US-89
STATE ENVIRONMENTAL STUDY
FARMINGTON TO I-84

DAVIS COUNTY, UTAH

MARCH 2018

VOLUME 1
CHAPTERS 1-4

UDOT Project Number: S-0089(406)398
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UDOT
Keeping Utah Moving

Approval

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on US-89 from Shepard Lane in Farmington, Davis County, to I-84 in South Weber, Weber County, Utah. The Selected Alternative consists of the following improvements:

- Widening US-89 from a four-lane arterial to a six-lane freeway from Shepard Lane to I-84 with limited access
- Utilizing existing roads or constructing new roads to provide local, two-way access
- Providing access to the northbound exit ramp at Main Street from the one-way frontage road
- Constructing a modified one-movement continuous-flow intersection on Lloyd Road at the Main Street intersection (while on Lloyd Road, drivers would crossover and merge with traffic on the US-89 southbound off-ramp)
- Grade-separating the Nicholls Road/US-89 crossing by providing a US-89 overpass and lowering Nicholls Road by approximately five feet
- Constructing a diamond interchange at 400 North with a northbound jug-handle entrance ramp and US-89 over 400 north
- Grade-separating the Crestwood Road/US-89 crossing by providing a US-89 overpass
- Constructing a diamond interchange at Oak Hills Drive, with US-89 over Oak Hills Drive
- Extending Gordon Avenue to US-89 and constructing a new diamond interchange at US-89, with US-89 over Gordon Avenue
- Constructing a tight diamond interchange at Antelope Drive with the northbound and southbound ramps shifted east and US-89 over Antelope Drive
- Retaining the SR-193 interchange, with access to the northbound exit ramp at SR-193 from Valley View Drive
- Retaining the South Weber Drive interchange
- Extending the third northbound lane from South Weber Drive to 6600 South and constructing an additional southbound lane from South Weber Drive to SR-193
- Replacing the bridge over the Weber River, contingent on funding
- Replacing the I-84 bridges over US-89, contingent on funding
- Coordinating with the local municipalities during final design to designate a Class III bike route east of US-89 between Farmington Main Street and South Weber Drive

During the environmental study process, the alternatives were evaluated and adjusted to minimize harm. Alignments and designs were selected to reduce impacts where possible while still meeting the project purpose and need. All practical measures to minimize environmental harm by the Selected Alternative have been considered and incorporated into the project.

As a result of this SES, UDOT has evaluated the effectiveness, benefits, costs, likely effects, and comments provided by the public and stakeholders on the proposed project. Based on the information summarized in this SES, UDOT has determined that the Selected Alternative will best meet the purpose and need of the project while minimizing environmental impacts.

Reviewed by

Chris Lizotte, UDOT Region One Environmental Manager — Mar 12, 2018 Date

Recommended by

Brandon Weston, UDOT Director of Environmental Services — Mar 12, 2018 Date

Approved by

Randall Park, UDOT Project Development Director — 3/12/2018 Date

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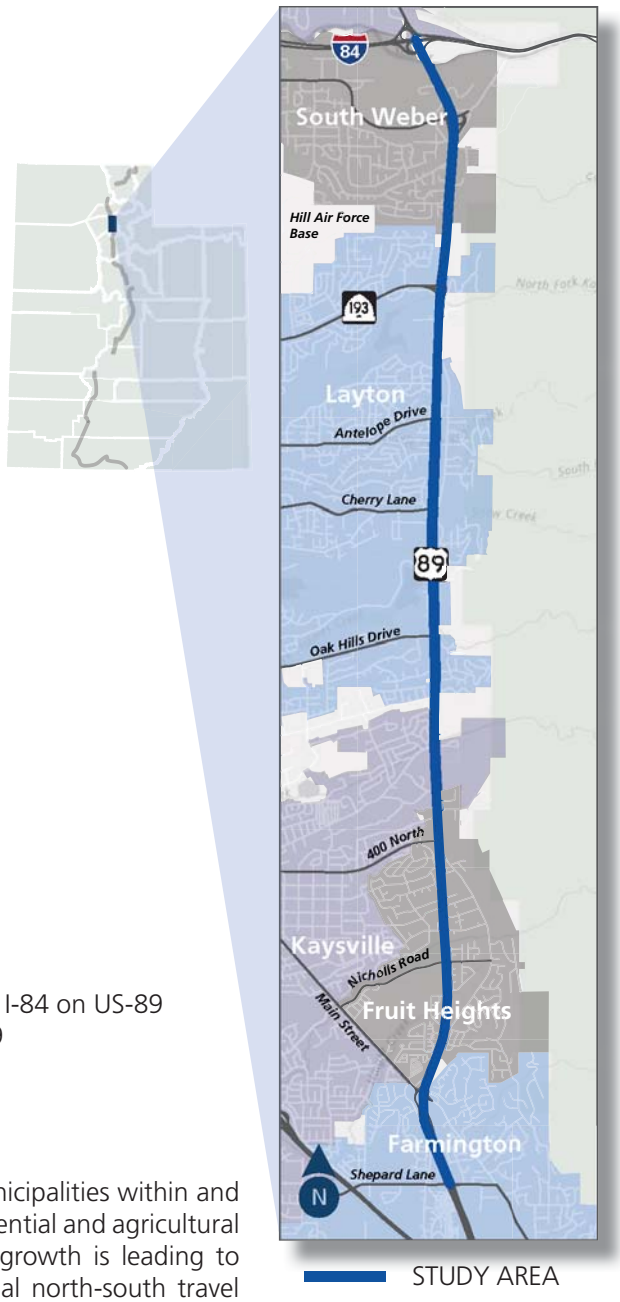
Executive Summary

ES.1 INTRODUCTION

The Utah Department of Transportation (UDOT) has conducted this State Environmental Study (SES) to evaluate proposed courses of action to meet the transportation needs along the US-89 corridor in Davis and Weber Counties. This SES identifies the Preferred Alternative that meets the needs of the proposed improvements while minimizing impacts to the human and natural environment. UDOT considered the needs for safe and efficient transportation while considering the social, economic, and environmental impacts of proposed improvements.

Figure ES-1 Study Area



ES.2 PURPOSE AND NEED

ES.2.1 Study Area

The study area is an approximately 9.6 mile-long corridor that begins at Shepard Lane in Farmington and extends north to I-84 in South Weber City. This study area passes through Farmington, Fruit Heights, Kaysville, Layton, and South Weber City (see Figure ES-1). The width of the SES study area varies throughout the corridor to include the existing intersections (cross streets) and has been drawn wide enough for consideration of all environmental resources. The study area varies for specific environmental resources depending on resource characteristics. Resource specific study areas are defined and illustrated in Chapter 3 of this document.

ES.2.2 Purpose of the Proposed Action

The purpose of the proposed improvements is to:

- Improve regional and local mobility
- Provide enhanced system linkage between I-15 and I-84 on US-89
- Address current and future travel demand on US-89
- Improve safety

ES.2.3 Summary of Transportation needs

The following needs would be addressed:

- *Increasing Regional Growth and Development:* Municipalities within and near the study area are transitioning from rural residential and agricultural to residential suburbanized and commercial. This growth is leading to increased travel demand on Davis County's regional north-south travel corridors.
- *Lack of a Well-Functioning Connection between I-15 and I-84:* US-89 is a vital system link between I-15 and I-84. In 2040, if no improvements are made, travel times will increase substantially.
- *Current and Future Traffic Congestion:* Currently, US-89 is operating at failing conditions. In 2040, if no improvements are made, congestion will worsen and the corridor will continue to operate at failing conditions.
- *Safety:* A high number of crashes are occurring that are related to signalized intersections where there are sudden speed or lane changes associated with traffic congestion. The frequency of crashes involving wildlife along this corridor is also high.

For additional information, see Chapter 1: Purpose and Need.

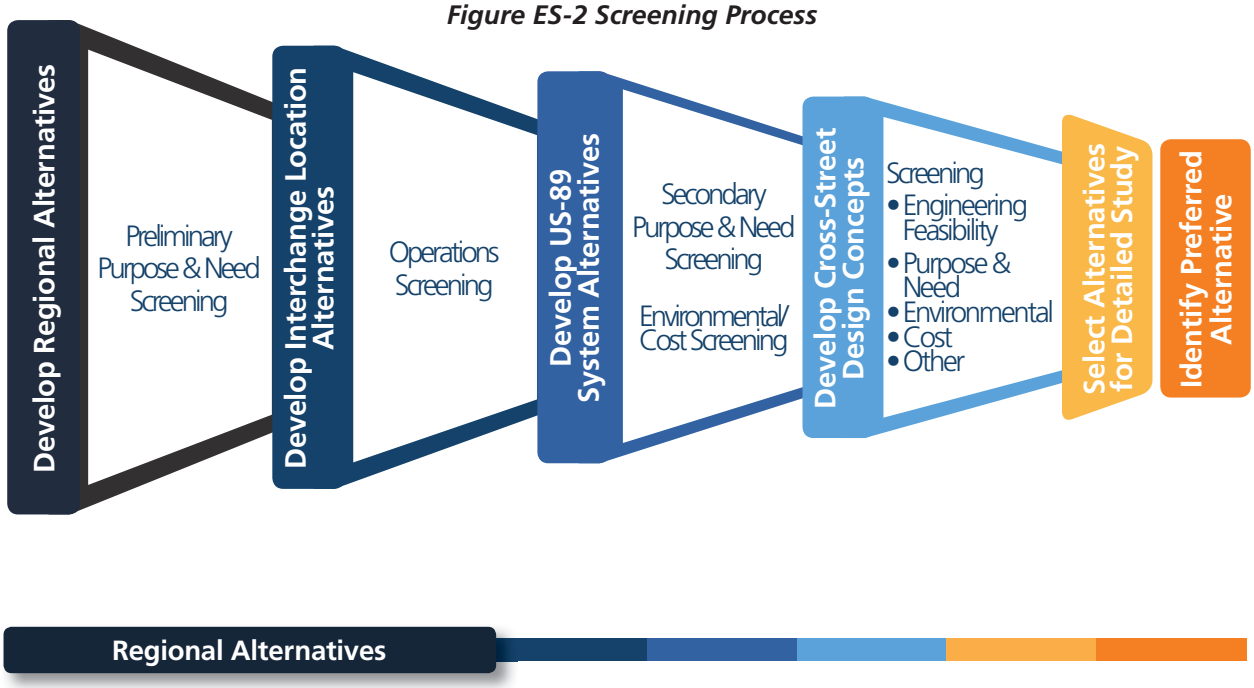
ES.3 ALTERNATIVES

The alternatives development and screening process included evaluating potential solutions that meet the purpose of the project (see Section ES.2 Purpose and Need).

ES.3.1 Alternatives Screening Process

The alternatives screening process started with high-level, regional alternatives, then focused on interchange location placement, the type of corridor facility, and finally to specific interchange and grade-separated cross-street designs (see Figure ES-2). The No-action Alternative moved forward throughout the entire screening process as it provided a baseline to compare impacts of build alternatives. For a more detailed explanation of the alternative screening process see Sections 2.2 to 2.3 of Chapter 2 of the SES.

Figure ES-2 Screening Process



ES.3.1.1 Develop and Screen Regional Alternatives

The study team developed high-level, regional alternatives that were more abstract in nature. This allowed the study team to evaluate the wider transportation system as a whole. The screening process for the Regional Alternatives included evaluating alternatives based on their ability to meet the following project purposes:

- Improve regional and local mobility
- Provide enhanced system linkage between I-15 and I-84 on US-89
- Improve safety

The project purpose to address current and future travel demand on US-89 is evaluated in Secondary Purpose and Need Screening in the US-89 System Alternatives section.

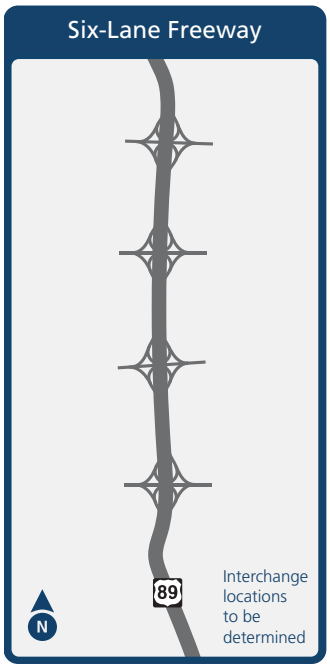
The study team developed high-level, regional alternatives to evaluate the wider transportation system as a whole. The study team developed the following regional alternatives:

- No-action Alternative
- US-89 Six-Lane Arterial Alternative
- US-89 Four-Lane Freeway Alternative
- US-89 Six-Lane Freeway Alternative

Additionally, the study team evaluated other concepts recommended by the public. These concepts included a connection from I-84 to I-15, increased transit, widening I-15, reduced speed on a four-lane US-89 freeway, combining concepts with the US-89 Six-Lane Arterial Alternative, and combining concepts with the US-89 Four-Lane Freeway Alternative.

Regional Alternatives Results

The Freeway Alternative was the only alternative that provided Level of Service (LOS) D or better and reduced conflict points on US-89. Therefore, the Freeway Alternative moved forward for further analysis. The Freeway Alternative would widen US-89 from four lanes to a six-lane freeway from Shepard Lane to I-84 with limited access. Current intersections would be eliminated or converted to grade-separated interchanges to provide ingress and egress to and from the freeway system.



Interchange Location Alternatives

ES.3.1.2 Develop and Screen Interchange Location Alternatives

The results of the Regional Alternatives screening process demonstrated that a six-lane freeway facility was required to meet the purpose and need. The next step in the process was to determine the placement of interchanges and grade-separated crossings. The screening process evaluated the Interchange Location Alternatives based on the following operational criteria:

- Provide reasonable access to US-89
- Determine if reasonable interchange demand is present at interchange locations
- Compatibility with the network roadway classification

Interchange Location Alternatives Results

The Baseline Freeway Alternative was the only alternative that met the operational criteria of having reasonable access to US-89, providing reasonable demand at interchange locations, and was compatible with the network roadway classifications. Therefore, the Baseline Freeway Alternative moved forward for further analysis. The Baseline Freeway Alternative has two grade-separated crossings, located at Nicholls Road and Crestwood Road, and grade-separated interchanges at the remaining cross-streets which would align either over or under US-89 as appropriate.

Existing Interchange ◆ Interchange ▬ Grade Separated Crossing

US-89 System Alternatives

ES.3.1.3 Develop and Screen US-89 System Alternatives

Once the study team determined the placement of interchange and grade-separated crossings, the next step was to focus on the details of the US-89 corridor itself. The study team developed system alternatives that included a traditional six-lane freeway alternative and three variations on a six-lane freeway with one-way frontage roads. The screening process for the US-89 System Alternatives included two steps:

1. Secondary Purpose and Need Screening

Secondary Purpose and Need Screening included evaluating alternatives based on their ability to meet the "address current and future travel demand on US-89" component of the purpose and need. A detailed VISSIM microsimulation traffic analysis was performed that focused on more specific, individual components of the transportation system.

Results of Secondary Purpose and Need Screening

All of the US-89 System Alternatives met the screening criteria of providing LOS D or better for interchanges on the US-89 corridor. Therefore, all US-89 System Alternatives moved forward for further analysis.

2. Environmental Resources and Cost Comparison Screening

The environmental screening analysis included an inventory of residences, commercial structures, historic architecture, and historic properties. Cost was also evaluated to help make a decision to determine which US-89 System Alternatives would be carried forward for further analysis.

Results of Environmental Resources and Cost Comparison Screening

The Freeway Alternative moved forward for further analysis for the following reasons:

- Fewer relocations when compared to all other build alternatives
- Fewer adverse effects to historic properties when compared to all other build alternatives
- Less costly when compared to all other build alternatives

The one-way frontage road alternatives were eliminated from further analysis.

The Freeway Alternative would include converting US-89 to a freeway that would provide local access by utilizing existing roads or constructing new connecting roads to provide a similar level of access as frontage roads.

LEGEND

- Existing Interchange
- Modified Existing
- Grade Separated Crossing
- Interchange

Cross-Street Design Concepts

ES.3.1.4 Develop and Screen Cross-Street Design Concepts

The final step in the process was to develop and screen cross-street design concepts for each interchange and grade-separated crossing location. The results of the screening process are described below:

Antelope Drive

The study team selected the Tight Diamond Concept at Antelope Drive for further study. This concept would construct a tight diamond interchange at Antelope Drive with the northbound and southbound ramps shifted to the east. US-89 would go over Antelope Drive.

Gordon Avenue

The study team selected the Diamond Concept at Gordon Avenue for further study. This concept would construct a diamond interchange at Gordon Avenue with a frontage road connection on the west of US-89 from Cherry Lane to Gentile Street. US-89 would go over Gordon Avenue.

Oak Hills Drive

The study team selected the Diamond Concept at Oak Hills Drive for further study. This concept would construct a diamond interchange at Oak Hills Drive, with US-89 over Oak Hills Drive.

Crestwood Road

The study team selected the US-89 Over Crestwood Concept at Crestwood Road for further study. This concept would grade-separate the Crestwood Road/US-89 crossing by providing a US-89 overpass (US-89 over Crestwood Road, with Crestwood Road to remain at the same elevation). The crossing would remain at the existing Crestwood Road location.

400 North

The study team selected the Diamond Jug Handle Concept at 400 North for further study. This concept would construct a diamond interchange with a northbound jug-handle entrance ramp, with US-89 over 400 North.

Nicholls Road

The study team selected the Hybrid Concept at Nicholls Road for further study. This concept would grade-separate the US-89 crossing by providing a US-89 overpass and lowering Nicholls Road by approximately five feet.

Main Street

The study team selected the Southbound Lloyd Road Modified Continuous Flow Intersection (CFI) Concept at Main Street for further study. This concept would provide a one-movement continuous-flow intersection on Lloyd Road (while on Lloyd Road, drivers would crossover and merge with traffic on the US-89 southbound off-ramp).

Select Alternatives for Detailed Study

ES.3.2 Alternatives Selected for Detailed Study

ES.3.2.1 No-action Alternative

The No-action Alternative would maintain the current roadway configuration of US-89. It also assumes that all other planned improvements would be completed by 2040.

The No-action Alternative includes short-term minor restoration types of activities (safety and maintenance improvements, etc.), allowing for continued operations of the existing roadways. These improvements include activities such as adding or lengthening left-turn pockets, signal phasing changes, and adding dual left-turn lanes if receiving lanes already exist.

ES.3.2.2 Freeway Alternative

The freeway alternative is a combination of the baseline freeway alternative (that determined interchange and grade-separated cross-street locations) and selected cross-street design concepts. This alternative would include the following:

- Widening US-89 from a four-lane arterial to a six-lane freeway from Shepard Lane to I-84 with limited access
- Utilizing existing roads or constructing new roads to provide local, two-way access
- Providing access to the northbound exit ramp at Main Street from the one-way frontage road
- Constructing a modified one-movement continuous-flow intersection on Lloyd Road at the Main Street intersection (while on Lloyd Road, drivers would crossover and merge with traffic on the US-89 southbound off-ramp)
- Grade-separating the Nicholls Road/US-89 crossing by providing a US-89 overpass and lowering Nicholls Road by approximately five feet
- Constructing a diamond interchange at 400 North with a northbound jug-handle entrance ramp and US-89 over 400 north
- Grade-separating the Crestwood Road/US-89 crossing by providing a US-89 overpass
- Constructing a diamond interchange at Oak Hills Drive, with US-89 over Oak Hills Drive
- Extending Gordon Avenue to US-89 and constructing a new diamond interchange at US-89, with US-89 over Gordon Avenue
- Constructing a tight diamond interchange at Antelope Drive with the northbound and southbound ramps shifted east and US-89 over Antelope Drive
- Retaining the SR-193 interchange, with access to the northbound exit ramp at SR-193 from Valley View Drive
- Retaining the South Weber Drive interchange
- Extending the third northbound lane from South Weber Drive to 6600 South and constructing an additional southbound lane from South Weber Drive to SR-193
- Replacing the bridge over the Weber River, contingent on funding
- Replacing the I-84 bridges over US-89, contingent on funding
- Coordinating with the local municipalities during final design to designate a Class III bike route east of US-89 between Farmington Main Street and South Weber Drive

Identify Preferred Alternative

ES.3.3 Identification of the Preferred Alternative

The Freeway Alternative meets the purpose and need, and when compared to all other build alternatives it has fewer relocations, fewer adverse effects to historic properties, and is less costly. For additional information, see Chapter 2: Alternatives.

ES.4 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

A summary of the affected environment and environmental consequences for the various environmental resources analyzed in the SES can be found in table ES-1. The No-action Alternative is used as the baseline for discussing impacts. For additional information, see Chapter 3: Affected Environment and Environmental Consequences.

Table ES-1 Comparison Summary of Alternatives

Resource	No-action Alternative	Preferred Alternative
Land Use	• No impact	• Approximately 28.8 acres of land currently zoned as residential and commercial would be converted to roadway. • Three recreational facilities: Davis Park Golf Course, Nicholls Park (Section 6(f) Property), and Adams Canyon Trail Head Parking Lot converted to roadway use. • Approximately 0.4 acres of the Antelope Drive park-and-ride would be converted to roadway use. • Existing bus stops would be removed from US-89.
Farmlands	• No impact	• No impact
Social Conditions	• No impact	• May cause changes to social conditions, including a potential for slight improvement in some areas where the connections of frontage roads would join currently disconnected neighborhoods. • Relocation of 20 residences and changes in access could potentially change social integration and cohesion in those neighborhoods.
Right-of-Way and Relocations	• Previously purchased property for corridor preservations would be disposed of in accordance with U.C.A. Section 72-5-111 – Disposal of real property and U.C.A. Section 72-5-404 – Disposition of excess property rights when property was acquired as part of transportation corridor preservation activities.	• Approximate acquisition of 28.8 acres of right-of-way, impacting approximately 165 parcels. • 22 relocations (20 residences, 1 business, and 1 municipal water tank).
Economic Conditions	• Existing commercial activities and trends would continue to influence the local economy.	• Displacement of one existing business. • Construction of a new interchange at Gordon Avenue would support Layton City's planned commercial development.

Resource	No-Action Alternative	Preferred Alternative
Pedestrians and Bicyclists	• No impact	• Bicyclists and pedestrians would be restricted from using US-89. However, UDOT will work with the local municipalities to designate a Class III bike route east of US-89 between Farmington Main Street and South Weber Drive. A Class III bike route utilizes the available roadway width, but includes signs that indicate the presence of cyclists along the route. • Pedestrian crossings would be provided at each grade-separated interchange and at grade-separated crossings. • Pedestrian and trail access would be provided with construction of the Weber River bridge and the Bair Creek culvert under US-89. • Future grade-separated crossings for planned trails would not be precluded.
Air Quality	• Would not result in new violations of National Ambient Air Quality Standards (NAAQS), increases in the frequency or severity of existing violations of the NAAQS, or delays in attaining the NAAQS.	• Compliant with State Implementation Plan (SIP) (required for non-attainment areas) resulting in no new violations of the NAAQS, increases in the frequency or severity of existing violations of the NAAQS, or delays in attaining the NAAQS. • Low potential for meaningful Mobile Source Air Toxics (MSAT) effects, with region-wide MSAT levels expected to be substantially lower in the design year than existing levels due in large part to the EPA's vehicle and fuel regulations in conjunction with fleet turnover.
Noise	• Noise levels would generally be the same as existing conditions.	• Noise levels would have an average increase of 7 dBA throughout the study area with no receptor having an increase of more than 12.8 dBA. • Approximately 420 receptors would be impacted by traffic noise.
Water Resources	• Drainage conditions would remain the same.	• 65% increase of impervious surface area and increase storm water runoff volumes. • Potential improvement to storm water quality discharge from construction of new storm drain system. • Potential impact to 19 Points of Diversion (PODs).
Wetlands and Waters of the U.S.	• No impact	• Approximately 0.26 acres of wetlands impacted. • Approximately 0.26 acres (2,234 linear feet) of Waters of the U.S. impacted. • It is believed that 0.030 acres of wetland and WOUS resources are isolated. This would reduce the total acres impacted to 0.49 acres.
Floodplains	• No impact	• Approximately 0.66 acres of impacts within the 100-year floodplain.

Resource	No-Action Alternative	Preferred Alternative
Wildlife and Threatened and Endangered Species	• Wildlife-vehicles collisions potential would continue.	• No impacts to threatened or endangered species, critical habitat, or state-sensitive species. • Wildlife-vehicle collisions potential would reduce due to installation of wildlife fencing. • Existing habitat is highly disturbed; impacts to wildlife would be limited. • Potential for short-term impacts to wildlife species (i.e. birds) during construction.
Cultural Resources	• No impact	• A total of nine historic buildings and one archaeological site would be adversely affected.
Paleontology	• No impact	• No impact
Hazardous Waste	• No impact	• Two properties that have Underground Storage Tanks (USTs) would be affected.
Visual Conditions	• No impact	• Both viewers and users of the roadway would encounter visual changes due to increased pavement widths, construction of grade-separated crossings, interchanges, and potential noise walls.
Energy	• No construction energy demands. • Increased congestions with lower Level of Service (LOS) reducing vehicle efficiency and increasing fuel consumption.	• Construction energy demands. • Reduced congestion with higher LOS increasing vehicle efficiently and lower fuel consumption.
Invasive Species	• No impact	• Potential for spread or introduction of invasive species included on the noxious weeds lists of the State of Utah.
Geology	• No impact	• No impact

Resource	No-Action Alternative	Preferred Alternative
Construction	• No impact	*Social Conditions* Local residents as well as those traveling through the study area would experience traffic congestion, delays, and detours during the construction period. In addition, some residents who live or work in close proximity to the study corridor may experience disturbance effects from noise and dust generated by construction activities. Access to all properties would be maintained; however, there may be some temporary construction impacts. *Economic Conditions* Commuters who work in the study area would experience traffic congestion, delays, and detours during the construction period, as well as disturbance effects from noise and dust generated by construction activities. Access to all businesses would be maintained; however, there may be some temporary construction impacts. *Pedestrian and Bicyclist Considerations* The Preferred Alternative could require the temporary closure of bike and pedestrian facilities. Alternative pedestrian routes would be provided for any facilities closed temporarily. *Air Quality* Construction of the Preferred Alternative would result in temporary negative effects to air quality in the study area due to increased dust and particulates. PM_{10} emissions from construction activities are usually local and short-term and last only for the duration of the construction period. Construction activity may also generate a temporary increase in MSAT emissions, especially for construction projects of a longer duration. *Noise* Area residents would experience temporary construction noise impacts. Extended disruption of normal activities is not anticipated, since no one receptor is expected to be exposed to construction noise of long duration. *Water Quality* During construction, there is the potential for temporary soil erosion and sediment/siltation impacts. Construction-related erosion and sedimentation would be managed through obtaining a Utah Pollution Discharge Elimination System (UPDES) permit from the Utah Department of Environmental Quality (UDEQ). Short-term impacts to water quality would be minimized through implementation of UDOT's BMPs from the Temporary Erosion and Sediment Control Manual. *Wetlands and Waters of the U.S.* There would be impacts to wetlands and waters of the U.S. during construction. Prior to construction, Nationwide and PGP 10 permits would be required.

Resource	No-Action Alternative	Preferred Alternative
Construction (continued	• No impact	*Cultural and Paleontological Resources* It is not expected than any previously unidentified cultural or paleontological resources would be encountered during construction. *Hazardous Waste* It is not expected that any hazardous materials would be encountered during construction activities. *Visual Conditions* There would be some temporary visual impacts to the study area with the addition of construction signs, barricades, exposed earth, and construction equipment during construction. *Invasive Species* Construction activities associated with the Preferred Alternative would provide opportunities for the movement of invasive species. *Energy* The Preferred Alternative would involve construction activities and would therefore directly consume energy to operate machinery, provide construction lighting, and produce and transport materials used in the construction of the project, such as asphalt.

ES.5 COMMENTS AND COORDINATION

Coordination with the public and municipalities has been ongoing and consistent. Public input was taken during scoping and alternatives development, which helped identify the issues that the public had with regards to this SES and their ideas as to possible solutions. Coordination is ongoing and continues to be documented. Public involvement materials, summaries of meetings, letters to stakeholders, and Native American consultation letters are included in Chapter 4: Comments and Coordination of the SES.

The draft SES was released for public comment on August 24, 2017 and a public hearing was held at the Davis Conference Center in Layton on September 7, 2017. Comments from the public were received in writing or orally at the public hearing, and through the study website, e-mail, and mail between August 24 and September 25, 2017.

An additional public hearing on the revised draft SES was held at Davis High School on January 16, 2018. Comments from the public were received in writing and orally at the public hearing, and through the study website, e-mail, and mail from January 2 to February 2, 2018.

