

Merit Criteria

1 Safety

The US-75/W. 81st Street Interchange project is designed to improve safety and traffic flow while providing a new connection for non-vehicular traffic that currently does not exist today. Converting the US-75/W. 81st Street interchange to a diverging diamond interchange (DDI) will reduce left turning conflicts, minimize queues through the innovative design, and provide safer accommodations for pedestrians and cyclists.

Collisions in and around the interchange were investigated to understand the history of crashes occurring within the project area. Over a ten-year period, from 2012 to 2021, a total of 163 crashes occurred along US-75 and on W. 81st Street within the project area. The crashes can be attributed to the rapid growth in the area as large volumes of traffic are passing through the diamond interchange. High frequency crash locations occur at the adjacent signalized intersections on W. 81st Street at S. Olympia Avenue (830 feet east) and S. Union Avenue (1,350 feet west), and at the US-75 terminal intersections. The crash data reflected 53 collisions occurring on US-75, 76 collisions on W. 81st Street at intersections near the interchange, and 34 at the ramp terminals of US-75 and W. 81st Street. More detailed collision data is available at [US-75/81st RAISE](#).

Figure 1 reflects a heat map of the collisions that occurred on US-75, including on the ramps and at the ramp terminal intersections. The collisions that occurred at the signalized ramp terminals consist of right-angle and angle turning collisions which can be attributed to vehicles failing to yield, making an improper turn, or running a red light. Short storage lanes are currently provided at the ramp terminal intersections for vehicles making a left turn maneuver. The short length of the turn lanes increases the exposure of collisions as heavy volumes access US-75.

A lack of connected sidewalk and safe accommodations for pedestrians and bicyclists throughout the project area restricts travel for non-motorist users attempting to safely cross the highway. The current design of the highway creates a physical barrier for non-motorist users and a lack of connection within the area. There was one bicycle-involved collision in the study area that resulted in an injury. The lack of shoulders also creates a confined area for vehicles, leading to additional crash exposure.

Figure 2 presents an overall issues map.

The proposed DDI configuration will reduce ramp crashes by 56% per FHWA’s *DDI Informational Guide (2nd Edition)*. In addition, the simplified two-phase signal operation would reduce anticipated future congestion at the S. Olympia Avenue intersection by providing longer signal cycle lengths while maintaining coordination at the DDI with half cycles.

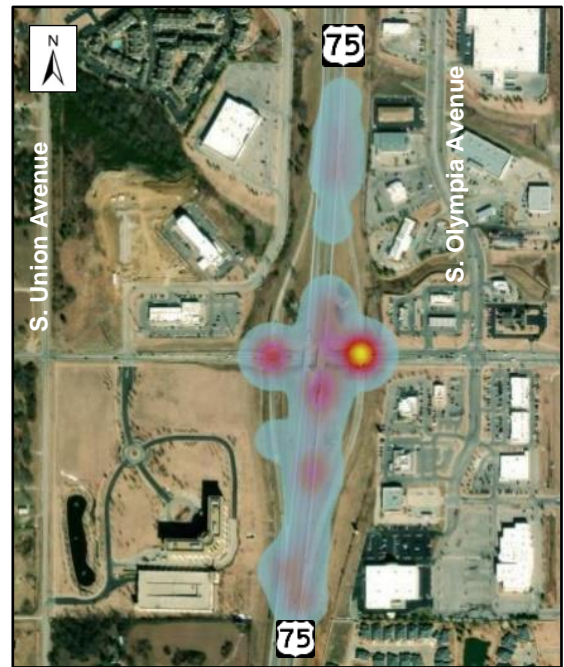


Figure 1: US-75 Collision Heat Map (2012-2021)



Figure 2: US-75/W. 81st Street Interchange Issues Map

2 Environmental Sustainability

The US-75/W. 81st Street Interchange project employs an innovative, transportation-efficient design that allows the interchange to be constructed entirely within ODOT right-of-way, essentially within the same footprint as the existing interchange. A small amount of right-of-way adjacent to W. 81st Street will be required to construct the multi-use trails; however, retaining walls will be used to minimize the necessary right-of-way. Temporary lanes and bridges will be used to maintain traffic while the new bridges are constructed. By limiting the footprint of the project, ODOT will avoid impacts to water quality, wetlands, endangered species, and historic properties. The NEPA document completed for the project in 2018 did not identify any significant impacts to environmental resources. Seasonal restrictions will be used to avoid impacts to northern long-eared bat and migratory bird habitat (i.e., the existing bridges on W. 81st Street and a few trees within the existing right-of-way). No streams or wetlands will be affected. Stormwater will be controlled during construction as dictated by the Oklahoma Department of Environmental Quality (ODEQ) stormwater construction general permit (OKR10), which the construction contractor will be required to obtain.

