Tishomingo Intersection Improvement Project

OUTCOME CRITERIA

May 6, 2024

2025/2026

Multimodal Project Discretionary Grant

Rural

OKLAHOMA Transportation

OUTCOME CRITERIA

Criterion #1: Safety

Per the ODOT Collision Analysis and Safety's Tabulation of Collisions, there were 7 collisions from 2017-2021. During this timeframe, 57% of collisions at the proposed project intersection were reported as a right angle or angle turning collision, and 29% of the collision resulted in injury. Today, the highway is considered a High-Risk Rural Road

Table 1: US-377 and SH-22 Collision & Injury Totals for 2017-2021

Year	Number of Collisions	Persons Injured
2017	1	0
2018	1	3
2019	3	1
2020	2	0
2021*	0	0
Total	**7**	**4**
* Denotes a year for which data may be incomplete		

The current intersection includes a stop control at SH-22 onto the free-flowing leg of US-377. Traffic from SH-22 is left turning, across a 45-mph traffic zone. The current intersection is subject to the following common problems experienced on rural highway intersections:

- Crashes at rural intersections often involve high speeds, which tend to result in severe injuries or fatalities. Roughly 1/3 of annual intersection fatalities in the U.S. occur along rural, two-lane highways.
- In many rural environments, drivers can miss a stop sign or traffic signal, leading to running through a stop sign or red light and resulting in an angle crash.
- For a driver turning left across oncoming traffic, it can sometimes be difficult to judge the speed of the approaching vehicle, resulting in misjudged gaps, and potentially severe crashes.

Existing Conditions at SH-22 to US-377

Alternative 1: The Four Legged Intersection

Alternative 2: The Tee Intersection

Alternative 3: The Modern Roundabout

The roundabout design (Alternative 3) is currently favored and is considered to improve safety in the following ways:

> "The alternative that I support for ODOT's US-377 & SH-22 in Johnston County Project is Alternative 3: Roundabout Intersection, because Alternative 3 will improve safety and reduce the number of intersection conflict points."
>
> *- Public Engagement Respondent*

- *Lower speeds:* Roundabouts are designed to slow down traffic as vehicles enter and navigate the circular intersection. This lower speed reduces the chances of avoiding collisions altogether.
- *One-way traffic:* Roundabouts operate on a one-way circulation pattern, which eliminates the potential for high-speed collisions with oncoming traffic that can occur with left turning.
- *Continuous traffic flow:* Unlike stop signs and signals that require vehicles to stop and wait for their turn, roundabouts promote a continuous flow of traffic. This eliminates the need for sudden stops and starts, reducing the chances of rear-end collisions.
- *Improved visibility:* Roundabouts typically have a smaller footprint compared to traditional intersections, which improves visibility for drivers approaching the intersection. This increased visibility allows drivers to better anticipate and react to other vehicles, further reducing the risk of collisions.

The US Department of Transportation reported the following statistics for roundabouts constructed at intersections along high-speed, two-lane rural highways:

- There were 11 fatal crashes in the 5 year "before" period and ZERO fatal crashes in the 5 year "after" period at 19 roundabouts constructed along high-speed, two-lane rural highways in six different states (KS, MD, MN, OR, WI, and WA).
- Overall crashes were reduced by up to 68% and reduced injury crashes by up to 88%.
- Eliminated 83% of angle-type crashes, that often occur from missed stop signals.

Improvements like stop signs and signals, while very familiar, are not always the safest choice. With intersections representing about one-quarter of annual U.S. traffic fatalities and roughly half of all injury crashes, safer designs are needed that improve mobility while saving lives. Since the late 1990s, an ever-growing number of State DOTs and local road agencies have been finding that roundabouts work in their jurisdictions. Their potential for saving lives is too significant to ignore.

