

Previously Incurred Project Cost:	\$1,900,100	Project on NHFN? Yes/no	YES
Future Eligible Project Cost:	\$120,099,900	Project on NHS? Yes/no	YES
Total Project Cost:	\$121,999,990	Project to add Interstate capacity? Yes/no	YES
NSFHP Request:	\$70,978,940	Project in national scenic area? Yes/no	NO
Total Federal Funds (including NSFHP)	\$94,998,920	Rail grade crossing or separation included?	NO
		Intermodal or freight rail project, or freight project within freight rail, water, or intermodal facility?	NO
Matching funds restricted to specific project component?	NO	If yes, specify:	
		NSFHP \$ to be spent on above two items:	NA

I-40 Douglas Boulevard Interchange Reconstruction and Related Widening Oklahoma City, OKLAHOMA



2016 FASTLANE Application submitted by Oklahoma Department of Transportation



State:	Oklahoma		
Begin Lat/Long:	35°26'0"N, 97°22'30"W	Inclusion in Planning Documents:	
End Lat/Long:	35°24'8 "N, 97°17'17"W	TIP:	NO
Size of project:	Large	STIP:	NO
Submitting TIGER project?	No	MPO LRTP:	YES
Urbanized Area (UA):	Oklahoma City	State LRTP:	YES
UA population, 2014	919,230	State Freight Plan:	NA

Supporting information can be found at: [I-40 and Douglas FASTLANE Grant](#)

ODOT Contact: Chelley Hilmes, Comptroller Financial Manager, ODOT. (405) 521-2591 email: chilmes@odot.org

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Appendices

Appendix A – Statement of ODOT Certification

Appendix B – Letters of Support

Appendix C – BCA Technical Memo

All Appendices can be found at the project website:

[www.ok.gov/odot/Programs and Projects/Transportation Programs/FASTLANE Grants/I-40 and Douglas Interchange Oklahoma County.html](http://www.ok.gov/odot/Programs_and_Projects/Transportation_Programs/FASTLANE_Grants/I-40_and_Douglas_Interchange_Oklahoma_County.html)

EXECUTIVE SUMMARY

The I-40 Douglas project in Oklahoma City takes 5.5 miles of never-before improved I-40, and brings this link in the national transportation system to 21st century standards. The project will reconstruct the increasingly problematic I-40/Douglas Interchange, widen the interstate, and update bridges and other infrastructure elements along the highway.

Importantly, this vintage section of the Eisenhower Interstate Highway System is vital to operations at the U.S. Air Force's Tinker Airbase, where our servicemen and women keep us safe by maintaining the world's most advanced aircraft. Moreover, Tinker is Oklahoma's largest on-site employer and requires thousands of daily trips from an already strained section of I-40.

The I-40 Douglas project is essential: constant high volumes of traffic approach and surpass the capacity of this section of the interstate. The all too common crashes on the congested corridor result in secondary collisions, massive delays, loss of life, and serious injuries.

The bridges are approaching the end of their functional life and/or have inadequate clearance for the tremendous volume of truck freight that relies on I-40. Indeed, commercial motor vehicle traffic is a high percentage of total traffic on this part of the National Highway System and National Highway Freight Network, and businesses can no longer count on this highway as a safe and reliable corridor within and through Oklahoma.

As I-40 struggles to handle current traffic, a turnpike project to the east will bring thousands of new trips daily starting in 2020, putting an increasing burden on I-40.

Because of the pressing need for the I-40 Douglas project, the clear harm that will come from waiting, and a project scale and scope that make federal involvement essential, the Oklahoma Department of Transportation, together with partners including Oklahoma City, Midwest City, the Association of Central Oklahoma Governments, Tinker Air Force Base, the Oklahoma Trucking Association and the Oklahoma City Chamber of Commerce, proudly submits this request for a FASTLANE grant.

The benefits of the I-40 Douglas Boulevard Interchange Reconstruction and Related Widening Project include:

- Modernizing an important but outdated part of the Interstate Highway System
- Providing improved access and mobility for freight
- Supporting a network critical to the economy and national defense
- Reducing the impact of collisions including saving lives

The project engineering and design work is underway and can be ready for construction by summer 2018.



1. PROJECT DESCRIPTION

The I-40 Douglas Boulevard Interchange Reconstruction and Related Widening Project ("I-40 Douglas Project") will widen 5.5 miles of vintage 1960s Interstate 40 (I-40) and reconstruct the I-40 and Douglas Boulevard Interchange. This will provide access improvements to Tinker Air Force Base and the cities of Oklahoma City, Midwest City, and Del City, as well as accommodate traffic flow throughout the metropolitan area, state, and nation.

In view of the I-40 Douglas Project's importance, the Oklahoma Department of Transportation (ODOT) is submitting this request for \$71 million in critically needed FASTLANE funds for the \$122 million I-40 Douglas Project. Over \$1.9 million has already been expended to date, leaving \$120.1 million in future eligible project costs.

From Industrial Boulevard and extending east 5.5 miles to the intersection with I-240, the interstate will be widened from four to six through lanes. This project will also raise the Post Road and Westminster Boulevard bridges over I-40, which do not meet current standards for vertical clearance. Additionally, this project will reconstruct the I-40 bridges over a recently-widened Anderson Road to raise the vertical clearances and add acceleration and deceleration lanes along I-40. Lastly, the bridges on mainline I-40 over the Westbound I-240 ramps at the I-40/I-240 interchange will be widened to accommodate six through lanes. Overall, the project will modernize this segment of I-40, correcting substandard ramp geometry and utilizing an urban interchange design that maintains a similar footprint, but with enhanced functionality. **Figure 1** illustrates the project location within the surrounding area.