Beyond the low-impact interchange design, installation of a multi-use path across US-75 will encourage a modal shift to transit, micro-mobility vehicles, and active transportation, and could reduce vehicle miles traveled. There are no pedestrian/bicycle accommodations on W. 81st Street today, and the narrow bridge opening under US-75 provides no space outside of the driving lanes. The closest possible pedestrian crossing of US-75 is over one mile away. With residential use (Harber Hills neighborhood) on the west side of US-75 and commercial and retail on the east, it is reasonable to assume some vehicle trips would shift to pedestrian, bicycle, or electric scooter if a safe facility was provided. Additionally, construction of a multi-use path would provide safe, accessible access to the Tulsa Transit bus stop on W. 81st Street and S. Tacoma Avenue. There are no sidewalks or other amenities at this stop today (see **Figure 6** below). This stop serves Routes 117 and 500 (**Figure 3**) which serve residents in West Tulsa and provides access to employment, recreation, and shopping at Tulsa Hills, City of Jenks, and Downtown Tulsa. While not quantified as part of this application, the project would make mode shift to pedestrian, bicycle, and transit trips across US-75 much more practical and attractive. Assuming a pedestrian would have to walk almost four miles out of direction to make the ¼ mile trip across US-75, the distance and time savings would be significant.

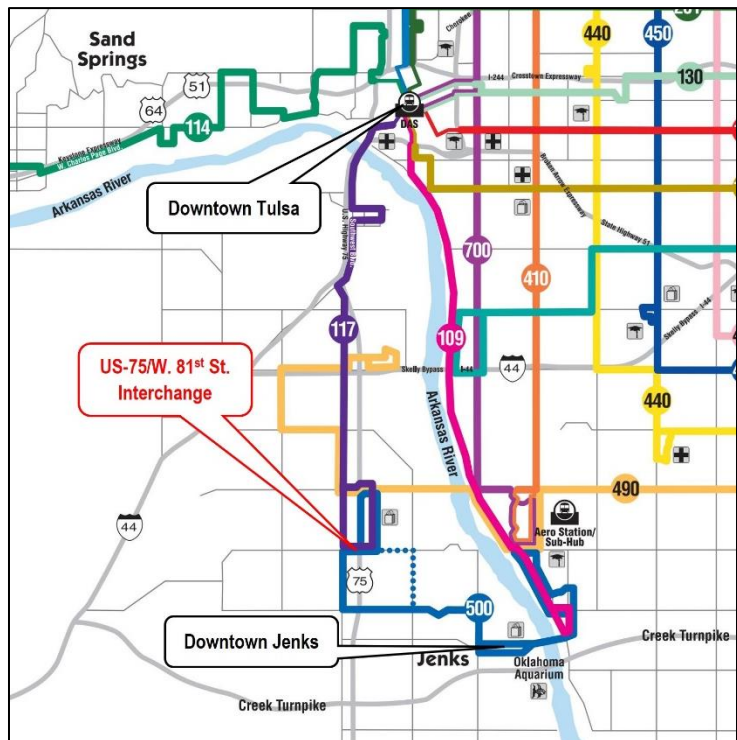


Figure 3: Tulsa Transit System Map

As a function of the decrease in vehicle delay at the US-75/W. 81st Street interchange and the reduction in idling time at intersections, the Project will create a positive and lasting impact on emissions in the area. Without the project, carbon dioxide and nitrogen oxide emissions are anticipated to increase by 140% on average by 2046. The Project is expected to reduce carbon dioxide and nitrogen oxide emissions by 37% over the No Build scenario. The Benefit Cost Analysis Technical Memorandum included with this application includes more detail on the emissions reductions anticipated by the project.

The City of Tulsa is a leader in promoting resiliency and disaster preparedness in its infrastructure development. In 2022, **Tulsa received a Class 1 rating from FEMA’s Community Rating System (CRS), one of only two cities in the nation with this top rating.** One of most impactful resiliency policies implemented by the City of Tulsa is the requirement that all new or improved city streets be designed to accommodate the 100-year storm¹, a much larger storm event than normally required by municipal roadways. Construction may not cause a rise in base flood elevations within mapped floodplains. This design standard will apply to the W. 81st Street improvements. The project will include a new enclosed storm drain system capable of carrying the 100-year storm event, resulting in improved stormwater management.

