$58.3 million of Rural Surface Transportation Grant funding in order to support the completion of this \$116.6 million project. Table 1 provides an overview of the project elements.

Table 1 Overview of the Safety Improvements on Oklahoma Rural Roadways Project

County	Highway	Total Length (miles)	Project Total
Atoka	SH 7	5.40	\$17,862,598
Beckham	SH 34	2.30	\$17,440,124
Cimarron	US 56	7.96	\$17,400,000
Ellis	SH 15	3.20	\$8,468,000
Grady	SH 19	5.87	\$24,838,588
Johnston	SH 48	6.00	\$12,664,880
Roger Mills	SH 152	3.83	\$9,821,017
Washita	SH 152	5.00	\$8,112,463
Total		39.56	\$116,607,670

The improvements from this project will build on the tremendous progress the State of Oklahoma has made in improving safety on its two-lane rural roadways and is aligned with strategic goals in both the Statewide Long Range Transportation Plan and State Freight Plan. Approximately 1,000 miles of two-lane highway are currently programmed in ODOT's 8-Year Construction Work Plan and under RAAMP out of nearly 5,300 miles of two-lane roadways with deficient shoulders in Oklahoma. This funding request will allow the State of Oklahoma to accelerate the delivery of these priority safety improvements.

Figure 1 Illustrative Example of Rural Roadway with Added Shoulders



Grant funding will allow for the improvement of sub-standard roadways in these rural areas by not only adding shoulders designed to modern safety standards (see Figure 1 for an illustrative example), but also corrections to outdated geometric design features such as vertical and horizontal curvatures, use of wet-visible reflective materials, and installation of rumble strips. These improvements will not only reduce crashes on the roadway segments, but also allow for safer recreational bicycling and allow for greater travel time reliability by allowing vehicular traffic to pass slow-moving agricultural equipment. Public transportation agencies operating in these areas, often providing door-to-door demand response service, will also benefit from improved roadway conditions.

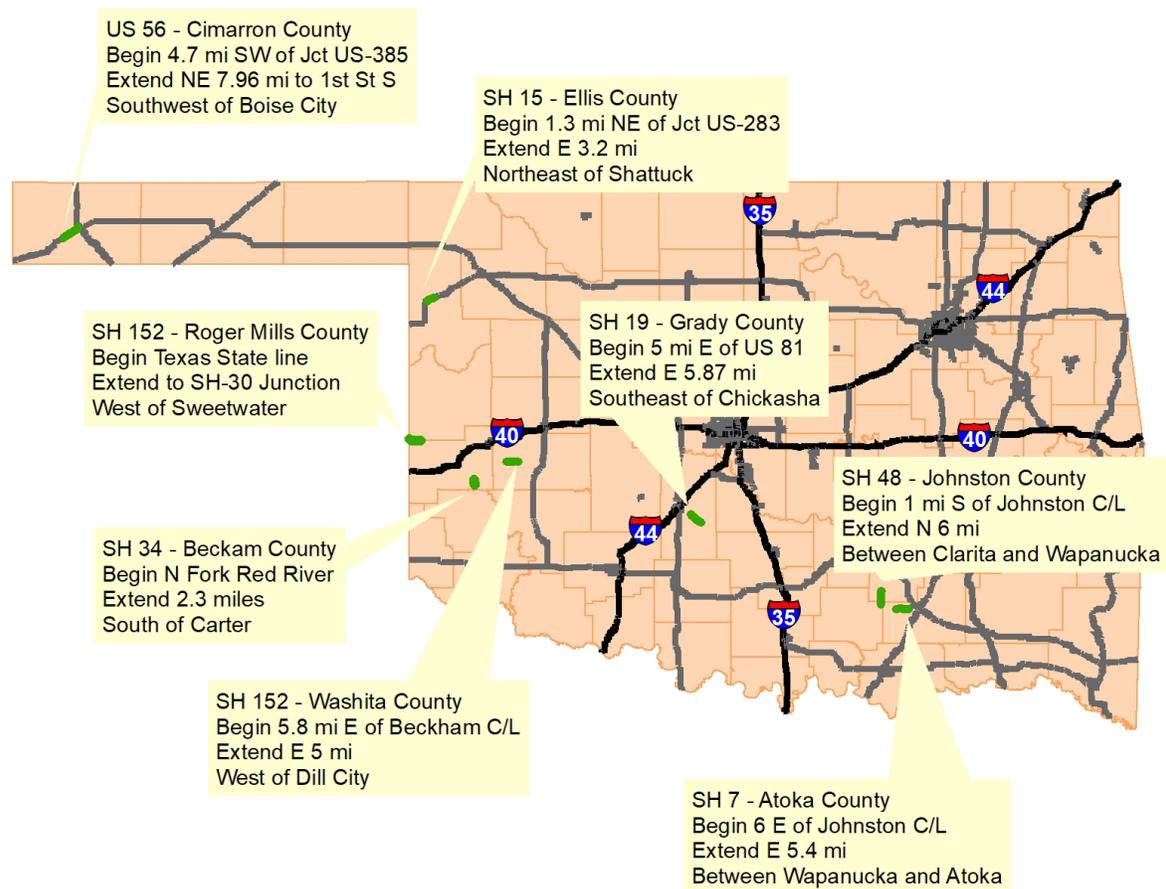
2 Project Location

This project is located on a network of roadways throughout the state with the intent to address fatality and serious injury rates in the rural areas of Oklahoma. The project is located along seven different roadway segments, as shown in Figure 2 on the following page.

As described in **Section 5.5**, this project has multiple segments in or bordering Areas of Persistent Poverty and Historically Disadvantaged Communities. It also includes segments in federally designated zones including an Opportunity Zone in Atoka County, the Tri-County Indian Nations Empowerment Zone, and the Choctaw Nation Empowerment Zone. Section 5.5 also notes that rural Oklahoma has a higher poverty rate than urbanized areas, and this project is entirely sited in – and will benefit – non-urbanized areas.

The roadway segments in this project are critical links between rural areas producing agricultural goods and energy and the interstate highway network, such as connections to I-40 and I-44. State Highway 287 near Boise City is under consideration for designation as an interstate highway that would link Mexico to Canada, and the segment of SH-56 near that highway is slated for improvement. There are also recreational bike trips using portions of the segments slated for improvement, as described in **Section 5.4**.

Figure 2 Safety Improvements on Oklahoma Rural Roadways Project Location



3 Project Parties

The Safety Improvements on Oklahoma Rural Roadways project recipient will be the Oklahoma Department of Transportation. ODOT is responsible for planning, designing, building, operating, and maintaining the state’s transportation system, with no other partners responsible for any aspects of project development or delivery.

ODOT has a long history of delivering similar projects. Within the last three years, the agency has initiated or completed improvements to 371 miles of two-lane roadways with deficient shoulders. In addition, ODOT is finalizing a TIFIA loan with the Build America Bureau to fund \$83 million in projects to address 44 miles of two-lane roadways with deficient shoulders as of the drafting of this application.

Several local, regional, and state partners from both the public and private sector are supportive of this project. All letters of support can be found on the [Project Website](#).

4 Grant Funds, Sources, and Uses of Project Funds

4.1 Previously Incurred Expenses

ODOT has already expended \$20.3 million on right-of-way, utility relocation, and engineering for this project. These expenses are not requested for reimbursement as a part of this funding request.