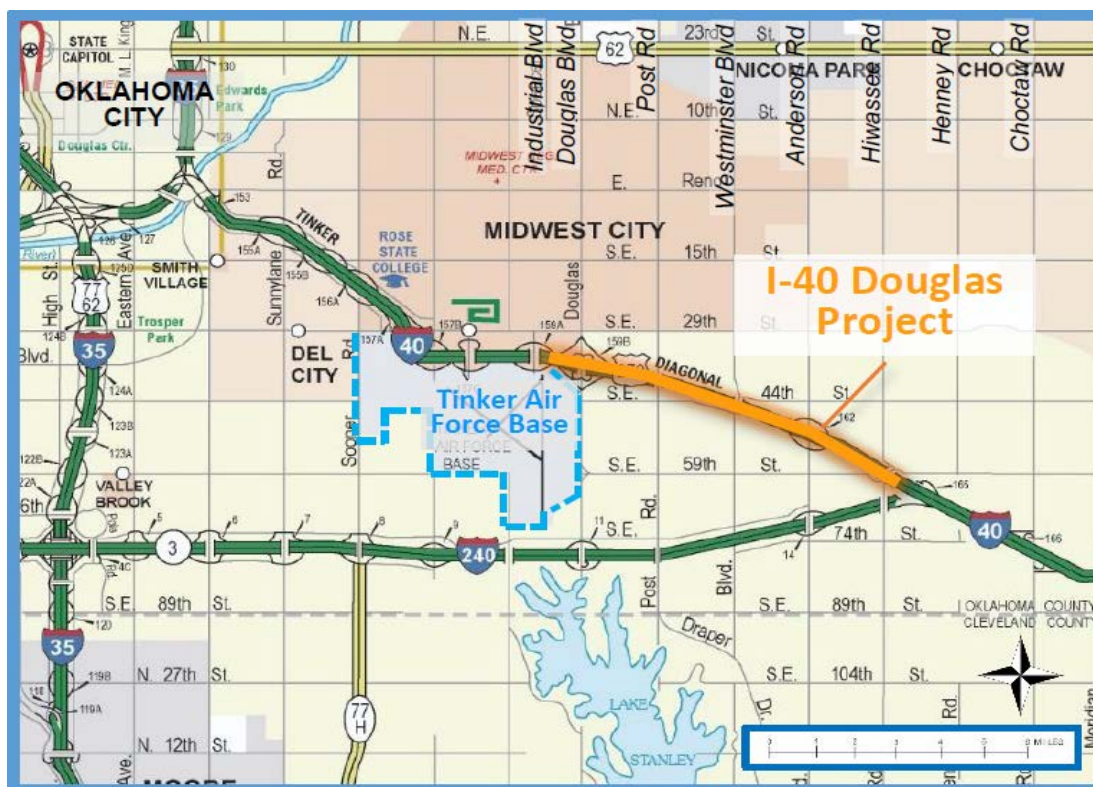


Figure 1: I-40 Douglas Project Location

This project will tie into another widened (six-lane) section of I-40 that will begin construction in early 2017. This related project begins at the I-240 interchange and extends east two miles.

An important need driving both of these widening projects is an upcoming Oklahoma Turnpike Authority project, the Northeast Oklahoma County Turnpike, which will connect two National Highway System (NHS) and National Highway Freight Network (NHFN) routes (I-40 and I-44) as a bypass of Oklahoma City. The new turnpike is scheduled to open to traffic by 2020, bringing thousands of additional vehicles per day onto I-40 headed east towards the Project area. (See **Figure 9** later in the document.)

Existing Conditions

Existing I-40 in the Project area, including the current I-40 Douglas Boulevard Interchange, was built in 1962 and is now four years beyond its recommended age for reconstruction. The interchange bridge structure is approaching structural deficiency and needs to be replaced. Other bridges are too narrow and most have minimal clearance for semi-trucks to pass safely underneath them. The I-40 bridges over Anderson Road, for example, require repairs approximately every five years due to damage from trucks with tall loads hitting the bridge as they pass underneath.

Congestion and safety are also a problem. The engineering analysis shows that the I-40 corridor has segments that operate at Level of Service (LOS) grade D (i.e., speeds below posted speed limit) or worse at peak hour. Collision rates on the existing highway are twice the state average for a similar interstate facility, and average two collisions per week.

I-40 carries more trucks than any other interstate in Oklahoma, moving almost 15,000

each day across the state. This includes approximately 6,640 per day through the Project segment of I-40. Maintaining interstate roadways and bridges to support heavy truck traffic without requiring trucks to reroute due to weight and height restrictions is vital to the efficiency of the national transportation system.

Concerns

The chief issues and concerns with I-40 in eastern Oklahoma County are its reliability, safety, and state of good repair. The current state of the highway is inadequate to the task of providing high quality transportation to the 44,000 cars and trucks that traverse it each day. By 2045, with the new traffic from the Turnpike extension, daily traffic is expected to exceed 66,000. Without improvement, operational analysis shows that by 2045, LOS F conditions (i.e., traffic flow is irregular and speeds vary substantially because of congestion) will occur along multiple segments as well as at ramps during peak hours.

Accident rates are high (see Section 7.1.3), and the facility is unable to manage the significant amount of truck traffic on this corridor which serves Tinker Air Force Base as well as surrounding industrial facilities and suburban communities.

One of the major problems experienced by drivers on the existing facility is the lack of a reliable travel time because of the numerous accidents which often result in lane closures. When this happens at peak travel times, traffic will often come to a standstill, and backups can run for miles. The I-40 Douglas project will provide an additional lane in each direction, to ensure that traffic will keep moving even when an accident occurs.

2. PROJECT LOCATION

The I-40 Douglas Project is situated in the southeastern part of Oklahoma County, 10 miles east of downtown. The project stretches east to west across 5.5 miles of the I-40 highway. The western boundary of the project area is positioned between Midwest City and Oklahoma City, one-half mile west of the I-40 Douglas Boulevard Interchange, and continues southeast to the I-240 and I-40 interchange. The majority of the project lies within the Oklahoma City Urbanized Area.

Interstate 40 across the United States

The project is located on I-40, one of the nation's most important interstate highways. I-40 runs through the south-central portion of the United States, beginning in California and ending in North Carolina. The highway travels

through cities including Albuquerque NM; Amarillo TX; Oklahoma City OK; and Memphis TN. The project's national and regional significance is illustrated in **Figure 2**, which shows the average daily freight traffic across the nation.

Tinker Air Force Base

Tinker Air Force Base (Tinker) is located immediately south of I-40, roughly between Sooner Road and Douglas Boulevard, and occupies a tract approximately five square miles in area. Tinker provides repair, communication, and logistics support for the U.S. Air Force, and also provides repair and maintenance for a wide array of military aircraft. Tinker's largest operation is the Oklahoma City Air Logistics Complex (OC-ALC) which is the largest repair complex in the entire Air Force, serving Air Force Bases in 46 states.

