Appendix E – Visual Impacts Assessment Memo

Job No. 100512, Walnut Ridge – Missouri State Line (Future I-57) P.E.

Prepared by Garver for the
Arkansas Department of Transportation
In cooperation with the Federal Hwy Administration

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Chapter 1 – Introduction

1.1 Project Overview

A Final Environmental Impact Statement (FEIS) is being conducted to study transportation improvements between Walnut Ridge in Arkansas and the Missouri State line. The Arkansas Department of Transportation (ARDOT) is providing direct oversight and management of the proposed project on behalf of the Federal Highway Administration (FHWA).

The project is located in Clay, Greene, Lawrence, and Randolph counties in northeast Arkansas. Construction of the proposed project would complete the improvements of future Interstate 57 (I-57) within Arkansas. The project includes improvements to the United States Highway (Hwy.) 67 corridor in northeastern Arkansas between the Hwy. 67/Hwy. 412 interchange in Walnut Ridge, Arkansas and the Missouri State line. The purpose of the project is to enhance connectivity and continuity of the National Highway System, provide a more resilient roadway, and provide for increased opportunity for economic development in northeast Arkansas.

The proposed project is needed to address a deficiency in the National Highway System in northeast Arkansas. The project is needed because there is a gap in the system linkage which diminishes connectivity and mobility of the National Highway System. Construction of the action alternative would complete the improvements of Future I-57 within Arkansas. Additionally, there is a lack of reliable transportation infrastructure to support economic development and a need to enhance resiliency to extreme weather events along the route. Furthermore, legislation designated this route as future Interstate Route 57. The project needs and supporting information are discussed further in Chapter 1 of the FEIS.

1.2 Project Alternatives

As shown in **Figure 1**, two main line alternatives (Alternatives 2 and 3) ranging from 39.2 to 41.3 miles in length and three Missouri connector alternatives (Alternatives A, B, and C) ranging from 2.3 to 2.8 miles in length are being evaluated for the project. Alternatives 2 and 3 begin at the Hwy. 67/Hwy. 412 interchange in Walnut Ridge, Arkansas and both terminate approximately just south of the Missouri state line. Missouri connector Alternatives A, B, and C begin at the terminal ends of Alternatives 2 and 3, extend northward, and terminate at Hwy. 67. The northern-most 0.5-mile of Alternative B occurs along existing Hwy. 67 while the rest of Alternative B and the vast majority of the other alternatives would be on new alignment.

The proposed roadway for all action alternatives would be a four-lane divided highway with a depressed grass median and an approximately 400-foot-wide right of way (ROW). As shown in **Figure 2**, the typical section would consist of four 12-foot-wide lanes, 10-foot-wide paved outside shoulders, 6-foot-wide paved inside shoulders, a 48-foot grass median, a 30-foot clear zone at 6:1, and a 3:1 slope outside the clear zone. The footprints of Alternatives A and C also include a 0.29-mile and 0.17-mile section, respectively, of County Road 278 to accommodate a temporary, four-lane roadway that would tie each alternative back to Hwy. 67. The four-lane section to Hwy. 67 would be an interim condition that would be replaced with the proposed interchange connecting to MoDOT's proposed future corridor. The interim sections of Alternatives A and C that are along County Road 278, would be a four-lane highway with an approximately 170-foot and 165-foot wide ROW, respectively (**Figure 2**).

Figure 1: Future I-57 Action Alternatives

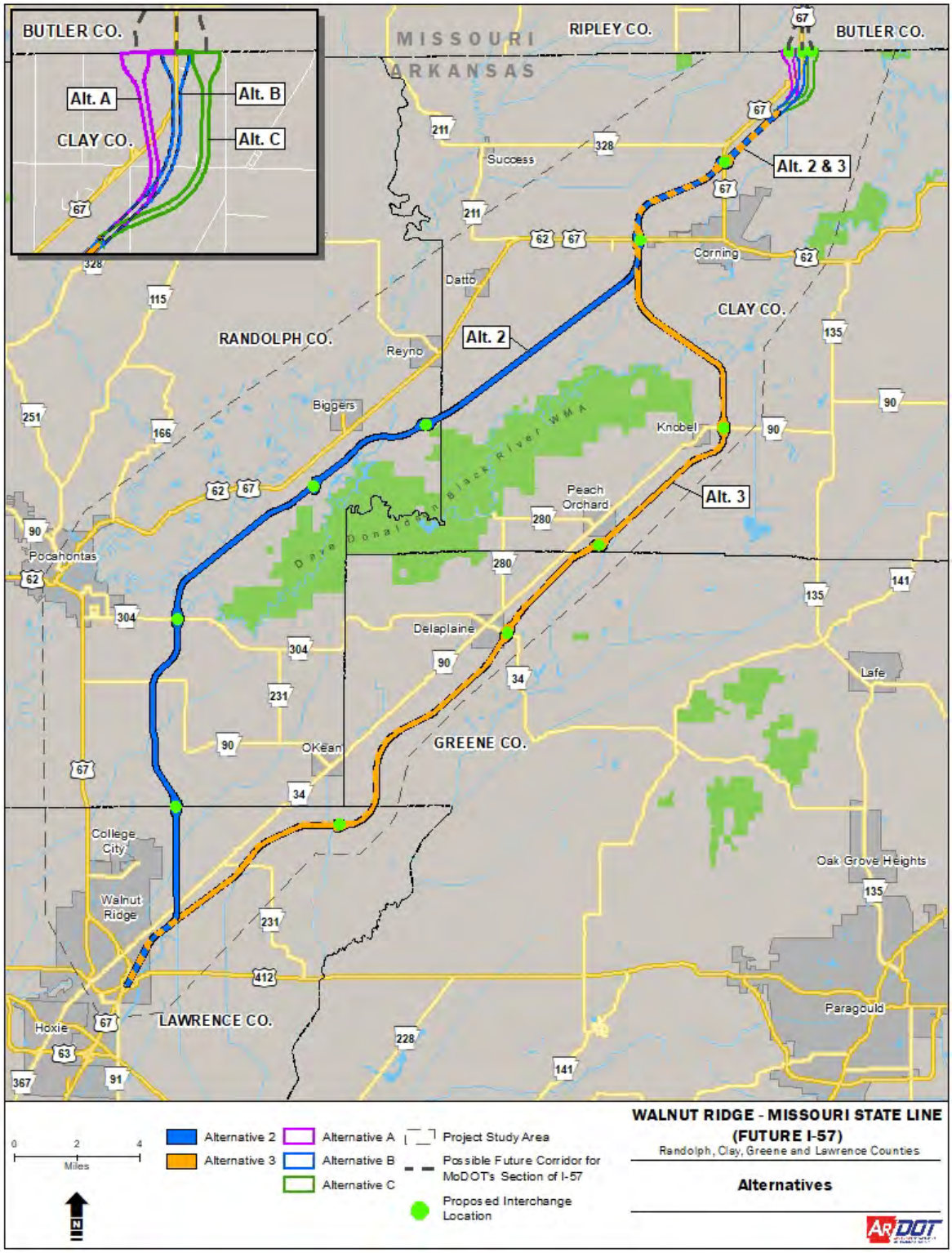
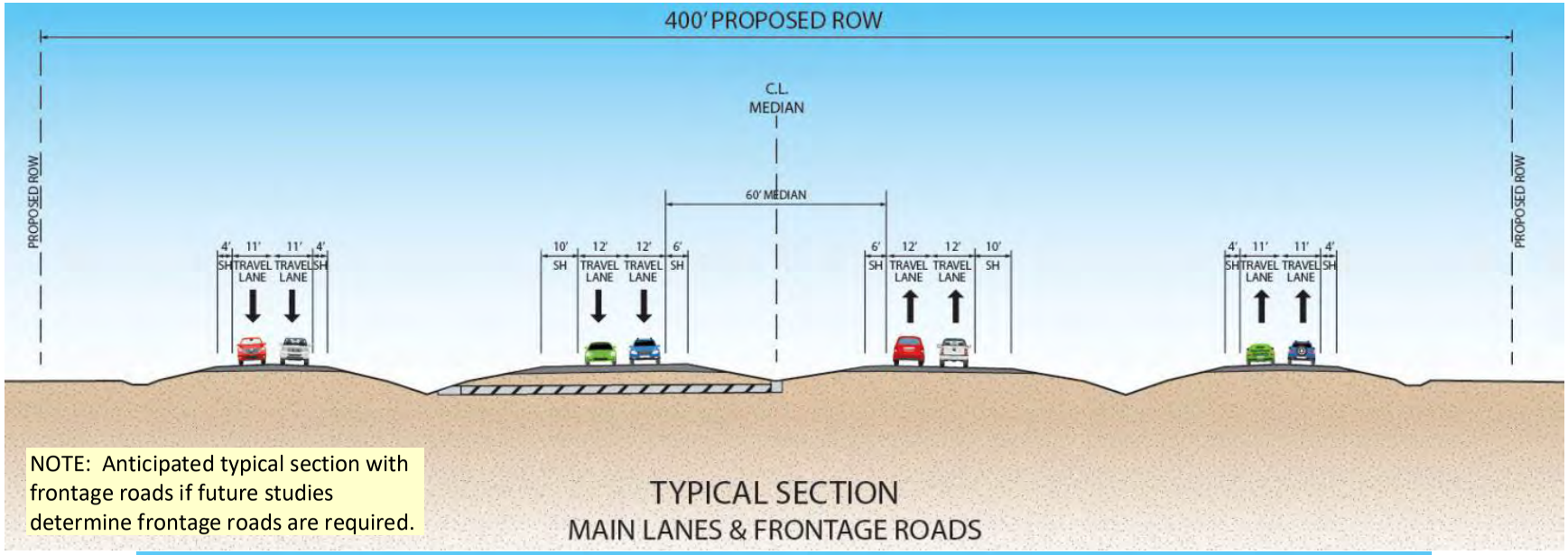
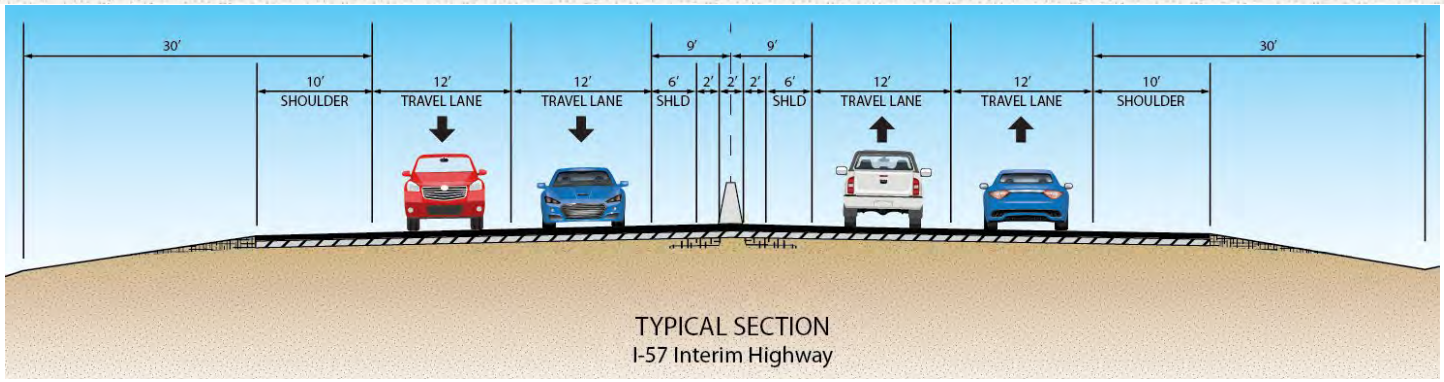


Figure 2: Typical Section of Proposed Roadway





A No Action Alternative is also evaluated in the FEIS document. The No Action Alternative would not involve improvements to Hwy. 67 or to construction of an interstate route on new location. The No Action Alternative would not result in changes to any visual resources of the natural, cultural, or project environments. No impact on the ability of the affected population to view visual resources is anticipated. Visual quality would, therefore, not be altered by the No Action Alternative. The No Action Alternative would have no adverse impacts on visual quality, nor would it create any opportunities to enhance visual quality within the project footprint. No mitigation is necessary. Therefore, only the action alternatives are discussed for potential impacts within the remainder of this memorandum.

Details regarding each project alternative and supporting information are provided in the FEIS document.

1.3 Purpose of this Memorandum

The purpose of this Visual Impact Assessment (VIA) Memorandum is to evaluate potential visual impacts associated with the Walnut Ridge – Missouri State Line (Future I-57) project. The VIA was prepared using guidance outlined in the Guidelines for the Visual Impact Assessment of Highway Projects published by the FHWA in January 2015.

The visual impacts described are associated with Alternatives 2, 3, A, B, and C.

Chapter 2 – Scoping and Methodology

2.1 Definitions Based on Regulatory Guidance

Visual resource and VIA definitions for the concepts and terms used in the remainder of this memo are described below.

The FHWA guidelines recognize three types of visual resources:

- **Project visual resources** include the existing highway's geometrics, structures, and fixtures and those that will be placed in the environment as part of the proposed project. For projects located on new alignment, no existing project visual resources would be present.
- **Cultural visual resources** include manmade elements such as roadways, embankments, bridges, and buildings.
- **Natural visual resources** include landforms and land cover such as trees, vegetation, and water. Farmland is also considered a natural visual resource.

The overall composition of visual resources helps determine the **visual character** of a scene or landscape. For highway project assessment purposes, visual resources and character are considered from the perspective of two types of proposed project viewers:

1. The view of the project as seen from the surrounding community (**neighbors**). Neighbors include residents and business occupants. This would be neighbors' views looking toward the proposed road.
2. The view from the project as seen by motorists (**travelers**). Travelers include users of the project corridor and adjacent roadways. This would be travelers' views looking from the proposed road.

Neighbors are often classified by land use type and the standard visual preferences of each particular group have been described by FHWA's VIA Guidelines for Highway Projects as follows:

- Residential Neighbors - Residential neighbors live within viewing distance of the proposed roadway. Residential neighbors' visual preferences tend toward a desire to maintain the existing landscape as it is—they settled where they are for a reason, including how their neighborhood looks. They are not very interested in change, even change that purports to improve the quality of their lives, unless they participated in defining the changes. Depending on their location, residential neighbors are often interested in cultural order and natural harmony, with less emphasis on project coherence unless it impacts their ability to appreciate the other two aspects of visual quality.
- Institutional Neighbors - Institutional neighbors provide or receive social services to the community and include a variety of institutions such as schools, hospitals, and churches. Institutional neighbors often want to express a public face to travelers adjacent to their facilities for a variety of reasons. The presentation of their buildings and grounds is critical to the impression they are trying to convey, and they often prefer to maintain or improve these impressions or to extend the duration of the views of their buildings and grounds to travelers. Orientation and wayfinding are also critical issues, requiring coordination between transportation and institutional officials. Institutional neighbors are primarily interested in cultural order but, depending on location, they may have equal interest in natural harmony. Project coherence can be critical.
- Retail Neighbors - Retail neighbors are merchants that sell goods and services to the public, or shoppers that buy the goods and services. Merchants prefer heightened visibility, free of competing visual intrusions. Shoppers prefer visual clarity to guide them to their destination. Retail neighbors are dependent on good project coherence and although an interest in cultural order would typically dominate, some merchants use natural harmony as a method for attracting shoppers.
- Commercial Neighbors - Commercial neighbors include those who occupy or use office buildings, warehouses, and other commercial structures. The visual preferences of commercial interests vary

depending on the business. Those with many visitors and customers mimic the visual preferences of retail neighbors. Others are more inclined to align themselves with the visual preferences of institutional neighbors. Some commercial development use natural harmony as a method for attracting and keeping tenants.

- Agricultural Neighbors - Agricultural neighbors are farmers of crops or herd animals. Agricultural neighbors regard cultural order and natural harmony as critical components of the landscape. They are less interested in project coherence.

Visual resource changes are assessed by considering the compatibility and/or contrast of the proposed projects with the visual character of existing environments. Viewer responses to these changes are predicted by considering both exposure and sensitivity.

Viewer exposure considers the physical limits of the views and the number and type of viewers. **Viewer sensitivity** considers the expectations of viewers based on existing environments and the extent to which various visual resources may be important to them.

Visual quality is a value placed on visual resources by viewers. The predicted viewer response to changes in the existing landscape are used to determine **visual quality** impacts. Potential impacts may be identified as neutral, adverse, or beneficial and described in the following terms:

- Extent – Are the effects site-specific, local, or even regional?
- Duration – Are the effects temporary or permanent, or short-term or long-term?
- Scale – Are the effects negligible, minor, moderate, or major?

Potential impact durations are defined below.

- Short-term – during construction.
- Short/medium-term – 1 to 5 years while new vegetation becomes established after construction.
- Medium/long-term – 5 to 15 years after construction when new vegetation would be effective mitigation.
- Long-term (permanent) – Over 15 years.

Potential impact scales are defined below.

- Negligible: Changes would be non-detectable or, if detected, effects would be slight and local. Impacts would not require mitigation.
- Minor: Changes would be noticeable, although the changes would be small and localized. Conventional mitigation measures may be necessary to reduce potential effects.
- Moderate: Changes would be noticeable and have localized and potentially regional scale impacts; historical conditions would be altered. Conventional mitigation measures may be necessary to reduce potential effects.
- Major: Changes would be noticeable and would have substantial consequences on a local and/or regional level. Mitigation measures to offset the effects would be required to reduce impacts, although long-term changes to the resource would be possible.

2.2 VIA Scoping Questionnaire

Following FHWA guidelines on Visual Impact Assessments, the VIA Scoping Questionnaire was completed in order to determine the appropriate level of the VIA documentation. A complete copy of this questionnaire is provided below. The response to each question has a corresponding value between 0 and 3, resulting in an overall score between 6 and 30. This questionnaire was completed for the Future I-57 project and resulted in

an overall score of 14. Consistent with FHWA guidelines, a score of 10 to 14 recommends the preparation of a brief visual impact assessment in memo format. This memo follows the recommended level of assessment.

Environmental Compatibility

1. *Will the project result in a noticeable change in the physical characteristics of the existing environment?* (Consider all project components and construction impacts - both permanent and temporary, including landform changes, structures, noise barriers, vegetation removal, railing, signage, and contractor activities.)

☐ High level of permanent change (3)
☒ Moderate level of permanent change (2)
☐ Low level of permanent or temporary change (1)
☐ No Noticeable Change (0)

2. *Will the project complement or contrast with the visual character desired by the community?* (Evaluate the scale and extent of the project features compared to the surrounding scale of the community. Is the project likely to give an urban appearance to an existing rural or suburban community? Do you anticipate that the change will be viewed by the public as positive or negative? Research planning documents or talk with local planners and community representatives to understand the type of visual environment local residents envision for their community.)

☐ Low Compatibility (3)
☒ Moderate Compatibility (2)
☐ High compatibility (1)

3. *What level of local concern is there for the types of project features (e.g., bridge structures, large excavations, sound barriers, or median planting removal) and construction impacts that are proposed?* (Certain project improvements can be of special interest to local citizens, causing a heightened level of public concern, and requiring a more focused visual analysis.)

☐ High concern (3)
☐ Moderate concern (2)
☐ Low concern (1)
☒ Negligible Project Features (0)

4. *Is it anticipated that to mitigate visual impacts, it may be necessary to develop extensive or novel mitigation strategies to avoid, minimize, or compensate for adverse impacts or will using conventional mitigation strategies, such as landscape or architectural treatment adequately mitigate adverse visual impacts?*

☐ Extensive Non-Conventional Mitigation Likely (3)
☐ Some non-conventional Mitigation Likely (2)
☐ Only Conventional Mitigation Likely (1)
☒ No Mitigation Likely (0)

5. *Will this project, when seen collectively with other projects, result in an aggregate adverse change (cumulative impacts) in overall visual quality or character?* (Identify any projects [both state and local] in the area that have been constructed in recent years and those currently planned for future construction. The window of time and the extent of area applicable to possible cumulative impacts should be based on a reasonable anticipation of the viewing public's perception.)

☐ Cumulative Impacts likely: 0-5 years (3)
☐ Cumulative Impacts likely: 6-10 years (2)
☒ Cumulative Impacts unlikely (1)

Viewer Sensitivity

1. *What is the potential that the project proposal may be controversial within the community, or opposed by any organized group?* (This can be researched initially by talking with the state DOT and local agency management and staff familiar with the affected community's sentiments as evidenced by past projects and/or current information.)

☐ High Potential (3)
☒ Moderate Potential (2)
☐ Low Potential (1)
☐ No Potential (0)

2. *How sensitive are potential viewer-groups likely to be regarding visible changes proposed by the project?* (Consider among other factors the number of viewers within the group, probable viewer expectations, activities, viewing duration, and orientation. The expected viewer sensitivity level may be scoped by applying professional judgment, and by soliciting information from other DOT staff, local agencies and community representatives familiar with the affected community's sentiments and demonstrated concerns.)

☐ High Sensitivity (3)
☐ Moderate Sensitivity (2)
☒ Low Sensitivity (1)

3. To what degree does the project's aesthetic approach appear to be consistent with applicable laws, ordinances, regulations, policies or standards?

☐ Low Compatibility (3)
☐ Moderate Compatibility (2)
☒ High compatibility (1)

4. *Are permits going to be required by outside regulatory agencies (i.e., Federal, State, or local)?* (Permit requirements can have an unintended consequence on the visual environment. Anticipated permits, as well as specific permit requirements - which are defined by the permitter, may be determined by talking with the project environmental planner and project engineer. Note: coordinate with the state DOT representative responsible for obtaining the permit prior to communicating directly with any permitting agency. Permits that may benefit from additional analysis include permits that may result in visible built features, such as infiltration basins or devices under a storm water permit or a retaining wall for wetland avoidance or permits for work in sensitive areas such as coastal development permits or on Federal lands, such as impacts to Wild and Scenic Rivers.)

☒ Yes (3)
☐ Maybe (2)
☐ No (1)

5. *Will the project sponsor or public benefit from a more detailed visual analysis in order to help reach consensus on a course of action to address potential visual impacts?* (Consider the proposed project features, possible visual impacts, and probable mitigation recommendations.)

☐ Yes (3) ☒ Maybe (2)
☐ No (1)

Total Project Score: 14

Determining the Level of Visual Impact Assessment

Totaling the scores for the 10 questions above results in a sum ranging from 6 to 30. The total score of the answers for the Future I-57 project was 14. Per FHWA guidance, the total score from the questionnaire is used as an indicator of the appropriate level of VIA documentation necessary to address visual issues. Projects generating a questionnaire score between 10 and 14 are recommended to prepare a *VIA Memorandum* addressing minor visual issues that indicates the nature of the limited impacts and any necessary mitigation strategies that should be implemented.

Preparation of a VIA Memorandum is consistent with the project teams' professional judgments. Due to the rural nature of the region, the project has relatively few neighbors and travelers. Additionally, during the public involvement meet held from August 13-September 2, 2020, no concerns related to visual impacts, visual quality, or visual resources were expressed and approximately 90% of the respondents believe the project is needed. However, some individuals in Corning have voiced opposition against Alternative 3 based on economic concerns.

