Environmental Assessment

STATE HIGHWAY 82 NORTH OF TAHLEQUAH

CHEROKEE COUNTY, OKLAHOMA

JP 27101(04)

JULY 31, 2017

SH-82 North of Tahlequah
Cherokee County, Oklahoma
JP 27101(04)

Environmental Assessment

US Department of Transportation
Federal Highway Administration
and
Oklahoma Department of Transportation

The proposed improvement includes reconstruction of SH-82 from the end of the 4-lane Bertha Parker Bypass in the City of Tahlequah, north approximately 8 miles to the Town of Gideon in Cherokee County. This Environmental Assessment (EA) describes the project's purpose and need, the different design alternatives considered and the alternatives selected for further consideration. In addition, the document outlines the social, economic and environmental effect of each of the alternatives and the Oklahoma Department of Transportation's (ODOT's) coordination of public and agency involvement conducted as part of the development of the EA.

This highway project is proposed for funding under Title 23, United States Code (USC). This statement for the improvement has been developed in consultation with the Federal Highway Administration (FHWA) and is submitted pursuant to 42 USC-4332(2)(c) and 49 USC 303.

Submitted:

Date: 7/11/17 _____

Environmental Programs Division Engineer
Oklahoma Department of Transportation

Approved:

Date: 7/31/17 _____

Division Administrator
Federal Highway Administration

What Are the Highlights of the Environmental Assessment (EA)?

The Oklahoma Department of Transportation (ODOT), in cooperation with the Federal Highway Administration (FHWA), has prepared this Environmental Assessment (EA) to document the environmental impacts of the SH-82 project north of Tahlequah in Cherokee County, Oklahoma. The EA has been prepared according to policies established by the National Environmental Policy Act (NEPA), which requires federal agencies to evaluate and consider impacts of their projects on the natural and human environment.

An EA is a decision –making document that provides enough details to determine if a project has significant environmental impacts. It includes a brief discussion of the project's need, alternatives studied, a summary of the project's effects, and the public communication efforts completed as part of the project.

This EA discusses the history of the SH-82 project, the process and reasoning by which alternatives were studied and eliminated, the anticipated impacts of the three alternatives under consideration, and the public involvement efforts conducted for the project. The document also discusses the commitments made by ODOT and FHWA to perform detailed field studies and either avoid, minimize, or mitigate the impacts of the project.

The SH-82 project is divided into two segments. The south segment begins at the end of the Bertha Parker Bypass in Tahlequah and extends north to W. 710 Road. The north segment begins at W. 710 Road and extends north to Gideon. This EA briefly discusses the two alternatives considered for the south segment, Alternative 1A and Alternative 9-5, and the single alternative for the north segment, Alternative 7. Alternative 1A is a divided four-lane highway on a new alignment. Alternative 9-5 is a partial 5-lane alternative on the existing SH-82 alignment south of Jones/Steely Hollow Road, and a divided four-lane highway on a new alignment north of Jones/Steely Hollow Road. Alternative 7 is a four-lane divided highway located adjacent to the existing SH-82 roadway on the east side. Each alternative was studied on how it will improve traffic operations and safety, and what costs and impacts it will have on properties, the community, and the environment. The preferred alternative will be selected after the public and agencies have had an opportunity to review this document and provide input and after a Public Hearing is held.

The final section of the EA documents the commitments made by ODOT and FHWA to perform detailed field studies of the selected alternative and to either avoid, minimize, or mitigate the impacts of the project on the environment. Some of these commitments will be performed prior to construction and some will be performed during construction. By signing this document, FHWA and ODOT are legally obligated to follow through on these commitments.

If significant impacts are identified by this EA, an Environmental Impact Statement (EIS) will be prepared. If no significant impacts are identified, the EA will be concluded with a Finding of No Significant Impact (FONSI), which would allow the project to move toward final design, right-of-way acquisition, and construction.

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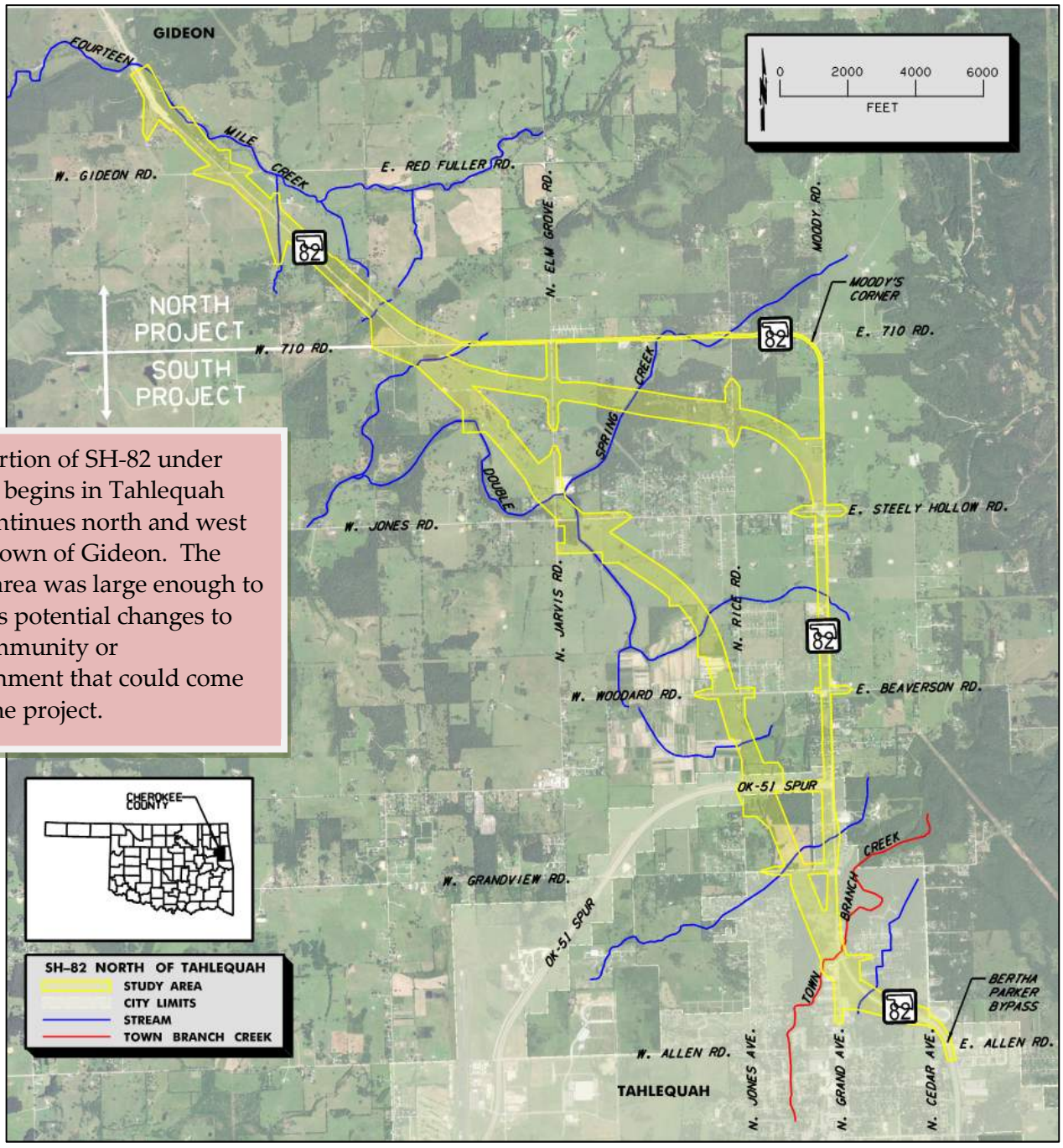
What Project Are We Studying?

The State Highway 82 (SH-82) project is located on the north side of the City of Tahlequah in Cherokee County, Oklahoma (see **Figure 1**). The portion of SH-82 under consideration begins approximately 1 mile north of the US-62/SH-51 junction in Tahlequah, where the existing SH-82 (Bertha Parker Bypass) narrows from four lanes to two lanes west of Cedar Avenue. The project extends approximately 8 miles to the north and west to the town of Gideon, where the Oklahoma Department of Transportation (ODOT) has recently completed improvements to SH-82 from Fourteen Mile Creek north approximately 1.4 miles. These improvements include a new 2-lane SH-82 roadway offset east from the old highway and new bridges over Fourteen Mile Creek and Thompson Branch. Building to the east allowed ODOT to expand its right-of-way to eventually accommodate 4 lanes. Ultimately, as traffic warrants and funding is available, ODOT intends to 4-lane SH-82 north all the way to US-412. The current project is one piece in these larger planned improvements for the SH-82 corridor. At the same time, the SH-82 project is independent of these other improvements. Even if the highway to the north remains 2 lanes, the current project would still function. The decision to expand SH-82 to 4 lanes north of the current project would be made if and when the volumes warrant and would not depend on the current project. Whether or not the SH-82 project is built does not promote or prevent other improvements from happening.

The study limits include the existing SH-82 highway from just east of Cedar Avenue to Gideon, as well as two corridors to the south and west of the existing highway where the new alignment alternatives were studied. The study area was large enough to make sure analysts could identify potential changes that the alternatives would have on the surrounding community and the environment.

For the purposes of the study, the SH-82 corridor is split into two segments. The south segment (referred to as the South Project in this EA) begins at the end of the Bertha Parker Bypass and continues north to W. 710 Road. The north segment (referred to as the North Project in this EA) extends north from W. 710 Road to Gideon. This split allowed an examination of a larger number of alternatives for the South Project, where new alignment alternatives were considered. More description of the alternatives is presented later in this document. ODOT's 8-Year Construction Work Plan includes one project acquiring right-of-way for both the north and south segments.



The portion of SH-82 under review begins in Tahlequah and continues north and west to the town of Gideon. The study area was large enough to address potential changes to the community or environment that could come from the project.

Figure 1: SH-82 Study Area Showing the South and North Projects

Why is This Project Needed?

The purpose of this project is to improve safety and traffic flow within the SH-82 corridor. Existing SH-82 has narrow shoulders, sharp curves, and rolling terrain which result in an inability to see far enough to safely pass slow moving vehicles or to see vehicles that have stopped on the highway. These factors contribute to a substantial accident history. In addition, the current average daily traffic count on SH-82 is 8,140 vehicles per day (vpd) with a future projected traffic count of 12,340 vpd in 2045. While the existing highway can adequately handle the existing traffic, in the future the current two-lane highway would not be able to adequately handle this amount of traffic. Without improvements, future traffic will experience significant congestion and delay. A multi-lane highway is also desirable to complete the outer loop around the City of Tahlequah in anticipation of future traffic needs. Each of these needs is discussed below in more detail.

Figure 2: Existing SH-82 2-lane Roadway Cross Section

SH-82 within the study corridor is a two-lane roadway beginning at the end of the Bertha Parker Bypass in Tahlequah to Gideon, Oklahoma (see **Figure 2**). The divided four-lane Bertha Parker Bypass in Tahlequah transitions into a two-lane roadway just east of Cedar Avenue. The two-lane roadway consists of two 12-foot-wide driving lanes with 4-foot-wide shoulders. There are several curves and hills that are too sharp or too steep for a roadway posted at 55 miles per hour (mph). The curves at Moody's Corner (**Figure 3**) and at W. 710 Road (**Figure 4**) are particularly problematic, with sharp curves at intersecting roadways. These conditions make turning on and off of SH-82 dangerous in these areas because it is difficult to see vehicles approaching the intersections.

Figure 3: Curve at Moody's Corner

Figure 4: Curve at W. 710 Road

Safety

As a result of the multiple curves and limited sight distance on the roadway, the accident rate on this portion of SH-82 is significantly higher than the state average for collisions on similar roadways. Using data gathered from 2006 through July of 2016, the study portion of SH-82 witnessed 227 accidents involving 175 people, including 6 fatal accidents. This accident rate is over 1.3 times the state average for similar types of highways. Crashes were most common at the N. Grand Avenue, Beaverson/Woodard Road, and Steely Hollow/Jones Road intersections.

The **accident rate** is a way to compare how many accidents occur on different roadways. It is expressed in number of accidents per 100 million vehicle miles. So if one vehicle travels one mile that is one vehicle mile. The accident rate for this portion of SH-82 is 134.15 accidents per 100 million vehicles miles.

Traffic Capacity

As discussed above, the current traffic count on SH-82 is 8,140 vehicles per day with a future projected traffic count of 12,340 vehicles per day in 2045. The current two-lane highway cannot adequately handle this amount of traffic and without improvements, future traffic will experience significant congestion and delay. Increased congestion also leads to increased accidents. Traffic operations are described on a scale from A through F, known as Level of Service (LOS). With A representing free-flow traffic with unlimited mobility, and F representing stop and go traffic with significant delay and poor travel times. Currently, traffic on SH-82 operates at LOS C/D. With the projected traffic growth in the future, by 2045 SH-82 is expected to erode to LOS D/E conditions. ODOT considers LOS D as acceptable for this type of highway.

Four-Lane Loop

In order to facilitate transportation in and around the City of Tahlequah, ODOT has been working to complete a four-lane loop around the city. This loop will allow traffic that is driving through Tahlequah and headed elsewhere, a way to travel through the area without slowing down local traffic. As shown in **Figure 5**, the portion of SH-82 between the Bertha Parker Bypass and the SH-51 Spur is the only remaining two-lane piece of the loop.

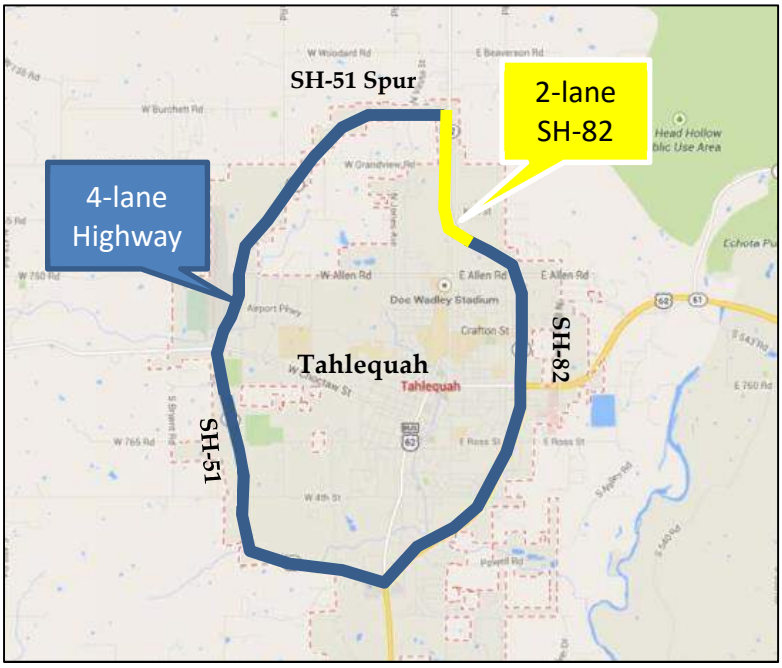


Figure 5: Four-Lane Loop Around Tahlequah

In summary, the purpose of the SH-82 project is to:

- Reduce accidents and improve safety along the roadway
- Provide the additional lanes that will be needed to handle future traffic
- Complete the Four-Lane Loop around Tahlequah

What is the History of the Project?

The need for improvements to the SH-82 corridor has been recognized by ODOT for many years. The project first appeared in ODOT's 8-Year Construction Work Plan in 2009. In 2012, ODOT began a study to look at alternatives to improve the highway, called a "*Preliminary Alignment Study*". The *Preliminary Alignment Study* included a comprehensive analysis of existing and future traffic levels, accidents, and safety concerns. In addition, the *Preliminary Alignment Study* also identified residences and businesses, existing utilities, and known environmental resources in the project area. Five new alignment alternatives (new alignment alternatives are proposed roadways that are not on or near existing ones) were studied for the South Project in the *Preliminary Alignment Study* (Alternatives 1, 2, 3, 4, and 5). A sixth alternative (Alternative 6) was developed but not carried through the study due to some very steep terrain that is not ideal for a new roadway. The complete *Preliminary Alignment Study* (November 21, 2012) is provided in **Appendix A.**

Alternatives 1 through 6 included in the *Preliminary Alignment Study* were designed to have four 12-foot-wide driving lanes, 10-foot wide outside shoulders, and 4-foot wide inside shoulders. The two directions of traffic would be separated by a 64-foot-wide grass median. This is shown in **Figure 6**.

Figure 6 shows the four-lane section proposed for SH-82.

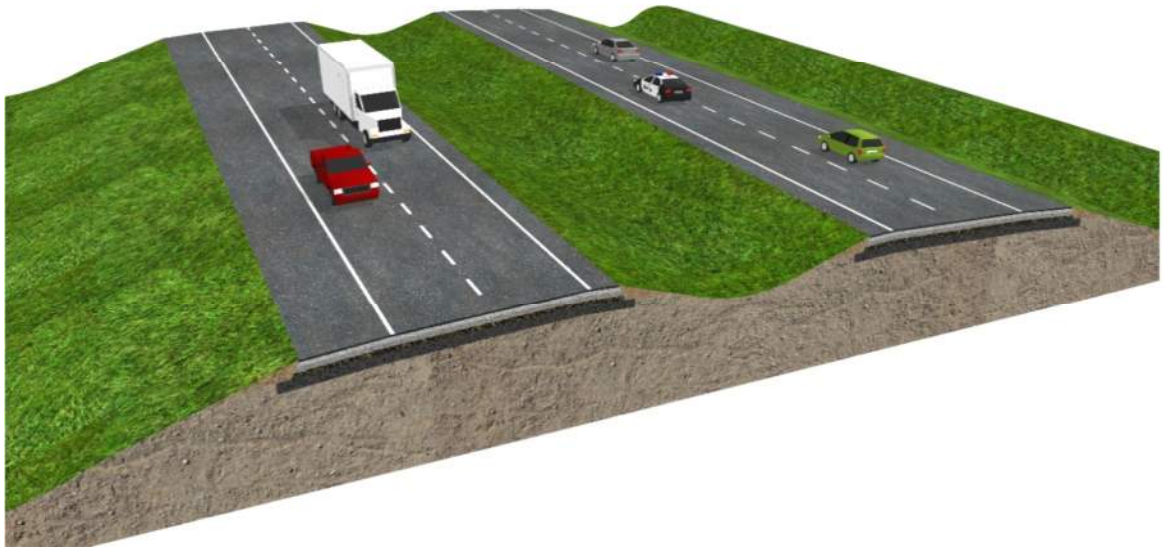


Figure 6: Proposed SH-82 Four-Lane Roadway

ODOT performed an initial screening of the alternatives presented in the *Preliminary Alignment Study* report. Each alternative was evaluated for its construction costs, environmental impacts, utility impacts, and right-of-way impacts. The result of this review was the elimination of Alternatives 2 and 4 due to high numbers of affected residences and businesses, and high overall costs. Also during this review, ODOT requested slight modifications to Alternatives 1 and 5 to improve safety and reduce costs, and so Alternatives 1A and 5A were developed. Alternative 5A was ultimately eliminated because it did not have any benefits over Alternative 5.

At this time ODOT also extended the study north to include the North Project, from W. 710 Road to Gideon. Two alternatives (Alternatives 7 and 8), one on the east side of the existing SH-82 highway and one on the west side, were developed for the North Project. The alternatives carried forward from the *Preliminary Alignment Study*, then, included Alternatives 1, 1A, 3, and 5 for the South Project, and Alternatives 7 and 8 for the North Project (see **Figure 7**).