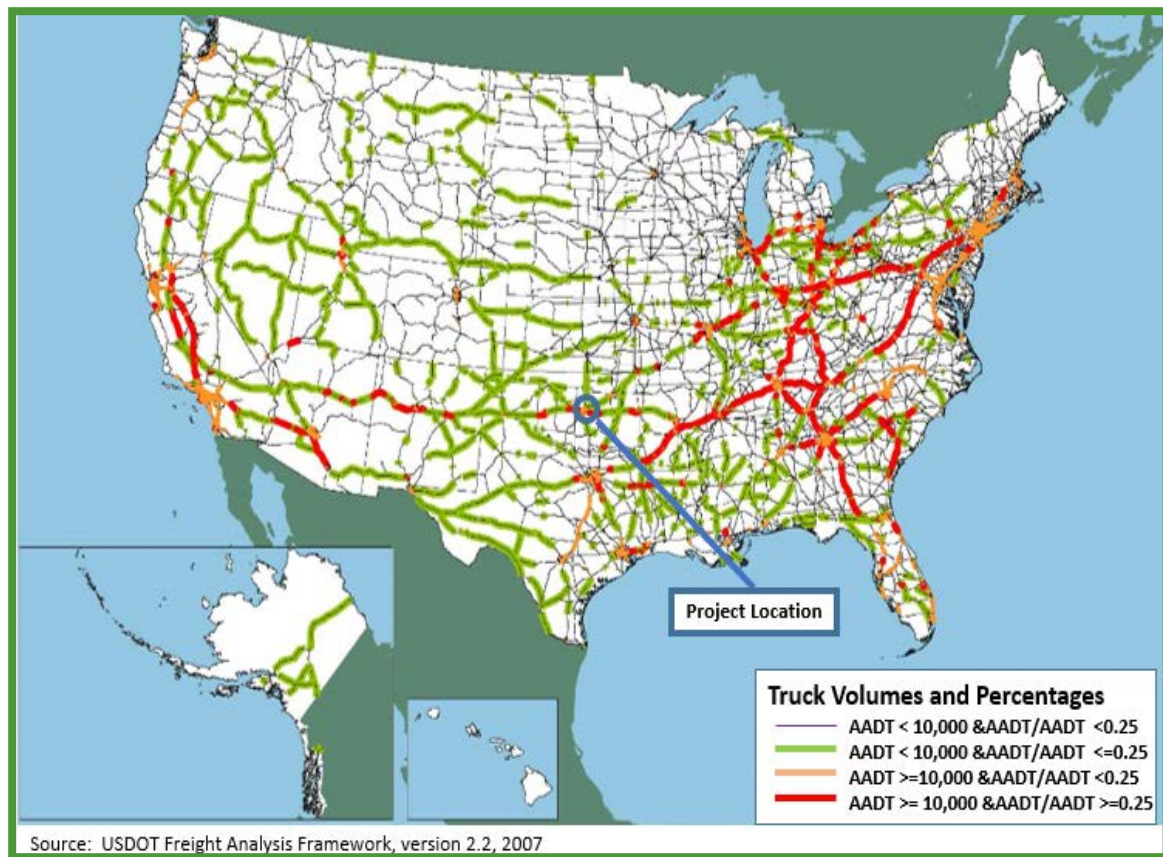


Figure 2: Project along Major Trucking Routes



Figure 3 : Map of U.S. Air Force Bases and Tinker's 5 Partner Sites

Tinker ships and receives a majority of its goods via truck. **Figure 3** shows a map of military bases across the nation that are served by Tinker.

In October 1940, with America entering into WWII, a dozen Oklahoma City businessmen formed the Oklahoma Industries Foundation to attract a bomber base, an aircraft plant, or an air repair depot to the area. Their efforts proved successful when the War Department announced in 1941, the site of a new air material depot in the Oklahoma's capital city. Construction of the new Midwest Air Depot began later that year.

In 1942, the Army Air Force located a huge wartime Douglas Aircraft Assembly Plant next to the depot. At the same time, in the Pacific, Major General Clarence Tinker, an Oklahoma native and part Osage Indian, gave his life while leading a group of bombers on a desperate mission against the Japanese near Wake Island. In his honor, the new military base was named Tinker Field, and later Tinker Air Force Base.

Throughout World War II, Tinker's 18,000 military and civilian employees repaired and modified aircraft and aircraft engines and shipped supplies around the world. Meanwhile, the Douglas Plant produced countless warplanes, and components for cargo planes. In the 1950s, Tinker continued work on aircraft engines and parts and played an important role in supporting the Berlin Airlift.

Northeast Oklahoma County

The I-40 Douglas Project is important to eastern Oklahoma County, because it provides essential east-west access in the county. The I-40 Douglas Project is also crucial to managing the traffic that the new 21-mile Turnpike extension will bring to I-40. The Northeast Oklahoma County project, identified in the Oklahoma Turnpike Authority's *Driving Forward OK* plan, links I-44 to I-40 about 5 miles east of the I-40 Douglas Project. This turnpike project will reduce the driving times to Tulsa from the southern and eastern parts of the Oklahoma City Metro area, as well as from points south along I-35, which connects Oklahoma City to Dallas and Fort Worth.

With I-40 already struggling with current traffic levels, the existing I-40 Douglas Project area simply lacks the capacity to handle the increased traffic and congestion from a growing regional population, and the new Turnpike extension. The project's additional lanes and the reconstructed bridges will ensure that automobile and truck

traffic can move safely and efficiently along this important segment of I-40.

Surrounding Cities

The I-40 Douglas project is bordered by Oklahoma City, Midwest City, and Del City, and a second tier of suburban cities including Choctaw, Nicoma Park, Spencer and Forest Park.

Land use surrounding the project ranges from urban on the west to mostly suburban area on the east. On the west, near the Douglas Interchange, the project provides access to a densely developed residential and industrial area, anchored by Tinker and the aviation-related businesses that surround it.

Oklahoma City, the Capital City

I-40 serves as a direct route to Oklahoma City, the state capital. Traffic on the project segment is generated by commuter traffic to the Tinker area, and travel to and from other parts of the Oklahoma City metropolitan area, including destinations such as Oklahoma University Medical Center, state government offices, the Oklahoma City Thunder NBA team, equestrian shows, and a convention center. In addition, Oklahoma City and the surrounding metro area is home to four two-year colleges, 14 four-year colleges and/or universities, and 12 vocational/career technical schools. These attractions, coupled with the fact that Oklahoma City is at the crossroads of two major interstate highways, I-40 and I-35, generate substantial traffic on I-40 in the Oklahoma City area.

Oklahoma City, Midwest City, and Del City – the cities that are adjacent to I-40 – have a combined population of nearly 700,000. Over a four-year period (2010-2014), the population

of Oklahoma City increased by 7.0 percent, more than double the national average growth rate during this time period. This growth speaks loudly to the increasing attractiveness of the city.

Unfortunately, the region’s infrastructure is not keeping up with travel demand, which can be an important factor in business location decision-making.¹ The I-40 Douglas Project is necessary to maintain the economy, ensure mobility, and strengthen communities through job creation and increased access to “Heartland City” – Oklahoma City.



Figure 4: Westbound morning traffic driving into Oklahoma City on I-40

¹ <http://newsok.com/article/5490047>

3. PROJECT PARTIES

Project Sponsors

The Oklahoma Department of Transportation (ODOT) is the project sponsor and FASTLANE grant recipient. The mission of ODOT is to provide a safe, economical, and effective transportation network for the people, commerce, and communities of Oklahoma. ODOT will sponsor, manage, and provide oversight for this project.