US-75 has been designated an Alternative Fuel Corridor (AFC) with 132 miles considered “Corridor Ready” in ODOT’s [National Electric Vehicle Infrastructure \(NEVI\) Plan](#). Designated as an electric vehicle (EV) and compressed natural gas (CNG) corridor, The US-75/W. 81st Street Interchange has been identified as a viable future EV charging location. This location has several amenities including retail, restaurants, convenience stores, and the appropriate electrical infrastructure to support an EV fast charger. The US-75/W. 81st Street Interchange Project will modernize the existing interchange to better accommodate future traffic, including potential EV traffic.

The US-75/W. 81st Street Interchange Project will reduce CO2 and NOx emissions by 37% over the No Build

The City of Tulsa requires all streets to be designed with drainage systems to accommodate the 100-year storm event

¹ The 100-year storm refers to the estimated probability of a storm event occurring in a given year. A 100-year event has a 1 percent chance of occurring in any given year.

3 Quality of Life

The US-75/W, 81st Street Interchange Project will eliminate barriers to an underserved populations within West Tulsa, increase access to affordable transportation, reduce vehicle dependence, improve access to vital services, and provide additional opportunities to public health through active transportation.

While the US-75/W, 81st Street Interchange is not in a USDOT-defined Area of Persistent Poverty or Historically Disadvantaged Community, there are multiple indicators that suggest this area is underserved. In 2020, the mean income for Census Tract 67.13 west of US-75 was \$32,009² as compared to \$58,863 for Tulsa County and \$53,840 for the state of Oklahoma. The Project area is among the most underserved areas in Tulsa for daily needs (**Figure 4**), defined as distance to schools, healthcare, social services, and healthy food sources, among others³.

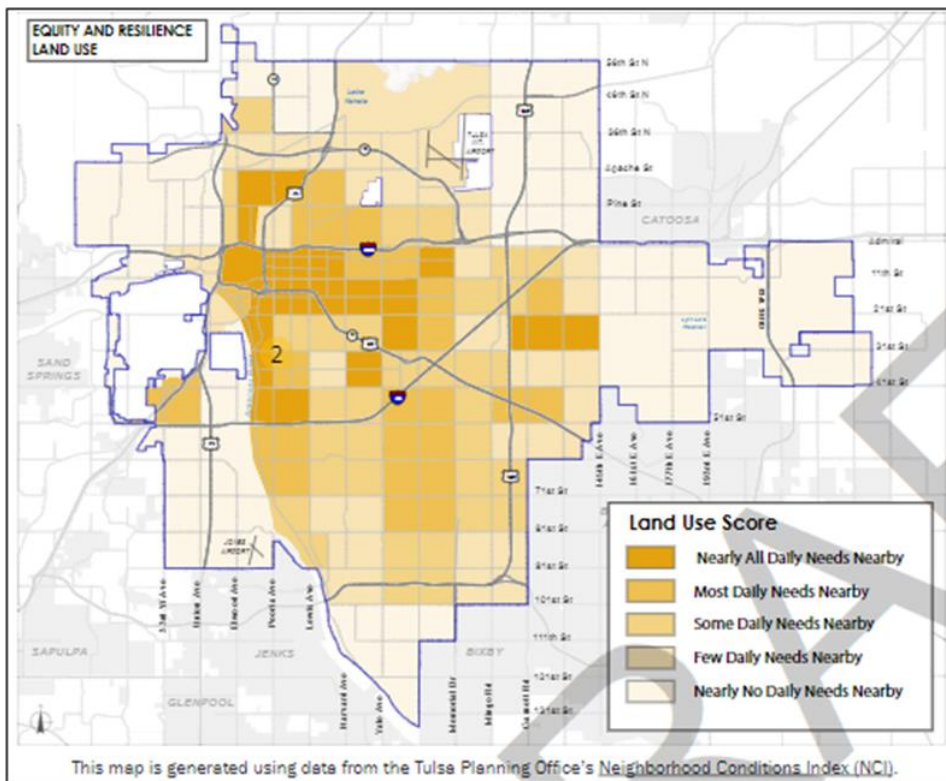


Figure 4: Equity and Resilience Land Use in Tulsa

in the project area are spending 9% more of their income on transportation. The US-75/81st Street Interchange Project will provide enhanced access to affordable transportation modes such as walking, cycling, and transit.