Comments received from the public expressed concerns about widening US-89 including direct impacts to property, impacts to property values, and impacts from noise. The public also expressed concerns regarding the necessity of the project, and suggested alternative solutions such as completing a connection from westbound I-84 to southbound I-15, improving transit options, widening I-15, or removing truck traffic from US-89. All public comments can be seen, with responses from the study team (see Chapter 5).

Chapter 1: Purpose and Need

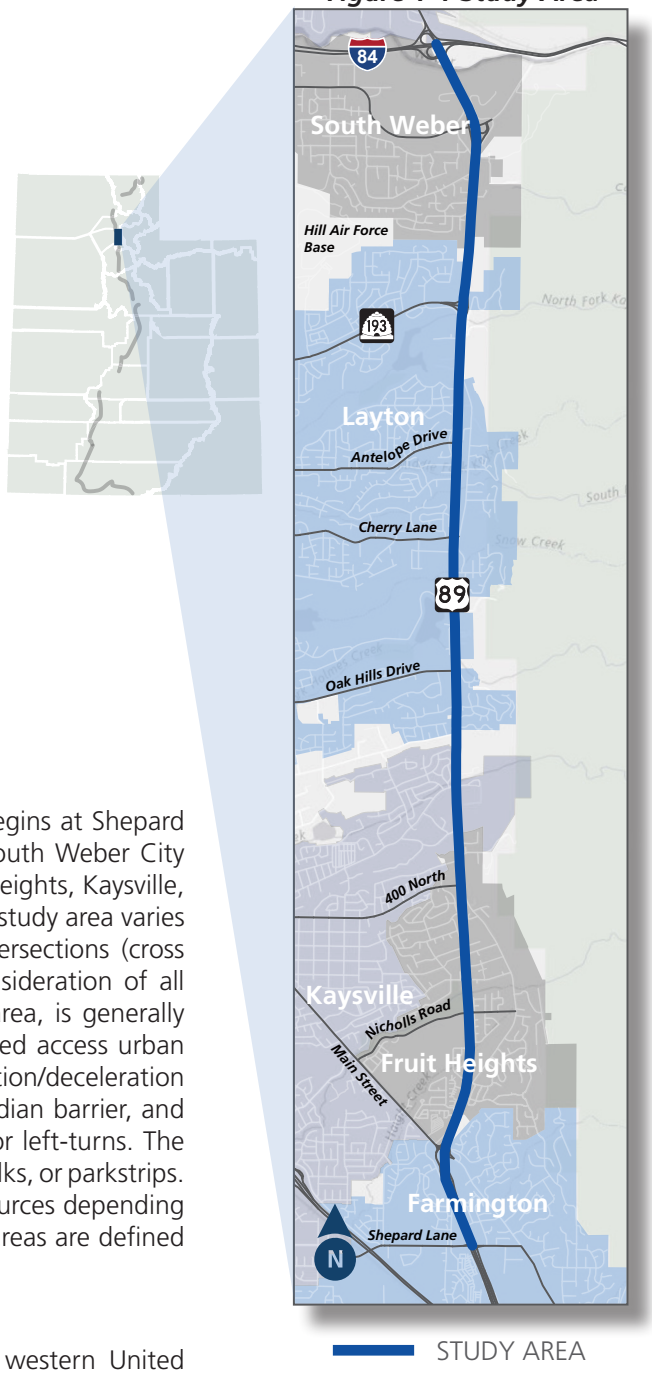
1.1 INTRODUCTION

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES) for proposed transportation improvements on US-89 from Shepard Lane in Farmington, Davis County, to I-84 in South Weber, Weber County, Utah.

Over the past twenty years, this corridor has been part of previous environmental studies. These studies identified the need for various improvements to the US-89 corridor. Proposed solutions to meet the need included converting signalized intersections to grade-separated interchanges and the creation of a two-way frontage road system on both sides of the highway.

This new study will evaluate existing and future needs for transportation improvements to US-89, assess the potential impacts of alternatives (including a No-action Alternative), and identify a preferred alternative. This SES has been prepared to assist local and state decision makers in identifying the best course of action, or actions, to meet current and future traffic needs.

Figure 1-1 Study Area



1.2 STUDY AREA

The study area is approximately 9.6 miles long. It begins at Shepard Lane in Farmington and extends north to I-84 in South Weber City (see Figure 1-1), passing through Farmington, Fruit Heights, Kaysville, Layton, and South Weber City. The width of the SES study area varies throughout the corridor to include the existing intersections (cross streets) and has been drawn wide enough for consideration of all environmental resources. US-89, within the study area, is generally a four lane (two travel lanes in each direction) limited access urban arterial with varying shoulder widths and acceleration/deceleration lanes at some intersections. Some areas include median barrier, and other areas include a center turn lane that allows for left-turns. The corridor does not include median landscaping, sidewalks, or parkstrips. The study area varies for specific environmental resources depending on resource characteristics. Resource specific study areas are defined and illustrated in Chapter 3 of this document.

1.3 EXISTING CONDITIONS

US-89 is a regional transportation corridor in the western United States with two segments. The first segment begins in Flagstaff, Arizona, travels north through Utah, briefly passes through the southeast corner of Idaho, and terminates at the Yellowstone National Park, South Entrance. The second segment begins at the Yellowstone National Park, North Entrance, in Montana and terminates at the United States – Canada border.

In northern Utah, US-89 is a connecting link between the Ogden and the Salt Lake areas and provides access to these areas for local corridor residents. US-89 also serves as the principal system link between I-84 (Weber Canyon) and I-15 in Farmington.

Within the study area, US-89 is a key north-south arterial system complete with traffic signals. The route travels along the foothills of the Wasatch Front. Generally, only residential neighborhoods, orchards, and a few parks occur east of US-89 before reaching the Wasatch-Cache National Forest. West of US-89 is also comprised primarily of residential neighborhoods and parks. Small intermittent and perennial streams flow perpendicularly through the study area.

1.4 SUMMARY OF PURPOSE AND NEED

The purpose and need sets the stage for the consideration of alternatives. The "purpose" defines the transportation problem to be solved and the "need" provides data to support the purpose.

The purpose of the proposed improvements is to:

- Improve regional and local mobility
- Provide enhanced system linkage between I-15 and I-84 on US-89
- Address current and future travel demand on US-89
- Improve safety

The following needs would be addressed:

- *Increasing Regional Growth and Development:* Municipalities within and near the study area are transitioning from rural residential and agricultural to residential suburbanized. This growth is leading to increased travel demand on Davis County's regional north-south travel corridors, including US-89.
- *Lack of a Well-Functioning Connection between I-15 and I-84:* US-89 is a vital system link between I-15 and I-84. In 2040, if no improvements are made, travel times will increase substantially.
- *Current and Future Traffic Congestion:* Currently, US-89 is operating at failing conditions. In 2040, if no improvements are made, congestion will worsen and the corridor will continue to operate at failing conditions.
- *Safety:* A high number of crashes are occurring that are related to signalized intersections where there are sudden speed or lane changes associated with traffic congestion. The frequency of crashes involving wildlife along this corridor is also high.

1.5 TRANSPORTATION PLANNING

Transportation planning is an important, on-going process to identify improvements to maintain an adequate transportation system. The Wasatch Front Regional Council (WFRC), UDOT, and surrounding municipalities are responsible for transportation planning in the study area.

1.5.1 Wasatch Front Regional Council

Planning for improvements began as part of **WFRC's** regional planning efforts. Consistent with federal law, WFRC is responsible for developing regional transportation plans that are limited by available and committed funding. These plans are based on a comprehensive, region-wide transportation systems analysis. This analysis addresses all modes of transportation including highways, transit, trucking, rail, air, pedestrian, and bicycle.

In the Wasatch Front Urban Area Regional Transportation Plan (RTP) 2015-2040, WFRC has identified several projects in and near the study area including the following:

- Widening US-89 from four lanes to a six-lane freeway from I-15 in Farmington to I-84 in South Weber
- The addition of frontage roads from Nicholls Road in Fruit Heights to Oak Hills Drive (SR-109) in Layton
- Constructing grade-separated interchanges at 400 North in Kaysville, Oak Hills Drive (SR-109) in Layton, Gordon Avenue in Layton, and Antelope Drive in Layton
- Constructing a grade-separated crossing at Nicholls Road in Fruit Heights and Crestwood Road in Kaysville

These proposed actions are included in WFRC's RTP 2015-2040 and are part of WFRC's overall plan to address congestion and provide for an adequate transportation system. All projects on the 2040 RTP in or near the study area are shown in Appendix A.

What is the WFRC?

WFRC has been the designated metropolitan planning organization (MPO) for the Wasatch Front Urban Area since 1969 and is responsible for developing and maintaining a region-wide, long-range transportation plan for Salt Lake, Davis, and western Weber Counties. WFRC works in close cooperation with UDOT, the Utah Transit Authority (UTA), the Utah Division of Air Quality (UDAQ), and the cities and counties located within its region to develop regional plans that include new transportation facilities and upgrades to the existing transportation systems and infrastructure.

1.5.2 Unified Transportation Plan

UDOT, the WFRC, and other metropolitan planning organizations in Utah have created Utah's Unified Transportation Plan (UTP) 2015-2040. The Unified Plan is an executive summary of five individual agency plans, including WFRC's RTP, and contains a comprehensive project list including all major capacity projects anticipated through 2040. Therefore, any project that is listed on the WFRC RTP is also listed on the Unified Plan and officially recognized as a planned project by UDOT.

1.6 DESCRIPTION OF THE TRANSPORTATION NEEDS

The "needs" are the transportation deficiencies the proposed improvements are intended to address. The needs are discussed in the following sections. Any related existing or projected traffic data for the below sections can be found within the traffic memos in Appendix A.

1.6.1 Regional and Local Mobility

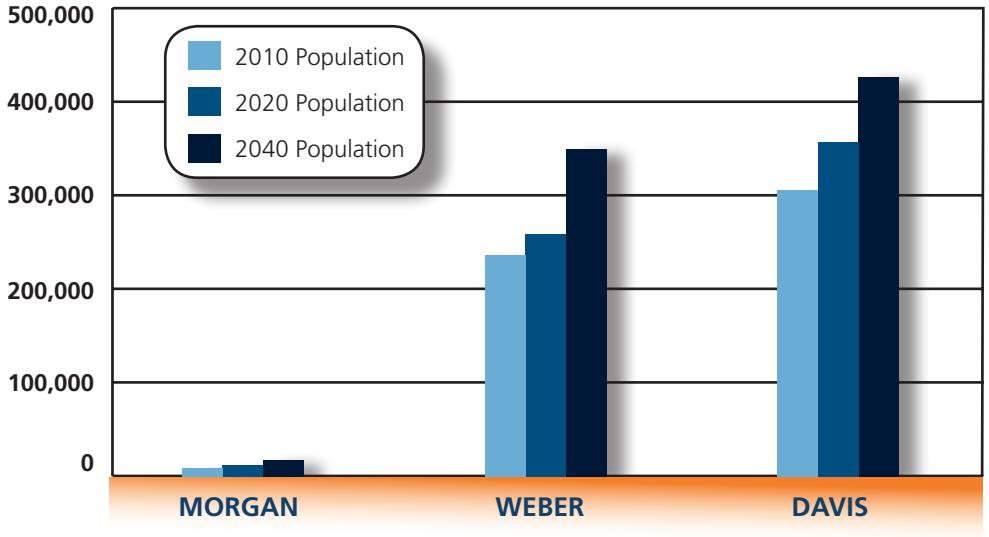
1.6.1.1 Increasing Regional Growth and Development

According to the U.S. Census, the population in Davis County was 306,479 residents in 2010 (U.S. Census). The Governor's Office of Planning and Management forecasts that by 2040, Davis County population will be 426,392.

Table 1-1 Existing and Projected Population Levels in Davis, Weber, and Morgan Counties

Location	Census	Projection		% Increase (2010 to 2040)
	2010	2020	2040	
Davis County	306,479	356,968	426,392	39%
Weber County	236,307	258,423	349,009	48%
Morgan County	9,955	11,945	17,926	20%

Figure 1-2 Existing and Projected Populations for Surrounding Counties

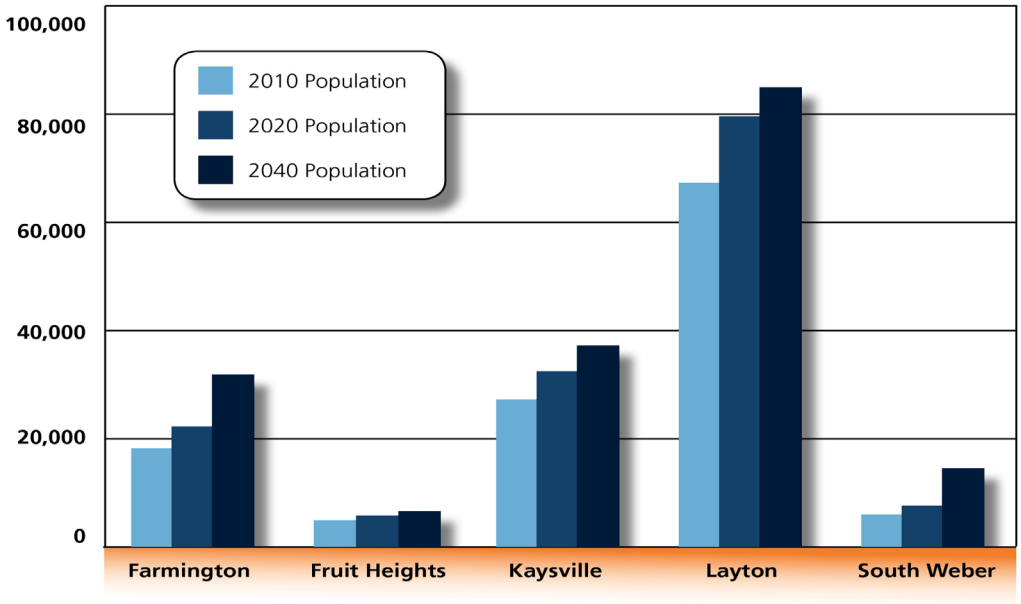


In addition to projected growth in Davis County, the nearby counties of Weber and Morgan are projected to grow as well, leading to increased demand on the regional transportation system, including the US-89 corridor. According to the U.S. Census and the Governor's Office of Planning and Management, the populations of Weber County and Morgan County are projected to increase by 48% and 20% respectively (see Table 1-1 and Figure 1-2).

Table 1-2 Existing and Projected Populations for Surrounding Cities

Location	Census	Projection		% Increase (2010 to 2040)
	2010	2020	2040	
Farmington	18,275	22,292	31,893	75%
Fruit Heights	4,987	5,816	6,663	34%
Kaysville	27,300	32,500	37,261	36%
Layton	67,311	79,594	84,953	26%
South Weber	6,051	7,656	14,578	141%

Figure 1-3 Existing and Projected Populations for Surrounding Cities



The cities within the study area and the surrounding communities in Davis County have experienced rapid growth over the last decade. These areas are transitioning from rural residential and agricultural to residential suburbanized. According to the Utah Governor's Office of Management and Budget, this growth is expected to continue (see Table 1-2 and Figure 1-3).

1.6.1.2 Increasing Travel Demand on the Regional Transportation System

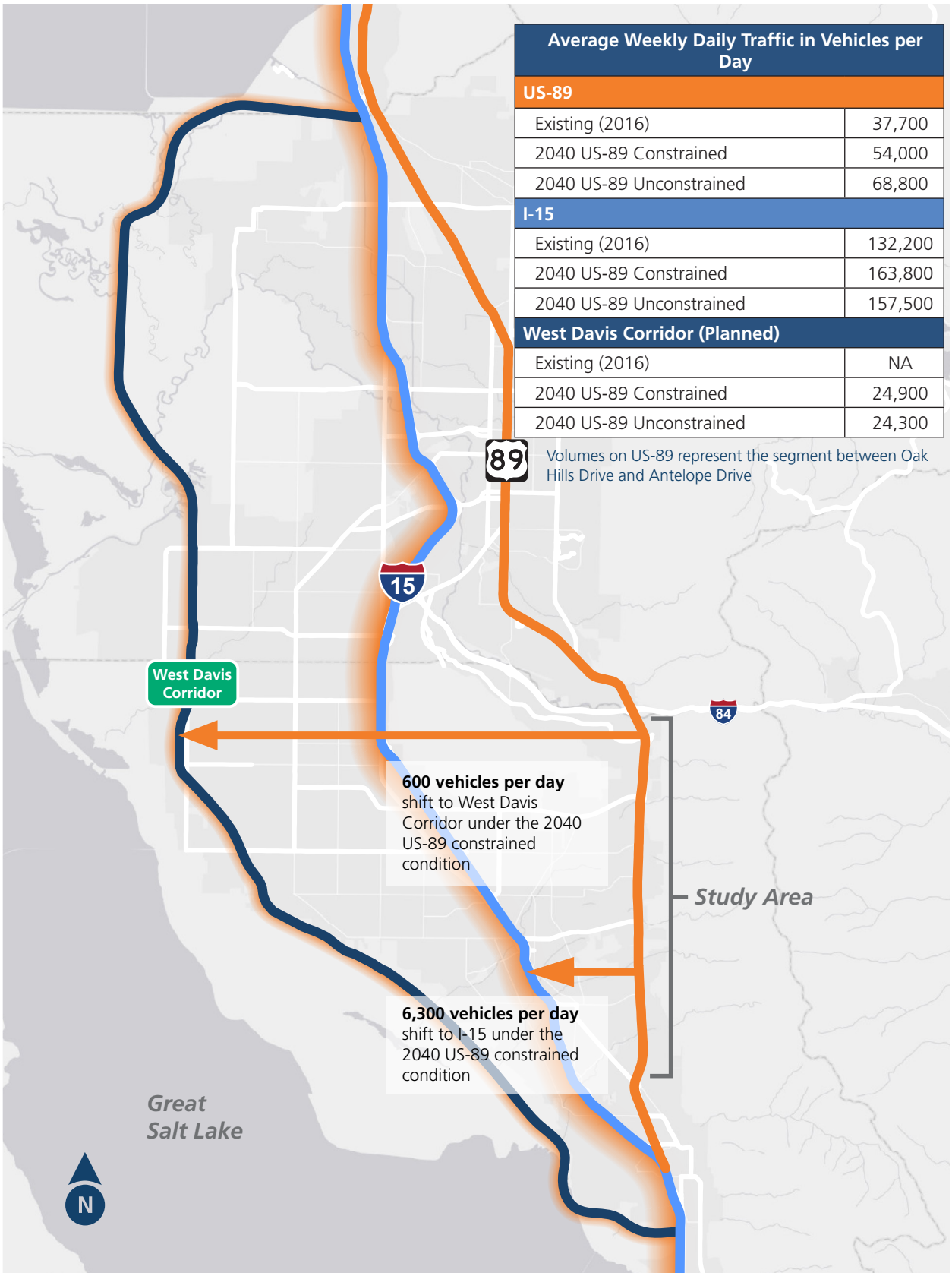
Due to the geography of the surrounding landscape which includes the Great Salt Lake to the west and the Wasatch Mountains to the east, there are unique constraints placed on the regional transportation system. There are only three existing and planned north-south regional transportation corridors in the region: US-89, I-15, and the proposed West Davis Corridor (see Figure 1-4). These corridors are intended to work together to provide north-south regional mobility in Davis County. The increase in population creates an increased travel demand which is reflected in the projected 2040 average daily traffic (ADT) on the regional transportation system (see Figure 1-4).

The study team evaluated the region's north-south corridors under three conditions: (1) existing, (2) 2040 with US-89 unconstrained (no limitations on corridor capacity), and (3) 2040 with US-89 constrained (limitations on roadway capacity). Under the 2040 US-89 unconstrained condition, all of the vehicles wanting to use US-89 are able to access US-89, regardless of congestion levels. Under the 2040 constrained condition, congestion on US-89 limits the number of vehicles that can access US-89, which is a more accurate representation of what currently occurs.

As shown in Figure 1-4, projected 2040 traffic volumes on US-89 and I-15 increase substantially when compared to existing conditions.

Additionally, if no improvements are constructed, high traffic volumes and congestion on US-89 will cause traffic to shift from US-89 to I-15 and the proposed West Davis Corridor, causing additional congestion on the regional north-south system. On US-89, the difference between the unconstrained and constrained conditions is 14,800 vehicles per day. These vehicles will find alternate routes, with 6,300 vehicles per day shifting to I-15, 600 vehicles per day shifting to the proposed West Davis corridor, and the balance using other roadways.

Figure 1-4 Average Daily Traffic on North-South Corridors in Davis County



Average Weekly Daily Traffic in Vehicles per Day	
US-89	
Existing (2016)	37,700
2040 US-89 Constrained	54,000
2040 US-89 Unconstrained	68,800
I-15	
Existing (2016)	132,200
2040 US-89 Constrained	163,800
2040 US-89 Unconstrained	157,500
West Davis Corridor (Planned)	
Existing (2016)	NA
2040 US-89 Constrained	24,900
2040 US-89 Unconstrained	24,300

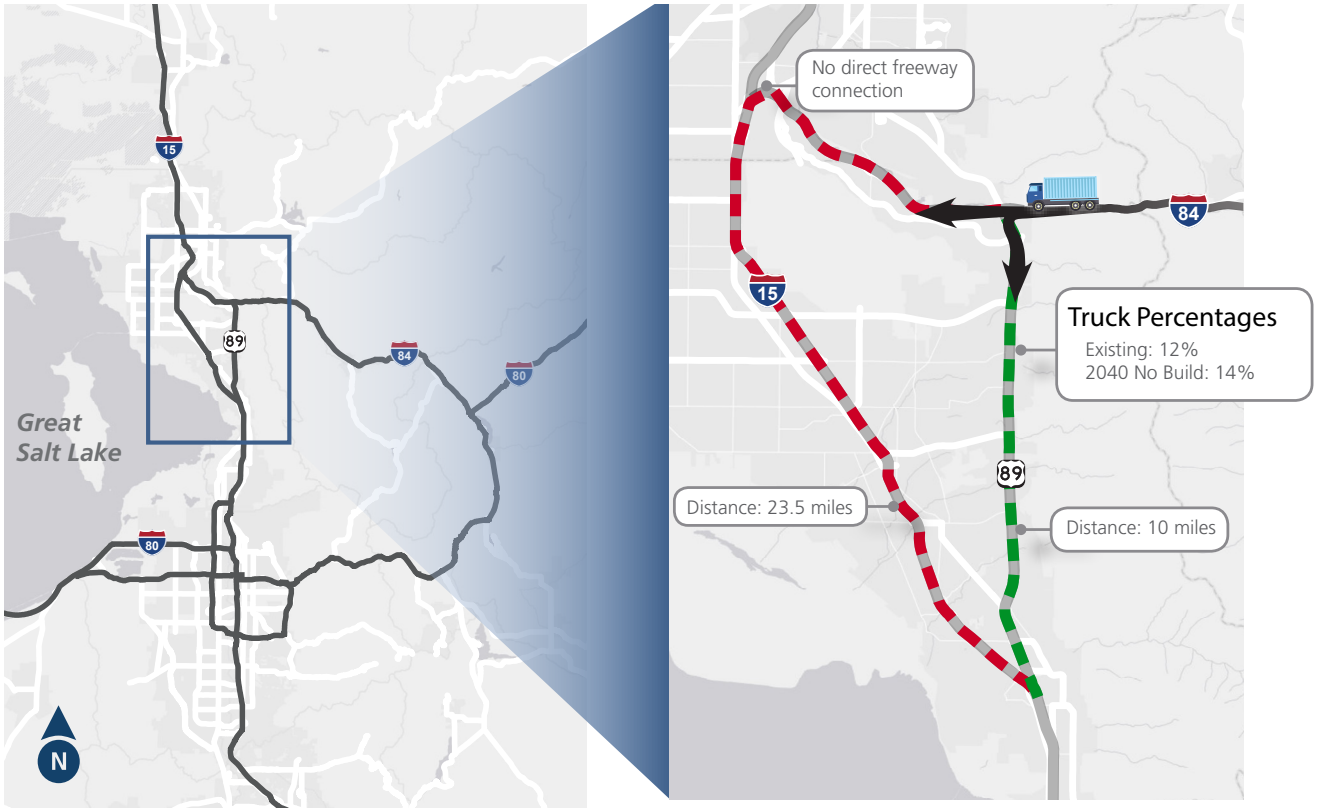
Volumes on US-89 represent the segment between Oak Hills Drive and Antelope Drive

1.6.2 Lack of a Well-Functioning Connection between I-15 and I-84 on US-89

US-89 is an important truck route that links I-15 and I-84. A total of 12% trucks made up the average daily traffic (ADT) on this road in 2016. By 2040, the ADT for trucks on US-89 is projected to be at 14% (see Figure 1-5). This transportation link is vital to both trucks and passenger vehicles. If the US-89 link between I-84 and I-15 did not exist, trucks and passenger vehicles wishing to access southbound I-15 from westbound I-84 would have to travel an additional 13.5 miles. The route requires drivers to travel 7 miles northwest along I-84, half a mile southwest along Riverdale Road, and then 16 miles south to reach the same point on I-15 that is only 10 miles in distance on US-89 (Figure 1-5).

If no improvements are made to US-89, travel times along this important link will get increasingly slower. Existing (2016) travel times along southbound US-89 between I-84 and Main Street averages 11 minutes between 8:00 and 10:00 a.m. In 2040, if no improvements to US-89 are constructed, travel times along southbound US-89 between 8:00 am and 10:00 am will increase to nearly 48 minutes.

Figure 1-5 Truck Routes



1.6.3 Current and Future traffic congestion Under the No-action Condition

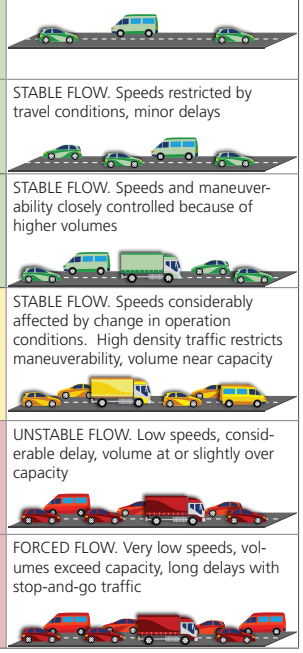
1.6.3.1 Level-of-Service

Transportation agencies use a qualitative measurement known as **"level-of-service" (LOS)** to measure the quality of the traffic flow rate. LOS characterizes the traffic operations of a facility in factors such as speed, average travel delay, travel times, and freedom to maneuver. LOS ranges from A to F, with LOS A representing the best operating conditions (little or no congestion or delay) and LOS F representing the worst operating conditions (extreme congestion and delay with long traffic queues and stop-and-go traffic). If a roadway exhibits LOS E or F conditions, it is considered failing.

Other factors that influence congestion on roadways include interchanges, spacing between traffic signals, number of street access points (business and residential driveways), design deficiencies, traffic crashes, and amount of queuing storage space at intersections. Existing congestion and delay measurements are based upon field observations, data collection from traffic counters, traffic simulation models, and data obtained from the UDOT Traffic Operations Center.

Level of Service (LOS)

A	FREE FLOW. Low volumes and no delays
B	STABLE FLOW. Speeds restricted by travel conditions, minor delays
C	STABLE FLOW. Speeds and maneuverability closely controlled because of higher volumes
D	STABLE FLOW. Speeds considerably affected by change in operation conditions. High density traffic restricts maneuverability, volume near capacity
E	UNSTABLE FLOW. Low speeds, considerable delay, volume at or slightly over capacity
F	FORCED FLOW. Very low speeds, volumes exceed capacity, long delays with stop-and-go traffic



1.6.3.2 Travel Demand Model

Future traffic (2040) was estimated using the WFRC travel demand model. This model analyzes regional traffic conditions. The No-action condition assumes that all planned projects (West Davis Corridor, I-15 improvements, etc.) included in the 2040 RTP would be completed by 2040, except for improvements to US-89 between Shepard Lane and I-84. Additionally, the No-action condition includes short-term minor restoration types of activities (safety and maintenance improvements, etc.) that maintain continuing operations of the existing roadways. These improvements include activities such as adding or lengthening left-turn pockets, signal phasing changes, and adding dual left-turn lanes if receiving lanes exist.

1.6.3.3 Existing (2016) and Future No-action (2040) Traffic Conditions

Corridor Level-of-Service

The information in the box to the right was developed based on principles in the Transportation Research Board's 2010 Highway Capacity Manual and in conjunction with WFRC's travel demand model. The table represents an estimate of capacity, which may be affected by signal spacing, access management, and other roadway specific conditions.

