American Recovery and Reinvestment Act (ARRA)
2009 TRANSPORTATION INVESTMENT GENERATING ECONOMIC RECOVERY (TIGER)
DISCRETIONARY GRANT APPLICATION FROM:

OKLAHOMA

Reconstruct I-244 Arkansas River Multimodal Bridges with High Speed Passenger Rail, Commuter Rail, and Bicycle/ Pedestrian Components

Tulsa, Oklahoma

September 15, 2009

Applicant Information

Name of Applicant: Oklahoma Department of Transportation

Address: 200 N.E. 21st Street, Oklahoma City, OK 73105

Primary Point of Contact Information

Name of Contact:

Telephone Number:

E-mail Address:

Project Summary

The present I-244 Arkansas River crossing sits at the confluence of several important bridges: the I-244 highway bridges, the Burlington Northern Santa Fe rail bridge, and the historic, abandoned Route 66 bridge. As one of only four Arkansas River crossings in Tulsa County, and one of 11 in the Tulsa Metropolitan Area, the I-244 Bridges will be reconstructed as Tulsa's first multimodal crossing to accommodate highway, high-speed intercity and commuter rail, pedestrian and bicycle traffic. With its provision for carrying high speed passenger rail, the project has national significance for this high priority system, as well as its historic role on the Interstate system.

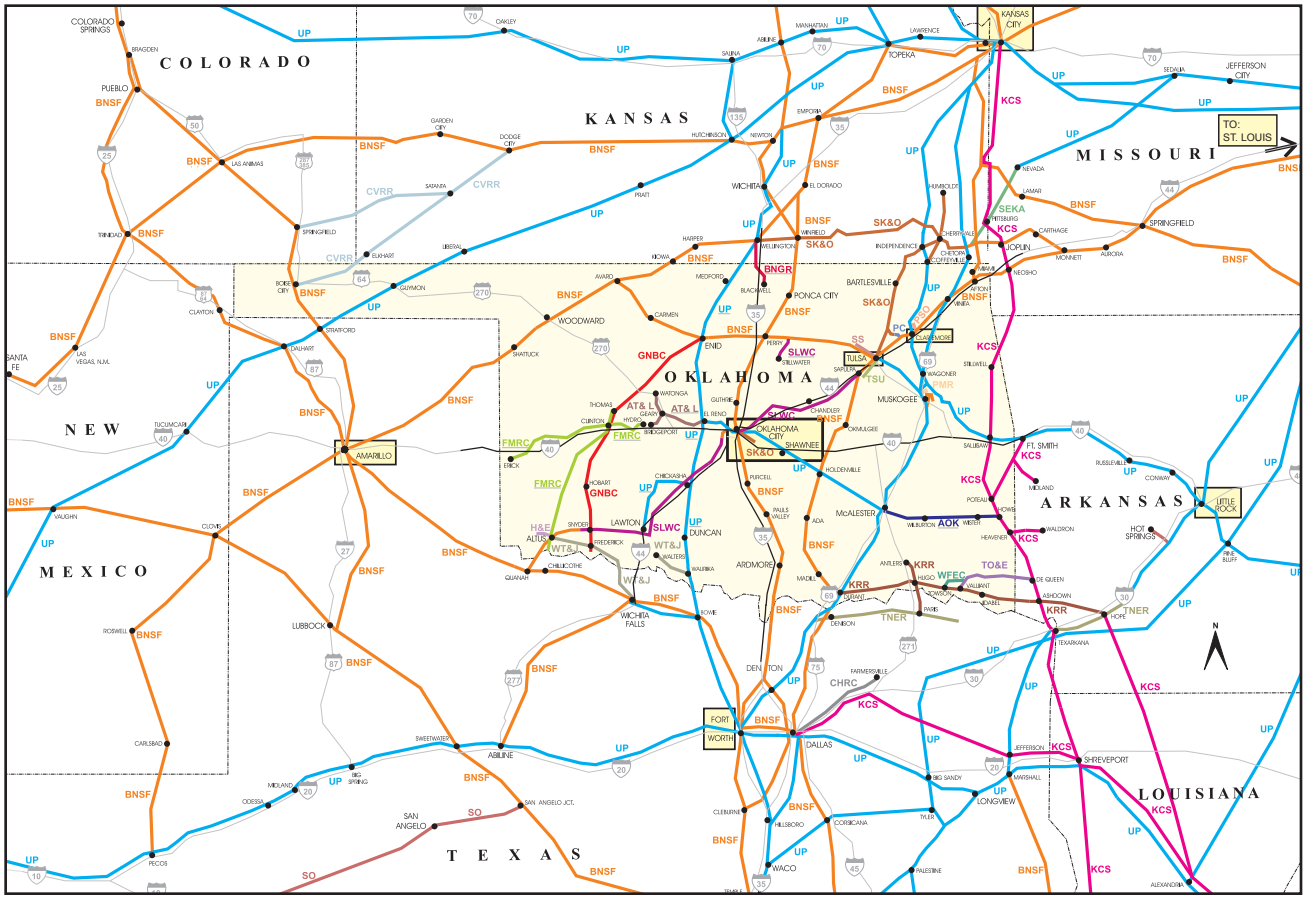
The investment now in replacing and upgrading the I-244 Bridges is a very cost-effective measure. Using a discount rate of three percent, the benefit/cost ratio (B/C) is 11.2 and at a seven percent discount rate, it is 7.8. The Net Present Value of the investment is $1.6 billion and $840 million, respectively.

While the B/C ratios capture the project's benefits well, several components of these benefits merit elaboration. The travel time savings to the motoring public are large. With scheduled maintenance regularly requiring lane closures and with at least one emergency repair happening annually requiring two lane closures, the public, including truckers, suffers delays. The travel time savings from the project have a present value, using a seven percent discount rate, of $12 million. Associated energy savings amount to $2.2 million, and greenhouse gas emission savings are valued at $324,000. But it is the economic development benefits that stand out – over $840 million in present value. The I-244 Bridge, with its key multimodal elements, is critical to Tulsa's proposed transit-oriented development plans. Without this bridge, a planned commuter rail line linking Tulsa's Central Business District and Tulsa's West Bank areas cannot proceed.

Type of Project:	Multimodal bridge structures	
Location of Project:	Tulsa County, City of Tulsa, Oklahoma; MPO: Indian Nation Council of Governments (INCOG); U.S. Congressional District OK-1: Representative John Sullivan and US Senator Jim Inhofe, US Senator Tom Coburn	
Urban or Rural:	Urban	
Amount of Funds Requested by Applicant:	$94,730,000 (72% of project funding being requested of the $131,970,000 total project cost)	
DUNS Number:	824700074	
FHWA CFDA Number:	20.205	
Central Contractor Registration No.:	339V2	
Project Support Website:	http://www.okladot.state.ok.us/recovery/tiger/tulsa_i244/	
Total Project Cost	$131,970,000	100%
Funds Secured		
State of Oklahoma (expended to date):	$240.000	
State of Oklahoma:	$32,000,000	
Indian Nations Council of Governments:	$5,000,000	
Total	$37,240,000	28%
Funds Requested under TIGER Discretionary Grant		
Based on the funding commitments in place as noted, the applicant requests:	$94,730,000	72%

"This project will improve highway operations, freight service and facilitate commuter rail and future high speed rail connections between Oklahoma City and ultimately other regional metropolitan areas, and further economic development. It will be of particular benefit to Tulsa, and new, programmed and planned developments within our community."

Kathy Taylor, Mayor of Tulsa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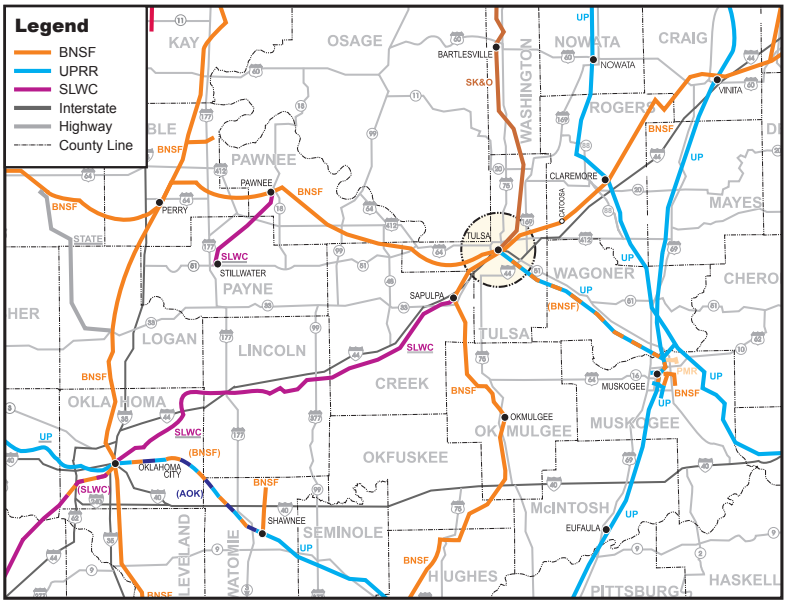
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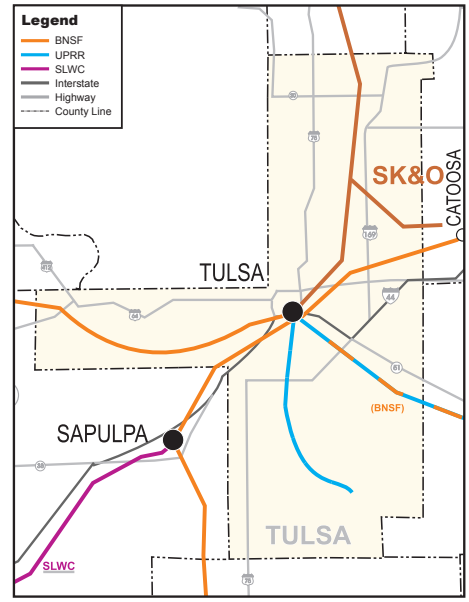
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SLWC
Interstate
Highway
County Line
SK&O
CATOOSA
TULSA
SAPULPA
(BNSF)
SLWC

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I. I-244 Arkansas River Multimodal Bridge Project

Table 1: Project Summary

Type of Project:	Multimodal bridge structures
Location of Project:	Tulsa County, City of Tulsa, Oklahoma; MPO: Indian Nation Council of Governments (INCOG); U.S. Congressional District OK-1: Representative John Sullivan and US Senator Jim Inhofe, US Senator Tom Coburn
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II. Description of the Proposed Project

Project Description and Challenges

The structurally deficient I-244 Arkansas River Bridges are in dire need of replacement, and with an average daily traffic (ADT) of 67,100 they use the second most traveled bridge in Tulsa. The bridges currently rank in the top five worst-rated bridges on the State of Oklahoma State-Owned Interstate Bridge System Inventory and are two of three of the state's worst five which are in Tulsa. The poor state of repair of both bridges (see **Figures 1 and 2**) has required an average of 50 minor repairs and one major emergency repair project every year over the last seven years. The highway crossing has two structures with sufficiency ratings of 32.1 and 36.8 respectively out of 100 points. These structures are expected to lose an average of one sufficiency point per year every year from this point forward unless extensive annual maintenance continues. An immediate investment of $45,000,000 is needed to slow these expected sufficiency losses, and in the last seven years an average of $1.1 million has been spent annually on repairs. The structurally deficient bridges are also functionally obsolete and will soon be operating under load posted restrictions. The existing I-244 Arkansas River Bridges are shown in **Figure 3**.