The Crash Records from the ODOT Collision Analysis and Safety Branch showed that 15 other crashes occurred at the large "Wye" shaped SH-22/ US-377 exchange, encompassing the roadways east of Wrecker Road, between 09-01-2011 and 08-31-2021 (10-year span). Nine of the crashes involved property damage and six crashes resulted in injury. According to ODOT, its data are based on crash reports obtained from local law enforcement.

Table 2: Collision Data

Date	Fatalities	Injuries	Vehicle Involved	At Crash Intersection (Highlighted areas represent the project location site)
10/14/2011	0	0	2	NW part of Y (turning crash)
11/4/2011	0	0	2	At intersection (rear end)
12/15/2011	0	1	2	Not at Y. on 377 east of Y (rear end)
3/6/2012	0	0	2	At intersection (rear end)
12/3/2012	0	2	2	At intersection (failure to yield to US377 traffic)
1/8/2013	0	0	2	At intersection (failure to yield to US377 traffic)
9/4/2013	0	1	2	NW part of Y (turning crash. Driver did it deliberately to "kill himself")
9/12/2013	0	1	2	At intersection (failure to yield to US377 traffic)
5/25/2017	0	0	2	Intersection of ray branum rd and US377
10/5/2018	0	2	2	At intersection (failure to yield to US377 traffic)
1/2/2019	0	0	2	At intersection (failure to yield to US377 traffic)
4/26/2019	0	0	2	North part of Y (turning crash)
6/6/2019	0	1	1	North part of Y (hydroplaning crash)
1/3/2020	0	0	2	At intersection (rear end)
4/23/2020	0	0	2	At intersection (failure to yield to US377 traffic)
11/1/2021*	1	0	2	At intersection (went through gore just north of intersection)
Totals	**1**	**8**	**31**	

*Tishomingo Police Department Case #2011-1101A obtained through www.ntsb.gov

Criterion #2: Climate Change, Resilience, and the Environment

Project's Anticipated Climate Change, Resiliency & Environment Outcomes

- The Project results in improvements to travel timesaving in the peak hours of the day of up to 17,615 hours, directly reducing emissions.
- Reduction in travel time will reduce Greenhouse Gas Emissions by 0.061 metric tons annually and 0.50 metric tons over 30 years.
- New Infrastructure will be More Resilient – This will provide reliable access for freight and evacuation use. All improvements will be consistent with Federal executive orders related to resilience and flood risk.
- The preliminary analysis indicates that the preferred conceptual alternatives have no known significant adverse impacts within their footprint.
- The project plans to incorporate nature-based solutions by reducing the impervious area by 25%.
- The Project Area is not currently a Location for Future Electric Vehicle Charging Infrastructure –however, when the network expands in the future, the project location may be added to the Oklahoma EV Infrastructure Plan, which is under development.

Emission Reductions

The intersection improvement will improve air quality and public health, benefiting adjacent vulnerable populations and sensitive environmental assets. The Project results in improvements to travel time saving in the peak hours of the day of up to 17,615 hours, directly reducing emissions. Reduction in travel time will reduce Greenhouse Gas Emissions by 0.061 metric tons annually and 0.50 metric tons over 30 years.

Future Electric Vehicle Charging Infrastructure

The Project Area is not currently a Location for Future Electric Vehicle Charging Infrastructure however, when the network expands in the future, the project location may be added to the Oklahoma EV Infrastructure Plan, which is under development.

Environmental Impacts

The preliminary analysis indicates that there are no known significant adverse environmental impacts within the footprint of the proposed intersection improvements. During the regulatory report review for the hazardous materials study, three mapped sites were noted. One leaking petroleum storage tank record from the Oklahoma Corporation Commission (OCC) for The Station located 0.01 miles southeast of the study corridor. The record was closed on 8/20/2013 and appears to be of low concern. Two records listed underground storage tanks (UST) for The Station and the ODOT facility located 0.01 miles north of the study corridor. Three USTs listed for The Station are permanently out of use. Two USTs for the ODOT facility are listed as permanently out of use, and two USTs are listed as currently in use. These records appear to be of low concern. The approximate locations of the storage tanks are shown in **Figure 1**.