Key Supporting Stakeholders

Project Sponsor



Project Supporters



The Association of Central Oklahoma Governments (ACOG) has written a letter of support for the I-40 Douglas project. ACOG, the regional metropolitan planning organization (MPO), is responsible for prioritizing the region's critical transportation and transit needs. The MPO has developed the long range Oklahoma City area Metropolitan Transportation Plan (MTP) *Encompass 2035*, and the short range Transportation Improvement Plan (TIP). While portions of the project scope are currently included in the MTP, the entire project scope

as defined in the proposal will be included in the updated MTP *Encompass 2040*, slated for completion this summer.

Tinker Air Force Base, the major employer and freight receiver along the project's stretch of I-40, has been closely involved with ODOT during project planning for the I-40 Douglas Interchange improvements. Recognizing the importance of the improved access to and from the base, Tinker Air Force Base has provided a letter of support for this project.

Oklahoma Turnpike Authority (OTA) is the organization responsible for constructing and managing the new Northeast Oklahoma County Turnpike which will feed traffic from Tulsa onto the I-40 Douglas project. OTA supports this project, recognizing the benefits an upgraded interchange and throughway will provide to the users of their toll roads.

Support letters for the project have been received from the following entities:

- City of Midwest City
- City of Oklahoma City
- Greater Oklahoma City Chamber of Commerce
- Oklahoma Trucking Association
- Oklahoma Turnpike Authority
- Tinker Air Force Base

Support Letters can be found in Appendix B on the website link in the cover.

4. GRANT FUNDS AND SOURCES/USES OF PROJECT FUNDS

The total capital cost for the I-40 Douglas Project is estimated at \$121,999,990 including environmental review, design, and construction.

Future Eligible Costs

To date, \$1,900,100 has been expended on this project. \$120,099,900 in eligible future costs are shown below in **Table 1**, and funding sources are provided in **Figure 5**.

Ongoing Operating and Maintenance Costs

Ongoing operating and maintenance costs will be paid for entirely by the state as needed. A \$5 million maintenance investment in this project is slated to be incurred in the initial 20 years after opening.

Sources of Funds

ODOT is requesting 60 percent of future eligible project costs in the amount \$71 million in FASTLANE funding for the project. ODOT will also be using an additional 20 percent federal funding amount of \$24,019,918. These funds will be matched with 20 percent state funds. A certification statement from ODOT assuring that the state has the 20 percent local match funding available can be found in Appendix A.

Uses	Cost Estimate
Engineering, Environmental, Design	\$1,701,660
ROW and Utility Relocation	\$100,000
Reconstruct I-40 Douglas Interchange	\$35,000,000
Bridge Improvements	\$19,000,000
Widening	\$61,000,000
Contingency	\$3,298,240
Total Uses	\$120,099,900

Table 1: Cost Estimate

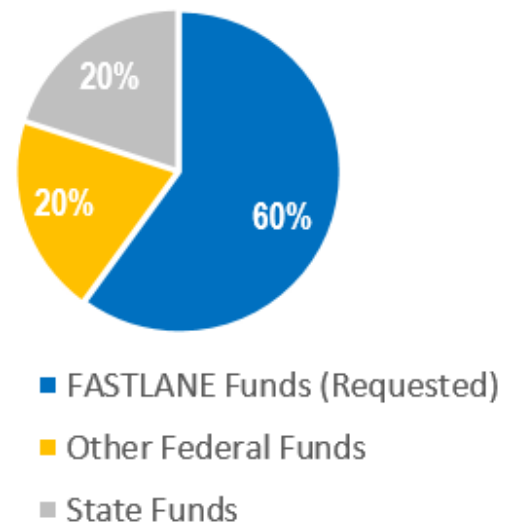


Figure 5: Sources and Uses of Funds Chart

5. COST EFFECTIVENESS

5.1. BCA Results

A formal benefit-cost analysis (BCA) was conducted for this project using best practices for BCA in transportation planning, and reflects all FASTLANE grant application guidance. It is important to note that a formal BCA is not a comprehensive measure of a project's total economic impact, as many benefits cannot be readily quantified or occur under conditions of uncertainty. The BCA restricted its analysis to the following quantifiable benefits:

1. *Travel time savings along the 5.5-mile segment of I-40 at peak hour*
2. *Travel time savings along the 5.5-mile segment of I-40 during off-peak hours*
3. *Improvement in travel time reliability along the 5.5-mile segment of I-40*
4. *Accident reduction along the 5.5-mile segment of I-40*
5. *Accident reduction at the Douglas Blvd. and Anderson Road interchanges*

Savings in operating and maintenance costs to the state of Oklahoma are also included in the BCA but are considered as a “negative cost” on the cost side of the equation.

Assumptions

Federal guidance recommends that applicants discount future benefits and costs to 2015 present values using a real discount rate of seven percent to represent the opportunity cost of money in the private sector. USDOT guidance also allows for present value analysis using a three percent discount rate when the funds currently dedicated to the project would be other public expenditures. For much of the cost of this project, the 3 percent discount rate would apply. However, the B/C ratio and individual project benefits are presented below using the more conservative seven percent discount rate

to demonstrate that the project's long term benefits clearly outweigh its costs.

This analysis was performed over a 30-year forecast period, from 2017 through 2046. The first year of benefits is expected to be 2022, which means 25 years of discounted benefits are considered in the BCA. To be conservative, no salvage value of the project's capital expenditures was modeled at 2046.

Additionally, it is anticipated that benefits will begin one year earlier in 2021, after the completion of the Douglas Blvd. interchange upgrades, however these were not considered in the model as the interference of construction equipment remaining on site through 2021 was conservatively assumed to offset any marginal benefits in safety and travel time savings associated with that year's opening of the completed Douglas interchange.

Cost Benefit Results

Table 2 summarizes the cost and the quantifiable benefits of the project in terms of Present Value. Detailed analysis of costs and benefits, including data sources and methodology descriptions, are available on the project's support website, in the BCA Technical Memo. As shown in the table, the present value of the project's cost is \$80.0 million (using the 7 percent discount rate), and the benefits have an estimated present value of \$111.1 million. The resulting benefit cost ratio and net present value (NPV) are 1.39 and \$31.1 million respectively, which give a clear indication that the project should proceed. A sensitivity analysis was performed which showed that, depending on various circumstances, the benefit-cost ratio might be as low as 1.11 or as high as 1.67. Even in the most pessimistic ('low') scenario, the benefits still exceed the project costs by over \$8 million.