By designing a replacement multimodal structure, the Oklahoma Department of Transportation (ODOT) is expanding Tulsa's and the state's passenger-carrying capacity by adding provisions on the replacement bridge for state-wide high speed passenger rail as part of the South Central High Speed Rail Corridor, area commuter rail, and bicycle and pedestrian traffic. The new design would carry a lower deck on which two dedicated rail lines would run (designed for rail system electrification) and a dedicated bicycle/pedestrian facility (see **Figure 4**). Adding these multimodal capabilities would yield economic, transportation,

Figure 1: I-244 Bridge Condition

Figure 2: I-244 Bridge Condition

"Tulsans do want a change in direction. They want a city where we can keep our young residents. We want a city that really attracts more than its share of good jobs and new industries and a vibrant downtown and transportation alternatives."

Kathy Taylor, Mayor of Tulsa

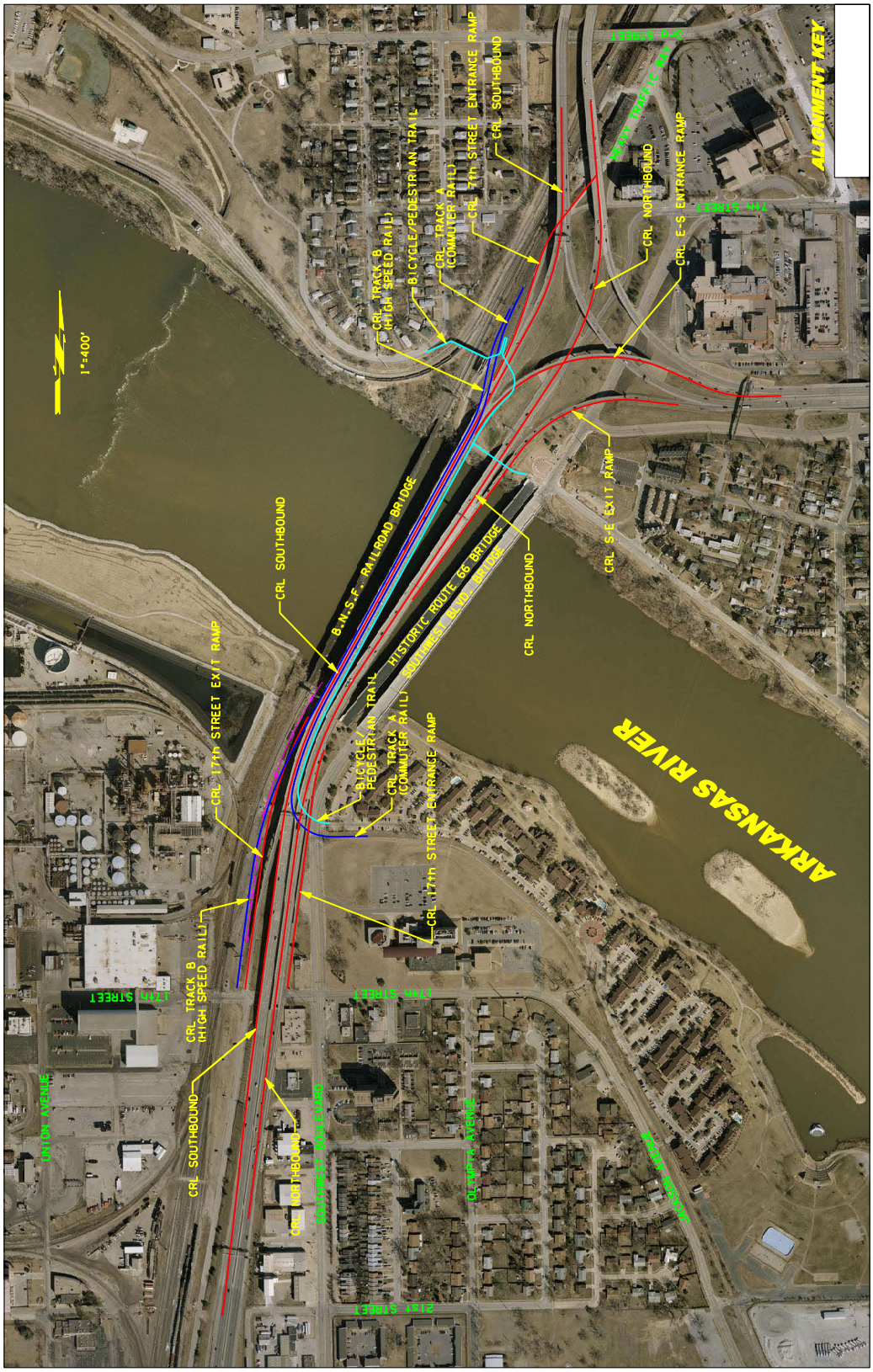

Figure 3: I-244 Location

public health, and quality of life benefits many times its capital cost.

The current structures consist of three through lanes and one auxiliary lane with narrow shoulders on each structure. They are functionally obsolete, having passed their design life. Because they lack wide shoulders which are now the current design standard, accidents and lane closures resulting from maintenance pose significant safety risks, congestion and travel time delays. In turn, these lead to poorer air quality and greater fuel consumption. The inadequate bridge facilities prevent it from serving its potential role in the area's Intelligent Transportation System (ITS), as well. Replacing the existing structures to meet current design standards would enhance the bridge's safety and capacity. They would be designed for future four through lanes and an auxiliary lane for normal operations so that when the adjoining highway systems are upgraded, a simple re-striping and new signage would accommodate this expansion. In addition to the additional lane mentioned, the new design's wide shoulder would allow emergency vehicles to bypass traffic and serve as an auxiliary lane during emergencies (See **Figure 5**). Conceptual design report and functional plans are available on the web link located in **Table 1**.

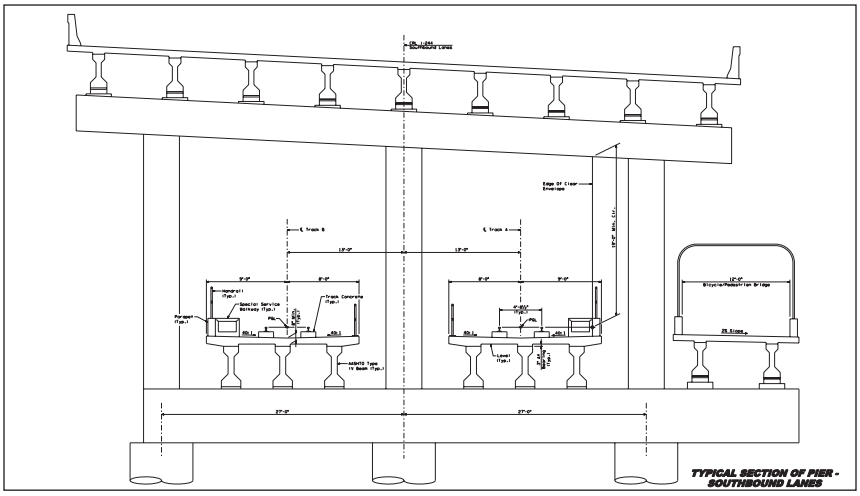

Figure 4: Conceptual Drawing of the Multimodal Bridge Design

Source: ODOT

As a critical link between downtown and west Tulsa, the bridge will provide new rail transit connectivity between Downtown Tulsa, Tulsa's proposed West Bank transit zone, and the city of Jenks. The provision of a rail link between downtown and the West Bank is key to the transit-oriented development planned as the "I-244 Bundle."

On a national scale, the bridge plays an important role in the national High Speed Intercity Passenger Rail (HSIPR) program by providing a dedicated track to downtown Tulsa's Union Station. It connects the proposed high-speed rail between Oklahoma's two largest economic centers, Oklahoma City and Tulsa, with the Dallas/ Ft. Worth area by way of the nationally-designated South

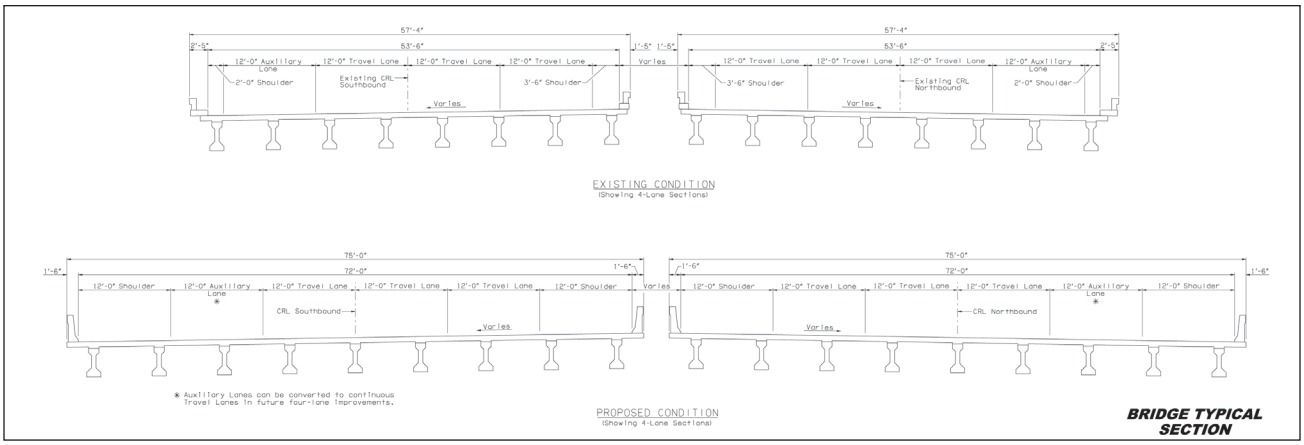

Figure 5: Conceptual Cross-section

Source: ODOT

Central High Speed Rail Corridor (see **Figure 6**). This bridge allows the HSIPR to operate separately from the existing BNSF freight line as it enters downtown Tulsa. Serving one of the largest yards on its national system, the existing BNSF freight rail corridor is extremely congested, and so adding high speed passenger rail to the existing configuration would prove to be difficult, if not impossible. Thus, the I-244's multimodal bridge plays a key role in preserving freight rail operations since it removes any potential conflict with the BNSF's only Arkansas River bridge crossing in the entire state.

The I-244 bridge will also enhance bicycle and pedestrian access adjacent to and across the Arkansas River. With a dedicated bicycle/pedestrian river crossing facility that would span the two new proposed high speed passenger/ commuter rail alignments and with new lighting, signage and fixed pathways, the bridge will increase safety and solidify Tulsa's extensive pedestrian network. It would carry pedestrian and bicycle traffic over the river where several city-wide pathways (see **Figure 7**) converge adjacent to the bridge. As part of the Trails Master Plan, the pedestrian facility would allow walkers, runners, bicyclists, skaters and wheelchair users to connect residential areas to employment and retail centers and outdoor recreational areas, among others.