4.2 Future Eligible Costs

The future eligible cost of this project is \$116,607,670, of which a 50% grant-funded match is requested at \$58,303,835. The cost breakdown of the individual segments can be found in **Section 1**. In the event of a partial award, the number of segments could be scaled proportionally. The project funding will be used exclusively for construction costs. Bridges are the largest category of spending outside of the pavement work. A breakdown of the budget by major category (bridge and roadway/shoulder construction, contingency, and construction management) is found in Figure 3.

Figure 3 Safety Improvements on Oklahoma Rural Roadways Project Budget Categories



4.3 Project Funding Sources

This project will use an equal share of MPDG funding and state funding to deliver the improvements as described. State funds will be in the form of the State ROADS fund in order to match the requested federal funding. All projects are programmed into the Statewide Transportation Improvement Program (STIP) as outlined in **Section 7.3**. A link to the STIP can be found on the [Project Website](#). Figure 4 shows the funding split.

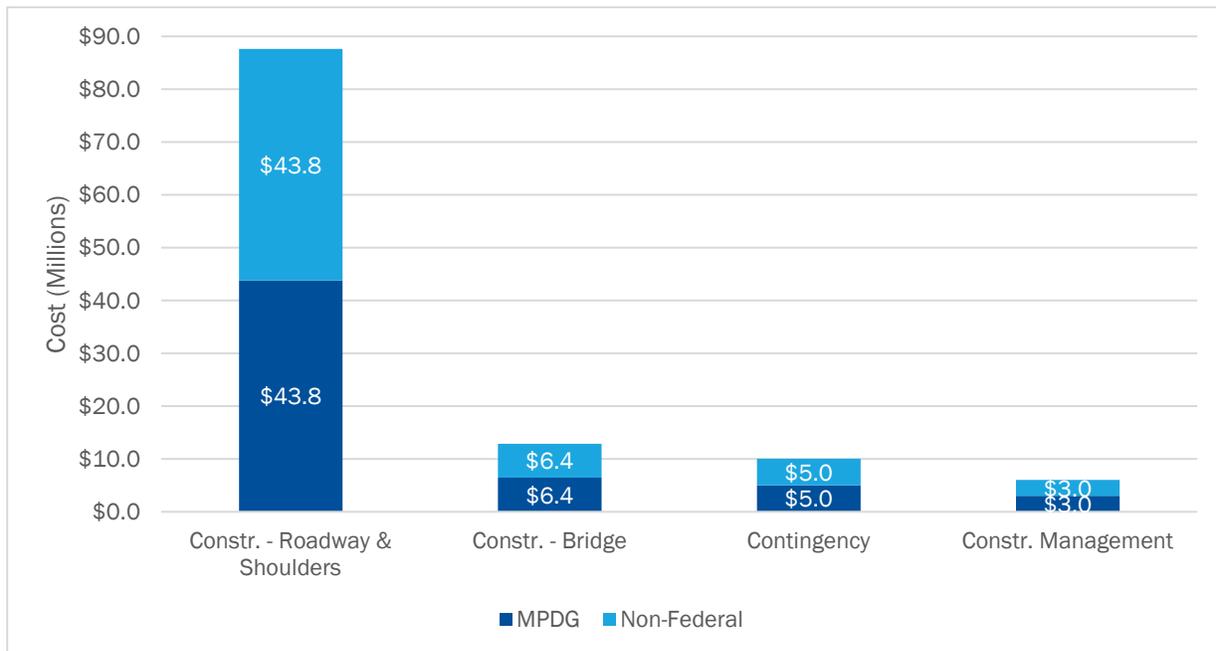
Figure 4 Project Budget by Source (\$M)



4.4 Project Budget by Funding Source

A budget depicting each category of eligible cost, planned funding sources, and their corresponding share of each major construction activity is depicted in Figure 5. The federal share for each construction activity is planned at 50%.

Figure 5 Project Budget Sources and Use



4.5 Contingency Reserves

The project is planned to have a 10% contingency reserve which reflects the expected continued volatility in labor and supply costs, in addition to any other unanticipated cost increases.

4.6 Limits on Freight, Rail, Port, and Intermodal Infrastructure

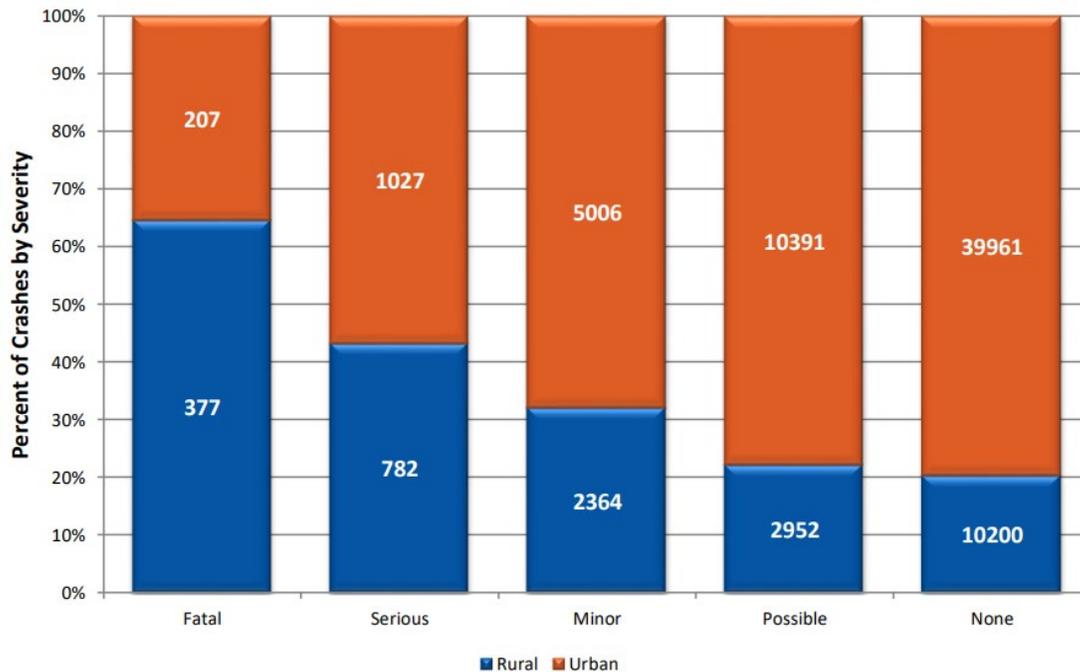
No components of this project are subject to the limits on freight, rail, port, and intermodal infrastructure.

5 Project Outcome Criteria

5.1 Safety

The Safety Improvements on Oklahoma Rural Roadways project is primarily a safety project. Rural roadways account for a disproportionate number of crashes in America, where 19% of the population lives but 45% of fatal crashes occur. The statistics in Oklahoma are even more stark, with 34% of the population residing in rural areas but 65% of fatal crashes occurring on rural roadways. The breakdown of crash types for urban versus rural roadways in Oklahoma is shown in Figure 6.

Figure 6 Rural versus Urban Crashes by Injury Severity, 2019



This project will do the following to improve roadways:

- Construct shoulders on the roadways, which are shown to reduce head-on crashes, sideswipe crashes, fixed object crashes, and pedestrian crashes.¹
- Correct vertical curves where thresholds do not meet modern design standards.

¹ https://safety.fhwa.dot.gov/ped_bike/tools_solve/walkways_brochure/

- Install rumble strips on shoulders and the majority of centerline miles to decrease accidental lane departure (estimated to reduce single-vehicle run-off roadway injury and fatal crashes by up to 36%).²
- Improve roadway surface condition, thereby reducing vehicle damage and erratic driving patterns due to avoiding poor pavement areas.