Increasing affordable and active transportation choices expands opportunities for reducing vehicle dependence. Today, the shortest distance required for pedestrians and cyclists to cross US-75 at a

The addition of the 12' multi-use trail crossings across US-75 will increase safety and enhance access to Tulsa Transit Routes 117 and 500 on W. 81st Street. Residents living in the project area spend 24% of their income on transportation costs, according to The Housing and Transportation Affordability Index⁴. Transportation costs are considered affordable if they are 15% or less of household income, indicating residents

² US Census Bureau 2020, S1902 Mean Income <https://data.census.gov/table?q=74132&g=1400000US40143006713&tid=ACSST5Y2021.S1902>

³ INCOG/Tulsa Planning Office. 2022. [replaced Future Land Use - Public Review Draft.pdf \(konveio.com\)](#)

⁴ The Housing + Transportation Affordability Index [H+T Map | H+T Index \(cnt.org\)](#)

reasonably safe location is almost 4 miles. With a new connection that reduces this distance to ¼ mile, some trips may become more feasible on foot or bike.

The addition of 12’ multiuse trails along both sides of W. 81st Street and their connection across US-75 will improve the safety and comfort of pedestrian access to bus transit, facilitating access to job centers such as Tulsa Hills, as well as vital services and amenities along the routes, including Daniel Webster High School, Oklahoma State University Medical Center, the Department of Human Services, Tulsa Community College, Tulsa Technology Center, the Oklahoma Aquarium, Page Belcher Golf Course, and Bales Baseball Park. Routes in this corridor also provide access to downtown Tulsa, which offers jobs and government services.

The addition of sidewalks may encourage more people to walk or bike to their destinations. According to the Tulsa Health Department Built Environment Report⁵, only 1.6 percent of Tulsa County residents reported that they walked or biked to work in 2020. That number, however, increased to 5.7 percent in West Tulsa, where the project is located. The US-75/W. 81st Street Interchange Project will support those that walk to work today, and potentially induce others to do so.

4 Mobility and Community Connectivity

One of the primary benefits of the US-75/W. 81st Street Interchange Project is an increase in system-wide connectivity for all users, particularly pedestrians, including improved access to transit and micro-mobility. W. 81st Street is identified as both a desired pedestrian/bicycle route and a sidewalk gap in the [INCOG GO Plan](#), the Bicycle/Pedestrian Regional Master Plan for the Tulsa Transportation Management Area (TMA) (**Figure 5**). A product of community participation and extensive data collection, the GO Plan involved the input of a steering committee, technical committee, area communities, and the general public. Once complete, the W. 81st Street multi-use trails will connect to sidewalks on the east side of US-75 and to proposed improvements at the W.

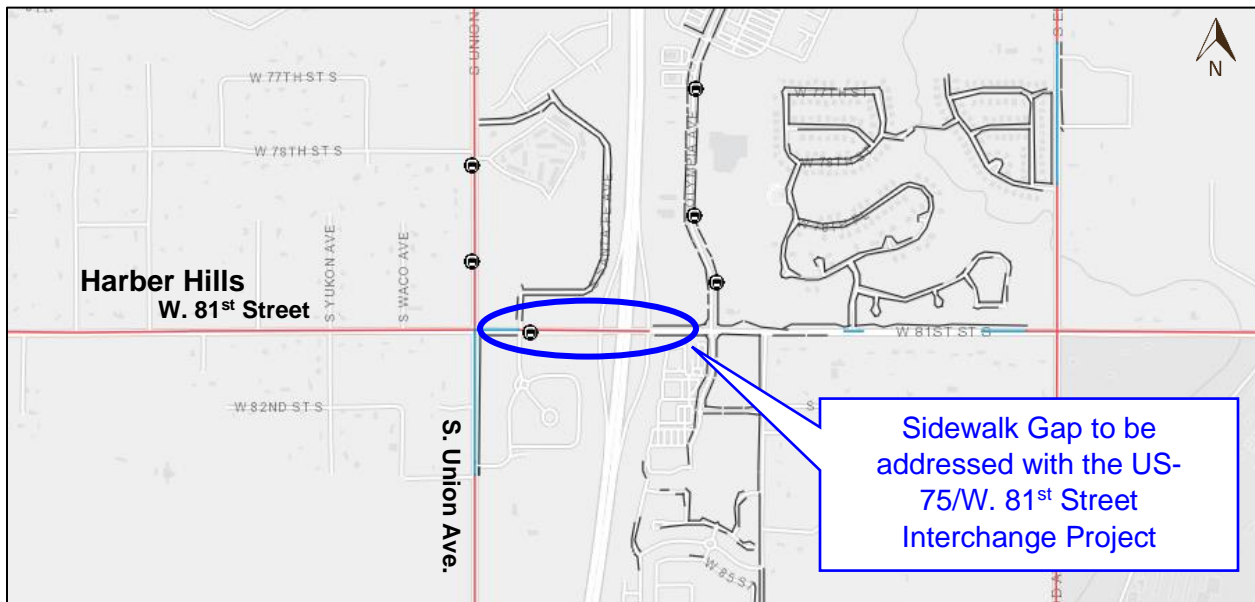


Figure 5: Sidewalk Gap Map, INCOG GO Plan

⁵ Tulsa County Health Status Report, Built Environment
[THD Health Status Report Built Environment | Tableau Public](#)