Category	Present Value at 7% (Low)	Present Value at 7% (Likely)	Present Value at 7% (High)
Costs			
Project capital and O&M costs	\$ 90,427	\$ 90,427	\$90,427
O&M savings relative to No Build	(\$ 10,429)	(\$ 10,429)	(\$ 10,429)
TOTAL COSTS	\$ 79,998	\$ 79,998	\$ 79,998
Benefits			
Travel time savings ²	\$ 26,119	\$ 32,648	\$ 39,178
Accident reduction	\$ 62,793	\$ 78,491	\$ 94,189
TOTAL BENEFITS	\$ 88,911	\$ 111,139	\$ 133,367
NPV	\$ 8,913	\$ 31,141	\$ 53,369
Benefit Cost Ratio	1.11	1.39	1.67

Table 2: Benefit Cost Analysis Summary (\$2015 in thousands)

² includes improvements to travel reliability

Quantifiable Benefits

Most (over 70 percent) of the benefits are a result of improvements to safety resulting from improvements to the corridor which include interchange upgrades with increased merging distance, lane additions, surface and marking renewals, paved inside shoulders, and shoulder rumble strips. These safety features and related design will bring this segment of the I-40 corridor to a quality that meets or exceeds national standards. Drivers will be less prone to accidents, and accident rates are expected to decrease to the state average accident rate per 100 million VMT for interstates and major highways.

In addition to accident reduction along the I-40 corridor, this project is expected to result in accident reduction at the Douglas Blvd. and Anderson Road interchanges, as the signage will be clearer and merging onto the I-40 will become easier. Most of the accidents today occur along the I-40 mainline lanes (not at the interchanges), and that is where much of the project's calculated safety benefit lies.

The remainder (almost 30 percent) of the benefits are travel time savings and improved travel time reliability which result primarily from the addition of one extra lane to the 5.5-mile segment of I-40 in each direction. Travel time savings are most notable in the peak hour but are expected to have an impact off peak as well. They are a significant benefit to this project as substantial increases to average speed, particularly in the peak hour, are possible with the addition of two lanes.

Also captured in the BCA are improvements to travel time reliability. Reliability is a real benefit for users of the facility, as planning can be done more efficiently and road users will allot less buffer time in their travels, allowing more time for other activities.

Non-Quantified Costs and Benefits

One major benefit that was left out of the BCA due to an inability to quantify it are the benefits of reduced delay after accidents. Accidents that block a lane of travel will cause breakdown conditions on I-40, with backups extending for miles, particularly during peak hours. In recent years, this segment of I-40 has experienced an average of nearly two accidents per week, although it is unknown how many block a lane of traffic. Although it was not quantified, the travel time savings and emissions reductions that would result from avoidance of these backups are real benefits of this project.

6. PROJECT READINESS

6.1. Technical Feasibility

ODOT has extensive experience completing projects of similar scope on time, on budget, and without incident. The project will be completed through phased construction, and traffic will proceed while construction on project segments is underway.

The I-40 Douglas project will raise the slab span bridges to increase the vertical clearances. Temporary widening on the outside of the lanes will occur to shift traffic to the exterior lanes while reconstruction of the median barrier, inside shoulders, and inside lanes occurs. Once completed, traffic will be shifted to the newly completed inside “through traffic” lanes while the outside lanes are reconstructed.

ODOT has:

- Awarded 18 similar interchange projects with a construction total of \$188.1 million.
- Widened portions of I-40 from four to six lanes in Oklahoma County and the adjacent Canadian County for 12 miles with an additional eight miles scheduled in the Eight Year Construction Work Plan.
- Completed the \$715 million I-40 Crosstown Relocation which increased capacity of I-40 from six lanes to ten lanes through the heart of Oklahoma City.

Two similar widening projects managed and completed by ODOT are:

- The widening of I-40 from four to six lanes from El Reno to the west side of Yukon which was completed in 80 percent of the projected time.
- The widening project from the west side of Yukon to Morgan Road was completed on budget and 30 percent ahead of schedule.



Figure 6: Crews hanging the second beam for the southbound I-235 off ramp to OKC Boulevard for the I-40 Crosstown Relocation in 2015

Similar bridges that have been constructed include:

- The reconstruction of the bridge on US-77 over Memorial Road in Oklahoma City was completed 8 percent ahead of schedule
- Redecking of the I-40 bridges over the North Canadian River in Oklahoma City was completed 15 percent ahead of schedule.

6.2 Project Schedule



Figure 7: Project Schedule

ODOT's timeline calls for a FASTLANE award for the I-40 Douglas project to be obligated by September 30, 2019, and that all pre-construction activities will be completed by March 2018.

Figure 7 shows the project's major milestones, and a detailed project schedule can be found the project's website. As shown in the schedule summary on this page, I-40 Douglas Project construction will be ready to commence as early as 2018, with total project completion occurring in 2021.

6.3 Approvals and Coordination

Environmental Approvals

The environmental studies (including but not limited to topics such as: air quality, biology, cultural resources, hazardous materials, historic properties, noise, socioeconomic data, and wetlands) were initiated by ODOT in 2015. As part of the NEPA process, ODOT's Environmental Programs Division will coordinate with other applicable state and federal agencies, and conduct community outreach and meetings as required.

ODOT has already begun the stakeholder involvement process and will continue to collaborate with local partners to receive all necessary approvals. The design will be completed with a goal of avoiding acquisition of additional right-of-way (ROW). The project expects to receive FHWA approval by mid-2017.

State and local planning approvals

The Project is consistent with the 2015-2040 Oklahoma Long Range Transportation Plan (LRTP). The 2015-2040 LRTP, adopted in August 2015, is a policy document. The I-40 Douglas Interchange and related widening addresses two policies in particular: Highway/Bridge Policy #2- Preserve and improve the condition of highways and bridges, and Highway/Bridge Policy #5- Provide for a safe, efficient, and effective National Highway System to improve commercial motor vehicle mobility and connectivity. In regards to #2, the candidate project addresses vertical clearance issues for bridges at Post, Westminster and Anderson Roads. The #5 item is addressed through the I-40 project by

improving commercial motor vehicle mobility and connectivity, and reducing collisions.

As mentioned earlier, the project has already received approval for inclusion in the Metropolitan Long Range Transportation Plan (MTP), expected to be complete in summer 2016. Once full funding is committed, ACOG is prepared to recommend the project for approval and acceptance into the Transportation Improvement Program (TIP) and the state will amend the State Transportation Improvement Program. Both documents are financially constrained and thus, can only be amended when sufficient funding is made available.

Coordination with FHWA

DOT staff has presented the project concept to the Oklahoma Division of FHWA, and communication and coordination is ongoing. An Access Justification Report (AJR) for the I-40/Douglas interchange will be required and completion is scheduled for May 2017.

Public Engagement

ODOT has begun the stakeholder engagement process regarding the proposed designs of the Interchange. Public meetings are anticipated to begin in the fall of 2016. As the project progresses, ODOT will keep the public informed of road closures or other changes in traffic patterns during construction.

6.4 Assessment of Risks and Mitigation Strategies

A description of the two possible projects risks and mitigation strategies are described below.

Earthquakes

Oklahoma has experienced numerous earthquakes in recent years. Therefore, there

is some risk that an earthquake could affect this project. ODOT has consulted with the California DOT in addressing appropriate bridge design, maintenance, and inspections. The Department has a policy of inspecting bridges based on the severity of the earthquake (as shown in **Table 3**).