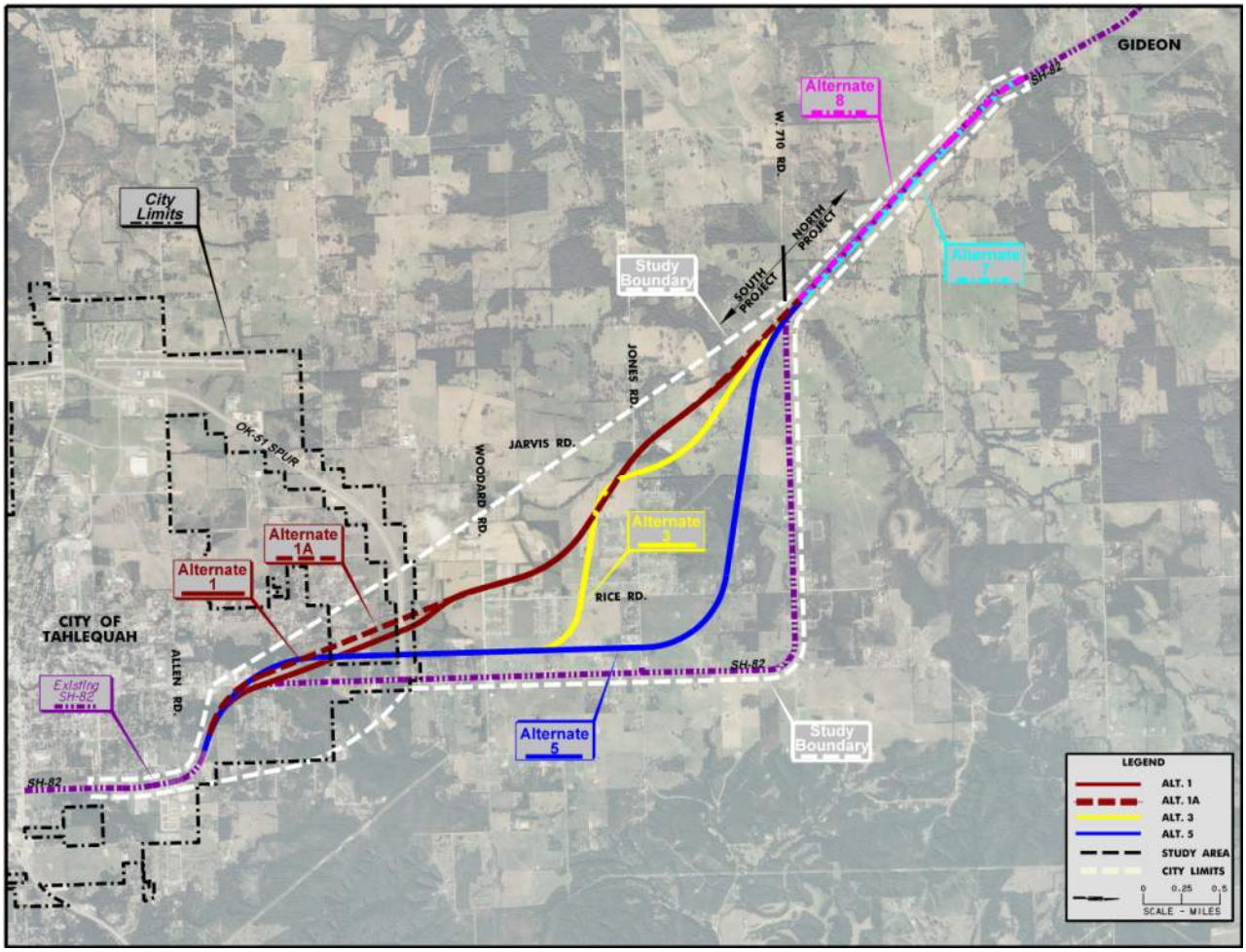


Figure 7: Alternatives Carried Forward from the Preliminary Alignment Study

Stakeholder Meeting

ODOT held a Stakeholder Meeting on April 3, 2013 with representatives from the City of Tahlequah, Cherokee County, the Cherokee Nation, the Tahlequah Chamber of Commerce, Northeastern State University, and some local business owners. The purpose of the meeting was to present information about the SH-82 project including why the project is needed, the alternatives under consideration, and the expected impacts to the community and the environment, and to obtain input from the stakeholders. The meeting presented the alternatives under consideration as well as some options for the intersection at SH-82 and Grand Avenue.

The discussion at the stakeholder meeting was focused on the importance of improving safety on SH-82 while minimizing impacts to homes and businesses. Some wanted to keep the new SH-82 alignment close to the existing SH-82 alignment, while others wanted to make the route as straight as possible for safety. All agreed that maintaining the connection at Grand Avenue was important. Representatives from the Cherokee Nation attended the meeting and did not raise concerns regarding impacts specific to members of their community. See **Appendix B** for the *Stakeholder Meeting Summary*.

1st Public Meeting

ODOT held the first public meeting for the SH-82 project on July 25, 2013 in Tahlequah. The meeting included a presentation on the SH-82 project, including why the project is needed, the alternatives under consideration, and the expected impacts to the community and the environment. The public was asked to provide input on the alternatives and any other areas of concern. One hundred and seventy-two people (172) signed in for the meeting, including representatives from ODOT, the Cherokee Nation, the City of Tahlequah, Cherokee County, Tahlequah Public Schools, Northeastern State University, and the general public.

In addition to the questions and discussions at the public meeting, ODOT received over 40 written comments as a result of the meeting. The majority of the discussion at the meeting, as well as the written comments, fell into two main categories. One group asked ODOT to consider new alternatives that widen the existing alignment of SH-82 to five lanes (4 driving lanes and a shared center left turn lane), at least in the southern portion of the project area. These individuals had concerns that the new alignment alternatives would have major impacts to homes, farms, and businesses. Another group expressed a preference for Alternatives 1 and 1A, believing these alternatives would improve safety and have fewer impacts. Several people also asked that the intersection of SH-82 and Grand Avenue include a traffic signal. No comments from the Cherokee Nation or comments specific to impacts to low-income or minority populations were received. See **Appendix C** for the *Public Meeting #1 Summary*.

Additional Alternatives

In response to the requests from the public at the first public meeting, ODOT developed six new alternatives for the SH-82 project that utilized the existing SH-82 alignment. Alternatives 9 through 14 looked at a five-lane roadway (two 12-foot-wide driving lanes in each direction and a 16-foot-wide center left turn lane). These alternatives included some options with 10-foot-wide shoulders and curb and gutter with underground storm sewer (Alternatives 9, 10, and 11;

see **Figure 8**), and a speed limit of 55 mph, and some options with 10-foot-wide shoulders and open ditches for drainage (Alternatives 12, 13, and 14; see **Figure 9**) and a speed limit of 65 mph.

Figure 8: Alternatives 9, 10, and 11 Roadway Cross-Section

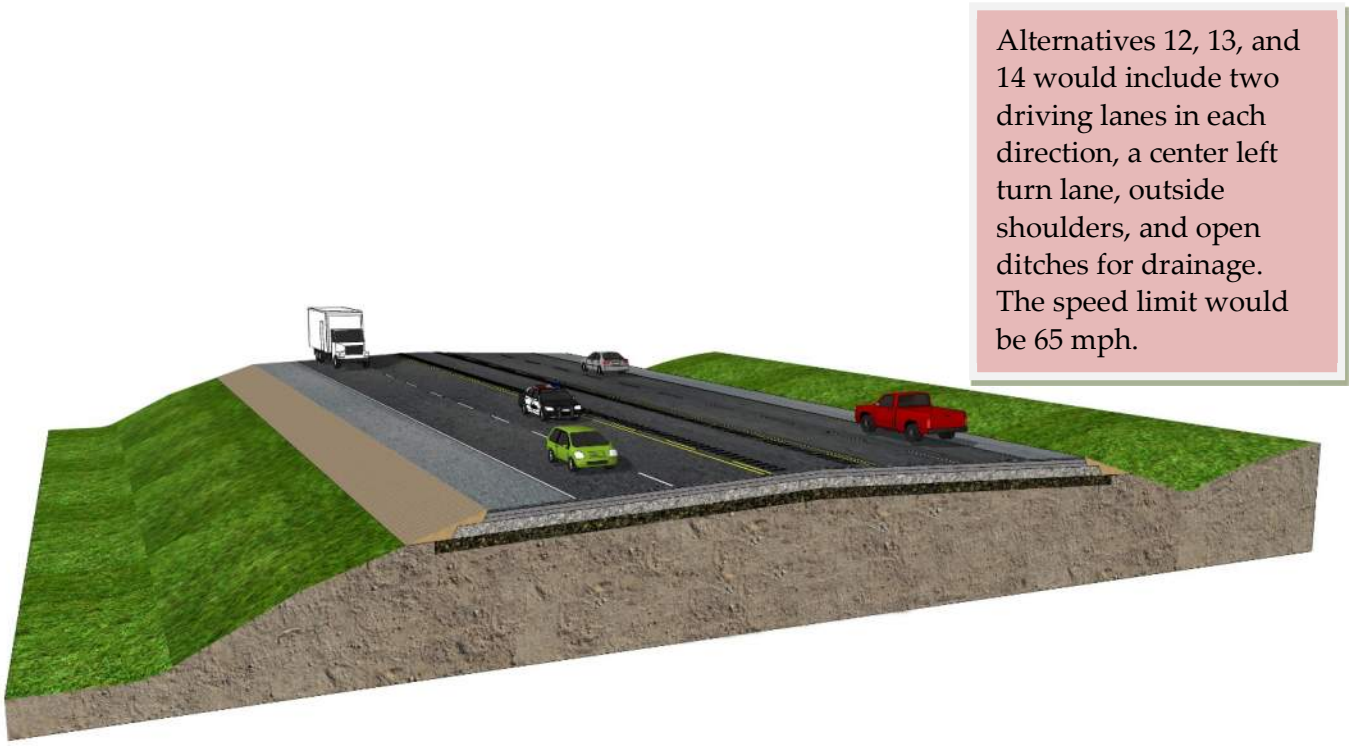


Figure 9: Alternatives 12, 13, and 14 Roadway Cross-Section

ODOT performed a similar analysis of Alternatives 9 through 14 as was done on Alternatives 1 through 8, looking at improving safety and traffic operations, while reducing construction costs, environmental impacts, utility impacts, and right-of-way impacts. Results of this analysis were presented in a *Supplemental Memorandum* to the *Preliminary Alignment Study*, completed in September of 2014. The *Supplemental Memorandum* is included as **Appendix D**. **Figure 10** shows all of the four-lane alternatives moving forward from the *Preliminary Alignment Study*, as well as all of the five-lane alternatives included in the *Supplemental Memorandum*.

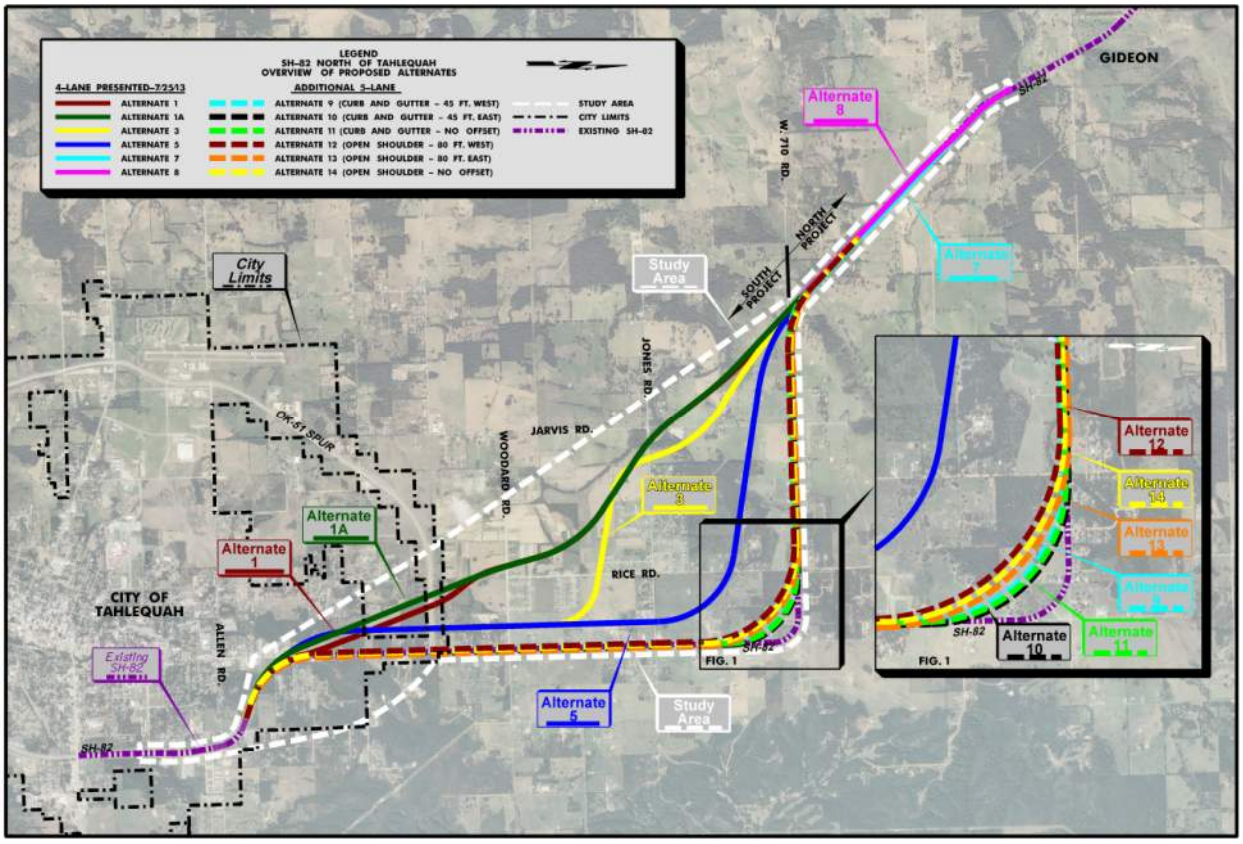


Figure 10: Alternatives Moving Forward from the Preliminary and Supplemental Alignment Studies

2nd Public Meeting

ODOT held the second public meeting for the SH-82 project on January 27, 2015 in Tahlequah. The meeting was held in an open house format, where attendees were free to come and go and view project information. The open house included a presentation on the SH-82 project, including why the project is needed, the alternatives under consideration, and the expected impacts to the community and the environment. This presentation was played on a continuous loop during the entire open house. The public was asked to provide input on the alternatives and any other areas of concern. One hundred and ninety-seven (197) people signed in for the open house including representatives from ODOT, the Cherokee Nation, the City of Tahlequah, Cherokee County, Grandview School, Gideon Fire Department, Northeastern State University,

and the general public. In addition to the presentation, attendees at the open house were able to view display boards on a number of topics, including:

- Purpose of the Meeting
- Purpose and Need for the Project
- Proposed Design Criteria
- General Project Information and Project Area Constraints
- Project Development Process
- Alternatives Overview
    - Initial Four-Lane Alternatives (Alternatives 1, 1A, 3, 5, 7, and 8)
    - First Public Meeting
    - New Five-Lane Alternatives (Alternatives 9 through 14)
    - Aerial View of Proposed Alternatives Layout (Four Lane vs. Five Lane)
- Alternatives Comparison
- Relocations
- Socioeconomic and Environmental Impacts
- Next Steps

ODOT received eighty-six (86) written comments as a result of the open house. These included nine (9) comments from agencies, one from an elected official, and seventy-six (76) written comments from the general public. Public comments fell into one of three general categories: those that prefer Alternative 1 or 1A, those that prefer one of the Five-Lane Alternatives, and other comments. A few also expressed general support for one of the four-lane alternatives. There were also a large number of comments from people requesting that the Log Store, located on SH-82 just north of Woodward/Beaverson Road, be left in place. The Log Store staff made comment forms available at the store location after the public meeting. While people had different thoughts on which alternative would be the best solution, most agreed that the improvements to SH-82 are needed to address safety and traffic operations.

People that preferred Alternative 1 or Alternative 1A felt that these alternatives were the safest because they removed curves and provided better sight distance. They also preferred these alternatives because they had the fewest impacts to homes and businesses and the environment. The lower cost of these alternatives was also mentioned.

People that preferred the five-lane alternatives felt that these alternatives would have fewer impacts to farmers and farmland, and that people living near the road would be more accepting of a new roadway than people living in the country. Lower cost was also mentioned by some for the five-lane alternatives. Some people expressed a preference for specific five-lane alternatives. Alternative 11 was the most frequently mentioned, although there was not a large difference in public preference between any of the 5-lane alternatives.

Several people expressed concern for their personal properties and potential impacts. Some people did not think the project is needed. Some made requests to avoid and minimize impacts, especially relocations. Others stated that relocations are not a major impact. A large number of

people also requested that the Log Store (at SH-82 and Beaverson Road) be avoided, as it is the closest store and gas station and is important to local residents. A few people also requested that ODOT consider a hybrid alternative, combining Alternative 9 (one of the five-lane alternatives) on the south end with Alternative 3 (one of the four-lane divided alternatives) on the north end. No comments from the Cherokee Nation or comments specific to impacts to low-income or minority populations were received. The *Public Meeting #2 Summary* is included in **Appendix E**.

In response to public comment, ODOT investigated the feasibility, costs, and impacts of three hybrid alternatives. Hybrid 1 combined Alternative 9 (the five-lane curb and gutter alternative offset 45 feet west of the existing SH-82), and Alternative 3 (one of the new alignment, four-lane alternatives). Hybrid 2 combined Alternatives 9, 3, and 1A. Hybrid 3 combined Alternatives 9 and 5. These hybrids were analyzed for safety and traffic operations, construction costs, environmental impacts, utility impacts, and right-of-way impacts, similar to the other alternatives. Ultimately, these hybrids were eliminated from further consideration because, while impacts were reduced somewhat over the five-lane alternatives, the hybrids did not improve safety or reduce costs or impacts over the four-lane alternatives.

Preferred Alternatives

ODOT compiled and summarized all of the comments from the second public meeting (public open house) (see **Appendix E**). In light of these comments and taking into account the need for improved safety and traffic operations, and the costs and anticipated impacts of all of the proposed alternatives, ODOT selected Alternative 1A (for the South Project) and Alternative 7 (for the North Project) as the preferred alternatives for the SH-82 project. Notices were mailed on June 15, 2016 notifying the public of the selection of Alternatives 1A and 7. These notices were mailed to all agencies involved with the project, and everyone that had signed into one or both of the public meetings (with a legible, complete address), or had submitted a comment. ODOT also issued a media release announcing the alternative selection.

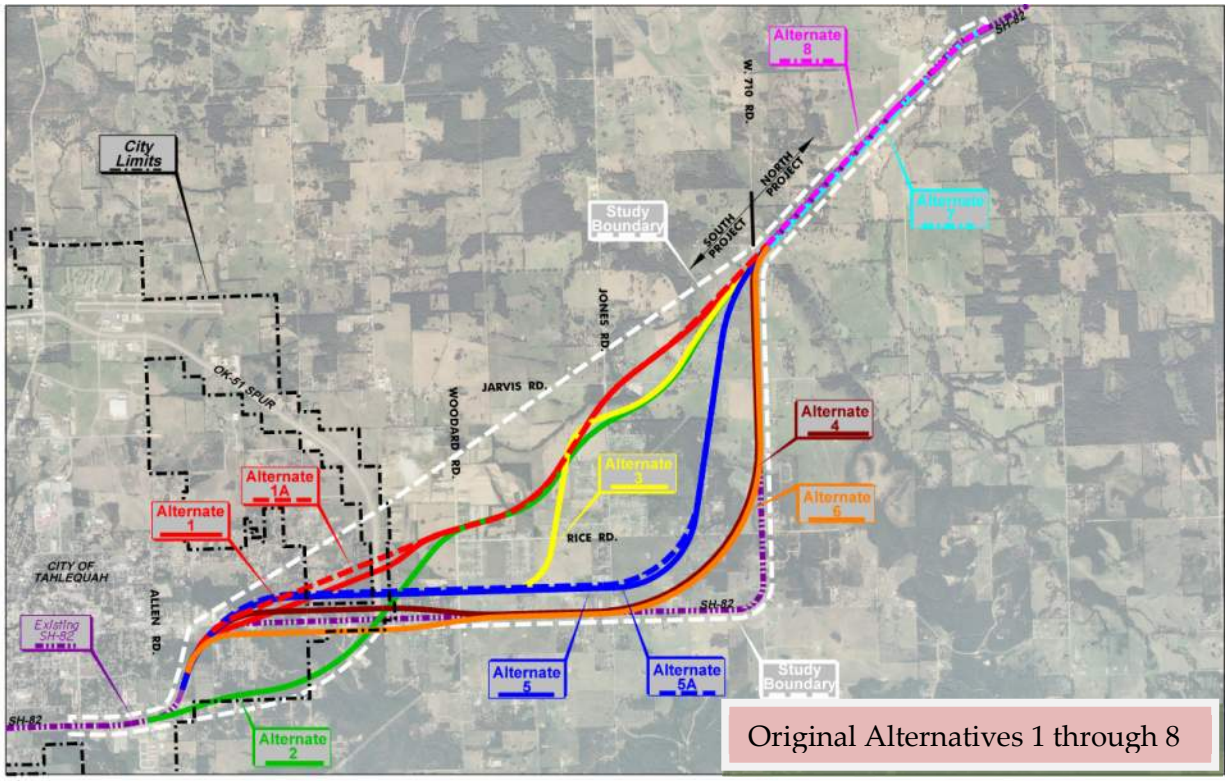
Subsequent to the decision to select Alternatives 1A and 7, the City of Tahlequah passed a Resolution 08-17-2015 requesting that ODOT change the preferred alternatives for the SH-82 South Project from Alternative 1A to a hybrid alternative combining portions of Alternative 9 and portions of one of the four-lane divided alternatives (not specifically named) north of Jones/Steely Hollow Road. In response to this resolution, ODOT reconsidered the hybrid alternatives investigated earlier and determined that Hybrid 3 (Alternatives 9 and 5) was the closest to the alignment described in the City's resolution, and provided a straighter alignment with fewer curves. This hybrid assumes construction of Alternative 9 from the south end of the project through Jones/Steely Hollow Road. North of Jones/Steely Hollow Road the alternative transitions to Alternative 5. In this EA this alternative is called Alternative 9-5. Alternative 9-5 also had lower costs and fewer impacts than the previously studied Hybrid 1 and Hybrid 2.