Figure 7: Trail along the Arkansas River

Source: flickr

"The opportunity is here to start planning and developing a comprehensive, integrated, and multimodal transportation system that is responsive to the mobility needs of the residents of our region."

Rail Transit Strategic Plan, INCOG

Figure 6: Designated *South Central High-speed Rail Corridor*

Source: FRA

Challenges Addressed by the Project

These structurally deficient bridges pose an operating inefficiency and safety risk to the traveling public and have insufficient geometry to allow for capacity expansion. The bridges consume large sums of an already strained bridge maintenance budget from the State of Oklahoma to maintain their currently deficient state. Annual population growth is expected to continue overall at a rate of about 0.8 percent annually, bringing the metropolitan statistical area's population from about 860,000 current residents to one million in 2030. The additional traffic accompanying this growth will compound existing problems. The bridges are expected to be operating at level of service (LOS) E by 2019.

Since they connect to the Tulsa Central Business District (CBD), the bridges must be capable of supporting high density, multimodal activity that enhances efficient, fast-paced living. This project would solve the difficult problem of fitting high-speed passenger/commuter rail lines and pedestrian/bicycle lanes into an already-crowded transportation corridor. These multimodal

bridges allow for implementation of Tulsa's new transit-oriented master plan that is expected to stimulate an economic surge for the city and relieve transportation congestion at the same time. Referred to as the "I-244 Bundle," there are 12 master plan elements dependent on the I-244 bridge as a keystone to their implementation. **Figure 8** shows key features of the plan.

The bridges support existing regional planning efforts and implement recommendations made in the following officially-adopted plans and studies: INCOG's 2005 Long Range Transportation Plan entitled "Destination 2030;" INCOG's 2008 "Rail Transit Strategic Plan;" INCOG's "Congestion Management Process" planning document; the city of Tulsa's "Tulsa 2025" Master Plan and the results of their "Which Way Tulsa" survey. All of these plans and studies used extensive public involvement to develop and select their plans including INCOG's "What About Rail" Open House and ongoing blog and the city of Tulsa's PlaniTulsa events that took place over the course of the past year and involved thousands of citizens. These efforts produced statistically significant polling results and surveys that show clear support for rail transit and development of the I-244 bundle. The results can be seen at www.planitulsa.com.

The transit planning process continues to move and INCOG's Board of Directors approved Urbanized Area Surface Transportation Program funding for conducting transit Alternatives Analysis on the four top tier commuter corridors at the Board meeting on September 10, 2009. The Alternatives Analysis will include transit options over the Arkansas River crossing at I-244.

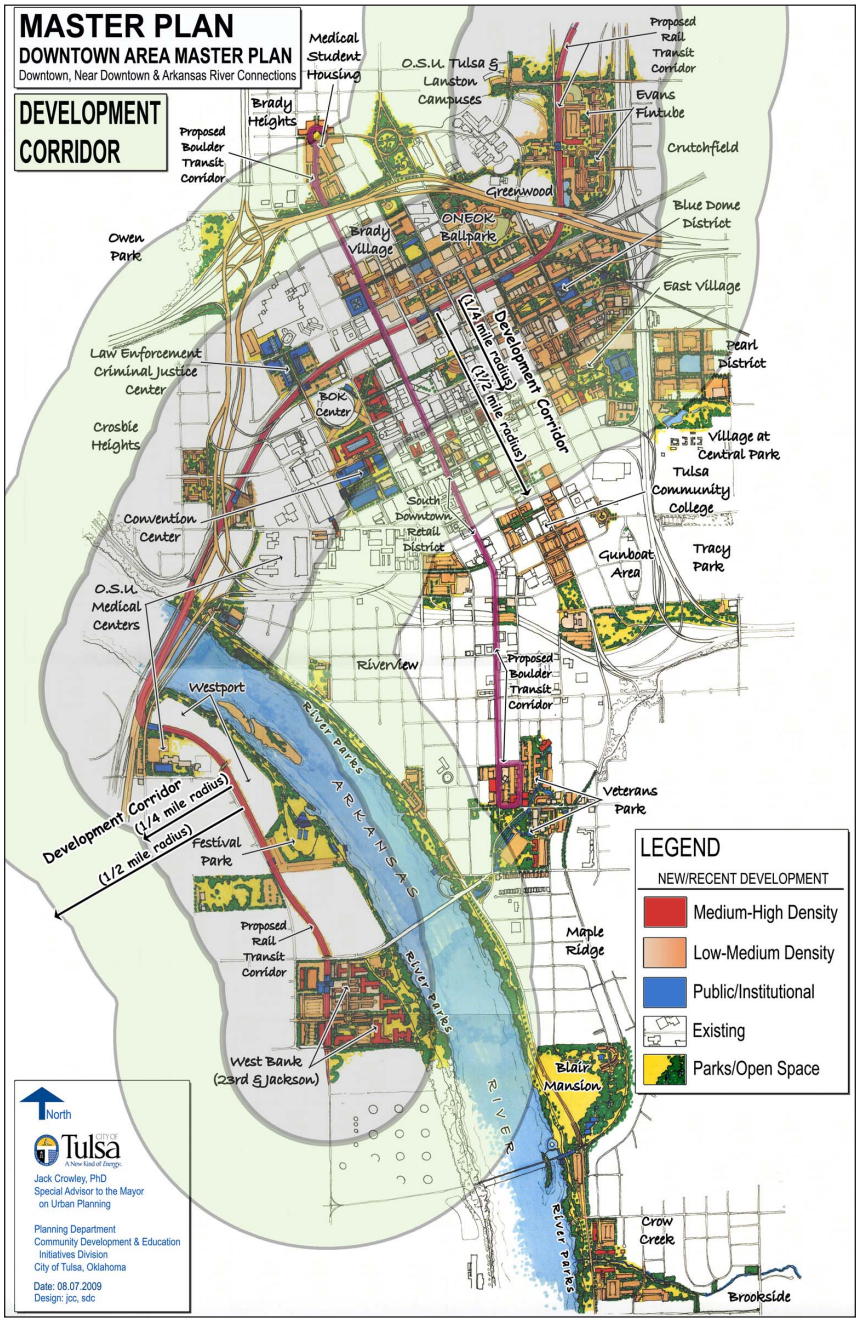

Figure 8: Tulsa Downtown Area Master Plan

Source: City of Tulsa

Figure 9: Community Involvement

Source: City of Tulsa

III. Project Parties

The grant recipient is the State of Oklahoma, Oklahoma Department of Transportation (ODOT), and the other project party is the Indian Nations Council of Governments (INCOG), the Tulsa area metropolitan planning organization.

Those providing non-monetary "community support" will be addressed in Item VI B

Table 2: Summary of Funds

Total Project Cost	$131,970,000	100%
Funds Secured		
State of Oklahoma (expended to date):	$240.000	
State of Oklahoma:	$32,000,000	
Indian Nations Council of Governments:	$5,000,000	
Total	$37,240,000	28%
Funds Requested under TIGER Discretionary Grant		
Based on the funding commitments in place as noted, the applicant requests:	$94,730,000	72%

IV. Grant Funds and Uses of Project Funds

Grant funds and uses of project funds are summarized in **Table 2**. The amount of funds already secured:

- $32 million, State Funds, eight-Year Construction Work Plan
- $5 million Indian Nations Council of Governments
- $240,000 State Funds expended to date

This amounts to 28 percent of the project's total. The amount of funds requested under this TIGER Discretionary Grant (DG) is $94,730,000. This is 72 percent of the total project cost. The funds will be used for construction.

TIGER grant funding will close the gap in financing the project. It will allow the State to continue moving forward on replacing the existing structure rather than having to continue costly stop-gap repair measures.

V. Primary Selection Criteria

A. Long Term Outcomes

1. State of Good Repair

The I-244 project will improve the condition of existing facilities, including minimizing life-cycle costs. This project replaces an existing facility with poor sufficiency ratings (32.1 and 36.8), high maintenance costs ($1.1 million annually over past 7 years and an average of 50 work orders annually), and the related excessive lane closures. The poor condition of the bridges threatens the Tulsa MSA's future economic growth and stability. I-244 carries the second highest volume of both freight and passenger traffic through Tulsa County and the city of Tulsa. Resulting from expected ADT growth and continued deterioration, these bridges will become load-posted and thus create traffic problems and limit commercial opportunities for the area. Because of expected increases in rail freight volumes shown in **Figure 10**, it will become increasingly difficult to include passenger and commuter rail service into this rail corridor without new alignments as provided by these new structures.

The I-244 project is appropriately capitalized up-front and ODOT uses asset management approaches to optimize the long-term cost structure for the project. Life Cycle Cost Analysis (LCCA) shows that if DOT continues to make repairs and perform maintenance instead of replacing the bridge, ODOT will be wasting money in the long run because ODOT will be paying to keep the failing structures operational and still have to replace them. Thus, LCCA shows the wisdom of replacing the structures now. ODOT's new Responsible Asset Management Program, (R.A.M.P.) will assure the bridge's long-term viability by tracking all ODOT assets over time. Further, ODOT uses PONTIS (AASHTO bridge management system) to optimize the use of bridge funds for repair, rehabilitation and replacement of all highway bridges in Oklahoma. The Department provides for a sustainable source of revenue for long-term operations and project maintenance. It uses both State level ODOT annual maintenance budget and Federal Highway

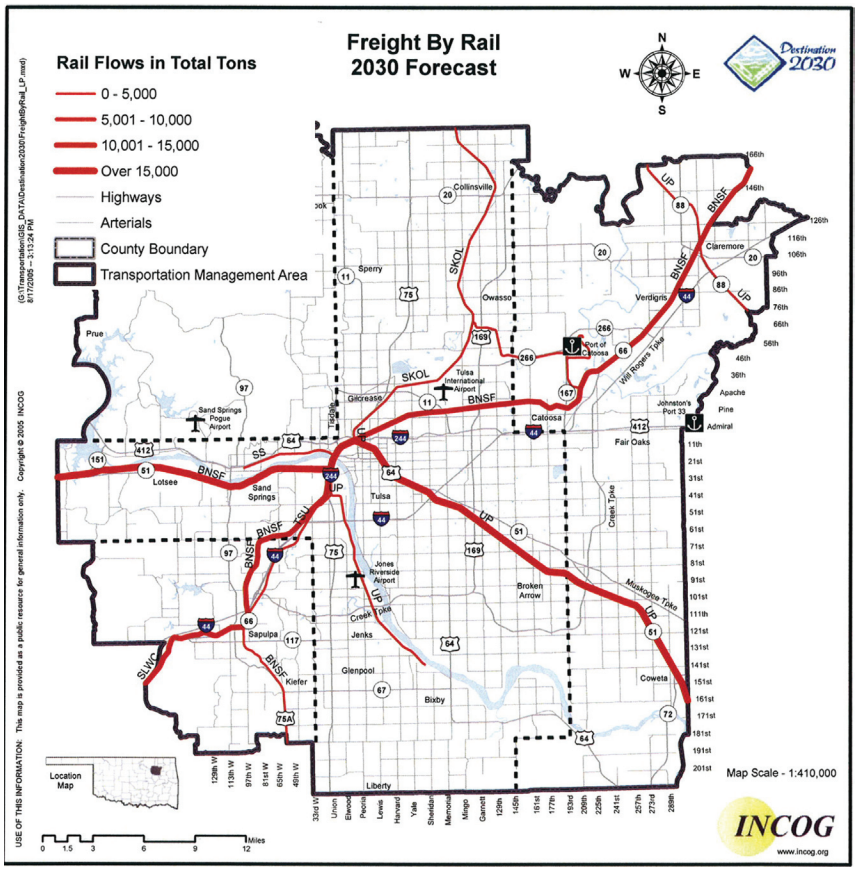

Figure 10: 2030 Freight Flow by Rail

Source: INCOG

Administration (FHWA) annual programmed funds.