According to the USGS, no earthquakes greater than a 2.6 magnitude have been recorded in the last 10 year within 3 miles of the project site.

Magnitude	Inspection Radius
4.4 to 4.7	5 miles
4.8 to 5.3	15 miles
5.4 to 5.8	30 miles
5.9 to 6.2	60 miles
6.3 and greater	120 miles

Table 3: Earthquake Inspection Policy, ODOT 2016

Threat of Tinker Air Force Base Reduction

A portion of the need for this project stems from the overwhelming activity occurring at Tinker. The Defense Base Realignment and Closure Commission (BRAC) commission was established in 2005 to provide a non-partisan and objective review and analysis of the list of military installation recommendations issued by the Department of Defense. Tinker Air Force Base has cooperated fully in previous reviews and has not experienced reductions as a result of the BRAC process.

The State, the Oklahoma City Chamber of Commerce, and the communities of Oklahoma have worked diligently with Tinker Air Force Base, and will continue to do so to make Tinker BRAC-proof. Given the history and success of

this effort, as well as the investment in facilities on the recently-expanded base, it is possible, but unlikely, that the Base Realignment and Closure commission would decrease the mission and employment at Tinker Air Force Base.

Eastern Oklahoma County Turnpike Risks

Another important driver of the I-40 Douglas project is the expected traffic that will be added to I-40 as a result of the Turnpike Extension. It is possible, but highly unlikely that the Eastern Oklahoma County Turnpike would experience delays or risks in construction. The turnpike project will be fully paid for by bonds and is not affected by the state budget process. The Oklahoma Turnpike Authority will begin the bond issuance process in September 2016.

The Oklahoma Turnpike Authority was authorized in 1947, and has been constructing, operating and maintaining turnpikes in Oklahoma for 80 years. In the 1990s, toll roads including the Chickasaw Turnpike, between Ada and Sulphur, the Cherokee Turnpike, thirty-three miles in northeast Oklahoma, and the John Kilpatrick Turnpike in Oklahoma City were built. The OTA has a “cross-pledge” turnpike system. Thus, tolls collected on all turnpikes pay the debt service, maintenance and expansion for the turnpike system, not each individual road, guaranteeing a reliable revenue source for the system.

7. SELECTION CRITERIA

7.1. Merit Criteria

7.1.1 Mobility Outcomes

The I-40 Douglas Project is an investment that supports economic vitality and national defense. President Eisenhower championed the formation of the Interstate Highway System to provide critical ground transport routes for military supplies and troop deployments in case of national necessity. The interstate system (shown in **Figure 8**) has grown immensely since its creation in 1956, and is now the world's second longest network, with a total length of 47,856 miles.



Figure 8: Interstate Highways

The stretch of I-40 where the project is located is one of the oldest segments of the original network, dating back to the 1960s. Updating the system is crucial to accommodate population growth, safety needs, and overall satisfaction of drivers. As mentioned in Section 2, *Project Location*, Oklahoma City serves as a meeting point for the national highway system. As shown in **Figure 9**, I-35 (north-south), I-44 (northeast-southwest) and I-40 (east-west) all meet in Oklahoma City. National Highway System (NHS) roadways are important to the United States economy, defense, and mobility; and this NHS segment handles a large volume of national and regional freight and passenger movement.

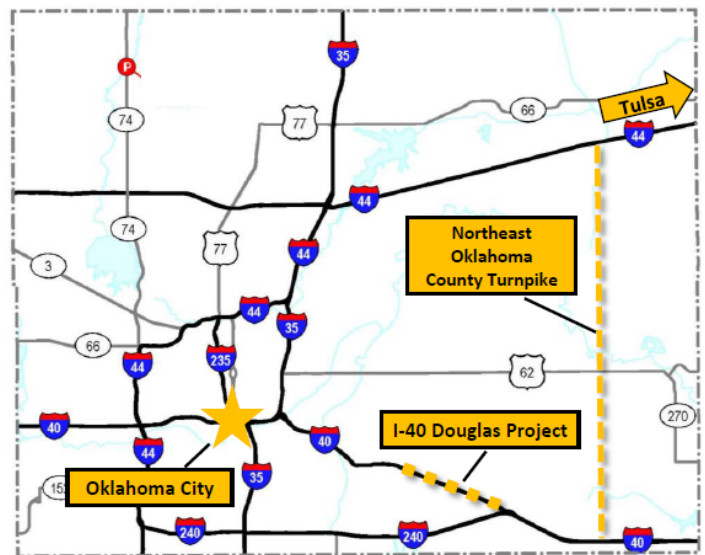


Figure 9: Northeast Oklahoma County Turnpike Addition

Currently, this section of I-40 experiences average daily traffic (ADT) ranging from 37,900 to 44,300, where truck movement contributes 15 percent of daily traffic. During the day, the

project section of I-40 experiences high delay, and during evening peak hour, segments near the Douglas interchange experience a substantial decrease in speed (*Source: NPMRDS Congestion Data*).

The I-40 Douglas Project responds to the continuing growth in freight movement by expanding the facility from 4 lanes to 6 lanes. Not only will this accommodate more through traffic, but it will also build in extra room when an accident occurs. With an extra lane and improved shoulders, fewer delays are likely to occur because of the additional space for the flow of traffic to redirect.

Traffic analysis shows that with one lane closed on the existing four-lane I-40, mainline speeds between Anderson and Douglas are near zero (break down conditions) when traffic exceeds 3,250 cars per hour. Current peak hour traffic is close to that level (3,035 in the morning rush and 3,140 in the evening peak). By 2045 traffic will exceed 4,000 in the two peak hours, and exceed the 3,250 threshold at other times as well.

Under the six-lane build condition, an accident that closes a lane of traffic would leave two lanes open, and traffic would still be able to travel over 40 mph even during the highest peak hour.

Given the geographic location of Oklahoma, a large number of external-to-external trips travel through the state (i.e., trips that have neither an origin nor a destination in

Oklahoma). The majority of truck traffic, 68 percent of all truck tonnage – on I-40 in Oklahoma is through traffic. The heaviest flows of truck volume occur in and around Oklahoma City, where the three major interstates converge. Therefore, the national freight industry is dependent on the access and mobility of I-40. The estimated freight volume growth is 52.4 percent from 2015-2040 (**Figure 10**); and for Oklahoma freight growth is concentrated in trucking. As industries continue to use Oklahoma's I-40 route to transport their goods, the traffic volume will significantly increase. In 2015, more than one billion tons of freight moved by highway, rail, and waterway in Oklahoma according to the Oklahoma Long Range Transportation Plan.