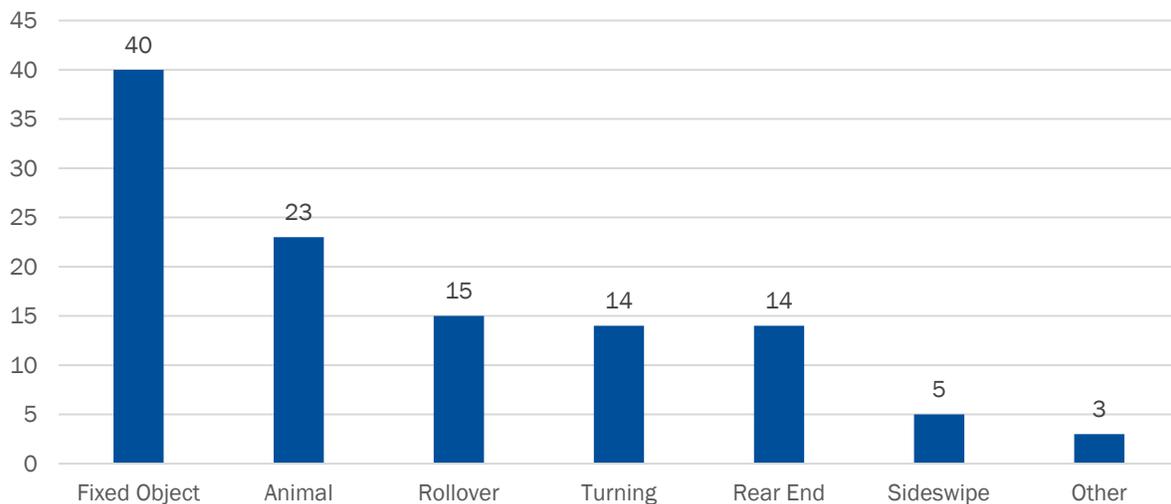
The ODOT Highway Safety Plan for 2021 noted that while urban traffic fatalities have been decreasing, rural traffic fatalities have increased.³ This is an important trend in the context of its first performance goal, “To limit a projected increase in traffic fatalities, from 657 in 2017 to 681 in 2021.” Given this trend in rural traffic fatalities, this project will support the overall safety goal to limit traffic fatalities on Oklahoma’s roadways by improving the safety of these rural two-lane roads.

The State of Oklahoma is also included in the list of states with a higher-than-average rate of lane departures, as indicated in the NOFO. The addition of shoulders and rumble strips will directly contribute to the reduction of lane-departure-related crashes on rural roadways.

The segments of roadway subject to this grant request will have stricter safety standards than are currently applied. When roadways are reconstructed, 4R design criteria from the latest AASHTO guidance will be applied. Currently, the roadways are held to a 3R standard, which is designed to a standard 15 mph below the 4R criteria from AASHTO.

In the project areas, there were 114 crashes between 2015 and 2020, or 19 crashes per year. From these crashes, 48 persons were injured and three killed. The breakdown of these crashes by type can be seen in Figure 7.

Figure 7 Crash Types on Project Roadways, 2015 - 2020



² https://safety.fhwa.dot.gov/roadway_dept/strat_approach/brochure/docs/FHWA-SA-21-023_Rollover_Crashes.pdf

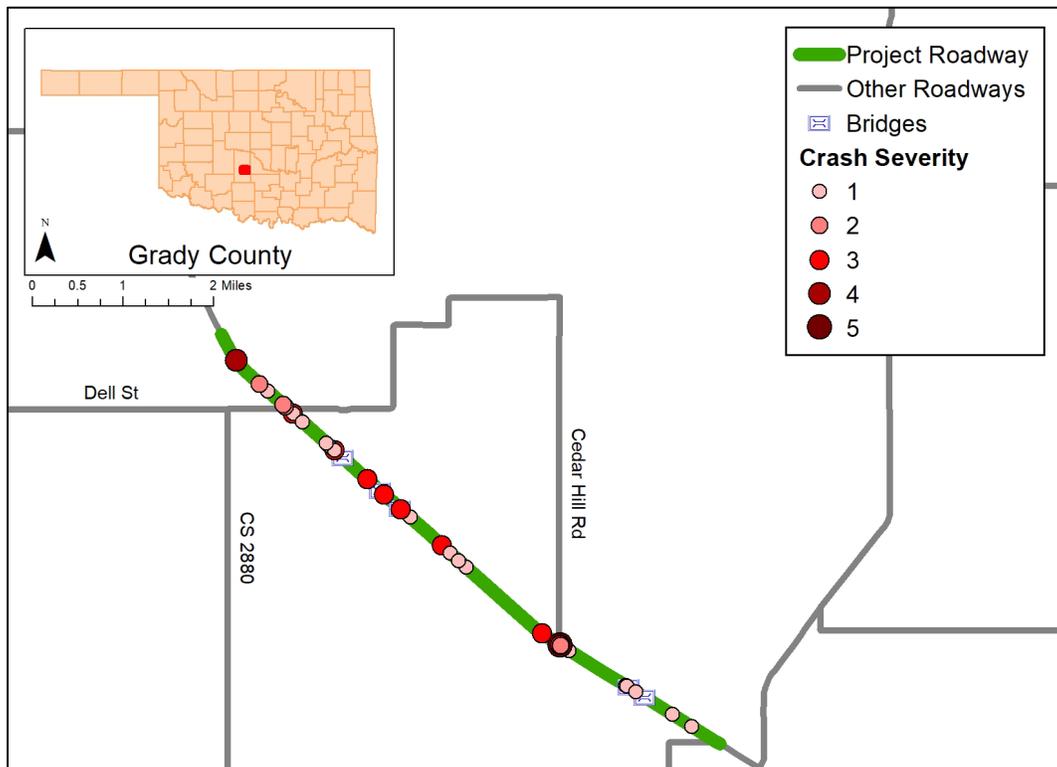
³ https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/ok_fy21_hsp.pdf

Approximately one-third of the crashes are classified as “fixed-object” crashes where the vehicle left the roadway and hit an object (tree, guard rail, traffic sign, etc.) that could have been avoided with the installation of shoulders and rumble strips. Other crash types, such as those resulting from oncoming traffic crossing the yellow dividing line, can be reduced by adding shoulders so that drivers have more room to maneuver out of the way as well as centerline rumble strips.

Additionally, the construction of shoulders will improve safety for bicyclists and pedestrians utilizing the roadway. Shoulders provide a path of travel for active transportation users that is spatially separated from higher-speed vehicular traffic. Rumble strips, when paired with adequate shoulder widths, add another layer of protection by alerting drivers drifting into the shoulder. While the rural nature of the area means that there are likely few people biking or walking for work commute purposes, recreational cycling will benefit; there are recreational cycling events actively promoted by the Oklahoma Tourism and Recreation Department, such as the [Dehydrator Bicycle Ride](#) in southwest Oklahoma.

As an example of the potential for crash reductions, Figure 8 shows the crash locations and their severity for the segment in Grady County. The Grady County segment includes 13 injuries (28% of injuries between 2015 and 2020) and one fatality (33% of fatalities between 2015 and 2020). These crashes are spread throughout this project extent, signifying that the systemic improvement of the entire segment will have a positive impact on the reduction of crashes. The full map series of crashes can be found in **Appendix C**.

Figure 8 Map of Crashes on Project Roadways – Grady County



5.2 State of Good Repair

Maintaining a state of good repair for Oklahoma’s roadways is a strategic priority for the state, and one in which it has made significant progress. In 2021, the Oklahoma Capital Improvement Authority was authorized to issue bonds and receive federal loans to make significant investments in the state’s roadways. RAAMP was specifically authorized as a multi-year program to invest in the state’s rural two-lane roadways.