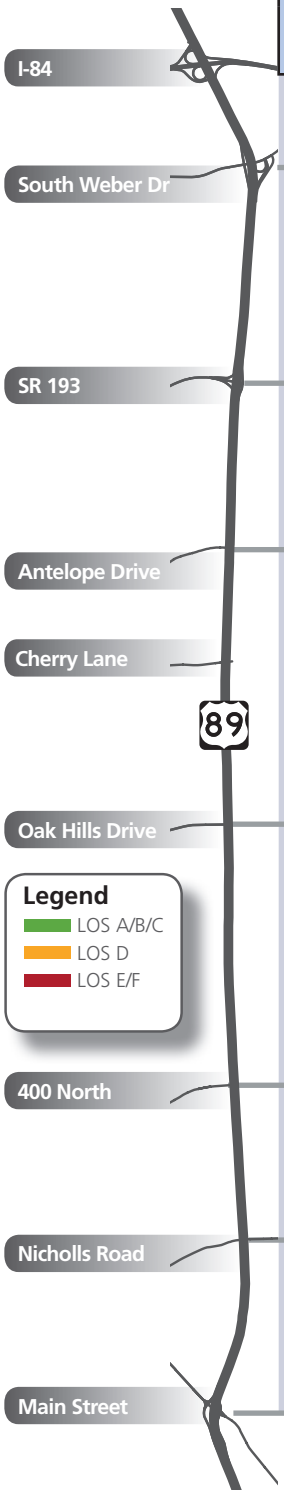
Existing and 2040 traffic volumes and corresponding LOS for US-89 are shown in Table 1-3. In 2016, the section between SR-193 and Main Street operated at LOS E. In 2040, if no improvements are constructed, the section between SR-193 and Main Street is projected to operate at LOS F, or failing conditions. The area between South Weber Drive and SR-193 operates at a better LOS in both existing and 2040 No-action conditions. This area of the US-89 corridor consists of grade-separated interchanges and functions as a freeway.

Corridor LOS

LOS	Average Daily Traffic (vehicles per day) for Arterials	
	4 Lanes	6 Lanes
A	< 12,600	< 18,400
B	12,600-18,900	18,400-28,100
C	18,900-26,100	28,100-39,300
D	26,100-31,500	39,300-47,900
E	31,500-39,000	47,900-60,200
F	> 39,000	> 60,200

LOS E and F indicate failing conditions.

Table 1-3 Corridor Level of Service



2016 Existing	2040 No-action	Roadway Segment	Segment Type	Lane	2016 Existing		2040 No-action	
					AWDT*	LOS	AWDT*	LOS
		I-84 to South Weber Drive	Suburban Freeway	4	56,200	F	76,100	F
		South Weber Drive to SR-193	Suburban Freeway	6	51,500	C	69,500	D
		SR-193 to Antelope Drive	Suburban Arterial	4	36,600	E	53,900	F
		Antelope Drive to Oak Hills Drive	Suburban Arterial	4	37,700	E	54,000	F
		400 North to Oak Hills drive	Suburban Arterial	4	37,600	E	52,700	F
		400 North to Nicholls Road	Suburban Arterial	4	36,900	E	51,500	F
		Nicholls Road to Main Street	Suburban Arterial	4	38,900	E	53,400	F

*Average weekly daily traffic in vehicles per day

Intersection Level-of-Service

Intersection LOS is determined by the amount of extra time it takes, or delay, to pass through an intersection as a result of starts and stops associated with the intersection control, such as stop signs and signals. LOS E or F describes very congested driving conditions where the number of vehicles arriving at an intersection exceeds the capacity of the intersection. Most drivers have to wait for multiple signal cycles before they get through the intersection. Long queues of left-turning vehicles stack out of the left turn pockets and block adjacent through lanes.

The intersection analysis evaluated each signalized intersection within the study area during the a.m. and p.m. peak period (see Figures 1-6 and 1-7). In 2040, intersection LOS degrades in both the a.m. and p.m. peak period. In the a.m. peak, southbound movements at Antelope Drive and Cherry Lane will operate at failing conditions. In the p.m. peak, northbound movements at Nicholls Road and 400 North will operate at failing conditions.

Better than expected LOS for several northbound approaches in 2040 in the p.m. peak are the result of severe upstream congestion at the US-89 Nicholls Road and 400 North intersections. This bottleneck substantially limits the amount of traffic on US-89 north of 400 North during the p.m. peak hours. This congestion causes the intersections to the north to operate at a better LOS than expected. If the congestion at Nicholls Road and 400 North were to be removed, such as by constructing grade-separated interchanges, the bottleneck would simply move north to Oak Hills Drive and so forth until reaching the high-T intersection at Antelope Drive (as illustrated in Table 1-4). A bottleneck during a.m. peak hours will occur to a smaller degree at Cherry Lane.

Intersection LOS

LOS	Average Control Delay (sec/veh)
A	0-10
B	>10-20
C	>20-35
D	>35-55
E	>55-80
F	>80

LOS E and F indicate failing conditions.

Figure 1-6 Intersection Level of Service

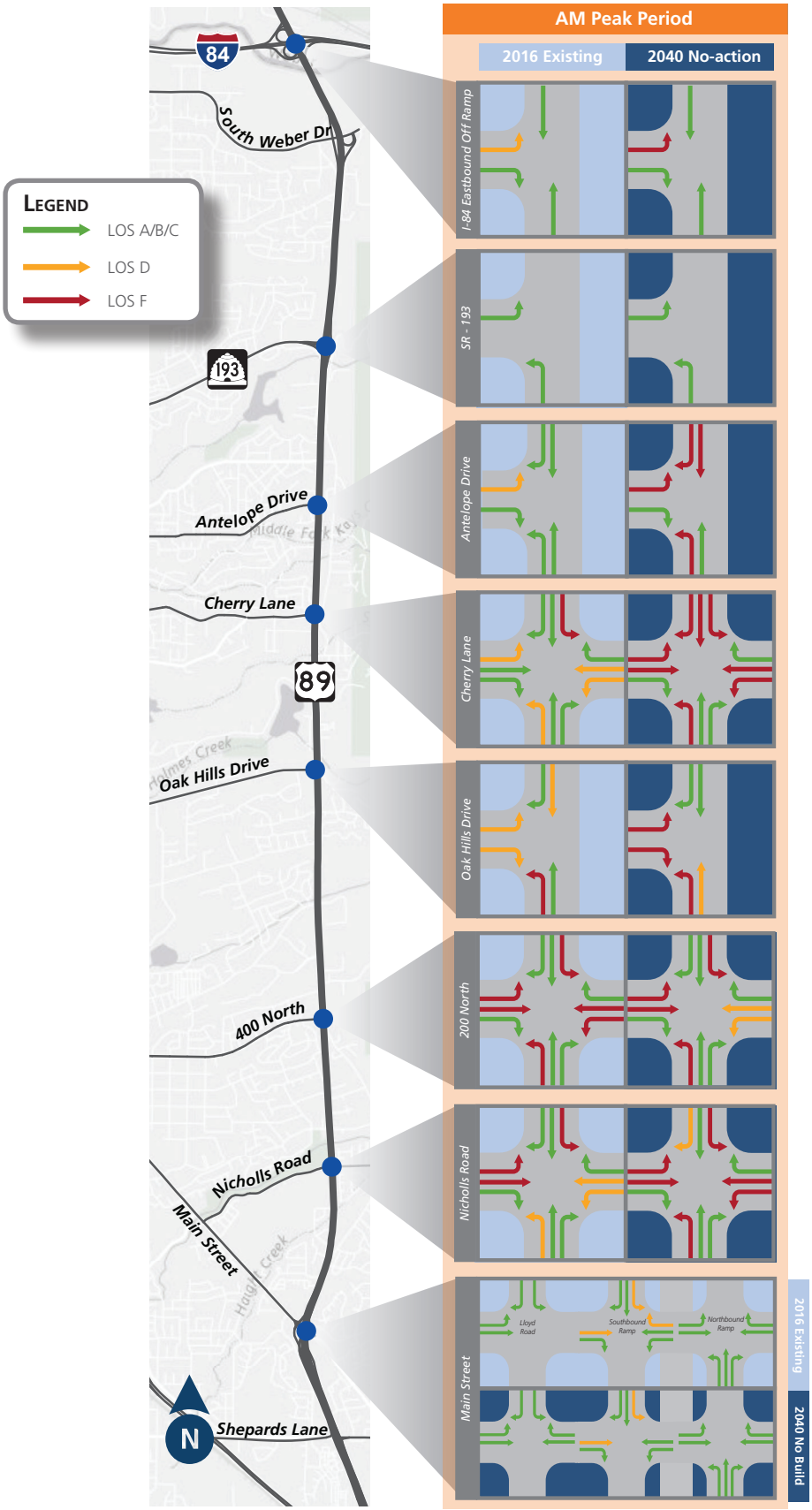


Figure 1-7 Intersection Level of Service

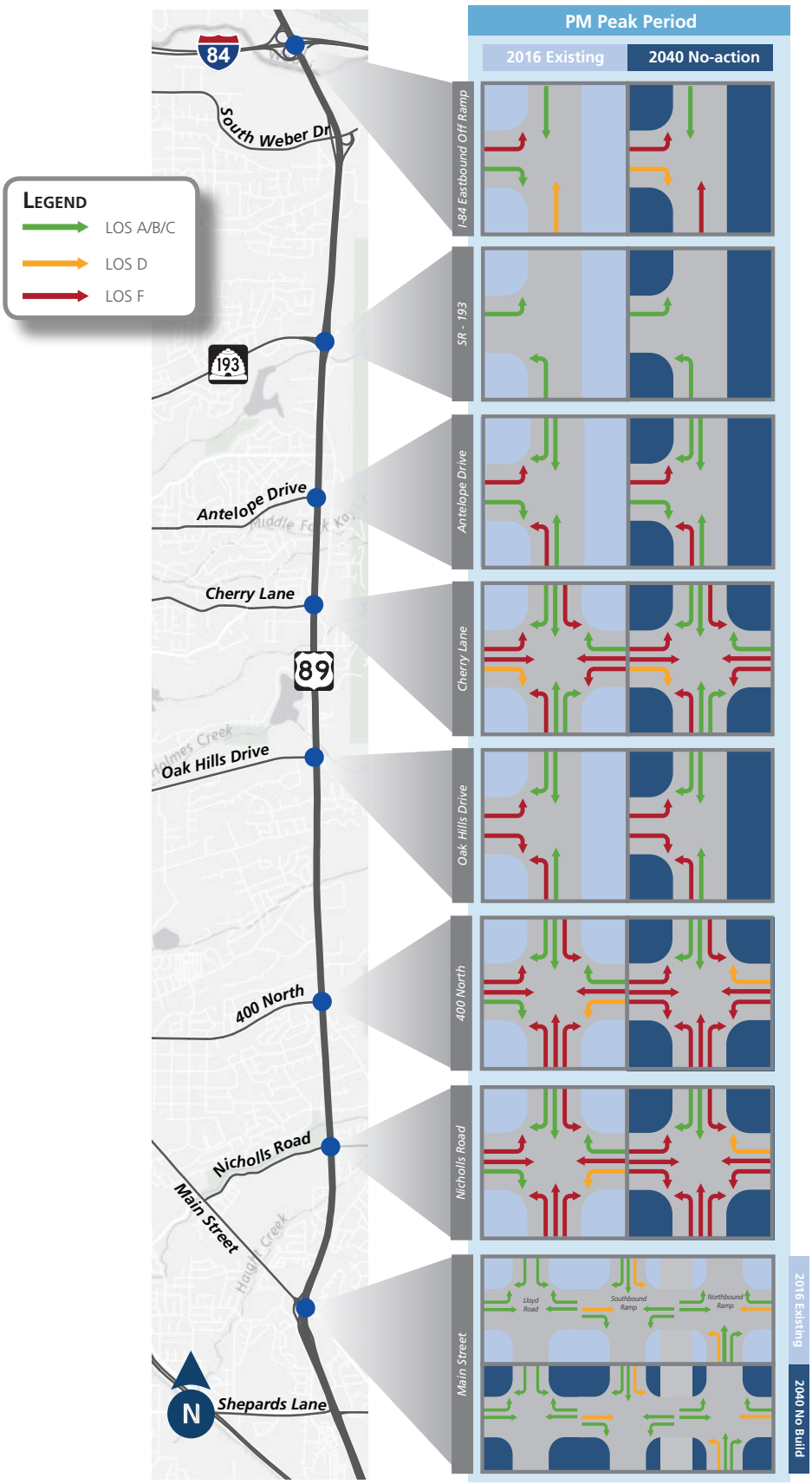
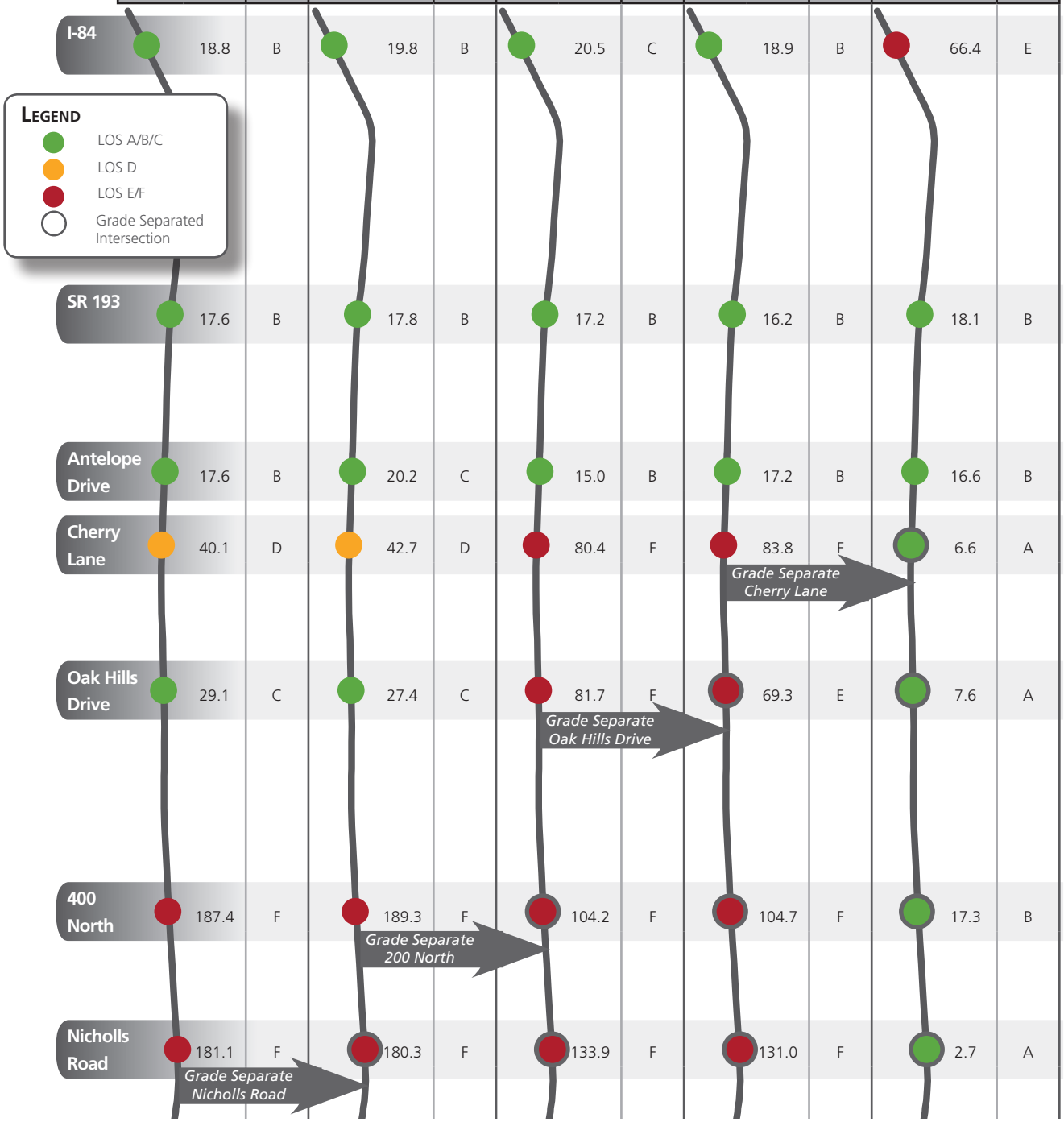


Table 1-4 Bottleneck Analysis

	No-action		Improve Nicholls Road		Improve 200 North		Improve Oak Hills		Improve Cherry Lane	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
I-84	18.8	B	19.8	B	20.5	C	18.9	B	66.4	E
SR 193	17.6	B	17.8	B	17.2	B	16.2	B	18.1	B
Antelope Drive	17.6	B	20.2	C	15.0	B	17.2	B	16.6	B
Cherry Lane	40.1	D	42.7	D	80.4	F	83.8	F	6.6	A
Oak Hills Drive	29.1	C	27.4	C	81.7	F	69.3	E	7.6	A
400 North	187.4	F	189.3	F	104.2	F	104.7	F	17.3	B
Nicholls Road	181.1	F	180.3	F	133.9	F	131.0	F	2.7	A



1.6.4 Safety

An Operational Safety Report (OSR) has been prepared using information supplied by the UDOT Safety Management System that documents the three year crash history (investigated period January 1, 2014 through December 31, 2016) within the study area. The complete OSR is in Appendix A and is protected under 23 USC 409.

The US-89 highway segment that was investigated begins just north of Shepard Lane and ends at I-84. This investigation did not find any pavement, roadway, or lighting conditions that contributed to overall crash frequency. The 9.6 mile section investigated had a total of 418 crashes during the investigation period, with the crashes varying in degree of severity. Table 1-5 illustrates the most prevalent types of crashes that have occurred in the study area.

Table 1-5 Principal Manners of Collision

Crash Severity	Front-to-Rear	Angle/ Head-On	Run-off-Road Right	Wild Animal Impact	Other
Fatal	0	1	0	0	
Incapacitating Injury	1	3	1	0	
Non-Incapacitating Injury	14	8	4	4	
Possible Injury	39	15	1	2	
Property Damage Only	108	30	8	74	
Total	**162**	**57**	**14**	**80**	**105**

Some of the intersections have been identified as crash hot spot areas, i.e., locations within the study area in which traffic crashes are more prevalent (see Figure 1-8). These hot spot areas are summarized as follows:

- *Nicholls Road:* A total of 70 crashes happened near this intersection. Of these 70 crashes, 20 resulted in injuries ranging from possible injury to incapacitating injury. One crash was fatal.
- *400 North:* A total of 50 crashes occurred near this intersection. Of these 50 crashes, 6 resulted in possible injury, 5 resulted in non-incapacitating injury, and 2 resulted in incapacitating injuries.
- *Oak Hills Drive:* A total of 49 crashes occurred near this intersection. Of these 49 crashes, 18 resulted in injuries ranging from possible to incapacitating.
- *Cherry Lane:* A total of 48 crashes happened near this intersection. Of these crashes, 12 resulted in possible injuries and 5 resulted in non-incapacitating injuries.
- *Antelope Drive:* A total of 39 crashes occurred near this intersection. Of these 39 crashes, 7 resulted in possible injuries, 3 resulted in incapacitating injuries, and 1 resulted in an incapacitating injury.

What is a front-to-rear crash?

The front end of one vehicle collides with the back of another vehicle, while the two vehicles are traveling in the same direction.

What is an angle crash?

A crash where two motor vehicles impact at an angle. For example, the front of one motor vehicle impacts the side of another motor vehicle.

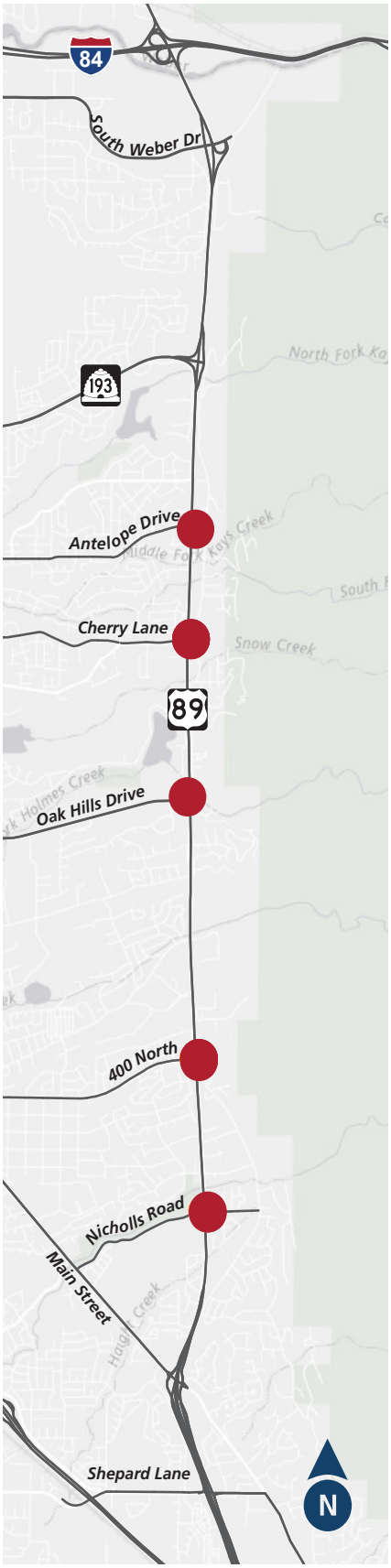
Most of the crashes (256) occurred at or near the hot spot intersections along US-89. Traffic conflicts occur at each intersection where local traffic attempts to enter or cross the existing highway. These crashes typically occur from sudden speed or lane changes associated with traffic congestion and signalized intersections. For example, on and near the intersections, there were a substantial number of front-to-rear crashes in which varying degrees of injuries occurred, particularly at the 400 North intersection. Through traffic is traveling at a high rate of speed, which can increase the severity of the crash.

An additional safety issue along US-89 is the frequency of wild animal impacts. In the OSR, data related to wildlife vehicle crashes are based on information collected by the Utah Highway Patrol (UHP) (see Table 1-5). Carcass data is collected by the Utah Division of Wildlife Resources (UDWR). This data indicates that in the past three years, an average of 75 carcasses were reported. Both data sets are considered incomplete and do not accurately depict all wildlife vehicle crashes due to incidents that are not reported, or where animals involved in collisions are not killed or die away from the roadway.

1.6.4.1 Conclusion

The highest occurrences of crashes within the study area occur at or near the major intersections. Of the severe crashes, there were several incapacitating injuries sustained in crashes that involved front-to-rear (or rear-end collisions) and at-angle collisions, all of which typically occur because of sudden speed and lane changes in congested conditions at intersections. Additionally, the high number of animal impact crashes is a safety issue.

Figure 1-8 Crash Hot Spots



Chapter 2: Alternatives

2.1 INTRODUCTION

Chapter 2 describes the alternatives considered and provides details on those alternatives that have been eliminated. This chapter also identifies the Preferred Alternative.

2.2 ALTERNATIVE DEVELOPMENT AND SCREENING

The alternatives development and screening process included evaluating potential solutions that meet the purpose of the project. The **purpose** is to improve regional and local mobility, provide enhanced system linkage between I-15 and I-84 on US-89, address current and future travel demand on US-89, and improve safety.

2.2.1 Traffic Analysis Methodology

The US-89 team used multiple tools to evaluate the transportation effectiveness of the various alternatives. These tools included the Wasatch Front Regional Council (WFRC) Travel Demand Model, the McTrans Highway Capacity Software (specifically the Freeplan Module), and Vissim from the PTV Group. All of these tools yielded similar results (see Traffic Memo in Appendix A).

2.2.1.1 Wasatch Front Regional Council Travel Demand Model

WFRC is the designated metropolitan planning organization that works in partnership with UDOT, Utah Transit Authority (UTA), local governments, and other stakeholders to develop long-range transportation plans for the communities in their jurisdiction. This jurisdiction includes Salt Lake, Davis, and western Weber Counties. WFRC maintains a regional travel demand model, which is a state-of-the-practice tool that allows transportation analysts to input various land use and growth scenarios to test road and transit networks with the expected traffic for each scenario.

Based on a review in August 2013 (Transportation Planning Certification Review for the Wasatch Front Regional Planning Area), the Federal Highway Administration (FHWA) and the Federal Transit Administration certified that the transportation planning process carried out by WFRC met transportation planning requirements. The WFRC travel demand model has been reviewed by experts from the FHWA Resource Center, and the model has been shared at numerous federal conferences as a best practice.

The travel demand model predicts future travel demand based on land-use, socioeconomic, and transportation system characteristics. The goal of the modeling is to determine, based on the distribution of population, households, and employment and available transportation facilities, the amount, type, and location of travel that residents will undertake.

WFRC is continually updating and refining the travel demand model to incorporate new observed data and increased capabilities. The US-89 State Environmental Study (SES) used version 8 of the travel demand model which was released as part of the WFRC 2015–2040 Regional Transportation Plan (RTP). This updated model included recalibration of version 7 using the 2012 Utah Household Survey, a new freight module to better forecast truck trips, inclusion of school trips, expansion of employment categories from 3 to 11, updated freeway capacities, and an upgraded transit module. The West Davis Corridor (WDC) Environmental Impact Statement also utilized version 8 of the travel demand model.

2.2.1.2 McTrans Highway Capacity Software (Freeplan Module)

The Freeplan Module uses information such as number of lanes, directional splits, percent heavy vehicles, terrain, and speed to provide planning level traffic capacities. The US-89 SES used the Freeplan Module to calculate capacity assumptions for a freeway facility which provided the data to perform a macro-level analysis of some of the alternatives (see Traffic Memo in Appendix A).

2.2.1.3 Vissim Software

Vissim is a microscopic simulation software program that is used to perform detailed traffic analysis, meaning each entity (car, bus, pedestrian) is modeled individually. The US-89 SES used Vissim to perform detailed traffic analysis for various concepts and alternatives (see Traffic Memo in Appendix A).

2.2.1.4 Independent Review

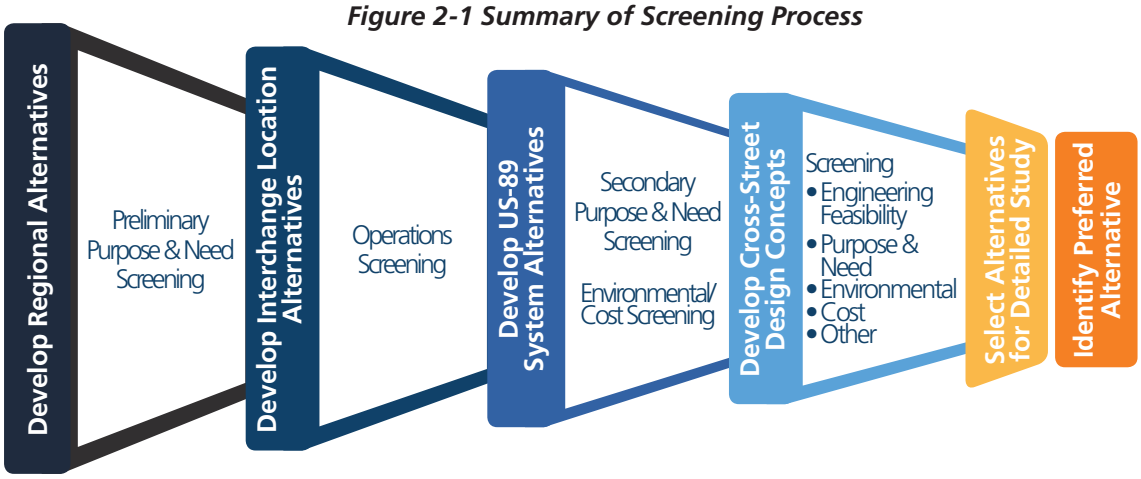
As part of the traffic analysis, an independent traffic engineer reviewed and validated the results (see Traffic Memo in Appendix A).

2.2.2 Alternative Screening

Each alternative assumes that all funded projects included in the WFRC 2040 RTP would be completed by 2040. These include the West Davis Corridor, I-15 Express Lanes, and other planned projects. The study team considered a wide range of alternatives including the No-action Alternative and several build alternatives. The following sections describe the alternatives considered as well as the screening process used to eliminate alternatives from further analysis.

The alternatives screening process started with high-level, regional alternatives, then focused on interchange location placement, the type of corridor facility, and finally to specific interchange and grade-separated cross-street designs. See Figure 2-1 for a summary of the screening process.

Figure 2-1 Summary of Screening Process



2.2.3 Regional Alternatives

The study team developed high-level, regional alternatives to evaluate the wider transportation system as a whole. The study team developed the following regional alternatives:

- No-action Alternative
- US-89 Six-Lane Arterial Alternative
- US-89 Four-Lane Freeway Alternative
- US-89 Six-Lane Freeway Alternative

Regional Alternatives represent generic concepts. Based on the results of the screening process, the alternatives that move forward will be further refined.

Additionally, the study team evaluated other concepts recommended by the public. These concepts are described below and discussed in additional detail in Section 2.2.3.2.