81st Street and S. Union Avenue intersection by City of Tulsa. South Union Avenue is designated as a Multimodal Corridor in the city’s [Complete Streets Procedural Manual](#), and carries Tulsa Transit fixed route bus service (Routes 117 and 500). As shown in **Figure 6**, there is a bus stop on eastbound W. 81st Street at S. Tacoma Avenue within the project area. Currently a single sign on the grass shoulder of W. 81st Street, this stop does not connect to any existing pedestrian facilities and does not



Figure 6: Existing Tulsa Transit Stop on W. 81st Street (facing east)

provide a safe or sheltered location for riders to wait or board the bus. **Figure 7** shows the proposed new multi-use path connection allowing riders safe access to transit service.

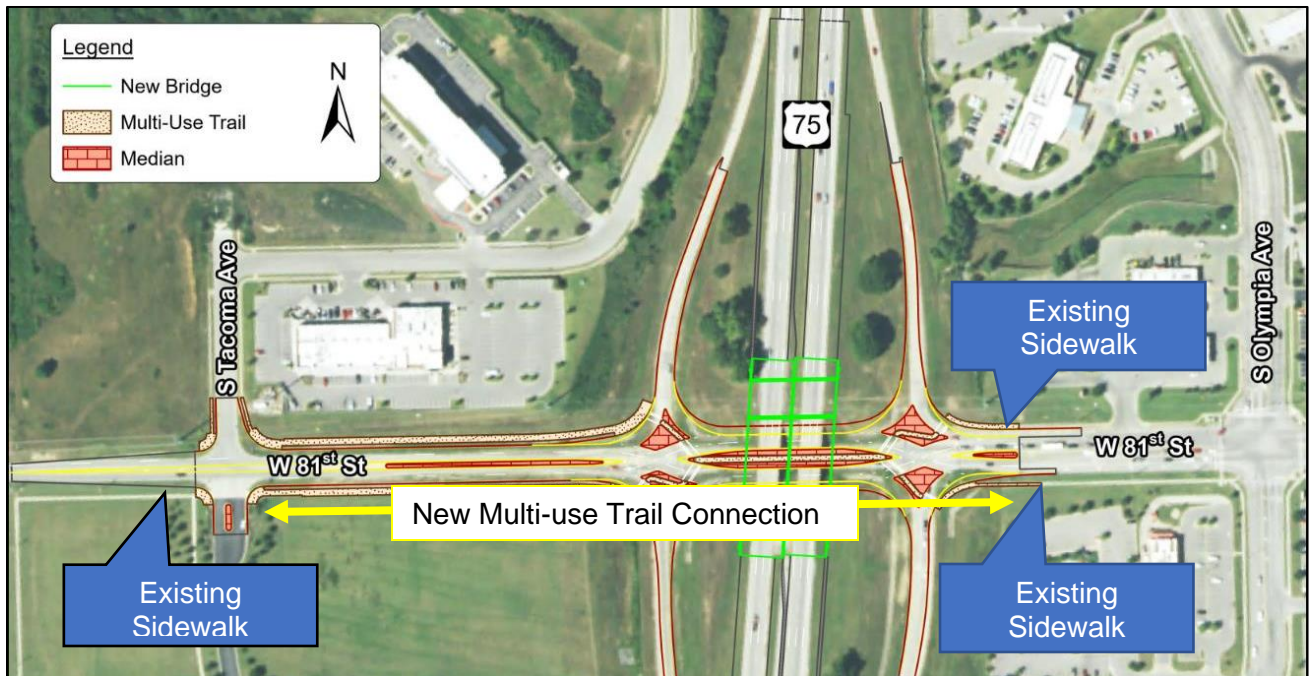


Figure 7: Proposed Connection of Existing Sidewalks on W. 81st Street

The addition of sidewalks will also increase access to micro-mobility. The city of Tulsa allows small vehicles such as electric scooters to park only on a sidewalk or other hard surface, within the

landscape/furniture zone⁶. The Project includes a 7-foot landscape zone that could be used for this purpose. Constructing a surface suitable for small vehicles, in particular on an established transit route, provides additional options for non-motorized travelers and may help complete “last mile” trips by connecting transit to specific employment or service destinations that may be beyond walking distance.