Poor pavement conditions on Oklahoma’s rural roadways. SH-82, Cherokee County.

State of good repair is critical for Oklahoma’s rural roads given their importance in agricultural and energy production, especially large-scale wind farms (described further in **Section 5.3**). Current price volatility in energy and food underscores the importance of these linkages.

The state’s Transportation Asset Management (TAM) Plan indicates that for non-National Highway System (NHS) pavement, the state is not on track to achieve its desired State of Good Repair over the next ten years. For pavement, the desired maximum percentage rated as “poor” is 12.7% and the projected 10-year performance is 18.1%, a 5.4% gap (Figure 9). This not only indicates that the 10-year projection for non-NHS pavement condition does not meet minimum goals, but it also shows a considerable decline in condition at existing funding levels.

Figure 9 Oklahoma Pavement Conditions of Non-NHS Pavements

Non-NHS Pavements	Good	Fair	Poor	
Desired State of Good Repair	42.1%	45.2%	12.7%	
Current Performance (2018)	29.8%	66.3%	3.9%	
Current Performance Gap	12.3%		-8.8%	
10-Year Projected Performance	24.1%	57.8%	18.1%	
10-Year Projected Performance Gap	18.0%		5.4%	

Source: [Oklahoma Transportation Asset Management Plan](#)

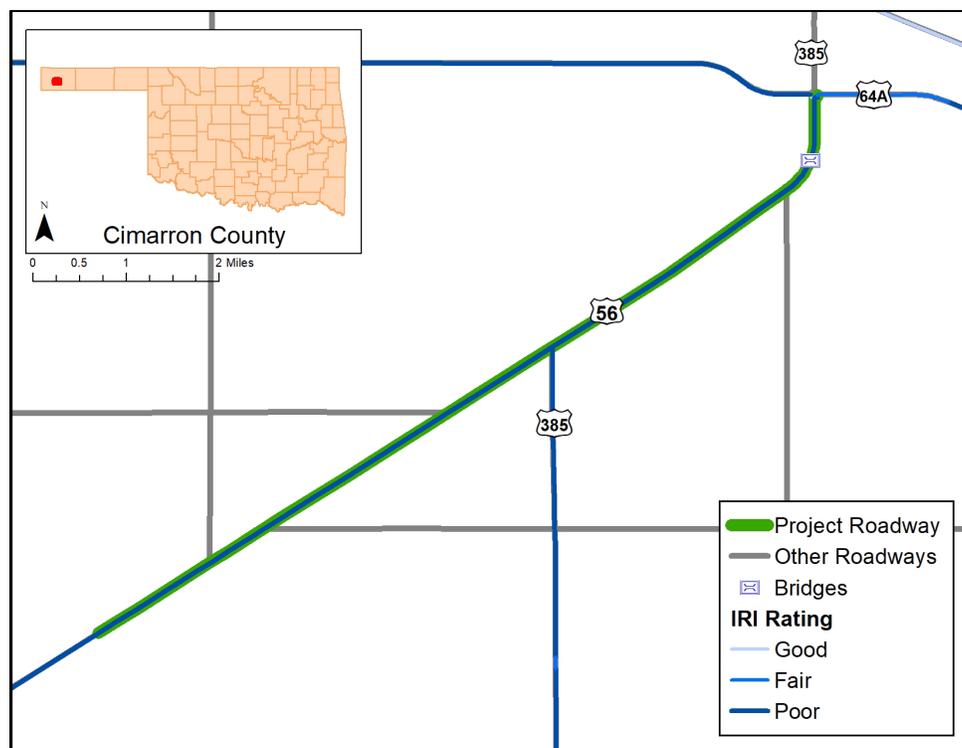
This project will support better pavement condition on the non-NHS roadways through the full-depth reconstruction of the selected project areas. This will support the TAM plan goal of no more than 12.7% of roadways rated as “poor” condition, and help move the needle on the

goal of at least 42.1% of roadways rated as “good.” Within the project extent, various segments are in more dire need of repair than others. Figure 10 on the following page shows the extent of the project segment in Cimarron County of which the entire segment is currently in poor condition (the full map series of pavement condition can be found in **Appendix C**). The completion of the Safety Improvements on Rural Oklahoma Roadways will help to reduce future maintenance costs, estimated to be \$84 million for pavement maintenance alone if this project is not completed versus \$25 million if this project is completed.

ODOT manages 30,389 lane miles of roads, the majority of which (20,743 lane miles) are non-NHS facilities. In general, non-NHS lane miles are in a worse state of repair than NHS (5.4% rated as poor compared to 4.1%, respectively). This trend is reflected in the segments included in this project – of the nearly 40 miles of roadway being improved by the proposed project, **68% is rated as having fair or poor condition.**

These improvements will also bring the benefit of reduced operations and maintenance costs. As shown in the Benefit Cost Analysis (Appendix A), the project will result in a discounted operations and maintenance (O&M) cost savings of over \$26 million. This is because ODOT plans to undertake a mill-and-overlay at a greater depth than typical repaving projects for the roadway segments included in this grant. This will extend the useful life of the pavement beyond the typical maintenance schedule, bringing future savings as compared to a no-build scenario.

Figure 10 Roadway Conditions Improved by Proposed Project – Cimarron County

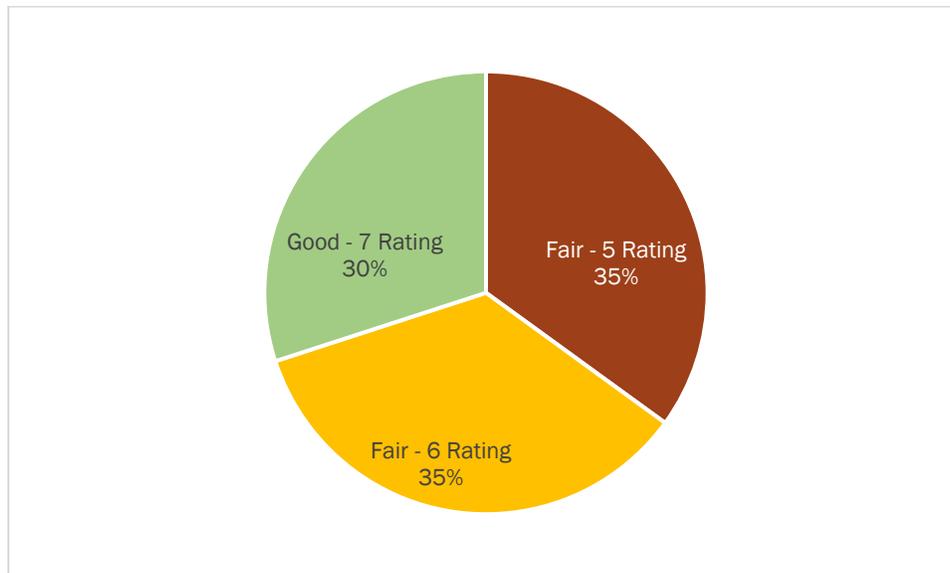


Another strategic improvement is the state of good repair in the condition of bridges. In 2004, Oklahoma was ranked 49th in the nation when 17% of its bridges were ranked as structurally

deficient or poor. After a deliberate investment program, Oklahoma reduced that number to 67 structurally deficient bridges, all of which are either under construction or programmed for replacement as of the drafting of this grant application. Today, Oklahoma ranks 7th in the nation for the lowest percentage of structurally deficient bridges.⁴

Out of the 20 bridges in the project extent, this project will replace six bridges and rehabilitate nine. One bridge is slated for removal. While none of these bridges are currently rated as poor, 70% of the bridges within the project extent are rated as “fair,” with 35% receiving the lowest “fair” rating (five) as shown in Figure 11. Improving these bridges will contribute to the enhancement of freight mobility by reducing weight restrictions, minimizing lengthy diversions, and improving the safety of the bridges for the traveling public. In addition, the \$14.9 million of the project cost to improve these bridges will help to avoid the \$4 million in anticipated bridge maintenance costs if this project is not completed. The portion of the project in Beckham County accounts for the largest portion of these bridge improvements at \$7.6 million, or 51% of that segment’s total cost, for bridge replacement. Both bridges located on this segment (Structures 3804 and 3815) are rated as having a condition of fair with a score of five.