2.3 Data Collection and Impact Assessment

Aerial photography and street views (albeit at limited availability) of the alternative alignments were initially used to become familiar with the project landscape and identify viewers that may be affected by the proposed project. Topographic maps and land cover data were also inspected to provide a detailed understanding of landforms, water bodies, recreational areas, land use, and roadways within the project area.

The project's viewshed was confirmed through the field visit conducted on March 1-4, 2021. The typical viewshed of each alternative extends, if unobstructed, up to a quarter mile as most features within these extents were visible due to no large elevation differences. The field visit also allowed visualization of the project landscape and further assessment of visual impacts. Each action alternative was visually inspected, and photographs of the visual resources and neighbors were taken. Residential and commercial properties that would require relocation as a result of the proposed project are not considered in this VIA.

Chapter 3 – Visual Impact Assessment

3.1 Existing Visual Character

The project's area of visual effect (AVE) occurs within a flat, rural landscape in northeast Arkansas. Extensive agricultural practices throughout the region have created a patchwork-like and largely homogenous landscape bisected by a few long and linear cultural resources such as transportation infrastructure and a railroad. Elevations range from approximately 253 to 299 feet above mean sea level. Long distance views are uncommon due to a combination of elevation uniformity and the screening effect of wooded areas located along riparian zones and transportation features. Few native natural areas exist, although the large river in the area (Black River) acts as a vegetated deciduous corridor located between Alternatives 2 and 3. Other narrow wooded riparian zones are present within the project area as well. These wooded areas consist primarily of bottomland hardwood forest and are dense at some locations. The landscape through which the proposed improvements occur is considered representative, or typical, of what occurs across the region, and is therefore not considered to be aesthetically or visually unique. There are no officially designated scenic areas or visually sensitive resources in the project area. The typical viewshed of each alternative extended up to a quarter mile as most features within these extents were visible if unobstructed. The existing visual character of each alternative was assessed within these typical limits of sight. The existing visual character of each alternative is described below and includes photographs showing key views of travelers and neighbors.

Alternative 2

Alternative 2 extends approximately 39.2 miles from Walnut Ridge northeast to the Missouri state line. As Alternative 2 would construct an entirely new roadway on new location, no project visual resources currently exist.

Cultural visual resources that would be visible by travelers along the Alternative 2 corridor include existing structures (residential and commercial buildings, grain bins/silos, and barns), six cemeteries, the Union Pacific Railroad (UPRR), and other linear transportation features such as local roads and county roads throughout the project area. Additionally, Alternative 2's starting point in Walnut Ridge includes the Hwy. 67/Hwy. 412 interchange (**Figure 3**). Alternative 2 also crosses existing Hwy. 67 west of and north of Corning (see **Figure 4** for the northern crossing and **Figure 5** for the western crossing).

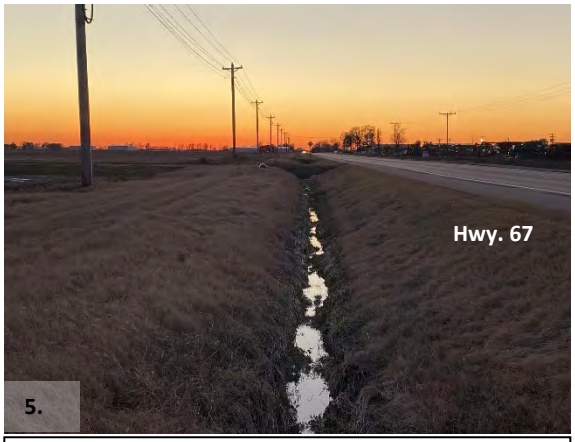
Figure 3: Existing Hwy. 67 at the Hwy. 67/Hwy. 412 Interchange at Start of Alternatives 2 and 3

View of the existing Hwy. 67 at the Hwy. 67/Hwy. 412 interchange. Photograph 1 was taken below the Hwy. 412 overpass at the beginning point of Alternatives 2 and 3; facing northeast. Photograph 1 also shows a lane of Hwy. 67 that is currently closed but would be extended by the proposed project. The Hwy. 67 southbound ramp is located nearby but not visible in the photograph. Photograph 2 was taken between the Hwy. 67 northbound ramp from Hwy. 67 and the Hwy. 67 northbound on ramp from Hwy. 412. This photograph shows the view a future traveler would have when facing east along the alignment of Alternative 2 or 3.

Figure 4: Residential Area North of Corning where Alternatives 2 and 3 Cross Hwy. 67

Photograph 3 shows the view from a potential Alternative 2 and 3 traveler of the existing agricultural field that is located on the west side of Hwy. 67. Alternatives 2 and 3 would cross this field. Photograph 4, which was taken facing northeast along the proposed alignment of Alternatives 2 and 3, shows the view from a potential Alternative 2 and 3 traveler of typical low-density residential areas that are scattered along Hwy. 67. The homes visible in the photograph would be relocated by the proposed project. Alternatives 2 and 3 would construct an interchange at this location.

Figure 5: Commercial Area West of Corning where Alternatives 2 and 3 Cross Hwy. 67



View from the south side of Hwy. 67 facing west toward a commercial property on the north side of Hwy. 67 and surrounding agricultural fields. This is a potential traveler's view from Alternatives 2 and 3.

Figure 6: Williams Cemetery Located West of Alternatives 2 and 3

View from intersection of CR 152 and the proposed alignment of Alternatives 2 and 3 (i.e., future travelers' views). Photograph taken facing west using a telephoto lens with Williams Cemetery in the background.

Neighboring structures along the proposed Alternative 2 route would afford partial or complete views of the proposed roadway and in turn would be visible to travelers. It is estimated that the Alternative 2 may be at least partially visible to approximately 63 residential neighbors, four commercial neighbors, 12 farming operations, and from six cemeteries. Dunn Cemetery is located 3.1 miles southwest of Biggers off Windmill Road and is approximately 0.17 mile from Alternative 2's alignment. Hite Cemetery is located 2.4 miles southwest of Biggers, adjacent to the east side of Hite Road, and is approximately a 0.09-mile from the Alternative 2 interchange at Windmill Road. Luttrell Cemetery is located 1.4 miles south-southeast of Biggers, 0.23 mile east of Hite Road, and is estimated to be approximately 0.10 mile from Alternative 2's alignment. Lawnbird Cemetery is located 1.3 miles southeast of Biggers, 0.09 mile west of an unnamed dirt road, and is approximately 0.13 mile from Alternative 2's alignment. Old Reyno Cemetery is located 2.2 miles south-southwest of Reyno, 130 feet east of Duck Levee Road, and is approximately 0.17 mile from the Alternative 2 interchange at Duck Levee Road. Williams Cemetery, which is also within Alternative 3's viewshed, is located on CR 152 and is approximately 0.16 mile from Alternative 2 and 3's alignments (**Figure 6**).

All residential neighbors are single-family homes, with rural structures scattered through the AVE associated with the surrounding agricultural fields. Many of the residences appear orderly and feature trees, grassy lawns, and other conventional landscaping elements. However, most of these rural residences also have multiple adjacent or nearby outbuildings such as barns, grain bins, or sheds. Some of the farming operations within the AVE appear disorderly due to their multiple outbuildings and scattered equipment. Existing infrastructure, much of which are unpaved county roads, lacks curbs and gutters and sidewalks, and may be perceived as disorderly.

Natural visual resources that would be visible by travelers along the Alternative 2 corridor primarily include farmland. As wooded areas are relatively sparse within the project area, the vast expanses of agricultural fields would afford often complete views of the proposed roadway and in turn would be visible to travelers. While individual farmstead views would be considered harmonious, the extreme uniformity and repetitiousness of

land use conveys an inharmonious element to the scene. The Black River Wildlife Management Area (WMA) is approximately 400 feet from Alternative 2 at its closest location. This WMA represents a natural visual resource and portions of the WMA are within the viewshed of Alternative 2. However, there are no building structures, public gathering areas, or other recreational establishments within the visible portions of the Black River WMA. One large perennial river, the Black River, lined with forested wetlands and floodplains is also present within the AVE. Alternative 2 would cross the Black River on new location east of Pocahontas; visual impacts are provided in the following section. Several other small watercourses are present in the AVE, but many are not visible simply because there are no neighbors present. A few stock ponds, small patches of wooded areas, and agricultural ditches are also present throughout the AVE. The foreground of Photograph 9 below shows a typical agricultural ditch within the AVE. The overall existing character of Alternative 2 is depicted in **Figures 3-8**, which show photographs of representative, existing views along the Alternative 2 alignment.

Figure 7: Rural Residential Area NE of Walnut Ridge within Alternative 2 Corridor

Photograph 7 shows the view from a potential Alternative 2 traveler of an existing residential property. Photograph taken facing north. Photograph 8 shows the existing view of Hwy. 34 as seen by the residential property in photograph 7 when looking southwest. Alternative 2 would cross this roadway. Photograph 9 shows the view from a potential Alternative 2 traveler of surrounding agricultural fields. Photograph taken facing north.

Figure 8: Rural Farmstead in Clay County within Alternative 2 Corridor

Photograph 10, taken facing west, shows view from a potential Alternative 2 traveler of an existing farming operation. Photograph 11 shows the existing view of the field south of the farming operation, as seen by the farming operation in photograph 10. Alternative 2 would cross this field. Photograph 12 shows view from a potential Alternative 2 traveler of surrounding agricultural fields. Photograph taken facing northeast along proposed Alternative 2 alignment.

Alternative 3

Alternative 3 extends approximately 40.5 miles from Walnut Ridge northeast to the Missouri state line. As Alternative 3 would construct an entirely new roadway on new location, no project visual resources currently exist.

Cultural visual resources that would be visible by travelers along the Alternative 3 corridor include existing structures (residential buildings, grain bins/silos, and barns), two cemeteries, the UPRR, and other linear transportation features such as local roads and county roads throughout the project area. Additionally, Alternative 3's starting point in Walnut Ridge includes the Hwy. 67/Hwy. 412 interchange (**Figure 3**). Alternative 3 also crosses existing Hwy. 67 west of and north of Corning (see **Figure 4** for the northern crossing and **Figure 5** for the western crossing). Neighboring structures would afford partial or complete views of the proposed roadway and in turn would be visible to travelers. It is estimated that Alternative 3 may be at least partially visible to approximately 79 residential neighbors, five commercial neighbors, nine farming operations, and from three cemeteries. Alternative 3 would be located adjacent to Bond Cemetery, which is shown in **Figure 9**, but would be separated by CR 250. Gilchrist Cemetery is located east of Knobel, approximately a 0.15-mile southwest of the intersection of Hwy. 90 and CR 227, and would be located within a proposed interchange. Williams Cemetery, which is also within Alternative 2's viewshed, is located on CR 152 and is approximately 0.16 mile from Alternative 2 and 3's alignments (**Figure 6**).

Figure 9: Bond Cemetery Located East of Alternative 3

View of Bond Cemetery facing north on CR 250 (potential Alternative 3 travelers' views). Alternative 3 would be located to the west of this cemetery and run parallel to CR 250.

All residential neighbors are single-family homes, with rural structures scattered through the AVE associated with the surrounding agricultural fields. Many of the residences appear orderly and feature trees, grassy lawns, and other conventional landscaping elements. However, most of these rural residences also have multiple adjacent or nearby outbuildings such as barns, grain bins, or sheds. Some of the farming operations within the AVE appear disorderly due to their multiple outbuildings and scattered equipment. Existing infrastructure, much of which are unpaved county roads, lacks curbs and gutters and sidewalks, and may be perceived as disorderly.

Natural visual resources that would be visible by travelers along the Alternative 3 corridor primarily include farmland. As wooded areas are relatively sparse within the project area, the vast expanses of agricultural fields would afford often complete views of the proposed roadway and in turn would be visible to travelers. While individual farmstead views would be considered harmonious, the extreme uniformity and repetitiousness of land use conveys an inharmonious element to the scene. One large perennial river, the Black River, narrowly lined with forested wetlands is also present within the AVE. Alternative 3 would cross the Black River on new location south of Corning; visual impacts are provided in the following section. Several other small watercourses are present in the AVE, but many are not visible simply because there are no neighbors present. A few stock ponds, small patches of wooded areas, and agricultural ditches are also present throughout the AVE.

The overall existing character of Alternative 3 is also depicted in **Figures 10-12**, which show photographs of representative, existing views along the Alternative 3 alignment.

Figure 10: Rural Residential Area NE of Walnut Ridge within Alternative 3 Corridor

Photograph 14, taken facing west, shows the view from a potential Alternative 3 traveler of existing residential properties along Hwy. 231. Photograph 15 shows the view from a potential Alternative 3 traveler of surrounding agricultural fields and residential properties. Photograph taken from Hwy. 231 facing southwest along proposed Alternative 3 alignment. Photograph 15 also shows the existing view of the agricultural field, as seen by surrounding residential properties.

Figure 11: Rural Residential Areas South of Knobel where Alternative 3 Crosses CR 216 & CR 222

Photograph 16, taken facing south, shows the view from a potential Alternative 3 traveler of surrounding agricultural fields and adjacent agricultural ditch along CR 216. Photograph 17, taken facing south, shows the view from a potential Alternative 3 traveler of an existing residence on CR 222. Alternative 3 would nearly perpendicularly cross both CR 216 and CR 222.

Figure 12: Rural Residential Areas Northeast of Knobel within Alternative 3 Corridor

Photograph 18, taken facing northeast, shows the view from a potential Alternative 3 traveler of an existing residential property. Photograph 19 shows the existing view of the agricultural field and the UPRR seen by the residential property in photograph 8 when looking west. This photograph also represents the view from a potential Alternative 3 traveler when looking west. Alternative 3 would be located within this field and run parallel to the UPRR.

Alternative A

Alternative A extends north-northwest approximately 2.5 miles from the terminal ends of Alternatives 2 and 3 to the west side of Hwy. 67. As the proposed four-lane highway for Alternative A would construct an entirely new roadway on new location, no project visual resources currently exist.

Cultural visual resources that would be visible by travelers along Alternative A include existing structures such as residential and commercial buildings, barns, and two institutional neighbors, a church located east of Hwy. 67 and the Arkansas Information Center located west of Hwy. 67. These institutional neighbors are surrounding by large parking lots (the church's is unpaved), but also feature some trees and grasses. The information center also has some conventional landscaping elements adjacent to the building and covered public-use pavilions. Alternative A may be at least partially visible to approximately 31 residential neighbors and six commercial neighbors (including a church and travel center). Other cultural visual resources include linear transportation features such as local county roads, driveways, and Hwy. 67. Future travelers along Alternative A would be afforded views of a portion of existing Hwy. 67 at the location where Alternative A crosses Hwy. 67. Many of the residential neighbors visible from Alternative A are located along Hwy. 67. All residential neighbors in the AVE are single-family homes. Most of the residences appear orderly and feature trees, grassy lawns, and other conventional landscaping elements. Additionally, most have multiple adjacent or nearby outbuildings such as barns or sheds. Besides Hwy. 67, existing infrastructure consists of unpaved county roads that lack curbs and gutters, shoulders, and sidewalks, and may be perceived as disorderly.

Natural visual resources that would be visible by travelers along the Alternative A corridor primarily include farmland. As wooded areas are relatively sparse within the project area, the vast expanses of agricultural fields would afford complete views of the proposed roadway and in turn would be visible to travelers. Small patches of wooded areas and agricultural ditches are also present along the Alternative A corridor.

The overall existing character of Alternative A is depicted in **Figures 13-17**, which show photographs of representative, existing views along the Alternative A alignment.

Figure 14: Rural Residential Areas within Alternative A and Alternative B Viewsheds

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Photograph 20, taken facing east, shows the view from a potential Alternative A or B traveler of an existing residential property located on CR 154. Photograph 21 shows the agricultural field seen by the residential property in photograph 20 when looking south. This photograph also represents the view as seen from a potential Alternative A or B traveler. Photograph 22, taken facing south, shows the view from a potential Alternative A or B traveler of an agricultural field located south of State Line Road (CR 278).

Figure 13: Visual Resources Visible by Alternative A (1 of 2)

23.

24.

Photograph 23, taken facing southwest, shows the view from a potential Alternative A traveler of the Arkansas Information Center located on the west side of Hwy. 67. Photograph 24 shows the existing view of Hwy. 67 as seen by Hwy. 67 travelers and as seen from the Arkansas Information Center looking northeast. This photograph also shows the location where Alternative A would perpendicularly cross Hwy. 67.

Figure 15: Visual Resources Visible by Alternative A (2 of 2)

Photograph 25, taken facing east, shows view from an existing Hwy. 67 traveler and a potential Alternative A traveler of a residential property located along Hwy. 67. Photograph 26 shows the existing view of Hwy. 67 as seen by existing and potential travelers looking south. This photograph also shows existing views of the roadway as seen by residential neighbors. Photograph 26 also shows the location where Alternative A would perpendicularly cross Hwy. 67.

Figure 16: Visual Resources Visible by Alternatives A, B, and C (1 of 2)

Photograph 27, taken facing east, shows view from an existing CR 155 traveler and a potential Alternative C traveler of a farming operation. This facility would be relocated by Alternatives A and B. Photograph 28 shows the existing view of an agricultural field as seen by existing CR 155 travelers and potential Alternative A, B, and C travelers looking southwest.

Figure 17: Visual Resources Visible by Alternatives A, B, and C (2 of 2)

Photograph 29, taken facing southeast, shows view from an existing CR 154 traveler and a potential Alternative A, B, or C traveler of a residential parcel. Alternatives A and B would be located within the field shown in the foreground. Photograph 30, taken facing northeast, shows the existing view of a field and homestead in the distance as seen by existing CR 154 travelers and potential Alternative B or C travelers.

Alternative B

Alternative B begins at the terminal end of Alternatives 2 and 3, extends northeast on new alignment for 1.8 miles, then extends north along Hwy. 67 for 0.5 mile to the Missouri state line. Alternative B would widen existing Hwy. 67 for 0.5 mile. Existing project visual resources within the Alternative B corridor consist of Hwy. 67, which typically has two 12-foot-wide lanes, 8-foot-wide paved shoulders, and a 100-foot-wide ROW on average. Many of the structural elements visible along Hwy. 67 are gray, tan, or brown in color and would be considered coherent with their surroundings. These project visual resources are comprised of galvanized metal (signage), concrete (roadway), or wood (utility poles).

Cultural visual resources that would be visible by travelers along the Alternative B corridor include existing structures (residential and retail), driveways, and other linear transportation features such as local crossroads. Some neighboring structures afford partial or complete views of existing Hwy. 67 and are in turn visible to existing Hwy. 67 travelers. The residential neighbors in the AVE are single-family homes primarily clustered along Hwy. 67 and some appear to be associated with the surrounding agricultural fields. Most of the residences feature trees, grassy lawns, and other conventional landscaping elements, but also have adjacent or nearby outbuildings such as barns and/or sheds. While some residential neighbors are perceived as orderly, others appear disorderly due to their differing styles and sizes, outbuildings, and because of their sporadic placements. Once constructed, Alternative B may be at least partially visible to approximately 25 residential neighbors and one retail neighbor. The retail property (a fruit stand) lacks an architecturally uniform appearance and has no landscaping. Existing infrastructure within Alternative B's AVE, which includes Hwy. 67, typically lacks curbs and gutters and sidewalks, and may be perceived as disorderly.

Natural visual resources that would be visible by travelers along the Alternative B corridor primarily include farmland located immediately adjacent to Hwy. 67 or behind the residential properties. As wooded areas are relatively sparse within the project area, the vast expanses of agricultural fields would afford often complete views of the proposed roadway and in turn would be visible to travelers. Small patches of wooded areas, agricultural ditches, and a small pond are also present along the Alternative B corridor.

The overall existing character of Alternative B is depicted in **Figure 14**, **Figure 16**, and **Figure 17**, which show photographs of representative, existing views along the Alternative B alignment.

Alternative C

Alternative C extends northeast approximately 2.8 miles from the terminal ends of Alternatives 2 and 3 to the east side of Hwy. 67. As the proposed four-lane highway for Alternative C would construct an entirely new roadway on new location, no project visual resources currently exist.

Cultural visual resources that would be visible by travelers along the Alternative C corridor include existing structures (residential buildings and barns) and other linear transportation features such as local crossroads. Alternative C may be at least partially visible to approximately 20 residential neighbors, one farming operation, and three commercial/retail neighbors. All of the residential neighbors are single-family, rural structures scattered through the corridor and are likely associated with the surrounding agricultural fields. Most of the residences appear orderly and feature trees, grassy lawns, and other conventional landscaping elements. Additionally, most have multiple adjacent or nearby outbuildings such as barns or sheds. The commercial/retail properties include a mechanic shop and fueling stations. These facilities lack architecturally uniform appearances, have no landscaping, and generally appears disorderly. Existing infrastructure consists of unpaved county roads that lack curbs and gutters, shoulders, and sidewalks, and may be perceived as disorderly.

Natural visual resources that would be visible by travelers along the Alternative C corridor primarily include farmland. As wooded areas are relatively sparse within the project area, the vast expanses of agricultural fields would afford often complete views of the proposed roadway and in turn would be visible to travelers. Small patches of wooded areas and agricultural ditches are also present along the Alternative C corridor.

The overall existing character of Alternative C is depicted in **Figure 16**, **Figure 17**, and **Figure 18**, which show photographs of representative, existing views along the Alternative C alignment.

Figure 18: Rural Residential Areas within Alternative C Corridor

Photograph 31, taken facing north, shows a typical view from an Alternative C traveler of an existing residential property and agricultural fields along CR 181. Alternative C would be located roughly perpendicular to CR 181. Photograph 32 shows the view as seen by existing State Line Road (CR 278) travelers and nearby neighbors when looking northwest toward businesses along Hwy. 67. This photograph also shows the view as seen by potential travelers of the terminal end of the Alternative C corridor.

3.2 Permanent Impacts

All action alternatives would permanently create new or additional infrastructure that would change neighbors' and travelers' visual resources. The impact of these changes to visual quality was assessed based on

standard visual preferences of various neighbor groups (as described in Chapter 2), combined with viewer exposure and sensitivity.

Alternatives 2, 3, A, and C

Project visual resource impacts consist of the creation of new infrastructure, including proposed bridges and interchanges, that are not currently present and would alter the current appearances of Alternative 2, 3, A, and C corridors. As described in Chapter 1 and shown in **Figure 2**, proposed project visual resources include a four-lane divided highway to be constructed with a depressed grass median within an approximately 400-foot-wide ROW. In addition to improving safety, the divided grass median is considered a visual streetscape enhancement and would be seeded with a wildflower seed mix. Overall, the proposed project's scale and form (i.e., cross sections) and materials (i.e., construction materials) are compatible with the visual character of the project environment. Project visual resources uncommon in the area would not be introduced. As applicable, local planning and development guidelines would be taken into consideration during final design to ensure visual compatibility of the Selected Alternative. Based on the factors described above, the project visual resources of Alternatives 2, 3, A, and C are predicted to be beneficial to the existing overall visual character of the project area.