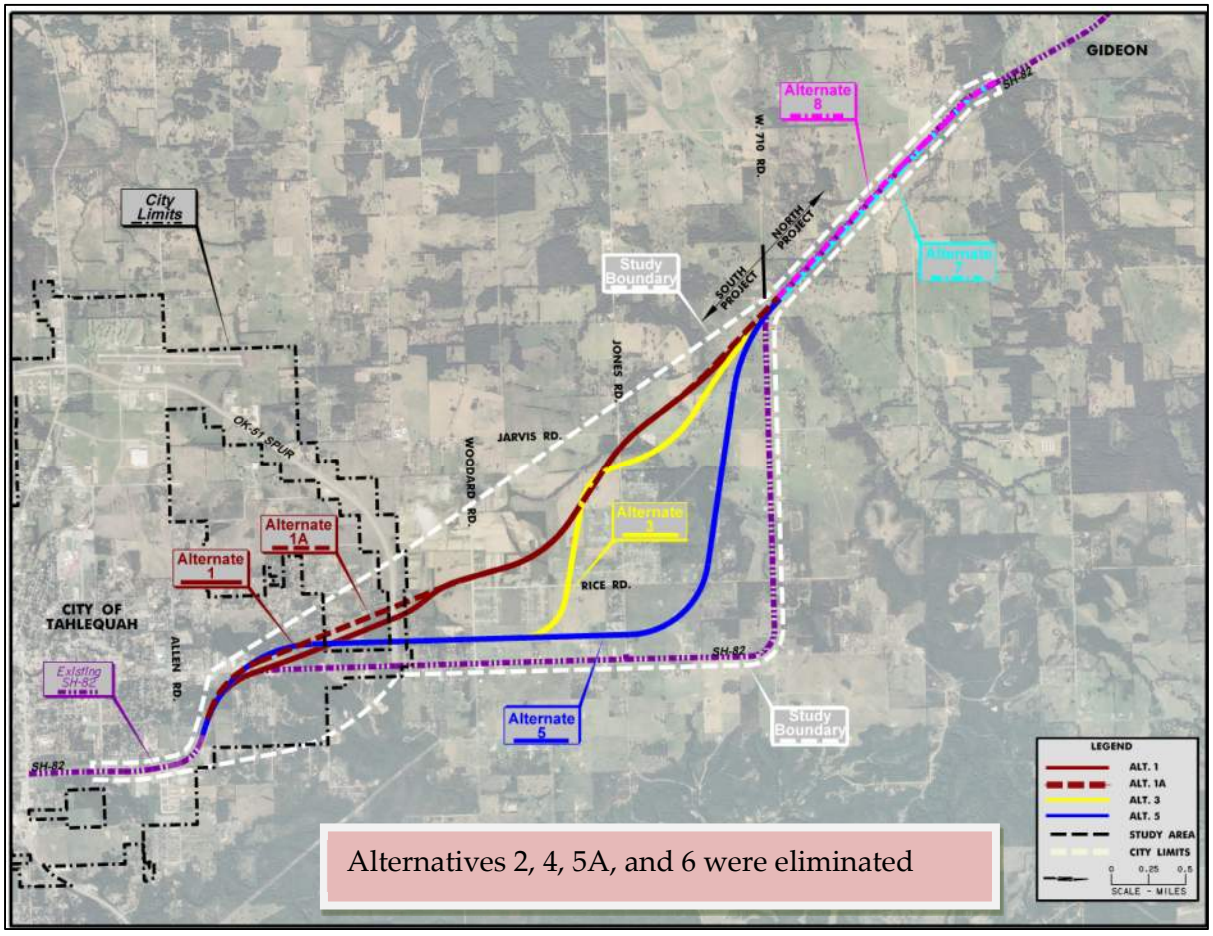
Figure 11 below summarizes the progression of the development of alternatives for the SH-82 project. All of the alternatives except Alternative 1A, Alternative 9-5, and Alternative 7 have been eliminated for the reasons discussed above. This Environmental Assessment considers the safety benefits, traffic operations, costs, and impacts of Alternative 1A and Alternative 9-5 for

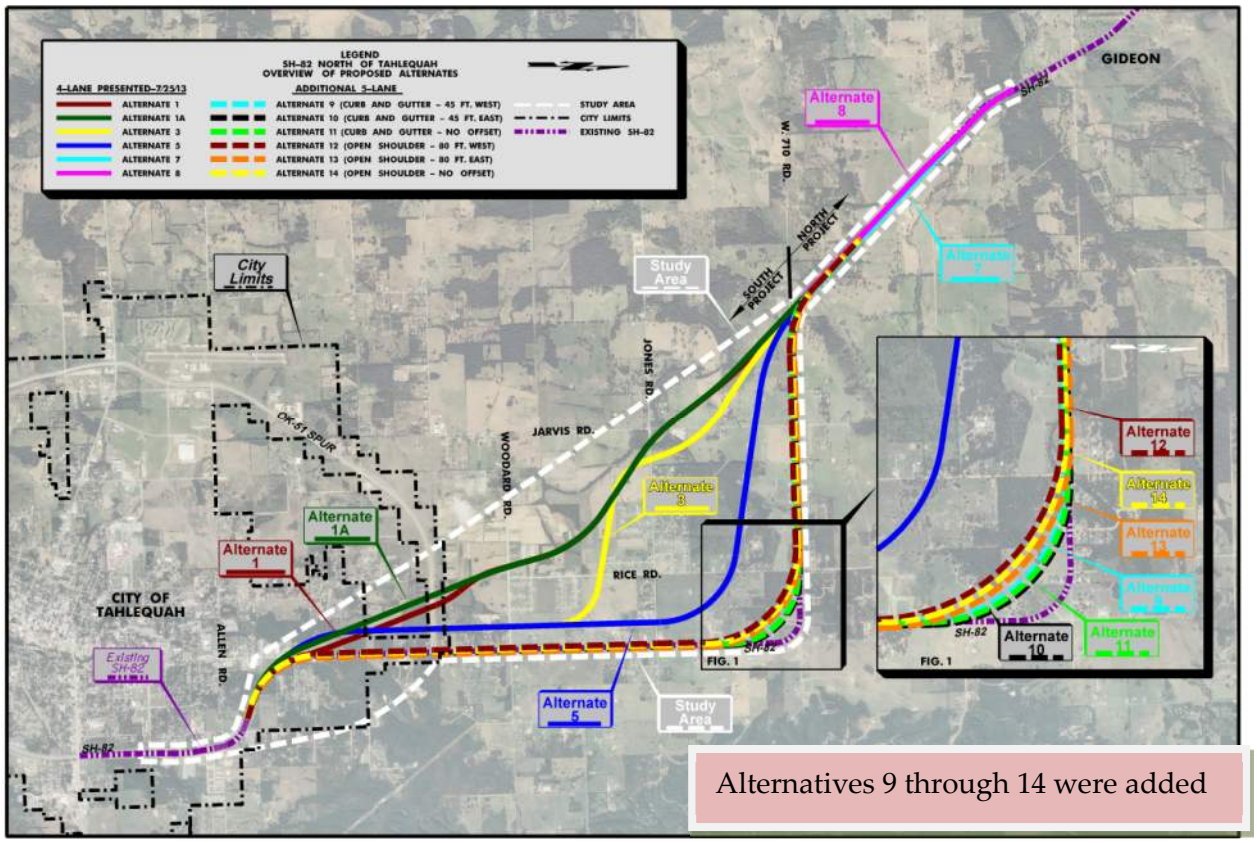
the South Project and Alternative 7 for the North Project. More details about each alternative are presented later in this document.

Regardless of which alternative is selected, ODOT plans to purchase the needed right-of-way for the roadway and then phase the construction. The southern portion of the corridor (between the Bertha Parker Bypass and the SH-51 Spur) would be constructed first to alleviate the congestion and traffic demand. The remainder of the roadway would be completed in phases, with the four-lane divided sections (i.e. Alternative 1A, Alternative 7, and the northern portion of Alternative 9-5) constructed first as two lanes. The additional lanes would be constructed in the future as traffic warrants and as funding is available.

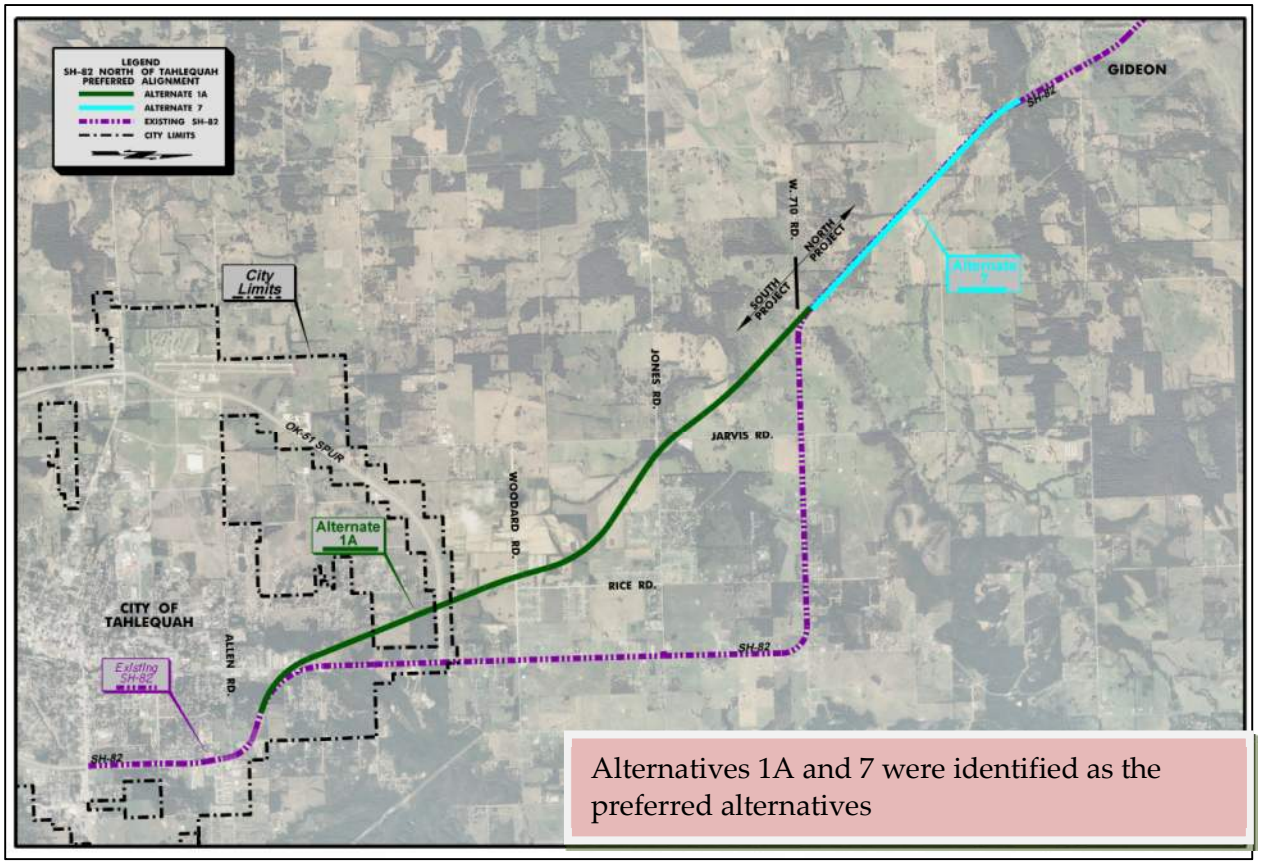
Figure 11: Progression of the Development of Alternatives



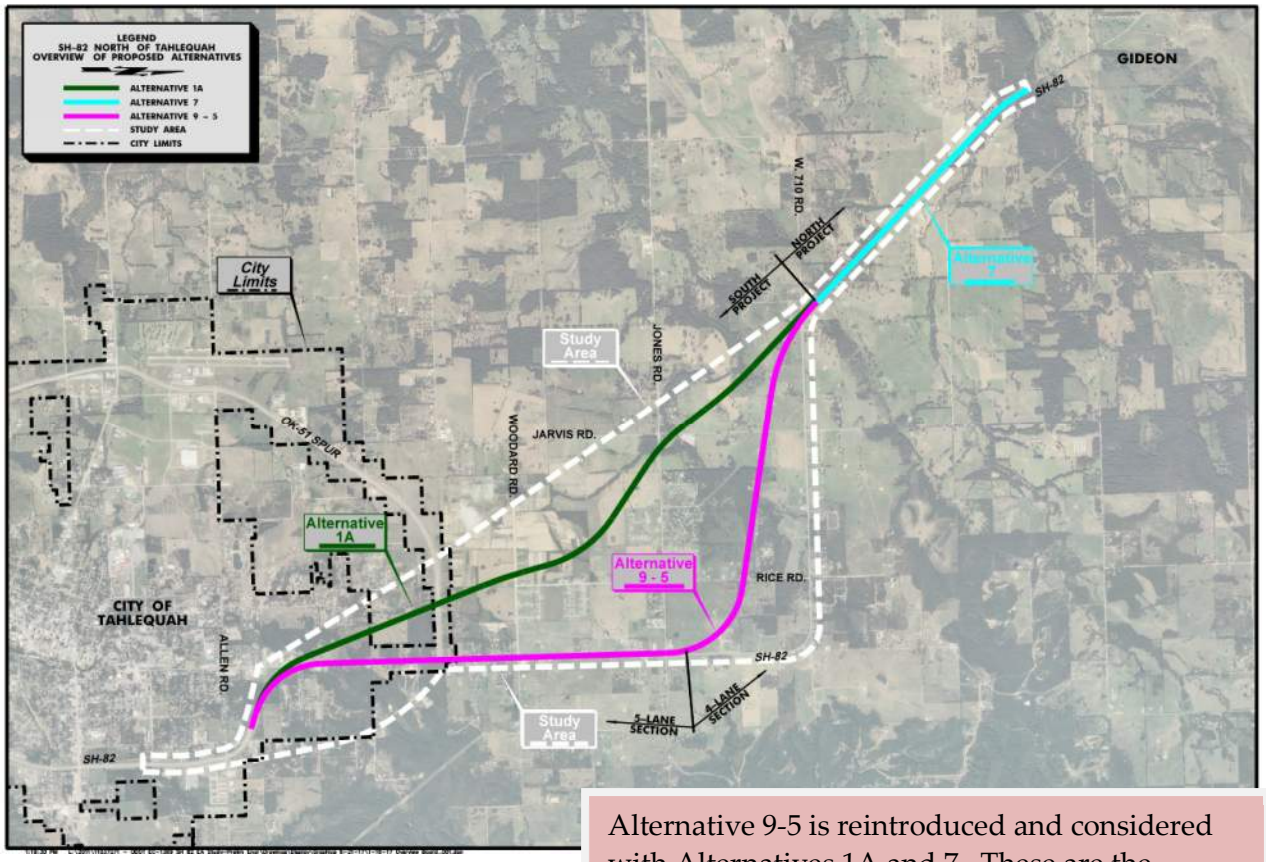




Alternatives 9 through 14 were added



Alternatives 1A and 7 were identified as the preferred alternatives



Alternative 9-5 is reintroduced and considered with Alternatives 1A and 7. These are the alternatives considered in this Environmental Assessment.

What Does This EA Accomplish?

This EA compares two "Build" alternatives for the SH-82 corridor, Alternative 1A and Alternative 9-5. These alternatives would both construct a new roadway for SH-82, although in very different ways. In addition, the EA considers a "No Build" Alternative, which means ODOT would not make any improvements to SH-82 and would only continue routine maintenance activities. The No Build Alternative serves as a basis of comparison for the build alternatives.

The EA examines traffic operations and safety benefits, the need to purchase right-of-way and impacts to people's properties, impacts to businesses and neighborhoods, impacts to utilities, impacts to the environment, and costs of each alternative. It considers input from elected officials, government agencies charged with the regulation and/or protection of various resources, Native American tribes, local government entities such as the City of Tahlequah, and the public. Once completed, the EA will help ODOT and FHWA select the preferred alternative and move forward with detailed design and environmental studies.

How Does the SH-82 Project Relate to Other On-Going Transportation Projects?

The project limits of the SH-82 project are from the end of the Bertha Parker Bypass east of Cedar Avenue in Tahlequah to the newly constructed bridge at Fourteen Mile Creek near Gideon. These are considered logical end points, or termini, because they connect to other areas on SH-82 already improved. The study area shown in **Figure 1** accounts for impacts that could occur as a result of the project.

ODOT has several other projects planned for the region (see **Figure 12**). Improvements are planned for SH-51 west of Tahlequah, to the US-62/SH-82 junction south of Tahlequah, to SH-10 east of Tahlequah, and to SH-82 north of the current project. These projects are not dependent on the SH-82 project to move forward. Similarly, these projects are not required to be built to support the SH-82 project. This is known as "independent utility".

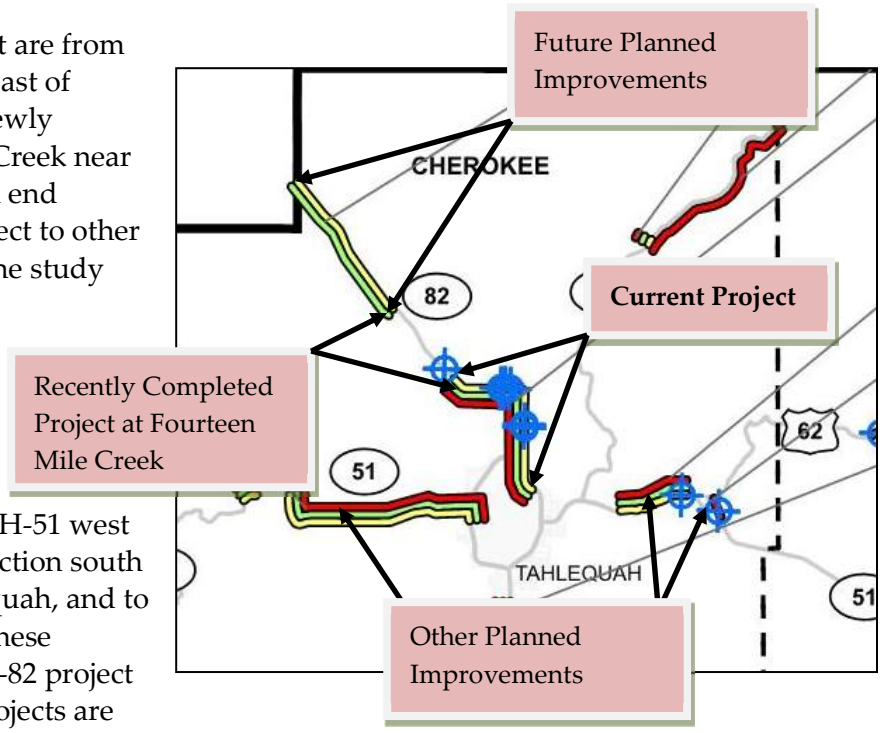


Figure 12: 2017-2025 ODOT 8-Year Work Plan

What Potential Solutions Are Being Studied?

As discussed above, ODOT developed and studied many alternatives for the SH-82 project, including new alignment alternatives and alternatives that follow the existing SH-81 alignment ("on-alignment" alternatives). Through analysis of the traffic and safety benefits of each alternative, their impacts to homes and businesses and the environment, and with input from agencies and the public, these alternatives have been narrowed down to two for the South Project: **Alternative 1A** and **Alternative 9-5**, and one for the North Project: **Alternative 7**. The No-Build Alternative is also studied as a baseline for comparison of the build alternatives.

No Build Alternative

The No Build Alternative means that ODOT would not make any improvements to SH-82, beyond routine maintenance. The No Build Alternative serves as a baseline of comparison for the two Build Alternatives, described below.

Alternative 1A

Alternative 1A for the South Project will construct a four-lane divided roadway from the Bertha Parker Bypass to the SH-51 Spur, and a two-lane roadway north of the SH-51 Spur until traffic warrants the four-lane roadway. Because the need for a four-lane roadway is anticipated in the future, ODOT is planning to purchase all of the needed property for the four-lane highway with this project. The four-lane roadway will include four 12-foot wide lanes with 10-foot wide outside shoulders and 4-foot wide inside shoulders, with the two directions of traffic separated by a 64-foot median. The roadway will have a design speed of 65 mph. Between the Bertha Parker Bypass and the SH-51 Spur, the new highway will be access controlled, meaning vehicles will only be able to access the highway at certain points, including Grand Avenue, Grandview Road, and a connection to the existing SH-82 approximately midway between Wheeler Street and Grandview Road. North of the SH-51 Spur, direct access from private properties (e.g. driveways) will be allowed. A traffic signal will be constructed at SH-82 and Grand Avenue.

The alignment of Alternative 1A (see **Figure 13**) begins at the improved Bertha Parker Bypass just west of N. Cedar Avenue and continues north, diverging west of the existing SH-82 alignment. A west offset allows the existing SH-82 corridor to remain in service, both during construction and after construction to serve local traffic. Alternative 1A intersects the SH-51 Spur approximately 1650 feet west of its original junction at a slight angle. N. Vinita Street would be realigned to the west and would intersect with the SH-51 Spur approximately 780 feet to the west.

Once the proposed roadway crosses SH-51 Spur, the alignment traverses open land, connecting to the existing SH-82 just north of W. 710 Road. Alternative 1A crosses Double Spring Creek and would require a bridge located north of Jones Road and Jarvis Road intersection, near the Cherokee County maintenance facility.