The Project will increase neighborhood connectivity and walkability, providing connections between residential areas on the west side of US-75 and shopping, entertainment, and job opportunities on the east side. The project will provide affordable access across US-75 which is currently a barrier to individuals wanting to cross by a non-vehicular mode. The proposed 12’ multi-use paths plus 7’ buffers will exceed ADA standards, embracing principles of universal design. The wide paths on both sides of the roadway will provide a safe and functional facility for all users.

5 Economic Competitiveness and Opportunity

Tulsa is a fast-growing center of employment within the state and region. In 2018, Tulsa-area employment grew 39 percent faster than the state and 47 percent faster than U.S. employment. Tulsa's real gross product grew 6.9 percent, while Oklahoma and the U.S. grew at 4.4 percent and 2.9 percent, respectively.⁷ As outlined in the [Regional Transportation Plan, Comprehensive Economic Development Strategy \(CEDS\)](#), and a host of other local planning documents, one of the primary goals of the City of Tulsa and INCOG is ensuring that all Tulsa residents have equitable access to transportation, employment, and job opportunities.

The US-75/W. 81st Street Interchange project will promote long-term economic growth in the US-75 corridor. US-75 is on the National Highway System (NHS) and National Highway Freight Network (NHFN) and is among the highest volume truck freight routes in the state⁸. US-75 is included in the top 5% of freight bottlenecks in the Tulsa area and is listed as a critical freight corridor in ODOT’s [Freight Transportation Plan, 2023-2030](#). As shown in **Figure 8**, the land adjacent to US-75 is designated for commercial development in the City of Tulsa’s comprehensive plan ([Planitulsa](#)). The Tulsa Hills area east of US-75 is designated as a Regional Center, which demands special attention to transportation access and circulation. This area is also identified as a Major Employment Center in [Connected 2050](#), INCOG’s long-range transportation plan. With an increasing focus on regional generators, it is vital that ODOT improve the US-75/W. 81st Street interchange. As one of two major access points to Tulsa Hills, W. 81st Street is important for incoming long-haul freight as well as local delivery and visitor trips. The DDI will ensure that the interchange continues to serve the needs of this developing area and provides reliable access to a major freight and visitor destination. The DDI will reduce vehicle delay at the US-75/W. 81st Street interchange by almost 85% over the existing diamond, providing a Level of Service (LOS) C or better as opposed to LOS E/F conditions. Traffic modeling results are provided at [US-75/81st RAISE](#).

The benefits of improved safety and more efficient and faster movement of goods and people will accumulate over the project design life for local residents and businesses and will serve to stimulate growth. Businesses that rely on ease of access for freight and customers will be more likely to

⁶ City of Tulsa Ordinance 24019

⁷ Tulsa Regional Chamber of Commerce, <https://www.tulsasfuture.com/data-and-research-tools/economic-profile>

⁸ Oklahoma Freight Transportation Plan, 2023-2030, available at [US-75/81st RAISE](#)

develop in the Tulsa Hills area after implementation of the Project. Enhanced pedestrian/bicycle connectivity will promote greater public and private investment in land use productivity.

Additional economic competitiveness benefits flow from the Project's **improved travel times**. Travel time reliability increases the efficiency of movement of goods and people. The Project will reduce delay for both vehicles and pedestrians. The Project will provide over \$17 million in travel time savings over the life of the project⁹.

Construction of the Project will also support good-paying jobs. Increasing job opportunities and improving business performance are particularly important for regional economic well-being, as Oklahoma has historically lagged other states in measures of economic well-being such as per capita and median household income. Based on multipliers provided by the Bureau of Economic Analysis' Regional Input-Output Modeling System (RIMS II)¹⁰, Project is projected to generate 93 jobs in construction. The RIMS II model produces multipliers specific to construction projects in the Tulsa metropolitan area. These multipliers are then applied to the anticipated construction cost of the Project¹¹. The RIMS II multipliers used in this calculation are provided at [US-75/81st RAISE](#).