The present two structures have sufficiency ratings of 32.1 and 36.8, and are currently operating at LOS C during peak hours when there is no maintenance underway; however, the bridge has lane closures of one lane in each direction about 20 weeks per year and two in each direction for about 10 weeks annually, thus negatively affecting LOS. Traffic on the bridge – when all lanes are open – operates at LOS C during peak hours, and at LOS A or B during off-peak hours. As regional travel demand grows, this level of service will decrease. Daily traffic is expected to reach LOS E in 2019, and to hit 95,000 in 2027 with associated daily gridlock as a result of LOS F traffic flow at this capacity. Under their current design these structures cannot offer service for pedestrians, cyclists, or rail transit riders.

2. Economic Competitiveness

<u>The I-244 Arkansas River Bridge and Its Role in the Regional Economy</u>

The Tulsa metropolitan region has a population of 860,553, and in 2007 was home to over 425,000 jobs. Tulsa is a nationally significant oil and natural gas production center. It also has economic strengths in aerospace, finance, technology, telecommunications, high tech, and manufacturing. Many of these industries are located or headquartered in the Tulsa CBD and rely on I-244 to provide connections for employees, visitors, products, and markets.

The I-244's multimodal bridge plays a key role in preserving freight rail operations since it removes any potential conflict with the BNSF's only Arkansas River bridge crossing in the entire state.

Tulsa is a growing city in a growing metropolitan region, as shown in **Tables 3 and 4**. Employment in the CBD is expected to grow by ten percent above 2000 levels by 2030, adding nearly 4,000 jobs to the downtown area directly served by the bridge. This is a very conservative number since the demographic forecasting was done in 2005 and does not reflect the impact of the I-244 Bundle or transit oriented development adopted in the city's new Master Plan.

Local Connections:
The I-244 bridges connect the Tulsa CBD to the area west of the river (West Bank). Both are high-density employment centers, with the West Bank supporting oil transshipment and other industrial activities. Each day, over 63,000 cars, 4,000 trucks and 70 commercial and commuter buses cross the bridges moving workers, visitors, and deliveries to and through Tulsa's downtown core.

Regional Connections:
I-244 serves as a critical link in the transportation network for

Table 3: Population Growth

Area	2000	2008	2030	2000-2030 Growth	2000-2030 Growth (%)
City of Tulsa	393,116	385,635	459,670	66,554	17%
Tulsa County	563,299	590,300	658,500	95,201	17%
Tulsa MSA	803,235	848,550	970,300	167,065	21%

Sources: U.S. Bureau of the Census, http://www.census.gov/; Oklahoma State Data Center: http://staging.okcommerce.gov/test1/dmdocuments/Population_Projections_2000_City_by_County_140904109.pdf ; Tulsa MSA data based on year 2000 definition. County and MSA 2008 estimates based on population growth between 2005 & 2010.

Table 4: Employment Growth

Area	2000	2008	2030	2000-2030 Growth	2000-2030 Growth (%)
City of Tulsa	131,794	137,479			
Tulsa CBD	39,397	39,870 (1)	43,390	3,993	10%
Rest of Tulsa County	335,160	339,182 (1)	383,979	48,819	14%
Tulsa MSA	518,896	536,331 (2)	694,802	175,906	34%

Sources: U.S. Bureau of Economic Analysis, http://www.bea.gov/; Indian Nations Council of Governments, www.incog.org; US Bureau of Labor Statistics, http://www.bls.gov/.
(1) based on BLS data from 2000 to 2008
(2) 2008 Based on growth from 2008 to 2030

Table 5: Current Bridge Traffic

Mode	AM Peak	Total Daily	Annual
Cars	7,381	63,100	23,031,500
Trucks/Freight/Commercial	443	4,000	1,460,000
Total	7,824	67,100	24,491,500

Source: ODOT traffic counts, August 2009

the daily commute of thousands of workers in the Tulsa region. Residents from communities throughout the Tulsa Metropolitan Area, including Skiatook, Sand Springs, Sapulpa, Jenks, Glenpool and Bixby, use the bridge to get to or across the downtown area.

National Connections:
The bridges are also important for interstate traffic flows as part of the national highway system. Without the I-244 bridge and I-44 bridge, which is nearly four miles down the river, the small local bridges in the area would be easily overwhelmed. Currently, with the I-44 bridge under extensive repair, the I-244 bridge is serving as a vital artery moving freight both to and from the Tulsa Port of Catoosa, one of America's largest inland river ports.

Connections between Tulsa and the Port of Catoosa (see **Figure 11**) are important, with industries having access to the port by rail or truck. More than two million tons of cargo in 1,300 barges is

Figure 11: Eastern U.S. Waterways

Source: Tulsa Port of Catoosa

shipped annually through the Port of Catoosa. The port is responsible for returning $2.8 billion in annual benefits to the regional economy, and studies clearly show truck traffic utilizes I-244 as a link between the Port of Catoosa and Tulsa's industrial West Bank area.

The ability to expand the new bridges to four through lanes in each direction with minimal cost will ensure that bridge congestion will not act as a brake on Tulsa's growth. Reduced congestion means that businesses will continue to have access to a wide range of employees. Furthermore, low congestion levels are an important aspect of quality of life, and make it easier to attract new residents to the area, and to allow residential growth to continue in areas southwest of the Arkansas River.

<u>Importance of I-244 on the Local/Regional/National Economy</u>
The bridges are 42 years old. Closures for the bridge structures currently occur for a minimum of 30 weeks per year, and ten of

those weeks require a multi-lane closure cutting travel speeds in half and creating periods of gridlock. Additional detail on the closures is included in the benefit cost analysis section.

If the structures are not replaced soon, additional lane closures will be required as the bridge continues to deteriorate. These closures contribute to delay and unreliability for commuters and local deliveries, as well as other trips, including truck traffic between Tulsa's industrial West Bank and the Port of Catoosa east of downtown Tulsa. This industrial traffic will be forced to re-route due to weight restrictions in the next decade if the bridges are not replaced.

In addition to the delays associated with frequent work zones, as traffic continues to grow, the current bridges will not provide sufficient capacity. Regular delays resulting from congestion will significantly compound the delays being experienced because of the lane closures.

By providing more reliable and faster trips, the project will make it easier for businesses in downtown Tulsa to attract employees. It will also encourage additional trips to downtown for recreation, shopping, and dining, contributing to a more vibrant and healthy downtown.

Freight Rail Benefits

With plans for high-speed passenger and commuter rail in high gear, one of the project's main benefits is that it bypasses the existing project area freight rail system (see **Figure 12**). The BNSF bridge is the only rail crossing over the Arkansas River, and the Cherokee freight yard, just west of the I-244 bridge, is the largest freight yard in Oklahoma. It moves 5,400 tons of cargo daily, and provides vital connectivity to the Tulsa Port of Catoosa, manufacturing plants, and the Tulsa International Airport. It also provides through-passage for a large portion of BNSF's national rail system cargo. INCOG expects freight rail to experience double digit growth in the next decade, and as such the need to keep the freight rail lines running efficiently will become even more important.

Bicycle and Pedestrian Component

The bridge replacements will allow numerous city of Tulsa-planned bicycle and pedestrian improvements to move forward and provide a dedicated bicycle/pedestrian facility to join both sides of the river. Residential development in downtown Tulsa is experiencing an upswing, and could expand as the area takes on a more urban dynamic with the addition of rail transit, and bike/walk access connecting downtown to the waterfront and the West Bank. The West Bank houses a large number of economically challenged residents who would now be able to utilize bicycle travel as a reliable and safe means to travel to Tulsa's Central Business District for work. Following are two web-links to the comprehensive plan for regional and local trails:

- http://www.incog.org/transportation/trails/trailsmap.pdf
- http://www.incog.org/transportation/destination2030/maps/4-2030Bicycle-PedestrianPlan.pdf

Economic Development and Downtown Area Master Plan

The Tulsa mayor's office is currently putting the finishing touches on the city of Tulsa's new transit-centered master plan which relies on the transit corridor centered on the I-244 Arkansas River Bridge multimodal crossing. (The plan's Executive Summary and plan's components can be viewed on the support website.) The bridge is a cornerstone of a larger vision to transform central Tulsa into a transit- and pedes-

Figure 12: BNSF Cherokee Freight Yard

Source: flickr

"The Downtown Master Plan is a road map for the future. It's a good map to follow and one that could lead to a successful destination."

Mike Jones,
Tulsa World

trian-centered city that promotes the concepts of New Urbanism. The master plan aims to trigger an economic boom by creating a transit corridor and actively promoting high-density development in station areas. This has occurred in cities such as Austin, Dallas, and Little Rock, where rail transit and large-scale mixed-use projects develop jointly.

Phase I of the commuter rail project links the Tulsa CBD with the West Bank area south of the river, including stations for popular destinations such as the city's Festival Park, the Oklahoma State University Medical Center and new Forensics Laboratory, the Oklahoma State Office Complex, BOK Center Arena and Convention Center, Williams Center, the new City Hall, Blue Dome-Greenwood-Brady Entertainment Districts, and the new ONEOK Ballpark. To maximize the rail project's development potential both of its termini for this first phase are large vacant sites. The West Bank tract at 23rd Street has already been designed to support a transit-oriented mixed use development with 935 residential units and 80,000 square feet of retail/commercial space to complement the existing 30,000 feet of office space near the proposed station.

The Evans-Fintube site is envisioned as a potential residential, arts and mixed-use development.

The Phase I rail is planned to cross the river on the new I-244 crossing. Without the bridges, the future of the commuter rail project is uncertain, and without the transit improvements, the planned station area developments are highly unlikely to occur. This is particularly true for the Evans-Fintube site, which is surrounded by freight rail lines and Interstate highways.