Existing traffic would continue to use SH-82 during construction of Alternative 1A. Temporary closures of county roads may be required during the construction of the new intersections. These closures would be phased to minimize impacts to drivers. Most of the existing SH-82

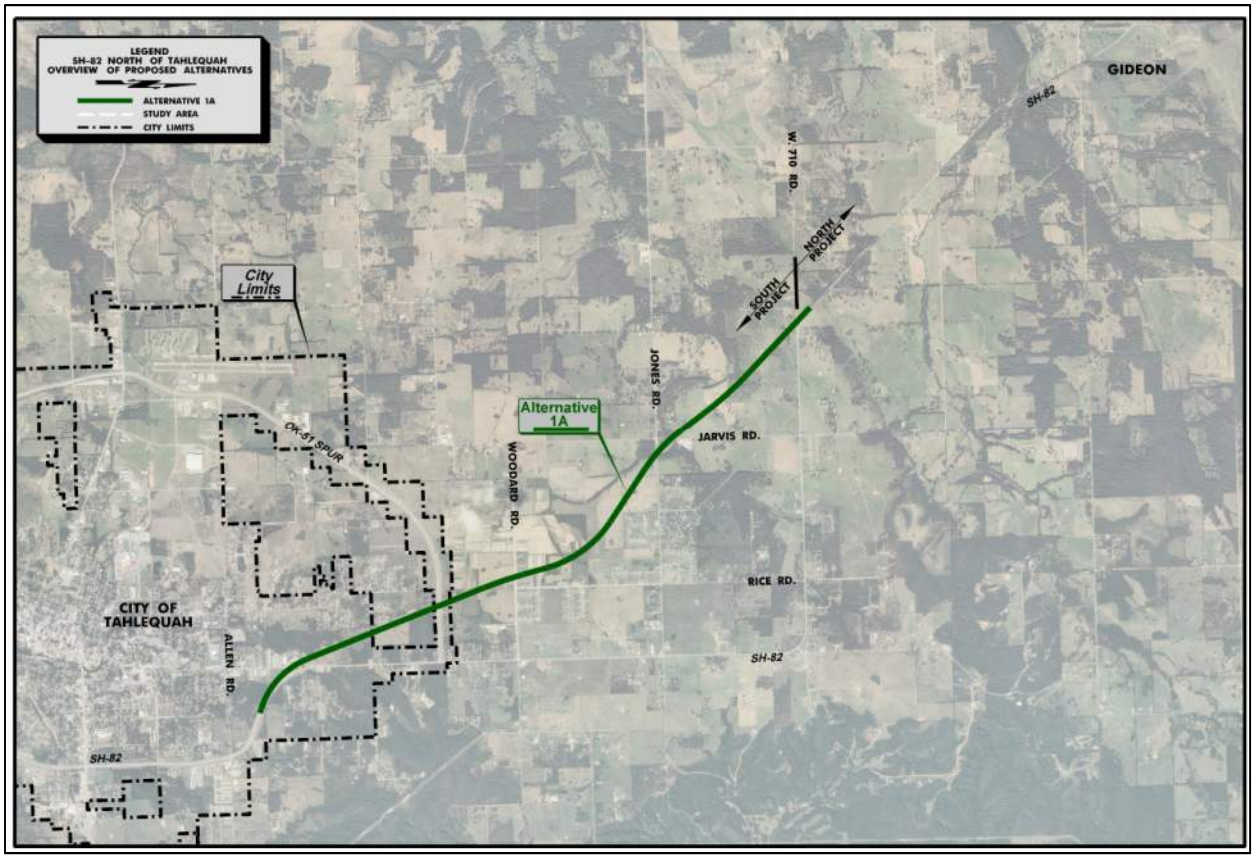


Figure 13: Alternative 1A for the South Project

highway would remain open after construction and would become a local road. We refer to this as "Old SH-82" in sections below.

Alternative 9-5

Alternative 9-5 for the South Project is a combination of a five-lane roadway and a four-lane divided roadway (**Figure 14**). From the Bertha Parker Bypass to just north of Steely Hollow/Jones Road, Alternative 9-5 would construct a five-lane roadway, following the existing SH-82 alignment, but offset 45 feet to the west. The roadway would include four 12-foot wide driving lanes, 10-foot wide outside shoulders, a 16-foot wide center turn lane, and curb and gutter and underground storm drain. This portion of the roadway will have a design speed of 55 mph. Alternative 9-5 will allow driveway access along the entire length of the 5-lane portion, with intersections provided at Grand Avenue and Grandview Road. Wheeler Street will be realigned to intersection SH-82 at Grand Avenue, which will have a traffic signal.

North of Steely Hollow/Jones Road, Alternative 9-5 heads northwest on a new alignment and transitions to a four-lane divided roadway, with four 12-foot wide lanes, 10-foot wide outside shoulders and 4-foot wide inside shoulders, with the two directions of traffic separated by a 64-foot median. The design speed of this portion of the roadway is 65 mph. The new alignment generally heads west and meets existing SH-82 at W. 710 Road. Similar to Alternative 1A, ODOT will purchase the necessary right-of-way for the full four-lane divided section at the

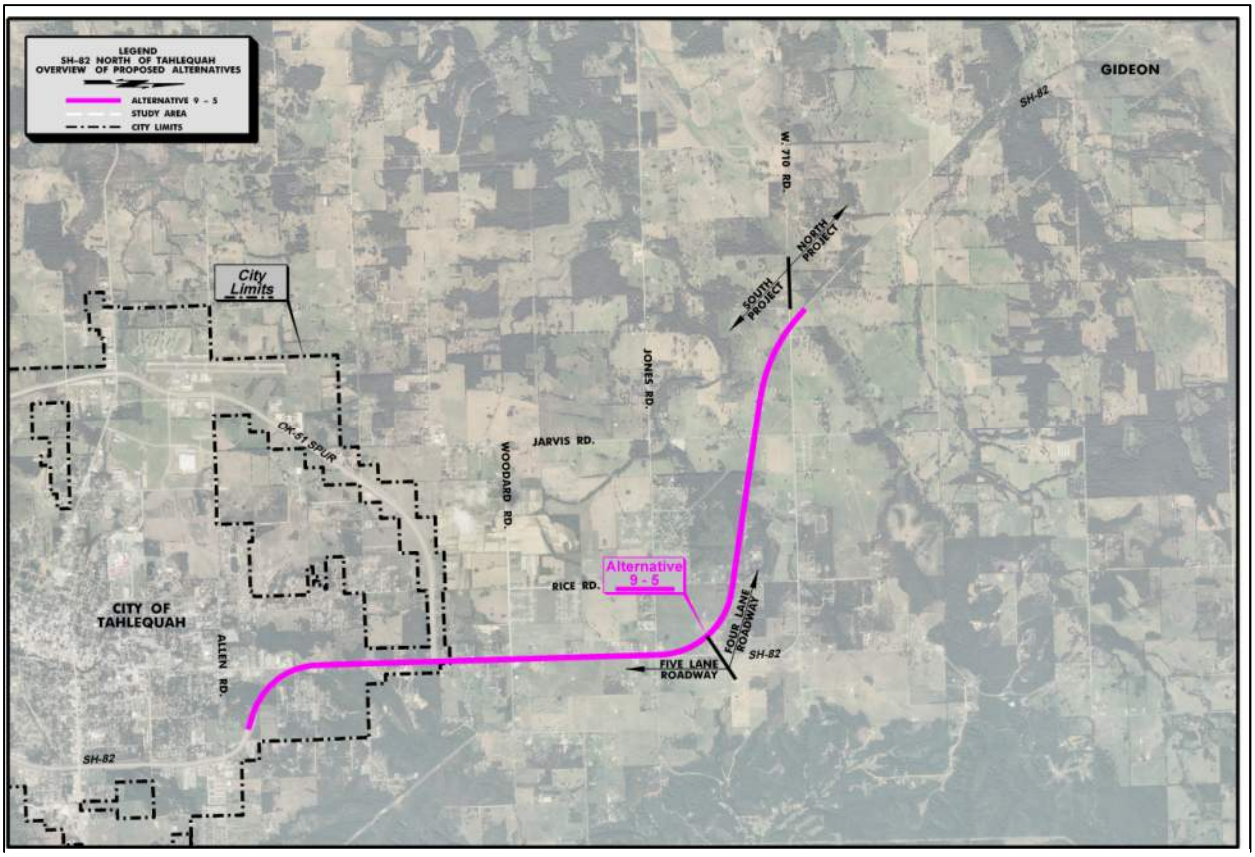


Figure 14: Alternative 9-5 for the South Project

conclusion of this study, but will build only two lanes initially. The additional two lanes will be constructed in the future, when traffic volumes warrant and as funding is available.

Alternative 9-5 would require that construction be done in phases for the southern piece adjacent to SH-82. This would be necessary to allow existing traffic to continue to use the existing highway during construction. Phased construction typically takes longer, may require lane shifts or closures, and traffic would likely experience delays. Rice Road and Jarvis Road may require temporary closures to construct the new intersections.

Alternative 7

Alternative 7 for the North Project is the continuation of either Alternative 1A or Alternative 9-5 to Gideon (**Figure 15**). No matter which alternative is selected for the South Project, Alternative 7 will be constructed for the North Project. Alternative 7 will be a four-lane divided roadway, with four 12-foot wide lanes, 10-foot wide outside shoulders and 4-foot wide inside shoulders, with the two directions of traffic separated by a 64-foot median. The design speed of this portion of the roadway is 65 mph. Alternative 7 will be built to the east of the existing highway, primarily to avoid impacts to the Blue Springs Cemetery and to match with the recently completed project at Fourteen Mile Creek to the north of this project. Alternative 7 will be built as a two-lane roadway until such time that a four-lane roadway is warranted.

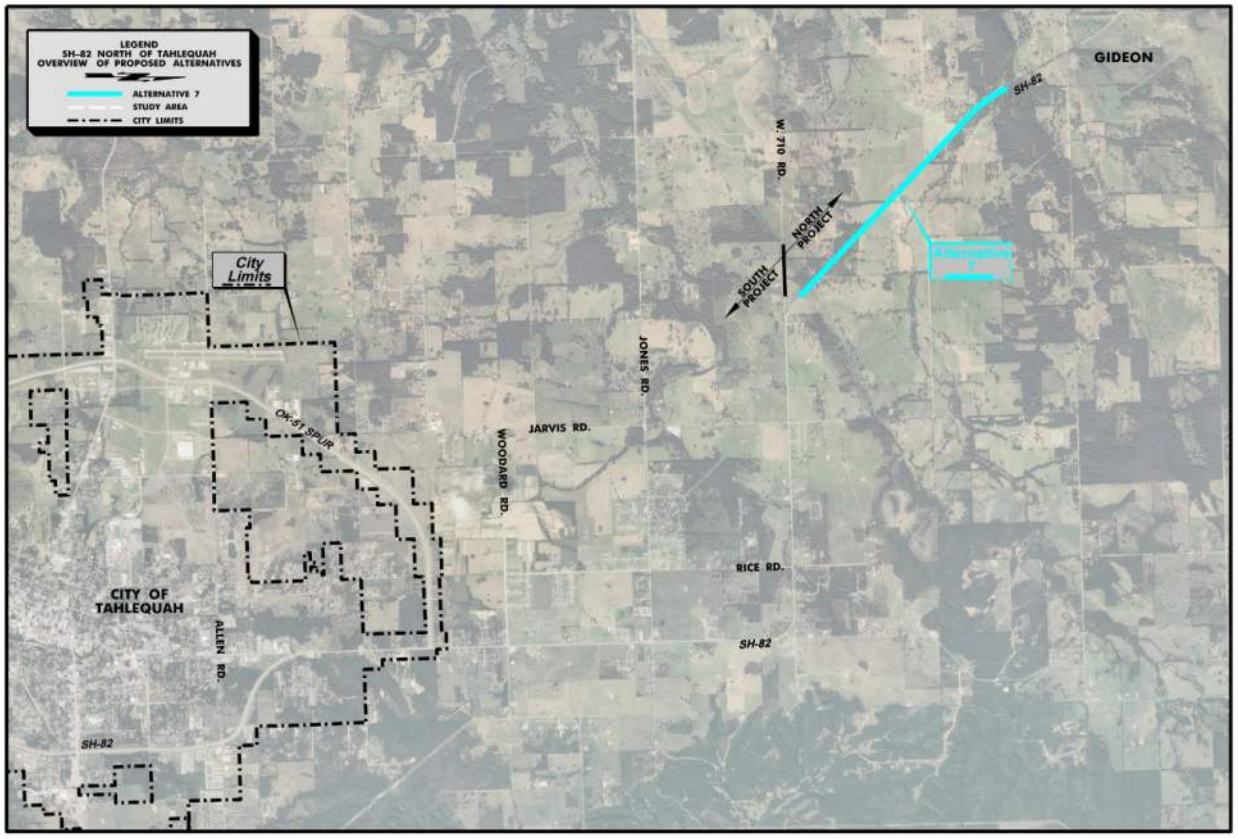


Figure 15: Alternative 7 for the North Project

Refer to the *Preliminary Alignment Study* and the *Supplemental Memorandum* in **Appendices A** and **D** for more detail on the three build alternatives.

How Much Would This Cost?

The costs of Alternative 1A and Alternative 9-5 for the South Project and Alternative 7 for the North Project are summarized in Table 1 below, with the constrution costs divided into two phases. The Initial Construction phase includes the following for each alternative:

- Alternative 1A for the South Project: Four-lane divided highway from the Bertha Parker Bypass to the SH-51 Spur, and the two-lane highway from the SH-51 Spur to W. 710 Road.
- Alternative 9-5 for the South Project: Five-lane highway from the Bertha Parker Bypass to Steely Hollow/Jones Road, and the two-lane highway from Steely Hollow/Jones Road to W. 710 Road.
- Alternative 7 for the North Project: Two-lane divded highway from W. 710 Road to Fourteen Mile Creek.

The "Future Construction" cost represents the cost of building the rest of the ultimate four-lane highway for each alternative.

Table 1: Alternative Cost Comparison (in $ Millions)

Alternative	Initial Construction	Future Construction	Right-of-Way	Utility Relocation	TOTAL COST
South Project					
1A	$30.6	$13.7	$3.0	$0.4	$47.7
9-5	$32.2	$6.5	$5.3	$1.7	$45.7
North Project					
7	$9.6	$7.2	$0.7	$0.4	$17.5

The detailed evaluation of the costs are part of the *Preliminary Alignment Study and Supplemental Memorandum* reports in **Appendices A** and **D**.

How Will the Alternatives Affect the Environment?

There are many resources in the SH-82 study area that could be affected (either positively or negatively) by the proposed alternatives (see **Figure 16** on the next page). There are some resources that are often discussed in environmental documents that are either not present in the SH-82 study area or will not be affected by either alternative. These resources include the following and are not discussed further in this document:

- Air Quality
- Parks and Recreation Facilities
- Bicycle and Pedestrian Facilities
- Energy

Impacts to other conditions and resources are discussed below. The impacts of each Build Alternative is discussed. Unless it is mentioned otherwise, the No Build Alternative would not have any impacts to these resources.

How Would the Project Affect Traffic?

A traffic analysis was conducted to determine how the various alternatives would affect the way traffic would operate in the area in the future. The analysis also looked at how each alternative would improve roadway safety and reduce the number of collisions that occur in the area. As mentioned above, accident rates on this portion of SH-82 are higher than other similar roadways in Oklahoma. Safety was therefore an important consideration in the evaluation of the alternatives.

Traffic Operations

The traffic on SH-82 was analyzed for the years 2012 and 2045 in the morning and evening rush hours. The analysis looked at the roadway as well as all of the intersections, both existing and future. As shown on the adjacent figure, the traffic flow conditions of roadways and intersections are defined by what is called Levels of Service or LOS as described in the Highway Capacity Manual (Transportation Research Board, 2010). LOS uses letters A through F to measure traffic flow with A being the best and F being the worst. The goal for SH-82 is to achieve LOS D or better.

Traffic on SH-82 today operates at LOS C/D. Under the No Build Alternative (that is, if no improvements are made), traffic on SH-82 will worsen to LOS D/E by 2045. This means that congestion and delay will worsen, particularly at the Jones Road, Woodward Road, SH-51 Spur, and Grand Avenue intersections.

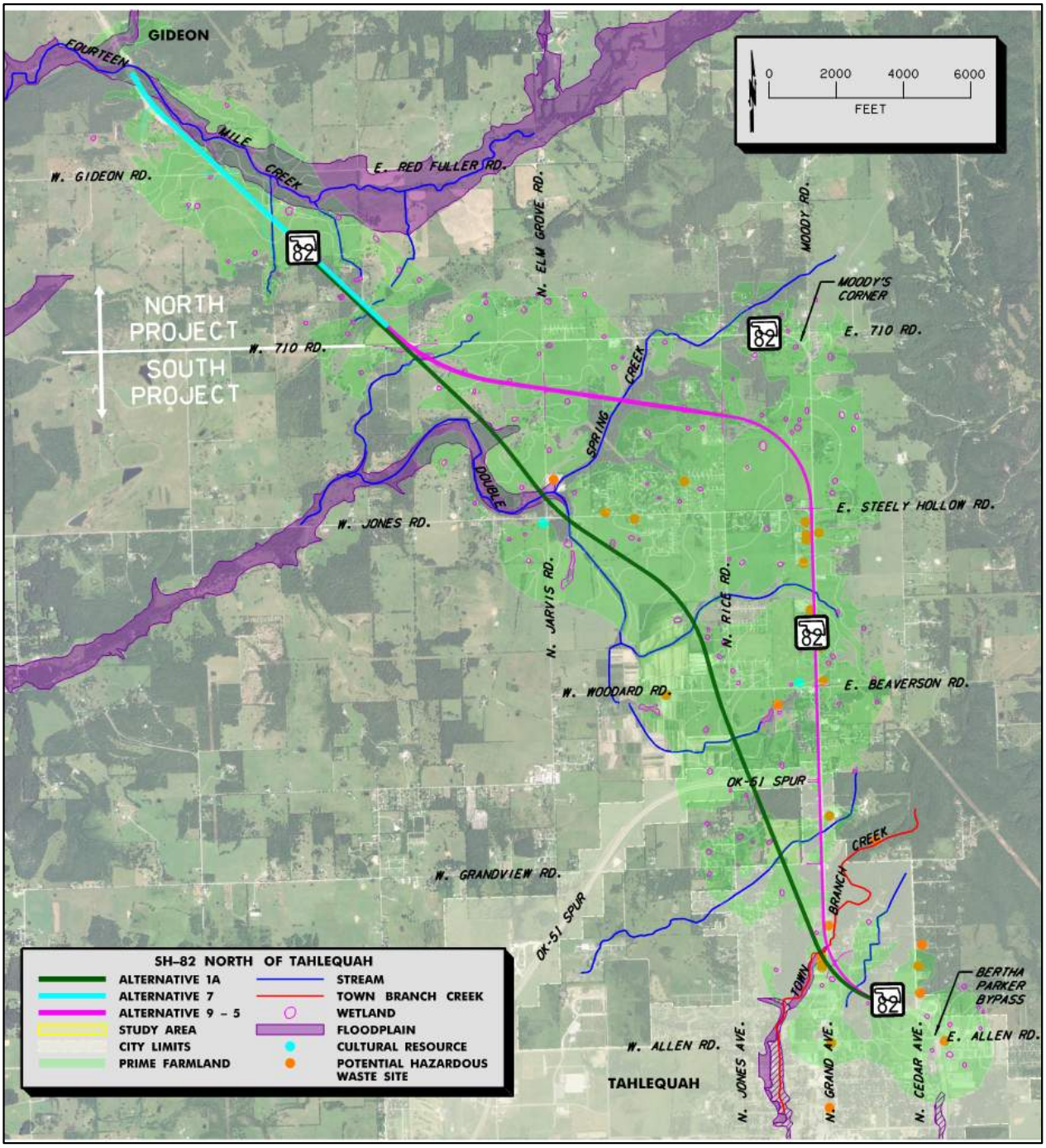


Figure 16: Project Area Constraints

For the South Project, both Alternative 1A and Alternative 9-5 would improve traffic operations over the No Build Alternative. Both alternatives would operate at LOS A in 2045, although busier portions of SH-82 (southern part of the project), could be LOS B for Alternative 9-5 due to higher traffic volumes and more driveways. This assumes that the initial two-lane portion of Alternative 1A is widened to four lanes by this time. All future intersections will operate with acceptable LOS under both alternatives. A traffic signal would be installed at the intersections of SH-82/Grand Avenue and SH-82/SH-51 Spur when the project is built. For the North Project, Alternative 7 would operate at LOS A in 2045, again assuming that the roadway is widened to four lanes by that time.

While traffic would experience little congestion or delay on the new SH-82 under either alternative, there would be a difference in how traffic would use the new highway. Under Alternative 1A, SH-82 would be on a new alignment and Old SH-82 would also remain in use, primarily for local traffic and to provide access to adjacent properties. The result would be that less traffic would use the new SH-82 highway than under the No Build Condition, or under Alternative 9-5, where SH-82 would remain in its existing location (at least in the southern portion). It is anticipated that through traffic (people passing through Tahlequah on their way to other destinations) would use the new highway, and local traffic (people making trips within the study area) would use Old SH-82 (see **Figure 17**). Under Alternative 9-5, all of the through traffic and local traffic would be on the same roadway, at least until the new alignment portion of Alternative 9-5 splits from the existing highway north of Jones Road (see **Figure 18**). The section on Traffic Safety below includes more discussion on the safety implications of this change in travel patterns.