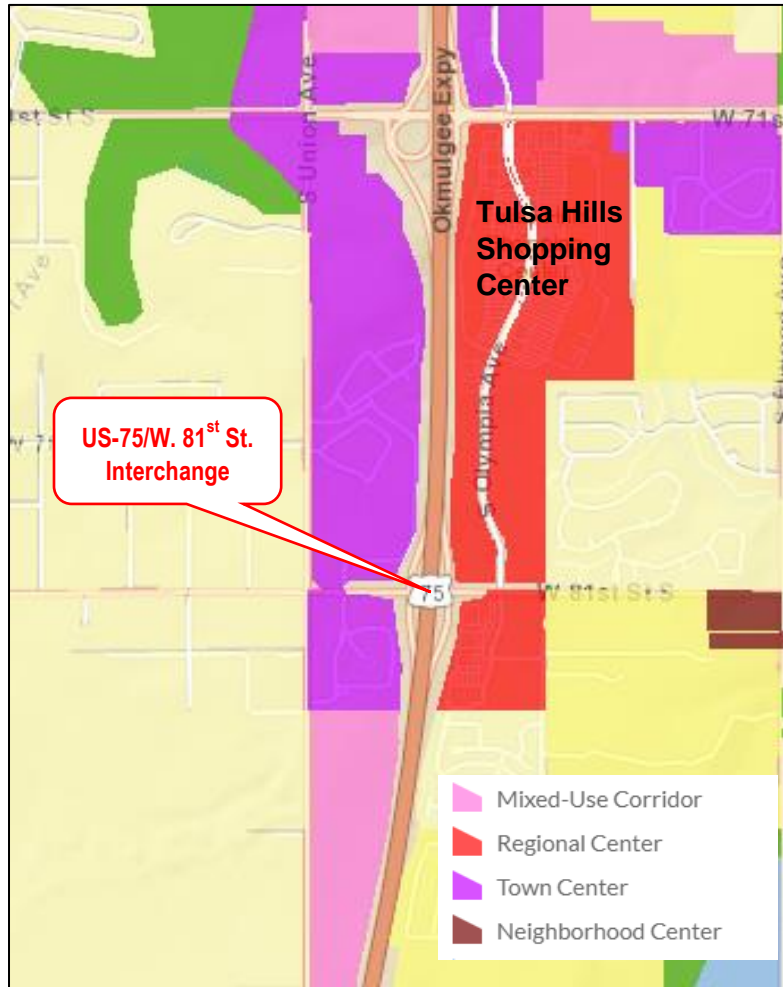


Figure 8: Excerpt from City of Tulsa Land Use Plan ([Land Use Plan Map](#))

The US-75/W. 81st Street Interchange Project will provide over \$17 million in travel time savings

The US-75/W. 81st Street Interchange Project will create 93 construction jobs

⁹ Assumes 7% annualized discount factor for future savings, see BCA Technical Memo at [US-75/81st RAISE](#)

¹⁰ Tulsa, OK Metropolitan Area, Transportation structures and highways and streets (2232F0)

¹¹ Deflated to 2019 dollars per RIMS II guidance

6 State of Good Repair

The existing bridges on US-75 over W. 81st Street were constructed in 1965 and are nearing the end of their useful lives. They are narrow and not of sufficient width to accommodate the future planned six-lane US-75. Similarly, the horizontal clearance on W. 81st Street under US-75 is not sufficient to accommodate the future planned 5-lane section. The vertical clearance on W. 81st Street is also less than desired (14' 7" vs. the standard 16' 9"). Pavement on the bridge decks is currently rated in "fair" condition. See photos in **Figure 10** on the next page.

The US-75/W. 81st Street Interchange Project will modernize the existing interchange while maintaining as much of the existing core infrastructure as possible. The existing bridges will be replaced with new 70' wide steel bridges (**Figure 9**). These bridges will be wide enough to accommodate the future six-lane US-75 typical section and will require only restriping when the highway is widened in the future. The bridges will provide a 17' vertical clearance for W. 81st Street, sufficient to accommodate large trucks, and a 140' long center span, sufficient to accommodate the proposed diverging diamond travel lanes and multimodal crossings. The bridge piers will be protected by 54" parapet walls on both sides of W. 81st Street.