Figure 11 Condition of Bridges Located in the Project Extent



5.3 Economic Impacts, Freight Movement, and Job Creation

This project will help Oklahoma support its rural economy, which has strong employment in agriculture and energy production. The importance of these two areas of the economy has recently been highlighted due to recent price volatility. Economic activity will be supported in the following ways:

⁴ <https://oklahoma.gov/odot/citizen/newsroom/2021/september/oklahoma-moves-up-to-no--7-in-highway-bridge-conditions--keeps-t.html>

1. **Improve System Operations:** Energy sector equipment, such as oil rig materials and large wind turbine towers, must move on these narrow roadways. Adding shoulders, smoothing vertical curves, and other geometric design improvements to the roadways will allow for faster movement of this equipment and therefore reduce shipping costs. The project will also reduce head-on conflicts between large agricultural equipment, such as combines, and personal vehicles which are able to travel at higher speeds. Sightlines will improve and shoulders will allow for easier passing of the equipment.
2. **Multimodal Transportation:** As described in **Section 5.5**, multiple public transportation operators use the rural roadways included in this project. The addition of shoulders and improvement of pavement conditions will improve the safety of vehicle operators. Shoulders in particular will provide a safer passenger discharging area for those riders boarding or alighting on these rural roadways.
3. **Job Opportunity Access:** These project areas provide critical connections between underserved rural communities and the more robust urban economies of Oklahoma. For instance, State Highways around Wapanucka (SH-7 and SH-48) are both proposed for improvements, and provide access between surrounding communities such as Atoka as well as north to Oklahoma City, the main economic engine of the State. Wapanucka, with a poverty rate of 43.6%,⁵ and Atoka, with a poverty rate of 30.0%,⁶ will both have improved job access in the region and to the main urban center as a result of this project.
4. **Improving Economic Strength:** The main products of these rural areas are energy and agriculture, two sectors vitally important to the American economy which have seen substantial price volatility over the past year. These improvements will cumulatively enhance the mobility of equipment that serves these sectors, such as large wind turbines (Figure 12), oil rig equipment, and combines, by improving pavement condition, upgrading bridges, and creating safer passing conditions for faster moving traffic.

Figure 12 Turbine Blade in Weatherford, OK



Source: [Wikimedia Commons](#)

5. **Recreational and Tourism Opportunities:** There has been unprecedented new interest in outdoor recreation and tourism since the onset of the COVID-19 pandemic, and these improvements will facilitate safer travel to the many scenic areas around the State of Oklahoma. As referenced in **Section 5.1**, there are recreational rides that take place on

⁵ <https://data.census.gov/cedsci/profile?g=1600000US4078300>

⁶ <https://data.census.gov/cedsci/table?q=Atoka%20city,%20Oklahoma%20Income%20and%20Poverty&tid=ACSST5Y2020.S1701>

these two-lane roadways which will benefit from having wider shoulders. The improvement on US-412 near Boise City will benefit those traveling to the Kiowa and Rita Blanca National Grasslands for birdwatching, hiking the Santa Fe Trail, picnicking, and other recreational activities.⁷

6. **High-Quality Job Creation:** This project will directly lead to good-paying jobs in the construction sector. The median hourly wage in Oklahoma is \$18.03 as compared to \$21.64 in construction, a 20% premium.⁸
7. **Workforce Opportunities:** ODOT also has a goal of 10% of its authorized funds expended with Disadvantaged Business Enterprises.⁹ To that end, it has several efforts dedicated to DBE firms such as its On-Boarding Program, its Small Enterprise Training Program, and its Contract Compliance Division.¹⁰ Funds allocated from the Rural Program for this project would be subject to the DBE goal.
8. **Addressing Acute Economic Challenges:** As described in **Section 5.5**, rural Oklahoma has much more acute economic challenges than urbanized areas in the State. This project will directly benefit mobility and safety in these rural parts of the State by updating roadway geometry to current standards and installing shoulders and rumble strips, a proven cost-effective safety measure that will save lives.
9. **Support Land-Use Productivity:** Rural Oklahoma is an economically productive, vital part of the State and the nation. In 2020, Oklahoma generated approximately \$6.2 billion in agricultural cash receipts, roughly 3.3% of State GDP.¹¹ The energy sector drives roughly 1/3 of Oklahoma's economic activity, with wind energy, oil, and gas located primarily in the State's rural areas.¹² These projects will directly support the mobility necessary to keep these sectors thriving.
10. **United States Competitiveness:** The large-scale deployment of wind energy is crucial to the future energy mix of the United States, and Oklahoma is leading the way. As of 2020, 1/3 of the State's electricity was generated by wind energy, third in the



Turbine tower transported through rural Oklahoma

⁷ https://www.fs.usda.gov/detail/cibola/home/?cid=fsbdev3_065702

⁸ https://www.bls.gov/oes/current/oes_ok.htm#47-0000

⁹ https://oklahoma.gov/content/dam/ok/en/odot/civil-rights/2021_DB_E_Program_Manual.pdf

¹⁰ <https://oklahoma.gov/odot/business-center/contract-compliance/dbe.html>

¹¹ <https://economic-impact-of-ag.uada.edu/oklahoma/>

¹² <https://ee.ok.gov/the-transformation-of-the-energy-sector/>

nation behind Texas and Iowa.¹³ There is tremendous potential to expand this wind energy, particularly in the western part of Oklahoma where many of the project segments are located. These large pieces of equipment must travel by two-lane roadway, and the safety and state of good repair improvements will enhance their mobility.

5.4 Climate Change, Resiliency, and the Environment

This project will enhance resiliency of ODOT assets and incorporate lower-carbon project delivery approaches. ODOT routinely uses warm mix asphalt instead of hot mix asphalt, which is estimated to reduce between 25% and 50% of the emissions related to asphalt production.

There are also six bridges to be replaced, nine modified, and one removed. Based on available data, bridges in at least three counties (Grady, Roger Mills, and Washita) are in or adjacent to a 100-year floodplain. The new bridges constructed as a part of this project will have updated hydraulic designs to better handle extreme weather events.

These designs can include widened drainage areas, raised bridge profiles to allow water and debris to clear the structure, stronger bridge foundation elements to withstand water flowing at fast speeds, and use of construction materials better suited to withstand extreme heat and precipitation events.