Alternatives 2, 3, A, and C would also alter cultural and natural visual resources. Although landforms would not be noticeably altered, the addition of a roadway would introduce new infrastructure to nearby residential neighbors and would create new views for potential travelers. Traveler views along these new location alternatives are anticipated to be beneficial by granting users exposure to previously unseen harmonious natural visual resources. Construction along these new location sections would modify visual resources for neighbors and future travelers by removing some existing structures and replacing farmland, some trees, and vegetation with infrastructure or ROW. Additionally, Alternatives 2 and 3 would each construct a new bridge over the Black River. The heights of these proposed bridge structures would increase neighbors' views of them. Although only five residential neighbors are within 1 mile of the proposed Alterative 2 bridge and none are present at the Alternative 3 bridge location. The proposed bridge structures would expand travelers' views of the surrounding area, which is almost exclusively undeveloped, harmonious natural areas including the river and forested wetlands. The proposed bridge over the Black River for Alternative 2 would make the Black River WMA more visible to travelers for Alternative 2. These new elevated structures would represent a moderate change from the project area's existing visual character. Other bridges and interchanges are proposed along these alternatives and are anticipated to have similar visual impacts as the proposed bridge over the Black River. Farmland reduction is anticipated to result in only minor adverse changes to viewer exposure or awareness as its abundance within the project area makes it unlikely that changes are discernable. The increased visibility of the Black River WMA is anticipated to be a minor beneficial change to travelers. The addition of a roadway near the Black River WMA is anticipated to result in only minor adverse changes to users of the Black River WMA as viewer exposure is anticipated to be very low. The visible portions of the Black River WMA contain only dense wooded areas and wetlands. There are no building structures, public gathering areas, or other recreational establishments within the visible portions of the Black River WMA. Overall viewer sensitivity to alterations to cultural and natural visual resources is anticipated to be low as viewer exposure is low (i.e., there are few project neighbors present to detect changes), viewer awareness is low to moderate (i.e., the proposed improvements are not unique to the region), travelers would be moving quickly along the roadway, and the uniformity in elevation limits the distance that changes are visible. Depending on viewer sensitivity, visual quality impacts are anticipated to range from neutral to adverse for the cemeteries within the corridors of Alternatives 2 and 3. For the institutional neighbor (i.e., the Arkansas Information Center and the church) within the corridors of Alternatives A and B, visual quality impacts may be beneficial due to increased visible and exposure to travelers. Permanent adverse impacts are anticipated for the few residential neighbors for whom exposure would be substantially increased. Visual quality impacts are anticipated to be beneficial for most travelers.

Alternative B

Project visual resource impacts consist of widening approximately a 0.5-mile of Hwy. 67 along its existing alignment and adding an interchange and frontage roads that were not previously present. These proposed visual resources would alter the current appearance of the Alternative B corridor. As described in Chapter 1 and shown in **Figure 2**, proposed project visual resources include construction of a four-lane divided highway with a depressed grass median within an approximately 400-foot-wide ROW. The proposed improvements would add additional pavement and ROW to the existing Hwy. 67 facility. These proposed improvements would result in similar project visual resource impacts as described for the other four action alternatives and the proposed project's scale, form, and materials are also compatible and coherent with the visual character of the existing environment. Project visual resources uncommon in the area would not be introduced. Based on the factors described above, the project visual resources of Alternative B are predicted to be beneficial for viewers to the existing overall visual character of the project area.

Alternative B would also alter cultural and natural visual resources. Along the approximately 1.8 miles on new alignment, the addition of a roadway would introduce new infrastructure to nearby residential neighbors and would create new views for potential travelers. Construction along these new location sections would modify visual resources by removing some existing structures and replacing farmland, some trees, and vegetation with infrastructure or right of way. Along the approximately 0.5-mile on existing alignment, the increase in roadway width and profile would modify the appearance of the existing roadway and would represent a minor change from the project area's existing visual character. Removing some existing structures and clearing adjacent farmland and vegetation along Alternative B would also alter the project corridors' current appearances. Proposed improvements to the existing Hwy. 67 facility would enhance the corridor by adding desirable coherent visual resources such as the grass median. The addition of frontage roads along those areas where access must be restored to existing properties would add coherent visual resources along each side of Hwy. 67. Farmland reduction is anticipated to result in only minor adverse changes to viewer exposure or awareness as its abundance within the project area makes it unlikely that changes would be discernable. Few impacts to other natural visual resources are anticipated. As a result of widening the roadway, some residential project neighbors along existing Hwy. 67 would be in closer proximity to the roadway and would have a more direct view of the roadway. However, the proximity of any structure would not exceed interstate safety standards. For all neighbors, the proposed improvements would be coherent with existing facilities and compatible with surrounding land development principles. Nevertheless, impacts may be adverse for residential neighbors for whom views of the roadway would become prominent. For the retail neighbor, visual quality impacts may be beneficial due to its increased visible and exposure to travelers. For travelers, Alternative B would not create substantial adverse impacts on visual quality as only minor adverse changes to the natural and cultural environments are anticipated.

3.3 Temporary Impacts

Construction of all action alternatives would result in the short-term presence of construction vehicles and equipment, grading and excavation, and vegetation clearing throughout the project area. For Alternatives 2, 3, A, and C, project construction would only be visible if an existing roadway or neighbor were present. Thus, much of the temporary impacts along these four alternatives would not be discernable due to the lack of viewers. For Alternative B, which partially occurs along existing Hwy. 67, temporary construction impacts would be much more visible due to the presence of more viewers (existing travelers and site-specific neighbors). Where discernable, a temporary change in the visual character of the project corridor would result from grading and excavation activities and the presence of construction vehicles and equipment. The temporary presence of construction vehicles and equipment is not expected to result in a substantially adverse response by typical viewers and would be localized to viewers for whom exposure would be increased. Ground disturbance impacts along proposed ROW would be short/medium-term until new vegetation becomes

established. These temporary visual impacts would be minor and not expected to result in an adverse response by typical viewers.

3.4 Avoidance, Minimization, and/or Mitigation Measures

Best management practices including reseeding, natural re-vegetation, and erosion prevention would aid in reducing visual impacts along the route while meeting the project objectives. Impacts to existing vegetation within the project area would be minimized through revegetation efforts as part of the process to ensure that biological resources are not adversely affected. The proposed divided grass median is considered a visual streetscape enhancement and would act as a minimization/mitigation measure for visual impacts. Aesthetic considerations such as "branding" or painting the new bridge in some kind of complementary color would be considered at the time of design. Additional minimization and/or mitigation measures are not anticipated as project visual resources are compatible, viewer exposure is low due to the rural nature of the project area, and the overall changes to visual quality are predominantly neutral.

Chapter 4 – References

Federal Highway Administration (FHWA). 2015. Guidelines for the Visual Impact Assessment of Highway Projects. 104 pages. Available online at: https://www.environment.fhwa.dot.gov/env_topics/other_topics/VIA_Guidelines_for_Highway_Projects.aspx

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U.S. Geological Society (USGS). 2020. 7.5 minute, 1:24,000 scale Corning, AR. Topographic Quadrangle Map.

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U.S. Geological Society (USGS). 2020. 7.5 minute, 1:24,000 scale Peach Orchard, AR. Topographic Quadrangle Map.

U.S. Geological Society (USGS). 2020. 7.5 minute, 1:24,000 scale Pocahontas, AR. Topographic Quadrangle Map.

U.S. Geological Society (USGS). 2020. 7.5 minute, 1:24,000 scale Reyno, AR. Topographic Quadrangle Map.

U.S. Geological Society (USGS). 2020. 7.5 minute, 1:24,000 scale Walnut Ridge, AR. Topographic Quadrangle Map.

U.S. Geological Society (USGS). 2020. 7.5 minute, 1:24,000 scale Walnut Ridge SE, AR. Topographic Quadrangle Map.

Appendix F – Conceptual Stage Relocation Statement

Job No. 100512, Walnut Ridge – Missouri State Line (Future I-57) P.E.

Prepared by Garver for the
Arkansas Department of Transportation
In cooperation with the Federal Hwy Administration

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CONCEPTUAL STAGE RELOCATION STATEMENT

Job 100512
Walnut Ridge-Missouri State Line (Future I-57) P.E.
Lawrence, Green, Randolph, and Clay Counties

March 21, 2023

GENERAL STATEMENT OF RELOCATION PROCEDURE

Persons displaced as a direct result of acquisition for the proposed project will be eligible for relocation assistance in accordance with Public Law 91-646, the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, as amended (The Uniform Act). The Relocation Program provides advisory assistance and payments to minimize the adverse impact and hardship of displacement upon such persons. No lawful occupant shall be required to move without receiving a minimum of 90 days advance written notice. All displaced persons; residential, business, farm, nonprofit organization, and personal property relocatees are eligible for reimbursement for actual reasonable moving costs.

It is the Department's Policy that adequate replacement housing will be made available, built if necessary, before any person is required to move from their dwelling. All replacement housing must be fair housing and offered to all affected persons regardless of race, color, religion, sex or national origin. Construction of the project will not begin until decent, safe and sanitary replacement housing is in place and offered to all affected persons.

There are two basic types of residential relocation payments: (1) Replacement Housing payments and (2) Moving Expense payments. Replacement Housing payments are made to qualified owners and tenants. An owner may receive a payment of up to $31,000.00 for the increased cost of a comparable replacement dwelling. The amount of this payment is determined by a study of the housing market. Owners may also be eligible for payments to compensate them for the increased interest cost for a new mortgage and the incidental expenses incurred in connection with the purchase of a replacement dwelling. A tenant may receive a rental subsidy payment of up to $7,200.00. Tenants may elect to receive a down payment rather than a rental subsidy to enable them to purchase a replacement dwelling. Replacement Housing payments are made in addition to Moving Expense payments.

Businesses, farms, and nonprofit organizations are eligible for reestablishment payments, not to exceed $25,000.00. Reestablishment expense payments are made in addition to moving expense payments. A business, farm, or nonprofit organization may be eligible for a fixed payment in lieu of the moving costs and reestablishment costs if relocation cannot be accomplished without a substantial loss of existing patronage. The fixed payment will be computed in accordance with the Uniform Relocation Act and cannot exceed $40,000.00.

If the displacee is not satisfied with the amounts offered as relocation payments, they will be provided a form to assist in filing a formal appeal. A hearing will be arranged at a time and place convenient for the displacee, and the facts of the case will be promptly and carefully reviewed.

Relocation services will be provided until all persons are relocated or their relocation eligibility expires. The Relocation Office will have listings of available replacement housing and commercial

properties. Information is also maintained concerning other Federal and State Programs offering assistance to displaced persons.

PROJECT SPECIFIC DISPLACEMENTS

Based on preliminary right of way plans and aerial photographs, it is estimated that the alternatives under consideration for the subject project could cause the following displacements and estimated costs:

Alternative 2:

3	Residential Owners	$	120,000.00
1	Residential Tenant	$	12,000.00
1	Landlord Business	$	25,000.00
10	Personal Properties	$	36,500.00
	Total	**$**	**193,500.00**

Alternative 3:

6	Residential Owners	$	240,000.00
3	Residential Tenants	$	75,000.00
3	Landlord Businesses	$	36,000.00
7	Personal Properties	$	31,500.00
	Total	**$**	**382,500.00**

Alternative A:

1	Residential Tenant	$	12,000.00
1	Landlord Business	$	25,000.00
1	Farm Operation	$	40,000.00
1	Personal Properties	$	4,000.00
	Total	**$**	**81,000.00**

Alternative B:

6	Residential Tenant	$	72,000.00
6	Landlord Business	$	150,000.00
1	Business	$	40,000.00
1	Farm Operation	$	40,000.00
11	Personal Properties	$	48,000.00
	Total	**$**	**350,000.00**

Alternative C:

5	Residential Owners	$	200,000.00
1	Residential Tenant	$	12,000.00
1	Landlord Business	$	25,000.00
1	Business	$	40,000.00
5	Personal Properties	$	25,000.00
	Total	**$**	**302,000.00**

The general characteristics of the displacees to be relocated are listed on the Conceptual Stage Relocation Inventory forms in the back of this report.

An available housing inventory was compiled in March 2021 for relocations associated with each alternative. The available housing inventory indicates that within a reasonable proximity of the relocations (an approximate eight-mile radius), the following quantities of replacement dwellings are available for sale:

- at least 10 comparable (i.e., those listed from $50,000 to $150,000) for the relocations at Alternative 2
- at least 24 comparable (i.e., those listed from $50,000 to $150,000) for the relocations at Alternative 3
- at least 22 comparable (i.e., those listed up to $200,000) for Alternatives A, B, and C

No identified residential properties within a reasonable proximity of the residential tenant relocations associated with Alternatives B and C were available for rent at the time of the housing inventory. Two apartment complexes are located within a reasonable proximity, but neither had available units at the time of this inventory. Multiple rental properties were available in the towns of Marmaduke, Paragould, Pocahontas, and Poplar Bluff. At least three developed commercial properties were for sale within a reasonable proximity of the business relocation associated with Alternatives B and C. Additionally, 11-16 vacant land properties were for sale at the time of this inventory within a reasonable proximity to relocations associated with all alternatives. A breakdown of the available properties is as follows:

Residential (For Sale)	# Units Available for Alt. 2	# Units Available for Alt. 3	# Units Available for Alts. A, B & C
$ 0 - 50,000	2	12	9
50,001 - 150,000	10	24	13
150,001 - 250,000	3	8	1
250,001 - 350,000	0	1	0
350,001 and up	1	4	0
Total	**16**	**49**	**23**

Vacant Land (For Sale)	# Units Available for Alt. 2	# Units Available for Alt. 3	# Units Available for Alts. A, B & C
$ 0 - 25,000	3	9	5
25,001 - 50,000	0	3	1
50,001 - 75,000	5	5	0
75,001 - 100,000	0	0	0
100,001 - 200,000	4	7	0
200,001 - 300,000	1	3	2
300,001 and up	3	4	3
Total	**16**	**31**	**11**

Commercial Properties (For Sale)	# Units Available for Alt. B
$ 0 - 100,000	3
Total	**3**

This is a roadway project located between Walnut Ridge, Arkansas and the Missouri state line. The units contained in the housing inventory are in Lawrence, Randolph, Green, Clay, and Butler Counties. The dwellings and number of dwellings are comparable and adequate to provide replacement housing for the families displaced on the project. The housing market should not be detrimentally affected and there should be no problems with insufficient housing at this time. In the event housing cannot be found or can be found but not within the displacees' economic means at the time of displacement, Section 206 of Public Law 91-646 (Housing of Last Resort) will be utilized to its fullest and practical extent.

The replacement property inventory was compiled from data obtained from web sites (such as Zillow, Appartments.com, Rent.com, HomeFinder.com, and EZMLS.com) for the subject area. The dwellings contained in the inventory have been determined to be comparable and decent, safe, and sanitary. The locations of the comparable dwellings are not less desirable in regard to public utilities and public and commercial facilities, are reasonably accessible to the displacees' places of employment, adequate to accommodate the displacees, and in neighborhoods which are not subject to unreasonable adverse environmental factors. It has also been determined that the available housing is within the financial means of the displacees and is fair housing open to all persons regardless of race, color, sex, religion or national origin consistent with the requirements of 49 CFR, Subpart A, Section 24.2 and Title VIII of the Civil Rights Act of 1968.

A commercial property inventory indicated there were at least three developed properties available in the subject area at the time of this inventory. Additionally, as shown in the table above, there are at least 11 vacant land properties for sale within a reasonable proximity of the Alternative B and C business relocation; six of those vacant properties are under $50,000 and could potentially be utilized to accommodate the business relocation. The business displaced on the project may not be able to relocate in the immediate area of their displacement resulting in termination of the operation. It is anticipated that the farm operation displaced by Alternatives A and B would be able to relocate onto adjacent land that would not be purchased for right of way. In order to assist the displaced businesses in relocating, the State will explore all possible sources of funding or other resources that may be available to businesses. Sources that will be considered include: State and Local entities, the Department of Housing and Urban Development, the Economic Development Administration, the Small Business Administration, and other Federal Agencies. Emphasis will be given in providing relocation advisory services to the businesses. Appropriate measures will be taken to ensure that each entity displaced is fully aware of their benefits, entitlements, courses of action that are open to it, and any special provisions designed to encourage businesses and nonprofit organizations to relocate within the same community.

All displacees will be offered relocation assistance under provisions in the applicable FHWA regulations. At the time of displacement another inventory of available housing in the subject area will be obtained and an analysis of the market made to ensure that there are dwellings adequate to meet the needs of all displacees. Also, special relocation advisory services and assistance will be administered commensurate with displacees' needs, when necessary. Examples of these include, but are not limited to, Housing of Last Resort as previously mentioned and consultation with local officials, social and federal agencies, and community groups.

There are no other identified unusual conditions involved with this project.

CONCEPTUAL STAGE RELOCATION INVENTORY

Job No.: 100512 Job Name: Walnut Ridge-Missouri State Line (Future I-57) P.E. Date of Inventory: Mar. 18, 2021

Relo. #	Relocation Type[1]	Name (Owner Name)	Street Name	Square Feet	Value Estimate[2]	Rental Estimate[3]	# of Emp.[4]	Occ. Length[5]
Alternative 2								
1	R/O	Home (H.M. Terry Liv. Trust)	127 Lawrence Rd 409, Lawrence Co.	3,200	$118,800	$1,100		
2	PP	Garage/Shed (H.M. Terry Liv. Trust)	127 Lawrence Rd 409, Lawrence Co.	875				
3	PP	Silo (Jabberwock LTD)	Rural, Randolph Co.	N/A	$36,950			
4	PP	Barn (Baltz)	Brimnage Rd, Randolph Co.	1,000	$61,775			
5	PP	2 Silos (Baltz)	Brimnage Rd, Randolph Co.	N/A				
6	PP	2 Silos (Cole)	CR 109, Clay Co., AR	N/A	$116,100			
7	PP	2 Silos (Wilma Cox Family LTD Partnership)	Rural, Clay Co.	1,300	$336,100			
8	PP	Barn (Goodman)	Rural, Clay Co., AR	2,360	$69,900			
9	R/O	Home (Bauschlicher)	5306 Hwy. 67, Corning	2,002	$72,400	$1,050		
10	PP	Garage/Shed (Bauschlicher)	5306 Hwy. 67, Corning	675				
11	R/O	Home (Davidson)	5424 Hwy. 67, Corning	1,766	$66,500	$986		
12 & 13	R/T + LLBUS	Home (Noel)	5468 Hwy. 67, Corning	2,600	$65,300	$1,100		
14	PP	Barn (Noel)	5468 Hwy. 67, Corning	2,900				
15	PP	Airstrip (Rice)	CR 148, Corning	N/A	$184,750			

Relo. #	Relocation Type[1]	Name (Owner Name)	Street Name	Square Feet	Value Estimate[2]	Rental Estimate[3]	# of Emp.[4]	Occ. Length[5]
Alternative 3								
1	R/O	Home (Brech)	845 Greene 234 Rd, Walnut Ridge	1,590	$40,450	900		
2	PP	Barn (Brech)	845 Greene 234 Rd, Walnut Ridge	600				
3	PP	6 Silos (Dodd)	CR 216, Knobel	N/A	$14,800			
4 & 5	R/T + LLBUS	Manufactured Home (Dodd)	CR 216, Knobel	728		$500		
6	R/O	Home (Hollis)	434 CR 227, Knobel	1,804	$62,650	$995		
7	R/O	Home (Bateman)	2688 Hwy. 90, Knobel	1,766	$63,100	$975		
8 & 9	R/T + LLBUS	Home (Bateman)	17 CR 250, Knobel	852	$48,750	$900		
10	PP	Barn (Townsend)	333 CR 250, Knobel	1,033	$92,850			
11	R/O	Home (Townsend)	333 CR 250, Knobel	2,332		$1,000		
12	R/O	Home (Bauschlicher)	5306 Hwy. 67, Corning	2,002	$72,400	$1,050		
13	PP	Garage/Shed (Bauschlicher)	5306 Hwy. 67, Corning	675				
14	R/O	Home (Davidson)	5424 Hwy. 67, Corning	1,766	$66,500	$986		
15 & 16	R/T + LLBUS	Home (Spence)	5468 Hwy. 67, Corning	2,600	$65,300	$1,100		
17	PP	Barn (Spence)	5468 Hwy. 67, Corning	2,900				
18	PP	Airstrip (Rice)	CR 148, Corning	N/A	$184,750			
19	PP	Abandoned manufactured home (Cloud Nine Inc.)	Near 845 Greene 234 Rd, Walnut Ridge	500	$10,000			
Alternative A								
1	FO	M & M Ahrent Farms LLC	CR 155, Corning	2,332	$139,850		3-4	9
2 & 3	R/T + LLBUS	Home (Ahrent)	798 State Line Rd, Corning	1,675	$230,900	$1,300		
4	PP	Metal Barn/Garage (Taylor)	PO Box 518, Poplar Bluff, MO	1,000	Unknown			

Relo. #	Relocation Type[1]	Name (Owner Name)	Street Name	Square Feet	Value Estimate[2]	Rental Estimate[3]	# of Emp.[4]	Occ. Length[5]
Alternative B								
1	FO	M & M Ahrent Farms LLC	CR 155, Corning	2,332	$139,850		3-4	9
2	PP	Barn (Briney)	932 CR 154, Corning	2,400	$131,900			
3 & 4	R/T + LLBUS	Home (Lafferty)	7106 Hwy. 67, Corning	1,224	$105,850	$1,200		
5	PP	Barn (Lafferty)	7106 Hwy. 67, Corning	1,321				
6	PP	Abandoned warehouse 1 (Dowdy Liv. Trust)	7167 Hwy. 67, Corning	1,536	$71,250			
7	PP	Abandoned warehouse 2 (Dowdy Liv. Trust)	7167 Hwy. 67, Corning	2,455				
8	PP	Abandoned warehouse 3 (Dowdy Liv. Trust)	7167 Hwy. 67, Corning	6,000				
9 & 10	R/T + LLBUS	Home (Haynes Investment Properties LLC)	11 CR 156-1, Corning	1,190	$28,200	$1,050		
11	PP	Abandoned store (Dowdy Liv. Trust)	Hwy. 67, Corning	3,104	$59,450			
12	PP	Abandoned garage (Dowdy Liv. Trust)	Hwy. 67, Corning	3,600				
13	PP	Abandoned business (Tri-State Metal Finishing-Equipment/Shop)	7210 Hwy. 67, Corning	4,512	$68,350			
14	PP	Abandoned business (Tri-State Metal Finishing-Warehouse 1)	7210 Hwy. 67, Corning	1,620				
15	PP	Abandoned business (Tri-State Metal Finishing-Warehouse 2)	7210 Hwy. 67, Corning	900				
16	PP	Abandoned business (Deb's Place-Retail Store)	7210 Hwy. 67, Corning	2,272				
17 & 18	R/T + LLBUS	Home 1 (Haynes Investment Properties LLC)	11 CR 156-1, Corning	1,190	$28,200	$1,050		
19 & 20	R/T + LLBUS	Home 2 (Haynes Investment Properties LLC)	11 CR 156-1, Corning	1,190		$1,050		