Further, there are many industries that rely on the movement of goods, and they are a key component of Oklahoma's economy. Five industry groups in Oklahoma have been identified as critical users of the freight transportation system, and several of these are among the major contributors to Oklahoma's gross domestic product (GDP). They accounted for more than half of the state's GDP in 2013 – Agriculture, Energy and Mining, Manufacturing, Transportation and Distribution, and Other Industry (including retail and construction). The future competitiveness of these major and emerging industries in the global marketplace require an integrated freight transportation system that can handle bulk shipments and intermodal containers and, relevant to this project,

Mode	MILLION TONS OF FREIGHT, 2015-2040							2015-2040 Change
	2015 Total Estimated	2040						
		Inbound	Outbound	Internal	Through	Total Forecast	% by Mode	
Truck	661.7	79.8	76.2	222.6	629.9	1,008.4	70.6%	52.4%
Rail	338.7	47.7	17.3	5.0	341.7	411.7	28.8%	21.6%
Waterway	6.4	4.0	4.3	0.0	0.0	8.3	0.6%	29.7%
Total	1006.8	131.5	97.8	227.6	971.6	1,428.4	100.0%	41.9%

Figure 10: Oklahoma Forecasted Freight Tonnage Flow, 2015-2040

highways that can serve distribution centers and warehouses.

The overall movement of cars and trucks will improve due to the I-40 project and its enhancements: adding an additional lane, repairing the aging roadway, widening the shoulders, and improving bridges. Oklahoma City is one of the fastest growing cities in the United States and freight traffic outpaces population growth, as truck freight traffic is projected to increase by 52 percent over 25 years. It is necessary to keep up with the overall growth of the surrounding cities and the growth of the entire state of Oklahoma.

In addition, the vehicles driving on this section of I-40 experience wear and tear from the pavement condition on this aging roadway. By reconstructing and widening this section of I-40, the state is enhancing the mobility for roadway users and improving safety for movement of people and goods.

7.1.2 Economic Outcomes

Greater Oklahoma City is in the geographic center of North America equidistant from the east and west coasts and major trade partners of Canada and Mexico. Oklahoma is also at the crossroads of the U.S., sitting at the heart of three major national highways important to national and international trade. Oklahoma is a desirable location for businesses as it is positioned within a day's drive of the rapidly-growing south-central region (OK, TX, AR, and LA) projected to grow more than 44 percent during the next 25 years. Oklahoma County is the economic center of the state and is an excellent location for serving all markets in Oklahoma, Texas, Arkansas, Kansas and Missouri, linked by I-40, I-35, and I-44.

The major sources of income in central Oklahoma are oil, agriculture, manufacturing,

business and government. Each industry relies on at least one, or often multiple modes for transport. The highway system provides connections not only to and from origins and destinations, but also serves as the “last and first mile” connector to users of rail, water and air transport.

Oklahoma is a Tier One energy state and typically receives economic shocks from oil price fluctuations. However, over the past several years Oklahoma City has also shown economic stability and diversification of its economy as well. Currently, the energy sector accounts for approximately 3 percent of the Oklahoma City metropolitan area employment.

The Oklahoma City metropolitan area continues to attract residents with its low cost of living and job opportunities. An important component to attracting and retaining a quality workforce is tied to amenities and quality of life. Nationally, the city is recognized for its Metropolitan Area Projects (MAPS) that specifically addresses these quality-of-life issues. MAPS is The City of Oklahoma City's visionary capital improvement program for new and upgraded sports, recreation, entertainment, cultural and convention facilities, all funded by a one-cent sales tax.

Oklahoma City's sustained population growth through the recession and into recovery sets it apart as one of the nation's fastest growing cities.

Oklahoma City MSA population grew 7.13 percent from 2007-2011 as much of the nation struggled through recession. Population growth has carried into the recovery and is poised to continue as its central location favors continued long-term economic development.

Construction employment surged in 2014, growing at an annual rate of 12.1 percent to an average monthly payroll employment of 30,500. The area's workforce with construction skills provides an opportunity for employment in the construction phases of the I-40 Douglas Project.

I-40, particularly the project's section, provides the primary access to Tinker, a major employment center in the State and one of foremost maintenance and repair facilities within the United States Department Defense.

Tinker was founded in the early 1940's and over the years, Tinker has provided continuous repair, logistics, and communication support to the Air Force. Tinker serves as the largest single-site employer in Oklahoma, employing more than 26,000 military and civilian personnel. The installation has an annual statewide economic impact of \$3.6 billion, stimulating an estimated 33,000 secondary jobs, including at businesses such as the Boeing facility on the east side of Douglas Avenue.

Additional jobs are likely to result from the new aircraft maintenance facility at Tinker. More than 1,300 jobs are anticipated for a center that will maintain the KC 46 A Pegasus aerial refueling aircraft (**Figure 11**).

Boeing Company is another major employer in the project area. The world's largest aerospace company, Boeing has long had a presence in Oklahoma City in the vicinity, and is known for its work in support of defense, aerospace, and security.



Figure 11: Tinker Air Force Base KC-46 Aircraft Center

7.1.3 Safety Outcomes

Increasing the safety of roadway users is an important priority for ODOT. The I-40 Douglas Project will introduce several roadway enhancements that will not only increase mobility, but will also improve design, construction, and maintenance of infrastructure to reduce accidents, injuries, and fatalities. Proper road maintenance and the

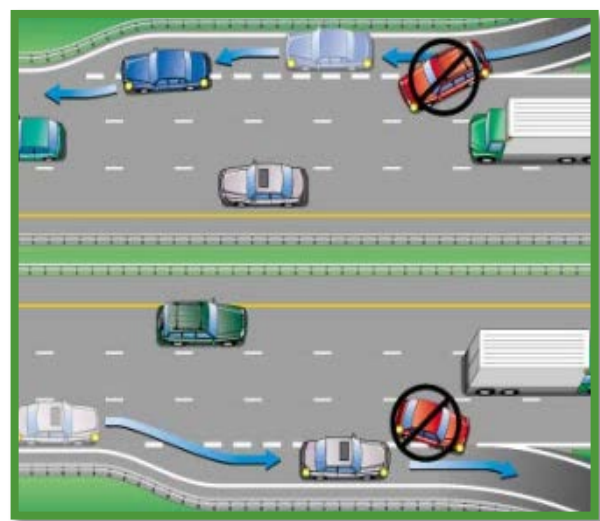


Figure 12: Acceleration and Deceleration Lanes

use of safety related improvements, such as concrete barriers, widened shoulders, and rumble strips, greatly enhance safety.

Accidents along the 5.5 mile stretch of I-40 outside of the Interchange occur at a high rate, with over 770 collisions logged over the six-year period from 2009 to 2014, which averages to two crashes each week. This crash rate is nearly twice the average on four-lane interstates in the state of Oklahoma. According to ODOT, “following too closely” during peak congestions times was the cause of 25 percent of all crashes due to bumper to bumper conditions. Relieving bottlenecks and congestion during peak travel times by increasing capacity along Anderson Road will reduce the number of such collisions.