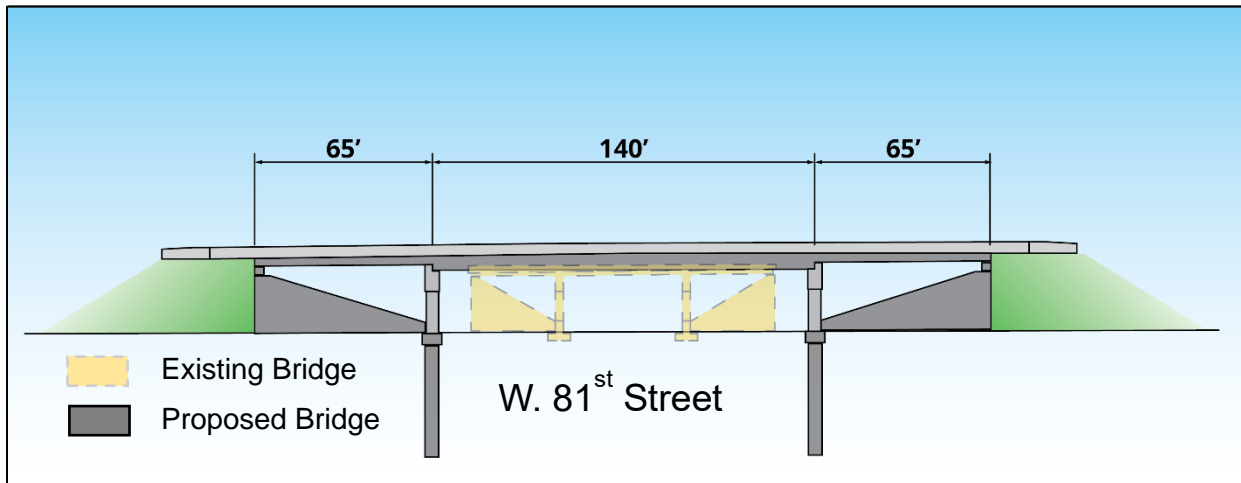


Figure 9: Existing and Proposed Bridge Elevations

The existing US-75 will remain, except for the minimum work on the mainline and ramps required to construct the new bridges and complete the DDI. This work will all take place within the existing interchange footprint. Preserving the existing mainline and ramp pavement in good condition reduces the construction burden and keeps future pavement maintenance consistent.



Figure 10: Existing US-75 Bridges over W. 81st Street

Table 1 shows the anticipated maintenance costs for the existing interchange (No Build) and proposed new interchange (Build) over the next 20 years. The age and condition of the existing bridges will demand several rehabilitation efforts over the next 20 years. The DDI will result in maintenance savings due in large part to the improved bridge condition and clearances. All infrastructure, both existing and new, will be maintained in a state of good repair.

Table 1: Maintenance Costs, Build and No-Build Scenarios

Year	No-Build	BUILD		
	Maint & Rehab Costs for US-75/81st	Capital Costs	Maintenance	TOTAL
2022				
2023				
2024				
2025		7,420,848		7,420,848
2026		14,841,697		14,841,697
2027			350,000	350,000
2030	1,612,000			
2035	1,000,000			
2040				
2045	1,612,000			-
2050				
TOTAL	\$4,224,000.00	\$22,262,545.00	\$350,000.00	\$22,612,545.00

Note: Costs in Table 1 represent future costs and do not include previously incurred costs or costs for activities assumed to be completed prior to grant award (i.e. design, environmental, right-of-way, and utility relocation).

7 Partnership and Collaboration

ODOT and the City of Tulsa are partnering to construct this project. ODOT has completed the design and will contribute funds to construct the interchange. The City of Tulsa is funding the right-of-way acquisition necessary for the W. 81st Street widening and is contributing \$4.4 million to the project. ODOT and City of Tulsa have worked closely together throughout development of the project, coordinating on roadway, sidewalk, and drainage design. The partnership between ODOT and the City of Tulsa is longstanding and has resulted in the construction of several similar projects. Often ODOT will construct improvements on the city’s street network to improve operations or access to state facilities. The City of Tulsa then maintains these improvements after construction. The city is relieved of the burden of construction cost and ODOT can remain focused on maintenance and preservation of the state system.



OKLAHOMA Transportation



8 Innovation

Innovative Technology

ODOT commits to providing 3D computer models of the project as part of the contracting process. This technology will allow contractors to utilize the most recent GPS controlled equipment with Automated Machine Guidance in the construction process. Using and following the 3D model will minimize the potential for human error in establishing grades and elevations while improving efficiency in earthmoving during the construction process. These efficiencies improve quality while reducing the overall cost of construction. E-Construction methods will include mobile inspection and video monitoring and reporting of construction progress.

ODOT will incorporate stipulations that the contractor can make use of embedded strain gauges to serve as maturity meters in newly placed concrete. Current wireless technology allows for smart-phone connection or remote logger with cloud connections to track strength of concrete. The readings from these meters would be utilized by the contractor and ODOT to make critical real-time decisions during concrete curing. This allows for removal of concrete forms and opening to traffic earlier than conventional time constrained specifications.

Innovative Project Delivery

ODOT will make use of “No Excuses Bonuses” on the Project, including a substantial completion incentive of five to ten percent of the contract with internal milestones included for key project elements. The internal milestones will also have incentives associated to encourage contractor innovation in early completion of major project components including stages that open portions of the corridor to traffic.