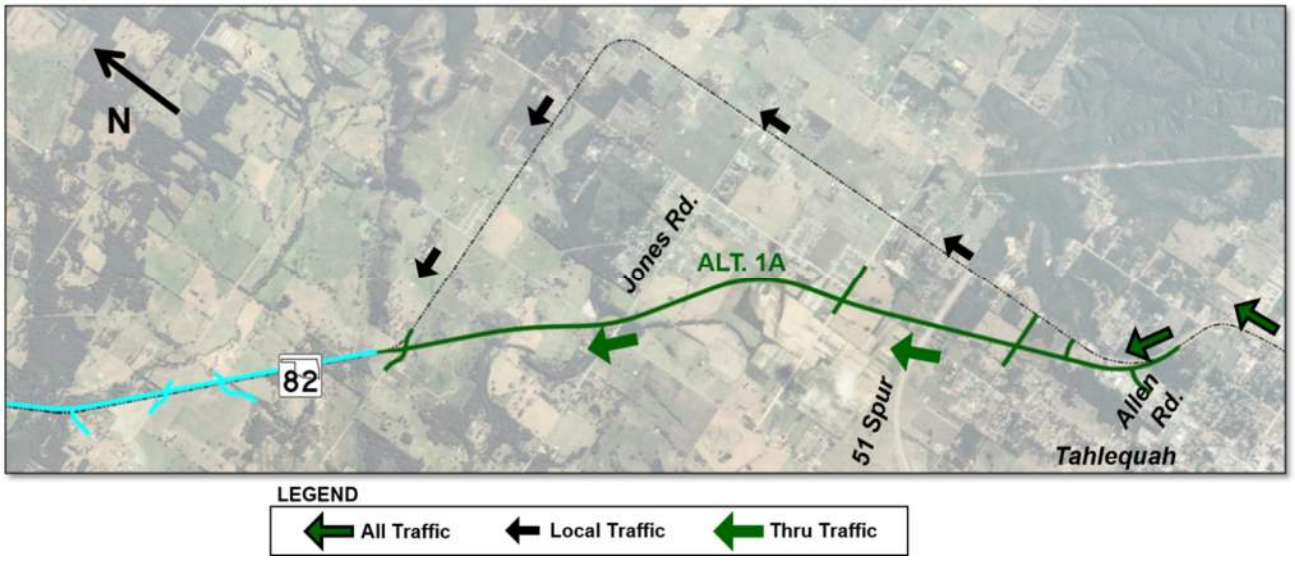


Figure 17: Alternative 1A Traffic Pattern

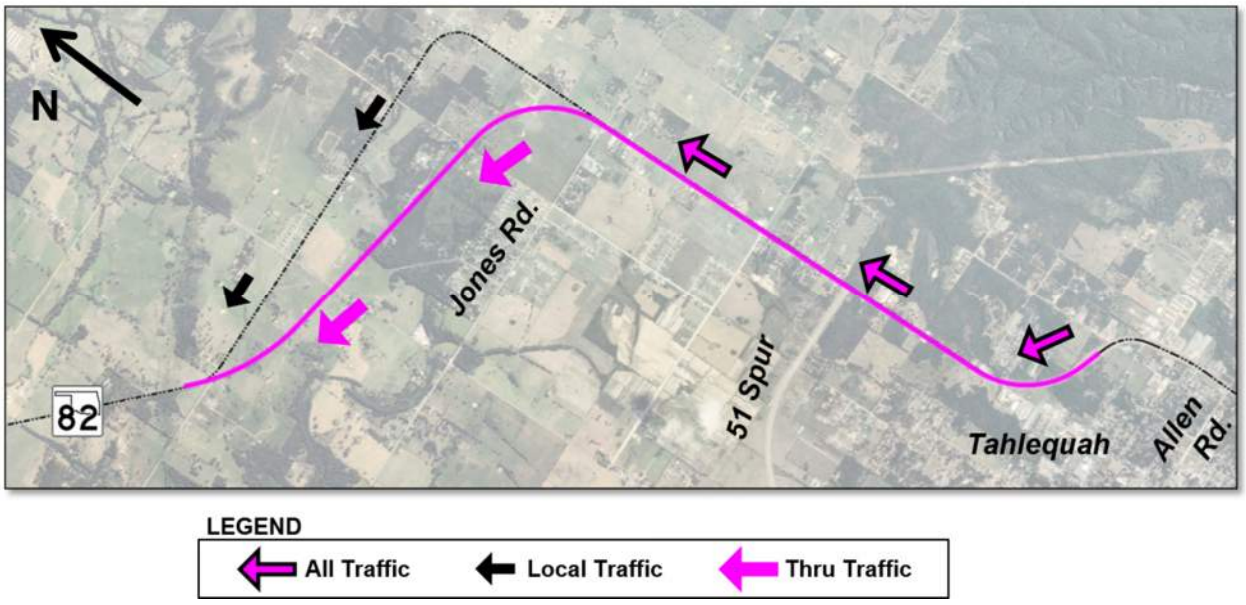


Figure 18: Alternative 9-5 Traffic Pattern

Traffic Safety

While traffic operations are similar, the two alternatives in the South Project are expected to have more differences in terms of improving safety and reducing accidents in the future. An analysis was performed according to the Highway Safety Manual (AASHTO, 2010), to predict the expected frequency of accidents on the future SH-82 roadways. **Table 2** below shows the expected accident rates for both alternatives.

Table 2: Alternative Accident Rate Prediction (in accidents per year)

Alternative	Property Damage	Injury/Fatality	TOTAL ACCIDENT RATE
1A*	2.4	1.0	3.4
9-5	5.3	2.2	7.4

*Includes the anticipated future crashes on Old SH-82

Alternative 9-5 is expected to have **HIGHER accident rates** in the future than Alternative 1A.

This analysis was based on predictive factors (known as "crash modification factors") that have been shown to affect safety of different types of roadways. According to the analysis, Alternative 9-5 is expected to have higher numbers of accidents than Alternative 1A. In fact, the predicted accident rates on the five-lane alternatives are up to twice as high as the divided four-lane alternatives. Alternative 1A is expected to be a safer roadway due to the lower traffic volumes anticipated for Alternative 1A (because some traffic will still use the Old SH-82 roadway), the wide median between the two directions of traffic, and the lower number of driveways and intersecting roadways. This would reduce the number of left turns, which also tend to be locations where accidents occur.

Alternative 9-5 is expected to have a higher accident rate because of the high traffic volumes on SH-82, the lack of a median (a two-way center turn lane does not provide a safety benefit because of the vehicles using this lane), and the high number of driveways accessing the highway.

The accident rates on Alternative 7 for the North Project would be expected to be reduced from the existing condition due to the wide median between the two directions of traffic and low number of intersecting roads and driveways. Traffic volumes in the North Project are also lower, reducing the potential for accidents.

To compare the results of the safety analysis with a real-world example, ODOT investigated the accident rates on US-62 south of Tahlequah (outside of the current study area). US-62 in this area contains sections of both divided four-lane roadway and five-lane with center left turn lane. Results show that the four-lane divided sections of US-62 had 30% fewer accidents than the five-lane sections in the last 10 years. While not as high as the predicted rates from the crash modification factors, this is still a significantly higher number of accidents on the five-lane section.

In summary, Alternatives 1A, 9-5, and 7 will operate at a high level of service through at least 2045. All alternatives will also improve safety, by reducing accidents on SH-82 compared to the existing condition. However, this improvement is expected to be much greater under Alternatives 1A than Alternative 9-5 because of lower traffic volumes, the median separating the two directions of traffic, and the limited number of driveways accessing the new highway. Alternative 7 is also anticipated to increase safety for similar reasons as Alternative 1A.

How Would the Project Affect Homes and Businesses?

All of the alternatives will affect existing homes and businesses in the study area – these effects are often referred to as socioeconomic impacts. These effects include relocation, or displacement of some homes and businesses. Relocation or displacement refers to the process where ODOT would purchase a home or business in advance of the project, and would assist the owner in finding suitable replacement housing or a new business location. Effects on homes and businesses can also be more indirect, including increased (or reduced) development potential as a result of the new roadway, and changes to traffic patterns. Relocation of businesses can also affect employment, depending on if and where the business relocates. Some employees may not be replaced, and some may not choose to commute to the new location. The report on *Socioeconomics and Environmental Justice* in **Appendix F** includes a detailed analysis of the socioeconomic impacts of the SH-82 project.

Relocations were tabulated based on the proposed conceptual alignments using estimates of the new right-of-way that would be required. The initial relocation estimates were based on information collected for the *Preliminary Alignment Study* (**Appendix A**). This information included assessment of all the properties affected and the relocation of homes and businesses. These estimates have been updated periodically as development has changed in the project area. Updated estimates of residential relocations were completed for the *Supplemental Alignment Study Memorandum* (**Appendix D**) as well as for each of the public involvement meetings, and were

again tabulated for the purposes of this report. Information about the relocation process and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) is discussed in both *Alignment Study* reports and all relocations required for the project will be performed according to the most up to date procedures under the Uniform Act. Once the preferred alignment is selected and preliminary design is completed, ODOT will complete a Relocation Study for the preferred alternative, which will document the relocations in more detail and the procedures for acquisition and relocation assistance. See **Appendix F** *Socioeconomic Impacts and Environmental Justice* for a more detailed discussion of how the relocations were identified.

Preliminary analysis indicates that for the South Project, under Alternative 1A, five residences would potentially require relocation and five businesses would potentially be displaced. Under Alternative 9-5, 16 residences would potentially require relocation. Three commercial properties would potentially be displaced, including two active businesses and one vacant property. One church may also require relocation. None of the potentially displaced businesses in the South Project are known to be minority-owned. Alternative 7 for the North Project would potentially require relocation of one home. Under Alternative 1A, the residences that could be displaced are somewhat more likely to be owner-occupied than renter-occupied; under Alternative 9-5, displaced residences are far more likely to be occupied by owners than by renters. The displaced residence in Alternative 7 is owner occupied based on conversations with that owner. This review indicated substantial availability of replacement homes for purchase in the Tahlequah area. Less availability was evident for rental properties in the area.

Under **Alternative 1A**:
- 5 Homes
- 5 Businesses

May Require Relocation.

Under **Alternative 9-5**:
- 16 Homes
- 2 Businesses
- 1 Church

May Require Relocation.

Under **Alternative 7**:
- 1 Home
- 0 Businesses

May Require Relocation.

Impacts to businesses can occur not only because of displacements, but also because of changes in traffic volumes. This is because pass-by traffic represents potential customers for many businesses. Impacts to businesses are discussed below for the South Project. Alternative 7 will not impact any businesses since there are no business in the North Project.

Alternative 1A, which diverges from the existing SH-82 beginning at Grand Avenue, will displace five non-farm businesses. It is estimated that these businesses employ approximately 12 people whose jobs could be moved or lost. North of Grand Avenue, there are roughly 10 businesses that may experience negative impacts due to the reduction in traffic. At least five of these remaining businesses are estimated to have 40 to 50 percent of their total sales as opportunity based, that is, they are 40 to 50 percent "traffic dependent." Estimated impacts to traffic-dependent businesses along that part of SH-82 could include a drop in sales by as much as 20 percent. For businesses that are not as dependent on pass-by traffic, the impacts would be much lower. South of Grand Avenue, businesses that are not displaced by Alternative 1A would generally experience positive, relatively minor increases in sales due to the expected

increase in daily traffic. At least one of the businesses along existing SH-82 that would potentially experience a decrease in sales is a Native American-owned business.

Alternative 9-5, which displaces two non-farm businesses, follows existing SH-82 as far north as Steely Hollow/ Jones Road. These two businesses are estimated to employ approximately 15 people whose jobs could move or be lost. Relocation of the church could also affect employment of approximately 6 people. Alternative 9-5 would have positive, though relatively minor, increases in sales at approximately 8 businesses due to the expected growth in daily traffic along this part of the alignment. See **Appendix F** for more discussion of business impacts of the South Project alternatives.

The two build alternatives for the South Project would open up new land for development where they diverge from the existing alignment. This could promote commercial development on adjacent properties because of the high levels of traffic passing by each day. The South Project alternatives, in spite of partial access control, by providing high-quality access to properties along and near the alignment, could also promote residential and other forms of development (office, manufacturing, etc.).

Impacts on development potential are difficult to predict. Given the low demand for development in this area currently, it is likely that Alternative 9-5 has the greatest potential for maintaining existing businesses and providing an economically healthy environment for new ones to thrive.

Alternative 1A would have the most commercial displacements, and would be the least able to support existing businesses as neither the existing SH-82 nor the new alignment would each carry as much traffic as the existing route would under the No Build. However, although Alternative 1A affects more businesses than Alternative 9-5, the businesses affected by Alternative 9-5 are larger and are estimated to employ more people and so more jobs could potentially be lost under Alternative 9-5.

Alternative 1A would open up more land for development than Alternative 9-5 by providing substantial access improvements to the greatest area of land. However, it is unknown if this potential would bring enough development (residents) to counteract the effects of sales losses for businesses along the existing alignment, as well as the impact of competition from potential new commercial development along the new alignment.

How Would the Project Affect Low-Income and Minority Populations?

All federal agencies must comply with Executive Order 12898: *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* signed on February 11, 1994. This order states that, "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." These populations are called "Environmental Justice [EJ] populations." FHWA adopted FHWA Order 6640.23, *FHWA Action*

to Address Environmental Justice in Minority Populations and Low-Income Populations on December 2, 1998. This FHWA Order states that "a disproportionately high and adverse effect" means the adverse effect is predominantly borne by EJ populations, or is appreciably more severe than the adverse effect made on non-EJ populations or the benefits to the EJ populations are delayed compared to non-EJ populations.

To determine how the SH-82 alternatives would affect EJ populations, minority and low-income populations were identified in study area census tracts and block groups, Tahlequah, and Cherokee County using information from the US Census Bureau's 2010-2014 American Community Survey. A census block group is a geographical unit used by the US Census Bureau and is the smallest unit they use to publish survey data. A census tract is larger and comprises one or more block groups. The *Socioeconomic and Environmental Justice Technical Memorandum* in **Appendix F** shows maps with the location of these census tracts and block groups and the Tahlequah city limits. **Table 3** and **Figures 19 and 20** show the resulting summary of population characteristics.

Table 3: Study Area Environmental Justice Characteristics (2010-2014 estimates)

Area	Total Population	Native American Population[1] (%)	Hispanic or Latino Population[2] (%)	Total Minority Population[3] (%)	Population Below Poverty Level (%)
Cherokee County	47,860	43.1%	6.5%	50.4%	22.6%
Tahlequah	16,190	41.4%	10.8%	52.5%	34.2%
Census Tract 9776	5,079	45.1%	3.1%	48.4%	18.7%
Block Group 3	778	44.2%	3.9%	49.1%	20.7%
Block Group 4	2,000	52.9%	2.4%	53.6%	17.3%
Census Tract 9778	6,499	51.3%	4.4%	57.5%	24.6%
Block Group 1	1,878	50.4%	3.4%	51.1%	21.1%
Census Tract 9779	6,459	43.4%	5.9%	53.2%	28.2%
Block Group 1	1,990	38.7%	4.4%	50.1%	29.7%
Block Group 2	1,218	48.4%	4.6%	60.3%	23.2%
Block Group 3	1,971	48.9%	6.6%	55.6%	34.5%

1 – Includes persons identifying as American Indian and Alaska Native alone or in combination with other races. Includes Native Americans also identifying as Hispanic or Latino.
2 – This is an ethnic classification and may include persons of any race.
3 – Includes Hispanic or Latino, Black or African-American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, "some other race," and persons of two or more races.

Source: US Census Bureau, 2010-2014 American Community Survey, 2015

The project study area has a substantial minority population: approximately 47.5 percent of study area census tract population is American Indian and Alaska Native alone or in combination with other races, and approximately 4.2 percent is Hispanic or Latino.

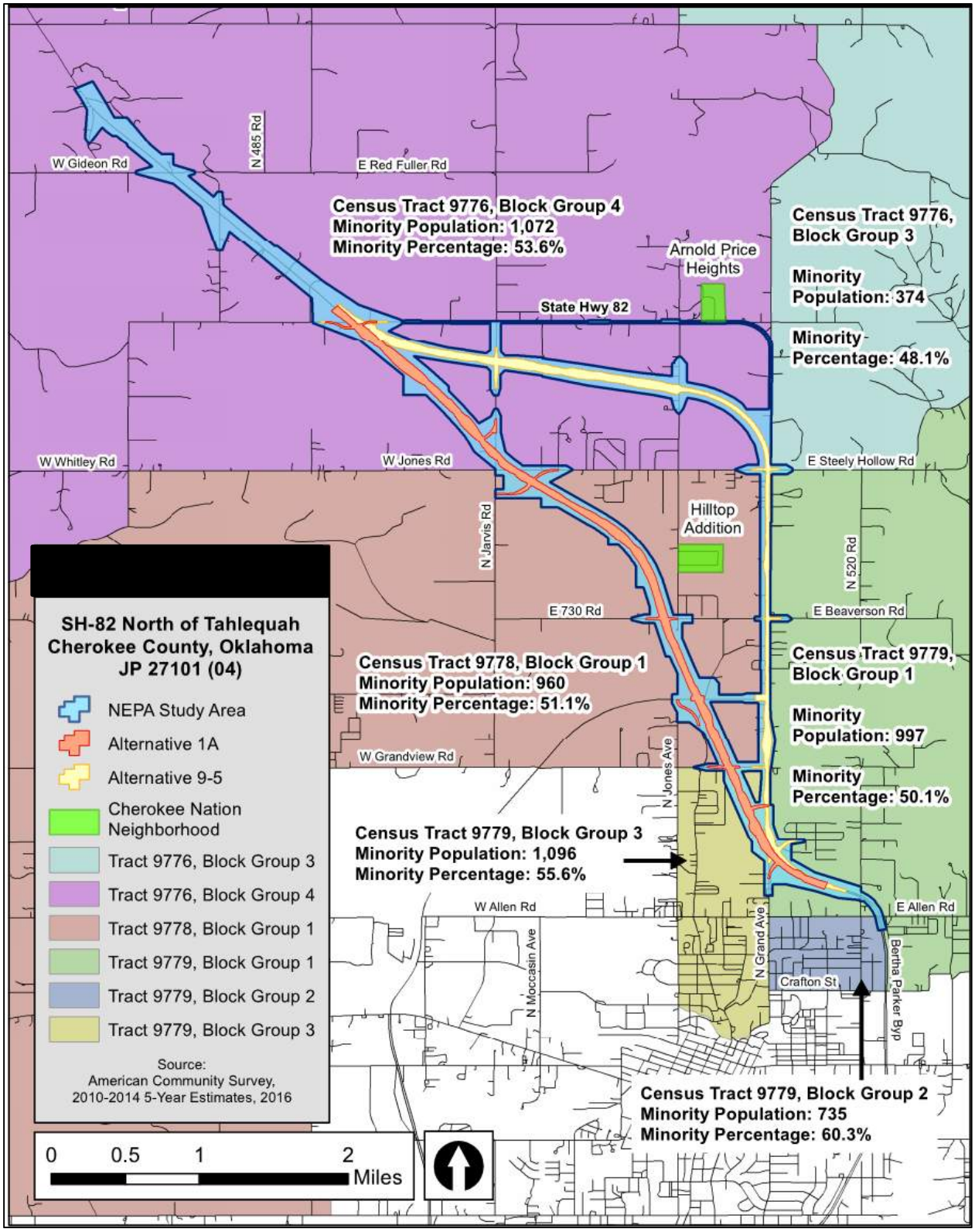


Figure 19: SH-82 Minority Population by Census Block Group

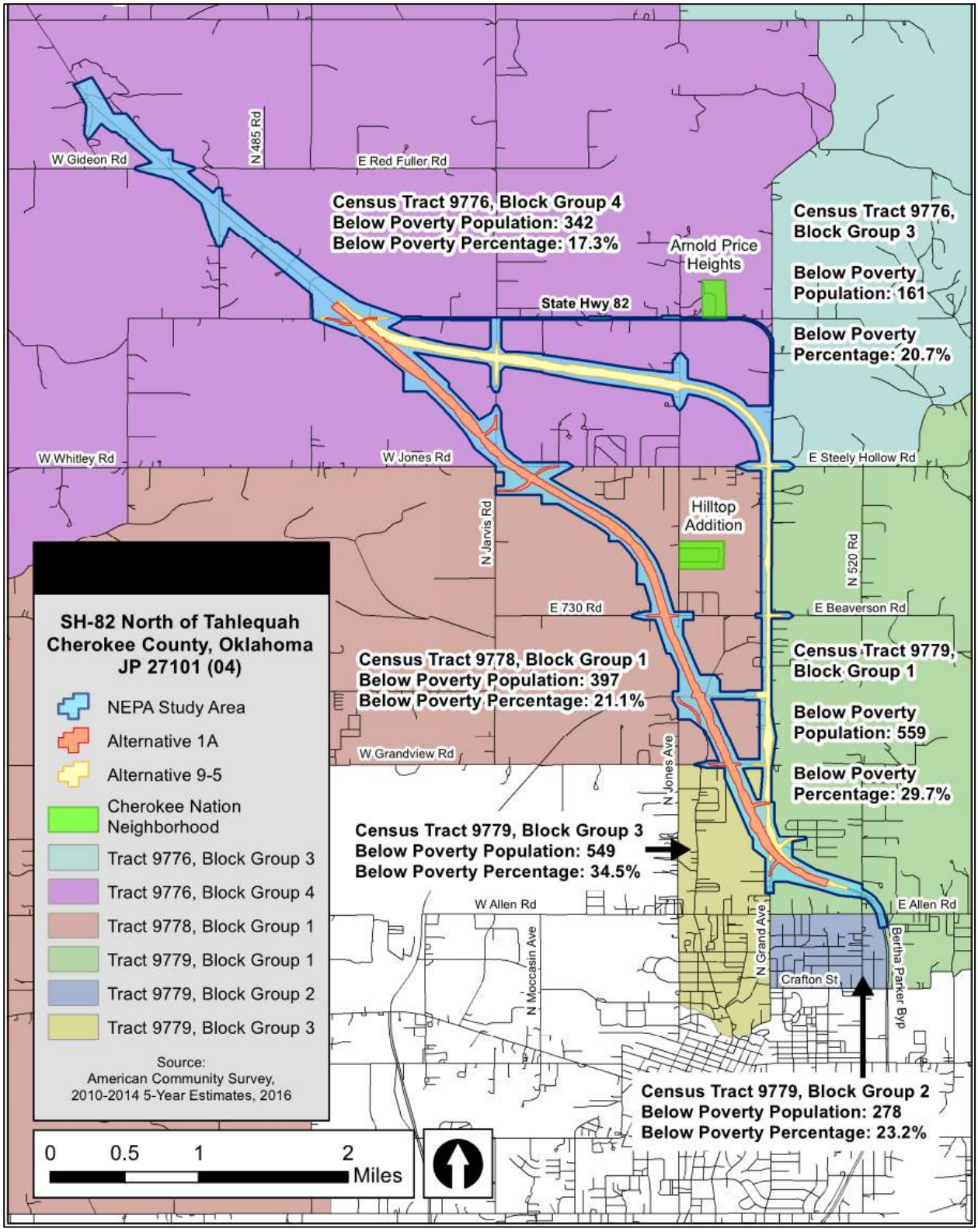


Figure 20: SH-82 Low-Income Population by Census Block Group

The Cherokee Nation community comprises a very large majority of the American Indian/Alaska Native population in the project area census tracts and the local community. Minority percentages in the study area are similar to those in Tahlequah (52.5% and in Cherokee County (54%). The minority populations in Tahlequah and Cherokee County contain higher proportions of Hispanics than in the study area, where a larger percentage of the minority population is Native American.