*Rural bridge in Oklahoma with poor pavement condition
Route 66, Washita County*

This project will also support public transportation operations. The following public transportation operators¹⁴ use these roadways that will have safety and state of good repair improvements:

- MAGB Transportation (Cimarron County)
- Red River Transit (Beckham County, Roger Mills County, Washita County, Ellis County)
- Washita Valley Transit (Grady County)
- JAMM Transit (Johnston County, Atoka County)

¹³ <https://www.eia.gov/state/analysis.php?sid=OK>

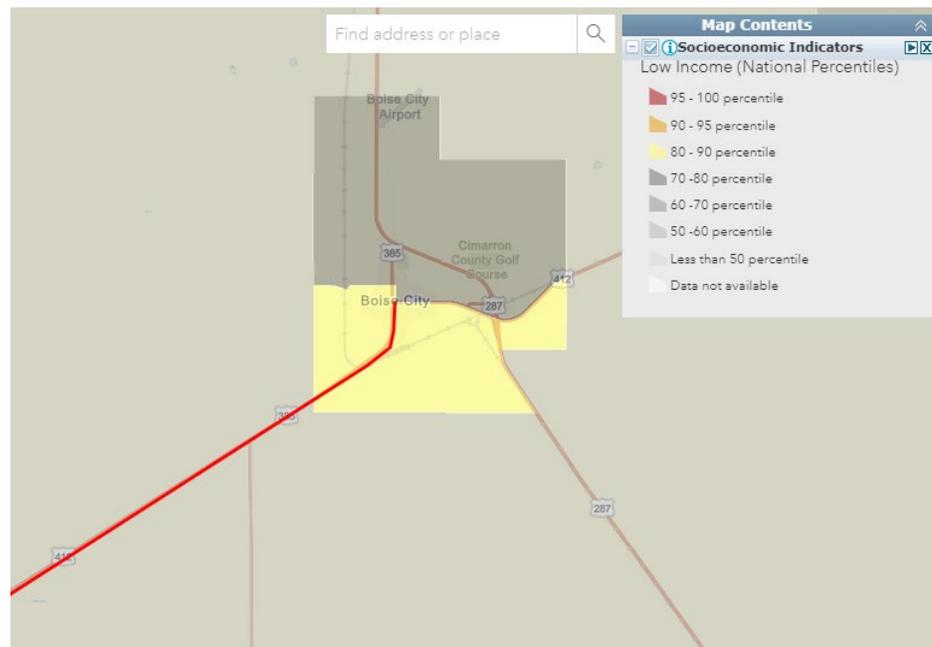
¹⁴ <https://www.arcgis.com/apps/webappviewer/index.html?id=630f8570ed27425b8fe6c135eefaeb7c>

The proposed improvements will allow for faster, safer travel and will result in less wear and tear on the transit vehicles. Because these rural transportation agencies primarily provide demand response service, there is no coordination needed on bus stop placement along the segments slated for upgrade. However, in those instances where passengers are discharged on upgraded street segments, the new shoulders will provide for a safer walking path than the current design with no or insufficient shoulders.

5.5 Equity, Multimodal Options, and Quality of Life

Rural Oklahoma has a higher poverty rate than populations residing inside the major metro areas. For example, the poverty rate in Oklahoma City was 13.9% in 2017 as compared to 19.1% outside of metropolitan areas.¹⁵ The EJScreen tool available from EPA confirms this general description, as well as several areas where the specific project locations are in underperforming economic areas. For example, the project area shown in red in Figure 13 is in an area designated in EJScreen as in the 80th to 90th percentile for Low Income residents.

Figure 13 Example Roadway Improvement (Red) in Low-Income Area



Source: EJScreen

Furthermore, within the state of Oklahoma, nearly half of the defined Census Tracts are identified as either an Area of Persistent Poverty (APP) or a Historically Disadvantaged Community (HDC). Of the eight project roadway segments, four fall within such Census Tracts as shown in Table 2. In the case of the SH 7 segment in Atoka County, two census tracts contain the project boundaries for a total of five Census Tracts impacted by this project.

¹⁵ <https://okpolicy.org/2017-oklahoma-poverty-profile/>

Table 2 Areas of Persistent Poverty and Historically Disadvantage Communities

County	Highway	Census Tract(s)	Area of Persistent Poverty – County	Area of Persistent Poverty – Census Tract	Historically Disadvantaged Community – Census Tract
Atoka	SH 7	5877	No	Yes	No
		5878	No	No	Yes
Ellis	SH 15	9526	No	Yes	No
Johnston	SH 48	3882*	No	Yes	Yes
Roger Mills	SH152	9665**	No	Yes	Yes

*This SH 48 improvement project in Johnston County extends within Coal County and Census Tract 3882.

**This SH 152 improvement project in Roger Mills borders Beckham County and Census Tract 9665 located in Beckham County.

Source: Areas of Persistent Poverty Project (APP) and Historically Disadvantaged Community (HDC) Status Tool

Portions of the Safety Improvements on Oklahoma Rural Roadways project also fall within federally designated areas. Most notably the project portions in Atoka and Johnston Counties are within several such areas. Both segments fall within the Choctaw Nation Promise Zone. The Atoka County segment is within the Atoka County Opportunity Zone and the Johnston County portion falls within the Tri-County Indian Nations Empowerment Zone. Note that several of these areas also overlap with the Areas of Persistent Poverty and Historically Disadvantaged Communities.

This project will help improve the geographic equity of these regions by allowing for more reliable and safer roadway travel in these rural areas of the state. This will further enhance mobility, providing greater access to jobs and improve the flow of goods and services.

5.6 Innovation Areas

Innovative Technology

ODOT plans to use innovative safety-related pavement treatments when constructing these new segments of rural roadway. One example is wet-reflective pavement markings. Rain events can cause the visibility of pavement markings to be reduced, thus increasing the potential for a crash due to lane departures. Improved materials that deliver superior retroreflectivity during wet road surface conditions were shown to decrease crashes on two-lane roads by up to 5.6% in one study.¹⁶ The [Crash Modification Clearinghouse](#) indicates that this treatment can reduce nighttime wet-weather crashes by 28% (CMF 10076).

¹⁶ <https://www.fhwa.dot.gov/publications/research/safety/15083/15083.pdf>

Innovative Project Delivery

ODOT engages in partnerships to expedite project delivery and streamline permitting, enhancing the speed of the project pipeline and thereby reducing administrative burden. Two partnerships in particular stand out as innovative:

- **Liaison to USACE and US Fish and Wildlife Service** – Given the number of projects that interact with waterways, ODOT maintains a liaison to the US Army Corps of Engineers and US Fish and Wildlife Service to streamline the permitting process. This has proven effective in enhancing communication and identifying problems early in the project development process.
- **University of Oklahoma partnership** – ODOT maintains a partnership with the University of Oklahoma to undertake NEPA permitting work on behalf of the agency. This taps into the environmental expertise at the flagship research university to support project delivery through often complex environmental issues, such as water quality management, historic preservation, and cultural resources.



*Rural Oklahoma roadway with no shoulder
US 277, Cement County*

Innovative Funding

RAAMP, as described in **Section 1**, is the State's approach for updating the safety elements of the thousands of miles of two-lane rural roadways to modern standards. In order to do this, the State used TIFIA loan financing to fund a portion of RAAMP and help accelerate other sections. This grant funding request is another example of the State leveraging its TIFIA loan funding to further expedite the delivery of these critical safety improvements in rural areas.

6 Benefit Cost Analysis

Benefit Cost Analysis

The benefit cost analysis showed a benefit/cost ratio (BCR) of 0.9 based on safety improvements, operations & maintenance savings, and residual value of the infrastructure. The project is estimated to generate \$65 million over the life of the project in discounted benefits resulting from safety improvements. A summary of the analysis is shown in Table 3.