Each accident on the four lane Interstate currently creates increased congestion, thus perpetuating the dangers of accidents during peak hours. Currently, the inside shoulder width at portions of the I-40 can be as narrow as two feet, and are not paved. This project will widen inside shoulders to a consistent paved ten feet, allowing broken down automobiles or vehicles involved in an accident to pull over and relieve congestion, decreasing the risk of secondary collisions.

At the Douglas Interchange, merge distance will be increased for all I-40 movements. Additionally, acceleration and deceleration lanes will be added to I-40 at Anderson Road to enhance safety while merging. These lanes promote a more seamless traffic flow when drivers are entering and exiting the interstate. The lanes provide drivers with the opportunity to either slow down or speed up before merging with high-speed traffic on the Interstate, or allowing them to begin exiting the interstate without interrupting the traffic pattern of the interstate users behind them.

The ability for drivers to safely position themselves to either enter or exit the Interstate greatly decreases the risk of collisions. These lanes enhance an interstate’s capacity and traffic efficiency, and also help to reduce congestion. The widened bridge over Anderson Road will allow for a dedicated turn lane that will reduce rear end accidents.

The project is expected to provide \$78 million in safety benefits from bringing the existing crash rate more in line with statewide averages for Interstates.

Type of Collision 2009 - 2014	I-40 from Industrial Rd to Henney Road	Douglas Blvd. Intersection	Anderson Rd. Intersection
Crashes	771	83	40
Fatalities (Persons)	5	2	0
Injury (Persons)	263	42	33
Property Damage	713	53	22
Accident Rate	141.3	NA	NA
Comparable State Accident Rate	63.5	NA	NA

Source: Oklahoma Department of Transportation

Figure 13: Crash Data 2009-2014

Bridge Structure Deficiencies

The Douglas interchange bridge is at risk of becoming structurally deficient and needs to be replaced or undergo major rehabilitation. Several of the bridges are too narrow or lack necessary height for today's semi-trucks to pass safely underneath them. The bridges on I-40 over Anderson Road have substandard vertical clearance and they will be reconstructed at a greater height over the newly widened Anderson Road.



Figure 14: Anderson Road Bridge -Beam repairs needed



Figure 15: Douglas Boulevard Bridge - Deck repairs needed

7.1.4 Community and Environmental Outcomes

The I-40 Douglas Project will improve the lives of those living in and moving through the Oklahoma City area by relieving congestion, increasing roadway safety, creating temporary construction jobs, enhancing access to permanent local and regional jobs, and promoting economic development through increased freight access. A few community and environmental outcomes are highlighted below.

Access to Employment

According to the 2015-2040 Oklahoma Long Range Transportation Plan, Oklahoma workers overwhelmingly rely on private automobiles for their journey to work. The I-40 Douglas project will provide an improved transportation route for employees travelling from east of Oklahoma City to Oklahoma City, which includes employees living or working in Del City, Midwest City, or at Tinker. In particular, this project helps ease congestion for the thousands of Tinker employees who live off base.

ACOG's *Encompass 2035* plan emphasizes that reliable, convenient, and well-connected transportation modes are essential to providing efficient movement of goods and effective services for all Central Oklahomans.

ODOT's LRTP notes that industries particularly dependent on transportation and the movement of goods are quickly growing as some of the state's largest industries. While this project will enhance access to existing regional jobs, and help secure future jobs in the shipping industry nationwide, it will also provide a valuable opportunity for local residents to partake in the three and a half year construction project. At the peak of

construction in 2020, it is estimated that 200 people will be working on the project.

Over the 2017-2021 period, the project is projected to create an estimated 1,200 person-years of employment – 630 direct jobs, and an additional 570 “indirect and induced” jobs that will result from the purchase of construction materials and the spending of the wages of the Project’s engineers and construction workers in the local economy.

The public Eastern Oklahoma Technology Center (EOCTC) is an established career and education center located only 20 miles north of the project. The EOCTC has been offering area residents an opportunity to become trained in engineering, architecture, and construction for the past 30 years.



Figure 16: Substandard Truck Clearance under Anderson Road

Access for Shippers

Freight tonnage in Central Oklahoma and in the nation is continuing to increase. Proactively planning for the heightened presence and movement of freight trucks will be critical for the region to remain economically competitive within the rest of the state and nation. The improved route is important for freight trucking companies to maintain their

current activities and increase capacity. Improving the efficiency of freight traffic in and through Oklahoma each day is one of the most important benefits this project provides.

Environment

The environmental benefit of the I-40 Douglas Project derives from improvements in network efficiency. By allowing more vehicles to utilize the new Turnpike Extension and avoid congested highways closer to the more densely developed parts of OK City, emissions from congested stop-and-go traffic are avoided.

In addition, as noted in the Mobility section, when accidents occur on I-40 that close a lane of traffic during peak hours, there are stop and go conditions that back up for miles and can last for an hour or more. By adding a third lane in each direction on I-40, the emissions that are created during the massive delays and idling after such an accident will be avoided.

Other environmental issues to be explored in the project development process include protecting neighborhoods from excessive noise, and addressing cultural and historic resource issues.

Other Community Benefits

A priority of both ODOT and ACOG is to encourage visually attractive streetscapes and highway rights of way. ODOT has already partnered with Creative Design Resolutions (CDR) to create a master design plan for the I-40 corridor, including the 5.5-mile segment of the I-40 Douglas project. The goals of this effort are to promote new development, preserve views and landscapes, and incorporate green spaces, where appropriate and possible. Incorporating the I-40 Douglas project into the larger comprehensive design plan for the area benefits all local residents

and users and promotes additional economic and social activity.

7.2 Other Review Criteria

7.2.1 Innovation and Partnership

This project includes the raising of the slab span bridges over I-40. This type of bridge rehabilitation has not previously been used in Oklahoma. The purpose of raising the bridges is to accommodate six lanes of traffic and maintain appropriate vertical clearance, without having to build entirely new structures. The slab span bridges are in good condition and structurally sound and do not otherwise need to be replaced.

Another innovative aspect of the Project will be a new design for the heavily used Douglas

Bldv. Interchange. ODOT has begun alternatives analysis, and is currently considering four innovative design options (shown below in **Figure 17**). Each of these options improves operations compared to the current inefficient cloverleaf design, and could be built within the existing right-of-way.

7.2.2 Cost Share

This project will be completed using 60 percent of federal FASTLANE funds and another 20 percent from other federal funds. The remaining 20 percent of funds will be contributed by ODOT. ODOT has provided a Certification Statement in Appendix A that the Department has the funds available to provide the 20 percent required local match.



Figure 17: Proposed Douglas Interchange Redesign Alternatives