Relo. #	Relocation Type[1]	Name (Owner Name)	Street Name	Square Feet	Value Estimate[2]	Rental Estimate[3]	# of Emp.[4]	Occ. Length[5]
21	BUS	Hog Wild Tire & Truck Repair (Emmons)	Hwy. 67 & CR 156, Corning	1,428	$49,550	Owned	4-5	7
22 & 23	R/T + LLBUS	Home (Duhon)	1008 Stateline Rd, Corning	1,380	$32,400	$975		
24 & 25	R/T + LLBUS	Home (Harpole)	1024 Stateline Rd, Corning	1,931	$92,550	$1,150		
Alternative C								
1	R/O	Home (Debord)	1006 CR 154, Corning	1,640	$56,900	$950		
2	PP	Silos (Coleman)	CR 154, Corning	N/A	$49,450			
3	PP	Barn 1(Thompson)	1094 Stateline Rd, Corning	825	$13,650			
4	PP	Barn 2 (Thompson)	1094 Stateline Rd, Corning	1,370				
5	PP	Barn (Cooper)	1158 Stateline Rd, Corning	750	$19,200			
6	PP	Barn (Cooper)	1158 Stateline Rd, Corning	672				
7	R/O	Manufactured Home (Cooper)	1158 Stateline Rd, Corning	980		$750		
8	R/O	Home (Woodruff)	County Road 278, Neelyville, MO	2,000	Unknown			
9	R/O	Home (Hardin)	2419 County Road 278, Neelyville, MO	2,643	Unknown			
10 & 11	R/T + LLBus	Home (Harpole)	1024 State Line Rd, Corning	1,931	$92,550	$1,150		
12	R/O	Home (Duhon)	1008 State Line Rd, Corning	1,380	$32,400	$975		
13	BUS	Hog Wild Tire & Truck Repair (Emmons)	Hwy. 67 & CR 156, Corning	1,428	$49,550	Owned	4-5	7

[1] Relo. Type:

R/O	Residential Owner	FO	Farm Operation
R/T + LLBUS	Residential Tenant and Landlord Business	NPO	Nonprofit Organization
BUS	Business	PP	Personal Property

[2] Value estimate of the entire parcel based the total appraised value of land and improvements as identified through the County Assessor (via AR County Data)

[3] Monthly rental cost based on estimates from websites such as Zillow, or from comparable properties

[4] Number of employees (based on interviews with owners or from websites such as dnb.com)

[5] Occupancy in years (based on interviews with owners or from websites such as dnb.com)

CONCEPTUAL STAGE RELOCATION INVENTORY

Job No.: 100512 Job Name: Walnut Ridge-Missouri State Line (Future I-57) P.E. Date of Inventory: Mar. 18, 2021

Alternative 2

Relocation Type	Number	Property Values or Residential Rental Rates*	Employees Affected (Range)
Residential Owner	3	$90,000.00 - $146,000.00	N/A
Residential Tenant	1	$1,100.00	N/A
Landlord Business	1	$95,000.00	N/A
Business	0	N/A	N/A
Farm Operation	0	N/A	N/A
Nonprofit Organization	0	N/A	N/A
Personal Property	10	N/A	N/A
Totals	14	N/A	Unknown

Alternative 3

Relocation Type	Number	Property Values or Residential Rental Rates*	Employees Affected (Range)
Residential Owner	6	$74,000.00 – $111,000.00	N/A
Residential Tenant	3	$900.00 – $1,100.00	N/A
Landlord Business	3	$49,000.00 – $95,000.00	N/A
Business	0	N/A	N/A
Farm Operation	0	N/A	N/A
Nonprofit Organization	0	N/A	N/A
Personal Property	7	N/A	N/A
Totals	16	N/A	Unknown

Alternative A

Relocation Type	Number	Property Values or Residential Rental Rates*	Employees Affected (Range)
Residential Owner	0	N/A	N/A
Residential Tenant	1	$1,300.00	N/A
Landlord Business	1	$190,000.00	N/A
Business	0	N/A	N/A
Farm Operation	1	$139,850.00	Unknown
Nonprofit Organization	0	N/A	N/A
Personal Property	0	N/A	N/A
Totals	2	N/A	Unknown

Alternative B

Relocation Type	Number	Property Values or Residential Rental Rates*	Employees Affected (Range)
Residential Owner	0	N/A	N/A
Residential Tenant	6	$975.00 – $1,200.00	N/A
Landlord Business	6	$32,000.00 – $121,000.00	N/A
Business	1	$50,000.00	4-5
Farm Operation	1	$139,850.00	Unknown
Nonprofit Organization	0	N/A	N/A
Personal Property	11	N/A	N/A
Totals	25	N/A	4-5

Alternative C

Relocation Type	Number	Property Values or Residential Rental Rates*	Employees Affected (Range)
Residential Owner	2	$20,000.00 – $79,000.00	N/A
Residential Tenant	0	N/A	N/A
Landlord Business	0	N/A	N/A
Business	0	N/A	N/A
Farm Operation	0	N/A	N/A
Nonprofit Organization	0	N/A	N/A
Personal Property	5	N/A	N/A
Totals	7	N/A	N/A

* Property value estimates based on the total appraised value of land and improvements for the entire parcel as identified through the County Assessor (via AR County Data). Property value estimates and estimated residential rental rates also assessed using websites such as Zillow, or from comparable properties.

Appendix G – Supplementary Regulatory Context on Environmental Justice Analysis

Job No. 100512, Walnut Ridge – Missouri State Line (Future I-57) P.E.

Prepared by Garver for the
Arkansas Department of Transportation
In cooperation with the Federal Hwy Administration

This report was funded in part by the Federal Hwy Administration, U.S. Department of Transportation. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.

Environmental Justice (EJ) Regulatory Context Memo

The purpose of this memo is to provide supplemental information used to inform the analysis of Environmental Justice (EJ) and Title VI populations with regard to the proposed project. This document is not intended to be a standalone document.

This memo only provides regulatory context information with regard to the EJ and Title VI analysis.

1.1 Executive Order 12898

Executive Order (EO) 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations – directs federal agencies to "achieve environmental justice by identifying and addressing disproportionately high and adverse human health and environmental effects including the interrelated social and economic effects of their programs, policies, and activities on minority populations and low-income populations in the United States."

1.2 DOT Order 5610.2C

According to Department of Transportation (DOT) Order 5610.2C, Environmental Justice is the fair treatment and meaningful involvement of all people, regardless of race, ethnicity, income, national origin, or educational level, with respect to the development, implementation and enforcement of environmental laws, regulations and policies. For the purpose of DOT's Environmental Justice Strategy, fair treatment means that no population, due to policy or economic disempowerment, is forced to bear a disproportionate burden of the negative human health and environmental impacts, including social and economic effects, resulting from transportation decisions, programs and policies made, implemented and enforced at the Federal, State, local or tribal level.

It is the policy of DOT to promote the principles of environmental justice (as embodied in the Executive Order) through the incorporation of those principles in all DOT programs, policies, and activities. This will be done by fully considering environmental justice principles throughout planning and decision-making processes in the development of programs, policies, and activities, using the principles of the National Environmental Policy Act of 1969 (NEPA), Title VI of the Civil Rights Act of 1964 (Title VI), the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, (URA), the Fixing America's Surface Transportation Act, Pub.L. No. 114-94, (FAST Act) and other DOT statutes, regulations and guidance that address or affect infrastructure planning and decision-making; social, economic, or environmental matters; public health; and public involvement.

These requirements will be administered so as to identify, early in the development and planning of the program, policy, or activity, the risk of discrimination and disproportionately high and adverse effects so that positive corrective action can be taken. In implementing these requirements, the following information should be obtained where relevant, appropriate and practical:

- Population served and/or affected by the program, policy, or activity by race, color, national origin, and income level;
- Proposed steps to guard against disproportionately high and adverse effects on persons on the basis of race, color, national origin, and income level;
- Present and proposed membership by race, color, national origin, in any planning or advisory body that is part of the program, policy, or activity.

Statutes governing DOT operations will be administered so as to identify and avoid discrimination and avoid disproportionately high and adverse effects on minority populations and low-income populations by:

1. Identifying and evaluating environmental, public health, and interrelated social and economic effects of DOT programs, policies, and activities.
2. Proposing measures to avoid, minimize and/or mitigate disproportionately high and adverse environmental and public health effects and interrelated social and economic effects, and providing offsetting benefits and opportunities to enhance communities, neighborhoods, and individuals affected by DOT programs, policies, and activities, where permitted by law and consistent with the Executive Order.
3. Considering alternatives to proposed programs, policies, and activities, where such alternatives would result in avoiding and/or minimizing disproportionately high and adverse human health or environmental impacts, consistent with the Executive Order, and
4. Eliciting public engagement opportunities and considering the results thereof, including soliciting input from affected minority and low-income populations in considering alternatives.

Following the guidance set forth in this Order, its Appendix, and DOT's Environmental Justice Strategy, the head of each Operating Administration and the responsible officials for other DOT components shall determine whether programs, policies, or activities for which they are responsible:

- will have an adverse human health or environmental effect on minority and low-income populations and
- whether that adverse effect will be disproportionately high.

In making determinations regarding disproportionately high and adverse effects on minority and low-income populations:

- mitigation and enhancement measures that will be implemented and all offsetting benefits to the affected minority and low-income populations may be taken into account, as well as the design, comparative impacts, and the relevant number of similar existing system elements in non-minority and non-low-income areas.

The Operating Administrators and other responsible DOT officials will ensure that any of their respective programs, policies or activities that will have a disproportionately high and adverse effect on minority populations or low-income populations will only be carried out if:

- further mitigation measures or alternatives that would avoid or reduce the disproportionately high and adverse effect are not practicable.
    - In determining whether a mitigation measure or an alternative is "practicable," the social, economic (including costs) and environmental effects of avoiding or mitigating the adverse effects will be taken into account.

The Operating Administrations and other responsible DOT officials will also ensure that any of their respective programs, policies, or activities that will have a disproportionately high and adverse effect on populations protected by Title VI ("protected populations") will only be carried out if:

1. A substantial need for the program, policy, or activity exists, based on the overall public interest; and
2. Alternatives that would have less adverse effects on protected populations (and that still satisfy the need identified in number 1 immediately above in this paragraph).
    a. Would have other adverse social, economic, environmental or human health impacts that are severe; or
    b. Would involve increased costs of extraordinary magnitude.

The findings, determinations, and/or demonstration made in accordance with this section must be appropriately documented in the NEPA document.

1.3 FHWA Order 6640.23A

FHWA Order 6640.23A specifically details the FHWA's responsibilities in complying with DOT Order 5610.2C, EO 12898, as well as Title VI of the Civil Rights Act of 1964 (Title VI). Under Title VI, FHWA managers and staff must administer programs in a manner to ensure that no person is excluded from participating in, denied the benefits of, or subjected to discrimination under any program or activity of FHWA because of race, color, or national origin. Under EO 12898, FHWA must administer their programs to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of FHWA programs, policies, and activities on minority populations and/or low-income populations. When determining whether an action will have a disproportionately high and adverse effect, FHWA will consider mitigation and enhancement measures. In determining whether a mitigation measure or alternative is "practicable," the social economic (including costs), and environmental effects of avoiding mitigating the adverse effects will be considered.

1.4 FHWA Guidance on Environmental Justice and NEPA

The information contained in FHWA memorandum Guidance on Environmental Justice and NEPA dated December 16, 2011 advises on the process to address EJ during NEPA review, including documentation requirements. The Guidance defines the process for identifying minority populations and low-income populations, documenting public participation, and identifying disproportionately high and adverse effects. The Guidance directs the agency to use localized census tract data and other relevant information sources to list any readily identifiable groups or clusters of minority and/or low-income persons in the EJ study area. Small clusters or dispersed populations should not be overlooked. The Guidance also directs FHWA to include a discussion of major proactive efforts to ensure public participation, the view of the affected population(s), and steps being taken to resolve any controversy that exists. Lastly, the Guidance provides a step-by-step procedure for summarizing beneficial and adverse effects, comparing impacts on the minority and non-minority populations and low-income and higher-income populations, and the consideration of mitigation measures if necessary.

1.5 EO 13166, Improving Access to Services for Persons with Limited English Proficiency (LEP)

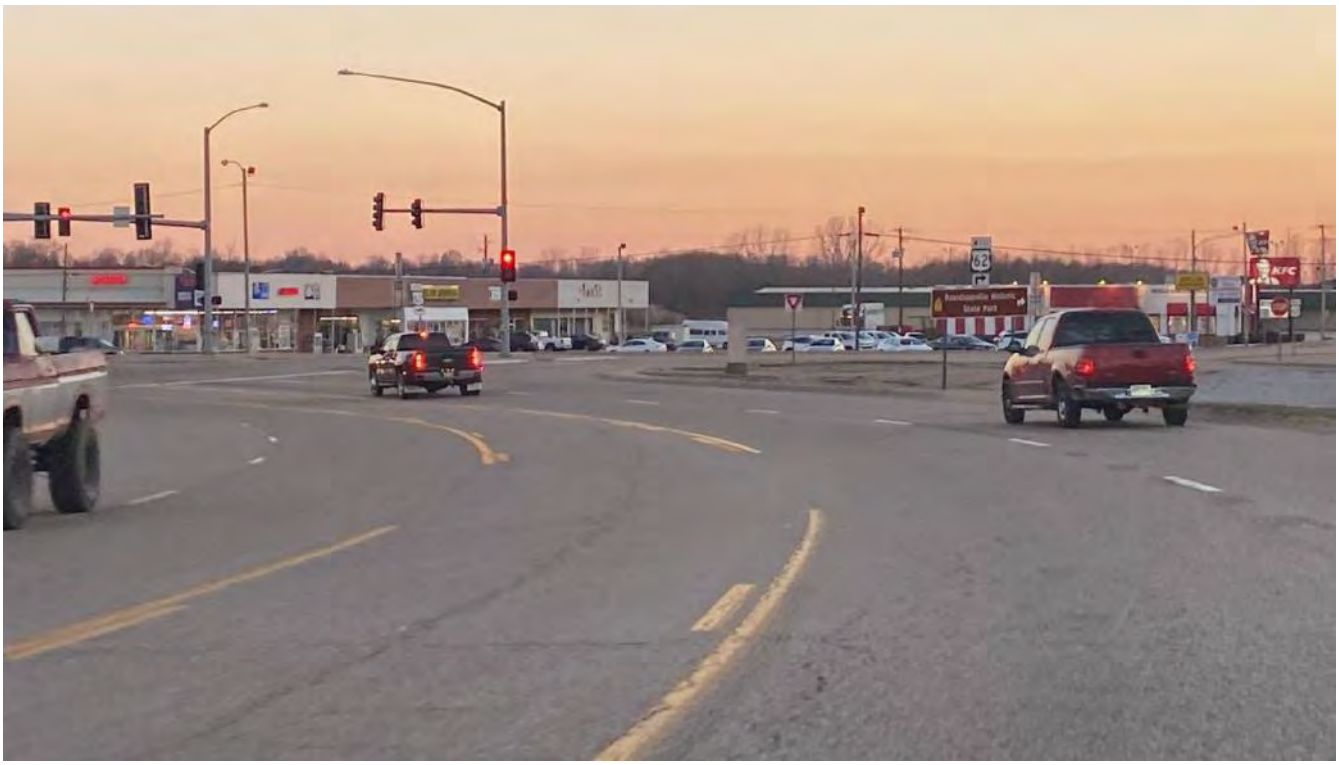
The August 2000 Executive Order strives to "improve access to federally conducted and federally assisted programs and activities for persons who, as a result of national origin, are limited in their English proficiency (LEP)". It requires each Federal agency to "examine the services it provides, and develop and implement a system by which LEP persons can meaningfully access those services consistent with, and without unduly burdening, the fundamental mission of the agency."

Appendix H – Economics Impact Analysis

Job No. 100512, Walnut Ridge – Missouri State Line (Future I-57) P.E.

Prepared by Garver for the
Arkansas Department of Transportation
In cooperation with the Federal Hwy Administration

This report was funded in part by the Federal Hwy Administration, U.S. Department of Transportation. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.



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MEMORANDUM

DATE: February 25, 2021
TO: William McAbee P.E.
CC: JD Allen, AICP, WSO-CSSD, TSSP-Rail/Bus
FROM: Jim Harvey, AICP
RE: Economic Impact Analysis of Future I-57 Alternatives

Introduction

This memo describes the economic impact analysis of three future I-57 corridor development alternatives for the segment of future I-57 from the Hwy 412/Hwy 67 intersection at Walnut Ridge to the Missouri state line. The corridor alternatives are contained within a study area that is composed of Randolph, Lawrence, Clay, and Greene counties. Each of the three corridors is defined by a specific alignment and set of associated cost assumptions that affect the economic impact analysis for each corridor. The three corridor alternatives are:

- Alternative 1 is the reconstruction, partial realignment, and upgrade of the existing US 67/62 alignment to interstate standards with a 4-lane controlled-access cross section. Alternative 1 is anticipated to be 44 miles in length and have a construction cost of approximately $527 million.
- Alternative 2, the central alignment of the three alternatives is the construction of a new location roadway east and south of US 67 between US 67 and the Black River Wildlife Management Area. The corridor is to be constructed to Interstate standards with a 4-lane cross section. Alternative 2 is anticipated to be approximately 41 miles in length with an approximate cost of $440 million.
- Alternative 3, the easternmost alignment, which follows the Hwy 34 / Hwy 90 Corridor from Walnut Ridge to Knobel, is the proposed construction of a new location roadway to Interstate standards with a 4-lane cross section. At Hwy 90 outside of Knobel, this corridor joins the Alternative 2 alignment, continuing to the Missouri state line. Alternative 3 is anticipated to be approximately 44 miles in length and have a construction cost of $480 million dollars.

Any corridor selected for construction will also have engineering and other pre-construction costs of approximately $24 million in addition to the costs listed above.

Overview of the Economic Impact Analysis

To evaluate the economic impacts of the respective transportation investment scenarios for each alternative alignment, an analysis was conducted to measure and quantify the dollar value of the outcomes of the proposed investments under each scenario. The analysis included the level of transportation investment based on the project cost estimates and the contribution of complementary economic development activities based on anticipated job creation and industry growth. The dollar value of productivity, efficiency and inter-industry economies anticipated in each of the investment scenarios was quantified and analyzed to determine the economic impacts of each scenario and measure each scenario's contribution to sustaining study area and statewide economic vitality and competitiveness.

The economic impact analysis used IMPLAN, an Input-Output model that is designed to predict the ripple effect of an economic activity, such as a transportation system investment, by using data based on previous industry spending. Production in one industry sector supports demand for production in other industry sectors throughout the economy due to supply chain spending and spending by workers.

As described in the user's guide, *IMPLAN expands upon the traditional Input-Output (I-O) approach to also include transactions between industries and institutions and between institutions themselves, thereby capturing all monetary market transactions in a given time. IMPLAN can thus more accurately be described as a Social Account Matrix (SAM) model, though the terms I-O and SAM are often used interchangeably.*

The IMPLAN analysis is based on reported 2019 industry sector outputs for the 546 industries contained in the IMPLAN datasets. Except as otherwise noted in the text, the results of the scenario analyses are reported in 2021 dollars. Because it is likely that project implementation will be phased and the project will be constructed in parts, the Alternative Transportation Investments were analyzed using three scenarios for the duration of the construction phase of the project. Scenario 1 assumes a 6-year construction phase beginning in early 2026 and extending through 2031. Scenario 2 extends for a 7-year construction period from 2026 through 2032, and Scenario 3 extends for 8 years from 2026 through 2033.

Economic Indicators

When an investment is modeled, the spending to construct the project represents a direct effect. Indirect effects are the supply chain effects stemming from the direct sector's purchases of local goods and services and the additional rounds of local business-to-business spending that results from the initial investment. Induced effects are the effects due to direct and indirect workers' purchases of local goods and services and the additional rounds of spending that stem from their purchases. IMPLAN reports values for the following economic indicators:

Employment – IMPLAN uses the BEA definition for jobs and reports employment in job-years. To provide a direct comparison among the scenarios, the employment / job reported in this tech memo are the aggregate for the life of the project. For example, if an industry grows by 240 jobs in Scenario 1, that total would equate to 40 jobs per year across the 6 years of the project. In Scenario 3, those same 240 jobs would equate to 30 jobs per year across the 8 years of the project.

Industry Output – IMPLAN defines output as the total production value of an Industry, which includes all components of production value for a given Industry. For comparison purposes the values reported in the memo are aggregate for the life of the project and must be divided by the number of years defined in the scenario to obtain annual values.

Value added to the economy – Value added is a measure of the contribution to Gross Domestic Product (GDP) and encompasses Labor Income, Other Property Income, and Taxes on Production and Imports. Reported values are for the life of the project and can be annualized by dividing by the number of years in the scenario.

Tax Impacts – Tax impact values show the amount of revenue generated for governments from Employee Compensation, Proprietor Income, and Taxes on Production and Imports, Households, and Corporations based on the modeled impact. For comparative purposes, the taxes reported are aggregate values for the life of the project. Average annual tax receipts resulting from the project can be obtained by dividing the reported value by the number of years in the scenario.