Table 3 Benefit-Cost Ratio Summary

BCA Metric	Project Lifecycle	
	Undiscounted (Millions of \$)	7% Discount (Millions of \$2020)
Benefits:		
Safety Crash Cost Reductions	\$240,041,956	\$65,128,383
Maintenance & Operations Savings	\$65,000,000	\$26,976,321
Residual Asset Value	\$8,291,844	\$776,638
Total Benefits	\$313,333,800	\$92,881,342
Total Costs	\$136,865,666	\$108,161,471
Benefit/Cost Ratio	2.3	0.9
Net Present Value	\$176,468,135	-\$15,280,129

ODOT recognizes that a BCR under 1.0 indicates that this project results in fewer discounted benefits than the cost of the project. Due to the low population densities that define rural areas, rural projects are at a structural disadvantage when conducting a benefit-cost analysis using typical benefit-cost approaches. The Federal government and State governments across the country have recognized this challenge and used various strategies, such as rural funding carve-outs or lane-mile-based formulas, to help ensure geographic equity. Unfortunately, the benefits derived from the BCA methodology prescribed in the guidance strongly favors project areas in densely populated regions, making achievement of a BCR of 1.0 or higher challenging for a rural project.

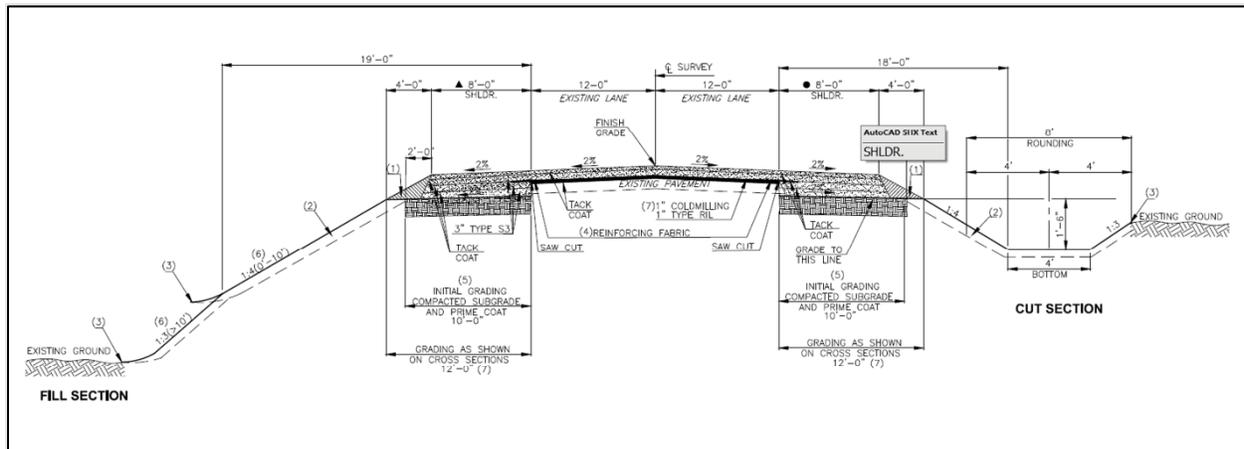
The BCR determined here does not include benefits that are harder to quantify which would likely increase the ratio above 1.0. The enhanced roadways will provide greater access to the State's outdoor areas and recreational bicycling events, further supporting its tourism industry and encouraging healthy lifestyles. Rural areas in the state are substantial producers of clean wind energy, and these roadway improvements will facilitate the transportation of large wind towers and turbine blades for large-scale wind farms. This will support a national goal of energy independence and greater use of carbon-free energy. These roadway improvements will also support areas historically underserved in the State, rural communities with higher poverty and unemployment, and lower household incomes. These roadway safety improvements and state of good repair investments will directly enhance the geographic and social equity of Oklahoma. Lastly, the addition of shoulders will provide refuge for emergency and maintenance vehicles, thereby reducing the impacts of a vehicle stopped on the roadway while creating a safer stopping point.

7 Project Readiness

7.1 Technical Feasibility

This project was designed using the most recent ODOT [Roadway Design Standards & Specifications](#) (see Figure 14 for a typical cross-section).

Figure 14 Example Cross-Section



ODOT has designed and delivered hundreds of miles of similar projects that include the technical elements listed in the Statement of Work found below. The agency has a high degree of confidence that, given the straightforward nature of the project combined with the previous similar project experience, there is a low likelihood of significant project delay or budget risk.

Environmental review has been completed for all of the project segments and they have been cleared as Categorical Exclusions (environmental documentation can be found on the [Project Website](#)). There were no findings of permanent negative environmental impact that could not be mitigated through typical project management practices.

Statement of Work

This project will consist of typical work elements, such as grading the surrounding right-of-way to prepare it for expansion of paved surface for shoulders, installation of sub-base material, and mill-and-overlay of the existing paved surface. These elements will directly impact residents living in nine Oklahoma counties (Atoka, Beckham, Cimarron, Coal, Ellis, Grady, Johnston, Roger Mills, and Washita) while providing secondary benefits for other surrounding counties as roadway users travel from place to place.

Specific work elements include:

- 39.56 miles of safety shoulders to rural highways
- 30.22 centerline-miles of asphalt overlay

- 9.71 centerline-miles of roadway reconstruction
- 15 bridge reconstructions/rehabilitations
- Installation of rumble strips on shoulders and centerline along length of project
- Replacement of guard rails



Roadway curvature on rural roadways.
US 77 and SH 51, Logan County

More detail on work elements can be found in the NEPA documentation found in the [Project Website](#).

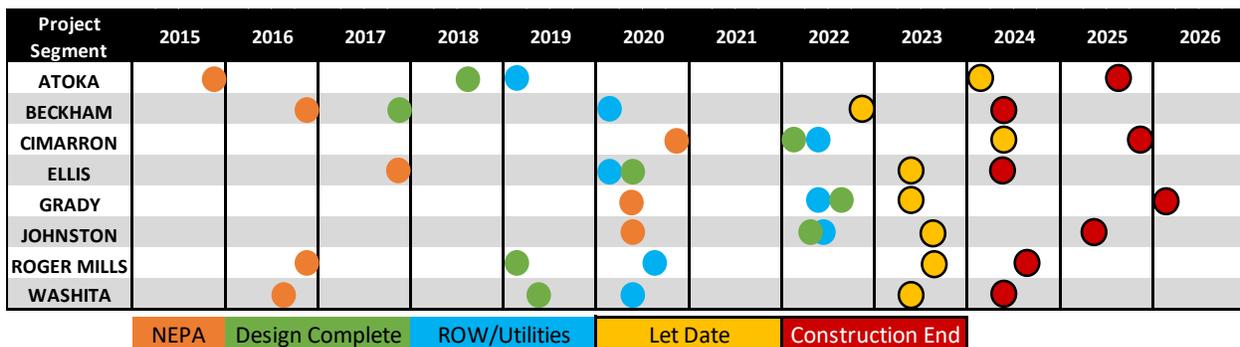
Title VI Compliance

This project complied with relevant aspects of Title VI of the Civil Rights Act of 1964. As a part of the NEPA process, consultation with American Indian tribes was undertaken on those project extents that impacted tribal land. Furthermore, the projects are programmed into the STIP. As a part of that process, members of the public were invited to comment on the project as proposed in compliance with the ODOT [Public Participation Plan](#) and [Language Access Plan](#).

7.2 Project Schedule

The project schedule is divided between the eight non-contiguous portions of the project, as shown in Figure 15. Several elements of the project have already been initiated and/or completed, such as NEPA evaluation, right-of-way acquisition and utilities relocation, and final design. Projects are expected to be let between late 2022 and mid-2024, with the final project completed at the start of calendar year 2026.