- *I-84 to I-15 Connection Concept* – Currently, there is no direct freeway connection from northbound I-15 to eastbound I-84, and westbound I-84 to southbound I-15. To access southbound I-15, drivers on westbound I-84 are required to exit I-84 onto Riverdale Road and then on to I-15, and vice versa for those wishing to access northbound I-15 to eastbound I-84. The I-84 to I-15 Connection Concept would establish a direct freeway connection from I-84 to I-15 that may reduce traffic volumes on US-89.
- *Transit Concept* – This concept includes increasing transit on the US-89 corridor. Based on feedback from UTA, the local bus and express bus routes on US-89 would be increased in frequency to a 15 minute headway (i.e., the buses would run at 15 minute increments). Additionally, a Bus Rapid Transit (BRT) line would be constructed from the transit station in Ogden to the transit station in Farmington.
- *I-15 Widening Concept* – The I-15 Widening Concept would expand I-15 to the point that there are no delays on I-15.
- *Reduced Speed US-89 Four-Lane Freeway Concept* – This concept would include constructing a Four-Lane Freeway on US-89 with a 55 mph speed limit.
- *Combined Concepts with US-89 Six-Lane Arterial* – This concept includes combining the I-84 to I-15 Connection, Transit, and I-15 Widening Concepts with the US-89 Six-Lane Arterial Alternative.
- *Combined Concepts with US-89 Four-Lane Freeway* – This concept includes combining the I-84 to I-15 Connection, Transit, and I-15 Widening Concepts with the US-89 Four-Lane Freeway Alternative.

Restrict Truck Traffic from US-89

A suggestion to restrict truck traffic on US-89 was considered but eliminated for the following reasons:

- Traffic analysis shows that if truck traffic was restricted on US-89, the peak hour traffic volumes on US-89 would not decrease because the trucks would be replaced by passenger vehicles. This increase in passenger vehicles would cause US-89 to still operate at failing conditions in 2040.
- The alternate route using I-15 and I-84 is 13.5 miles farther in distance, resulting in 300,000 annual hours of lost productivity at an estimated annual cost of $27 million for heavy trucks in 2040.
- The increased truck volumes on I-15 would increase delay on I-15 by 33%.
- Truck volumes would increase on local streets, particularly Church Street, Fort Lane, and Fairfield Road.
- US-89 is part of the National Highway System and trucks are not prohibited at any point along this highway. If trucks were prohibited along this segment of US-89 due to specific circumstances, they would likewise need to be prohibited along many other sections of US-89 that have similar characteristics. This would not meet the purpose and intent of the National Highway System to efficiently move people, goods, and services.

2.2.3.1 Description of Regional Alternatives

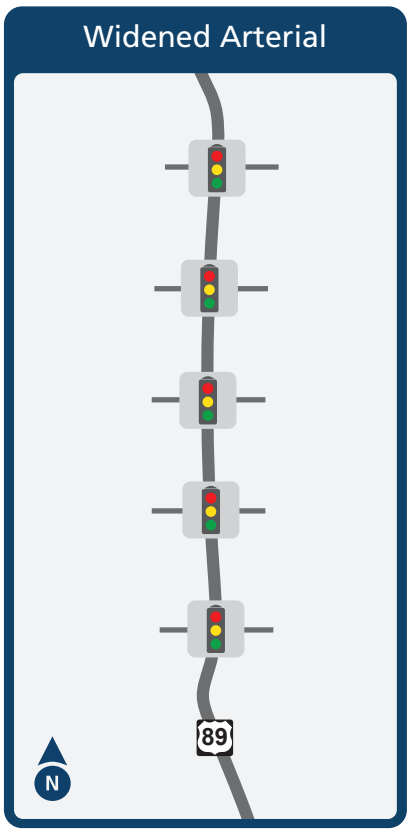
No-action Alternative

The No-action Alternative would maintain the current roadway configuration of US-89. It also assumes that all other planned improvements would be completed by 2040.

The No-action Alternative includes short-term minor restoration types of activities (safety and maintenance improvements, etc.) allowing for continued operations of the existing roadways. These improvements include activities such as adding or lengthening left-turn pockets, signal phasing changes, and adding dual left-turn lanes if receiving lanes already exist.

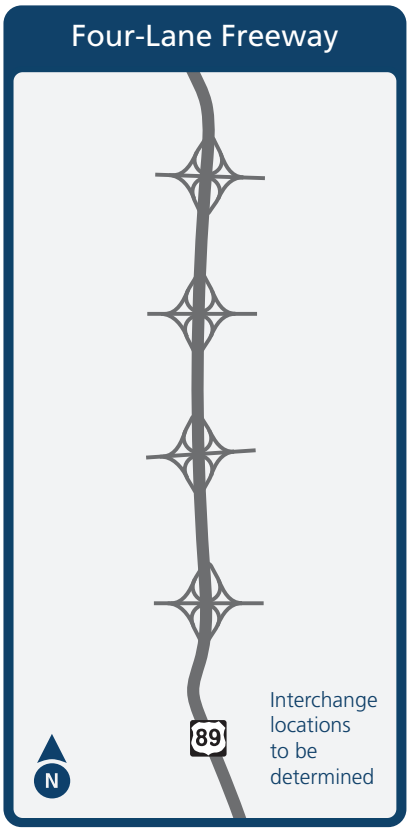
US-89 Six-Lane Arterial Alternative

This alternative would widen US-89 from a four-lane arterial to a six-lane arterial from Shepard Lane to I-84. It would leave in place the existing intersections and interchanges.



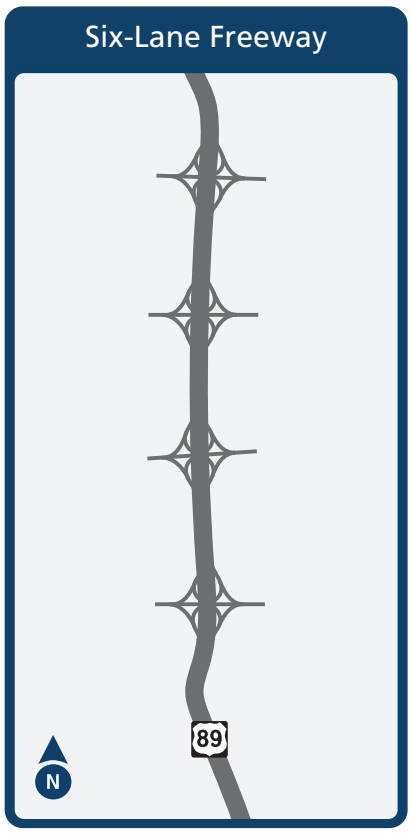
US-89 Four-Lane Freeway Alternative

This alternative would widen US-89 from a four-lane arterial to a four-lane freeway from Shepard Lane to I-84 with limited access. Current intersections would be eliminated or converted to grade-separated interchanges to provide ingress and egress to and from the freeway system.



US-89 Six-Lane Freeway Alternative

This alternative would widen US-89 from a four-lane arterial to a six-lane freeway from Shepard Lane to I-84 with limited access. Current intersections would be eliminated or converted to grade-separated interchanges to provide ingress and egress to and from the freeway system.



2.2.3.2 Preliminary Purpose and Need Screening

The preliminary purpose and need screening process evaluated Regional Alternatives based on their ability to meet the following project purposes:

- Improve regional and local mobility
- Provide enhanced system linkage between I-15 and I-84 on US-89
- Improve safety

The project purpose to address current and future travel demand on US-89 is evaluated in Secondary Purpose and Need Screening in Section 2.2.3. See Table 2-1 for the purpose and need criteria and associated measures. If an alternative was able to meet the purpose and need criteria, it advanced for further analysis.

Table 2-1 Preliminary Purpose and Need Criteria and Measure

Preliminary Purpose and Need Criteria	Measure
Improve regional and local mobility Provide enhanced system linkage between I-15 and I-84 on US-89	Provide a well-functioning connection between I-15 and I-84 on the US-89 corridor that operates at Level-of-Service (LOS) D* or better (LOS measures the quality of the traffic flow rate and will help the study team determine if the system link between I-15 and I-84 is functioning adequately)
Improve safety	Reduce conflict points on US-89 between I-15 and I-84

*When planning for future improvements a roadway must have adequate capacity to handle the anticipated flow rate and must provide for a minimum acceptable LOS. UDOT's Roadway Design Manual of Instruction states that roadway designers should provide LOS C or higher in rural areas and LOS D or higher in urban areas. The proposed action is within an urbanized area; therefore, streets should operate at LOS D or better during peak hours.

Improve Regional and Local Mobility and Provide Enhanced System Linkage

The study team evaluated the corridor LOS for US-89 in the segments shown in Table 2-2 by comparing the Average Weekly Daily Traffic (AWDT) volumes with planning-level daily capacity estimates. The traffic volumes were calculated using the WFRC travel demand model. LOS was determined using the Freeplan module and Vissim (see Traffic Memo in Appendix A). In order for an alternative to meet the first purpose and need screening criteria, it had to operate at LOS D or better for each segment along the US-89 corridor. Table 2-2 illustrates the LOS and traffic volumes for each regional alternative.

Table 2-2 LOS and Traffic Volumes by Segment for Each Regional Alternative

	NO-ACTION		WIDENED ARTERIAL		FOUR-LANE FREEWAY		SIX-LANE FREEWAY	
	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
I-84								
	76,100	F	76,100	D	86,200	E	86,200	D
South Weber Drive								
	69,500	D	69,500	D	80,200	E	80,200	D
SR-193								
	53,900	F	53,900	E	67,300	F	67,300	C
Antelope Drive								
	54,000	F	54,000	E	68,800	F	68,800	C
Oak Hills Drive								
	52,700	F	52,700	E	63,800	E	63,800	C
400 North								
	51,500	F	51,500	E	63,900	E	63,900	C
Nicholls Road								
	53,400	F	53,400	E	65,500	E	65,500	C
Main Street								

Improve Safety

To meet the second purpose and need screening criteria, an alternative needed to reduce conflict points on US-89 to improve safety (see Table 2-3). As discussed in Section 1.6.4 in Chapter 1, the highest occurrences of crashes within the study area occur at or near major intersections; therefore, reducing conflict points at intersections would improve safety. To address the high frequency of animal impact crashes, all build alternatives would include wildlife fencing along US-89 to minimize wildlife vehicle collisions.

Table 2-3 Conflict Points

Alternative	Result	Total Conflict Points	Reduce Conflict Points on US-89
No-action	Does not make any improvements to US-89.	163	No
Six-Lane Arterial	Maintains existing intersections and interchanges on US-89 and construct an additional through travel lane in each direction.	205	No
Four-Lane Freeway	Provides grade-separated interchanges and crossings on US-89.	30	Yes
Six-Lane Freeway	Provides grade-separated interchanges and crossings on US-89.	30	Yes

The preliminary purpose and need screening process also evaluated other concepts recommended by the public. The results of that screening process are summarized in Table 2-4 (see Traffic Memo in Appendix A).

Table 2-4 Preliminary Purpose and Need Screening for Other Concepts Recommended by the Public

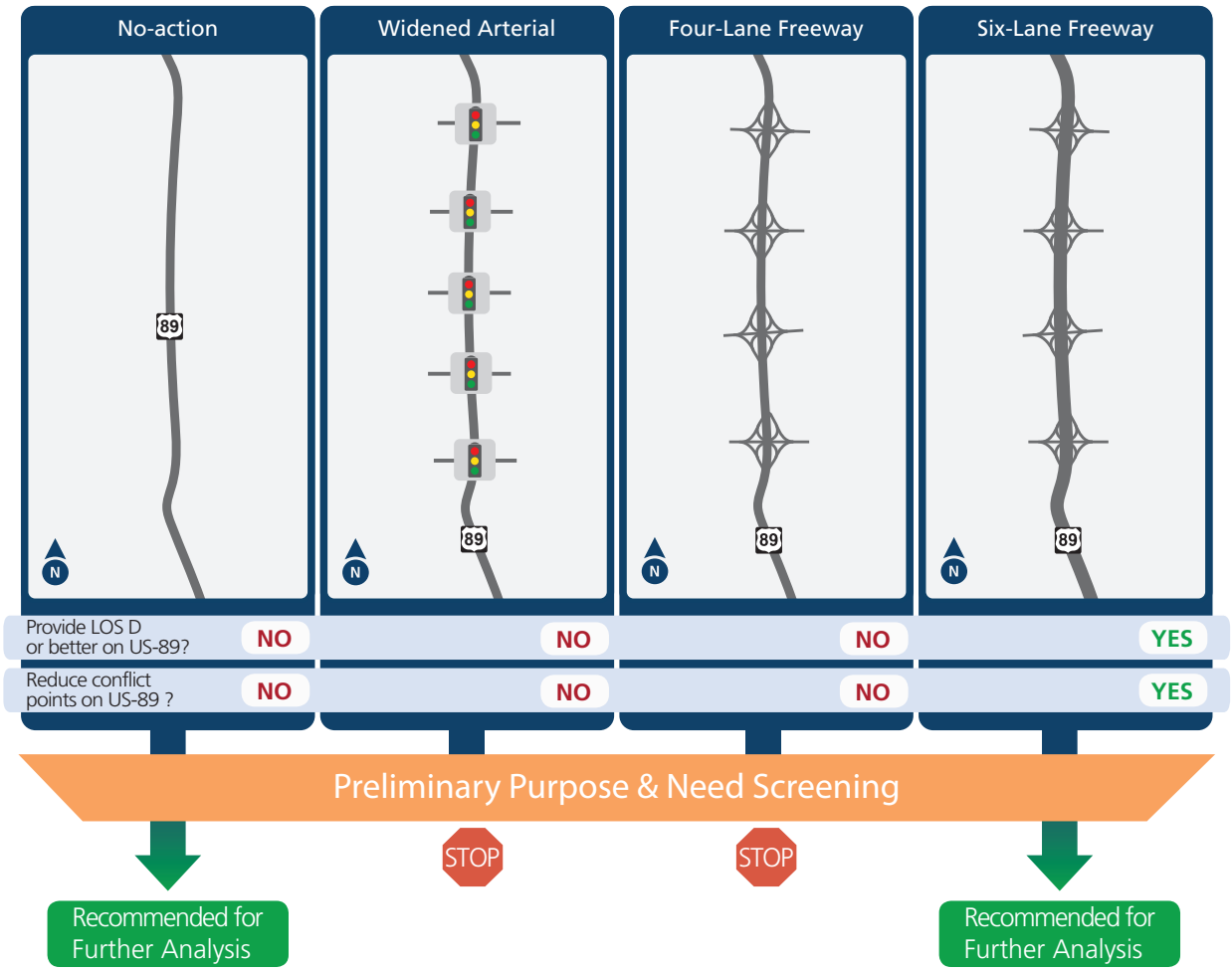
Concept	Provide LOS D or better	Reduce Conflict Points	Meet Preliminary Purpose and Need Screening Criteria
I-84 to I-15 Connection – Provide a direct freeway connection from northbound I-15 to eastbound I-84, and westbound I-84 to southbound I-15	No	No	No
Transit – Local bus and express bus routes would have a 15 minute headway and a BRT line would be constructed from Ogden to Farmington	No	No	No

Concept	Provide LOS D or better	Reduce Conflict Points	Meet Preliminary Purpose and Need Screening Criteria
I-15 Widening – Expand I-15 to the point that there are no delays on I-15	No	No	No
Reduced Speed US-89 Four-Lane Freeway Concept – This concept would include constructing a Four-Lane Freeway on US-89 with a 55 mph speed limit.	No	Yes	No
Combined Concepts with US-89 Six-Lane Arterial – Combine the I-84 to I-15 Connection, Transit, and I-15 Widening Concepts with the US-89 Six-Lane Arterial Alternative	No	No	No
Combined Concepts with US-89 Four-Lane Freeway – Combine the I-84 to I-15 Connection, Transit, and I-15 Widening Concepts with the US-89 Four-Lane Freeway Alternative	No	Yes	No

Preliminary Purpose and Need Screening Summary

The Six-Lane Freeway Alternative was the only alternative that provided LOS D or better and reduced conflict points on US-89. Therefore, the Six-Lane Freeway Alternative moved forward for further analysis. For the purposes of this SES, the Six-Lane Freeway Alternative will be referred to as the Freeway Alternative throughout the rest of this document. The No-action Alternative also moved forward in the screening process as it provided a baseline to compare impacts of build alternatives (see Figure 2-2).

Figure 2-2 Summary of Primary Purpose and Need Screening



2.2.4 Interchange Location Alternatives

The next step in the alternatives screening process evaluated the placement of interchange locations for the US-89 Freeway Alternative based on traffic operations. The study team developed the following seven Interchange Location Alternatives:

- No-action Alternative
- Baseline Freeway
- Add Nicholls Road Interchange
- Add Crestwood Road Interchange
- Interchange at Nicholls Road and Crestwood Road (minus 400 North)
- Interchange at Crestwood Road (minus Oak Hills Drive)
- Gordon Avenue Crossing Only

Interchange Location Alternatives represent generic concepts to determine the placement of interchange locations. The alternatives that move forward as a result of the screening process will be further refined.

2.2.4.1 Operations Screening

The operations screening process evaluated the Interchange Location Alternatives based on the following criteria:

Reasonable Access

Interchanges in developed urban areas are typically spaced one to two miles apart. In order to provide reasonable access to US-89, interchanges should not be spaced farther than two miles apart, with the minimum desired spacing of one mile.

Demand

Interchange locations were evaluated to determine if there was demand for an interchange at each location. An interchange was considered to have a reasonable demand if the total ramp volumes exceeded 5,000 vehicles per average weekday in 2040. The travel demand of an interchange was determined using the WFRC Travel Demand Model.

Compatibility with Network Roadway Classification

In an effort to balance mobility and access, roadways are classified as local, collector, arterial, or freeway. Local roads provide a high degree of access at the expense of mobility, while freeways provided limited access with a high degree of mobility. Local roads typically feed into collector roads which feed into arterials, which feed freeways. Interchanges should only be placed at arterials that can support the projected traffic volumes.

Table 2-5 Operations Screening Criteria and Measure

Operations Screening Criteria	Measure
Provide reasonable access to US-89	Interchanges are between one and two miles apart
Reasonable interchange demand is present at interchange locations	Total interchange ramp volumes exceed 5,000 vehicles per average weekday in 2040
Be compatible with the network roadway classification	Interchange locations are placed at arterials that can support the projected traffic volumes.

No-action Alternative

The No-action Alternative would maintain the current roadway configuration of US-89.

Recommendation

The No-action Alternative did not meet any of the screening criteria described in Table 2-5; however, it moved forward in the screening process as it provided a baseline to compare impacts of build alternatives.

Recommended for further analysis

Baseline Freeway Alternative

The Baseline Freeway alternative is the configuration represented in the WFRC RTP. This alternative would include the following improvements:

- Maintaining the existing interchanges at Main Street, SR-193, and South Weber Drive
- Constructing new interchanges at 400 North, Oak Hills Drive, Gordon Avenue, and Antelope Drive
- Constructing grade-separated crossings at Nicholls Road and Crestwood Road

Reasonable Access

The cross-street spacing between Oak Hills Drive and Gordon Avenue is just below the one mile desired minimum and would require auxiliary lanes to accommodate the short spacing.

Interchange Travel Demand

The minimum interchange travel demand is met with all interchange ramp volumes exceeding 5,000 vehicles/day in 2040.

Compatibility with Network Roadway Classification

All interchanges are located at cross streets that are classified as arterials. It should be noted that although 400 North is classified as a major collector in Fruit Heights, in Kaysville, 400 North is classified as an arterial. Additionally, 400 North operates as an arterial with direct access to I-15.

Recommendation

Recommended for further analysis

Add Nicholls Road Interchange Alternative

This alternative would include the following improvements:

- Maintaining the existing interchanges at Main Street, SR-193, and South Weber Drive
- Constructing new interchanges at Nicholls Road, 400 North, Oak Hills Drive, Gordon Avenue, and Antelope Drive
- Constructing a grade-separated crossing at Crestwood Road

Reasonable Access

The Nicholls Road interchange meets minimum cross-street spacing (1.1 miles to Main Street and 1.0 miles to 400 North).

Interchange Travel Demand

Ramp volumes at a Nicholls Road Interchange are projected to be 4,300 vehicles/day in 2040, less than the minimum interchange travel demand of 5,000 vehicles/day.

Compatibility with Network Roadway Classification

Nicholls Road is classified as a 2-lane major collector by Fruit Heights City. Traffic on Nicholls Road is projected to quadruple west of US-89 and double east of US-89 if an interchange at Nicholls Road is constructed. These traffic volumes would be incompatible with the roadway classification.

Recommendation

Placing an interchange at Nicholls Road would substantially increase the amount of regional through traffic on a 2-lane collector road and would not have the recommended interchange travel demand.

Screened from further analysis.

Existing Interchange Interchange Grade Separated Crossing

Add Crestwood Road Interchange

This alternative would include the following improvements:

- Maintaining the existing interchanges at Main Street, SR-193, and South Weber Dr
- Constructing new interchanges at 400 North, Crestwood Road, Oak Hills Drive, Gordon Avenue, and Antelope Drive
- Constructing a grade-separated crossing at Nicholls Road

Reasonable Access

Cross-street spacing between Crestwood Road and adjacent interchanges (0.9 miles to Oak Hills and 0.8 miles to 400 North) is below the desired one-mile minimum. Auxiliary lanes would need to be constructed to accommodate the short spacing.

Interchange Travel Demand

The Crestwood Road interchange travel demand ramp volumes are projected to be 6,800 vehicles/day, but would lower the interchange travel demand at the 400 North interchange to 3,800 vehicles/day (less than the minimum interchange travel demand of 5,000 vehicles/day).

Compatibility with Network Roadway Classification

Crestwood Road is classified as a 2-lane significant local road by Kaysville City. Traffic on this road is projected to increase by over 2,000 vehicles/day if an interchange at Crestwood Road is constructed. These traffic volumes would be incompatible with the roadway classification.

Recommendation

Placing an interchange at Crestwood Road would substantially increase the amount of regional traffic on a 2-lane local road, would not have the recommended interchange travel demand at 400 North, and would not meet desired spacing minimums.

Screened from further analysis.

Interchange at Nicholls Road and Crestwood Road (minus 400 North)

This alternative would include the following improvements:

- Maintaining the existing interchanges at Main Street, SR-193, and South Weber Dr
- Constructing new interchanges at Nicholls Road, Crestwood Road, Oak Hills Drive, Gordon Avenue, and Antelope Drive
- Constructing a grade-separated crossing at 400 North

Reasonable Access

Cross-street spacing between Crestwood Road and the Oak Hills interchange to the north (0.9 miles) is below the desired one mile minimum. Auxiliary lanes would need to be constructed to accommodate the short spacing.

Interchange Travel Demand

The Nicholls Road and Crestwood Road interchange travel demand ramp volumes are projected to be 4,800 vehicles/day (less than the minimum interchange travel demand of 5,000 vehicles/day) and 8,100 vehicles/day, respectively.

Compatibility with Network Roadway Classification

Crestwood Road is classified as a 2-lane significant local road by Kaysville City. Nicholls Road is classified as a 2-lane major collector by Fruit Heights City. Traffic on both these roads is projected to increase substantially, making the roadways incompatible with the roadway classifications.

Recommendation

Placing interchanges at Crestwood Road and Nicholls Road would substantially increase the amount of regional traffic on 2-lane local/collector roads, would not meet desired spacing minimums, and would not have the interchange travel demand to justify an interchange at Nicholls Road.

Screened from further analysis.

Existing Interchange Interchange Grade Separated Crossing

Interchange at Crestwood Road (minus Oak Hills Drive)

This alternative would include the following improvements:

- Maintaining the existing interchanges at Main Street, SR-193, and South Weber Dr
- Constructing new interchanges at 400 North, Crestwood Road, Gordon Avenue, and Antelope Drive
- Constructing grade-separated crossings at Nicholls Road and Oak Hills Drive

Reasonable Access

Cross-street spacing between Crestwood Road and the 400 North interchange to the south (0.8 miles) is below the desired one mile minimum. Auxiliary lanes would need to be constructed to accommodate the short spacing.

Interchange Travel Demand

Ramp volumes for an interchange at Crestwood Road is projected to be 8,000 vehicles/day, but would lower the interchange travel demand at the 400 North interchange to 3,800 vehicles/day (less than the minimum interchange travel demand of 5,000 vehicles/day).

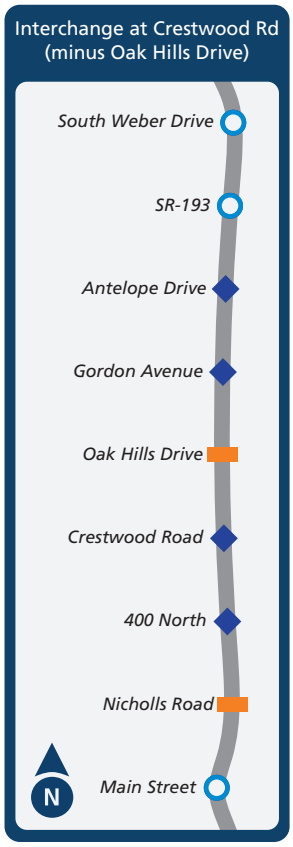
Compatibility with Network Roadway Classification

Crestwood Road is classified as a 2-lane significant local road by Kaysville City. Traffic on this road is projected to increase substantially, making Crestwood Road incompatible with the roadway classification.

Recommendation

Placing an interchange at Crestwood Road would substantially increase the amount of regional traffic on a 2-lane local road, would not have the recommended interchange travel demand to justify interchanges at both 400 North and Crestwood Road, and would not meet desired spacing minimums.

Screened from further analysis.



Gordon Avenue Crossing Only

This alternative would include the following improvements:

- Maintaining the existing interchanges at Main Street, SR-193, and South Weber Dr
- Constructing new interchanges at 400 North, Oak Hills Drive, and Antelope Drive
- Constructing grade-separated crossings at Nicholls Road, Crestwood Road, and Gordon Avenue

Reasonable Access

The Gordon Avenue Crossing Only Alternative meets minimum cross-street spacing.

Interchange Travel Demand

Removing the interchange at Gordon Avenue is expected to increase the interchange travel demand ramp volumes at Oak Hills by nearly 3,000 vehicles/day and Antelope Drive by 1,800 vehicles/day.

Compatibility with Network Roadway Classification

Removing the interchange at Gordon Avenue substantially increases the travel demand on the local street network, particularly Hobbs Creek, Woodridge Drive, and Eastside Drive (all classified as local roads).

Recommendation

Removing the interchange at Gordon Avenue creates a system that feeds regional traffic from an arterial street to the 2-lane local street network (Hobbs Creek, Woodridge Drive, and Eastside Drive).

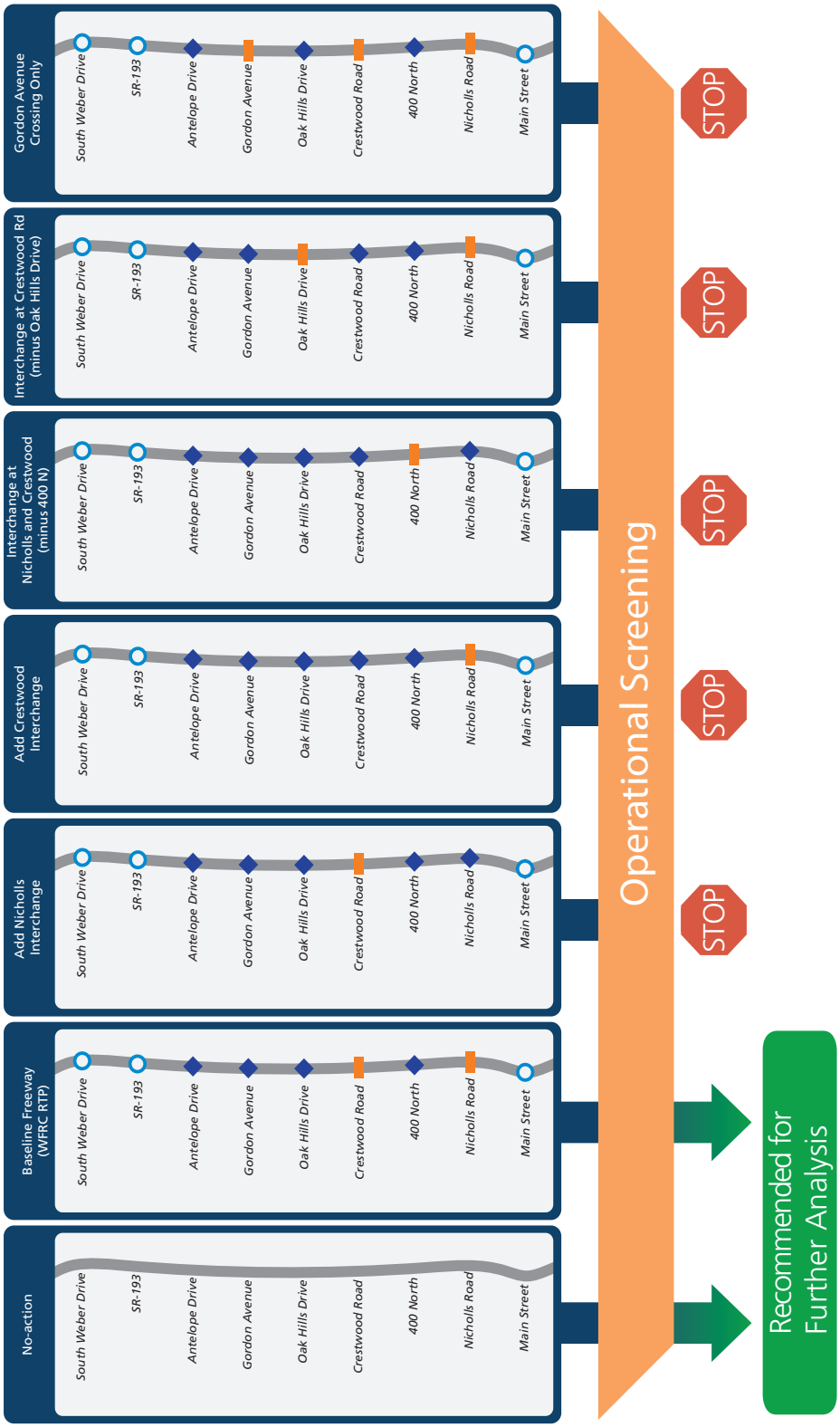
Screened from further analysis.