A number of other civic projects are also being planned in conjunction with the bicycle, pedestrian and rail elements of the replacement bridge. Known locally as the "I-244 Bundle," these projects target key transportation elements, improving safety while enhancing the area's economic competitiveness, livability and sustainability. The bundle projects include $80 million worth of grade separation projects that would elevate four streets above existing BNSF freight rail tracks. This would allow pedestrians and drivers to avoid crossing busy rail lines at-grade. Other proposed projects include:

- Cincinnati and Detroit Avenue Roundabouts
- Trails Connections Development Plan II
- Storey Wrecker (Justice Center)
- Avery Park Southwest
- I-244 Area Trail Enhancements
- Tulsa Route 66 Memorial Park
- Tulsa-Central Area Multi-Modal Corridors and Major Economic Development Project Locations
- Greenwood Development

Taken together, these projects will have a transformational effect on the region, providing multiple opportunities for infill development, a more sustainable, livable and less-auto dependent city, and a denser, more vibrant urban core. As noted in the Downtown Tulsa Master Plan and other documents, the development of the future regional rail system is a crucial catalyst adding additional opportunity and energy for Tulsa's economic revitalization.

In addition, they will have an impressive long-term stimulus effect, increasing jobs, retail sales and income. An analysis done by the city of Tulsa Planning Department indicates that four transit-oriented developments, Evans-Fintube, West Bank Phase I and II, and Greenwood (just northeast of the CBD), would generate total retail sales of between $33,560,000 and $41,950,000 at build-out, with a local retail sales tax generation ranging between $2,936,500 and $3,670,625 annually. On average, the commercial and retail sales projected are estimated to range from $200 to $250 per square foot. These figures do not estimate the

"Imagine a downtown connected by trolleys. Imagine trains moving freight and passengers through and to downtown. Imagine entertainment districts, parks, open spaces and residential neighborhoods all connected yet all with their distinctive personalities."

Mike Jones,
Tulsa World

benefits of the substantial residential, hotel and office uses included in the developments

Upon project completion, the study indicated that an additional 300 office workers and 160 to 200 full-time and part-time retail workers would be employed annually in project businesses. An additional 60 to 100 teachers, support, and administrative personnel would be employed at the liberal and performing arts school at the Evans-Fintube site. Total new employment would be 520 to 600 workers.

3. Livability

The I-244 Arkansas River Bridge project links Tulsa's Central Business District and Tulsa's West Bank. These two areas combined form a microcosm of a traditional urban center, as they contain high density housing, medical centers, industry/ big business, and educational venues. Demographically it contains high concentrations of several resident populations which traditionally require greater public services and assistance. **Figure 13** shows the locations of economically distressed areas, as measured by unemployment, poverty, and housing quality. An enlarged version of **Figure 13** is also available on the project website found in **Table 1**.

The project is also centrally located at a crossroads where several of Tulsa's major transportation corridors meet and then disperse throughout the remainder of the city and county. Demographic characteristics are summarized in the maps listed on the support website. As such, this project will have a positive impact on many segments of Tulsa's population in need of aid and

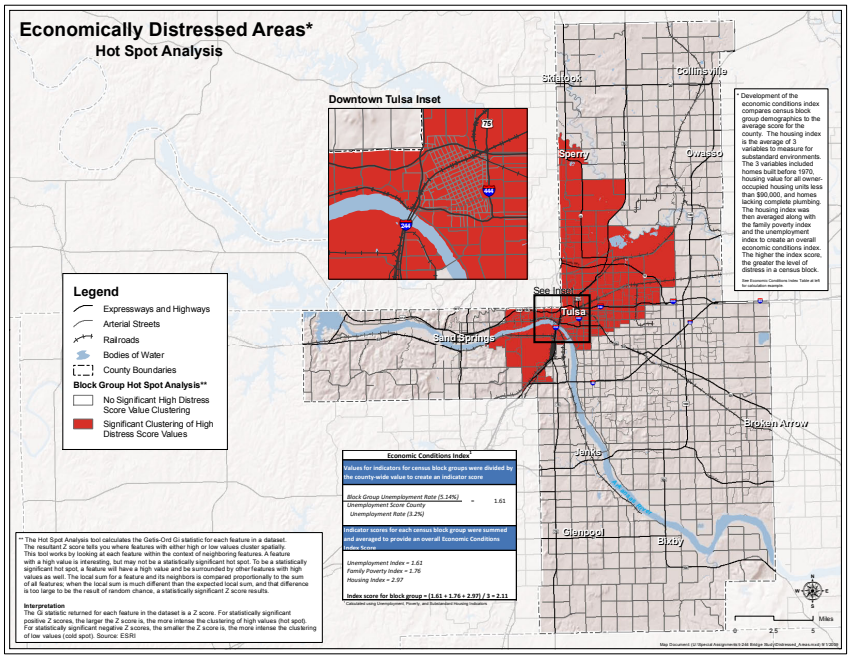

Figure 13: Economically Distressed Areas

Source: INCOG

assistance to improve their quality of life.

This project will transform and enhance travel options for central Tulsa on all fronts. It will carry a dedicated bike/pedestrian lane which currently does not exist over the Arkansas River. And by adding the rail connections, it provides the keystone for Tulsa's planned city-wide rail transit system which both the public and local planning organizations have identified as a priority, and around which Tulsa's new master plan centers. Additionally the Tulsa/OKC/Dallas/Fort Worth high speed rail line would be able to reach its downtown terminal (Union Station) without conflicting with freight rail traffic.

The I-244 Bridges improve existing transportation choices by enhancing points of modal connectivity and reducing congestion on existing modes. They will join two existing bike and pedestrian corridors on opposite sides of the river and eliminate vehicular/bike and vehicular/pedestrian conflict. The bridges will be designed for future capacity expansion and reduce maintenance and accident congestion by carrying shoulders wide enough to support emergency traffic and that can be converted to additional through-lanes when the highway system is upgraded. The new rail service provisions on the bridge will be done in conjunction with planned park and ride facilities called for in both Tulsa's new master plan for commuter rail as well as in the planned South Central High Speed Rail Corridor. The section between Oklahoma City to Tulsa will take some intercity passenger demand off the main route of the Turner Turnpike.

The I-244 bridges will improve accessibility and transportation services for disadvantaged populations, non-drivers, senior

citizens, and persons with disabilities. They will also make goods and services more readily available to these groups. This project sits in a core of traditionally disadvantaged people, and by providing mobility options that do not require an automobile this project will help those households and individuals that do not have such an option. Introducing rail transit to the city will reduce their monthly transportation costs. According to INCOG, families in auto dependent neighborhoods spend approximately 25 percent of their monthly budget on transportation. Transit rich neighborhoods, however, spend an average of nine percent. The national average per family is that 19 percent of their monthly budget is spent on transportation.

This project is a product of a planning process which coordinated transportation and land use planning decisions. Both INCOG and the city of Tulsa have produced several plans the last five years (these are listed elsewhere in this application) that call for the mode choices and long-term planning facilitated by this project – the fixed guideway transit mode choices, transit-oriented development (TOD), and transportation development to support these hubs discussed throughout this grant application. The community participation in these planning processes used many techniques to engage the public. For example, INCOG held numerous open houses (see **Figure 14**), non-traditional meetings like at the Tulsa State Fair, citizen surveys including via the web, and hosted a blog that focused on citizen involvement in transportation decision-making. All of their planning committees included representatives from numerous local entities and interests. The city of Tulsa just completed a year-long community planning process called PlaniTulsa that involved thousands of residents from throughout Tulsa to develop a set of priorities reflecting their desires. These priorities support the mode and design choices called for by the I-244 Arkansas River Bridge project, and are reflected in Tulsa's new master plan.

"People are ready to break down the old barriers and see every part of the community become revitalized."

John Fregonese,
President,
Fregonese Associates

4. Sustainability

While currently within air quality conformance, the Tulsa MSA is very close to falling into non-compliance. Thus, any mobility improvements moving travelers from less efficient modes to more efficient ones are valuable. As documented in other sections of this proposal, the proposed I-244 Arkansas River crossing would provide numerous emissions reductions, time savings, and fuel savings by adding new travel modes to the transportation system, wider shoulders on the bridges to keep traffic and emergency services flowing, elimination of most of the maintenance closures, and building in capacity expansion by way of future lanes.

One of the most exciting aspects of the proposed bridge is the sub-deck that will carry passenger rail, commuter rail, and bicycle/ pedestrian users. These alternate travel modes will have a positive impact on reducing auto emissions as they draw auto commuters off the roadways, especially during peak travel times when pollution is worse. In Oklahoma, more than 80 percent of all commuters travel alone. Thus, often a one to one correlation exits between mode shift and vehicle reduction. These provisions improve air quality and public health.

Figure 14: Community Involvement

Source: City of Tulsa

Additionally, the bridge has been designed for electrification of the rail lines which will further reduce emissions. Because of the proposed high density developments on both sides of the river the pedestrian corridor will be a viable means to commute to work for many people since the corridor will be physically separated from vehicular traffic.

The on-going maintenance and repair cycle on the bridge is causing roadway congestion and delay that aggravates Tulsa's air quality. The benefit cost section quantifies specific emissions reductions from auto and truck traffic as a result of eliminating extensive maintenance closures.

5. Safety
While the direct accident safety benefit of building a new I-244 Arkansas River Bridge will not be a significant improvement since currently the bridge experiences 1.7 automotive accidents per year, several indirect benefits exist that show the project's regional importance. The current 3'-6" inside and 2'-0" outside shoulder widths mean that traffic congestion can prevent emergency vehicles from traversing the river. As the second busiest river crossing in Tulsa, I-244 carries a large percentage of the emergency response traffic. It is also adjacent to three large medical facilities. The new bridge will have shoulders wide enough to serve as auxiliary lanes in times of emergency or accident.

By adding rail and bicycle travel modes to the bridge, traveler mode choice options increase. This can result in overall accident reduction in the city by removing some automobile traffic from the roadways. This reduction in congestion can have positive effects far outside the vicinity of the bridge itself.

The separation of all three rail modes (freight, passenger, commuter) through dedicated travel alignments provide for safety in the Arkansas River area. These prevent freight/ passenger interactions and conflicts.

B. Job Creation and Economic Stimulus

The I-244 Bridge project is expected to create significant near-term economic benefits for the Tulsa County area, Oklahoma, and the United States. Oklahoma's economic benefits from the project would be driven by an increase in construction spending in the region. These project expenditures would generate a short term increase in demand for construction-related labor and material as well as engineering and technical services.

Influence on Economically Distressed Area
According to an analysis by INCOG, the metropolitan planning organization (MPO) for the Tulsa area, there are several census tracts in Tulsa and adjacent counties that are characterized by low and moderate income households. Additionally, a review of recent census data indicates that four out of five counties in the Tulsa MSA fit the definition of Economically Distressed Areas, as defined by the Public Works and Economic Development Act of 1965. The combination of low income households, under- or un-employed workers, and local training programs provide great opportunities for the bridge construction project to have a speedy and positive impact on the economy.