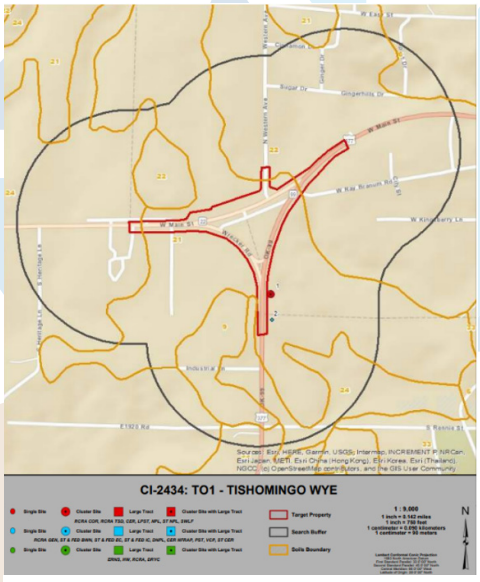

Figure 1

The intersection improvements will not have a significant environmental impact and will have a low impact on existing utilities compared to other alternative intersection solutions. This is due to being located primarily in the middle of the existing intersection and will have minimal impact on the utilities surrounding the intersection. The most impacted utilities for would be the overhead powerlines running through the center of the project area. However, options for relocating the overhead powerlines within the existing right-of-way would be likely.

Wildlife Considerations

The project is located adjacent to Tishomingo National Wildlife Refuge, as shown in **Figure 2**. The proposed intersection improvements will greatly reduce the intersection's footprint and pavement by 25%. With the reduction in pavement, nearby wildlife will have fewer conflict points when navigating through the area and less exposure to cars. In addition, project will improve air quality through lowered emissions. The project aims to enhance the connectivity of natural habitats by minimizing pavement and consolidating roadways. The area surrounding the project is a rural area with significant natural habitat. By reducing the amount of pavement and minimizing the impact of the roadway, the project will increase the connectivity of wildlife migration and connectivity of natural habitats.

Figure 2

Low-carbon Construction Methods and Materials

Goal area 2 of Oklahoma's Department of Transportation Carbon Reduction Strategy is to "Preserve and maintain the condition of Oklahoma's multimodal transportation system in a state of good repair through a process that considers lower emission construction practices." The department commits to examining current practices in construction, maintenance, and agency operations to identify areas for potential energy conservation in this project. This could include using warm-mix asphalt, reducing roadside mowing during peak hours, and other measures that will use less environmentally impactful materials.

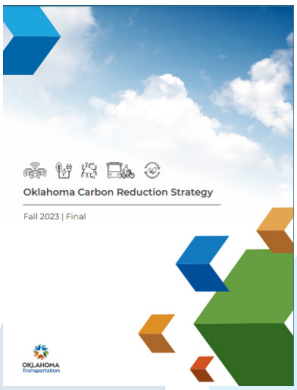

Figure 3

ODOT Work Plan and State Transportation Improvements Program

The project is included in both ODOT's eight-year construction work plan and the 2024-2027 ODOT STIP (ID 3617804).

Resilience and the Environment

Resiliency

The project aims to enhance the intersection's resilience by utilizing intersection improvements that eliminate the need for an electrical component, such as signalization. This approach will save money on maintenance costs and ensure the intersection can function without power. The project will also improve access and increase the resiliency of nearby neighborhoods, particularly those that are low-income minority communities, which are typically the most impacted by climate change impacts. All improvements will align with Federal executive orders regarding resilience and flood risk.

Nature Based Solutions

The project incorporates nature-based solutions by reducing the impervious area by 25% compared to the existing intersection configuration. This reduction allows for additional pervious surface for stormwater and reduced lane-mile maintenance. ODOT commits to evaluating potential additional nature-based solutions to include in the project, including bioswales, vegetated swales, and/or planting native and climate-appropriate plants.