Existing Interchange ◆ Interchange ▬ Grade Separated Crossing

Operations Screening Summary

The Baseline Freeway Alternative was the only alternative that met the operational criteria of having reasonable access to US-89, providing reasonable demand at interchange locations, and was compatible with the network roadway classifications. Therefore, the Baseline Freeway Alternative moved forward for further analysis. The No-action Alternative also moved forward in the screening process as it provided a baseline to compare impacts of build alternatives (see Figure 2-3).

Figure 2-3 Summary of Operations Screening



2.2.5 US-89 System Alternatives

The next step in the alternatives screening process refined the Baseline Freeway Alternative by developing the following five US-89 System Alternatives.

- No-action Alternative
- One-Way Frontage Road (Main Street to SR-193) Freeway Alternative
- One-Way Frontage Road (400 North to SR-193) Freeway Alternative
- One-Way Frontage Road (400 North to SR-193) Freeway with Split Interchanges at Oak Hills and Gordon Avenue Alternative
- Freeway Alternative

2.2.5.1 Description of Alternatives

No-action Alternative

The No-action Alternative would maintain the current roadway configuration of US-89. It also assumes that all other planned improvements would be completed by 2040.

One-Way Frontage Road (Main Street to SR-193) Freeway

This alternative would include converting US-89 to a freeway with a one-way frontage road system on both sides of US-89 that extends from Main Street to SR-193. The study team did not consider one-way frontage roads (OWFR) north of SR-193 because no changes are being proposed to the local street network.

One-Way Frontage Road (400 North to SR-193) Freeway

This alternative would include converting US-89 to a freeway with a one-way frontage road (OWFR) system that extends from 400 North to SR-193.

Existing Interchange Modified Existing Grade Separated Crossing Interchange

One-Way Frontage Road (400 North to SR-193) Freeway with Split Interchanges at Oak Hills and Gordon Avenue

This alternative would include converting US-89 to a freeway with a one-way frontage road (OWFR) system that extends from 400 North to SR-193 and constructing a split-interchange between Oak Hills Drive and Gordon Avenue.

Freeway

This alternative would include converting US-89 to a freeway that would provide local access by utilizing existing roads or constructing new connecting roads to provide a similar level of access as frontage roads.

Existing Interchange Modified Existing Grade Separated Crossing Interchange

2.2.5.2 Secondary Purpose and Need Screening

Secondary Purpose and Need Screening included evaluating alternatives based on their ability to meet the "address current and future travel demand on US-89" component of the purpose and need. See Table 2-56for the secondary purpose and need criteria and associated measures. If an alternative was able to meet the secondary purpose and need criteria, it advanced for further analysis.

Table 2-6 Secondary Purpose and Need Criteria and Measure

Secondary Purpose and Need Criteria	Measure
Address Current and future travel demand on US-89	Provide LOS D or better for interchanges on US-89 between Shepard Lane and I-84

The study team evaluated intersection LOS along the US-89 corridor by using VISSIM microsimulation traffic analysis. The South Weber Drive and I-84 interchanges were not included in the analysis because they are existing interchanges and no improvements are required. In order for an alternative to meet the secondary purpose and need screening criteria, it had to demonstrate LOS D or better for each interchange along the US-89 corridor. Table 2-7 illustrates the LOS and delay for each US-89 System Alternative.

Table 2-7 LOS and Delay for Each US-89 System Alternative

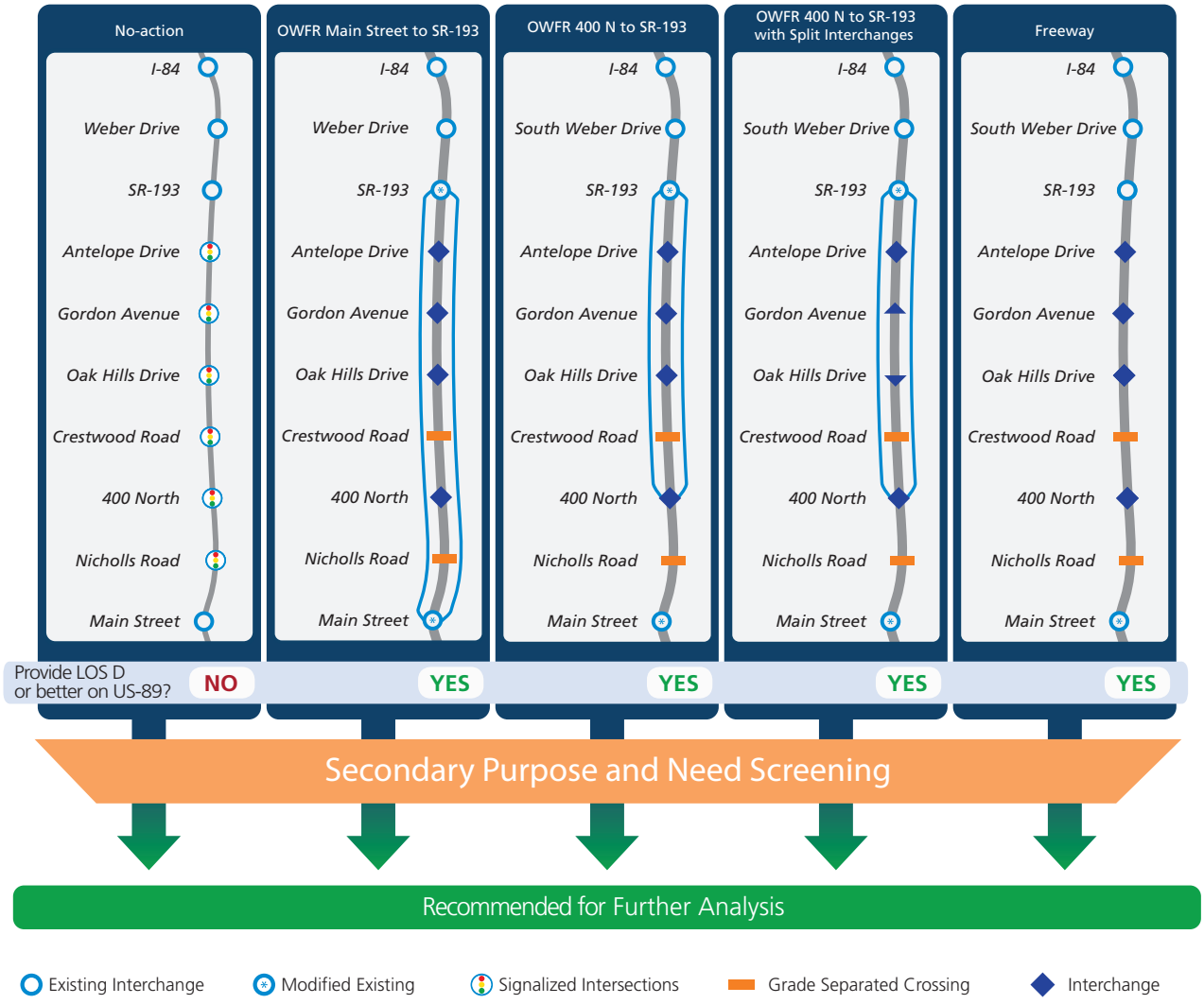
	No-action		OWFR Main Street to SR-193		OWFR 400 N to SR-193		OWFR 400 N to SR-193 with Split Interchanges		Freeway	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
SR-193	C*	20	B	19	C	21	C	21	C	20
Antelope Drive	C*	31	D	36	B	14	B	14	A-C	9-26
Gordon Avenue	n/a	n/a	C	21	C	21	C	32	A-B	8-13
Oak Hills Drive	C*	21	C	32	C	26	C	26	B	11-14
Crestwood Road	C*	32	B	10	B	11	B	11	A	8
400 North	F	>100	B	15	C	22	C	22	A-B	9-15
Nicholls Road	F	>100	A	9	A	9	A	9	A	9
Main Street	C	30	B	14	B	13	B	10	B	14

* Better than expected LOS are due to severe upstream bottlenecks at the Nicholls Road and 400 North intersections. For a discussion of the bottleneck analysis, see Chapter 1.

Secondary Purpose and Need Screening Summary

All of the US-89 System Alternatives met the screening criteria of providing LOS D or better for interchanges on the US-89 corridor. Therefore, all US-89 System Alternatives moved forward for further analysis. The No-action Alternative also moved forward in the screening process as it provided a baseline to compare impacts of build alternatives (see Figure 2-4).

Figure 2-4 Summary of Secondary Purpose and Need Screening



2.2.5.3 Environmental Resources and Cost Comparison Screening

The US-89 System Alternatives that passed the secondary purpose and need screening moved forward to environmental resources and cost comparison screening.

Screening Criteria

The environmental screening analysis included an inventory of residences, commercial structures, historic architecture, and historic properties. It should be noted that the environmental screening process is not a full environmental analysis of the alternatives. A full environmental analysis was conducted for alternatives only selected for detailed study (see Chapter 3: Affected Environment and Environmental Consequences). The screening criteria are listed in Table 2-8.

Table 2-8 Environmental Screening and Cost Comparison Criteria and Measure

Environmental Screening	Measure
Impacts to the built environment	Number of potential residential and commercial relocations Number of Adverse Effects to historic properties
Cost	Cost in dollars ($)

Residential and Commercial Relocations

Potential residential relocations are designated under the following conditions:

- There is a direct impact to the structures (construction of the proposed roadway crosses the existing structure), or
- The roadway moves substantially closer to the residential structure footprint AND requires the acquisition of right-or-way, or
- The alternative would remove all access to the property.

Potential commercial relocations are designated under the following conditions:

- There is a direct impact to the structure (construction of the proposed roadway crosses the existing structure), or
- The alternative would remove all access to the property, or
- The acquisition of right-of-way would prohibit the operation of the business.

The screening process quantified the number of residential and commercial relocations for each alternative.

Adverse Effects to Historic Properties

Cultural resources include archaeological resources (both prehistoric and historic), architectural or historic resources (buildings and structures), and traditional cultural properties (TCPs). As per 36 CFR §800, the Advisory Council on Historic Preservation (ACHP) defines a historic property as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP (National Register of Historic Places)." A property is considered historic if it is 50 years and older; however, UDOT evaluates properties that are 45 years or older to allow for the time needed to complete construction of complex roadway projects.

A finding of Adverse Effect is made "[w]hen an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, and association" (see 36 CFR §800.5(a)(1)).

Cost

Cost was also evaluated to help make a decision to determine which US-89 System Alternatives would be carried forward for further analysis.

Table 2-9 displays the number of potential residential and commercial relocations, the number of adverse effects to historic properties, and the cost.

Table 2-9 Relocations, Adverse Effects to Historic Properties, and Cost

	No-action			OWFR Main Street to SR-193			OWFR 400 N to SR-193			OWFR 400 N to SR-193 with Split Interchanges			Freeway		
	Relocations	Historic Properties	Cost	Relocations	Historic Properties	Cost	Relocations	Historic Properties	Cost	Relocations	Historic Properties	Cost	Relocations	Historic Properties	Cost
I-84	0	0	0	0	0	$32.6 M	0	0	$32.6 M	0	0	$32.6 M	0	0	$32.6 M
South Weber Drive	0	0	0	0	1	$16.4 M	0	0	$16.4 M	0	0	$16.4 M	0	0	$16.4 M
SR-193	0	0	0	0	0	$37.3 M	0	0	$37.3 M	0	0	$37.3 M	0	0	$37.3 M
Antelope Drive	0	0	0	5	2	$48.4 M	5	2	$48.4 M	5	2	$48.4 M	5	2	$42.5 M
Gordon Avenue	0	0	0	10	3	$38.9 M	10	3	$38.9 M	10	3	$38.2 M	4	3	$45.2 M
Oak Hills Drive	0	0	0	11	2	$44.4 M	11	2	$44.4 M	11	2	$43.1 M	11	1	$48.5 M
Crestwood Road	0	0	0	2	0	Included in 400 North Cost	2	0	Included in 400 North Cost	2	0	Included in 400 North Cost	0	0	$33.7 M
400 North	0	0	0	3	3	$89.6 M	3	3	$89.6 M	3	3	$89.6 M	2	3	$42.9 M
Nicholls Road	0	0	0	32	7	$60.5 M	0	0	$40.1 M	0	0	$40.1 M	0	0	$40.1 M
Main Street	0	0	0	0	0	$3.1 M	0	0	$3.1 M	0	0	$3.1 M	0	0	$3.1 M
	0	**0**	**0**	**63**	**18**	**$371.2 M**	**31**	**10**	**$350.8 M**	**31**	**10**	**$348.8 M**	**22**	**9**	**$342.3 M**

Environmental Resources and Cost Comparison Screening Summary

The One-Way Frontage Road Freeway (Main Street to SR-193) Alternative, the One-Way Frontage Road Freeway (400 North to SR-193) Alternative, and the One-Way Frontage Road Freeway (400 North to SR-193) with Split Interchange at Oak Hills Drive and Gordon Avenue Alternative were eliminated from further consideration because they caused a greater number of residential and commercial relocations when compared to the Freeway Alternative (31-63 relocations versus 22 relocations). Additionally, the one-way frontage road alternatives would cause greater out of direction travel.

The Freeway Alternative moved forward for further analysis for the following reasons:

- Fewer relocations when compared to all other build alternatives
- Fewer adverse effects to historic properties when compared to all other build alternatives
- Less costly when compared to all other build alternatives

The No-action Alternative also moved forward in the screening process as it provided a baseline to compare impacts of build alternatives (see Figure 2-5).

Figure 2-5 Summary of Environmental Resources and Cost Comparison Screening

Cross-Street Design Concepts

2.2.6 Cross-Street Design Concepts

The next step in the process included developing and screening specific interchange/crossing concepts at the following cross-street locations. Cross-streets are streets that cross US-89 in an east/west direction.

- Antelope Drive
- Gordon Avenue
- Oak Hills Drive
- Crestwood Road
- 400 North
- Nicholls Road
- Main Street

The Cross-Street Concepts were screened based on the methodology described in Figure 2-6. This section presents an abbreviated version of the Cross-Street Screening process. For a detailed description of the Cross-Street screening process, see Volume 4.

Figure 2-6 Summary of Cross-Street Screening Process

Primary

ENGINEERING FEASIBILITY

PRIMARY (ENGINEERING FEASIBILITY) SCREENING CRITERIA	MEASURE
Feasible from an engineering perspective	Meet UDOT and local municipality engineering standards

PURPOSE & NEED

PRIMARY (PURPOSE AND NEED) SCREENING CRITERIA	MEASURE
Address current and future travel demand on US-89	Provide LOS D or better for intersections on US-89
Improve safety	Reduce conflict points

Secondary

ENVIRONMENTAL

SECONDARY (ENVIRONMENTAL) SCREENING CRITERIA	MEASURE
Impacts to the built environment	• Number of residential and commercial relocations • Number of "Adverse Effects" to Cultural Resources • Aqueduct Relocation (Yes/No)

COST

SECONDARY (COST BENEFIT) SCREENING CRITERIA	MEASURE
Cost	Cost in dollars ($)

Tertiary

OTHER SCREENING FACTORS

OTHER SCREENING FACTORS	MEASURE
• Safety • Driver Expectancy • Constructability • Long Term Maintenance • Active Transportation • Operations	Evaluate based on whether or not the "Other Screening Factors" are an advantage, disadvantage, or neutral

Antelope Drive

The study team selected the Tight Diamond Concept at Antelope Drive for further study. This concept would construct a tight diamond interchange at Antelope Drive with the northbound and southbound ramps shifted to the east. US-89 would go over Antelope Drive. The Tight Diamond Concept was selected because it was feasible from an engineering perspective, it provided LOS D or better for all intersections, it improved safety, and it had fewer relocations and adverse effects to historic properties. Additionally, when compared to other concepts, the Tight Diamond Concept was more advantageous in terms of safety, driver expectancy, constructability, long term maintenance, and active transportation.

Gordon Avenue

The study team selected the Diamond Concept at Gordon Avenue for further study. This concept would construct a diamond interchange at Gordon Avenue with a frontage road connection on the west of US-89 from Cherry Lane to Gentile Street. US-89 would go over Gordon Avenue. The Diamond Concept was selected because it was feasible from an engineering perspective, it provided LOS D or better for all intersections, it improved safety, and it had fewer relocations and adverse effects to historic properties. Additionally, when compared to other concepts, the Diamond Concept was more advantageous in terms of driver expectancy, long term maintenance, and active transportation.

Oak Hills Drive

The study team selected the Diamond Concept at Oak Hills Drive for further study. This concept would construct a diamond interchange at Oak Hills Drive, with US-89 over Oak Hills Drive. The Diamond Concept was selected because it was feasible from an engineering perspective, it provided LOS D or better for all intersections, it improved safety, and it had fewer relocations and adverse effects to historic properties. Additionally, when compared to other concepts, the Diamond Concept was more advantageous in terms of safety, driver expectancy, constructability, long term maintenance, and active transportation.

Crestwood Road

The study team selected the US-89 Over Crestwood Concept at Crestwood Road for further study. This concept would grade-separate the Crestwood Road/US-89 crossing by providing a US-89 overpass (US-89 over Crestwood Road, with Crestwood Road to remain at the same elevation). The crossing would remain at the existing Crestwood Road location. The US-89 Over Crestwood Concept was selected because it was feasible from an engineering perspective, it improved safety, and it had fewer relocations and adverse effects to historic properties.

400 North

The study team selected the Diamond Jug Handle Concept at 400 North for further study. This concept would construct a diamond interchange with a northbound jug-handle entrance ramp, with US-89 over 400 North. The Diamond Jug Handle Concept was selected because it was feasible from an engineering perspective, it provided LOS D or better for all intersections, it improved safety, and it had fewer relocations and adverse effects to historic properties. Additionally, when compared to other concepts, the Diamond Jug Handle Concept was more advantageous in terms of safety, driver expectancy, constructability, and long-term maintenance.

Nicholls Road

The study team selected the Hybrid Concept at Nicholls Road for further study. This concept would grade-separate the US-89 crossing by providing a US-89 overpass and lowering Nicholls Road by approximately five feet. The Hybrid Concept was selected because it was feasible from an engineering perspective, it improved safety, and it had no relocations and adverse effects to historic properties.

Main Street

Improvements to the Main Street interchange were considered because the proposed grade-separation at Nicholls Road would cause additional traffic at the Lloyd Road/Main Street intersection. The study team selected the Southbound Lloyd Road Modified Continuous Flow Intersection (CFI) Concept at Main Street for further study. This concept would provide a one-movement continuous-flow intersection on Lloyd Road (while on Lloyd Road, drivers would crossover and merge with traffic on the US-89 southbound off-ramp).

The Southbound Lloyd Road Modified Continuous Flow Intersection (CFI) Concept was selected because it was feasible from an engineering perspective, it provided LOS D or better for all intersections, it improved safety, it had no relocations and adverse effects to historic properties, and it costs substantially less than the other concepts.

Select Alternatives for Detailed Study

2.3 ALTERNATIVES SELECTED FOR DETAILED STUDY

2.3.1 No-action Alternative

The No-action Alternative would maintain the current roadway configuration of US-89. It also assumes that all other planned improvements would be completed by 2040.

The No-action Alternative includes short-term minor restoration types of activities (safety and maintenance improvements, etc.), allowing for continued operations of the existing roadways. These improvements include activities such as adding or lengthening left-turn pockets, signal phasing changes, and adding dual left-turn lanes if receiving lanes already exist.

2.3.2 Freeway Alternative

The freeway alternative is a combination of the baseline freeway alternative (that determined interchange and grade-separated cross-street locations) and selected cross-street design concepts.

This alternative would include the following:

- Widening US-89 from a four-lane arterial to a six-lane freeway from Shepard Lane to I-84 with limited access
- Utilizing existing roads or constructing new roads to provide local, two-way access
- Providing access to the northbound exit ramp at Main Street from the one-way frontage road
- Constructing a modified one-movement continuous-flow intersection on Lloyd Road at the Main Street intersection (while on Lloyd Road, drivers would crossover and merge with traffic on the US-89 southbound off-ramp)
- Grade-separating the Nicholls Road/US-89 crossing by providing a US-89 overpass and lowering Nicholls Road by approximately five feet
- Constructing a diamond interchange at 400 North with a northbound jug-handle entrance ramp and US-89 over 400 north

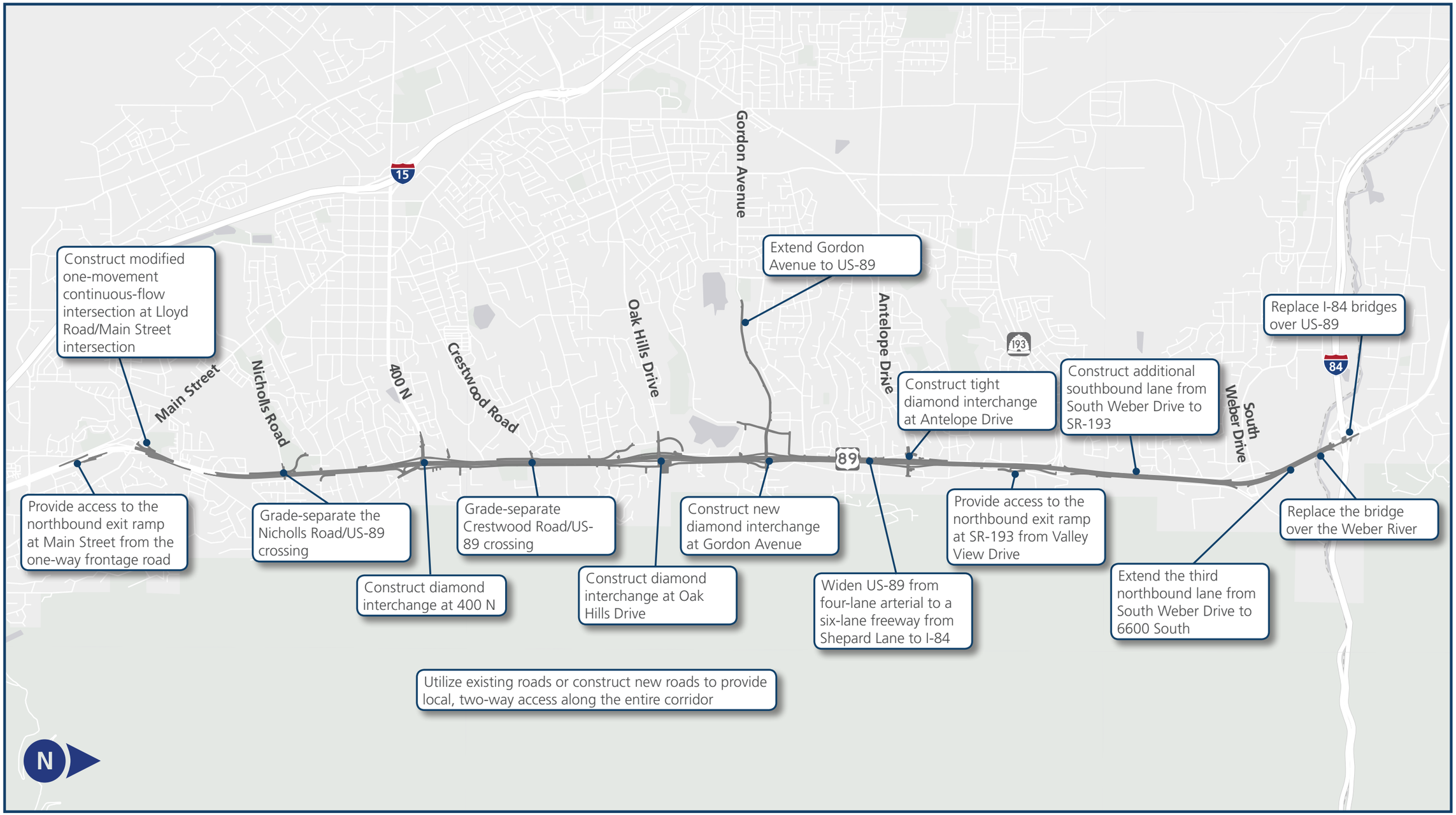
- Grade-separating the Crestwood Road/US-89 crossing by providing a US-89 overpass
- Constructing a diamond interchange at Oak Hills Drive, with US-89 over Oak Hills Drive
- Extending Gordon Avenue to US-89 and constructing a new diamond interchange at US-89, with US-89 over Gordon Avenue
- Constructing a tight diamond interchange at Antelope Drive with the northbound and southbound ramps shifted east and US-89 over Antelope Drive
- Retaining the SR-193 interchange, with access to the northbound exit ramp at SR-193 from Valley View Drive
- Retaining the South Weber Drive interchange
- Extending the third northbound lane from South Weber Drive to 6600 South and constructing an additional southbound lane from South Weber Drive to SR-193
- Replacing the bridge over the Weber River, contingent on funding
- Replacing the I-84 bridges over US-89, contingent on funding
- Coordinating with the local municipalities during final design to designate a Class III bike route east of US-89 between Farmington Main Street and South Weber Drive

Identify Preferred Alternative

2.4 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The Freeway Alternative meets the purpose and need, and when compared to all other build alternatives it has fewer relocations, fewer adverse effects to historic properties, and is less costly (see Figure 2-7 and Preferred Alternative maps in Volume 4).

Figure 2-7 Preferred Alternative



Chapter 3: Affected Environment and Environmental Consequences

This chapter describes the existing environmental, social, and economic conditions within the study area and how these conditions would be affected by the No-action and Preferred Alternatives. Existing conditions were identified based on literature and data file searches, coordination with federal, state, and local agencies, and field investigations. Additional details relating to technical research performed in preparation of this State Environmental Study (SES) that are not discussed in this document are included in the project records.

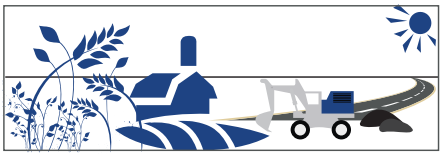
Each environmental resource will be evaluated for direct, indirect, and cumulative impacts, including appropriate avoidance, minimization, and mitigation measures. Types of impacts are explained in the following definitions and illustrated in Figure 3-1:

- **Direct impacts** are caused by the project and occur at the same time and place. These impacts are discussed in each resource area subsection.
- **Indirect impacts** are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable. Indirect impacts are generally not quantifiable but can be reasonably predicted to occur. These impacts are discussed in each resource area subsection.
- **Cumulative impacts** are the impacts to the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. These impacts are discussed in Section 3.21 of this Chapter.

The study area is defined in Chapter 1 (see Figure 1-1). The study area may vary for individual resources, depending on the characteristics of the individual resource. Unless otherwise noted, the study area for each resource is the study area defined in Figure 1-1.

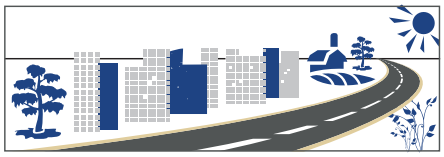
Figure 3-1 Types of Impacts

DIRECT IMPACTS



Several acres of farmland are removed to make room for construction of a new road.

INDIRECT IMPACTS



As a result of improved access, a commercial development replaces much of the farmland along the corridor a few years after the construction of the new road.