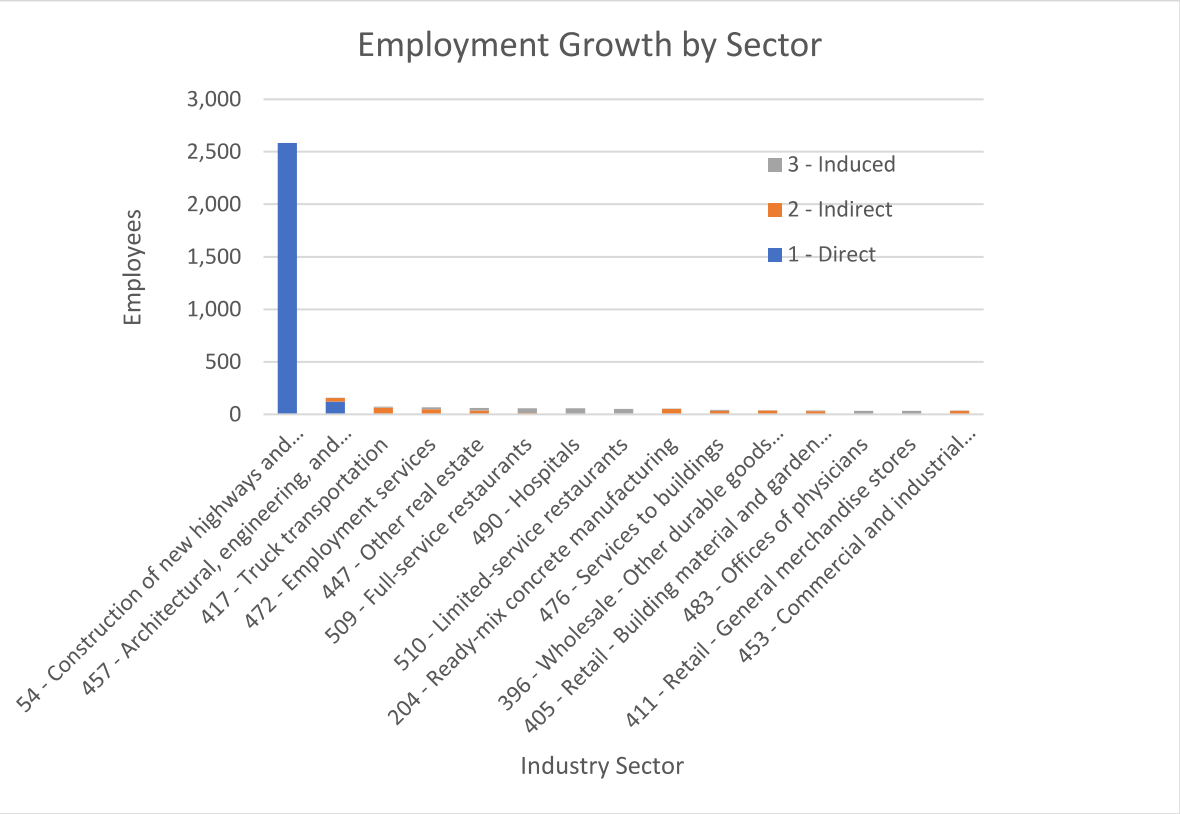
All the economic indicators reported in dollar values are reported in current year (2021) dollars. To convert nominal (year of expenditure dollars) to 2021 dollars, IMPLAN applies a deflator or index number that represent the ratio of nominal GDP to real GDP, and which allow analysts to adjust for relative price changes over time.

Although the deflator values vary depending on the industry mix, the adjustment to overall dollar value equates to about 1.9% per year.

Industry Overview

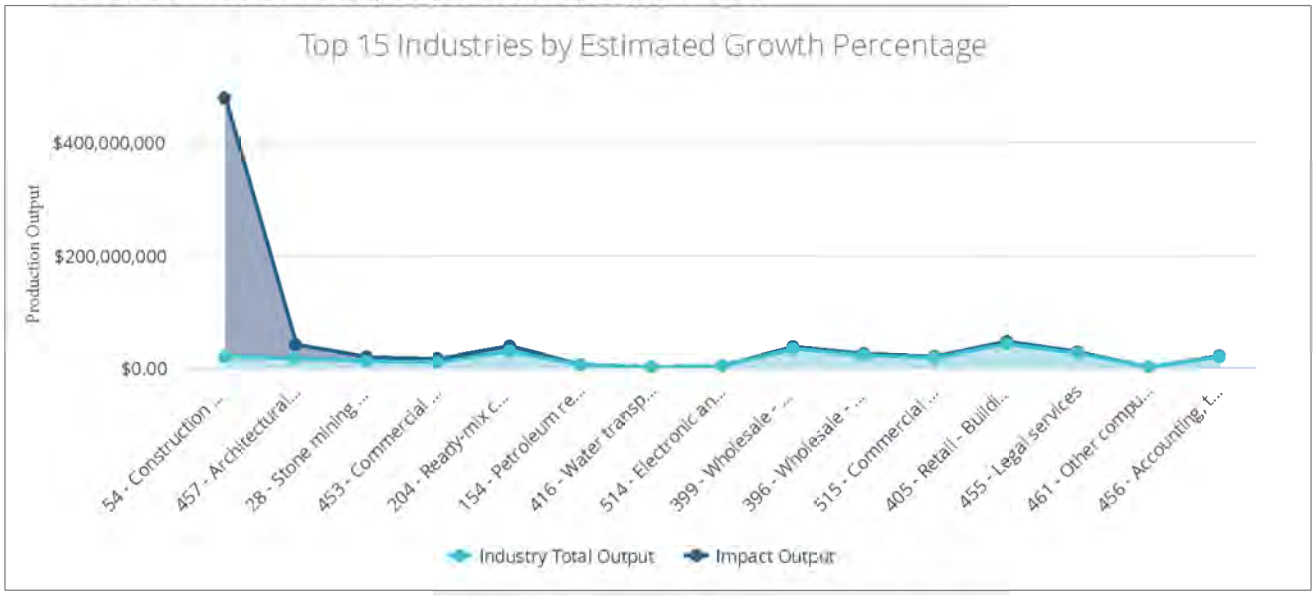
Because the alternatives being analyzed are similar investments in transportation infrastructure with the primary differences being the dollar value of the investment and the duration of the construction phase scenario, the industries affected by the investment in terms of employment, total output and value capture are relatively consistent across the alternatives and scenarios. Figure 1 shows the top 15 industries in terms of employment growth across the range of alternatives and scenarios. The employment distribution represents a combination of direct, indirect, and induced employment.

Figure 1: Top 15 Industries: Industry Gains in Employment; IMPLAN



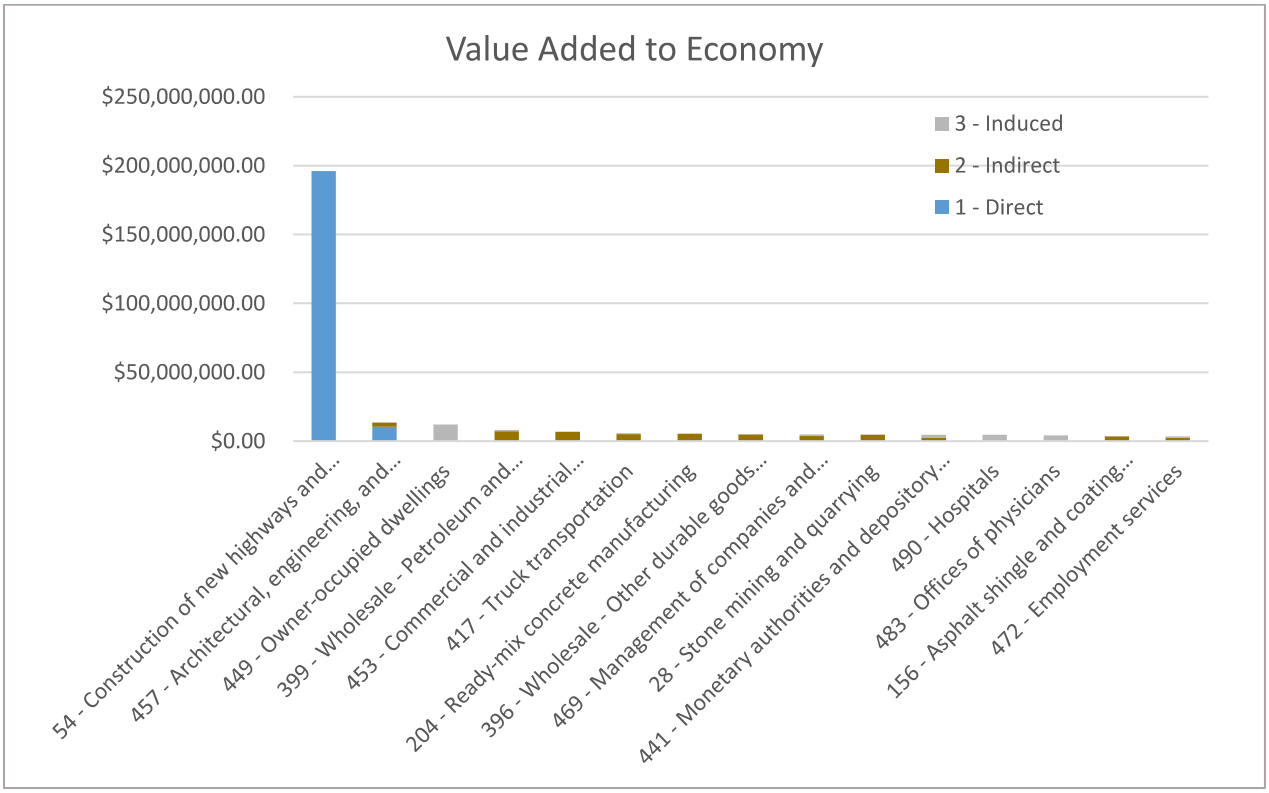
The economic model uses economic indicators to report industry impacts based on the production outcomes of the investment scenario. The IMPLAN model reports this production in terms of both total industry output and growth in industry output resulting from the transportation investment. Figure 2 shows the Top 15 industries based on their percentage growth in production output.

Figure 2: Top 15 Industries: Industry Output Growth by Sector; IMPLAN



Although total industry output is useful in understanding the magnitude of the economic impact resulting from the transportation investment, IMPLAN also reports economic analysis results in terms of the value added to the economy by the investment. This indicator is the sum of employee compensation, proprietor income, other property income, and taxes on production and imports less subsidies. Figure 3 shows the Top 15 industries in terms of the value each industry added to the economy based on the transportation investment.

Figure 3: Top 15 Industries: Economic Value Added by Sector; IMPLAN.



Although the pattern of industries affected by the various alternatives in combination with the construction phasing scenarios is relatively consistent across industry sectors, the magnitude of the impacts varies across the alternatives based on the specific corridor investment and construction phasing. The following sections provide the detailed results of the analysis for each alternative transportation investment under the three construction phasing scenarios. Each alternative is discussed in terms of employment growth, total output, value added to the economy and tax benefits accruing to the various government sectors based on the value capture produced by each transportation alternative.

Each alternative description reports the impacts to the state economy combined with an estimate of the proportion of the economic impact likely to occur within the four-county study area containing the proposed corridors. However, the regional distribution of economic outcomes is highly dependent on decisions by the state and decisions by private sector industry, such as whether to scale up direct operations or purchase resources. For example, by its nature construction activity is site specific but engineering activity may be more distributed, with substantial portion of the activity happening outside of the study area. For this reason, the estimated allocation of impacts between the state and immediate region should be viewed as potential opportunities as opposed to given outcomes.

It should also be noted that at this point in the analysis, until we have more information on how business and industry are likely to respond to the implementation of each alternative alignment in terms of new development, business growth or industry expansion, it is difficult to forecast the permanent, long-term return on investment provided by the proposed project through improved mobility and safety. At the present stage of the analysis, the economic impact analysis described in this technical memorandum focus primarily on the short term to midterm economic return on investment provided by the implementation/construction phase of the project.

Scenario 1

Scenario 1 is the most ambitious of the three scenarios with an anticipated start date in 2026 and a construction phase duration of approximately six years continuing through the end of 2031. Although there may be varying levels of construction activity across the six-year period, for purposes of the analysis it was assumed that construction activity would be relatively uniform across all six years. For input into IMPLAN the interim year 2028 was used as a surrogate year that balances the lower deflation rates of the early years with the higher deflation rates of the later years in the construction phase.

Alternative 1/ Scenario 1

This alternative examines the economic impacts of implementing Alternative 1 along the current US 67 alignment with the shortest of the three proposed construction phases, namely six (6) years, with engineering beginning in 2023 and continuing through 2025 and construction beginning in 2026 and ending in 2031. As described earlier, Alternative 1 is estimated to have a nominal (year of expenditure) dollar investment $24,000,000 in engineering and other preconstruction phase activities. Total construction cost is estimated to be $526,500,000 in nominal (year of expenditure) dollars.

Employment Gains

Table 1 shows the top 15 industries for employment growth that were estimated for Alternative 1 Scenario 1. Employment figures represent a combination of direct, indirect, and induced employment. When consumers purchase goods and services, final demand is created for the sectors producing the goods and services consumed. When consumer spending is modeled for a given sector, investment in transportation system infrastructure in this case, this spending represents a direct effect.

Table 1: Top 15 Industries: Industry Gains in Employment; Alternative 1-Scenario 1; IMPLAN

Industry Sector	Direct Emp	Indirect Emp	Induced Emp	Total
54 - Construction of new highways and streets	2,585	0	0	2,585
457 - Architectural, engineering, and related services	121	34	1	156
417 - Truck transportation		65	8	73
472 - Employment services		48	18	66
447 - Other real estate		36	24	60
509 - Full-service restaurants		13	46	59
490 – Hospitals		0	57	57
510 - Limited-service restaurants		5	47	52
204 - Ready-mix concrete manufacturing		51	0	51
476 - Services to buildings		33	11	44
396 - Wholesale - Other durable goods merchant wholesalers		37	2	39
405 - Retail - Building material and garden equipment and supplies stores		31	6	37
483 - Offices of physicians		0	34	34
411 - Retail - General merchandise stores		2	31	33
453 - Commercial and industrial machinery and equipment rental and leasing		32	1	33

As shown in Table 1, the highest gains in employment for Alternative 1 Scenario 1 are in the sector related to construction of highways and streets. The highway construction industry, through the direct investment defined in the scenario, added about 2,585 direct employees and the engineering sector added about 156 through a combination of direct, indirect, and induced employment. The next highest sectors, adding indirect and induced employment would be truck transportation, employment services and real estate.

Increased employment across all industry sectors totaled to about 4,524 employees statewide or 0.27% of total state employment. Because of the site-specific nature of the construction industry the four-county area would be likely to host 4,018 of these employees, or about a 9.7% increase in total employment for the region. This increase in employment combined with the quality of jobs across each sector in which job growth is anticipated would result in an increase in labor income of about $229 million across the state and about $181 million within the four-county area.

Economic Output Impacts

The economic model calculates the anticipated employment based on the production requirement of the investment scenario. The IMPLAN model reports this production in terms of industry output. Table 2 presents the expected Alternative 1 / Scenario 1 growth in statewide industry output by sector. The expected growth in transportation construction is anticipated to be slightly under 50%.

Table 2: Top 15 Industries: Industry Output Growth by Sector; Alternative 1 Scenario 1; IMPLAN

Industry Sector	Base Output*	Added Output	Est. Growth %
Construction of new highways and streets	$920,165,915	$459,314,523	49.92%
Asphalt shingle and coating materials manufacturing	$177,182,573	$10,906,160	6.16%
Miscellaneous nonmetallic mineral products manufacturing	$31,666,309	$1,123,585	3.55%
Ready-mix concrete manufacturing	$579,667,147	$20,560,165	3.55%
Other concrete product manufacturing	$53,928,424	$1,666,859	3.09%
Concrete pipe manufacturing	$39,591,907	$1,186,700	3.00%
Stone mining and quarrying	$274,459,125	$8,078,843	2.94%
Asphalt paving mixture and block manufacturing	$138,890,584	$3,145,270	2.26%
Architectural, engineering, and related services	$1,333,228,101	$26,767,159	2.01%
Prefabricated wood building manufacturing	$5,467,468	$83,607	1.53%
Commercial and industrial machinery and equipment rental and leasing	$789,249,982	$10,799,544	1.37%
Sand and gravel mining	$217,599,666	$2,909,566	1.34%
Cement manufacturing	$88,831,524	$860,668	0.97%
Fabricated structural metal manufacturing	$526,879,737	$4,794,916	0.91%
Brick, tile, and other structural clay product manufacturing	$126,671,306	$869,577	0.69%

**Base output is the 2019 study area industry output prior to implementing the scenario. Added output is the study area increase due to the scenario.* All values are in 2021 dollars.

Under this scenario, statewide final demand (i.e., direct output) for the highway construction industry would be expected to add about $459 million in increased production to the economy. Impacts to other sectors through multiplier and feedback effects would bring the total added production impact to about $820 million or about 0.29% of the state's $282 billion in total production output. Based on comparison of the IMPLAN results for the

state versus the four-county area, about $642 million of that production, about 9.6% of the region's current gross output of around $6.7 billion, would be expected to occur within the four-county study area.

Value Added Impacts

Value added to the economy is analogous to GDP. This indicator is the sum of employee compensation, proprietor income, other property income, and taxes on production and imports less subsidies. The value added to the economy is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs. Value added to the economy equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported).

Alternative 1 Scenario 1 adds overall value of about $376 million to the statewide economy or approximately 0.28 % of the state's $133 billion GDP. For this alternative and scenario, the four-county area would be expected to contribute about $264 million or about 10.2 % of the $2.6 billion regional GDP. Table 3 shows the top 15 industries with most value added to the economy because of this Alternative 1 investment scenario.

Table 3: Top 15 Industries: Industry Value Added to the Economy by Sector; Alternative 1 Scenario 1; IMPLAN.

Industry Sector	Employee Comp. (000)	Proprietor Income (000)	Other Property Income (000)	Taxes on Production & Imports (000)	Value Added (000)
Construction of new highways and streets	$86,775	$44,356	$63,290	$1,707	$196,128
Architectural, engineering, and related services	$10,225	$1,198	$1,914	$106	$13,443
Owner-occupied dwellings	$0	$0	$10,257	$1,721	$11,978
Wholesale - Petroleum and petroleum products	$357	$21	$1,054	$6,570	$8,002
Commercial and industrial machinery and equipment rental and leasing	$1,472	$472	$3,965	$923	$6,832
Truck transportation	$4,014	$618	$956	$113	$5,701
Ready-mix concrete manufacturing	$3,001	$200	$2,064	$148	$5,413
Wholesale - Other durable goods merchant wholesalers	$2,571	$108	$2,036	$426	$5,141
Management of companies and enterprises	$4,279	($4)	$489	$64	$4,828
Stone mining and quarrying	$1,369	($87)	$2,559	$845	$4,686
Monetary authorities and depository credit intermediation	$2,053	$5	$2,493	$102	$4,653
Hospitals	$3,687	$147	$591	$70	$4,495
Offices of physicians	$3,301	$131	$666	$38	$4,136
Asphalt shingle and coating materials manufacturing	$1,186	$5	$2,313	$36	$3,540
Employment services	$2,000	$355	$1,427	$59	$3,841

Tax Benefits

Tax benefits refer to transfer payments (e.g., taxes, fees, and other apportionments) that accrue to units of government due to the economic value added by the transportation investment and its ancillary effects. Values

for the state represent state-owned government activity, while county values represent locally owned government activity. Tax receipts (presented in Table 4) are reported in deflated 2021 dollars.

Table 4: Tax Benefits: Increase in Tax Receipts by Sector Alternative 1 Scenario 1; IMPLAN.

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
Direct	$190,547	$110,338	$172,461	$5,158,010	$25,404,147	$31,035,503
Indirect	$1,375,654	$750,432	$1,225,315	$10,131,169	$11,202,393	$24,684,963
Induced	$803,407	$438,658	$715,776	$6,170,220	$8,189,462	$16,317,523
Total	$2,369,607	$1,299,428	$2,113,551	$21,459,399	$44,796,001	$72,037,986

The reported tax receipts are for the state as a whole, so local and subarea taxes may include areas from outside the four-county study area. However, comparison of state versus the four-county local study area results suggests that the four-county proportion of added Sub County General taxes would be on the order of $997,000, added Sub County Special District taxes would be on the order of $668,000, and four-county values for County Taxes would be on the order of $1.6 million in new county tax receipts.

Alternative 2 / Scenario 1

This alternative examines the economic impacts of implementing Alternative 2, a new location roadway east and south of US 67 between US 67 and the Black River Wildlife Management Area. Under Scenario 1, the construction phase is anticipated to be six (6) years, with engineering beginning in 2023 and continuing through 2025 and construction beginning in 2026 and ending in 2031. As described earlier, Alternative 2 is estimated to have a nominal (year of expenditure) dollar investment of $24,000,000 in engineering and other preconstruction phase activities. Total construction cost is estimated to be $442,875,000 in nominal (year of expenditure) dollars.

Employment Gains

Table 5 shows the top 15 industries for employment growth that were estimated for Alternative 2 Scenario 1. Employment figures represent a combination of direct, indirect, and induced employment. When consumers purchase goods and services, final demand is created for the sectors producing the goods and services consumed. When consumer spending is modeled for a given sector, investment in transportation system infrastructure in this case, this spending represents a direct effect.

Table 5: Top 15 Industries: Industry Gains in Employment; Alternative 2-Scenario 1; IMPLAN

Industry Sector	Direct Emp	Indirect Emp	Induced Emp	Total
54 - Construction of new highways and streets	2,174	0	0	2,174
457 - Architectural, engineering, and related services	121	29	1	151
417 - Truck transportation	0	54	7	61
472 - Employment services	0	43	15	58
447 - Other real estate	0	31	21	52
509 - Full-service restaurants	0	11	39	50
490 – Hospitals	0	0	49	49
510 - Limited-service restaurants	0	4	40	44
204 - Ready-mix concrete manufacturing	0	43	0	43
476 - Services to buildings	0	28	9	37
396 - Wholesale - Other durable goods merchant wholesalers	0	31	2	33
405 - Retail - Building material and garden equipment and supplies stores	0	26	5	31
483 - Offices of physicians	0	0	29	29
411 - Retail - General merchandise stores	0	1	27	28
469 - Management of companies and enterprises	0	20	7	27

As shown in Table 5, the highest gains in employment for Alternative 2 / Scenario 1 are in the sector related to construction of highways and streets. The highway construction industry, through the direct investment defined in the scenario, added about 2,174 direct employees and the engineering sector added about 151 through a combination of direct, indirect, and induced employment. The next highest sectors (adding indirect and induced employment) would be truck transportation, employment services and real estate.

Increased employment across all industry sectors totaled to about 3,843 employees statewide or 0.23% of total state employment. Because of the site-specific nature of the construction industry the four-county area would be likely to host 3,416 of these employees, or about an 8.3% increase in total employment for the region. This increase in employment combined with the quality of jobs across each sector in which job growth is anticipated would result in an increase in labor income of about $195 million across the state and about $154 million within the four-county area.

Economic Output Impacts

The economic model calculates the anticipated employment based on the production requirement of the investment scenario. The IMPLAN model reports this production in terms of industry output. Table 6 presents the expected Alternative 2 / Scenario 1 growth in statewide industry output by sector. The expected growth in transportation construction is anticipated to be about 42%.

Table 6: Top 15 Industries: Industry Output Growth by Sector; Alternative 2 Scenario 1; IMPLAN

Industry Sector	Base Output*	Added Output	Estimated Growth %
Construction of new highways and streets	$920,165,915	$386,360,720	41.99%
Asphalt shingle and coating materials manufacturing	$177,182,573	$9,174,181	5.18%
Ready-mix concrete manufacturing	$579,667,147	$17,305,141	2.99%
Miscellaneous nonmetallic mineral products manufacturing	$31,666,309	$945,164	2.98%
Other concrete product manufacturing	$53,928,424	$1,403,046	2.60%
Concrete pipe manufacturing	$39,591,907	$998,794	2.52%
Stone mining and quarrying	$274,459,125	$6,797,560	2.48%
Architectural, engineering, and related services	$1,333,228,101	$25,885,852	1.94%
Asphalt paving mixture and block manufacturing	$138,890,584	$2,646,006	1.91%
Prefabricated wood building manufacturing	$5,467,468	$70,337	1.29%
Commercial and industrial machinery and equipment rental and leasing	$789,249,982	$9,096,998	1.15%
Sand and gravel mining	$217,599,666	$2,449,175	1.13%
Cement manufacturing	$88,831,524	$724,606	0.82%
Fabricated structural metal manufacturing	$526,879,737	$4,035,169	0.77%
Brick, tile, and other structural clay product manufacturing	$126,671,306	$732,040	0.58%

**Base output is the 2019 study area industry output prior to implementing the scenario. Added output is the study area increase due to the scenario.* All values are in 2021 dollars.