In addition to Census data, aerial and roadside photography, property records, public meeting sign-in sheets, and other sources were reviewed to identify the presence of EJ populations in the study area. A review of property ownership records indicates that the Cherokee Nation Housing Authority owns and/or administers two neighborhoods in the study area – the Hilltop Addition located west of SH-82 north of Woodard Road (access from Rice Road), and the Arnold Price Heights, located just north of SH-82 west of Moody's Corner (see **Figures 19 and 20**). The Housing Authority offers mortgage and/or rental assistance to Cherokee Nation members to purchase or occupy these homes.

A search of the list of Cherokee Nation Certified Native American-owned Businesses identified one Native American-owned business in the study area. No other indications of minority ownership of businesses were observed in the study area, nor was it determined that those businesses primarily serve minority or low-income customers.

Table 3 also shows that the study area census tracts host a population where approximately 24.6 percent of residents receive household income below the federal poverty level. This is lower than the poverty rate in Tahlequah (34.2%), and in Cherokee County (22.6%). The study area percentages are considerably higher than poverty rates for Oklahoma (16.9%) and the United States (15.6%).

ODOT made a concerted effort throughout the study to identify and reach out to low-income and minority populations to keep them informed of the project and given them ample opportunity to provide input. The Cherokee Nation (including the Housing Authority) were invited to and attended all the stakeholder and public meetings. ODOT also asked the public meeting attendees to voluntarily provide information on minority status during sign-in. This information proved very useful in determining the minority status of the affected properties. ODOT also made an effort to invite renters and tenants to all of the public meetings. Each property in the study area was invited by postcard. If the owner of the property had a different address on file than the property address, a postcard was sent to both addresses. Please see the section called "How Did ODOT Involve the Public in the Project?" for more information on the efforts to involve the low-income and minority populations.

ODOT will continue this outreach during the public hearing process, by distributing flyers door to door and at community facilities (including tribal facilities). ODOT will mail an Environmental Justice questionnaire to all affected property owners prior to conducting field studies to identify any special needs or concerns. During the detailed environmental studies, ODOT will hold one-on-one meetings or community meetings as needed at locations such as churches or the Cherokee Nation Housing Authority to present project updates and address concerns.

Since EJ populations and non-EJ populations are distributed widely throughout the study area, both populations are expected to benefit from the increased vehicular mobility and access provided by the proposed Build alternatives. The No Build Alternative would not provide mobility and access benefits. Direct impacts on the human population from the proposed Build alternatives were examined to assess the potential impact on minority and low-income populations. Displacements and relocations, noise impacts (preliminary), and the other community impacts discussed above were examined, as well as air quality and visual impacts. No air quality or substantial visual impacts are anticipated from the proposed alternatives. Minority and non-minority populations reside in those census block groups where the proposed Build alternatives would result in residential displacements and noise impacts. These populations include substantial percentages of American Indian residents, persons of two or more races (mostly representing persons identifying partly as American Indian), and Hispanic residents.

Review of property ownership information compared to public meeting attendance records (indicating racial identification) suggests that a small number of the relocations may affect minority individuals. Under Alternative 1A, one of the five residential relocations (or 20%) is owned by a Native American individual. The other four relocations are not minority-owned. This percentage is lower than the 48-58% percent minority population present in the study area. One minority-owned business could experience potential decrease in sales under Alternative 1A due to less traffic using the existing SH-82 roadway.

Under Alternative 9-5, at least four of the 16 residential relocations (25%) are owned by either the Cherokee Nation Housing Authority or by Native American individuals. The ownership of the majority of the remaining residential relocations under Alternative 9-5 is either identified as White or is unknown, as these owners either did not attend the public meetings or did not indicate race on the sign-in sheets. Similar to Alternative 1A, the percentage of minority relocations is lower than the percentage of minority population in the project area. The two Cherokee Nation Housing Authority neighborhoods are not anticipated to be affected by relocations or increases in traffic noise.

Evaluation of the locations of residential displacements, residences affected by noise, and the ACS census block group data do not indicate that relocations or noise impacts from the proposed Build alternatives would be predominantly borne by the Native American or Hispanic/Latino populations, as the impacts would likely be shared with the White non-Hispanic population in relative proportion to the occurrence of these populations in the total project study area and in Cherokee County. Consequently, it does not appear that relocations, other community impacts, or noise impacts would constitute a disproportionately high and adverse impact on these populations.

Evaluation of the locations of residential displacements, residences affected by noise, and the ACS census block group data do not indicate that relocation or noise impacts from the proposed Build alternatives would be predominantly borne by the below-poverty population. Consequently, it does not appear that relocations, other community impacts, or noise impacts would constitute a disproportionately high and adverse impact on the low-income population.

If you want to read more about this topic, you can get more details from the *Socioeconomic and Environmental Justice Technical Memorandum* located in **Appendix F**.

How Would the Project Affect Farmland?

Portions of both Build Alternatives would require dividing some large rural properties. Where acquisition would be required for new right-of-way, division of properties was avoided as much as practical when the alternatives were being designed, so as not to create remnants of properties that would be so small or inaccessible that they would no longer be economically viable as farmland. However, for some of the largest properties affected, it was not reasonable or practical to completely avoid dividing farm properties. Under Alternative 1A, seven properties that are in agricultural use or could potentially be used for agriculture would be divided. Under Alternative 9-5, two such properties would be similarly affected. None of the parcels divided would be left without public roadway access. Either the new parcels resulting from division would retain existing roadway access or the project design would accommodate access to a public roadway. Alternative 7 will not divide any farm properties since the alignment is located adjacent to the existing roadway. While some farmland will be affected by Alternative 7, it will not divide any existing farms.

Under **Alternative 1A**:
- 7 Farm Properties Will be Divided.

Under **Alternative 9-5**:
- 2 Farm Properties Will be Divided.

Under **Alternative 7**:
- 0 Farm Properties Will be Divided.

ODOT also consulted with the US Department of Agriculture, Natural Resource and Conservation Service (NRCS) regarding impacts to farmlands. The NRCS has a formula for calculating impacts to what they consider "prime and unique" farmlands in an area (shown in **Figure 21**). Farmland impact scores for Alternatives 1A and Alternative 9-5 were very similar. For more information on the farmland impact scores, see **Appendix G**.

How Would the Project Affect Historic and Archaeological Resources?

ODOT's Cultural Resources Program (ODOT-CRP) conducted file searches of known archaeological sites and historic properties and a study area field review in July of 2012. File searches were updated in September of 2016. There are no documented archaeological sites or sites listed in the National Register of Historic Places within the study area. Review of historic maps and aerial photographs did not reveal the presence of any sites or buildings with historically significant characteristics. Based on information collected to date, neither alternative is expected to impact any historic or archaeological sites.

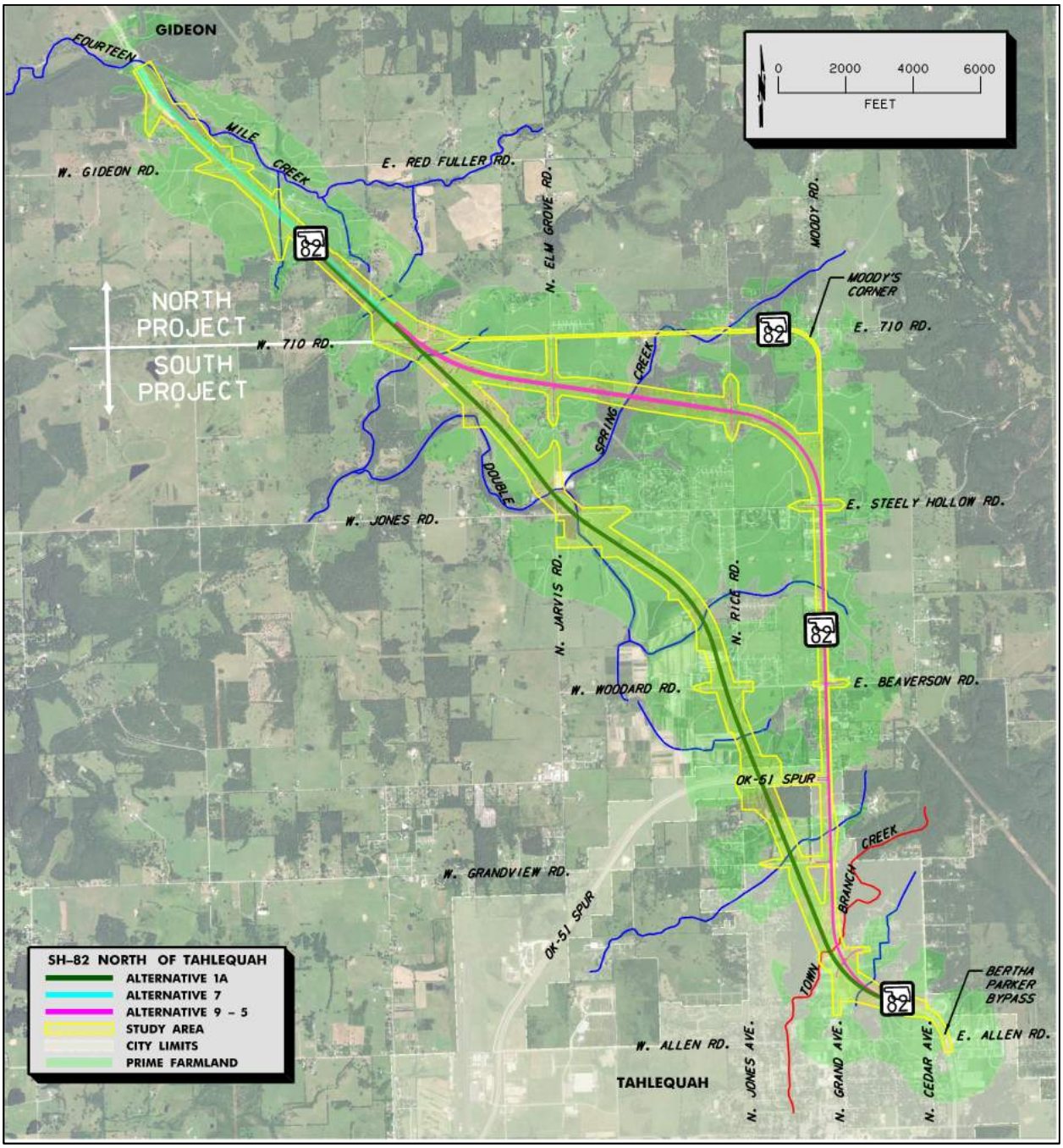


Figure 21: Farmland in the Study Area

ODOT has also consulted with Native American tribes to determine if the tribes have any religious or traditional cultural properties in the area that may be affected. ODOT consulted with the Caddo Nation, the Cherokee Nation, the Osage Nation, the United Keetoowah Band of Cherokees, and the Wichita and Affiliated Tribes in July of 2013. To date, ODOT has not received any responses from these tribes.

Once a preferred alternative is selected, ODOT will complete a detailed survey of the proposed alignment and will document all properties 45 years of age or older. In consultation with the State Historic Preservation Officer (SHPO) and Native American Tribes, ODOT and FHWA will determine if there are any historic properties within the project area that are significant and will assess the impacts on these properties. If significant properties are present that will be adversely affected, ODOT will avoid, minimize, and/or mitigate impacts to these properties as determined through consultation. Cultural resource review information is available on request from ODOT.

How Will the Project Affect Natural Resources?

Waters and Wetlands

ODOT has performed a reconnaissance-level review of the study area to identify waters, wetlands, and floodplains. **Figure 22** shows the streams, wetlands, and floodplains within the study area. Town Branch of Tahlequah Creek (Town Branch) is shown in red on the map because it is within the Illinois River watershed and is considered an "Outstanding Resource Water" (ORW) by the Oklahoma Department of Environmental Quality (ODEQ) as described in the Oklahoma Water Quality Standards (Title 785, Chapter 45 of the Oklahoma state statutes). ORWs have exceptional recreational and/or ecological significance and are subject to stringent requirements to maintain water quality. The Illinois River watershed is also Oklahoma's only designated Scenic River system, which also has certain standards for water quality and aesthetics.

Town Branch is also an impaired waterbody according to the Oklahoma Department of Environmental Quality (ODEQ) and the Environmental Protection Agency (EPA). Impaired waterbodies carry higher loads of contaminants than is allowed by clean water standards. Town Branch carries high levels of *Escherichia coli* (E. coli) bacteria and is impaired for primary body contact recreation (i.e. swimming).

The U.S. Army Corps of Engineers (USACE) regulates all work within waters of the United States, which includes the blue line streams and wetlands shown on **Figure 22**. Once a preferred alternative is selected, ODOT will perform detailed surveys of all the waters and wetlands and will determine what type of permit will be required. ODOT will obtain all necessary permits prior to construction.

There is an existing reinforced concrete box (RCB) structure under SH-82 where it currently crosses Town Branch. Under Alternative 9-5, this box would require extension to accommodate the widened SH-82 roadway. Under Alternative 1A, a new crossing of Town Branch would be required just west (downstream) of the existing highway. The existing structure would also remain since Old SH-82 would remain. Alternative 1A will disturb more of the Town Branch

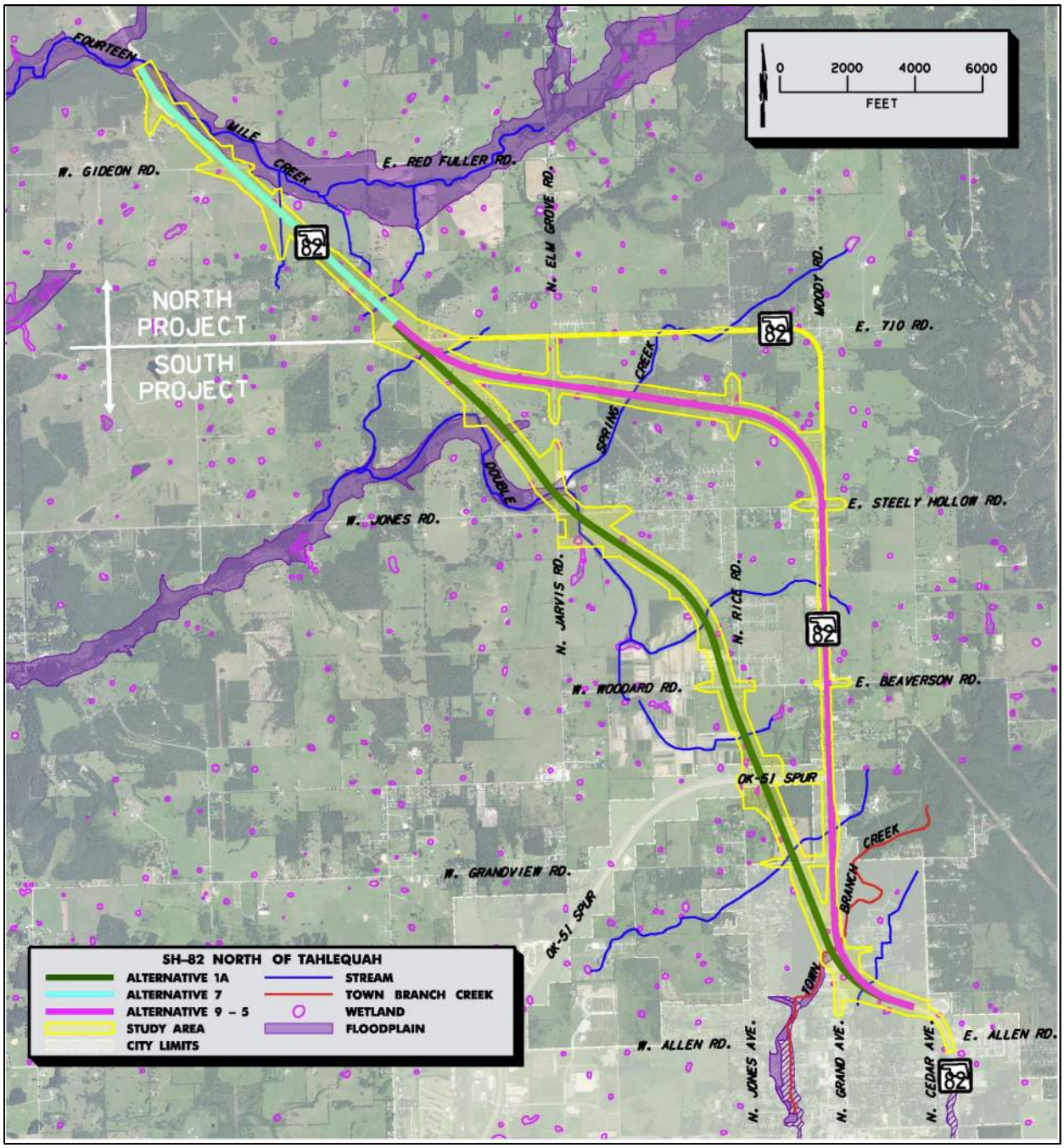


Figure 22: Water Resources in the Study Area

stream channel than Alternative 9-5. However, both alternatives would still likely be permitted under General Permit 14.

Preliminary research suggests that Alternative 1A would affect approximately 3.2 acres of wetlands, and Alternative 9-5 would affect approximately 2.5 acres. Alternative 7 would affect approximately 0.1 acre. Once detailed wetland delineations are complete and impacts are known more precisely, ODOT will coordinate with the USACE for the appropriate permits.

Floodplains

The Federal Emergency Management Agency (FEMA) maps floodplains of major streams and rivers across the United States. These floodplains represent areas subject to flooding at different levels during different storm events. There are three mapped floodplains in the SH-82 study area, associated with Town Branch Creek and Double Spring Creek in the South Project and Fourteen Mile Creek in the North Project. All of these floodplains are classified as "Zone A" by FEMA, which means they have a 1% chance of flooding in any given year, or are expected to flood once every 100 years (on average). Good floodplain management means that these areas are left free of development and obstructions so that the streams do not back up and cause flooding during large storm events. See **Appendix H** for the location of the mapped floodplains in the study area.

In the South Project, Alternative 1A crosses the floodplains of both Town Branch and Tahlequah Creeks (see **Figure 22**). Alternative 9-5 crosses the floodplain of Town Branch Creek. These crossings will require new culverts or bridges at these locations. ODOT will perform a hydraulic analysis to make sure the new structures are large enough so as not to impede the floodplain.

In the North Project, Alternative 7 is adjacent to the floodplain of Fourteen Mile Creek. ODOT will design the roadway in this portion of the corridor so as not to cause any significant change to the floodplain. A new bridge on SH-82 over Fourteen Mile Creek was recently completed so no new bridges will be required in the North Project.

Habitat for Protected Species

The U.S. Fish and Wildlife Service (USFWS) is responsible for protecting threatened and endangered plants and animals under the Endangered Species Act. According to the USFWS, the SH-82 project area has the potential to contain habitat for the following protected species:

Birds:
- Least Tern
- Piping Plover
- Red Knot

Clams:
- Neosho Mucket
- Rabbitsfoot

Fish:
- Arkansas Darter

Insects:
- American Burying Beetle

Mammals:
- Gray Bat
- Northern Long-Eared Bat
- Ozark Big-Eared Bat

Field observations of the study area suggest that the SH-82 project area may contain habitat for the American Burying Beetle and the listed bat species. The area is less likely to contain habitat for the listed bird and aquatic species. A detailed habitat assessment will be performed on the selected alternative and consultation with the USFWS will be completed. The project will include any necessary measures to avoid, minimize, or mitigate impacts on protected species. If you want to see the preliminary report from the USFWS on potential habitat, you can go to **Appendix I**.