CUMULATIVE IMPACTS

The combined impacts of construction of the new road, construction and planned construction of other roadway projects, and private development transforms this rural, agricultural town into an urban, commercial center.

3.1 LAND USE

The Utah State Legislature has delegated responsibility for land use planning to local governments (Utah Code 17-27a-102). Zoning maps and general plans show the current and planned land uses for jurisdictions within the study area. These maps and plans are used, in conjunction with other documents, to identify community goals and priorities and to assist in decision making processes.

3.1.1 Affected Environment

The current and planned land uses for each jurisdiction are described below (see Figure 3-2 for jurisdictional boundaries and Appendix A for Zoning Maps and General Plans).

3.1.1.1 Current Zoning

Farmington

The area around the Farmington Main Street interchange is currently zoned primarily large residential and residential, with small areas of commercial and agricultural.

Fruit Heights

Fruit Heights does not appear to distinguish between current zoning and general plan designation. The southern end of the city, near the Farmington Main Street interchange, contains commercial, medium-density residential, and agricultural designations. The remainder of the study area within the city is agricultural and medium-density residential with small, individually-zoned, commercial properties at Green Street, 400 North, and 650 North.

Kaysville

A small segment of the study area passes through Kaysville, between 200 North (400 North in Fruit Heights) and Mutton Hollow Road. Zoning in this area includes medium-density single-family residential, light agricultural, and public use. The land designated for public use includes East Mountain Wilderness Park and an unnamed creek west of US-89 and north of Ward Road (see Map 6 in Volume 4).

Layton

The areas of Layton City currently adjacent to US-89 are zoned primarily for residential use with smaller agricultural areas near Oak Hills Drive and 1400 North. Commercial areas are planned for 1400 North and Cherry Lane. The east side of the highway at 1400 North, around Valley View Drive, is zoned for public use.

South Weber

South Weber zoning in the study area consists of low-to-medium-density residential and agricultural land south of Deer Run Drive, commercial areas around Deer Run Drive and South Weber Drive, and a natural resources designation for the gravel pit near the Weber River.

Davis County

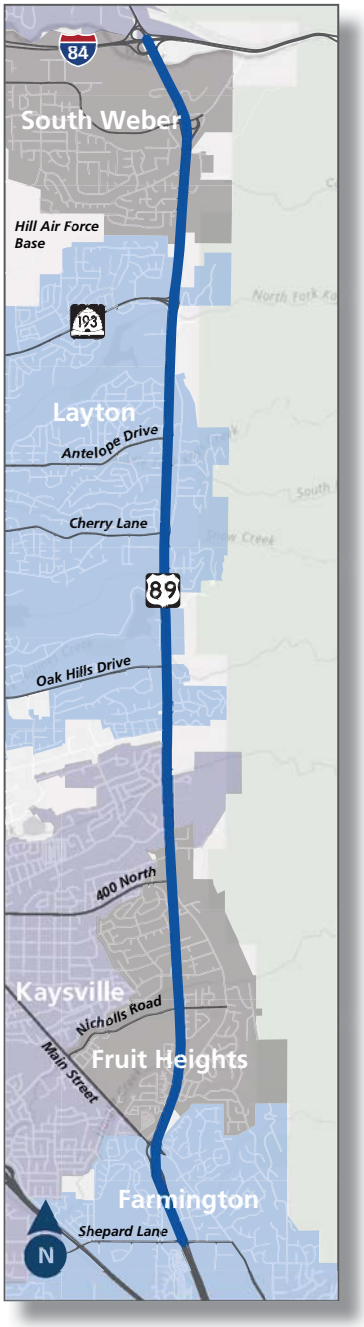
Land under the jurisdiction of Davis County includes Mutton Hollow Township and a few other parcels of unincorporated land. All areas of county land adjacent to US-89 are zoned for either limited agriculture, or in the case of Mutton Hollow Township, agricultural estate.

3.1.1.2 General Plan Designation

Farmington

The general plan designation for the area around the Farmington Main Street interchange includes public/private recreation open space, low density residential, and small areas of office/business park and neighborhood mixed use.

Figure 3-2 Cities within Study Area



Fruit Heights

Fruit Heights does not appear to distinguish between current zoning and general plan designation (see discussion in Current Zoning section).

Kaysville

The Kaysville General Plan does not identify general plan designations for specific areas. However, it does discuss density in the city east of I-15 as being between zero and five units per acre, and that most residential development should be single-family.

Layton

The Layton City General Plan does not identify general plan designations for specific areas. However, the eastern portion of the city is identified to be generally medium-density residential, with a large, future commercial development on the west side of the proposed Gordon Avenue interchange.

South Weber

The South Weber General Plan Projected Land Use Map shows very low and low density residential use east of US-89, medium density residential west of US-89, commercial around Deer Run Drive and South Weber Drive, and commercial recreation in the current area of the gravel pit.

Davis County

Davis County does not adopt land use designations aside from the current zoning discussed above. The Mutton Hollow Township General Plan directs that Mutton Hollow remain residential with a rural character until it is annexed into a neighboring city. The Davis County General Plan also encourages development standards that limit the conflict between developed and agricultural land.

3.1.1.3 Recreational Facilities

The following recreational facilities are present within or adjacent to the study area:w

- Heritage Park, Farmington (see Map 1 in Volume 4)
- Cherry Hill Campground and Water Park, Kaysville (see Map 2 in Volume 4)
- Harvey Park, Fruit Heights (see Map 3 in Volume 4)
- Davis Park Golf Course, Fruit Heights (see Map 3 in Volume 4)
- Nicholls Park, Fruit Heights (see Maps 3 and 4 in Volume 4)
- East Mountain Wilderness Park, Kaysville (see Map 6 in Volume 4)
- Adams Canyon Trail, Layton (see Map 8 in Volume 4)
- Valley View Golf Course, Layton (see Maps 18 and 19 in Volume 4)
- Andy Adams Park, Layton (see Map 18 in Volume 4)

3.1.1.4 Public Use Facilities

There are two public education facilities adjacent to the study area, Knowlton Elementary School in Farmington south of Shepard Lane, and East Layton Elementary School, near the proposed extension of Gordon Avenue (see Map 19 in Volume 4). A water treatment plant operated by the Weber Basin Water Conservancy District is located at the SR-193 interchange (see Map 13 in Volume 4) and the Fruit Heights City Center is located adjacent to Harvey Park (see Map 3 in Volume 4). Layton City plans to construct a new fire station near the proposed Gordon Avenue interchange.

There are three park-and-ride facilities located adjacent to the US-89 corridor:

- 400 North in Fruit Heights (see Map 5 in Volume 4)
- Antelope Drive in Layton (see Map 11 in Volume 4)
- South Weber Drive in South Weber (see Map 16 in Volume 4)

The Utah Transit Authority (UTA) provides mass transit services in the study area through two bus routes: the local 455 from Ogden to the University of Utah and the express 473 from Ogden to the University of Utah. The express bus (473) stops in the study area only at existing park-and-ride lots. The local (455) makes multiple stops both at the park-and-ride lots and on US-89 itself.

3.1.1.5 Section 6(f) of the Land and Water Conservation Fund

The Land and Water Conservation Fund Act (LWCFA) was established in 1964 to enable the purchase of land, water, and wetlands by federal, state, and local governments for the benefit of all Americans. It has been used to protect wildlife habitat, historic treasures, and clean water sources, as well as to expand recreational opportunities, such as parks and trails. Areas in which these funds were used have special protection under Section 6(f) of the LWCFA. The National Park Service (NPS) is responsible for administering the program and has delegated authority to the Utah Department of Natural Resources, Division of State Parks and Recreation as the State Liaison Officer (SLO).

Section 6(f)(3) of the LWCFA requires that no property acquired or developed with LWCFA assistance shall be converted to anything other than public outdoor recreation uses without the approval of the Secretary of the Department of the Interior. Further, if a conversion of land from outdoor recreational use is required, the protected park land must be replaced with property that is of at least equal fair market value and equivalent recreation utility as the property that was converted. The replacement property must constitute a viable recreation unit or be acquired as an addition to an existing recreation unit. Development of the replacement property may be required to ensure that a level of recreation utility is achieved similar to what was lost at the converted site.

Nicholls Park, located immediately adjacent to US-89 on the northwest quadrant of the intersection of Nicholls Road and US-89 in Fruit Heights (see Maps 3 and 4 in Volume 4), was identified as a recreational facility that is protected under Section 6(f) of the LWCFA. Nicholls Park was originally developed in 1969-1974 as the Davis County Memorial Park under project Nos. 49-00061 and 49-00238, with Davis County as the project sponsor. The name was later changed to Nicholls Park and the project sponsor from Davis County to the City of Fruit Heights. Nicholls Park currently consists of approximately 16 acres of land and includes three baseball/softball diamonds on the eastern end of the park. The western end of the park contains playground equipment, sand volleyball courts, restroom facilities, two covered boweries, and a small parking lot. No additional Section 6(f) properties have been identified within the study area.

3.1.2 Environmental Effects

3.1.2.1 No-Action Alternative

Direct Effects

The No-action Alternative would not directly impact land uses within the study area.

Indirect Effects

The No-action Alternative would not have any indirect impacts on land use.

3.1.2.2 Preferred Alternative

Direct Effects

Zoning and General Plans

The Preferred Alternative would be consistent with the Regional Transportation Plan established by the Wasatch Front Regional Council (WFRC) (see Section 1.5 in Chapter 1). Local zoning and land use policies take regional transportation planning into consideration. Approximately 28.8 acres of land currently zoned as residential and commercial would be converted to roadway use (see Section 3.4 Relocations and Right-of-Way Acquisition). This conversion would not affect the land use characteristics of the study area as remaining and adjacent areas would continue to be used according to established zoning and general plan designations. The Preferred Alternative would accommodate Layton City's planned commercial development at Gordon Avenue.

Recreational Facilities

The Preferred Alternative would impact three recreational facilities:

- **Davis Park Golf Course** – The Preferred Alternative would require the acquisition of 0.91 acres of Davis Park Golf Course (see Map 3 in Volume 4). This acquisition would not change the nature or use of the golf course.
- **Nicholls Park** – The Preferred Alternative would convert one acre of property within the boundaries of the Park to roadway facilities (see Maps 3 and 4 in Volume 4).
- **Adams Canyon Trail Head Parking Lot** – The Preferred Alternative would convert the existing trail head parking lot into roadway facilities (see Map 8 in Volume 4).

Public Use Facilities
The Preferred Alternative would have no impact to East Layton Elementary, the Weber Basin Water Conservancy District, Fruit Heights City Center, and the 400 North and South Weber Drive park-and-ride lots. The Preferred Alternative would facilitate access to the planned Layton City fire station and would convert approximately 0.4 acres of the park-and-ride to roadway use at Antelope Drive.

The Preferred Alternative would no longer allow for the safe passage of passengers to and from bus stops on US-89. Therefore, bus stops on US-89 itself would need to be moved to adjacent frontage roads or other local roads. The express 473 bus would not be affected, while the local 455 bus would need new stops, and possibly a somewhat modified route. UTA has expressed their willingness to make route and/or stop changes to accommodate the Preferred Alternative.

Section 6(f) of the Land and Water Conservation Fund
The Preferred Alternative would impact Nicholls Park, requiring a conversion of Section 6(f) property from recreational use to transportation use. The Preferred Alternative includes the construction of a connection between Nicholls Road and Lloyd Road, which would extend from Nicholls Road and wrap around the perimeter of the baseball/softball diamond fence (see Map 4 in Volume 4). The new roadway would require the acquisition of approximately one acre of property within the boundaries of Nicholls Park. This acquisition would not change the nature or use of the park or impact any recreational facilities within the Section 6(f) boundaries.

Indirect Effects
The Preferred Alternative would impact the Adams Canyon Trail parking lot, indirectly affecting the use of the trail for patrons that would normally use the parking lot.

3.1.3 Mitigation

3.1.3.1 Land Use and Zoning
No mitigation required.

3.1.3.2 Recreation
UDOT, in coordination with Layton City, will reestablish the Adams Canyon Trail parking area and connect it to the existing trail facility (see Map 8 in Volume 4).

3.1.3.3 Public Use Facilities
During final design, the park-and-ride lot at Antelope Drive will be reconfigured to maximize the remaining space.

3.1.3.4 Section 6(f) of the Land and Water Conservation Fund
The conversion of the land from outdoor recreational use to transportation use would require compliance with the conversion procedures of the LWCFA, including obtaining substitution recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location. UDOT will comply with all required LWCFA procedures pertaining to the conversion of the property within Nicholls Park from outdoor recreational use to transportation use. No construction activities would proceed in relation to the land acquired from Nicholls Park without prior approval from the SLO.

3.2 FARMLAND

In Utah Code Annotated, Title 17, Chapter 41, the State of Utah allows for the formation of Agricultural Protection Areas (APAs). Areas so designated are protected for the production of commercial crops, livestock, and livestock products.

3.2.1 Affected Environment

There are no APAs located within the study area.

Land that is currently in use for agricultural production exists adjacent to the US-89 corridor; however, this land is not legally protected.

3.2.2 Environmental Consequences

3.2.2.1 No-action Alternative

Direct Impacts

The No-action Alternative would have no direct impacts to farmland.

Indirect Impacts

The No-action Alternative would have no indirect impacts to farmland.

3.2.2.2 Preferred Alternative

The Preferred Alternative would have no impact to APAs. Additionally, the Preferred Alternative would not impact any land that is currently in use for agricultural production, nor would it impact the daily operation of agricultural activities or farm support services in the area.

3.2.3 Mitigation

No mitigation required.

3.3 SOCIAL CONDITIONS

Existing social and demographic characteristics of the population in the study area were analyzed for potential impacts to community cohesion and to identify the presence of populations that may experience heightened susceptibility to disturbance from the Preferred Alternative.

3.3.1 Affected Environment

3.3.1.1Social Conditions

The areas bordering US-89 are largely residential. These neighborhoods are a mix of older and newer construction and many residents have lived in the area for some time. Based on census and income data, some inferences about the general conditions of the neighborhoods surrounding the US-89 corridor can be made. These data indicate that the study area is characterized by relatively stable neighborhoods, incomes, and employment levels. Additionally, the value of real estate properties continues to rise.

US-89 forms a barrier between residential areas east and west of the roadway. There are two public education facilities adjacent to the study area, Knowlton Elementary School in Farmington south of Shepard Lane, and East Layton Elementary School, near the proposed extension of Gordon Avenue (see Map 19 in Volume 4).

The study area also contains five churches in or immediately adjacent to the study area. Additional churches are located on adjacent streets. In terms of public services, a Weber Basin Water Conservancy District water treatment plant is located in the study area, the Fruit Heights City Center is adjacent to the corridor, and Layton City has plans to build a fire station adjacent to Gordon Avenue.

As discussed in Section 3.1 Land Use, there are currently five public parks located in or adjacent to the study area. Additionally, there are two golf courses, a trail, and the Cherry Hill Campground and Water Park.

3.3.1.2 Census-Based Data

According to the 2010 Census data, the combined population of Davis County totals 306,479. The US Census Bureau establishes geographies for conducting census studies. At the local level, these geographies are defined by state, county, city, census tract, block group, and block. For this analysis, the study area includes Census Tracts 1251.02, 1251.04, 1258.04, 1259.05, 1259.06, 1259.08, 1261.01, 1262.02, 1262.03, and 1271 (see Figure 3-3).

These census tracts were compared to the overall census data in Davis County. Selected social and demographic characteristics of the population are summarized in Tables 3-1 to 3-3.

Figure 3-3 Census Tracts in Study Area

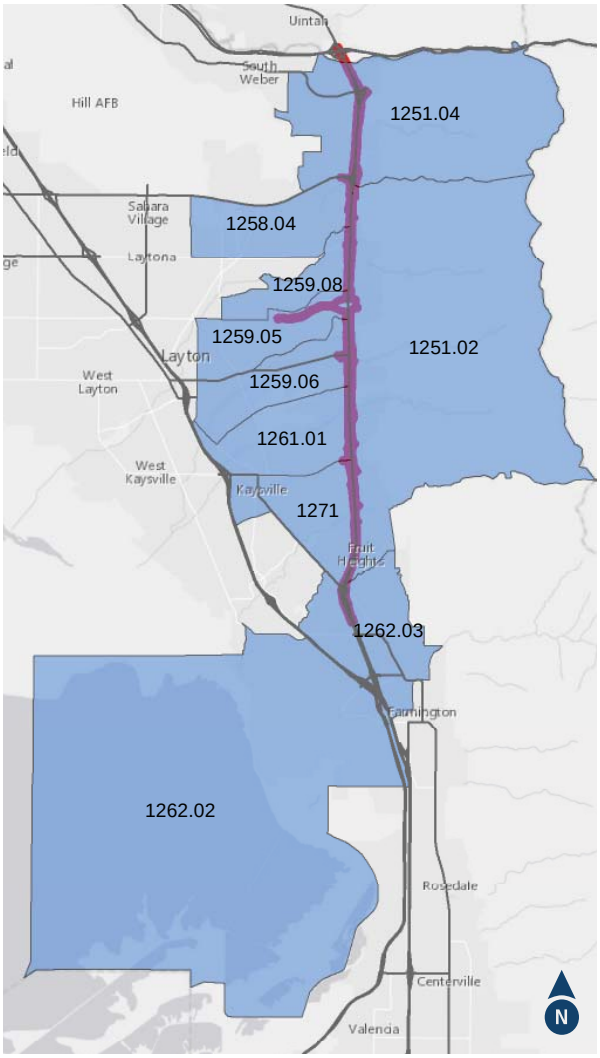


Table 3-1 Selected Population Characteristics for Davis County

Characteristics	Davis County
Population	306,479
Race	
White	90%
Black or African American	1.2%
Asian	1.76%
American Indian and Alaskan Native	0.46%
Native Hawaiian or Other Pacific Islander	0.59%
Hispanic or Latino	8.4%
Persons below poverty level (percent in 2015)	7.7%

Table 3-2 Selected Population Characteristics for Census Tracts in Davis County (bolded values are above the Davis County average)

Characteristics	1251.04	1258.04	1259.08	1251.05	1259.05
Population (2010)	5,788	6,377	4,770	4,143	6,156
Race (2010)					
White	93%	90.4%	92.10%	93.57%	87.50%
Black or African American	1.01%	**4.67%**	**1.34%**	1.01%	**1.38%**
Asian	1.54%	**2.61%**	1.34%	1.69%	1.75%
American Indian and Alaskan Native	**0.58%**	0.29%	0.33%	0.14%	**0.71%**
Native Hawaiian or Other Pacific Islander	0.58%	0.29%	0.33%	0.14%	**0.71%**
Hispanic or Latino (2010)	4.75%	5.77%	6.22%	4.10%	**10.10%**
Persons below poverty level (percent in 2015)	7.40%	4.46%	2.57%	4.90%	**17.17%**

Table 3-3 Selected Population Characteristics for Census Tracts in Davis County (continued) (bolded values are above the Davis County average)

Characteristics	1259.06	1261.01	1271	1262.02	1262.03
Population (2010)	6,987	6,367	6,957	8,580	4,023
Race (2010)					
White	91%	95.10%	95.11%	94.70%	94.80%
Black or African American	0.91%	0.51%	0.60%	1.21%	0.62%
Asian	1.38%	0.69%	0.93%	0.90%	1.49%

Characteristics	1259.06	1261.01	1271	1262.02	1262.03
American Indian and Alaskan Native	**0.75%**	0.20%	0.34%	0.33%	0.12%
Native Hawaiian or Other Pacific Islander	0.41%	0.21%	0.21%	0.43%	0.17%
Hispanic or Latino (2010)	7.94%	5.96%	3.92%	5.15%	2.51%
Persons below poverty level (percent in 2015)	3.80%	3.30%	**8.99%**	2.42%	3.23%

Minority Populations

Three of the census tracts in the study area (1258.04, 1259.08, and 1259.05) are characterized by higher concentrations of Black or African American persons than the Davis County average of 1.2%. One census tract (1258.04) has a higher average of Asian persons than the Davis County average of 1.76%. Three census tracts (1251.04, 1259.05 and 1259.06) have a higher average of American Indian and Alaskan Natives than the Davis County average of 0.46%.

Hispanic or Latino persons make up 8.4% of the overall population in Davis County, but they represent much higher population levels in one tract within the study area (1259.05) at 10.10%.

Low-Income Populations

The average percentage of persons below the poverty level in Davis County is 7.7%. The percentage of individuals below the poverty level in the study area ranges between 2.42% and 17.17%. Census Tracts 1259.05 and 1271 have a higher average of individuals living below the poverty level than the Davis County average at 17.17% and 8.99% respectively.

The analysis of census tracts and the consideration of social impacts indicate that there may be concentrations of persons below the poverty level within the study area. These concentrations occur in Census Tracts 1259.05 and 1271.

3.3.2 Environmental Consequences

3.3.2.1 No-action Alternative

Direct Impacts

The No-action Alternative would not impact social conditions and trends, nor would it impact minority or low-income populations.

Indirect Impacts

The No-action Alternative would not result in any indirect impacts.

3.3.2.2 Preferred Alternative

Direct Impacts

Social Conditions

Inferences regarding the social interaction of residents in and around the US-89 corridor can be made based on the fact that the US-89 corridor is an existing barrier and has already impacted social and neighborhood interactions since its construction. The construction of the Preferred Alternative would facilitate future social interactions for some residents on the east and west sides of the US-89 corridor by easing travel across the corridor.

Levels of social integration and cohesion at the level of individual neighborhoods and in the broader local community would generally not be altered as a result of changes to the US-89 corridor, with slight improvements in areas where the connections of frontage roads would join currently disconnected neighborhoods. The Preferred Alternative would require the acquisition and relocation of 20 residences and changes in access, potentially changing social integration and cohesion in those neighborhoods. The Preferred Alternative would have no impact to educational facilities or public use facilities, and a minor impact on recreational facilities (See Section 3.1.2).

The Preferred Alternative would generally remain within the existing US-89 corridor, but some residential relocations and encroachment into residential properties would occur. The Preferred Alternative would require a total of 22 relocations in the study area (see Table 3-4 and Section 3.4 Relocations and Right-of-Way Acquisition).

Table 3-4 Number of Relocations by Census Tract

Census Tract	Number of Relocations
1251.02	11
1259.06	10
1261.01	1
Total	**22**

The Preferred Alternative does not require relocations in census tracts with higher-than-average levels of low-income or minority populations. Therefore, the Preferred Alternative would not impact minority or low-income populations.

Indirect Impacts

The Preferred Alternative would have no indirect impacts to social conditions and minority or low-income populations.

3.3.3 Mitigation

No mitigation required.

3.4 RELOCATIONS AND RIGHT-OF-WAY ACQUISITION

Where property acquisition is necessary and state funds are used, land owners are compensated under the Utah Relocation Assistance Act (U.C.A. Section 57-12-1 et seq.).

3.4.1 Affected Environment

The study area and the areas adjacent to the study area are mostly characterized by residential, with some commercial land uses. See Section 3.1 Land Use for more detail.

3.4.2 Environmental Consequences

3.4.2.1 No-action Alternative

Direct Impacts

The No-action Alternative would not require the acquisition of right-of-way or any relocations.

Indirect Impacts

Certain corridor preservation property acquisitions have already been undertaken to preserve the right-of-way for eventual corridor improvements in various portions of the study area as allowed by Utah law (U.C.A. Section 72-5-401, et. seq.). See Maps in Volume 4 for properties that are currently owned by UDOT. If transportation corridor improvements are not made, then previously purchased property would be disposed of in accordance with U.C.A. Section 72-5-111 – Disposal of real property and U.C.A. Section 72-5-404 – Disposition of excess property rights when property was acquired as part of transportation corridor preservation activities.

3.4.2.2 Preferred Alternative

Direct Impacts

Under the Preferred Alternative, right-of-way acquisition would be required in order to accommodate the wider roadway footprint and the construction of interchanges. Some property acquisition has already occurred in the study area for corridor preservation purposes (see Maps in Volume 4 for properties that are currently owned by UDOT). Additional right-of-way acquisition would consist of either full or partial acquisition of certain parcels, with the exact amount of acreage to be determined during final design. The Preferred Alternative would require approximately 28.8 acres of additional right-of-way acquisition, impacting approximately 165 parcels.

The Preferred Alternative would include 22 relocations (20 residences, one business, and one municipal water tank). See Table 3-5. Those properties that have already been acquired under corridor preservation authority would not be classified as a relocation since the property has already been acquired; however, residents in such properties would be given sufficient time to find new accommodations.

Table 3-5 Relocations

Relocation Number	Address	Map
1	529 North 1300 East, Fruit Heights	5
2	1275 East 700 North, Fruit Heights	6
3	2825 East Oak Hills Drive, Layton	8
4	2885 East Oak Hills Drive, Layton	8
5	2900 East Oak Hills Drive, Layton (water tank)	8
6	538 North Highway 89, Layton	8
7	644 North 2875 East (Woodridge Drive), Layton	8
8	658 North 2875 East (Woodridge Drive), Layton	8
9	688 North 2875 East (Woodridge Drive), Layton	9
10	704 North 2875 East, (Woodridge Drive) Layton	9
11	718 North 2875 East (Woodridge Drive), Layton	9
12	734 North 2875 East, (Woodridge Drive) Layton	9
13	748 North 2875 East (Woodridge Drive), Layton	9

Relocation Number	Address	Map
14	1480 North Highway 89, Layton (Grounds for Coffee)	10
15	1573 N Valley View Drive, Layton	10
16	1738 North Highway 89, Layton	10
17	1768 North Highway 89, Layton	11
18	2018 North 2950 East, Layton	11
19	2024 North 2950 East, Layton	11
20	2068 North 2950 East, Layton	11
21	2211 North Valley View Drive, Layton	11
22	2225 North Valley View Drive, Layton	11

Indirect Impacts

There would be no indirect impacts as a result of the Preferred Alternative.

3.4.3 Mitigation

No mitigation required.

3.5 ECONOMIC CONDITIONS

This section addresses the current economic climate and the direct and indirect impacts of alternatives that could occur in the study area.

3.5.1 Affected Environment

3.5.1.1 Regional Setting

Davis County labor market conditions are continuing to follow state and national trends, with year-to-year increases over the last five years. Job growth occurred across all but the mining industry (which experienced a 19.8% decline) and Information (which experienced a 7.1% decline). General trends in Davis County showed a 3.8% growth in employment in 2015, for a total of 4,360 jobs (See Figure 3-4). Job growth was broad across most industries. Construction, in particular, showed growth of 9.6% and contributed to 18% of the total job gains for the county despite accounting for only 8 percent of total employment. Seasonally adjusted unemployment rates for Davis County are lower when compared to the State and Nation (See Table 3-6 and Figure 3-5).

Figure 3-4 Year-to-Date Change in Non-farm Jobs (Department of Workforce Services)

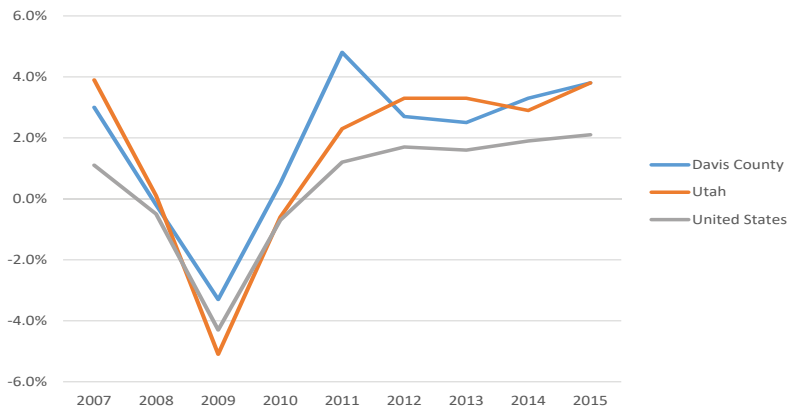
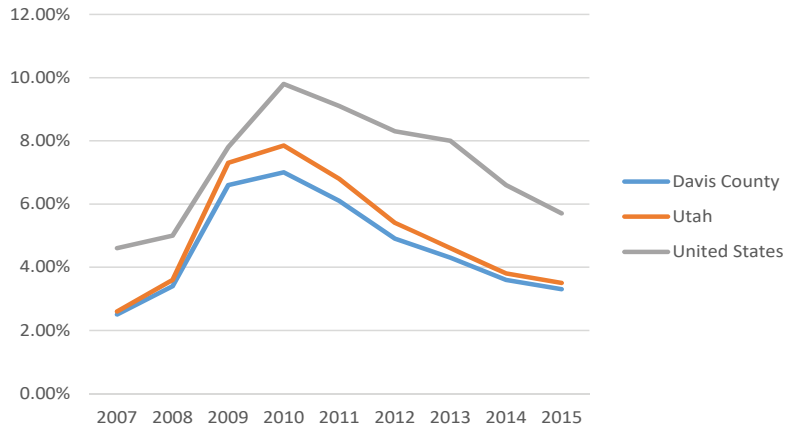


Table 3-6 2015 Seasonally Adjusted Unemployment Rate

Location	Employment Rate
Davis County	3.3%
State of Utah	3.5%
United States	5.7%

Figure 3-5 Seasonally Adjusted Unemployment Rates (2007-2015)



Davis County has historically emphasized residential and agricultural land uses. Currently, Davis County is focused on three core areas: business retention, expansion, and recruitment. According to the *United States Census Bureau 2014*, there are approximately 6,667 businesses in the County (excluding home occupation businesses).