To quantify the near-term economic benefits of this project an analysis was conducted utilizing Bureau of Economic Analysis (BEA) Regional Input-Output Multipliers (RIMS II) multipliers. RIMS II multipliers classify each capital cost category according to industrial sectors, which can vary widely depending on the geographic region being analyzed. This particular analysis utilizes RIMS II data for the State of Oklahoma and Tulsa County. RIMS II industry codes 7 (Construction) and 47 (Professional, Scientific, and Technical Services) were utilized in this analysis. The multipliers were used to determine the quantity and industry composition of benefits generated by the project resulting in estimations of short-term job creation, earnings, and economic output as a result of the project. The multipliers estimate two types of impacts:

"This is going to be a real economic stimulus for [Oklahoma City and Tulsa] and for every town in between."

Matthew Dowty,
Oklahoma Passenger Rail Association

Direct Impacts: Direct impacts represent new spending, hiring, and production by civil engineering construction companies to accommodate the demand for resources in order to complete the project.

Indirect/Induced Impacts: Indirect impacts result from the quantity of inter-industry purchases necessary to support the increase in production from the construction industry experiencing new demand for its goods and services. All industries that produce goods and services consumed by the construction industry will also increase production and help preserve or create new jobs to meet the additional demand. The level of inter-industry trade within the area will determine the size of the indirect impact. Induced impacts stem from the re-spending of wages earned by workers benefiting from the direct and indirect activity within an area. For example, if an increase in demand leads to new employment and earnings in a set of industries, workers in these industries will

spend some proportion of their increased earnings at local retail shops, restaurants, and other places of commerce, further stimulating economic activity.

The results of the short term economic impacts are shown in **Table 6**. The schedule for these impacts is based on the I-244 Construction Schedule and is available as a part of the Supporting Documentation on the website found in **Table 1**.

In addition to measuring the project effects on the Tulsa County economy, the economic impacts of the project that will be realized in other areas were also quantified. These impacts, referred to as "spillover" benefits, reflect the inter-county trade that occurs with supply industries.

The degree of these out-of-county "spillover" benefits depends on the size and composition of the local economy for a given county. Counties such as Tulsa that have large, diverse workforces and a broad industry base often rely less on inter-county trade to support local production than smaller, less diverse county economies.

Beginning in 2010, the I-244 Bridge project is expected to generate significant economic benefits for the region. An estimated average of 1,021 jobs will be created annually by the project, including an average of 559 direct jobs per year.

Figure 15 shows the profile of average annual full-time equivalent (FTE) employment generated annually by the project's expenditures. At the peak of spending, in the fourth quarter of 2010, approximately 1,723 FTE persons are employed as a result of the project, including 944 direct jobs. In total, the project is projected to create 2,809 person years of employment, including 1,538 direct job person years. **Table 7** shows the number of persons employed on the project per quarter.

Figure 16 shows the breakdown of jobs created by industry and type of impact. As expected, the civil engineering construction (1,312 person years) industry is estimated to receive the largest increase in jobs from the project, almost all of which are direct jobs created. The industries that will see the largest number of

Table 6: Summary of Near-term Economic Impacts Resulting From the Project

Direct Impacts	
Employment (Average Annual FTE Employment)	559
Earnings (2009 $)	$55,954,000
Output (2009 $)	$105,216,000
Indirect/Induced Impacts	
Employment (Average Annual FTE Employment)	462
Earnings (2009 $)	$40,758,000
Output (2009 $)	$195,800,000
Total Impacts	
Employment (Average Annual FTE Employment)	1,021
Earnings (2009 $)	$96,712,000
Output (2009 $)	$301,016,000

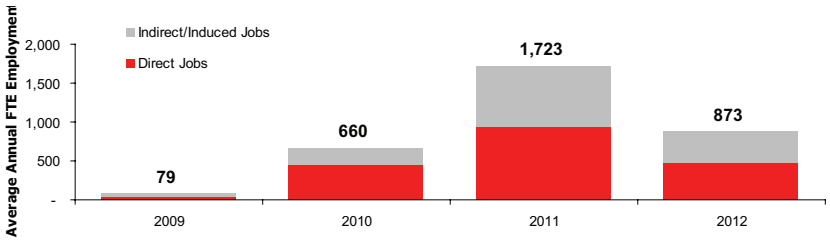

Figure 15: Average Annual Employment per Year During Construction

Source note: Calculations are based on federal Bureau of Economic Analysis (BEA) multipliers.

Table 7: Direct (On-Project) Jobs by Quarter by Calendar Year

2009			
		Q3	Q4
		22	63
2010			
Q1	Q2	Q3	Q4
71	21	777	944
2011			
Q1	Q2	Q3	Q4
944	944	944	944
2012			
Q1			
478			

Source note: Calculations are based on federal Bureau of Economic Analysis (BEA) multipliers.

indirect jobs created include retail trade (272 person years), professional services (227 person years), health care (189 person years), manufacturing (131 person years), food services (119 person years), administration and waste management (100 person years), and other services (85 person years).

It is also important to consider the quality of the jobs that would be created by the project, which can be most easily measured by the number of jobs created at various levels of compensation. **Figure 17** shows that the majority of jobs generated by the project would receive compensation above $20,000/year, indicating that the project would generate average paying jobs that would help stimulate the regional economy.

Ready for Quick Start

The amount of short-term economic activity generated by the project is shown in **Figure 18**. In total, the project would generate $301 million in real economic output (measured in 2009 dollars), with over $89 million dollars of economic output generated in 2010. Consistent with job creation, the majority of economic activity would be generated in 2011.

(i) Project Schedule: Please refer to the website link found in **Table 1**.

(ii) Environmental Approvals: NEPA Process is underway and is expected to be completed as a categorical exclusion by December 21, 2009.

(iii) Legislative Approvals: none is required for this specific project; all general approvals have been put in place previously as the

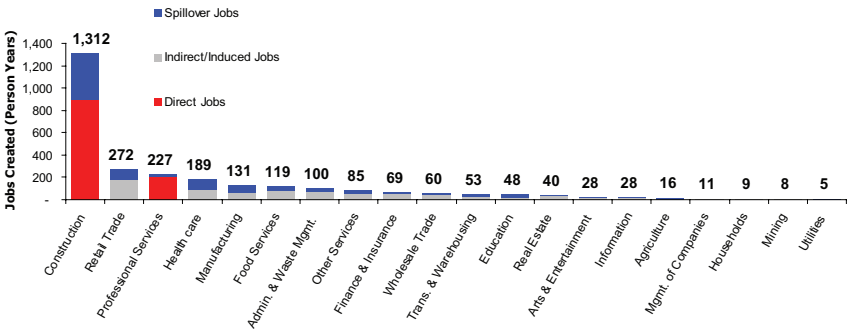

Figure 16: Breakdown of Job Creation by Industry and Type of Impact

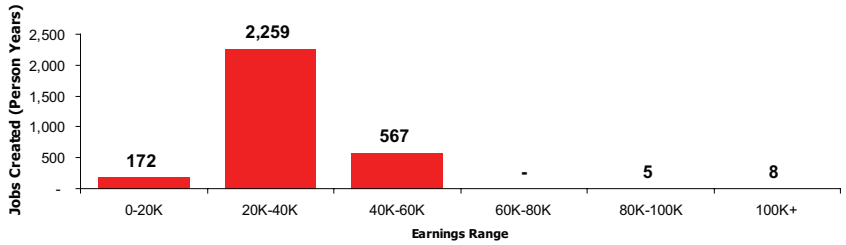

Figure 17: Breakdown of Job Creation by Earnings Range

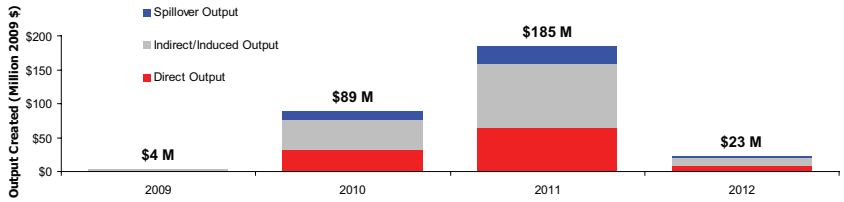

Figure 18: Breakdown of Statewide Economic Output Generated by Contract

Source note for Figures 16 - 18: Calculations are based on federal Bureau of Economic Analysis (BEA) multipliers.

State and ODOT are already participating in other national government stimulus programs.

(iv) State & Local Planning: INCOG has committed formally to add this project to their planning documents at their September 2009 Meeting. The project is currently programmed in ODOT's 8 Year Construction Work Plan. However, since full funding has not yet been achieved, the project has not been included in the STIP. As soon as the project is fully funded, all planning documents, including the STIP, will be modified to include this project.

(v) Technical Feasibility: Conceptual Plans, Preliminary Engineering, and "Rail track and Bridge Design Criteria Report" already completed; these documents are on the support website and can be viewed in entirety.

(vi) Financial Feasibility: see attachment signed by ODOT

C. Evaluation of Costs and Benefits

Benefit Cost Analysis

The formal benefit cost analysis has been conducted using best practices for benefit cost analysis in transportation planning. It reflects all TIGER grant application guidelines. It is important to note that a formal benefit cost analysis is not a comprehensive measure of a project's total economic impact, as many benefits cannot be readily quantified and occur under conditions of uncertainty. The broader set of long term economic benefits and impacts on local and regional economic well being and competitiveness are described in Section V.B.

To the extent possible given available data, the formal benefit cost analysis prepared in connection with this TIGER grant application, and reported below, reflects quantifiable economic benefits in all five major long term impact areas identified in the TIGER grant application guidelines. These include:

State of Good Repair

The project will reduce maintenance cost substantially over the next few decades. Reducing work zone related delay is another quantifiable aspect of improving the facility's state of repair. Detailed engineering and life cycle analysis comparing the replacement and maintenance costs of the new bridge relative to the existing bridge, which has exceeded its useful service life, indicate a life cycle cost savings. Life-cycle costs of the new bridge, measured in present value terms using a discount rate of three percent, are $158.9 million, compared to a life cycle cost of $190.0 million for maintaining the existing structure for another 25 years – a net project benefit of $31.1 million for life cycle costs alone.

Long Term Economic Competitiveness

Reducing vehicular delays from reduced work zone lane closures as well as from the additional capacity provided by a fourth lane in each direction will allow commuters to have increased productivity, improved quality of life, and will allow Tulsa employers access to a wider pool of potential employees. This improved mobility for commutes, deliveries, and other types of trips will retain jobs in Tulsa's economy, allow for growth, and will benefit Tulsa by making it a more dynamic interactive region.

Sustainability

The project will reduce auto emissions resulting from slow speeds and idling by reducing work zone lane closures and speeding trips across the bridge by providing a fourth lane in future years. This will enhance sustainability in the region, and reduce greenhouse gas emissions. Note that additional sustainability benefits, such as those provided by future commuter and passenger rail service are not specifically quantified here.

Livability

Downtown Tulsa, the core of the metropolitan region, will benefit greatly from improved traffic flow on the I-244 bridge. Making commutes shorter and less frustrating, and reducing barriers for recreational trips to downtown will enhance the region's connectivity and promote job and entertainment growth in the CBD.