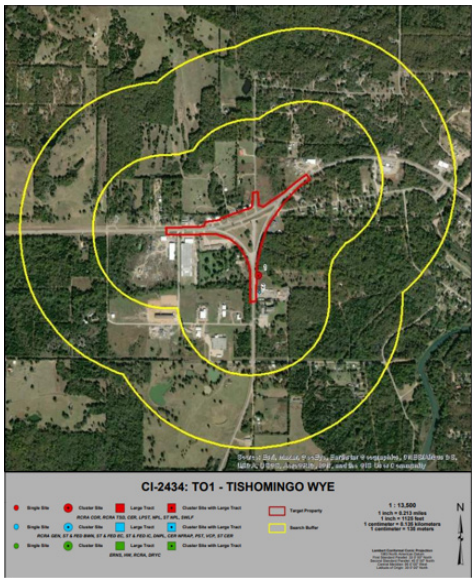

Figure 4

The intersection improvements were analyzed based on its overall change in impervious areas, which would affect runoff. The removal of Wrecker Road, in addition to the various roads in the center of the intersections, would lead to significant reductions in impervious areas for the roundabout by up to 25%. The project would require additional grading of the intersection and ditches to serve the roundabout. Storm drain infrastructure or occasional curb cuts would be expected to be used to channel drainage within the curbed sections of each alternative. A Waters of the U.S. Jurisdictional Stream (blue line stream) is located on the northeast corner of the intersection, crossing near the existing intersection of SH-22 and US-377, north of Ray Branum Road. The impacts to this stream would be expected to be relatively minor since the roundabout will be designed to match the grade and width of the existing roadway at this location.

Reduce Climate Change Risks

The project aims to implement solutions that can help reduce the risks caused by climate change. The proposed intersection improvements are expected to reduce travel time, which in turn will reduce emissions. Additionally, the project will enhance the intersection's ability to handle climate change risks by not relying on any power source. This approach will save resources on maintenance and improve resilience for freight movement and evacuation.

Criterion #3: Equity, Multimodal Options, and Quality of Life

ODOT Public Involvement Initiatives and Project Efforts

ODOT follows the ODOT Public Involvement Plan (PIP) (2022) when conducting public participation and gathering public opinion on transportation projects. According to the plan, "Public Involvement is important in transportation planning not only because of Federal requirements, but also because communities being impacted have insight into their community's infrastructure that ODOT may not have." The PIP complies with authorization acts for federal transportation programs, environmental, historic preservation, and non-discrimination laws, along with regulations, policies, and guidance created by federal agencies (e.g., Americans with Disabilities Act (ADA) and National Environmental Policy Act (NEPA)).

The PIP provides tools and activities for public involvement and community outreach, while also providing guidance on facilitating tribal coordination. All coordination between stakeholders, tribal groups, and the public, have been consistent with the guidelines provided in the 2022 ODOT PIP.

ODOT has taken great strides to ensure public, stakeholder, and tribal opinions hold weight when considering intersection alternatives. Three stakeholder meetings have been conducted, primarily including City of Tishomingo staff and representatives of the Chickasaw Nation. The first public involvement meeting took place on April 23, 2024, and a public comment period extending from April 23, 2024 to May 7, 2024 has been established for residents to voice project feedback and alternative preference. Stakeholder and public opinion generally supports Alternative 3, the proposed roundabout, as the prioritized intersection improvement.