Construction in Davis County has continued to improve since the recession. New dwelling units for both the State of Utah and Davis County have increased, but the overall increase in total values of construction permits has been inconsistent (Figures 3-6 and 3-7).

Figure 3-6 New Dwelling Units, State of Utah and Davis County

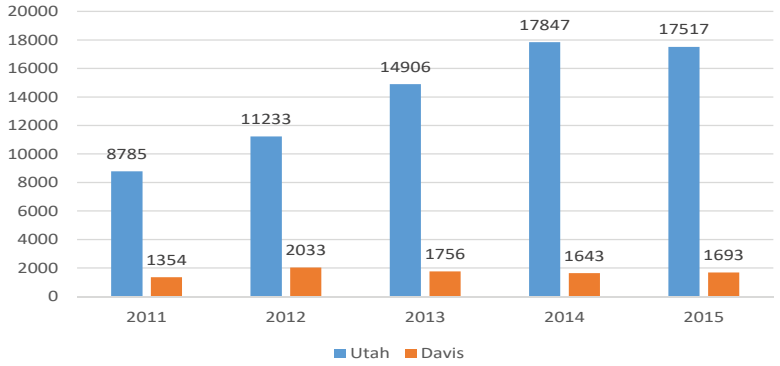
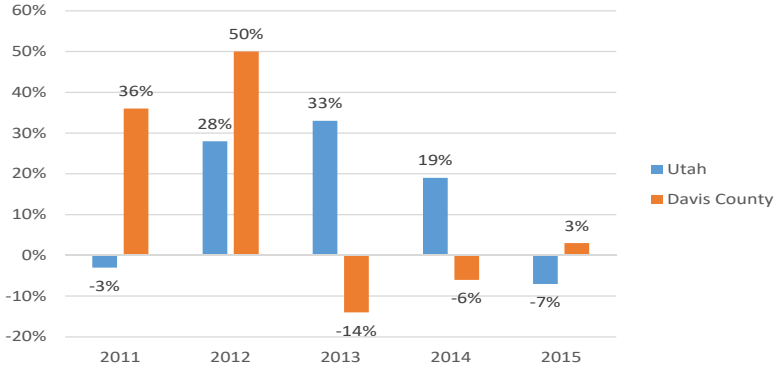
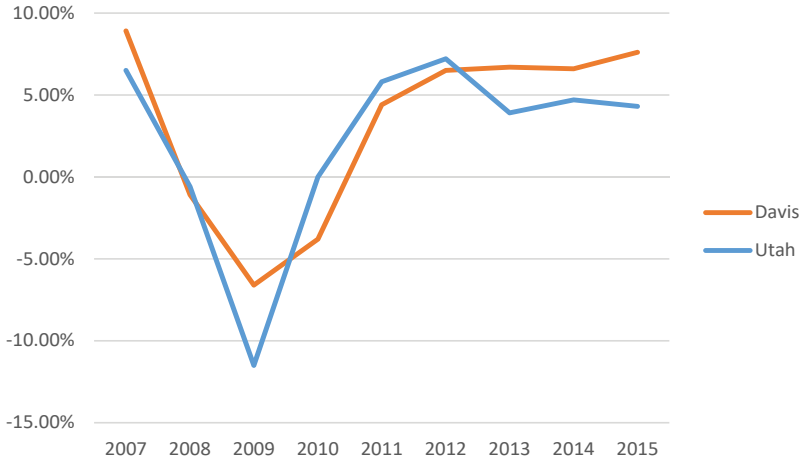


Figure 3-7 Change in Construction Value for State of Utah and Davis County



Property tax and sales tax are the County's main sources of revenue. When combined, they represent over half of the County's total general fund revenue. The County continues to seek to reduce sales tax leakage to other counties and create local job opportunities through business development. The stabilization, improvement, and expansion in the Davis County labor market since mid-2010 have been reflected in gross taxable sales (see Figure 3-8). Since the first quarter of 2013, Davis County sales tax collections have been positive. The total year over change for Davis County in 2015 was 4.3 percent.

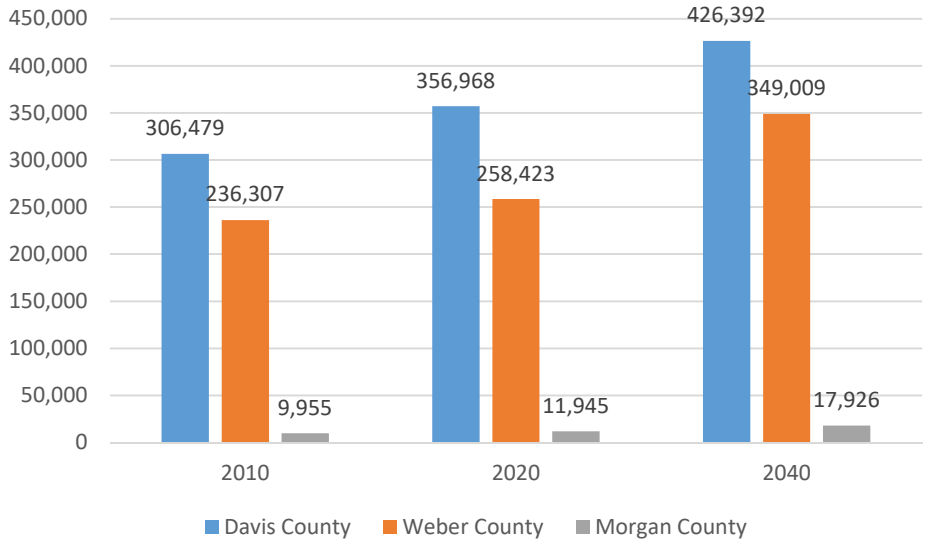
Figure 3-8 Change in Gross Taxable Sales



3.5.1.2 Population

2010 census data for Davis County places its population at 306,479. The Governor's Office of Management and Budget shows that the county population in Davis County is projected to increase by 39% by 2040. The populations of adjacent Morgan and Weber Counties are also projected to increase by 20% and 48% respectively.

Figure 3-9 Current Population and Projected Population Levels in the Region



3.5.1.3 Employment

Using adjusted Traffic Area Zone (TAZ) data, by 2022, Davis County is projected to experience a slight increase (2.1%) in overall jobs through 2022. The development of new construction, computer and mathematical, legal, and healthcare support industries will likely result in increased tax revenues for the community as well as other economic benefits.

Davis County is home to several important employers. The two major employers in Davis County are the Federal Government (Hill Air Force Base) and Davis County School District. Aerospace manufacturing, grocery stores, amusement, and healthcare are other important employers in this county.

Table 3-7 Most Common Employers in Davis County, 2015

Employer	Type of Business	Employee Range
United States Government	Federal Government	10,000-14,999
Davis County School District	Local Government	7,000- 9,000
ATK Space Systems	Aerospace Manufacturing	1,000-1,999
Smith's Food and Drug/Market-place	Grocery Stores	1,000-1,999
Wal-Mart	Warehouse Clubs and Supercenters	1,000-1,999
Lifetime Products	Sports and Athletic Equipment Manufacturing	1,000-1,999
Lagoon Corporation, Inc.	Amusement and Recreation	1,000- 1,999
Davis County	Local Government	1,000-1,999
Utility Trailer Manufacturing Co.	Truck Trailer Manufacturing	500-999
Davis Hospital and Medical Center	Health Care	500-999

3.5.1.4 Income Statistics

Income demographics show that income levels within census tracts in the study area are on par with, or slightly better than the county average with the exceptions of census tracts 1271 and 1259.05 (see Table 3-8).

Table 3-8 2015 Income by Census Tract in Davis County

Location	Census Tract	Median Household Income	Per Capita Income	Median Family Income
Study Area	1251.04	$89,233	$31,943	$97,581
	1258.04	$83,361	$27,269	$91,653
	1259.08	$90,000	$38,514	$95,556
	1251.02	$108,016	$36,786	$112,063
	1259.05	$62,815	$25,659	$62,855
	1259.06	$73,889	$26,689	$81,127
	1261.01	$70,441	$28,255	$84,839
	1271	$65,077	$25,876	$72,500
	1262.02	$86,020	$29,513	$92,163
	1262.03	$101,000	$40,726	$116,250
Davis County		$70,388	$26,309	$77,577
State of Utah		$59,846	$24,312	$67,612

Source: Department of Workforce Services, Davis County 2015 Comprehensive Financial Report

3.5.2 Environmental Consequences

3.5.2.1 No-action Alternative

Direct Impacts

Under the No-action Alternative, existing commercial activities and trends would continue to influence the local economy. Increased congestion on US-89 could hamper access to local businesses from the US-89 corridor; however, US-89 is a major thoroughfare through Davis County and impacts to local businesses would be low.

Indirect Impacts

Any indirect effect are likely to be small, as ongoing development trends are expected to continue.

3.5.2.2 Preferred Alternative

Direct Impacts

The Preferred Alternative would not adversely affect the economic viability of cities adjacent to the US-89 corridor or Davis County. The Preferred Alternative would displace one existing business, Grounds for Coffee, located at 1480 North Highway 89 in Layton. This relocation would have an insignificant impact on taxable sales and tax base within the community. Construction of the Preferred Alternative would directly affect the owner of this business, but this owner would be compensated the fair market value.

Indirect Impacts

The construction of a new interchange at Gordon Avenue under the Preferred Alternative would support Layton City's planned commercial development on the west side of US-89.

3.5.3 Mitigation

No mitigation required.

3.6 PEDESTRIAN AND BICYCLIST CONSIDERATIONS

3.6.1 Affected Environment

Bicycle and pedestrian resources in the study area consist of both existing and planned facilities. To determine the affected environment, bicycle, pedestrian, and trails plans were examined from the Wasatch Front Regional Council (WFRC), Davis County, South Weber City, Layton City, Kaysville City, and Farmington City. Aerial photographs and field visits were also consulted to identify existing facilities.

3.6.1.1 Existing Facilities

Existing facilities in the study area consist of sidewalks, grade-separated and at-grade pedestrian crossings, bicycle lanes, shared-use trails. Each category is discussed separately below.

Sidewalks

US-89 is a limited-access facility that does not have pedestrian facilities. Frontage roads for US-89 have intermittent sidewalks, generally depending on the time period in which the road was constructed. Older, predominantly agricultural or low-density residential areas have no sidewalks, while newer, higher-density residential areas have sidewalk on at least one side of the frontage road. Intersecting roadways have similarly intermittent sidewalk based on the same considerations.

Grade-Separated Pedestrian Crossings

A grade-separated pedestrian bridge crosses US-89 in Fruit Heights at approximately 970 South (see Map 2 in Volume 4). This is the only existing pedestrian bridge in the study area. Pedestrian crossings associated with grade-separated roadways include South Weber Drive and Farmington Main Street.

At-Grade Pedestrian Crossings

At-grade pedestrian crossings along US-89 are located at Nicholls Road, 400 North, and Cherry Lane.

Bicycle Lanes

Bicycle lanes are located in the following locations:

- Antelope Drive west of US-89, extending to Fairfield Road
- Mountain Road from 400 North to Green Road

Shared-Use Paths

A shared-use path connects 2950 East and Valley View Drive at Fernwood Drive (see Map 11 in Volume 4). Another shared-use path exists along the North Fork of Kays Creek, south of SR-193 and west of US-89 in Layton (see Map 13 in Volume 4).

3.6.1.2 Planned Facilities

Planned facilities in the study area include the same categories as existing facilities. Each category is discussed separately below.

Sidewalks

None of the plans reviewed specifically identified sidewalks to be constructed within the study area. However, the cities in the study area generally require the installation of sidewalk during new development or substantial renovation of a building. Therefore, it can be expected that the total amount of sidewalk present in the study area will rise over time.

Grade-Separated Pedestrian Crossings

Additional grade-separated crossings are identified at Nicholls Road, Bair Creek, 400 North, Crestwood Road, Gordon Avenue, and SR-193. All of these, with the exception of Bair Creek, would likely be adjacent to the existing grade-separated roadways. Although not specifically identified as grade-separated, it is likely that trail crossings at Oak Hills Drive, the planned Weber-Davis Canal Trail, and the planned Weber River Parkway Trail would also require grade-separated crossings in the future.

At-Grade Pedestrian Crossings

No additional at-grade pedestrian crossings were identified in any of the plans reviewed.

Bicycle Lanes

Additional bicycle lanes are planned along US-89 from Nicholls Road in the south to the South Weber town limit in the north. Bicycle lanes are also planned on South Weber Drive, SR-193, Oak Hills Drive, Crestwood Road, 400 North, Country Road, Green Road, Nicholls Road, Mountain Road east of US-89, and Farmington Main Street.

Shared-Use Paths

Local plans show a shared-use path along US-89 between Farmington Main Street and Oak Hills Drive. Additional paths cross or intersect US-89 in the following locations:

- Bair Creek (see Map 4 in Volume 4)
- Mutton Hollow Road (see Map 7 in Volume 4)
- Oak Hills Drive, leading to Holmes Reservoir (see Map 8 in Volume 4)
- Gordon Avenue (see Map 10 in Volume 4)
- Kays Creek/Layton Ridge Drive (see Map 13 in Volume 4)
- Weber-Davis Canal (see Map 15 in Volume 4)
- South Weber Drive (see Map 16 in Volume 4)
- Weber River (see Map 17 in Volume 4)

A connector trail also links the Weber-Davis Canal Trail and Weber River Parkway Trail along the west side of US-89 (see Maps 15, 16, and 17 in Volume 4).

3.6.2 Environmental Consequences

3.6.2.1 No-Action Alternative

Direct Effects

The No-action Alternative would not have any direct effects on bicycle and pedestrian resources. Bicyclists would continue to use US-89.

Indirect Effects

The No-action Alternative would have no indirect effects to pedestrian and bicyclist resources.

3.6.2.2 Preferred Alternative

Direct Effects

To help ensure a safe corridor, under the Preferred Alternative bicyclists and pedestrians would be restricted from using US-89. However, UDOT will work with the local municipalities to designate a Class III bike route east of US-89 between Farmington Main Street and South Weber Drive. A Class III bike route utilizes the available roadway width, but includes signs that indicate the presence of cyclists along the route. The bike route would include the Mountain Road from Farmington Main Street to 200 North, the new frontage road to Gordon/1200 North, the existing Valley View Drive to SR-193, and a new shared-use path to the frontage road down to South Weber Drive. A map of this route is shown in the Preferred Alternative maps in Volume 4.

The Preferred Alternative would provide pedestrian crossings at each grade-separated interchange and at grade-separated crossings at Nicholls Road and Crestwood Drive. No other crossings between the interchanges would be allowed. The new bridges over the Weber River would be constructed to accommodate the planned Weber River Trail, and the culvert carrying Bair Creek under US-89 would be constructed to accommodate the planned future trail. The Lloyd Road extension would also accommodate the existing Bair Creek Trail. Future grade-separated crossings for planned trails would not be precluded by the Preferred Alternative.

Indirect Effects

The Preferred Alternative would have no indirect effects to pedestrian and bicyclist resources.

3.6.3 Mitigation

UDOT will work with the local municipalities during final design to designate potential bike routes that parallel US-89.

3.7 AIR QUALITY

Air quality is assessed on both the regional and project levels. The regional level analysis for this SES includes Davis County, Utah. The project level analysis encompasses the study area.

3.7.1 Regulatory Background

3.7.1.1 National Ambient Air Quality Standards

The Clean Air Act Amendments (CAAA) of 1990 (42 USC 7401 et seq.) established the National Ambient Air Quality Standards (NAAQS) for airborne pollutants. The six criteria pollutants addressed in the NAAQS are carbon monoxide (CO), particulate matter (PM), ozone (O_3), nitrogen dioxide (NO_2), lead (Pb), and sulfur dioxide (SO_2). Particulate matter is broken into two categories: particulate matter with a diameter of 10 micrometers or less (PM_{10}) and particulate matter with a diameter of 2.5 micrometers or less ($PM_{2.5}$). Current NAAQS are shown in Table 3-9.

Table 3-9 National Ambient Air Quality Standards

Pollutant	Primary/ Secondary	Level	Averaging Time	Violation Determination
Carbon Monoxide (CO)	Primary	9 ppm	8 hours	Not to be exceeded more than once per year
		35 ppm	1 hour	
Lead (Pb)	Primary/ Secondary	0.15 µg/m³	Rolling 3-Month Average	Not to be exceeded
Nitrogen Dioxide (NO_2)	Primary/ Secondary	53 ppb	Annual	Annual mean
	Primary	100 ppb	1 hour	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Particulate Matter (PM_{10})	Primary/ Secondary	150 µg/m³	24 hours	Not to be exceeded more than once per year on average over 3 years
Particulate Matter ($PM_{2.5}$)	Primary/ Secondary	35 µg/m³	24 hours	98th percentile, averaged over 3 years
	Primary	12.0 µg/m³	Annual	Annual mean, averaged over 3 years
	Secondary	15.0 µg/m³	1 year	Annual mean, averaged over 3 years
Ozone (O_3)	Primary/ Secondary	0.070 ppm	8 hours	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Sulfur Dioxide (SO_2)	Primary	75 ppb	1 hour	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	0.5 ppm	3 hours	Not to be exceeded more than once per year

Source: EPA (as of January 30, 2017 (https://www.epa.gov/criteria-air-pollutants/naaqs-table)
*Final rule signed October 1, 2016, and effective December 28, 2016.
Note: Units of measure for the standards are parts per million (ppm) and parts per billion (ppb) by volume, milligrams per cubic meter of air (mg/m³), and micrograms per cubic meter of air (µg/m3). Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

If the levels of the criteria air pollutants exceed the NAAQS, then the area is designated a non-attainment area and the development of a State Implementation Plan (SIP) is required. The SIP sets allowable emissions levels to be met and identifies control strategies to meet the NAAQS for those specific criteria pollutants that experienced exceedances. All proposed transportation projects must conform to the SIP. The Transportation Conformity Rule (40 C.F.R. parts 51 and 93) sets forth the standards and guidelines for determining conformity

of a proposed transportation project with the SIP. Air quality analysis occurs at both regional and project levels. Conformity requirements apply in areas that either do not meet or previously have not met national ambient air quality standards (NAAQS) for ozone (O_3), carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$), or nitrogen dioxide (NO_2). These areas are known as "nonattainment areas" and "maintenance areas," respectively. No nonattainment or maintenance areas have been designated in Utah for ozone or nitrogen dioxide, although the Governor has submitted a geographic recommendation for the Uintah Basin and Wasatch Front nonattainment areas for the 2015 Ozone NAAQS to the EPA, with technical support from the Utah Division of Air Quality (UDAQ).

3.7.1.2 Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary source (e.g., factories or refineries). Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. The seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) are:

- Acrolein
- Benzene
- 1.3-butadiene
- Diesel exhaust particulate matter plus diesel exhaust organic gases (diesel PM)
- Formaldehyde
- Naphthalene
- Polycyclic organic matter

3.7.2 Affected Environment

3.7.2.1 Climate

The study area is located in Davis County between the Great Salt Lake and the Wasatch Mountains and is at an elevation of approximately 4,400 feet above mean sea level. Davis County is considered by scientists to be in a cold semi-arid climate, which means the climate can feature warm to hot summers and cold, sometimes very cold winters, as well as major temperature swings between day and night by as much as 55 degrees Fahrenheit. The coldest temperatures in Davis County occur in January with an average low of 20°F, whereas the hottest temperatures occur in July with an average high of 89°F.

Annual precipitation levels average between 18 and 25 inches, with the month of May being the highest with an average of 2.7 inches and the month of July being the lowest with only 0.98 inches. It must be noted that due to Davis County's bordering relationship with the Great Salt Lake, an occurrence called "Lake-Effect Snow" can produce above average snowfalls because cold winds from the west move across the long expanse of the Great Salt Lake's warmer water, providing energy and picking up water vapor which freezes into snow. The snow is deposited onto the relatively narrow section of Davis County that is sandwiched between the Great Salt Lake to the west and the Wasatch Mountain Range to the east. This can lead to snow during the winter on the valley floor of Davis County of roughly 60 inches and on the high bench areas up to 90 inches average for the entire winter season.

3.7.2.2 Attainment Status

The study area for the air quality analysis was limited to the US-89 corridor from Shepard Lane in Farmington to I-84 in South Weber City, as this is the area where transportation improvements would be implemented. According to the EPA, Davis County (in which the study area is located) is a nonattainment area for $PM_{2.5}$ (particulate matter with a 2.5 micrometer diameter or smaller). It is not in a nonattainment or maintenance area for carbon monoxide (see the EPA Green Book website at https://www.epa.gov/green-book).

3.7.2.3 Existing Air Quality Data

The Utah Division of Air Quality (UDAQ) maintains a network of air quality monitoring stations throughout the area. In general, these monitoring stations are located where there are known air quality problems, usually in or near urban areas or close to specific emission sources. Other stations are located in remote areas to provide an indication of regional air pollution levels. Data from the Davis County Bountiful Monitoring Station # 49-011-0004 (located at 171 West 1370 North, Bountiful) was used to compile air quality data for the years of 2011-2015 (see Table 3-10). No information on CO levels are included in Table 3-10 since this monitoring station does not measure for said pollutant. See also the *Utah Air Quality Monitoring Network Five-year Network Assessment,* issued by UDAQ in June 2016.

Table 3-10 Pollutant Data from Davis County Bountiful Monitoring Station #49-011-0004

Pollutants		NAAQS	2011	2012	2013	2014	2015
SO_2	1 hour (ppb)	75 ppb	8.0	11.0	9.0	no data	no data
NO_2	1-hour (ppb)	53 ppb	50.0	47.0	60.0	60.0	54.0
O_3	8-hour (ppm)	0.070 ppm	0.068	0.067	0.070	0.074	0.073
PM_{10}	24-hr (µg/m^3)	150 µg/m^3	46	54	54	81	38
$PM_{2.5}$	24-hr (µg/m^3)	35 µg/m^3	33.7	25.9	45.1	43.9	29.2

3.7.3 Environmental Consequences

3.7.3.1 No-action Alternative

Vehicle emission rates would continue to improve due to increasingly tougher Environmental Protection Agency (EPA) regulations regarding vehicle emissions, which would help to improve air quality in the study area. There would be no construction activities, so no temporary increase in particulate matter related to such activities would occur. The No-action Alternative would have a slight increase in vehicle emissions due to continuing congestion and delays in the study area and an increase in vehicle miles traveled. The Tier 3 emission standards for light duty motor vehicles require reductions of about 80% in tailpipe emissions of non-methane organic gases and nitrogen oxides (both of which contribute to the formation of ground-level ozone) and of about 70% in tailpipe emissions of particulates. The increase in emissions from increase in vehicle miles traveled (VMT) in the study area (currently estimated at approximately 31%) and the continuing congestion related to the intersections which would remain, the increase in emissions would be more than offset by the improved vehicle emission rates under the No-action Alternative.

3.7.3.2 Preferred Alternative

Transportation Conformity

A regional level analysis looks at the WFRC Regional Transportation Plan (RTP) to see that all of the projects included in the RTP, including the proposed project, conform to the control strategies and emissions levels set in the SIP. An individual project is said to conform to the SIP if, both by itself and in combination with the other planned transportation projects in the plan, it would not result in any of the following conditions (see 40 CFR 93.116):

- New violations of the NAAQS
- Increases in the frequency or severity of existing violations of the NAAQS
- Delays in attaining the NAAQS

Utah does not currently have an approved SIP for $PM_{2.5}$. Because Utah does not currently have an approved SIP for $PM_{2.5}$, interim conformity requirements apply, which require that future NOx emissions (a precursor to $PM_{2.5}$) and primary particulate emissions not exceed 2008 levels. NOx is a generic term for the mono-nitrogen oxides NO and NO_2 (nitric oxide and nitrogen dioxide) and are produced from the reaction among nitrogen, oxygen and even hydrocarbons (during combustion), especially at high temperatures.

Based on the air quality conformity analysis conducted by the WFRC for the 2040 RTP and documented in the WFRC's draft Air Quality Memorandum #36 dated June 20, 2017, all the transportation projects in the 2015-

2040 RTP conform to the SIP or the EPA interim conformity guidelines. This project is identified in Phase 1 of WFRC's 2015-2040 RTP, a financially-constrained long-range plan.

For PM_{10}, the draft Air Quality Memorandum #36 demonstrates that projected mobile source emissions are within the emissions budget defined in the SIP for Salt Lake Non-attainment area (which includes Davis, Salt Lake and portions of Weber, Box Elder and Tooele Counties). For $PM_{2.5}$, the draft Air Quality Memorandum #36 demonstrates projected mobile source emissions of NOx in the five-county $PM_{2.5}$ non-attainment area are less than 2008 NOx. Additionally, direct particle emissions of $PM_{2.5}$ are less than 2008 $PM_{2.5}$ emissions. These standards are required under the interim conformity requirements that are currently applicable to this area. (see the Interim Transportation Conformity Guidance for 2006 $PM_{2.5}$ NAAQS Nonattainment Areas). Further, with support from WFRC, the UDAQ has been developing a new plan (or a new section of the SIP) to reduce $PM_{2.5}$ related emissions to the point that the Wasatch Front Region will once again be in compliance with national $PM_{2.5}$ standards. The improved vehicle emission technology and national standards enacted in 2004 and 2007 respectively will be instrumental in the UDAQ plan to achieve the new $PM_{2.5}$ standard.

Project Level Analysis

Project level analysis is performed when a project is located in a non-attainment area for CO or PM_{10} /$PM_{2.5}$ or in an area that was previously designated as non-attainment but has been subsequently redesignated as attainment, otherwise known as a maintenance area. Project level analysis may consist of either a qualitative or quantitative analysis or both.

Carbon Monoxide

The study area is not located in a non-attainment area for carbon monoxide; therefore, no project level analysis is required under transportation conformity rules.

Particulate Matter

A quantitative analysis for PM_{10} and $PM_{2.5}$ is only required for a "project of air quality concern" (see 40 CFR Section 93.123(b)(1)). Projects of air quality concern are certain highway and transit projects that involve a significant level of diesel vehicle traffic or any other project that is identified in the $PM_{2.5}$ or PM_{10} SIP as a localized air quality concern. Examples of projects of air quality concern include the following:

- new or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
- projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
- new bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location) expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location;
- projects in or affecting locations, areas, or categories of sites which are identified in the $PM_{2.5}$ or PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The Federal Highway Administration (FHWA) provided examples of projects that would not be considered projects of air quality concern. See the Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM_{10} and $PM_{2.5}$ Nonattainment and Maintenance Areas, issued March 2006. These examples included the following:

- Any new or expanded highway project that primarily services gasoline vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles), including such projects involving congested intersections operating at Level-of-Service D, E, or F;
- An intersection channelization project or interchange configuration project that involves either turn lanes or slots, or lanes or movements that are physically separated. These kinds of projects improve freeway operations by smoothing traffic flow and vehicle speeds by improving weave and merge operations, which would not be expected to create or worsen $PM_{2.5}$ or PM_{10} violations; and,
- Intersection channelization projects, traffic circles or roundabouts, intersection signalization projects at

individual intersections, and interchange reconfiguration projects that are designed to improve traffic flow and vehicle speeds, and do not involve any increases in idling. Thus, they would be expected to have a neutral or positive influence on $PM_{2.5}$ or PM_{10} emissions.

This project is not exempt under either 40 CFR 93.126 or 40 CFR 93.128. Further, this project does not qualify as a project of air quality concern since it would not result in a significant increase in diesel traffic in the study area. See the Project of Air Quality Concern (POAQC) Memo in Appendix A. The project is not expected to influence the vehicle mix in the study area nor attract a significant number of new diesel vehicles to the area. The project involves converting the existing roadway with multiple intersections into a limited access freeway with a frontage road system, which would improve the traffic flow in the area by eliminating intersections and replacing them with interchanges. This project is not a project of air quality concern. Since the project has been determined to not be a project of air quality concern, no project level analysis is required for conformity purposes.

Construction-Related Fugitive Dust
Construction-related dust is not identified in the Utah SIP as a Contributor to the PM_{10} non-attainment area. Therefore, there is no conformity requirement for construction dust. Section 93.122(d) (1) of 40 CFR reads as follows:

> "For areas in which the implementation plan does not identify construction-related fugitive PM_{10} as a contributor to the non-attainment problem, the fugitive PM_{10} emissions associated with highway and transit project construction are not required to be considered in the regional emissions analysis."