Under this scenario, statewide final demand (i.e., direct output) for the highway construction industry would be expected to add about $386 million in increased production to the economy. Impacts to other sectors through multiplier and feedback effects would bring the total added production impact to about $696 million or about 0.24% of the state's $282 billion in total production output. Based on comparison of the IMPLAN results for the state versus the four-county area, about $545 million of that production, about 8.1% of the region's current gross output of around $6.7 billion, would be expected to occur within the four-county study area.

Value Added Impacts

Value added to the economy is analogous to GDP. This indicator is the sum of employee compensation, proprietor income, other property income, and taxes on production and imports less subsidies. The value added to the economy is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs. Value added to the economy equals gross output (sales or receipts and other operating

income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported).

Alternative 2 Scenario 1 adds overall value of about $319 million to the statewide economy or approximately 0.24 % of the state's $133 billion GDP. For this alternative and scenario, the four-county area would be expected to contribute about $224 million or about 8.6 % of the $2.6 billion regional GDP. Table 7 shows the top 15 industries with most value added to the economy because of this Alternative 2 investment scenario.

Table 7: Top 15 Industries: Industry Value Added to the Economy by Sector; Alternative 2 Scenario 1; IMPLAN.

Industry Sector	Employee Comp. (000)	Proprietor Income (000)	Other Property Income (000)	Taxes on Production & Imports (000)	Value Added (000)
Construction of new highways and streets	$72,992	$37,311	$53,237	$1,436	$164,976
Architectural, engineering, and related	$9,888	$1,158	$1,851	$103	$13,000
Owner-occupied dwellings	$0	$0	$8,726	$1,464	$10,190
Wholesale - Petroleum and petroleum products	$301	$18	$888	$5,536	$6,743
Commercial and industrial machinery and equipment rental and leasing	$1,240	$398	$3,340	$777	$5,755
Truck transportation	$3,385	$521	$806	$95	$4,807
Ready-mix concrete manufacturing	$2,526	$168	$1,737	$125	$4,556
Wholesale - Other durable goods merchant wholesalers	$2,167	$91	$1,716	$359	$4,333
Management of companies and enterprises	$3,654	($4)	$418	$55	$4,123
Stone mining and quarrying	$1,747	$5	$2,122	$86	$3,960
Monetary authorities and depository credit intermediation	$1,152	($74)	$2,153	$711	$3,942
Hospitals	$3,137	$125	$503	$60	$3,825
Offices of physicians	$2,809	$111	$567	$33	$3,520
Asphalt shingle and coating materials manufacturing	$1,754	$31	$1,252	$52	$3,089
Employment services	$998	$4	$1,946	$30	$2,978

Tax Benefits

Tax benefits refer to transfer payments (e.g., taxes, fees, and other apportionments) that accrue to units of government due to the economic value added by the transportation investment and its ancillary effects. Values for the state represent state-owned government activity, while county values represent locally owned government activity. Tax receipts (shown in Table 8) are reported in deflated 2021 dollars.

Table 8: Tax Benefits: Increase in Tax Receipts by Sector Alternative 2 Scenario 1; IMPLAN.

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
Direct	$161,678	$93,639	$146,339	$4,381,564	$21,632,756	$26,415,976
Indirect	$1,160,807	$633,246	$1,033,955	$8,557,045	$9,512,855	$20,897,908
Induced	$683,559	$373,221	$609,000	$5,249,770	$6,967,713	$13,883,263
Total	$2,006,045	$1,100,107	$1,789,294	$18,188,379	$38,113,324	$61,197,149

The reported tax receipts are for the state as a whole, so local and subarea taxes may include areas from outside the four-county study area. However, comparison of state versus four-county local study area results suggests that the four-county proportion of added Sub County General taxes would be on the order of $844,000, added Sub County Special District taxes would be on the order of $565,000, and four-county values for County Taxes would be on the order of $1.3 million in new county tax receipts.

Alternative 3 / Scenario 1

This alternative examines the economic impacts of implementing Alternative 3, a new location roadway following the Hwy 34 / Hwy 90 Corridor from Walnut Ridge to Knobel. Under Scenario 1, the construction phase is anticipated to be six (6) years, with engineering beginning in 2023 and continuing through 2025 and construction beginning in 2026 and ending in 2031. As described earlier, Alternative 3 is estimated to have a nominal (Year of expenditure) dollar investment $24,000,000 in engineering and other preconstruction phase activities. Total construction cost is estimated to be $479,750,000 in nominal (year of expenditure) dollars.

Employment Gains

Table 9 shows the top 15 industries for employment growth that were estimated for Alternative 3 Scenario 1. Employment figures represent a combination of direct, indirect, and induced employment. When consumers purchase goods and services, final demand is created for the sectors producing the goods and services consumed. When consumer spending is modeled for a given sector, investment in transportation system infrastructure in this case, this spending represents a direct effect.

Table 9: Top 15 Industries: Industry Gains in Employment; Alternative 3-Scenario 1; IMPLAN

Industry Sector	Direct Emp	Indirect Emp	Induced Emp	Total
54 - Construction of new highways and streets	2,355	0	0	2,355
457 - Architectural, engineering, and related services	121	31	1	153
417 - Truck transportation	0	59	8	67
472 - Employment services	0	45	16	61
447 - Other real estate	0	33	22	55
509 - Full-service restaurants	0	12	42	54
490 - Hospitals	0	0	52	52
510 - Limited-service restaurants	0	5	44	49
204 - Ready-mix concrete manufacturing	0	47	0	47
476 - Services to buildings	0	30	10	40
396 - Wholesale - Other durable goods merchant wholesalers	0	34	2	36
405 - Retail - Building material and garden equipment and supplies stores	0	28	5	33
483 - Offices of physicians	0	0	31	31
411 - Retail - General merchandise stores	0	1	29	30
453 - Commercial and industrial machinery and equipment rental and leasing	0	29	1	30

As shown in Table 9, the highest gains in employment for Alternative 3 Scenario 1 are in the sector related to construction of highways and streets. The highway construction industry, through the direct investment defined in the scenario, added about 2,355 direct employees and the engineering sector added about 153 through a

combination of direct, indirect, and induced employment. The next highest sectors, adding indirect and induced employment would be truck transportation, employment services and real estate.

Increased employment across all industry sectors totaled to about 4,144 employees statewide or 0.25% of total state employment. Because of the site-specific nature of the construction industry the four-county area would be likely to host 3,682 of these employees, or about an 8.9% increase in total employment for the region. This increase in employment combined with the quality of jobs across each sector in which job growth is anticipated would result in an increase in total labor income of about $210 million across the state and about $166 million within the four-county area.

Economic Output Impacts

The economic model calculates the anticipated employment based on the production requirement of the investment scenario. The IMPLAN model reports this production in terms of industry output. Table 10 presents the expected Alternative 3 / Scenario 1 growth in statewide industry output by sector. The expected growth in transportation construction is anticipated to be slightly over 45%.

Table 10: Top 15 Industries: Industry Output Growth by Sector; Alternative 3 Scenario 1; IMPLAN

Industry Sector	Base Output*	Added Output	Estimated Growth %
Construction of new highways and streets	$920,165,915	$418,530,185	45.48%
Asphalt shingle and coating materials manufacturing	$177,182,573	$9,937,908	5.61%
Miscellaneous nonmetallic mineral products manufacturing	$31,666,309	$1,023,840	3.23%
Ready-mix concrete manufacturing	$579,667,147	$18,740,465	3.23%
Other concrete product manufacturing	$53,928,424	$1,519,376	2.82%
Concrete pipe manufacturing	$39,591,907	$1,081,652	2.73%
Stone mining and quarrying	$274,459,125	$7,362,550	2.68%
Asphalt paving mixture and block manufacturing	$138,890,584	$2,866,160	2.06%
Architectural, engineering,	$1,333,228,101	$26,274,470	1.97%
Prefabricated wood building manufacturing	$5,467,468	$76,189	1.39%
Commercial and industrial machinery and equipment rental and leasing	$789,249,982	$9,847,747	1.25%
Sand and gravel mining	$217,599,666	$2,652,187	1.22%
Cement manufacturing	$88,831,524	$784,604	0.88%
Fabricated structural metal manufacturing	$526,879,737	$4,370,184	0.83%
Brick, tile, and other structural clay product manufacturing	$126,671,306	$792,688	0.63%

**Base output is the 2019 study area industry output prior to implementing the scenario. Added output is the study area increase due to the scenario.* All values are in 2021 dollars.

Under this scenario, statewide final demand (i.e., direct output) for the highway construction industry would be expected to add about $419 million in increased production to the economy. Impacts to other sectors through multiplier and feedback effects would bring the total added production impact to about $750 million or about 0.27% of the state's $282 billion in total production output. Based on comparison of the IMPLAN results for the state versus the four-county area, about $587 million of that production, about 8.8% of the region's current gross output of around $6.7 billion, would be expected to occur within the four-county study area.

Value Added Impacts

Value added to the economy is analogous to GDP. This indicator is the sum of employee compensation, proprietor income, other property income, and taxes on production and imports less subsidies. The value added to the economy is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs. Value added to the economy equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported).

Alternative 3 Scenario 1 adds overall value of about $344 million to the statewide economy or approximately 0.26 % of the state's $133 billion GDP. For this alternative and scenario, the four-county area would be expected to contribute about $242 million or about 9.3 % of the $2.6 billion regional GDP. Table 11 shows the top 15 industries with most value added to the economy because of this Alternative 3 investment scenario.

Table 11: Top 15 Industries: Industry Value Added to the Economy by Sector; Alternative 3 Scenario 1; IMPLAN.

Industry Sector	Employee Comp. (000)	Proprietor Income (000)	Other Property Income (000)	Taxes on Production & Imports (000)	Value Added (000)
54 - Construction of new highways and streets	$79,070	$40,417	$57,670	$1,556	$178,713
457 - Architectural, engineering, and related services	$10,037	$1,176	$1,879	$104	$13,196
449 - Owner-occupied dwellings	$0	$0	$9,401	$1,577	$10,978
399 - Wholesale - Petroleum and petroleum products	$326	$20	$961	$5,992	$7,299
453 - Commercial and industrial machinery and equipment rental and leasing	$1,342	$431	$3,615	$841	$6,229
417 - Truck transportation	$3,663	$563	$872	$103	$5,201
204 - Ready-mix concrete manufacturing	$2,736	$182	$1,881	$135	$4,934
396 - Wholesale - Other durable goods merchant wholesalers	$2,345	$98	$1,857	$389	$4,689
469 - Management of companies and enterprises	$3,930	($4)	$449	$59	$4,434
28 - Stone mining and quarrying	$1,248	($80)	$2,332	$770	$4,270
441 - Monetary authorities and depository credit intermediation	$1,882	$5	$2,286	$93	$4,266
490 - Hospitals	$3,380	$135	$541	$64	$4,120
483 - Offices of physicians	$3,026	$120	$611	$35	$3,792
472 - Employment services	$1,862	$33	$1,329	$55	$3,279
156 - Asphalt shingle and coating materials manufacturing	$1,081	$4	$2,107	$33	$3,225

Tax Benefits

Tax benefits refer to transfer payments (e.g., taxes, fees, and other apportionments) that accrue to units of government due to the economic value added by the transportation investment and its ancillary effects. Tax benefits by receiving unit of government are summarized in Table 12. Values for the state represent state-owned government activity, while county values represent locally owned government activity. Tax receipts are reported in deflated 2021 dollars.

Table 12: Tax Benefits: Increase in Tax Receipts by Sector Alternative C Scenario 1; IMPLAN.

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
Direct	$174,408	$101,003	$157,858	$4,723,943	$23,295,776	$28,452,988
Indirect	$1,255,545	$684,920	$1,118,336	$9,251,165	$10,257,868	$22,567,834
Induced	$736,407	$402,076	$656,083	$5,655,648	$7,506,451	$14,956,665
Total	$2,166,360	$1,187,999	$1,932,277	$19,630,757	$41,060,095	$65,977,488

The reported tax receipts are for the state as a whole, so local and subarea taxes may include areas from outside the four-county study area. However, comparison of state versus four-county local study area results suggests that the four-county proportion of added Sub County General taxes would be on the order of $911,000, added Sub County Special District taxes would be on the order of $610,000, and four-county values for County Taxes would be on the order of $1.4 million in new county tax receipts.

Summary Comparison of Alternatives for Scenario 1

For comparison purposes, Table 13 provides a summary comparison of the economic impacts of each of the three corridors under the Scenario 1 construction phasing. Because it represents a slightly higher level of investment, Alternative 1 provides the greatest economic benefit, but not to such a dramatic degree that it would necessarily outweigh other infrastructure, operational or environmental criteria, should one of the other corridors prove to be superior in regard to other project goals.

Table 13: Scenario 1 Summary: Economic Indicators by Corridor; IMPLAN

Impact	Employment	Labor Income	Value Added	Output	Taxes
Alternative 1	4,524	$229,070,395	$376,116,431	$819,897,738	$72,037,986
Alternative 2	3,843	$194,913,984	$319,375,781	$695,505,610	$61,197,149
Alternative 3	4,144	209,975,480	344,395,948	750,357,147	$65,977,488

In fact, when scaled for construction costs, there is virtually no difference in return on investment among the three alternatives. Each alternative provides a return of about $0.42 in labor income, $0.68 in value added, $1.49 worth of growth in total output, and $0.13 in tax revenue for each dollar invested in engineering and construction. Although the project clearly provides economic value to the state and the region, the economic impacts provide very little basis for differentiating among the three alternatives.

Scenario 2

Scenario 2 assumes a slightly longer timeline with an anticipated start date in 2026 and a construction phase duration of approximately seven years continuing through the end of 2032. Although there may be varying levels of construction activity across the seven-year period, for purposes of the analysis it was assumed that construction activity would be relatively uniform across all seven years. For input into IMPLAN the interim year 2029 was used as a surrogate year that balances the lower deflation rates of the early years with the higher deflation rates of the later years in the construction phase.

Alternative 1 / Scenario 2

This alternative examines the economic impacts of implementing Alternative 1 along the current US 67 alignment with the Scenario 2 proposed construction phases, namely seven (7) years, with engineering beginning in 2023 and continuing through 2025 and construction beginning in 2026 and ending in 2032. As described earlier, Alternative 1 is estimated to have a nominal (Year of expenditure) dollar investment $24,000,000 in engineering and other preconstruction phase activities. Total construction cost is estimated to be $526,500,000 in nominal (year of expenditure) dollars.

Employment Gains

Table 14 shows the top 15 industries for employment growth that were estimated for Alternative 1 Scenario 2. Employment figures represent a combination of direct, indirect, and induced employment. When consumers purchase goods and services, final demand is created for the sectors producing the goods and services consumed. When consumer spending is modeled for a given sector, investment in transportation system infrastructure in this case, this spending represents a direct effect.

Table 14: Top 15 Industries: Industry Gains in Employment; Alternative 1-Scenario 2; IMPLAN

Industry Sector	Direct Emp	Indirect Emp	Induced Emp	Total
54 - Construction of new highways and streets	2,552	0	0	2,552
457 - Architectural, engineering, and related services	119	33	1	153
417 - Truck transportation	0	64	8	72
472 - Employment services	0	47	18	65
447 - Other real estate	0	36	24	60
509 - Full-service restaurants	0	13	46	59
490 - Hospitals	0	0	56	56
510 - Limited-service restaurants	0	5	47	52
204 - Ready-mix concrete manufacturing	0	51	0	51
476 - Services to buildings	0	32	11	43
396 - Wholesale - Other durable goods merchant wholesalers	0	36	2	38
405 - Retail - Building material and garden equipment and supplies stores	0	31	6	37
483 - Offices of physicians	0	0	34	34
411 - Retail - General merchandise stores	0	2	31	33
453 - Commercial and industrial machinery and equipment rental and leasing	0	31	1	32

As shown in Table 14, the highest gains in employment for Alternative 1 Scenario 2 are in the sector related to construction of highways and streets. The highway construction industry, through the direct investment defined in the scenario, added about 2,552 direct employees and the engineering sector added about 153 through a combination of direct, indirect, and induced employment. The next highest sectors, adding indirect and induced employment would be truck transportation, employment services and real estate.

Increased employment across all industry sectors totaled to about 4,467 employees statewide or 0.27% of total state employment. Because of the site-specific nature of the construction industry the four-county area would be likely to host 3,970 of these employees, or slightly less than a 9.6% increase in total employment for the region. This increase in employment combined with the quality of jobs across each sector in which job growth is anticipated would result in an increase in labor income of about $226 million across the state and about $179 million within the four-county area.

Economic Output Impacts

The economic model calculates the anticipated employment based on the production requirement of the investment scenario. The IMPLAN model reports this production in terms of industry output. Table 15 presents the expected Alternative 1 / Scenario 2 growth in statewide industry output by sector. The expected growth in transportation construction is anticipated to be slightly over 49%.

Table 15: Top 15 Industries: Industry Output Growth by Sector; Alternative 1 Scenario 2; IMPLAN

Industry Sector	Base Output*	Added Output	Estimated Growth %
Construction of new highways and streets	$920,165,915	$453,557,225	49.29%
Asphalt shingle and coating materials manufacturing	$177,182,573	$10,769,456	6.08%
Miscellaneous nonmetallic mineral products manufacturing	$31,666,309	$1,109,501	3.50%
Ready-mix concrete manufacturing	$579,667,147	$20,302,453	3.50%
Other concrete product manufacturing	$53,928,424	$1,645,966	3.05%
Concrete pipe manufacturing	$39,591,907	$1,171,825	2.96%
Stone mining and quarrying	$274,459,125	$7,977,578	2.91%
Asphalt paving mixture and block manufacturing	$138,890,584	$3,105,845	2.24%
Architectural, engineering, and related services	$1,333,228,101	$26,431,645	1.98%
Prefabricated wood building manufacturing	$5,467,468	$82,559	1.51%
Commercial and industrial machinery and equipment rental and leasing	$789,249,982	$10,664,176	1.35%
Sand and gravel mining	$217,599,666	$2,873,096	1.32%
Cement manufacturing	$88,831,524	$849,880	0.96%
Fabricated structural metal manufacturing	$526,879,737	$4,734,814	0.90%
Brick, tile, and other structural clay product manufacturing	$126,671,306	$858,677	0.68%

**Base output is the 2019 study area industry output prior to implementing the scenario. Added output is the study area increase due to the scenario.* All values are in 2021 dollars.

Under this scenario, statewide final demand (i.e., direct output) for the highway construction industry would be expected to add about $454 million in increased production to the economy. Impacts to other sectors through multiplier and feedback effects would bring the total added production impact to about $810 million or about 0.29% of the state's $282 billion in total production output. Based on comparison of the IMPLAN results for the

state versus the four-county area, about $634 million of that production, about 9.5% of the region's current gross output of around $6.7 billion, would be expected to occur within the four-county study area.

Value Added Impacts

Value added to the economy is analogous to GDP. This indicator is the sum of employee compensation, proprietor income, other property income, and taxes on production and imports less subsidies. The value added to the economy is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs. Value added to the economy equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported).

Alternative 1 Scenario 2 adds overall value of about $371 million to the statewide economy or approximately 0.28 % of the state's $133 billion GDP. For this alternative and scenario, the four-county area would be expected to contribute about $261 million or about 10.04 % of the $2.6 billion regional GDP. Table 16 shows the top 15 industries with most value added to the economy because of this Alternative 1 investment scenario.

Table 16: Top 15 Industries: Industry Value Added to the Economy by Sector; Alternative 1 Scenario 2; IMPLAN.

Industry Sector	Employee Comp. (000)	Proprietor Income (000)	Other Property Income (000)	Taxes on Production & Imports (000)	Value Added (000)
54 - Construction of new highways and streets	$85,687	$43,800	$62,496	$1,686	$193,669
457 - Architectural, engineering, and related services	$10,097	$1,183	$1,890	$105	$13,275
449 - Owner-occupied dwellings	$0	$0	$10,128	$1,699	$11,827
399 - Wholesale - Petroleum and petroleum products	$353	$21	$1,040	$6,487	$7,901
453 - Commercial and industrial machinery and equipment rental and leasing	$1,453	$466	$3,915	$911	$6,745
417 - Truck transportation	$3,964	$610	$944	$112	$5,630
204 - Ready-mix concrete manufacturing	$2,964	$198	$2,038	$146	$5,346
396 - Wholesale - Other durable goods merchant wholesalers	$2,539	$106	$2,010	$421	$5,076
469 - Management of companies and enterprises	$4,226	($4)	$483	$63	$4,768
28 - Stone mining and quarrying	$1,352	($87)	$2,527	$834	$4,626
441 - Monetary authorities and depository credit intermediation	$2,028	$6	$2,462	$100	$4,596
490 - Hospitals	$3,641	$145	$583	$69	$4,438
483 - Offices of physicians	$3,260	$129	$658	$38	$4,085
156 - Asphalt shingle and coating materials manufacturing	$1,171	$5	$2,284	$35	$3,495
472 - Employment services	$1,974	$35	$1,409	$58	$3,476

Tax Benefits

Tax benefits refer to transfer payments (e.g., taxes, fees, and other apportionments) that accrue to units of government due to the economic value added by the transportation investment and its ancillary effects. Tax benefits by receiving unit of government are summarized in Table 17. Values for the state represent state-owned government activity, while county values represent locally owned government activity. Tax receipts are reported in deflated 2021 dollars.

Table 17: Tax Benefits: Increase in Tax Receipts by Sector Alternative 1 Scenario 2; IMPLAN.

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
Direct	$188,158	$108,955	$170,299	$5,093,357	$25,085,717	$30,646,486
Indirect	$1,358,410	$741,025	$1,209,956	$10,004,180	$11,061,976	$24,375,547
Induced	$793,337	$433,159	$706,804	$6,092,879	$8,086,811	$16,112,990
Total	$2,339,905	$1,283,139	$2,087,059	$21,190,416	$44,234,504	$71,135,023

The reported tax receipts are for the state as a whole, so local and subarea taxes may include areas from outside the four-county study area. However, comparison of state versus four-county local study area results suggests that the four-county proportion of added Sub County General taxes would be on the order of $984,000, added Sub County Special District taxes would be on the order of $659,000, and four-county values for County Taxes would be on the order of $1.5 million in new county tax receipts.