Figure 15 Project Schedule by Milestone Completion Date



7.3 Required Approvals

Environmental Permits and Reviews

NEPA Status

This project has been environmentally cleared as of the drafting of this application and is not expected to have significant impacts on the environment, historical or cultural resources, residential displacements, or other individual or cumulative impacts. Environmental clearance was provided between 2015 and 2020 for the various project segments.

ODOT conducts its NEPA process at the start of the project development process and has obtained categorical exclusions for all portions of the project. Upon construction initiation, depending on elapsed time, ODOT will use its programmatic agreement with FHWA to use a NEPA checklist to review the project and confirm there have been no substantive changes to project area conditions. An example of the checklist can be found on the [Project Website](#).

Reviews, Approvals, and Permits by Other Agencies

There are no approvals remaining for this project. These projects are conducted under a nationwide permit and will not require a Pre-Construction Notification with the US Army Corps of Engineers. Other approvals were obtained through the NEPA process.

Environmental Studies or Other Documents

Environmental review was undertaken through Categorical Exclusions for the eight project segments which are available on the [Project Website](#). They have all been approved as of the drafting of this application.

Discussions with U.S. Department of Transportation Modal Administrations

ODOT has worked closely with the Federal Highway Administration in the development and delivery of RAAMP, the program in which this project is reflected as a targeted need. Meetings with the local FHWA office are conducted as needed regarding coordination for these programs. Numerous meetings have taken place with the Build America Bureau regarding the TIFIA funding being leveraged for similar two-lane road improvement projects. These meetings have been opportunities to describe the cost-effective safety interventions that these improvements deliver to users of these rural roadways.

Public Involvement

This project went through the STIP process which allowed for public input. Outside of metropolitan planning areas, transportation projects are selected by the State in consultation with the affected local officials. A documented public involvement process to ensure consultation with local officials has been developed which is separate and discrete from the transportation policy and project development in metropolitan areas of greater than 50,000 population. Public comments on the [STIP](#) are included starting on page 74.

Additionally, notices went out to impacted property owners during the project development process. Those notifications alerted these impacted property owners to the project and impacts to the areas adjacent to the roadway, typically arising from the need for additional right-of-way for the construction of shoulders.

State and Local Approvals and Planning

The projects are programmed into the STIP under the following project numbers in Table 4.

Table 4 STIP Project Numbers

County	Project Number
Atoka	Project Number 2406604
Beckham	Project Number 2699904
Cimarron	Project Number 3186704
Ellis	Project Number 2967404
Grady	Project Number 3042507
Johnston	Project Number 3104704
Roger Mills	Project Number 2953004
Washita	Project Number 2435210

The project segments are outside of metropolitan areas and therefore not included in any of the regional Transportation Improvement Programs.

Federal Transportation Requirements Affecting State and Local Planning

The [Statewide Long-Range Transportation Plan](#) includes as a goal to add shoulders on portions of the state highway system that lack them or have deficient shoulders (page 116). This goal was developed to address safety issues on the State’s rural roadways.

Additionally, the [Oklahoma Freight Plan](#) cites a need for shoulders on rural two-lane highways (page 24). The reason for this is that lack of shoulders makes passing, particularly of slow-moving agricultural equipment, less safe and also affords no provision to pull over when breakdowns occur.

From the Oklahoma State Freight Plan:

“We need to work on providing adequate shoulders on our rural state highways for the safety of our employees and for rural residents.”

- Oklahoma construction material supply
Communications Director

7.4 Assessment of Project Risks and Mitigation Strategies

ODOT has completed an assessment of project risks. Mitigation strategies to address those risks will continue throughout the project development process. The most significant risks and mitigation strategies are summarized in Table 5.

Table 5 Project Risks and Mitigation Strategies

Project Risk	Mitigation Strategy
Material Availability	There is an ongoing shortage of material and equipment, exacerbated by Buy America requirements. ODOT has managed these uncertainties through bulk purchasing and economy-of-scale procurements that are able to successfully compete for construction materials and equipment.
Labor Availability	There is a labor shortage that is especially acute in the construction sector which is being intensified by the volume of construction work happening not only in Oklahoma but around the country. This project will mitigate that risk by procuring these project segments individually, thereby attracting the more numerous small- and mid-sized contractor firms.

8 Statutory Requirements

The Safety Improvements on Oklahoma Rural Roadways Project is applying for consideration of the Rural Surface Transportation Grant. As such, this project meets the criteria list in the Notice of Funding Opportunity as shown in Table 6.

Table 6 Rural Project Statutory Requirements

Rural Project Requirement	Safety Improvements on Oklahoma Rural Roadways Project Features
1. The Project will generate regional economic, mobility, or safety benefits.	The Project is located on rural roadways within the state of Oklahoma which connect rural areas to one another and the State’s urbanized areas. The project will enhance the safety of those roadways by adding shoulders and other safety measures, and will enhance mobility by improving the pavement and bridge conditions for users, including commercial, personal, and public transportation users. Over the course of the project life, 276 property-damage-only crashes, 201 injuries, and 14 fatalities will be avoided.
2. The Project will be cost-effective.	This project serves historically disadvantaged rural parts of the state and is projected to reduce crashes resulting in fatalities and serious injuries. The region that will benefit from these safety improvements generates critical energy and agricultural products used around the nation, the importance of which is highlighted by consumer hardship produced by recent price volatility. This project is a cost-effective way to support these communities through safer roadways enhancing mobility.
3. The project will contribute to the accomplishment of one or more of the	Safety: There were 114 crashes in the project area between 2015 and 2020. The project is anticipated to decrease the cost of fatal and injury crashes by \$65 million over the life of the project (discounted).

Rural Project Requirement	Safety Improvements on Oklahoma Rural Roadways Project Features
<p>national goals under 23 U.S.C. § 150.</p>	<p>Infrastructure Condition: This project will support better pavement condition on non-NHS roadways through the full-depth reconstruction of the selected project areas. This will support the TAM plan goal of no more than 12.7% of roadways rated as “poor” condition, and help move the needle on the goal of at least 42.1% of roadways rated as “good.”</p> <p>Congestion Reduction: This project will allow for smoother flow of traffic on rural two-lane roadways through improved pavement condition and installation of shoulders. These two-lane roads often have slow agricultural equipment using them, and shoulders will allow for vehicular traffic to more safely pass this equipment.</p> <p>System Reliability: This project will reduce the number of crashes, including periodic fatal crashes. While the reduction of fatal crashes is a critical benefit unto itself, avoiding these crashes will also reduce the amount of time that these two-lane roads are shut down to investigate and clear fatal crash scenes, enhancing travel time reliability.</p> <p>Freight Movement and Economic Vitality: Oklahoma’s rural areas have been shown to have a higher poverty rate than its metropolitan regions, and this project will deliver benefits of safety and mobility directly to these areas. This project will also enhance freight mobility, particularly for the energy sector of Oklahoma which operates in these rural areas.</p> <p>Environmental Sustainability: This project will benefit transit operators running service along these two-lane roads. It will also benefit bicyclists and pedestrians by improving safety and providing a pathway separate from faster moving traffic.</p> <p>Reduced Project Delivery Delays: This funding request will accelerate the delivery of shoulders on these two-lane roadways. This is a critical need as the cost of labor and materials is impacted by current inflation.</p>
<p>4. The project is based on the results of preliminary engineering.</p>	<p>Preliminary engineering was prepared as a part of the Initiation Reports conducted for each project segment and can be provided upon request.</p>
<p>5. The project is reasonably expected to begin construction not later than 18 months after the date of obligation of funds for the project.</p>	<p>All segments of roadway included in the project are anticipated to be let by ODOT between November 2022 and May 2024, well within the statutory obligation deadline of September 30, 2025.</p>