In addition to the Endangered Species Act, there are other federal acts that protect specific species, including the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. ODOT will perform a detailed assessment to identify any habitat for bald or golden eagles and other migratory birds. This will include habitat for barn and cliff swallows that often nest under bridges. If habitat is identified, additional surveys will be performed and ODOT may place potential restrictions on the contractor during the nesting season to protect nesting birds. If active nests are present under bridges, ODOT will avoid any bridge work during the nesting season (generally April to September), or will place nets under the bridges prior to April 1 to prevent birds from nesting.

How will the Project Affect Noise Levels?

Analysts conducted a preliminary noise analysis to estimate how the SH-82 alternatives would affect noise-sensitive land uses in the area. Noise sensitive land uses are those areas where the perception of noise could be changed by the project, and primarily consist of homes and places of worship. Because the alternatives are only conceptual in nature at this point and because detailed survey has not been performed, this noise analysis is at a planning level. A full noise study will be performed on the selected alternative, which will include a complete noise wall analysis, if applicable.

ODOT and FHWA regulations define noise exposure limits for various land uses (**Table 4**). We call these limits Noise Abatement Criteria (NAC). These levels are measured in decibels, adjusted to account for the frequencies audible to the human ear (dBA). The dBA measurement is commonly used in environmental analysis.

For the SH-82 project, noise scientists predicted noise levels for the rush hours in 2012 and 2045 to represent the worst-case traffic conditions. Noise impacts occur when noise is expected to reach 66 dBA, which is considered "approaching" the NAC of 67 dBA for homes. Noise impacts also occur when future noise levels are expected to be 15 dBA or higher over existing noise levels. Both of the South Project alternatives are expected to produce noise impacts to adjacent homes. **Table 5** summarizes the results.

For Alternative 1A, 99 locations were considered in the analysis, including 97 homes or residential lots and 2 churches. None of these locations are expected to approach the 67 dBA level in the future. Fifty two (52) homes or residential lots are expected to experience a 15 dBA or greater increase over the current conditions, which is considered a substantial increase. Because of these substantial increases, ODOT looked at the feasibility of constructing noise

Table 4: FHWA Noise Abatement Criteria – Hourly Weighted Sound Level

Activity Category	Leq(h) dBA	Description of Activity Category
A	57	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the presetation of those qualities is essential if the area is to continue to serve its intended purposes.
B	67	Residential
C	67	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medial facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior activity areas in auditoriums, day care centers, hospitals, libraries, medial facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	-	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	-	Undeveloped lands that are not permitted.
Source: FHWA 2010		

Table 5: Preliminary Estimates of Noise Impacts

Alternative	# of Residences that will Approach 67 dBA	# of Residences with a 15+ dBA increase	TOTAL IMPACTS
South Project			
1A	0	52*	52
9-5	10	3	13
North Project			
7	0	0	0

*Includes 36 existing homes and 16 empty platted residential lots

walls within the future right-of-way. Based on the location of the homes experiencing increased noise, noise walls may be feasible at 44 of the 52 impacted residential sites.

Under Alternative 9-5, 77 locations were considered in the analysis, including 75 homes or residential lots and 2 churches. Ten (10) of these homes are expected to approach or exceed the 67 dBA NAC for residential and church uses. Noise levels are expected to approach 70 dBA at some homes under Alternative 9-5. Three (3) residential receptors (homes or residential lots) are expected to experience a 15 dBA or greater increase over the current conditions which is considered a substantial increase. Based on the location of the homes experiencing increased noise, noise walls maybe feasible at 3 of the 13 impacted sites. The other sites have driveway access to the future SH-82 or are located near an intersecting roadway.

For Alternative 7 in the North Project, 10 locations were considered in the analysis, including 9 homes and the Blue Springs Cemetery. None of these sites are ancitipated to approach or exceed the 67 dBA NAC for residential and cemetery uses. None were determined as having a 15 dBA or greater increase over the current conditions. Alternative 7 is not anticpated to have noise impacts.

Once the preferred alternative is selected, a traffic noise assessment will be completed. The noise assessment will serve as an updated noise analysis based on the preferred alternative preliminary design plans and include the use of a precision sound level meter for model validation purposes. This effort will include field measurements at selected receptor locations to determine ambient (or background) noise levels. In addition, the updated noise analysis will recalculate the existing and future noise levels based on traffic data, preliminary alignment and roadway elevations, and the elevations of the receptors. A noise model barrier analysis will be conducted for all impacted receivers to determine if a noise wall would meet ODOT Noise Policy feasibility and reasonable criteria. If a noise wall is found to be feasible and reasonable then ODOT will communicate with the benefitted property owners and get their input on the proposed walls prior to final design of the project. **Appendix J** provides more detailed information on the noise analysis conducted for the study thus far.

How Will the Project Change the Look of the Area?

The Build Alternatives were examined for how they would affect the visual quality of the surrounding area. The SH-82 project area is primarily rural farmland with scattered residences. There are some areas of denser residential development, and the existing SH-82 corridor has mixed land use including residential, commercial, and community facilities such as churches. Visual impacts of the two build alternatives would vary primarily in the southern, 5-lane portion, where Alternative 9-5 follows the existing SH-82 alignment. In this area, views of SH-82 under Alternative 9-5 would be of a widened roadway with five lanes of continuous pavement. **Figure 23** shows how the new roadway would look within the existing SH-82 corridor. In general, views from adjacent properties would not change greatly, although homes and businesses remaining on the west side of SH-82 would have the roadway directly adjacent and in the foreground view of their properties. The rolling terrain would be somewhat less visible because the project would reduce some of the existing hills to provide better sight distance.

Figure 23: Visual Impact of Alternative 9-5 (Southern 5-lane Portion)

The northern, 4-lane divided portion of Alternative 9-5 (north of Steely Hollow Road) would be on a new alignment and would have visual impacts similar to Alternative 1A (see below).

Alternative 1A would be constructed on a new alignment for its entirety. This would change the visual environment for surrounding properties, creating views of the roadway where none exist today. These views would be of two two-lane roadways, separated by a grassy median. If noise walls are incorporated into the project, views of these walls would be apparent rather than the roadway. **Figure 24** below shows how Alternative 1A would change the visual appearance of the surrounding area. This impact would be similar for the northern portion of Alternative 9-5.

Alternative 7 would construct two new additional lanes adjacent to the existing roadway. Alternative 7 would look very much like Alternative 1A (see **Figure 24** below) when it is completed.

Figure 24: Visual Impact of Alternative 1A

Overall, Alternative 1A will have more change on the visual environment, since it will construct more roadway in currently undeveloped areas. The magnitude of this change is considered greater than widening an existing roadway.

How Will Potential Hazardous Materials Affect the Project?

ODOT reviewed the study area to identify potential sites with environmental contamination that could affect the choice between the SH-82 alternatives. This review included studying historic aerial photographs, topographic maps, resource agency records, and a windshield survey of the area. Sites with the potential for environmental contamination include those containing above- and below-ground storage tanks (e.g. gas stations) and sites with known releases of hazardous materials. Other sites include those that generate or store hazardous materials, including businesses such as auto sales and repair shops, welding and manufacturing shops, salvage and recycling facilities, and dry cleaning/commercial cleaning shops. A more detailed study of hazardous sites, known as an *Initial Site Assessment*, will be conducted on the selected alternative.

The location of potential hazardous materials sites is shown in **Figure 25**. Alternative 1A will affect three of these sites, a former gas station, a carpet cleaning facility, and an auto sales business, all located on Grand Avenue just south of the SH-82 intersection. Alternative 9-5 will affect five of these sites, a gas station, a wrecker/generator service shop, two salvage/recycling yards, and a former collision repair center. Impacts to these sites in some cases involves relocation, and in some cases involves some property acquisition. Environmental contamination is not necessarily expected at all sites, but the existing and/or former uses of the sites suggests that it could be present. If you would like to know more about the known environmental conditions in the study area, the results of the environmental database search are included in **Appendix K**.

Under **Alternative 1A**:
- 3 potential hazardous waste sites could be affected.

Under **Alternative 9-5**:
- 5 potential hazardous waste sites could be affected.

Under **Alternative 7**:
- No potential hazardous waste sites will be affected.

What Will be the Impacts of Construction?

Construction impacts are things like traffic delays, lane or road closures, changes to access, and increased nuisances like noise and dust that are a result of construction activities. These impacts are short term, but can cause inconveniences for those living and working in the project area as well as for drivers on the highway.

Construction impacts are anticipated to be greater under Alternative 9-5 than under Alternative 1A and 7. While both alternatives will cause increased noise and dust during construction, this is expected to affect more people under Alternative 9-5 because more people live and work in the vicinity of the Alternative 9-5 alignment. Noise and dust impacts of Alternative 1A and 7 would affect fewer people.

Other construction impacts such as traffic delays, reduced speeds in construction zones, and potential temporary driveway closures are also expected to be higher under Alternative 9-5. Alternative 9-5 must be constructed on an existing highway while maintaining traffic, which

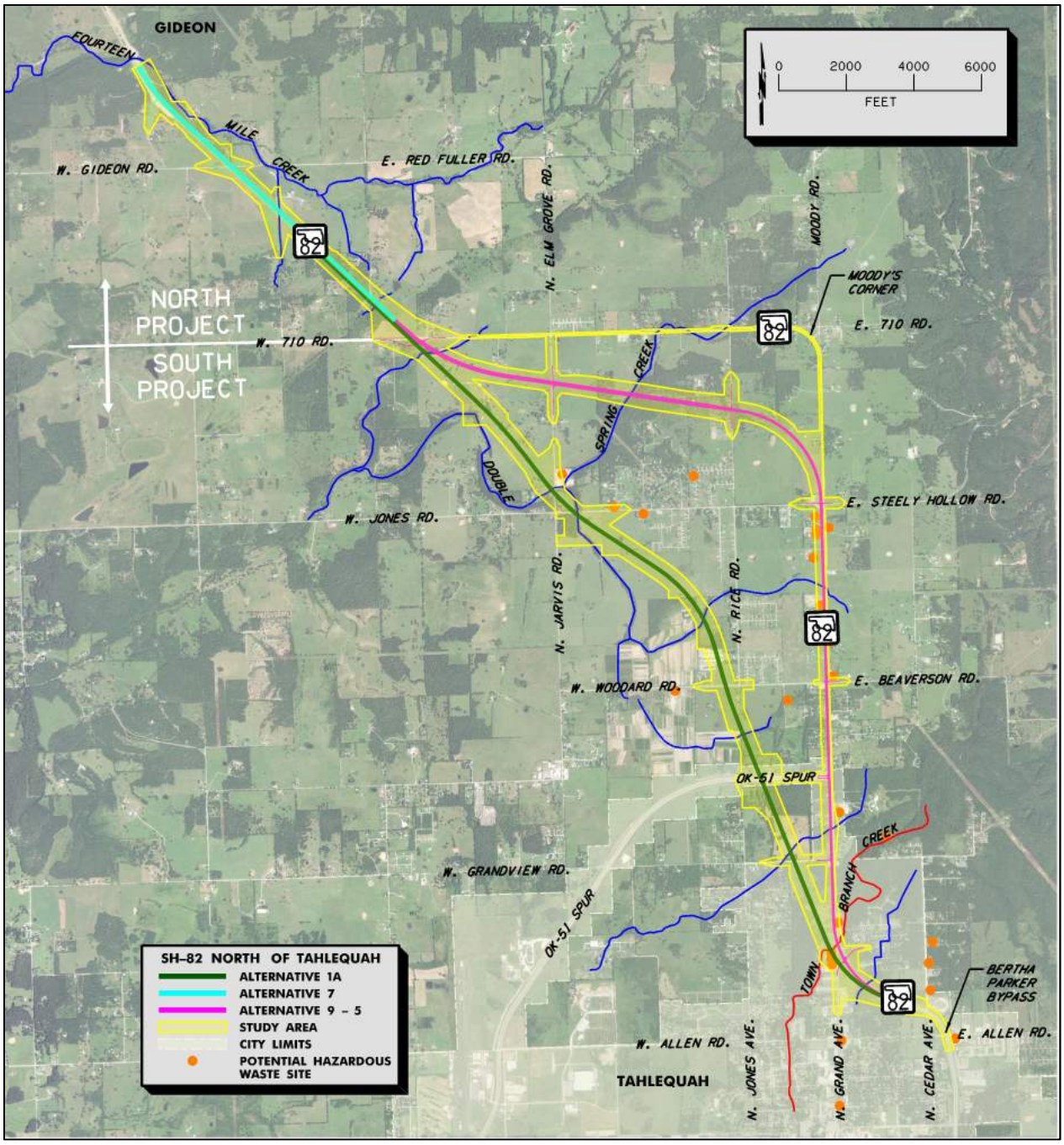


Figure 25: Sites with Potential Hazardous Materials in the Study Area

means construction must be done in phases which takes longer and is more inconvenient for nearby residents, business, and drivers. Adjacent homes and businesses may experience delays turning on and off the highway, and some side streets and driveways may have to be closed temporarily to facilitate construction. Alternatives 1A and 7 would be constructed on a new alignment and could be built more quickly because traffic would not use the new highway until construction was complete.

What Indirect and Cumulative Impacts Will the Project Have?

Under the National Environmental Policy Act (NEPA), the federal government has a policy of assessing indirect and cumulative impacts. Direct impacts are those we have just discussed – those that occur at the same time and place as the project. Indirect impacts are caused by the project and occur later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts are things like changes in future population or land use due to a new roadway, or changes to downstream waterways and/or habitat as a result of activities in the project area. These impacts could be positive or negative.

Cumulative impacts are impacts that result from adding the impacts of a project to the impacts of other past, present, or reasonably foreseeable future projects. To do this you have to consider whether adding "one more project" to what is already going on in an area will be the tipping point into making the impact significant. While impacts of the project alone may not be significant, when considered together with other ongoing or planned projects these impacts together could be considered significant.

For the SH-82 project, indirect impacts could occur to land use as a result of the new roadway alignments. Portions of both alternatives will pass through areas currently undeveloped, or used for farm and ranch lands. Building a new roadway could encourage new types of development, including residential and commercial development, to occur. While Cherokee County and the City of Tahlequah will be responsible for zoning and permitting any new development, the presence of a new roadway could provide favorable conditions for development. These impacts would be more prevalent under Alternative 1A, which involves more new alignment roadway.

Under Alternative 9-5 where it follows the existing SH-82 alignment, development would likely occur in the same way it has up until today. Because the existing highway contains more existing development, it is unlikely that land use will change a great deal. More businesses could be constructed in the future, again depending on zoning and permitting decisions by the county and city. Future development will also be constrained by parcel size, as many parcels particularly on the west side of SH-82 will be reduced in size by property acquisition under Alternative 9-5.

Alternative 7 is not anticipated to cause indirect impacts. Alternative 7 is located adjacent to the existing roadway so is not anticipated to change land use or development patterns in the area.

In the future ODOT intends to complete the widening of SH-82 to four lanes from the current project north to US-412. The portion of SH-82 immediately north of the current project has

already been improved. The ODOT 2017-2024 8-year Construction Work Plan includes improvements to SH-82 from Gideon north to the Cherokee County Line, and from the Cherokee County Line north to US-412. Right-of-way acquisition for these projects is currently scheduled to begin in 2020, with construction on the northern piece scheduled in 2024. There are also plans to improve SH-82 in southern Cherokee County, improving regional connections to the Muskogee Turnpike and I-40.

The primary effect of these future projects on the current SH-82 project would be increased traffic. As traffic increases, the potential for land use changes also increases. The cumulative impact of increased development potential, discussed above, extended over many years, could lead to a change in the nature of the project area from primarily rural to more suburban, characterized by roadside commercial development and potentially more denser residential development. This change is more likely to occur under Alternative 1A since this corridor is predominantly rural today, although could also occur in the portions of Alternative 9-5 that pass through rural areas. Ultimately, the City of Tahlequah, Cherokee County, and other municipal entities along the route would determine future development through planning and zoning decisions.

The completion of the additional projects on SH-82 will also have the cumulative impact of enhanced regional mobility and better access of goods and people between the communities of northeastern Oklahoma. The eventual improved connections to US-412 and I-40 would better connect the Tahlequah area with commercial freight corridors and provide more opportunity for economic development. Local access to community facilities such as churches, schools, and medical facilities will also be improved. Less congestion on the new SH-82 as well as on the existing SH-82 will mean faster travel times for residents as well as emergency service vehicles.

Positive cumulative impacts on air quality are anticipated to occur as a result of the proposed project. With no improvements, the traffic on SH-82 is expected to experience significant congestion and delay, with traffic Level of Service (LOS) declining to level D/E by 2045. Congested roadways with idling vehicles can have negative impacts on air quality. By improving traffic mobility and reducing congestion, the proposed improvements on SH-82 would be expected to improve overall air quality over time. These improvements would be independent from the effects of development.

Cumulative impacts are also considered specifically for low-income and minority populations. The direct impacts and benefits of the project, including cumulative impacts, are anticipated to shared among these special status populations and the general population and are not anticipated to disproportionately affect low-income and minority populations.

How Did ODOT Involve the Public in the Project?

Public involvement was a large part of the EA process for the SH-82 project and directly affected how alternatives were developed. ODOT offered the public the opportunity to participate in the EA process through one stakeholder meeting and two public meetings held on April 3, 2013 (Stakeholder Meeting), July 25, 2013 (Public Meeting #1), and January 27, 2015 (Public Meeting #2). These meetings are described in the *What is the History of the Project?* section at the beginning of this document (see page 5) and are summarized again below. These meetings were all held to keep the public informed throughout the project and to get comments about the alternatives. ODOT advertised each public meeting via a direct mail postcard to all the property owners in the study area, and by news release. The letters requested that owners, if they were leasing their property, to inform their lessees of the public meetings. In addition, if the Cherokee County Assessor information indicated that the property owner had a different address than the property address, letters were sent to both addresses. This was done to capture both owners and renters in an effort to be as broad and inclusive as possible in the public involvement process. Information was also provided on ODOT's website, which allowed individuals to download meeting information and provide additional comments.

Opportunity for minority and low-income groups to participate in the project was an important goal of the public involvement process. ODOT engaged the leadership of the Cherokee Nation early in the project, and representatives from the Cherokee Nation attended the Stakeholder Meeting as well as both public meetings. Participation of minority individuals at the public meetings was tracked and, based on the data voluntarily provided by the attendees, attendance at these meetings by minority individuals was roughly equivalent to the overall population. No comments from the Cherokee Nation or any members of the public were received that suggested that impacts of the projects would be disproportionately high or adverse on minority or low-income populations.

Stakeholder Meeting

ODOT held a Stakeholder Meeting on April 3, 2013 with representatives from the City of Tahlequah, Cherokee County, the Cherokee Nation, the Tahlequah Chamber of Commerce, Northeastern State University, and some local business owners. The purpose of the meeting was to present information about the SH-82 project including why the project is needed, the alternatives under consideration, and the expected impacts to the community and the environment, and to obtain input from the stakeholders. The meeting presented the alternatives under consideration as well as some options for the intersection at SH-82 and Grand Avenue.

The discussion at the stakeholder meeting was focused on the importance of improving safety on SH-82 while minimizing impacts to homes and businesses. Some wanted to keep the new SH-82 alignment close to the existing SH-82 alignment, while others wanted to make the route as straight as possible for safety. All agreed that maintaining the connection at Grand Avenue was important. Representatives from the Cherokee Nation attended the meeting and did not

raise concerns regarding impacts specific to members of their community. See **Appendix B** for the *Stakeholder Meeting Summary*.

1st Public Meeting

ODOT held the first public meeting for the SH-82 project on July 25, 2013 in Tahlequah. The meeting included a presentation on the SH-82 project, including why the project is needed, the alternatives under consideration, and the expected impacts to the community and the environment. The public was asked to provide input on the alternatives and any other areas of concern. One hundred and seventy-two people (172) signed in for the meeting, including representatives from ODOT, the Cherokee Nation, the City of Tahlequah, Cherokee County, Tahlequah Schools, Northeastern State University, and the general public. Racial/ethnic identification data were collected at the public meeting, with 95 people choosing to provide the requested information. Based on the data collected, 61 people present (64%) identified as White and 34 people (36%) identified as Native American alone or in combination with another race. No other minorities identified themselves on the sign-in sheets. No data were requested regarding participants' income or poverty status.

In addition to the questions and discussions at the public meeting, ODOT received over 40 written comments as a result of the meeting. The majority of the discussion at the meeting, as well as the written comments, fell into two main categories. One group asked ODOT to consider new alternatives that widen the existing alignment of SH-82 to five lanes (4 driving lanes and a shared center left turn lane), at least in the southern portion of the project area. These individuals had concerns that the new alignment alternatives would have major impacts to homes, farms, and businesses. Another group expressed a preference for Alternatives 1 and 1A, believing these alternatives would improve safety and have fewer impacts. Several people also asked that the intersection of SH-82 and Grand Avenue include a traffic signal. No comments from the Cherokee Nation or comments specific to impacts to low-income or minority populations were received. See **Appendix C** for the *Public Meeting #1 Summary*.