Alternative 2 / Scenario 2

This alternative examines the economic impacts of implementing Alternative 2, a new location roadway east and south of US 67 between US 67 and the Black River Wildlife Management Area. Under Scenario 2, the construction phase is anticipated to be seven (7) years, with engineering beginning in 2023 and continuing through 2025 and construction beginning in 2026 and ending in 2032. As described earlier, Alternative 2 is estimated to have a nominal (Year of expenditure) dollar investment $24,000,000 in engineering and other preconstruction phase activities. Total construction cost is estimated to be $442,875,000 in nominal (year of expenditure) dollars.

Employment Gains

Table 18 shows the top 15 industries for employment growth that were estimated for Alternative 2 Scenario 2. Employment figures represent a combination of direct, indirect, and induced employment. When consumers purchase goods and services, final demand is created for the sectors producing the goods and services consumed. When consumer spending is modeled for a given sector, investment in transportation system infrastructure in this case, this spending represents a direct effect.

Table 18: Top 15 Industries: Industry Gains in Employment; Alternative 2-Scenario 2; IMPLAN

Industry Sector	Direct Emp	Indirect Emp	Induced Emp	Total
54 - Construction of new highways and streets	2,147	0	0	2,147
457 - Architectural, engineering, and related services	119	28	1	148
417 - Truck transportation	0	54	7	61
472 - Employment services	0	42	15	57
447 - Other real estate	0	31	20	51
509 - Full-service restaurants	0	11	39	50
490 - Hospitals	0	0	48	48
510 - Limited-service restaurants	0	4	40	44
204 - Ready-mix concrete manufacturing	0	43	0	43
476 - Services to buildings	0	27	9	36
396 - Wholesale - Other durable goods merchant wholesalers	0	31	2	33
405 - Retail - Building material and garden equipment and supplies stores	0	26	5	31
483 - Offices of physicians	0	0	29	29
411 - Retail - General merchandise stores	0	1	26	27
469 - Management of companies and enterprises	0	20	7	27

As shown in Table 18, the highest gains in employment for Alternative 2 Scenario 2 are in the sector related to construction of highways and streets. The highway construction industry, through the direct investment defined in the scenario, added about 2,147 direct employees and the engineering sector added about 148 through a combination of direct, indirect, and induced employment. The next highest sectors, adding indirect and induced employment would be truck transportation, employment services and real estate.

Increased employment across all industry sectors totaled to about 3,795 employees statewide or 0.23% of total state employment. Because of the site-specific nature of the construction industry the four-county area would be likely to host 3,373 of these employees, or slightly less than an 8.2% increase in total employment for the region. This increase in employment combined with the quality of jobs across each sector in which job growth is anticipated would result in an increase in labor income of about $192 million across the state and about $152 million within the four-county area.

Economic Output Impacts

The economic model calculates the anticipated employment based on the production requirement of the investment scenario. The IMPLAN model reports this production in terms of industry output. Table 19 presents the expected Alternative 2 / Scenario 2 growth in statewide industry output by sector. The expected growth in transportation construction is anticipated to be approximately 41.5%.

Table 19: Top 15 Industries: Industry Output Growth by Sector; Alternative 2 Scenario 2; IMPLAN

Industry Sector	Base Output*	Added Output	Estimated Growth %
Construction of new highways and streets	$920,165,915	$381,517,865	41.46%
Asphalt shingle and coating materials manufacturing	$177,182,573	$9,059,187	5.11%
Ready-mix concrete manufacturing	$579,667,147	$17,088,229	2.95%
Miscellaneous nonmetallic mineral products manufacturing	$31,666,309	$933,316	2.95%
Other concrete product manufacturing	$53,928,424	$1,385,459	2.57%
Concrete pipe manufacturing	$39,591,907	$986,274	2.49%
Stone mining and quarrying	$274,459,125	$6,712,356	2.45%
Architectural, engineering, and related services	$1,333,228,101	$25,561,385	1.92%
Asphalt paving mixture and block manufacturing	$138,890,584	$2,612,840	1.88%
Prefabricated wood building manufacturing	$5,467,468	$69,456	1.27%
Commercial and industrial machinery and equipment rental and leasing	$789,249,982	$8,982,972	1.14%
Sand and gravel mining	$217,599,666	$2,418,476	1.11%
Cement manufacturing	$88,831,524	$715,524	0.81%
Fabricated structural metal manufacturing	$526,879,737	$3,984,590	0.76%
Brick, tile, and other structural clay product manufacturing	$126,671,306	$722,864	0.57%

**Base output is the 2019 study area industry output prior to implementing the scenario. Added output is the study area increase due to the scenario.* All values are in 2021 dollars.

Under this scenario, statewide final demand (i.e., direct output) for the highway construction industry would be expected to add about $382 million in increased production to the economy. Impacts to other sectors through multiplier and feedback effects would bring the total added production impact to about $687 million or about 0.24% of the state's $282 billion in total production output. Based on comparison of the IMPLAN results for the state versus the four-county area, about $538 million of that production, about 8.03% of the region's current gross output of around $6.7 billion, would be expected to occur within the four-county study area.

Value Added Impacts

Value added to the economy is analogous to GDP. This indicator is the sum of employee compensation, proprietor income, other property income, and taxes on production and imports less subsidies. The value added to the economy is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs. Value added to the economy equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported).

Alternative 2 Scenario 2 adds overall value of about $315 million to the statewide economy or approximately 0.24 % of the state's $133 billion GDP. For this alternative and scenario, the four-county area would be expected to contribute about $221 million or about 8.5 % of the $2.6 billion regional GDP. Table 20 shows the top 15 industries with most value added to the economy because of this Alternative 2 investment scenario.

Table 20: Top 15 Industries: Industry Value Added to the Economy by Sector; Alternative 2 Scenario 2; IMPLAN.

Industry Sector	Employee Comp. (000)	Proprietor Income (000)	Other Property Income (000)	Taxes on Production & Imports (000)	Value Added (000)
54 - Construction of new highways and streets	$72,077	$36,843	$52,570	$1,418	$162,908
457 - Architectural, engineering, and related services	$9,765	$1,144	$1,828	$101	$12,838
449 - Owner-occupied dwellings	$0	$0	$8,617	$1,446	$10,063
399 - Wholesale - Petroleum and petroleum products	$298	$18	$877	$5,467	$6,660
453 - Commercial and industrial machinery and equipment rental and leasing	$1,224	$393	$3,298	$768	$5,683
417 - Truck transportation	$3,343	$514	$796	$94	$4,747
204 - Ready-mix concrete manufacturing	$2,494	$166	$1,715	$123	$4,498
396 - Wholesale - Other durable goods merchant wholesalers	$2,139	$90	$1,694	$355	$4,278
469 - Management of companies and enterprises	$3,608	($4)	$412	$54	$4,070
441 - Monetary authorities and depository credit intermediation	$1,725	$5	$2,095	$85	$3,910
28 - Stone mining and quarrying	$1,138	($73)	$2,126	$702	$3,893
490 - Hospitals	$3,098	$123	$496	$59	$3,776
483 - Offices of physicians	$2,773	$110	$560	$32	$3,475
472 - Employment services	$1,732	$30	$1,236	$51	$3,049
156 - Asphalt shingle and coating materials manufacturing	$985	$4	$1,921	$30	$2,940

Tax Benefits

Tax benefits refer to transfer payments (e.g., taxes, fees, and other apportionments) that accrue to units of government due to the economic value added by the transportation investment and its ancillary effects. Tax benefits by receiving unit of government are summarized in Table 21. Values for the state represent state-owned government activity, while county values represent locally owned government activity. Tax receipts are reported in deflated 2021 dollars.

Table 21: Tax Benefits: Increase in Tax Receipts by Sector Alternative 2 Scenario 2; IMPLAN.

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
Direct	$159,651	$92,465	$144,505	$4,326,643	$21,361,599	$26,084,863
Indirect	$1,146,257	$625,309	$1,020,995	$8,449,786	$9,393,616	$20,635,963
Induced	$674,991	$368,543	$601,367	$5,183,967	$6,880,376	$13,709,244
Total	$1,980,899	$1,086,317	$1,766,867	$17,960,396	$37,635,591	$60,430,070

The reported tax receipts are for the state as a whole, so local and subarea taxes may include areas from outside the four-county study area. However, comparison of state versus four-county local study area results suggests that the four-county proportion of added Sub County General taxes would be on the order of $833,378, added Sub County Special District taxes would be on the order of $558,226, and four-county values for County Taxes would be on the order of $1.3 million in new county tax receipts.

Alternative 3 / Scenario 2

This alternative examines the economic impacts of implementing Alternative 3, a new location roadway following the Hwy 34 / Hwy 90 Corridor from Walnut Ridge to Knobel. Under Scenario 2, the construction phase is anticipated to be seven (7) years, with engineering beginning in 2023 and continuing through 2025 and construction beginning in 2026 and ending in 2032. As described earlier, Alternative 3 is estimated to have a nominal (Year of expenditure) dollar investment $24,000,000 in engineering and other preconstruction phase activities. Total construction cost is estimated to be $479,750,000 in nominal (year of expenditure) dollars.

Employment Gains

Table 22 shows the top 15 industries for employment growth that were estimated for Alternative 3 Scenario 2. Employment figures represent a combination of direct, indirect, and induced employment. When consumers purchase goods and services, final demand is created for the sectors producing the goods and services consumed. When consumer spending is modeled for a given sector, investment in transportation system infrastructure in this case, this spending represents a direct effect.

Table 22: Top 15 Industries: Industry Gains in Employment; Alternative 3-Scenario 2; IMPLAN

Industry Sector	Direct Emp	Indirect Emp	Induced Emp	Total
54 - Construction of new highways and streets	2,326	0	0	2,326
457 - Architectural, engineering, and related services	119	30	1	150
417 - Truck transportation	0	58	8	66
472 - Employment services	0	44	16	60
447 - Other real estate	0	33	22	55
509 - Full-service restaurants	0	12	42	54
490 - Hospitals	0	0	52	52
510 - Limited-service restaurants	0	5	43	48
204 - Ready-mix concrete manufacturing	0	46	0	46
476 - Services to buildings	0	30	10	40
396 - Wholesale - Other durable goods merchant wholesalers	0	33	2	35
405 - Retail - Building material and garden equipment and supplies stores	0	28	5	33
483 - Offices of physicians	0	0	31	31
411 - Retail - General merchandise stores	0	1	28	29
453 - Commercial and industrial machinery and equipment rental and leasing	0	29	1	30

As shown in Table 22, the highest gains in employment for Alternative 1 Scenario 1 are in the sector related to construction of highways and streets. The highway construction industry, through the direct investment defined in the scenario, added about 2,326 direct employees and the engineering sector added about 150 through a

combination of direct, indirect, and induced employment. The next highest sectors, adding indirect and induced employment would be truck transportation, employment services and real estate.

Increased employment across all industry sectors totaled to about 4,092 employees statewide or 0.25% of total state employment. Because of the site-specific nature of the construction industry the four-county area would be likely to host 3,636 of these employees, or approximately an 8.8% increase in total employment for the region. This increase in employment combined with the quality of jobs across each sector in which job growth is anticipated would result in an increase in employee compensation of about $207 million across the state and about $164 million within the four-county area.

Economic Output Impacts

The economic model calculates the anticipated employment based on the production requirement of the investment scenario. The IMPLAN model reports this production in terms of industry output. Table 23 presents the expected Alternative 3 / Scenario 2 growth in statewide industry output by sector. The expected growth in transportation construction is anticipated to be slightly under 45%.

Table 23: Top 15 Industries: Industry Output Growth by Sector; Alternative 3 Scenario 2; IMPLAN

Industry Sector	Base Output*	Added Output	Estimated Growth %
Construction of new highways and streets	$920,165,915	$413,284,100	44.91%
Asphalt shingle and coating materials manufacturing	$177,182,573	$9,813,341	5.54%
Miscellaneous nonmetallic mineral products manufacturing	$31,666,309	$1,011,006	3.19%
Ready-mix concrete manufacturing	$579,667,147	$18,505,562	3.19%
Other concrete product manufacturing	$53,928,424	$1,500,331	2.78%
Concrete pipe manufacturing	$39,591,907	$1,068,094	2.70%
Stone mining and quarrying	$274,459,125	$7,270,264	2.65%
Asphalt paving mixture and block manufacturing	$138,890,584	$2,830,234	2.04%
Architectural, engineering, and related services	$1,333,228,101	$25,945,132	1.95%
Prefabricated wood building manufacturing	$5,467,468	$75,234	1.38%
Commercial and industrial machinery and equipment rental and leasing	$789,249,982	$9,724,310	1.23%
Sand and gravel mining	$217,599,666	$2,618,943	1.20%
Cement manufacturing	$88,831,524	$774,769	0.87%
Fabricated structural metal manufacturing	$526,879,737	$4,315,406	0.82%
Brick, tile, and other structural clay product manufacturing	$126,671,306	$782,752	0.62%

**Base output is the 2019 study area industry output prior to implementing the scenario. Added output is the study area increase due to the scenario.* All values are in 2021 dollars.

Under this scenario, statewide final demand (i.e., direct output) for the highway construction industry would be expected to add about $413 million in increased production to the economy. Impacts to other sectors through multiplier and feedback effects would bring the total added production impact to about $741 million or about 0.26% of the state's $282 billion in total production output. Based on comparison of the IMPLAN results for the state versus the four-county area, about $580 million of that production, about 8.7% of the region's current gross output of around $6.7 billion, would be expected to occur within the four-county study area.

Value Added Impacts

Value added to the economy is analogous to GDP. This indicator is the sum of employee compensation, proprietor income, other property income, and taxes on production and imports less subsidies. The value added to the economy is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs. Value added to the economy equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported).

Alternative 3 Scenario 2 adds overall value of about $340 million to the statewide economy or approximately 0.26 % of the state's $133 billion GDP. For this alternative and scenario, the four-county area would be expected to contribute about $239 million or about 9.2 % of the $2.6 billion regional GDP. Table 24 shows the top 15 industries with most value added to the economy because of this Alternative 3 investment scenario.

Table 24: Top 15 Industries: Industry Value Added to the Economy by Sector; Alternative 3 Scenario 2; IMPLAN.

Industry Sector	Employee Comp. (000)	Proprietor Income (000)	Other Property Income (000)	Taxes on Production & Imports (000)	Value Added (000)
54 - Construction of new highways and streets	$78,079	$39,910	$56,947	$1,536	$176,472
457 - Architectural, engineering, and related services	$9,911	$1,161	$1,855	$103	$13,030
449 - Owner-occupied dwellings	$0	$0	$9,283	$1,557	$10,840
399 - Wholesale - Petroleum and petroleum products	$322	$19	$949	$5,917	$7,207
453 - Commercial and industrial machinery and equipment rental and leasing	$1,325	$425	$3,570	$831	$6,151
417 - Truck transportation	$3,617	$556	$861	$102	$5,136
204 - Ready-mix concrete manufacturing	$2,701	$180	$1,858	$134	$4,873
396 - Wholesale - Other durable goods merchant wholesalers	$2,316	$97	$1,834	$384	$4,631
469 - Management of companies and enterprises	$3,880	($4)	$444	$58	$4,378
28 - Stone mining and quarrying	$1,232	($79)	$2,303	$761	$4,217
441 - Monetary authorities and depository credit intermediation	$1,859	$5	$2,257	$92	$4,213
490 - Hospitals	$3,337	$133	$535	$63	$4,068
483 - Offices of physicians	$2,988	$118	$603	$35	$3,744
472 - Employment services	$1,839	$32	$1,313	$54	$3,238
156 - Asphalt shingle and coating materials manufacturing	$1,067	$4	$2,081	$32	$3,184

Tax Benefits

Tax benefits refer to transfer payments (e.g., taxes, fees, and other apportionments) that accrue to units of government due to the economic value added by the transportation investment and its ancillary effects. Tax benefits by receiving unit of government are summarized in Table 25. Values for the state represent state-owned government activity, while county values represent locally owned government activity. Tax receipts are reported in deflated 2021 dollars.

Table 25: Tax Benefits: Increase in Tax Receipts by Sector Alternative 3 Scenario 2; IMPLAN.

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
Direct	$172,222	$99,737	$155,879	$4,664,731	$23,003,774	$28,096,343
Indirect	$1,239,808	$676,335	$1,104,318	$9,135,206	$10,129,291	$22,284,958
Induced	$727,176	$397,036	$647,860	$5,584,757	$7,412,361	$14,769,190
Total	$2,139,206	$1,173,108	$1,908,057	$19,384,694	$40,545,426	$65,150,491

The reported tax receipts are for the state as a whole, so local and subarea taxes may include areas from outside the four-county study area. However, comparison of state versus four-county local study area results suggests that the four-county proportion of added Sub County General taxes would be on the order of $900,000, added Sub County Special District taxes would be on the order of $603,000, and four-county values for County Taxes would be on the order of $1.4 million in new county tax receipts.

Summary Comparison of Alternatives for Scenario 2

For comparison purposes, Table 26 provides a summary comparison of the economic impacts of each of the three corridors under the Scenario 2 construction phasing. Because it represents a slightly higher level of investment, Alternative 1 provides the greatest economic benefit, but not to such a dramatic degree that it would necessarily outweigh other infrastructure, operational or environmental criteria, should one of the other corridors prove to be superior in regard to other project goals.

Table 26: Scenario 2 Summary: Economic Indicators by Corridor; IMPLAN

Impact	Employment	Labor Income	Value Added	Output	Taxes
Alternative 1	4,467	226,199,102	371,401,983	809,620,694	$71,135,022
Alternative 2	3,795	192,470,826	315,372,551	686,787,764	$60,430,070
Alternative 3	4,092	207,343,533	340,079,102	740,951,762	$65,150,491

In fact, when scaled for construction costs, there is virtually no difference in return on investment among the three alternatives. Each alternative provides a return of about $0.41 in labor income, between $0.67 and $0.68 in value added, $1.47 worth of growth in total output, and $0.13 in tax revenue for each dollar invested in engineering and construction. Although the project clearly provides economic value to the state and the region, the economic impacts provide very little basis for differentiating among the three alternatives.

Scenario 3

Scenario 3 assumes the longest timeline with an anticipated start date in 2026 and a construction phase duration of approximately eight years continuing through the end of 2033. Although there may be varying levels of construction activity across the eight-year period, for purposes of the analysis it was assumed that construction activity would be relatively uniform across all eight years. For input into IMPLAN the interim year 2030 was used as a surrogate year that balances the lower deflation rates of the early years with the higher deflation rates of the later years in the construction phase.

Alternative 1 / Scenario 3

This alternative examines the economic impacts of implementing Alternative 1 along the current US 67 alignment with the Scenario 3 proposed construction phases, namely eight (8) years, with engineering beginning in 2023 and continuing through 2025 and construction beginning in 2026 and ending in 2033. As described earlier, Alternative 1 is estimated to have a nominal (Year of expenditure) dollar investment $24,000,000 in engineering and other preconstruction phase activities. Total construction cost is estimated to be $526,500,000 in nominal (year of expenditure) dollars.

Employment Gains

Table 27 shows the top 15 industries for employment growth that were estimated for Alternative 1 Scenario 3. Employment figures represent a combination of direct, indirect, and induced employment. When consumers purchase goods and services, final demand is created for the sectors producing the goods and services consumed. When consumer spending is modeled for a given sector, investment in transportation system infrastructure in this case, this spending represents a direct effect.

Table 27: Top 15 Industries: Industry Gains in Employment; Alternative 1-Scenario 3; IMPLAN

Industry Sector	Direct Emp	Indirect Emp	Induced Emp	Total
54 - Construction of new highways and streets	2,520	0	0	2,520
457 - Architectural, engineering, and related services	118	33	1	152
417 - Truck transportation	0	63	8	71
472 - Employment services	0	47	18	65
447 - Other real estate	0	35	24	59
509 - Full-service restaurants	0	12	45	57
490 - Hospitals	0	0	56	56
510 - Limited-service restaurants	0	5	46	51
204 - Ready-mix concrete manufacturing	0	50	0	50
476 - Services to buildings	0	32	10	42
396 - Wholesale - Other durable goods merchant wholesalers	0	36	2	38
405 - Retail - Building material and garden equipment and supplies	0	30	6	36
483 - Offices of physicians	0	0	33	33
411 - Retail - General merchandise stores	0	1	31	32
453 - Commercial and industrial machinery and equipment rental and leasing	0	31	1	32

As shown in Table 27, the highest gains in employment for Alternative 1 Scenario 3 are in the sector related to construction of highways and streets. The highway construction industry, through the direct investment defined in the scenario, added about 2,520 direct employees and the engineering sector added about 152 through a combination of direct, indirect, and induced employment. The next highest sectors, adding indirect and induced employment would be truck transportation, employment services and real estate.

Increased employment across all industry sectors totaled to about 4,411 employees statewide or 0.26% of total state employment. Because of the site-specific nature of the construction industry the four-county area would be likely to host 3,918 of these employees, or slightly less than a 9.5% increase in total employment for the region. This increase in employment combined with the quality of jobs across each sector in which job growth is anticipated would result in an increase in total labor income of about $223 million across the state and about $177 million within the four-county area.

Economic Output Impacts

The economic model calculates the anticipated employment based on the production requirement of the investment scenario. The IMPLAN model reports this production in terms of industry output. Table 28 presents the expected Alternative 1 / Scenario 3 growth in statewide industry output by sector. The expected growth in transportation construction is anticipated to be slightly under 49%.

Table 28: Top 15 Industries: Industry Output Growth by Sector; Alternative 1 Scenario 3; IMPLAN

Industry Sector	Base Output*	Added Output	Estimated Growth %
Construction of new highways and streets	$920,165,915	$447,872,092	48.67%
Asphalt shingle and coating materials manufacturing	$177,182,573	$10,634,466	6.00%
Miscellaneous nonmetallic mineral products manufacturing	$31,666,309	$1,095,594	3.46%
Ready-mix concrete manufacturing	$579,667,147	$20,047,971	3.46%
Other concrete product manufacturing	$53,928,424	$1,625,334	3.01%
Concrete pipe manufacturing	$39,591,907	$1,157,137	2.92%
Stone mining and quarrying	$274,459,125	$7,877,583	2.87%
Asphalt paving mixture and block manufacturing	$138,890,584	$3,066,915	2.21%
Architectural, engineering, and related services	$1,333,228,101	$26,100,336	1.96%
Prefabricated wood building manufacturing	$5,467,468	$81,524	1.49%
Commercial and industrial machinery and equipment rental and leasing	$789,249,982	$10,530,506	1.33%
Sand and gravel mining	$217,599,666	$2,837,083	1.30%
Cement manufacturing	$88,831,524	$839,227	0.94%
Fabricated structural metal manufacturing	$526,879,737	$4,675,465	0.89%
Brick, tile, and other structural clay product manufacturing	$126,671,306	$847,914	0.67%

**Base output is the 2019 study area industry output prior to implementing the scenario. Added output is the study area increase due to the scenario.* All values are in 2021 dollars.