Safety

The new bridge will improve safety in a number of ways:

1. Because of the frequent lane closures, and the inadequate shoulder widths on the current bridge, safety for construction personnel is currently of great concern. The new structure, built to meet current standards, would improve safety for construction personnel as well as for drivers.

2. Safety vehicle response time will improve, as these vehicles will be able to use the shoulders to move quickly around traffic even when congestion is high.

3. In emergency situations, the shoulder can be utilized as a fifth lane.

4. The fact that this bridge is currently structurally deficient coupled with its very low sufficiency rating is cause for concern; replacing the structure eliminates the possibility of a critical failure that would be catastrophic.

In addition, the project will enable commuter rail and high speed rail projects to go forward. It also supports a number of other "Tulsa Bundle" projects, further adding to Tulsa's long-term economic competitiveness, thus creating a more sustainable, livable, transit-friendly region.

Given the definitions and limitations noted , the computed benefit cost (B/C) ratio for the Tulsa I-244 Arkansas River Bridge project is 11.2 using a three percent discount rate, and 7.8 using a seven percent discount rate.

The cost-benefit analysis described in this section compares the project's capital construction costs to the quantifiable benefits of the project including:

- Reduced maintenance costs
- Travel delay savings for vehicles resulting from reduced lane closures
- Travel delay savings for vehicles resulting from the use of an additional lane in each direction to meet future travel needs
- Vehicle fuel and operations cost savings
- Emissions reductions
- Economic development benefits

A Note on the Discount Rates

As required by the Federal Register guidelines for TIGER grant applications, a seven percent discount rate has been applied uniformly to all project costs and benefits to arrive at the discounted benefit cost ratio and net present value. As an alternative, and again in keeping with the Federal Register guidelines, benefits and costs have also been valued using a three percent discount rate. Sources for these rates are OMB circulars A-4 and A-94, where seven percent is represented as the average expected return on private capital and three percent represents the social rate of time preference. The former might be more appropriately applied to benefit streams that accrue to private firms, while the latter might be more appropriately applied to long term benefits that accrue strictly to current households and subsequent generations. More particularly, the latter may be appropriately used where these benefits accrue to lower income households for whom long term wealth accumulation or future social benefits will be more highly valued.

No specific attempt has been made in the benefit cost analysis presented in this application to apply different discount rates to different benefit or cost streams. However, as projects will typically benefit a mixture of private and public stakeholders, as well as different income or social groups, the B/C ratios would undoubtedly fall somewhere between those computed at seven percent and three percent had this been done.

Cost/Benefit Results

Table 8 summarizes the costs and the quantifiable benefits of the project in terms of present value. Individual cost and benefit items are described in the following pages. A detailed analysis of costs and benefits, including data sources and methodology descriptions are available at the web link located in **Table 1**.

Project Costs

The total project cost is $131,730,000. This does not include $240,000 in preliminary engineering that has already been completed. If the final funding piece can be secured, final engineering and environmental studies are ready to begin this year, with land acquisition to start in early 2010. Construction can begin in mid 2010, and is expected to be complete by the first quarter of 2012.

Bridge Maintenance Costs

With the new bridge, the need for maintenance and rehabilitation over the next few decades will be dramatically less. In addition to the travel time delays estimated, the dollars spent on rehabilitating the decaying bridge structures is a heavy burden on the ODOT. Current annual maintenance costs are about $1.1 million. Because of the current condition, a $45 million rehabilitation on the existing structure will be required

Table 8: Calculation of Benefit/Cost Ratio and Net Present Value ($2009)

Category	Present Value at 3%	Present Value at 7%
	Costs	
60 -year Life-Cycle Cost of the Bridge	$158,889,191	$122,871,957
	Benefits	
Travel Time Savings from Reduced Maintenance Work Zone Delay	$11,418,539	$5,942,768
Travel Time Savings from Use of Fourth Lane	$13,593,325	$5,978,616
Avoided 60-year life-cycle expenses needed to maintain existing bridge through to 2035	$190,035,395	$106,798,137
Vehicle Fuel Cost Savings	$4,549,728	$2,158,234
Emissions Savings	$678,873	$323,584
Economic Development Benefits	$1,554,816,662	$841,724,321
Total Benefits	$1,775,092,522	$962,925,661
Net Present Value	$1,616,203,331	$840,053,704
Benefit Cost Ratio	11.17	7.84

in 2010 if funding cannot be identified to replace the structures. This rehabilitation – at a cost more than a third of the replacement cost -- will stabilize the bridges' safety rating, and will hold back the growth in required maintenance. Costs in 2009 dollars for maintaining the existing structures through to 2034 are an estimated $193.5 million, greatly exceeding the $132 million replacement cost, even if maintenance costs through 2035 for the new structures are added to it ($2 million total).

A 60-year life-cycle cost analysis is presented in the web link in **Table 1**, comparing the costs of replacing the bridge now as proposed or undergoing increasingly expensive maintenance on the existing structure for the next 25 years before replacing it in 2035 (No Build). A time period of 60 years was examined so that a fair comparison could be made between the long-term costs of the Build and No Build alternatives. In a detailed analysis produced by the ODOT Bridge Division, the Build alternative involves a high construction cost followed by low maintenance costs in the near term. The No Build alternative requires a $45 million capital rehabilitation cost in the near term with high maintenance costs in the early years, followed by a high capital cost during the replacement year of 2035. In the out-years (2036-2062) the situation changes. The maintenance for the Build alternative is higher, as the bridge structures built in 2010 will be over 25 years old starting in 2036. The No Build structure would be brand new in 2036, requiring much less maintenance.

Table 9: Projected Use of Project Funds

($ in thousands)

Uses of Funds ($2009)	2009	2010	2011	2012	Total
Environmental Studies	$50				$50
Land Acquisition		$250			$250
Final Design	$1,946	$1,908			$3,855
Construction Management		$2,080	$4,564	$578	$7,221
Construction		$34,662	$76,064	$9,628	$120,354
Total	$1,996	$38,901	$80,627	$10,206	$131,730

The present value of the maintenance costs is shown in **Table 8**. Depending on the discount rate, the Build scenario is either more or less costly than the No-Build. The three percent discount rate more heavily favors the long-term cost savings, while the seven percent discount rate is heavily influenced by the early, up-front construction costs of the Build scenario, making the No Build option appear less expensive.

Benefits

Travel Delay Savings from Reduced Need for Work Zone Closures

One of the major and most immediate benefits of the bridge replacement project is the travel time savings that will result from reducing the extensive current lane closures on the bridge. This section quantifies those travel time savings.

As noted, maintenance requires frequent lane closures from both planned bridge maintenance work and responding to emergency repair needs. In a typical year, planned bridge maintenance requires 20 weeks (10 weeks per structure). During this time one lane of the bridge is closed for six hours per day, four days per week. This totals 480 hours of annual lane closure per bridge. Major incident repairs require two-lane closures. These repairs are averaging ten weeks per year (five weeks on each structure), with each week of closure involving a four day, six hour long closure time. The need for this closure type can also be expected to escalate at an additional week every two years if the existing structures are not replaced. This will escalate even with the $45 million rehabilitation that will be needed in 2010, and again in 2030, if funding cannot be secured for the replacement project.

With lane closures for the bridge structures currently occurring for a minimum of 30 four-day weeks per year, there is on average at least one lane closure every other week throughout the year. The maintenance-related travel delays will compound over time as traffic grows and as maintenance closures become more extensive as a result of the aging of the structures.

The new structures will dramatically reduce lane closures for two reasons. First, the new structure will require much less mainte-

Figure 19: Morning Backup on I-244

Source: flickr

nance work. And secondly, even as the new structure ages and begins to require more upkeep, the additional lanes and wider shoulders will allow three or even four lanes to remain open during any required maintenance work.

Travel delay savings for passenger and freight/delivery vehicles have been calculated with Highway Capacity Software Plus using actual 2009 traffic figures. Traffic is assumed to grow by two percent annually. These figures were then integrated into equations centered around reduced capacity caused by the one-lane and two-lane closures. The number of weeks of closures varies by year.

- The one-lane closures will be eliminated after the major rehabilitation that will occur in 2010 if the bridges are not replaced. The need for one-lane closures will return in 2020, growing by one week every other year until the scheduled 2030 rehabilitation.
- Two-lane closures are expected to remain at 10 weeks per year through 2015. In 2016 and 2017, this will double to 20 weeks. After that they will increase by an additional five weeks every other year, and then five additional weeks each year until the 2030 rehabilitation.
- The benefits analysis stops in 2036, as it is assumed that due to sufficiency point loss and the fact that the bridge will then be past its life expectancy of 75 years, the bridge will have to be replaced with a new structure. There is no doubt that the replacement bridge designed at that time will provide a minimum of four lanes in each direction, with shoulders adequate to provide for occasional maintenance closures.

Traffic volumes were cut in half to account for the fact that the closures only affect one structure at a time, and not both. This also explains how the total weeks of closure exceed 52 weeks per year in later years.

The delay from the one-lane closures (four seconds per vehicle) is greatly exceeded by the delay caused during two-lane closures, which averages 90 seconds.

Valuation of the traffic delays is based on the latest wage data from the Bureau of Labor Statistics. Truck trips (six percent of traffic by volume) were valued at the average hourly rate for heavy and light-duty truck drivers in the Tulsa Metropolitan Area ($15.61). The average overall wage rate for the area is $17.85, which was used to calculate the value of business trips (assumed to be 20 percent of auto traffic). Non-business travel was valued at half the rate of business travel, or $8.93 per hour. The present value of the resulting travel time delay savings for 2012 to 2035 (the last year of traffic benefits) is $11.4 million using a three percent discount rate, and $5.9 million using a seven percent discount rate.

In 2035, the bridge would be replaced under the No Build, most likely with a pair of four-lane bridges. There would be no difference in travel times compared to the "replace now" option.

<u>Travel Delay Savings from Additional Lanes</u>

In later years, traffic on the bridge will continue to grow, hitting LOS E in 2019. At this point, it is assumed that the new bridges' wide shoulders (see **Figure 5**) will be re-striped to allow for a fourth lane of traffic in each direction. The current structures, with three lanes and narrow shoulders, do

not allow for this conversion. By 2027, traffic growth will lead to LOS F conditions during peak travel times, increasing peak hour delays from an estimated 2.4 seconds to 90 seconds per vehicle.

As with the travel delay savings resulting from reduced maintenance closures, the travel delay savings from the availability of a fourth lane will increase each year as traffic grows. The present value of this stream of benefits over the 2019 to 2035 period is actually greater than the value of the savings resulting from the maintenance closures. (As with the maintenance-related closures, benefits are assumed to zero out after 2035 when the existing structure must be replaced.) Total present value is $13.6 million (using a three percent discount rate) and $6.0 million (seven percent discount rate).

Vehicle Fuel and Operations Cost Savings

As discussed above, replacing the bridge structures as soon as possible will reduce travel delay times starting from the opening day. The travel time savings will result immediately from reduced maintenance closures, and in the out years, the availability of a fourth lane on the new structures will result in even greater reductions in travel delay.