2nd Public Meeting

ODOT held the second public meeting for the SH-82 project on January 27, 2015 in Tahlequah. The meeting was held in an open house format, where attendees were free to come and go and view project information. The open house included a presentation on the SH-82 project, including why the project is needed, the alternatives under consideration, and the expected impacts to the community and the environment. This presentation was played on a continuous loop during the entire open house. The public was asked to provide input on the alternatives and any other areas of concern. One hundred and ninety-seven (197) people signed in for the open house including representatives from ODOT, the Cherokee Nation, the City of Tahlequah, Cherokee County, Grandview School, Gideon Fire Department, Northeastern State University, and the general public. Racial/ethnic identification data were collected at the public meeting, with 127 people choosing to provide the requested information. Based on the data collected, 71 people present (56%) identified as White and 53 people (42%) identified as Native American alone or in combination with another race. Total minority participation included 56 people, or 44 percent of all participants. No data were requested regarding participants' income or poverty status.

In addition to the presentation, attendees at the open house were able to view display boards on a number of topics, including:

- Purpose of the Meeting
- Purpose and Need for the Project
- Proposed Design Criteria
- General Project Information and Project Area Constraints
- Project Development Process
- Alternatives Overview
    - Initial Four-Lane Alternatives (Alternatives 1, 1A, 3, 5, 7, and 8)
    - First Public Meeting
    - New Five-Lane Alternatives (Alternatives 9 through 14)
    - Aerial View of Proposed Alternatives Layout (Four Lane vs. Five Lane)
- Alternatives Comparison
- Relocations
- Socioeconomic and Environmental Impacts
- Next Steps

ODOT received eighty-six (86) written comments as a result of the open house. These included nine (9) comments from agencies, one from an elected official, and seventy-six (76) written comments from the general public. Public comments fell into one of three general categories: those that prefer Alternative 1 or 1A, those that prefer one of the Five-Lane Alternatives, and other comments. A few also expressed general support for one of the four-lane alternatives. There were also a large number of comments from people requesting that the Log Store, located on SH-82 just north of Woodward/Beaverson Road, be left in place. The Log Store staff made comment forms available at the store location after the public meeting. While people had different thoughts on which alternative would be the best solution, most agreed that the improvements to SH-82 are needed to address safety and traffic operations.

People that preferred Alternative 1 or Alternative 1A felt that these alternatives were the safest because they removed curves and provided better sight distance. They also preferred these alternatives because they had the fewest impacts to homes and businesses and the environment. The lower cost of these alternatives was also mentioned.

People that preferred the five-lane alternatives felt that these alternatives would have fewer impacts to farmers and farmland, and that people living near the road would be more accepting of a new roadway than people living in the country. Lower cost was also mentioned by some for the five-lane alternatives. Some people expressed a preference for specific five-lane alternatives. Alternative 11 was the most frequently mentioned, although there was not a large difference in public preference between any of the 5-lane alternatives.

Several people expressed concern for their personal properties and potential impacts. Some people did not think the project is needed. Some made requests to avoid and minimize impacts, especially relocations. Others stated that relocations are not a major impact. A large number of

people also requested that the Log Store (at SH-82 and Beaverson Road) be avoided, as it is the closest store and gas station and is important to local residents. A few people also requested that ODOT consider a hybrid alternative, combining Alternative 9 (one of the five-lane alternatives) on the south end with Alternative 3 (one of the four-lane divided alternatives) on the north end. No comments from the Cherokee Nation or comments specific to impacts to low-income or minority populations were received. The *Public Meeting #2 Summary* is included in **Appendix E**.

In response to public comment, ODOT investigated the feasibility, costs, and impacts of three hybrid alternatives. Hybrid 1 combined Alternative 9 (the five-lane curb and gutter alternative offset 45 feet west of the existing SH-82), and Alternative 3 (one of the new alignment, four-lane alternatives). Hybrid 2 combined Alternatives 9, 3, and 1A. Hybrid 3 combined Alternatives 9 and 5. These hybrids were analyzed for safety and traffic operations, construction costs, environmental impacts, utility impacts, and right-of-way impacts, similar to the other alternatives. Ultimately, these hybrids were eliminated from further consideration because, while impacts were reduced somewhat over the five-lane alternatives, the hybrids did not improve safety or greatly reduce costs or impacts over the four-lane alternatives.

Summary of Public Comments

Public comments varied over both meetings but overall, the following three public comments stood out and were common throughout the process.

- The existing highway has safety and congestion issues and the new highway needs to improve safety.
- Consider impacts to peoples' homes, farms, and businesses.
- Keep the alignment on or near the existing highway

This last comment to keep the alignment on or near the existing highway was expressed by several people at the first public meeting. In response to this comment, ODOT developed Alternatives 9 through 14 and presented them at the second public meeting. The response to these alternatives at the second public meeting was mixed. While some preferred the five-lane, on-alignment alternatives, others preferred one of the original divided four-lane, new alignment alternatives. **Table 6** on the next page offers a brief summary of the meeting dates, comments, and outcomes. **Appendices B, C and E** contain more detailed documentation of the comments received.

As a result of the feedback received from both public meetings, as well as the engineering and environmental analysis conducted on all of the alternatives, ODOT identified Alternative 1A as the preferred alternative. On June 15, 2015, ODOT mailed letters to this effect to all federal and state agencies, elected officials, local government representatives, and members of the public that had attended any of the public meetings or commented on the project.

In response to this letter, the City of Tahlequah passed Resolution No. 08-17-2015 on August 17, 2015 asking ODOT to change the preferred alternative from 1A to a modified Alternative 9. Cherokee County also accepted this resolution. In response to these requests, ODOT agreed to

carry forward both Alternative 1A and a modified Alternative 9 known as Alternative 9-5 through the EA process. Alternative 9-5 follows the description of the alternative included in the City's resolution.

Table 6: Public Involvement Summary

Date	Purpose of the Meeting	General Comments	Response
April 3, 2013 Stakeholder Meeting	• Present the project and alternatives to key stakeholders • Identify issues of concern • Learn about other projects planned by the city and county in the area	• SH-82/Grand Avenue should remain open (4)	• SH-82/Grand Avenue will remain open and options looked at for a new intersection design.
		• Keep alternatives as close as possible to the existing SH-82 (3)	• On-alignment alternatives generally have more impacts to homes, businesses, and utilities
		• Safety is a priority. Alts. 1/1A are straighter and seem safer (1).	• All alternatives were designed for safety.
July 25, 2013 Public Meeting #1	• Present the project and alternatives to the public • Present the analysis of social, economic, and environmental impacts of the alternatives. • Identify issues of concern to the public. • Collect feedback on the alternatives.	• Keep SH-82 near the existing alignment (20)	• New Alternatives 9 through 14 were developed that looked at a five-lane alternative on the existing alignment.
		• Concerns about impacts to property (11)	• Exact impacts are still unknown. More detail was presented at Public Meeting #2 on property acquisition and relocations.
		• Concerns about economic development in north Tahlequah (9)	• A detailed socioeconomic study of business impacts was completed.
		• Prefer Alternative 1 or 1A (8)	• Alternative 1A was initially identified as ODOT's preferred alternative and was carried forward for analysis in the EA.
		• SH-82/Grand Avenue needs to be signalized. (3)	• SH-82/Grand Avenue will be signalized under all alternatives.

Date	Purpose of the Meeting	General Comments	Response
January 27, 2015 Public Meeting #2	• Update the public on the project. • Discuss how input from the previous public meeting was incorporated. • Present the five-lane alternatives developed as a response to comments received at Public Meeting #1. • Present the analysis of social, economic, and environmental impacts of all of the alternatives. • Collect feedback on the alternatives.	• Save the Log Store (25)	• Both Alternatives 1A and 9-5 preserve the Log Store. Alt. 9-5 would require some acquisition from the Log Store property.
		• Safety is the number one concern (17)	• The four-lane divided alternatives are considered safer than the five-lane alternatives.
		• Prefer Alternative 1 or 1A or other four-lane alternative (17)	• Alternative 1A was initially identified as ODOT's preferred alternative and was carried forward for analysis in the EA.
		• Improvements are needed (15)	• Comment noted and agreed. SH-82 has a substantial collision history.
		• Concern about impacts to properties (14).	• Alternatives 1A and 9-5 are among the lowest of the alternatives presented for impacts to property, homes and businesses.
		• Prefer one of the five-lane alternatives (12)	• A modified five-lane alternative (Alternative 9-5) was carried forward for analysis in the EA.

Public Hearing

This section will be completed after the public hearing is held.

How did ODOT Involve Other State and Federal Organizations?

ODOT solicited comments from the following local, state, and federal agencies/organizations, and Native American tribes:

- Caddo Nation
- Cherokee County
- Cherokee Nation
- City of Tahlequah
- Eastern Oklahoma Economic Development District
- Gideon Fire Department
- Northeastern State University
- Oklahoma Archaeological Survey
- Oklahoma Conservation Commission
- Oklahoma Department of Agriculture
- Oklahoma Department of Commerce
- Oklahoma Department of Education
- Oklahoma Department of Environmental Quality
- Oklahoma Department of Tourism and Recreation
- Oklahoma Department of Wildlife Conservation
- Oklahoma Geological Survey
- Oklahoma Highway Patrol
- Oklahoma Historical Society
- Oklahoma Scenic Rivers Commission
- Oklahoma Transportation Commission
- Oklahoma Water Resources Board
- Osage Nation
- Tahlequah Chamber of Commerce
- Tahlequah Fire Department
- Tahlequah Public Schools
- U.S. Army Corps of Engineers, Tulsa District
- U.S. Department of Agriculture – Natural Resources Conservation Service
- U.S. Department of Housing and Urban Development
- U.S. Department of the Interior - Bureau of Indian Affairs
- U.S. Department of the Interior - Bureau of Land Management
- U.S. Department of Interior - National Park Service
- U.S. Fish and Wildlife Service
- United Keetoowah Band of Cherokees
- Wichita and Affiliated Tribes

The following agencies provided comments on the SH-82 project. A copy of the agency correspondence can be found in **Appendix L**.

- The Bureau of Land Management, National Park Service, and Oklahoma Department of Environmental Quality had no comments or objections.
- The Bureau of Indian Affairs recommended that ODOT consult with the affected tribes directly.

- Oklahoma State Parks did not identify any State Park or Land and Water Conservation Fund properties in the study area. Bicycle trails were suggested as a potential mitigation measure to enhance area recreation.
- The U.S. Army Corps of Engineers, Tulsa District Regulatory Branch recommended that any bridges proposed within the Illinois River wastershed (Outstanding Resource Water) fall within the parameters of General Permit 14. All other creeks are outside the ORW and Nationwide Permits would apply if bridges are designed to their specifications.
- The U.S. Army Corps of Engineers, Tulsa District Floodplain Program Manager had no objections. They recommended protecting against flooding.
- Northeastern State University indicated their priorities of safety, traffic movement, and economic development. They requested a hybrid of Alternatives 9, 3, and 1A.
- The Oklahoma Conservation Commission expressed general concerns with disturbance and siltation of riparian areas, channelization of streams, erosion and flood control. They requested that streams remain free-flowing with naturally vegetated stable banks and free of excess sediment.
- The Oklahoma Water Resources Board recommended that ODOT contact the local floodplain administrator for any permit requirements.
- The Oklahoma Archaeological Survey requested that while no known sites are present in the study area, an archaeological field inspection be conducted to identify significant archeological resources that may be present.
- The Oklahoma Historical Society requested that documentation and photographs of any structures over 45 years old be provided for review so that the State Historic Preservation Officer can issue an opinion on the effect of the project on cultural and historical resources.

How Do the Alternatives Compare to Each Other?

The SH-82 alternatives were compared to each other based on consideration of the project purpose and need and more specifically the engineering requirements, environmental, social, and economic impacts on the natural and built environments, and public input.

Purpose and Need

The purpose of the SH-82 project is threefold:

- Accommodate the existing and future traffic volumes
    - Alternative 1A will accommodate future traffic at a Level of Service A, which is the best possible.
    - Alternative 9-5 will accommodate future traffic at a Level of Service A/B.
- Reduce accidents and improve safety

- Alternative 1A is anticipated to improve safety and reduce accidents over the No Build Alternative. The four-lane divided highway would have a median separating the two directions of traffic which is an added safety benefit.

- Alternative 9-5 is anticipated to improve safety and reduce accidents over the No Build Alternative. However, Alternative 9-5 is not anticipated to improve safety as much as Alternative 1A. The center turn lane does not provide the same benefit as a median for separating traffic. Alternative 9-5 is also anticipated to have more driveways and cars turning on and off the roadway than Alternative 1A. Alternative 9-5 is anticipated to have accident rates approximately 30% higher than Alternative 1A.

- Complete the Multi-lane loop around Tahlequah

  - Alternative 1A completes the multi-lane loop with a four-lane divided highway with limited access between the Bertha Parker Bypass and SH-51 Spur. SH-82 is expected to carry mostly through traffic.

  - Alternative 9-5 completes the multi-lane loop with a five-lane highway with no access control between the Bertha Parker Bypass and SH-51 Spur. SH-82 will carry both local and through traffic.

Public Input

Both Alternatives 1A and Alternative 9-5 received support from the public. Alternative 9-5 was developed in response to public comment and while was not previously presented to the public as a separate alternative, it does represent the request of several individuals who requested a "hybrid" 5-lane/4-lane alternative. While more people supported the five-lane alternatives early on, after these alternatives were developed and presented to the public, more people expressed preference for the four-lane alternatives, particularly Alternative 1A. The City of Tahlequah, Northeastern State University, and local elected officials supported a hybrid alternative (like Alternative 9-5). Public comments indicate a strong interest in improving safety as well as economic development. The alternatives respond to these concerns in different ways.

Alternative Comparison Matrix

Table 8 summarizes the anticipated impacts of both build alternatives. These impacts are based on information collected to date. Detailed studies of environmental resources will be conducted on the selected alternative subsequent to this EA. As shown in **Table 8**, Alternative 1A best meets the purpose and need for the project, particularly improving safety. Alternative 1A has more impacts to businesses, farms, and wetlands. Alternative 1A would also have noise impacts to a large number of homes. It is possible that noise barriers could mitigate some of these impacts.

Alternative 9-5 is not expected to improve safety as much as Alternative 1A. Accident rates are anticipated to be approximately 30% higher under Alternative 9-5 than under Alternative 1A. Alternative 9-5 would also require more residential relocations than Alternative 1A. Alternative 9-5 has fewer impacts to businesses, farms, and wetlands. Alternative 9-5 is expected to have fewer noise impacts, although noise barriers would not likely be feasible under this alternative.

Table 7: Comparison of Alternatives

ALT.	PURPOSE			COSTS	PROPERTY IMPACTS			BUSINESS AND EMPLOYMENT IMPACTS			
	Traffic	Safety	Multi-Lane Loop	Total Cost	Residential Relocations	Farm Properties Divided	Church Relocation	Business Relocations	Businesses with Negative Sales Impacts	Businesses with Positive Sales Impacts	Number of Employees Affected
South Project											
1A	LOS A	Improved Greatly	Yes	$47.7	5	7	0	5	10	3	12
9-5	LOS A/B	Improved Somewhat	Yes	$45.7	16	2	1	3*	0	8	21
North Project											
7	LOS A	Improved Greatly	N/A	$17.5	1	0	0	0	0	0	0

*Includes 1 vacant commercial property

ALT.	ENVIRONMENTAL IMPACTS					
	Known Cultural Resources Sites	Wetlands (acre)	Potential Hazardous Materials Sites	Potential Noise Impacts (Homes)	Construction Impacts (temporary)	Environmental Justice Considerations
South Project						
1A	0	3.2	3	52	Lower	One minority-owned residential relocation, one minority-owned business with negative sales impacts. Impacts to mintority and low-income populations are not disproportionately high or adverse.
9-5	0	2.5	5	13	Higher	At least four minority-owned residential relocations. Impacts to mintority and low-income populations are not disproportionately high or adverse.
North Project						
7	0	0.1	0	0	Lower	None

What Commitments Have Been Made to Minimize Project Impacts?

Throughout the planning and study of the SH-82 project, ODOT has made efforts to avoid, minimize, or mitigate impacts to both the natural and human environment. These efforts will continue through the design and construction of the SH-82 project. As discussed throughout this document, ODOT will conduct detailed environmental studies of all environmental resources on the selected alternative and consult with the appropriate agencies. These studies will identify, in more detail, which resources will be affected and what avoidance, minimization, and/or mitigation measures are reasonable and feasible for the project. These studies will also ensure ODOT and FHWA are in compliance with all of the federal and state laws that protect the environment. These detailed studies will include:

- Archaeological and Historic Resources and consultation with the State Historic Preservation Officer and Oklahoma State Archeologist
- Streams and Wetlands
- Threatened and Endangered Species and consultation with the U.S. Fish and Wildlife Service
- Hazardous Materials
- Noise (including analysis of noise walls)
- Relocation Plan and Environmental Justice

The commitments listed below will apply regardless of which alternative is selected. Additional commitments will likely result from the detailed studies and will also be included in the project.

- Relocations are anticipated for the project. Acquisition and relocation assistance will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, effective February 3, 2005. Housing of last resort may be required and will be provided if sufficient comparable replacement housing is not available within the financial means of displacees.
- The action may involve work in potentially jurisdictional waters and potentially jurisdictional wetlands. The Section 404 permit application form will be submitted by the Designer through Project Management Division to Environmental Programs Division at the time of right-of-way submittal for evaluation and determination of the appropriate Clean Water Act Section 404 permit application for the project.
- A storm water pollution prevention plan (SWP3) will be developed for the project, and a temporary erosion and sediment control plan will be included in the construction plans to avoid or minimize impacts to water quality.
- All properties will remain accessible during construction of the project.
- Additional efforts will be made to reach low-income and minority populations during the detailed studies. These could include one-on-one meetings or small group meetings through community services such as churches or the Cherokee Nation Housing

Authority. Prior to conducting field studies, ODOT will mail out an Environmental Justice questionnaire to all affected property owners to identify any special needs or concerns.

References

AASHTO. 2010. The Highway Safety Manual, American Association of State Highway Transportation Officials, Washington, D.C., 2010.

Transportation Research Board. 2010. Highway Capacity Manual, Transportation Research Board. Washington D.C., 2010.

List of Preparers

Nicholas Braddy, PE – Garver, 6450 S. Lewis Ave., Suite 300, Tulsa, OK. Project Manager. B.S.C.E., Civil Engineering, University of Arkansas. 8 years experience (Lead Designer, Public Involvement, QA/QC).

Darryl Del Frate – WSP USA, 6100 Uptown Blvd. NE, Suite 700, Albuquerque, NM. Associate of Applied Science, Geographic Information Technology. 9 years experience (Exhibits and Figures).

Eric Fuselier, CWB – Garver, 2049 E. Joyce Blvd., Suite 400, Fayetteville, AR. Environmental Scientist/Environmental Specialist. B.S.A, Environmental, Soil, and Waster Science, University of Arkansas. B.A. Sociology, Louisiana Tech University. 3 years experience (Noise Study Analysis).

James Hamilton, AICP – WSP USA, 1601 South MoPac Expressway, Suite 325, Austin, TX. Lead Environmental Planner. B.A., Political Science, Wichita State University, M.A. Political Science, University of Kansas, Master of Urban Planning, University of Kansas. 24 years experience (Socioeconomics, Environmental Justice).

William C. McAbee – Garver, 4701 Northshore Drive, North Little Rock, AR. Environmental Team Leader. M.S., Biology – Louisiana Technical University. B.S., Wildlife Ecology, Oklahoma State University. 16 years NEPA experience (NEPA QA/QC).

Kirsten McCullough, AICP, RPA – Garver, 6450 S. Lewis Ave., Suite 300, Tulsa, OK. Environmental Team Leader. M.A., Anthropology, University of New Mexico. B.A., Anthropology, University of British Columbia. 18 years experience (EA Lead Author, Public Involvement).

Michael McKay – ODOT Cultural Resources Program, 111 E. Chesapeake, Norman, OK. Highway Archaeologist. B.S., University of Oklahoma. B.S., Ultrasonography, University of Oklahoma. M.A., Anthropology, University of Oklahoma. 17 years experience (Cultural Resources).

Ryan Mountain, PWS – Garver, 2049 E. Joyce Blvd., Suite 400, Fayetteville, AR. Environmental Special Studies Manager. B.S., Fisheries and Wildlife Management, Arkansas Tech University. 16 years experience (Environmental Studies Lead, QA/QC).

Tracey Nixon, AICP – WSP USA, Two Miranova Place, Suite 450, Columbus, OH. Lead Planner. B.A., Economics, State University of New York at Buffalo. Master of Urban Planning, New York University. 24 years experience (Socioeconomics).

Jenny Sallee, PE - Garver, 6450 S. Lewis Ave., Suite 300, Tulsa, OK. Project Manager. B.S. & M.S., Civil Engineering, Oklahoma State University. 20 years experience (Project Manager, Roadway Design Lead).

Lacee Stanley, EI, CFM – Garver, 6450 S. Lewis Ave., Suite 300, Tulsa, OK. Project Engineer. B.S., Civil Engineering, University of Oklahoma. 7 years experience (Exhibits and Figures).