Under this scenario, statewide final demand (i.e., direct output) for the highway construction industry would be expected to add about $448 million in increased production to the economy. Impacts to other sectors through multiplier and feedback effects would bring the total added production impact to about $799 million or about 0.28% of the state's $282 billion in total production output. Based on comparison of the IMPLAN results for the

state versus the four-county area, about $626 million of that production, about 9.3% of the region's current gross output of around $6.7 billion, would be expected to occur within the four-county study area.

Value Added Impacts

Value added to the economy is analogous to GDP. This indicator is the sum of employee compensation, proprietor income, other property income, and taxes on production and imports less subsidies. The value added to the economy is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs. Value added to the economy equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported).

Alternative 1 Scenario 3 adds overall value of about $367 million to the statewide economy or approximately 0.28 % of the state's $133 billion GDP. For this alternative and scenario, the four-county area would be expected to contribute about $258 million or about 9.9 % of the $2.6 billion regional GDP. Table 29 shows the top 15 industries with most value added to the economy because of this Alternative 1 investment scenario.

Table 29: Top 15 Industries: Industry Value Added to the Economy by Sector; Alternative 1 Scenario 3; IMPLAN.

Industry Sector	Employee Comp. (000)	Proprietor Income (000)	Other Property Income (000)	Taxes on Production & Imports (000)	Value Added (000)
54 - Construction of new highways and streets	$84,613	$43,251	$61,713	$1,665	$191,242
457 - Architectural, engineering, and related services	$9,970	$1,168	$1,866	$103	$13,107
449 - Owner-occupied dwellings	$0	$0	$10,001	$1,678	$11,679
399 - Wholesale - Petroleum and petroleum products	$349	$21	$1,027	$6,406	$7,803
453 - Commercial and industrial machinery and equipment rental and leasing	$1,435	$461	$3,866	$900	$6,662
417 - Truck transportation	$3,914	$602	$932	$110	$5,558
204 - Ready-mix concrete manufacturing	$2,926	$195	$2,013	$145	$5,279
396 - Wholesale - Other durable goods merchant wholesalers	$2,507	$105	$1,985	$415	$5,012
469 - Management of companies and enterprises	$4,173	($4)	$477	$62	$4,708
28 - Stone mining and quarrying	$1,335	($86)	$2,495	$824	$4,568
441 - Monetary authorities and depository credit intermediation	$2,002	$6	$2,431	$99	$4,538
490 - Hospitals	$3,595	$143	$576	$68	$4,382
483 - Offices of physicians	$3,219	$127	$650	$37	$4,033
156 - Asphalt shingle and coating materials manufacturing	$1,157	$5	$2,255	$35	$3,452
472 - Employment services	$1,950	$34	$1,392	$58	$3,434

Tax Benefits

Tax benefits refer to transfer payments (e.g., taxes, fees, and other apportionments) that accrue to units of government due to the economic value added by the transportation investment and its ancillary effects. Values for the state represent state-owned government activity, while county values represent locally owned government activity. Tax receipts (presented in Table 30) are reported in deflated 2021 dollars.

Table 30: Tax Benefits: Increase in Tax Receipts by Sector Alternative 1 Scenario 3; IMPLAN.

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
Direct	$185,800	$107,590	$168,164	$5,029,514	$24,771,279	$30,262,347
Indirect	$1,341,383	$731,737	$1,194,790	$9,878,782	$10,923,319	$24,070,011
Induced	$783,393	$427,730	$697,944	$6,016,507	$7,985,446	$15,911,020
Total	$2,310,576	$1,267,057	$2,060,898	$20,924,803	$43,680,044	$70,243,378

The reported tax receipts are for the state as a whole, so local and subarea taxes may include areas from outside the four-county study area. However, comparison of state versus four-county local study area results suggests that the four-county proportion of added Sub County General taxes would be on the order of $972,000, added Sub County Special District taxes would be on the order of $651,000, and four-county values for County Taxes would be on the order of $1.5 million in new county tax receipts.

Alternative 2 / Scenario 3

This alternative examines the economic impacts of implementing Alternative 2, a new location roadway east and south of US 67 between US 67 and the Black River Wildlife Management Area. Under Scenario 3, the construction phase is anticipated to be eight (8) years, with engineering beginning in 2023 and continuing through 2025 and construction beginning in 2026 and ending in 2033. As described earlier, Alternative 2 is estimated to have a nominal (Year of expenditure) dollar investment $24,000,000 in engineering and other preconstruction phase activities. Total construction cost is estimated to be $442,875,000 in nominal (year of expenditure) dollars.

Employment Gains

Table 31 shows the top 15 industries for employment growth that were estimated for Alternative 2 Scenario 3. Employment figures represent a combination of direct, indirect, and induced employment. When consumers purchase goods and services, final demand is created for the sectors producing the goods and services consumed. When consumer spending is modeled for a given sector, investment in transportation system infrastructure in this case, this spending represents a direct effect.

Table 31: Top 15 Industries: Industry Gains in Employment; Alternative 2-Scenario 3; IMPLAN

Industry Sector	Direct Emp	Indirect Emp	Induced Emp	Total
54 - Construction of new highways and streets	2,120	0	0	2,120
457 - Architectural, engineering, and related services	118	28	1	147
417 - Truck transportation	0	53	7	60
472 - Employment services	0	42	15	57
447 - Other real estate	0	30	20	50
509 - Full-service restaurants	0	11	38	49
490 - Hospitals	0	0	47	47
510 - Limited-service restaurants	0	4	39	43
204 - Ready-mix concrete manufacturing	0	42	0	42
476 - Services to buildings	0	27	9	36
396 - Wholesale - Other durable goods merchant wholesalers	0	30	2	32
405 - Retail - Building material and garden equipment and supplies stores	0	25	5	30
483 - Offices of physicians	0	0	28	28
411 - Retail - General merchandise stores	0	1	26	27
469 - Management of companies and enterprises	0	20	7	27

As shown in Table 31, the highest gains in employment for Alternative 2 Scenario 3 are in the sector related to construction of highways and streets. The highway construction industry, through the direct investment defined in the scenario, added about 2,120 direct employees and the engineering sector added about 147 through a combination of direct, indirect, and induced employment. The next highest sectors, adding indirect and induced employment would be truck transportation, employment services and real estate.

Increased employment across all industry sectors totaled to about 3,748 employees statewide or 0.23% of total state employment. Because of the site-specific nature of the construction industry the four-county area would be likely to host 3,331 of these employees, or slightly less than an 8.1% increase in total employment for the region. This increase in employment combined with the quality of jobs across each sector in which job growth is anticipated would result in an increase in total labor income of about $190 million across the state and about $150 million within the four-county area.

Economic Output Impacts

The economic model calculates the anticipated employment based on the production requirement of the investment scenario. The IMPLAN model reports this production in terms of industry output. Table 32 presents the expected Alternative 2 / Scenario 3 growth in statewide industry output by sector. The expected growth in transportation construction is anticipated to be slightly over 40%.

Table 32: Top 15 Industries: Industry Output Growth by Sector; Alternative 2 Scenario 3; IMPLAN

Industry Sector	Base Output*	Added Output	Estimated Growth %
Construction of new highways and streets	$920,165,915	$376,735,712	40.94%
Asphalt shingle and coating materials manufacturing	$177,182,573	$8,945,634	5.05%
Ready-mix concrete manufacturing	$579,667,147	$16,874,036	2.91%
Miscellaneous nonmetallic mineral products manufacturing	$31,666,309	$921,618	2.91%
Other concrete product manufacturing	$53,928,424	$1,368,093	2.54%
Concrete pipe manufacturing	$39,591,907	$973,912	2.46%
Stone mining and quarrying	$274,459,125	$6,628,220	2.42%
Architectural, engineering, and related services	$1,333,228,101	$25,240,985	1.89%
Asphalt paving mixture and block manufacturing	$138,890,584	$2,580,089	1.86%
Prefabricated wood building manufacturing	$5,467,468	$68,585	1.25%
Commercial and industrial machinery and equipment rental and leasing	$789,249,982	$8,870,374	1.12%
Sand and gravel mining	$217,599,666	$2,388,161	1.10%
Cement manufacturing	$88,831,524	$706,555	0.80%
Fabricated structural metal manufacturing	$526,879,737	$3,934,645	0.75%
Brick, tile, and other structural clay product manufacturing	$126,671,306	$713,803	0.56%

**Base output is the 2019 study area industry output prior to implementing the scenario. Added output is the study area increase due to the scenario.* All values are in 2021 dollars.

Under this scenario, statewide final demand (i.e., direct output) for the highway construction industry would be expected to add about $377 million in increased production to the economy. Impacts to other sectors through multiplier and feedback effects would bring the total added production impact to about $678 million or about 0.24% of the state's $282 billion in total production output. Based on comparison of the IMPLAN results for the state versus the four-county area, about $531 million of that production, about 7.9% of the region's current gross output of around $6.7 billion, would be expected to occur within the four-county study area.

Value Added Impacts

Value added to the economy is analogous to GDP. This indicator is the sum of employee compensation, proprietor income, other property income, and taxes on production and imports less subsidies. The value added to the economy is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs. Value added to the economy equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported).

Alternative 2 Scenario 3 adds overall value of about $311 million to the statewide economy or approximately 0.23 % of the state's $133 billion GDP. For this alternative and scenario, the four-county area would be expected to contribute about $219 million or about 8.4 % of the $2.6 billion regional GDP. Table 33 shows the top 15 industries with most value added to the economy because of this Alternative 2 investment scenario.

Table 33: Top 15 Industries: Industry Value Added to the Economy by Sector; Alternative 2 Scenario 3; IMPLAN.

Industry Sector	Employee Comp.	Proprietor Income	Other Property Income	Taxes on Production & Imports	Value Added
54 - Construction of new highways and streets	$71,174	$36,381	$51,911	$1,400	$160,866
457 - Architectural, engineering, and related services	$9,642	$1,130	$1,805	$100	$12,677
449 - Owner-occupied dwellings	$0	$0	$8,509	$1,427	$9,936
399 - Wholesale - Petroleum and petroleum products	$294	$18	$866	$5,398	$6,576
453 - Commercial and industrial machinery and equipment rental and leasing	$1,209	$388	$3,256	$758	$5,611
417 - Truck transportation	$3,301	$508	$786	$93	$4,688
204 - Ready-mix concrete manufacturing	$2,463	$164	$1,694	$122	$4,443
396 - Wholesale - Other durable goods merchant wholesalers	$2,113	$88	$1,673	$350	$4,224
469 - Management of companies and enterprises	$3,563	($4)	$407	$53	$4,019
441 - Monetary authorities and depository credit intermediation	$1,704	$5	$2,069	$84	$3,862
28 - Stone mining and quarrying	$1,124	($72)	$2,099	$693	$3,844
490 - Hospitals	$3,059	$122	$490	$58	$3,729
483 - Offices of physicians	$2,739	$108	$553	$32	$3,432
472 - Employment services	$1,710	$30	$1,221	$50	$3,011
156 - Asphalt shingle and coating materials manufacturing	$973	$4	$1,897	$29	$2,903

Tax Benefits

Tax benefits refer to transfer payments (e.g., taxes, fees, and other apportionments) that accrue to units of government due to the economic value added by the transportation investment and its ancillary effects. Values for the state represent state-owned government activity, while county values represent locally owned government activity. Tax receipts (Shown in Table 34) are reported in deflated 2021 dollars.

Table 34: Tax Benefits: Increase in Tax Receipts by Sector Alternative 2 Scenario 3; IMPLAN.

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
Direct	$157,650	$91,306	$142,694	$4,272,411	$21,093,841	$25,757,902
Indirect	$1,131,889	$617,471	$1,008,197	$8,343,872	$9,275,871	$20,377,300
Induced	$666,531	$363,924	$593,829	$5,118,988	$6,794,133	$13,537,405
Total	$1,956,070	$1,072,701	$1,744,720	$17,735,271	$37,163,845	$59,672,607

The reported tax receipts are for the state as a whole, so local and subarea taxes may include areas from outside the four-county study area. However, comparison of state versus four-county local study area results suggests

that the four-county proportion of added Sub County General taxes would be on the order of $823,000, added Sub County Special District taxes would be on the order of $551,000, and four-county values for County Taxes would be on the order of $1.3 million in new county tax receipts.

Alternative 3 / Scenario 3

This alternative examines the economic impacts of implementing Alternative 3, a new location roadway following the Hwy 34 / Hwy 90 Corridor from Walnut Ridge to Knobel. Under Scenario 3, the construction phase is anticipated to be eight (8) years, with engineering beginning in 2023 and continuing through 2025 and construction beginning in 2026 and ending in 2033. As described earlier, Alternative 3 is estimated to have a nominal (Year of expenditure) dollar investment $24,000,000 in engineering and other preconstruction phase activities. Total construction cost is estimated to be $479,750,000 in nominal (year of expenditure) dollars.

Employment Gains

Table 35 shows the top 15 industries for employment growth that were estimated for Alternative 3 Scenario 3. Employment figures represent a combination of direct, indirect, and induced employment. When consumers purchase goods and services, final demand is created for the sectors producing the goods and services consumed. When consumer spending is modeled for a given sector, investment in transportation system infrastructure in this case, this spending represents a direct effect.

Table 35: Top 15 Industries: Industry Gains in Employment; Alternative 3-Scenario 3; IMPLAN

Industry Sector	Direct Emp	Indirect Emp	Induced Emp	Total
54 - Construction of new highways and streets	2,297	0	0	2,297
457 - Architectural, engineering, and related services	118	30	1	149
417 - Truck transportation	0	57	7	64
472 - Employment services	0	44	16	60
447 - Other real estate	0	32	22	54
509 - Full-service restaurants	0	12	41	53
490 - Hospitals	0	0	51	51
510 - Limited-service restaurants	0	5	42	47
204 - Ready-mix concrete manufacturing	0	46	0	46
476 - Services to buildings	0	29	10	39
396 - Wholesale - Other durable goods merchant wholesalers	0	33	2	35
405 - Retail - Building material and garden equipment and supplies stores	0	28	5	33
483 - Offices of physicians	0	0	31	31
411 - Retail - General merchandise stores	0	1	28	29
453 - Commercial and industrial machinery and equipment rental and leasing	0	28	1	29

As shown in Table 35, the highest gains in employment for Alternative 3 Scenario 3 are in the sector related to construction of highways and streets. The highway construction industry, through the direct investment defined in the scenario, added about 2,297 direct employees and the engineering sector added about 149 through a combination of direct, indirect, and induced employment. The next highest sectors, adding indirect and induced employment would be truck transportation, employment services and real estate.

Increased employment across all industry sectors totaled to about 4,040 employees statewide or 0.24% of total state employment. Because of the site-specific nature of the construction industry the four-county area would be likely to host 3,590 of these employees, or slightly less than an 8.7% increase in total employment for the region. This increase in employment combined with the quality of jobs across each sector in which job growth is anticipated would result in an increase in total labor income of about $205 million across the state and about $162 million within the four-county area.

Economic Output Impacts

The economic model calculates the anticipated employment based on the production requirement of the investment scenario. The IMPLAN model reports this production in terms of industry output. Table 36 presents the expected Alternative 3 / Scenario 3 growth in statewide industry output by sector. The expected growth in transportation construction is anticipated to be just over 44%.

Table 36: Top 15 Industries: Industry Output Growth by Sector; Alternative 3 Scenario 3; IMPLAN

Industry Sector	Base Output*	Added Output	Estimated Growth %
Construction of new highways and streets	$920,165,915	$408,103,772	44.35%
Asphalt shingle and coating materials manufacturing	$177,182,573	$9,690,335	5.47%
Miscellaneous nonmetallic mineral products manufacturing	$31,666,309	$998,334	3.15%
Ready-mix concrete manufacturing	$579,667,147	$18,273,603	3.15%
Other concrete product manufacturing	$53,928,424	$1,481,525	2.75%
Concrete pipe manufacturing	$39,591,907	$1,054,706	2.66%
Stone mining and quarrying	$274,459,125	$7,179,135	2.62%
Asphalt paving mixture and block manufacturing	$138,890,584	$2,794,758	2.01%
Architectural, engineering, and related services	$1,333,228,101	$25,619,921	1.92%
Prefabricated wood building manufacturing	$5,467,468	$74,291	1.36%
Commercial and industrial machinery and equipment rental and leasing	$789,249,982	$9,602,420	1.22%
Sand and gravel mining	$217,599,666	$2,586,116	1.19%
Cement manufacturing	$88,831,524	$765,058	0.86%
Fabricated structural metal manufacturing	$526,879,737	$4,261,314	0.81%
Brick, tile, and other structural clay product manufacturing	$126,671,306	$772,940	0.61%

**Base output is the 2019 study area industry output prior to implementing the scenario. Added output is the study area increase due to the scenario.* All values are in 2021 dollars.

Under this scenario, statewide final demand (i.e., direct output) for the highway construction industry would be expected to add about $408 million in increased production to the economy. Impacts to other sectors through multiplier and feedback effects would bring the total added production impact to about $732 million or about 0.26% of the state's $282 billion in total production output. Based on comparison of the IMPLAN results for the state versus the four-county area, about $573 million of that production, about 8.6% of the region's current gross output of around $6.7 billion, would be expected to occur within the four-county study area.

Value Added Impacts

Value added to the economy is analogous to GDP. This indicator is the sum of employee compensation, proprietor income, other property income, and taxes on production and imports less subsidies. The value added to the economy is the difference between an industry's or an establishment's total output and the cost of its intermediate inputs. Value added to the economy equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported).

Alternative 3 Scenario 3 adds overall value of about $336 million to the statewide economy or approximately 0.25 % of the state's $133 billion GDP. For this alternative and scenario, the four-county area would be expected to contribute about $236 million or about 9.1 % of the $2.6 billion regional GDP. Table 37 shows the top 15 industries with most value added to the economy as a result of this Alternative 3 investment scenario.

Table 37: Top 15 Industries: Industry Value Added to the Economy by Sector; Alternative 3 Scenario 3; IMPLAN.

Industry Sector	Employee Comp. (000)	Proprietor Income (000)	Other Property Income (000)	Taxes on Production & Imports (000)	Value Added (000)
54 - Construction of new highways and	$77,100	$39,410	$56,233	$1,517	$174,260
457 - Architectural, engineering, and related services	$9,787	$1,147	$1,832	$102	$12,868
449 - Owner-occupied dwellings	$0	$0	$9,167	$1,538	$10,705
399 - Wholesale - Petroleum and petroleum products	$318	$19	$937	$5,843	$7,117
453 - Commercial and industrial machinery and equipment rental	$1,309	$420	$3,525	$821	$6,075
417 - Truck transportation	$3,571	$549	$850	$101	$5,071
204 - Ready-mix concrete manufacturing	$2,667	$178	$1,834	$132	$4,811
396 - Wholesale - Other durable goods merchant wholesalers	$2,287	$96	$1,811	$379	$4,573
469 - Management of companies and enterprises	$3,832	($4)	$438	$57	$4,323
28 - Stone mining and quarrying	$1,217	($78)	$2,274	$751	$4,164
441 - Monetary authorities and depository credit intermediation	$1,835	$5	$2,229	$91	$4,160
490 - Hospitals	$3,295	$131	$528	$63	$4,017
483 - Offices of physicians	$2,950	$117	$596	$34	$3,697
472 - Employment services	$1,816	$32	$1,296	$54	$3,198
156 - Asphalt shingle and coating materials manufacturing	$1,054	$4	$2,055	$32	$3,145

Tax Benefits

Tax benefits refer to transfer payments (e.g., taxes, fees, and other apportionments) that accrue to units of government due to the economic value added by the transportation investment and its ancillary effects. Values for the state represent state-owned government activity, while county values represent locally owned government activity. Tax receipts (Shown in Table 38) are reported in deflated 2021 dollars.

Table 38: Tax Benefits: Increase in Tax Receipts by Sector Alternative 3 Scenario 3; IMPLAN.

Impact	Sub County General	Sub County Special Districts	County	State	Federal	Total
Direct	$170,063	$98,487	$153,925	$4,606,260	$22,715,432	$27,744,167
Indirect	$1,224,267	$667,857	$1,090,476	$9,020,701	$10,002,325	$22,005,626
Induced	$718,062	$392,059	$639,739	$5,514,755	$7,319,451	$14,584,066
Total	$2,112,392	$1,158,403	$1,884,140	$19,141,716	$40,037,208	$64,333,859

The reported tax receipts are for the state as a whole, so local and subarea taxes may include areas from outside the four-county study area. However, comparison of state versus four-county local study area results suggests that the four-county proportion of added Sub County General taxes would be on the order of $889,000, added Sub County Special District taxes would be on the order of $595,000, and four-county values for County Taxes would be on the order of $1.4 million in new county tax receipts.

Summary Comparison of Alternatives for Scenario 3

For comparison purposes, Table 39 provides a summary comparison of the economic impacts of each of the three corridors under the Scenario 3 construction phasing. Because it represents a slightly higher level of investment, Alternative 1 provides the greatest economic benefit, but not to such a dramatic degree that it would necessarily outweigh other infrastructure, operational or environmental criteria, should one of the other corridors prove to be superior in regard to other project goals.

Table 39: Scenario 2 Summary: Economic Indicators by Corridor; IMPLAN

Scenario 3 Economic Indicators by Corridor					
Impact	Employment	Labor Income	Value Added	Output	Taxes
Alternative 1	4,411	223,363,799	366,746,628	799,472,467	$70,243,378
Alternative 2	3,748	190,058,292	311,419,500	678,179,193	$59,672,607
Alternative 3	4,040	204,744,577	335,816,365	731,664,269	$64,333,859

In fact, when scaled for construction costs, there is virtually no difference in return on investment among the three alternatives. Each alternative provides a return of about $0.41 in labor income, $0.67 in value added, $1.45 worth of growth in total output, and $0.13 in tax revenue for each dollar invested in engineering and construction. Although the project clearly provides economic value to the state and the region, the economic impacts provide very little basis for differentiating among the three alternatives.

Conclusion

Based on the analysis, the proposed transportation investment in the future I-57 corridor clearly has positive economic impacts on the state and the four-county study area. The gross impacts are heavily dependent on the Corridor selected and the construction phasing scenario adopted for implementation, with a slightly greater economic benefit the earlier the project can be implemented. Depending upon the combination of corridor and scenario, ranges for the economic indicators are 3,748 to 4,524 aggregate jobs; $190M to 290M in aggregate labor income; $311M to $376M in value added to the GDP; $678M to $819M in increased industry output; and between $60M and $72M increase in tax revenues.

In considering these economic impacts, it is important to remember that these numbers have been aggregated across the life of the project to simplify the comparison of the various combinations of alternatives and scenarios and need to be averaged across the duration of the scenario in years to obtain annual numbers for each economic indicator.

As noted earlier in the scenario summaries, when scaled for total cost, the economic indicators for return on investment per dollar invested are nearly identical across the alternatives and the scenarios and provide limited information for differentiating among alternatives. The economic impacts of the implementing this segment of future I-57 should also be considered in context as just one of the many factors that contribute to the goals and objectives for the project.