In addition to saving time and enhancing regional quality of life, the project's travel time savings will also reduce the use of gasoline and diesel fuel, as cars and trucks can travel faster or with less idling time. This results in lower fuel usage, as well as drivers spending substantially less on fuel.

The fuel saved by the project between 2012 and 2035 is estimated at 2.5 million gallons. Using an average fuel rate of $3.22, the present value of fuel savings is $4.5 million (three percent discount rate), and $2.2 million (seven percent discount rate).

Emissions

As vehicular delays and fuel use are reduced, and speed increases, the amount of vehicle emissions will be substantially reduced. An estimate was developed by using multipliers formulated by Mobile6.2 software:

- Volatile organic compound (VOC) emissions are reduced by 23.59 grams per vehicle hour
- Nitrogen oxides (NOx) emissions are reduced by 5.8 grams per hour
- Carbon monoxide (CO) emissions are reduced by 324.64 grams per hour
- Carbon dioxide (CO2) emissions are reduced by 13.2 pounds per hour
- Particulate Matter (PM10) emissions are reduced by around one gram per hour of truck travel

The dollar value of reduced emissions was developed using TIGER guidance. Values came from the March 2009 Final Regulatory Impact Analysis: Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks. Office of Regulatory Analysis and Evaluation, National Center for Statistics and Analysis.

The annual reduction in emissions in 2012 will be approximately 90 tons. Because of the growing traffic on the bridge, and the increased peak hour congestion that will result if the bridge is not replaced, by 2035 the annual emissions savings grows to nearly 3,000 tons. The Present Value of the emissions reductions is

Figure 20: I-244 and Downtown Tulsa

Source: flickr

$679,000 (using a three percent discount rate) and $324,000 (seven percent discount rate).

Economic Development

The replacement I-244 structure has been designed to enable the region's commuter rail plans to be implemented. With the bridge in place, transit oriented developments that are already being planned for future station areas will move forward, and civic improvements associated with the bridge's rail, bicycle and pedestrian facilities will be implemented as well. The city of Tulsa has developed cost and job estimates for some of these "I-244 Bundle" projects, as follows:

- Development of Evans Fintube site – $80 million
- Development of West Bank site (phase I) – $128 million
- Development of West Bank site (phase II) – $163 million
- Development of Greenwood site – $47 million

The city of Tulsa analysis indicates that approximately 580 permanent, recurring new jobs will be created because of the development – including office workers, retail staff, and teachers at the school proposed for the Evans-Fintube site. In the present value analysis, because some of these positions are part-time, the average earnings per job was conservatively assumed to be $20,000.

An additional quantified benefit of the project is the estimated $37.8 million in retail sales to be generated by the project once fully built.

The present value calculations assumed that the projects would be built during 2012 to 2015, and that it would take until 2016 for the employment and retail sales activity to reach the levels assumed by the project. The resulting total economic development benefits over the next 60 years is $1.6 billion using the three percent discount rate, and $840 billion using the seven percent discount rate. This does not include the value of the public sector investments, such a rail, streetscape, and station improvements, that will commence once the I-244 bridge project is in place.

"I firmly believe that our nation needs a comprehensive plan to address our growing transportation needs, and expanding mass transit capability is one piece of that puzzle."

John Sullivan,
U.S. Representative,
Oklahoma's 1st District

These figures are included as benefits in **Table 8** as a rough estimate of the benefits attributable to the project. The economic benefits of the transit oriented development projects are sizeable, and far exceed the direct transportation benefits, measured in terms of travel time and vehicle operating cost savings. It is assumed in this analysis that the TOD projects will materialize *only* if the bridge is rebuilt to accommodate Tulsa's long range plan to develop passenger rail. Reconstruction of the bridge, as noted, will be necessary for the rail project to proceed. While other market factors must also be in place for the TOD developments to be fully realized, INCOG believes that such market based factors are going to be present – i.e., that strong demand exists now, and will continue to exist, in the Tulsa metropolitan area for these types of developments. Accordingly, the I-244 bridge project with passenger rail carrying capacity represents the remaining piece of the puzzle needed to complete these major land use and economic development projects in Tulsa.

Additional Development And Other Non-Quantifiable Benefits

The true measure of all of this project's benefits is not summarized in the cost-benefit ratio, as many benefits cannot be quantified. The regional economic benefit in terms of population and employment growth resulting from having a fully operational bridge, shorter commute times as well as a pedestrian and bicycle friendly, dynamic, growing downtown will result in many benefits – including happier, wealthier families and increased tax revenues. In addition, approximately 1,500 construction workers would be employed annually for four years over the period of projects' construction (this is not included in the quantified benefits of the BCA).

Similarly, the travel time savings benefits for drivers, for example, do not include the thousands of riders who will zip underneath traffic congestion riding the future rail system that the bridge will carry, saving time, fuel, and emissions for generations to come. Improved transit options can also allow households to reduce the number of cars they own, allowing them to spend more on housing and other items, boosting the local economy. And the addi-

tional development benefits of commuter rail are vast when TOD opportunities at the post-Phase-I rail stations are considered. Thus, the calculated net present value of $840 million to $1.6 billion may be only the start of project benefits.

D. Plan for Evaluating Success of Project Performance

The I-244 Arkansas River Multimodal Bridge Replacement project can be evaluated with respect to achievement of short term economic recovery goals by utilizing information from ODOT's periodic Maintenance of Effort (MOE) reports to gauge performance on a number of items, including but not limited to: obligation of funds, number of direct and indirect jobs created and sustained, opportunities for low income and minority workers, and opportunities for disadvantaged business enterprises (DBEs).

With respect to long term outcomes, it may be difficult to ascertain benefits directly and solely attributable to this project. Also, in some cases, benefits may be evident several years after completion of construction. Nevertheless, the following actions are proposed in relation to the long-term outcomes:

(1) State of Good Repair: Information on maintenance of the new facility in a state of good repair can be measured by bridge inspection data maintained in the ODOT's PONTIS program as well as numerous items that will be tracked through our brand new R.A.M.P asset management program. Responsible Asset Management Program, a state-of-the-art statewide network, will keep real-time data on all of ODOT's infrastructure.

(2) Economic Competitiveness: The project's contribution to improved economic activity can be assessed with economic data provided by the Tulsa Metro Chamber of Commerce.

Also, we will enact a partnership between Tulsa community service employment providers and ODOT, and set goals for the number of agency referrals to contractors, and then count/track the number of people residing in these areas or that are clients of these agencies who are hired on this project. This will also be the DBE goal and achievement of this goal will link to our DBE goals that will be established following the completion of an economic disparity study currently underway in ODOT's DBE division.

(3) Livability: The project's effect on quality of life can be measured in various ways, such as a comparison of "before and after" transit ridership on defined transit lines that link between the downtown and West Bank projects, and field estimates of bicycle ridership on the new bike lanes constructed on the replaced bridge. Additionally, calculations can be used to determine estimated change in speeds for remaining vehicles, and average daily traffic (ADT) can be used to show mode shift and to calculate emissions reductions.

(4) Sustainability: INCOG is on the brink of being found in violation of the National Ambient Air Quality Standards (NAAQS) for ozone. Measurement of ozone levels at nearby air-quality monitoring stations can provide an indicator of this project's contribution to reduced ozone levels and associated emissions reductions.

(5) Safety: The safety benefits of this project can be measured by reviewing collision data as collected and maintained by ODOT, FHWA, Federal Motor Carrier Safety Administration (FMCSA), and Federal Railroad Administration (FRA), and by surveying the adjacent medical facilities to find out if response times have been reduced.

VI. Secondary Selection Criteria

A. Innovation

By combining and condensing numerous multimodal facilities into a single structure, ODOT has put forth a highly innovative design solution to a complicated transportation problem.
Going forward, this basic innovation will be furthered as ITS (Intelligent Transportation Systems) deployments incorporate the I-244 Arkansas River Bridge into a city-wide Congestion Management Process. Plans for deploying both traffic cameras and dynamic message boards at the river crossing are in place. These additions will provide real-time information to users about roadway conditions including incidents, construction, and major events. Additionally, the rail components have been designed to allow for electrification and by providing individual alignments for both rail modes. The project is further enhancing long-range planning by assuring no conflicts arise between freight and passenger rail as these modes become increasingly active.

Plans are also on the table to provide crossing capacity for information networks relying on fiber optic carriers. There is currently a fiber optic hub on the West Bank that will need to traverse the river without traditional boring techniques and ODOT'S proposed bridge facilities would allow for this.

B. Partnership

This project fully aligns with city of Tulsa and INCOG plans for long-range development. Additionally, numerous clubs and organizations such as the Tulsa County Board of Commissioners, Tulsa Metropolitan Area Planning Commission, Metro Tulsa Chamber of Commerce, River Parks Authority, Tulsa Bicycle Club, Tulsa Running Club, Mayor and City Council of Tulsa, Southwest Tulsa Chamber of Commerce, Tulsa Preservation Commission, Oklahoma Historic Preservation Office, Red Fork Main Street Program, and Oklahoma State Route 66 Association all have provided letters of support.

VII. Program Specific Criteria

A. Bridge Replacement Projects: See 23 CFR 605.707

ODOT complies with all FHWA requirements in CFR Titles 23 and 49.

B. Transit

No federal requirements noted.

VIII. Federal Wage Certification and Other Certifications and Assurances

As the applicant for TIGER funds, the Oklahoma Department of Transportation will comply with federal wage rate requirements, as per Subchapter IV of Chapter 31, USC Title 40. A certification statement regarding compliance with federal wage rates, as well as additional documentation about the Department's ability and pledge to comply with other requirements is included as an attachment. The documentation speaks to issues including, but not limited to: worker safety, civil rights, ability to proceed quickly with the project, submittal of periodic Maintenance of Effort (MOE) reports.

IX. National Environmental Policy Act Requirement

Though the NEPA process has not yet been completed, it is expected that the required NEPA documentation will result in a Categorical Exclusion. As such, it is anticipated that the project will not result in any significant negative impacts to the natural, social or economic environment. Environmental studies, consisting of hazardous waste, cultural and biological studies have been initiated. The anticipated completion of the NEPA Process is December 21, 2009.

X. Environmentally Related Federal, State & Local Actions

The NEPA document will need to be approved by FHWA. Though there is a Section 4(f) property (a structure across the Arkansas River, listed in the National Register of Historic Places [NRHP]) in close proximity to the proposed new structures, it is believed not to be negatively affected by the proposed project. As part of the cultural studies, Section 106 coordination is underway with the State Historic Preservation Office (SHPO). Section 7 consultation with the United States Fish and Wildlife Service (USFWS) will be done as part of the biological studies. As the Arkansas River is considered jurisdictional waters of the United States, coordination with the United States Army Corps of Engineers (USACE) will be initiated as part of the biological studies and it is anticipated that an appropriate level Section 404 permit will need to be obtained. Also, an Oklahoma Water Resources Board permit will need to be issued. The Tulsa area is currently in attainment of all National Ambient Air Quality Standards (NAAQS). Therefore, the need to meet conformity regulations does not apply to this project. This project is expected to benefit the air quality of the region.