> "I believe a roundabout would be a great option for the US-377 and State Highway 22 interchange. One would think that all residents coming and going would benefit greatly and see even a reduction in traffic."
>
> - *Public Engagement Respondent*

Disadvantaged Business Enterprises (DBEs)

The proposed project will be mindful of the 2021 ODOT Transportation Disparity study, while also considering USDOT's aspirational nationwide goal for recipients to collectively spend at least 10% of the awarded funds on small, disadvantaged businesses through specified DOT assisted projects (USDOT, 2023). In order to improve equitability amongst DBEs, ODOT has created the ODOT Transportation Disparity Study (2021) to conduct targeted outreach to underrepresented Disadvantaged Business Enterprises (DBEs), especially for Black and Hispanic firms that are not actively participating in the DBE program (ODOT, 2021). The results of the study proposed several action items to further engage increase participation in the DBE program and incentivize DBEs to bid on ODOT projects through various contractual modifications.

ODOT currently provides the Unified Certification Program (UCP), providing a one-stop-shop for disadvantaged businesses meeting DBE certification requirements to become certified and eligible to be used to meet USDOT's DBE goals. ODOT acts as the certifying agency and maintains all signed agreements from Oklahoma UCP partners. DBE Supportive Services program is also available to provide training, assistance and services to certified firms in the DBE program to facilitate firm's development into viable, self-sufficient, business capable of competing for and performing on, federally assisted highway projects. (ODOT, 2024).

Improving Quality of Life

The US-377 and SH-22 intersectionis located within the census tract 6602.01. According to the Climate and Economic Justice Screening Tool (CEJST), the project's census tract is identified as disadvantaged based on the categories of Climate Change and Health, identified in Table 3. The proposed interchange improvement would mitigate health burdens by providing improved access to healthcare via Mercy Hospital Tishomingo, and promoting use of parks and recreational facilities in Tishomingo, including Pennington Creek Park. The proposed project is not anticipated to worsen the burden of Climate Change. As previously stated in Criterion #4: Climate Change, Resilience, and the Environment, there are no known significant adverse impacts within the footprint of the preferred conceptual alternatives.

Table 3: CEJST Screening Results

Climate Change	
Expected agriculture loss	90th above 90th percentile
Projected wildfire risk	90th above 90th percentile
Low Income	78th above 65th percentile
Health	
Heart Disease	92nd above 90th percentile
Low Life Expectancy	91st above 90th percentile

According to 2022 ACS data, 94.7% of the population within the project's census tract have access to one or more vehicles per household. This data is supported by commuting patterns within the census tract, as 87.8% of the population drive or carpool to work. The project does not include additional active transportation facilities, however, data suggests that the improvement of the intersection will ultimately be beneficial for a greater percentage of the population due to the current auto-dominated travel patterns. Limited public transportation is served by JAMM Transit, but ACS data indicates that 0% of the population use public transportation as a means of commuting. The existing intersection's outdated design does not support local safety or regional growth, and has a history of collisions. The proposed project will provide an improved intersection that will bolster confidence when driving along SH-22 or US-377, ultimately creating a safer access to Tishomingo through physical design and mental perception of the roadway.

Improving Accessibility to Essential Services in Tishomingo

Tishomingo is the largest city in Johnston County, serving as the county seat and home of the Chickasaw Nation's Capitol Building. Tishomingo provides access to several essential services including access to healthcare at Mercy Hospital Tishomingo, educational resources at Murray State College and local primary education facilities, and several restaurants, government resource buildings, and parks. According to ODOT's 2022 Annual Average Daily Traffic by county, the eastern-leg of the existing interchange (W Main Street/US-377) has the highest AADT compared to the rest of Johnston County (7,000 AADT). The 2022 AADTs are represented in **Figure 3**.

Figure 3: 2022 AADT around project intersection

Due to the population growth and essential services currently provided within Tishomingo, it is anticipated that this roadway volume will increase. ODOT's priority is to construct an intersection improvement that would provide a safe access for the growing population and freight traffic. While the roundabout design would not add capacity, it will effectively promote traffic calming and ensure the intersection would be utilized safely and efficiently. As stated previously, the proposed roundabout would be constructed with three single-lane legs, with bypass lanes. The roundabout is anticipated to operate with LOS A during both the AM and PM peak hour, and would be able to accommodate the existing and growing freight traffic.