In the Utah PM_{10} SIP, construction-related PM_{10} is not included in the inventory, nor is it included in the attainment demonstration or control strategies.

Control of construction-related PM_{10} emissions are mentioned in qualitative terms in Section IX.A.7 of the SIP as a maintenance measure to preserve attainment of the PM_{10} standard achieved by application of the control strategies identified in the SIP. Section IX.A.7.d of the SIP requires UDOT and local planning agencies to cooperate and review all proposed construction projects for impacts on the PM_{10} standard. This SIP requirement is satisfied through the Utah State Air Quality Rules. R307-309 requires that sponsors of any construction activity file a dust control plan with the State Division of Air Quality.

Mobile Source Air Toxics (MSAT)
MSAT analysis is based upon the Interim Guidance Update on MSAT in NEPA (December 6, 2012). FHWA developed a three-tiered approach for analyzing MSAT, depending on specific project circumstances.

Tier 1 – No potential for meaningful MSAT effects or exempt projects: No analysis is required, only documentation that the project qualifies as a categorical exclusion or an exempt project

- Projects that qualify as a CE under 23 CFR 771.117(c)
- Projects exempt under the CAA conformity rule (40 CFR 93.126)
- Projects with no meaningful impacts on traffic volumes or vehicle mix

Tier 2 – Low potential for meaningful MSAT effects: A qualitative analysis is required

- Defined as any project not meeting Tier 1 or Tier 3 standards types of projects and are those that serve to improve operations of highway, transit or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions
- Examples include the following:
  - Minor widening
  - New interchanges
  - Projects where design-year traffic projected to be less than 140,000 to 150,000 AADT

Tier 3 – Higher potential for meaningful MSAT effects: A quantitative analysis is required, analyzing all seven

priority MSATs

- Potential for meaningful differences in MSAT emissions among project alternatives, including:
  - New or additional roadway capacity with traffic volumes of 140,000 to 150,000 AADT or greater in the design year, and
  - Located in proximity to populated areas or, in rural areas, in proximity to vulnerable populations (near schools, nursing homes, hospitals, etc.)

The improvements included as part of the Preferred Alternative are intended to improve speed and reduce delays in the study area and to improve the operation of US-89 without having a meaningful impact on MSAT emissions. The Preferred Alternative involves constructing additional northbound and southbound lanes and the conversion of the existing highway to a limited access freeway. The project would improve traffic flow and reduce congestion due to the reduction of access points and the removal of traffic chokepoints (intersections). Design-year traffic is expected to be between approximately 60,000 and 80,000 AADT and it is not likely to meaningfully increase MSAT emissions; therefore, a qualitative MSAT analysis under Tier 2 was performed.

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled "A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives," found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

For the proposed project under all of the alternatives, including the No-action Alternative, the amount of MSATs emitted would be proportional to the vehicle miles traveled (VMT), assuming that other variables such as fleet mix are the same for each alternative. The Preferred Alternative results in a nearly 70 percent increase in vehicle miles traveled (VMT) in the study area and a nearly 40 percent higher percentage of VMT over the No-action Alternative, which is most likely due to increased efficiency of the roadway attracting rerouted trips from elsewhere in the transportation network (see Table 3-11). However, the Energy Information Administration (EIA) projects a decline in light-duty vehicle energy use between 2018 and 2040 as improvements in fuel economy more than offset increases in light-duty vehicles (provided that the new fuel economy standards are not revoked or altered). The EIA predicts that although the miles that light-duty vehicles travel will increase five percent from 2017 to 2025, fuel consumption from those vehicles will decrease 12 percent over the same period.

Table 3-11 Difference in VMT Between Existing Conditions, the No-Action Alternative, and the Preferred Alternative

Scenario	VMT (Daily)	Difference	Percent Change	Difference	Percent Change
Existing (2016)	352,000	NA	NA	NA	NA
2040 No-action	461,000	109,000	31%	NA	NA
2040 Preferred	596,000	244,000	69%	135,000	29%

Under the Preferred Alternative emissions would likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

The transportation improvements contemplated as part of the Preferred Alternative would have the effect of moving some traffic closer to nearby homes, schools, parks, and businesses; therefore, there may be localized areas along the corridor where ambient concentrations of MSAT could be higher under the Preferred Alternative than the No-action Alternative. However, the magnitude and the duration of these potential increases compared to the No-action Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Preferred Alternative could be higher relative to the

No-action Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, would over time cause substantial reductions that, in almost all cases, would cause region-wide MSAT levels to be substantially lower than today.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

Information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings, cancer in animals, and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282), or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts, each step in the process builds on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame since such information is unavailable. Given that some of the information needed is unavailable, it is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways, to determine the portion of time that people are actually exposed at a specific location, and to establish the extent attributable to a proposed action.

There are many uncertainties in existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, as expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no

greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response which are better suited for quantitative analysis.

Conclusion

The Preferred Alternative would not result in new violations of the NAAQS, increases in the frequency or severity of existing violations of the NAAQS, or delays in attaining the NAAQS. Therefore, the Preferred Alternative has been determined to conform to the SIP. In regards to MSAT emissions, the Preferred Alternative would have a low potential for meaningful MSAT effects, with region-wide MSAT levels expected to be substantially lower in the design year than existing levels due in large part to the EPA/s vehicle and fuel regulations in conjunction with fleet turnover.

3.7.4 Mitigation

No mitigation required.

3.8 NOISE

A preliminary noise analysis was completed in accordance with the UDOT Noise Abatement Policy, last revised June 15, 2017. The preliminary noise analysis is summarized below.

3.8.1 Affected Environment

Traffic noise is measured in A-weighted sound levels in decibels (dBA), which most closely approximates the way the human ear hears sounds at different frequencies (see Figure 3-10). Since traffic noise varies over time, the sound levels for this noise analysis are expressed as "equivalent levels" or Leq, representing the average sound level over a one hour period of time. Unless noted otherwise, all sound levels in this noise analysis are expressed in the hourly equivalent noise level.

UDOT has established Noise Abatement Criteria for several categories of land use activities (see Table 3-12). UDOT's noise criteria is based on sound levels that are considered to be an impact to nearby property owners, also known as receptors. Primary consideration is to be given for exterior areas where frequent human use occurs.

UDOT has developed a Noise Abatement Policy for transportation projects. UDOT's Noise Abatement Policy states that a traffic noise impact occurs when either 1) the future worst case noise level is equal to or greater than the UDOT Noise Abatement Criteria for specified land use categories or, 2) the future worst case noise level is greater than or equal to an increase of 10 dBA over the existing noise level.

Figure 3-10 Sound Levels (in dBA) of Common Sounds

(Compiled from Federal Transit Administration and Environmental Protection Agency Data)

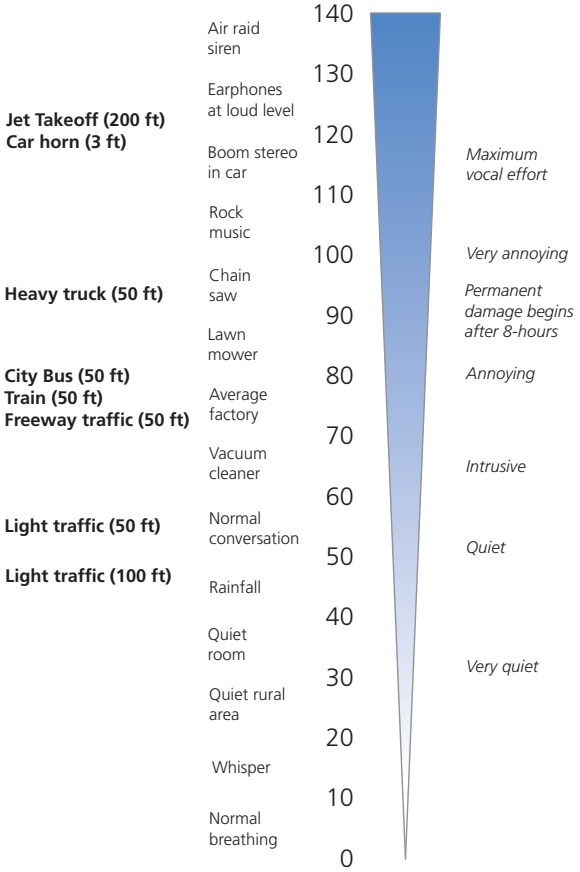


Table 3-12 Noise Abatement Criteria

Activity Category	UDOT Criteria Leq(h)	Evaluation Location	Activity Description
A	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66	Exterior	Residential
C	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios trails and trail crossings.
D	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in Categories A-D or F
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	Undeveloped lands that are not permitted.

Noise impact and abatement analyses are required within Land Use Activity Categories A, B, C, D, and E (see Table 3-12) only when development exists or has been permitted (formal building permit issued prior to the date the final environmental decision document is approved). Activity Categories F and G include lands that are not sensitive to traffic noise. There are no impact criteria for these land use types and an analysis of noise impacts is not required.

There are no Activity Category A land uses within the study area. Activity Category B land uses include all residences. Activity Category C land uses within the study area include churches (multiple meetinghouses for the Church of Jesus Christ of Latter-day Saints and Mountain Road Evangelical Presbyterian Church), East Layton Elementary School, Valley View Golf Course, Tanglewood Community Clubhouse, Davis Park Golf Course, Nicholls Park, Harvey Park, Andy Adams Park, and Cherry Hill Water Park. The interior of the churches would be considered Activity Category D. Activity Category E land uses include all other businesses and offices located within the study area. The UDOT Noise Policy states that a noise impact analysis will not be required for Activity Categories F and G.

3.8.1.1 Existing Noise Levels

The primary source of noise in the study area is automobile and truck traffic on US-89, I-84, and other roadways in the area. Existing traffic sound levels for each receptor in the study area were calculated using the Traffic Noise Model (TNM) 2.5 software using existing conditions (travel lane configurations and the posted speed limit). Existing noise levels were determined using the greatest hourly traffic noise conditions likely to occur on a regular basis, or Level-of-Service (LOS) C traffic volumes.

On-site measurements were made to verify the accuracy of the model and are shown in Table 3-13. To verify that the model represents real-life conditions, the noise measurements must be within 3 dBA of the model's predicted noise level, using the traffic volumes and speeds actually present when the noise measurements were taken. For existing noise levels and figures see the Noise Report in Appendix A.

Table 3-13 Field Noise Measurements

Site #	Location	Field Noise Level (dBA)	TNM Output (dBA)	Difference
1	2620 E. 8200 S., South Weber, UT	65.3	64.3	1.0
2	2071 N. 2950 E., Layton, UT	66.5	68.5	-2.0
3	776 Woodbridge Dr., Layton, UT	60.0	63.0	-3.0
4	700 N. Oakmont Lane, Fruit Heights, UT	74.9	71.9	3.0
5	77 S. 1325 E., Layton, UT	66.1	67.1	-1.0
6	179 South 1250 East, east side of 1250 East	55.3	58.3	-3.0
7	450 South, end of cul-de-sac	51.6	53.5	-1.9
8	Nicholls Park Baseball Field	55.6	58.1	-2.5
9	670 Golden Circle Drive (backyard)	66.1	68.9	-2.8
10	910 S. Mountain Road, Fruit Heights, UT	68.0	68.0	0
11	East Layton Elementary School, Baseball Field, Layton, UT	45.8	N/A*	N/A*
12	Valley View Golf Course, Tee for 8th Hole, Layton, UT	47.0	N/A*	N/A*
13	Andy Adams Park, Layton, UT	47.0	N/A*	N/A*
14	2050 East Gordon Avenue, Layton, UT	45.6	N/A*	N/A*

*Because the Gordon Avenue extension is a new road on new alignment, existing noise readings cannot be used to calibrate the noise model. Ambient noise in this area comes from neighborhood noises such as wind, lawn mowers, people, and traffic on subdivision streets, not traffic from Gordon Avenue or US-89. Therefore, TNM output is not applicable here.

3.8.2 Environmental Consequences

3.8.2.1 No-action Alternative

Direct Impacts

Noise levels for the No-action Alternative would generally be the same as existing conditions.

Indirect Impacts

There would be no indirect impacts to noise levels in the study area as a result of the No-action Alternative.

3.8.2.2 Preferred Alternative

Direct Impacts

Under the Preferred Alternative noise levels would have an average increase of 7 dBA throughout the study area, with no receptor having an increase of more than 12.8 dBA (see the Noise Report in Appendix A).

Approximately 420 receptors would be impacted by traffic noise (see maps in Volume 4).

Indirect Impacts

There would be no indirect impacts to noise levels in the study area as a result of the Preferred Alternative.

Noise Abatement

According to the UDOT Noise Abatement Policy, specific conditions must be met before traffic noise abatement is implemented as part of the Preferred Alternative. Noise mitigation must be considered feasible and reasonable. Some of the factors considered when determining if mitigation is feasible and reasonable include, but are not limited to, the following:

- **Engineering Considerations:** Engineering considerations such as safety, presence of cross streets, sight distance, access to adjacent properties, wall height, topography, drainage, utilities, maintenance access and maintenance of the abatement measure must be taken into account as part of establishing feasibility. Noise abatement measures are not intended to serve as privacy fences or safety barriers. Abatement measures installed on structures will not exceed 10-feet in height measured from the top of deck or roadway to the top of the noise wall. Noise walls will not be installed on structures that require retrofitting to accommodate the noise abatement measure.
- **Safety on Urban Non-Access Controlled Roadways:** To avoid a damaged wall from becoming a safety hazard in the event of a failure, wall height shall be no greater than the distance from the back of curb to the face of proposed wall.
- **Acoustic Feasibility:** Noise abatement must be considered "acoustically feasible". This is defined as achieving at least a 5 dBA highway traffic noise reduction for at least 50% of front-row receptors.
- **Noise Abatement Design Goal:** Every reasonable effort should be made to obtain substantial noise reductions. UDOT defines the minimum noise reduction (design goal) from proposed abatement measures to be 7 dBA or greater for at least 35% of front-row receptors.
- **Cost Effectiveness:** The cost used to determine reasonable mitigation for Activity Category B is $30,000 per benefited receptor. (A benefited receptor is a noise-sensitive receptor that is predicted to receive a minimum of 5 dBA of noise reduction as a result of noise abatement.) The cost used to determine reasonable mitigation for Activity Categories A, C, D, or E is $360 per linear foot. The total cost for the wall (wall length x wall height x $360) is divided by the number of benefited receptors to determine the cost per benefited receptor. If this amount is $30,000 or less, the wall meets the cost-effectiveness criterion and is considered to be reasonable.
- **Viewpoints of Property Owners and Residents:** As part of the final design phase, public balloting would take place if noise abatement measures appear to meet the criteria outlined in UDOT's Noise Abatement Policy.

Under UDOT's Noise Abatement Policy, only Type I projects are eligible for noise abatement measures. Type I projects are projects that include any of the following: the construction of a highway at a new location, the physical alteration of an existing highway that substantially alters its alignment, the addition of a through traffic lane, the addition of an auxiliary lane, or the addition or relocation of interchange lanes or ramps. The Preferred Alternative is a Type I project so noise abatement was considered.

3.8.3 Mitigation

3.8.3.1 Traffic Management Measures

Traffic management measures include reducing speed or signing for the restriction of compression brakes. According to the Highway Traffic Noise Analysis and Abatement Policy and Guidance report produced by FHWA, a reduction in speed of more than 20 mph is necessary for a noticeable decrease in noise levels. Therefore, speed reduction is not a reasonable abatement measure for this project because it is not consistent with the roadway classification.

3.8.3.2 Noise Barriers

For a sound wall to be effective, it must be high enough and long enough to block the view of the noise source from the receptor's perspective. The *Highway Traffic Noise Analysis and Abatement Policy and Guidance* states that a good rule of thumb is that the noise barrier should extend four times as far in each direction

as the distance from the receptor to the barrier. For instance, if the receptor is 50 feet from the proposed noise barrier, the barrier needs to extend at least 200 feet on either side of the receptor in order to shield the receptor from noise traveling past the ends of the barrier.

Noise walls were analyzed for 25 locations along US-89 where noise impacts occur. The majority of the analyzed noise walls were found to be not feasible or reasonable. The farther away a receptor is from US-89, the less likely the 7 dBA reduction for at least 35% of front-row receptors criterion can be met. This is because a noise wall creates a noise "shadow zone" behind it. The shadow zone is where the noise benefits are the greatest. When a receptor is farther from a potential wall at the edge of US-89, the benefits are decreased. Additionally, solitary receptors or receptors that are widely spaced are also less likely to receive a noise wall because it takes a longer wall to create a noise reduction benefit and the cost effectiveness criteria cannot be met.

See below for a summary of the eight recommended noise walls. The majority of the proposed noise walls are located on the west side of US-89. In general, the receptors on the east side of US-89 are higher in elevation than US-89 and more widely spaced, making noise walls less effective. A more detailed noise wall analysis is located in the Noise Report (see Appendix A).

Noise Wall 1

Noise Wall 1 would be located on the west side of US-89 (as shown in Maps 14 and 15) and would be 3,370 feet long. This area includes 16 platted subdivision lots which were vacant on the aerial photography. These lots were checked for building permits on August 8, 2017. It was found that two of the lots had completed homes and 10 more had been issued building permits. This information was used in considering whether the noise wall met the UDOT Noise Abatement Policy requirements.

A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA or more for 35% of the front row receptors and is not considered reasonable. A 16-foot wall would reduce noise levels by 7 dBA for 80% of front-row receptors and would be cost-effective at $15,859 per benefited receptor. This wall is reasonable and feasible.

What is a benefited noise receptor?

A noise sensitive receptor that receives a noise reduction of at least 5 dBA. The number of benefited receptors is used in determining if a noise abatement measure has a reasonable cost.

What makes a noise wall feasible?

Feasibility is the ability to build a wall that is effective at reducing noise. This is determined through a combination of acoustical and engineering factors.

What makes a noise wall reasonable?

A noise wall is considered reasonable if it can provide a 7 dBA or more reduction for at least 35% of the front-row receptors AND if it is cost-effective (costs $30,000 or less per benefited receptor).

Noise Wall 6

Noise Wall 6 consists of Wall 6A (2,100 feet long) and Wall 6B (785 feet long) as shown in Maps 11 and 12. A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for 35% of the front row receptors. A 16-foot wall would reduce noise levels by 7 dBA for 50% of front-row receptors and would be cost-effective at $25,928 per benefited receptor. This wall is reasonable and feasible.

Noise Walls 8 and 9

Noise Walls 8 and 9 consist of a 4,275-foot-long wall along the west side of US-89 between Antelope Drive and Cherry Lane and a 610-foot long wall where the Antelope Drive southbound entrance ramp merges onto mainline US-89 (as shown in Maps 10 and 11. A 6-foot to 8-foot wall would not reduce noise levels by 7 dBA for 35% of the front row receptors. A 10-foot to 16-foot wall would reduce noise levels by 7 dBA for at least 35% of front row receptors and would be cost-effective at $24,420 or less per benefited receptor. In this case, more than one wall height (12 ft, 14 ft, or 16 ft) would meet the feasibility and reasonability requirements. Walls 8 and 9 are reasonable and feasible.

Noise Wall 12

Noise Wall 12 would be located on the west side of US-89 (as shown in Maps 8 and 9 of Volume 4) and would be 3,090 feet long. A 6-foot to 10-foot wall would not be cost-effective at over $61,700 per benefited receptor. A 12-foot to 16-foot wall would reduce noise levels by 7 dBA for at least 54% of front-row receptors and would be cost-effective. In this case, more than one wall height (12 ft, 14 ft, or 16 ft) would meet the feasibility and reasonability requirements. This wall is reasonable and feasible.

Noise Wall 14

Noise Wall 14 consists of Wall 14A (4,165 feet long) on the west side of US-89 and continuing along the southbound entrance ramp, and Wall 14B (670 feet long), which overlaps the ramp wall (as shown in Maps 7 and 8 of Volume 4). A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for 35% of the front row receptors. A 16-foot wall would reduce noise levels by 7 dBA for 44% of front row receptors and would be cost-effective at $28,658 per benefited receptor. This wall is reasonable and feasible.

Noise Wall 17

Noise Wall 17 consists of Wall 17A (2,750 feet long) and Wall 17B (1,195 feet long) on the west side of US-89 (as shown in Maps 4 and 5 of Volume 4). A 6-foot to 10-foot wall would not be cost-effective. A 14-foot or 16-foot wall would reduce noise levels by 7 dBA for at least 65% of front row receptors and would be cost-effective at $26,860 or less per benefited receptor. In this case, more than one wall height (14 ft or 16 ft) would meet the feasibility and reasonability requirements. This wall is reasonable and feasible.

Noise Walls 18, 19, and 20

Noise Walls 18, 19, and 20 would be located on the east side of US-89 (as shown in Maps 3, 4, and 5). The total length of these three walls would be approximately 7,400 feet. A 6-foot to 12-foot wall would not be cost-effective. A 14-foot to 16-foot wall would reduce noise levels by 7 dBA for at least 75% of front-row receptors and would be cost-effective at $26,022 or less per benefited receptor. In this case, more than one wall height (14 ft or 16 ft) would meet the feasibility and reasonability requirements. These three walls are reasonable and feasible.

Noise Wall 22

Noise Wall 22 would be located on the east side of US-89 (as shown in Maps 2 and 3) and would be 3,000 feet long. A 6-foot to 14-foot wall would not be cost-effective. A 16-foot wall would reduce noise levels by 7 dBA for 93% of front-row receptors and would be cost-effective at $27,259 per benefited receptor. This wall is reasonable and feasible.

Viewpoints of Property Owners and Residents

Once the final design for the Preferred Alternative is complete, UDOT will re-evaluate and finalize the noise analysis and potential location of noise walls. If the proposed noise abatement measures are still feasible and reasonable, UDOT will then consider the viewpoints of property owners and residents to determine whether the proposed noise abatement measures are desired. Balloting will be conducted consistent with the procedures described in UDOT's Noise Abatement Policy.

3.9 WATER RESOURCES

The Federal Water Pollution Control Act (33 USC §1251-1376), as amended by the Clean Water Act (CWA) of 1977 and 1987, acts as the primary regulation for water quality. It controls discharge of dredge or fill material into "waters of the United States" and requires states and Native American tribes to set specific water quality criteria and pollution control programs. The EPA is charged with regulating its implementation and has delegated certain portions of its authority to the U.S. Army Corps of Engineers (USACE) and the Utah Department of Environmental Quality (UDEQ), which includes the Utah Division of Water Quality (UDWQ) and the Utah Division of Drinking Water (UDDW).

The CWA requires the development and maintenance of water quality standards, along with water body classifications, to identify beneficial uses to be sustained. UDWQ is responsible for this task and, through UAC §R317-2-13, classifies each water body. Waters that do not meet water quality standards for its classified use, are placed on a list of impaired waters where further analysis is conducted to determine pollutants and remedial actions, if necessary.

3.9.1 Affected Environment

3.9.1.1 Storm Water

In general, areas with storm drain systems capture storm water runoff from roads and convey it to a discharge point through catch basins, pipes, and/or detention ponds. These systems can be effective at reducing total suspended solids (TSS) if storm water is conveyed to a detention pond with discharge control devices prior to storm water entering surface waters. Discharge control devices regulate the flow exiting a detention pond, thus slowing storm water and allowing sufficient time for suspended solids to fall from the flow. Paved areas without storm drain systems allow storm water to sheet flow into nearby surface waters or to nearby pervious surfaces. These areas allow for storm water to infiltrate into the ground.

If not managed properly, roadway runoff can negatively impact water quality by increasing total dissolved solids (TDS) and TSS entering nearby streams and lakes. Highway surfaces collect automobile related pollutants (mainly lead, copper, zinc, oil, grease, and rust) and de-icing chemicals (salt and salt solutions), which are then washed off highway surfaces from rain or snow melt. Unmanaged runoff can become concentrated, gather sediment through erosion, and enter streams and lakes unless measures are taken to reduce pollutants.

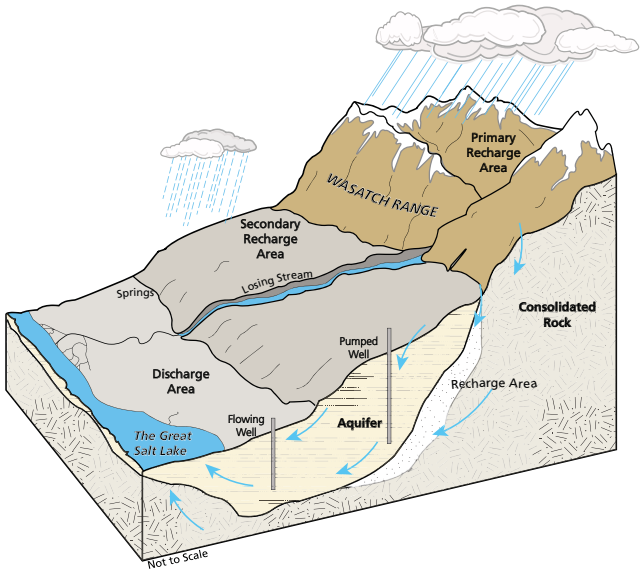
Most of the study area is dominated by impervious surfaces (roadways, sidewalks, parking lots, etc.), with the exception of some small undeveloped tracts of land. Storm water generally sheet flows to roadside ditches. At this point, the water remains in the ditch or flows to detention basins or discharges to one of the creeks or reservoirs in the area. In several locations storm water from adjacent facilities crosses under US-89 via culverts.

3.9.1.2 Groundwater/Aquifers

Springs or seeps may be found in areas where ground water discharge from the table surface intersects with the land surface. Runoff may flow into fresh water bodies such as lakes or streams or may flow into saltwater bodies, such as the nearby Great Salt Lake (see Figure 3-11).

Three recognized aquifers comprise the groundwater system near the

Figure 3-11 Schematic block diagram showing recharge areas, location of water table, direction of ground-water movement, and discharge areas (modified from Wallace, Inkenbrandt, and Lowe, 2011)



study area: a shallow aquifer system, the Sunset aquifer, and the Delta aquifer (according to the EPA's Region 8 Sole Source Aquifer Program, none of these aquifers are designated as sole source aquifers). In the study area, the shallow aquifer system is located between approximately 30 and 300 feet below ground surface (bgs); the Sunset aquifer is located between approximately 300 and 500 feet bgs; and the Delta aquifer is located between approximately 500 and 1000 feet bgs. Groundwater production wells tap the Delta aquifer, and less commonly, the Sunset Aquifer. Hill Air Force Base contaminant releases affect the shallow aquifer, which does not currently provide groundwater for potable use because of poorer yields and poorer ambient water quality compared to the Sunset and Delta aquifers. Confining aquitards between the shallow and the Sunset aquifers and between the Sunset and the Delta aquifer render migration of Hill Air Force Base contamination to the Sunset and Delta aquifers unlikely. Utah classifies ground water according to TDS concentration and contaminant concentration according to the rules established by the Utah Ground Water Quality Protection Program. Depending on location and depth, groundwater in the shallow aquifer system not impacted by Hill Air Force Base contaminant releases would be classified as Class I and Class II (Pristine, Irreplaceable, Ecologically Important, or Drinking Water Quality). Groundwater in the shallow aquifer at contaminant release sites would be classified as Class III (Limited Use Groundwater).

The ultimate source of ground water recharging the east shore aquifer system, which includes the Delta and Sunset aquifers, is precipitation in the drainage basin. Recharge enters the east shore aquifer system through channel seepage along losing stretches; seepage from irrigated fields, lawns ,and gardens; direct infiltration of precipitation; and subsurface inflow from bedrock of the Wasatch Range. According to UDEQ, the study area is all classified as "Class IA- Pristine Ground Water."

3.9.1.3 Points of Diversion

The points at which water is extracted for use by both private and public parties are called points-of-diversion (POD). The Utah Division of Water Rights (UDWR) records permitted PODs from both surface water and groundwater sources. According to the UDWR, 199 PODS are located within 0.25 miles of the study area,128 of which are underground water wells that are owned by both municipal and private land owners. Several of the PODs within the study area have been impacted by previous projects and are considered inactive. Table 3-14 shows the POD types and the number that occur within 0.25 miles of the study area.

Table 3-14 PODs within 0.25 Miles of the Study Area

Type	Number
Abandoned Well	7
Spring	3
Surface	61
Underground	128

3.9.1.4 Surface Water

Surface waters within the study area include Haight Creek, Bair Creek, Holmes Creek, North Fork Holmes Creek, Snow Creek, Middle Fork Kay's Creek, North Fork Kay's Creek, Corbett Creek, and the Weber River. Two reservoirs, Holmes and Hobbs, located in Layton, are located just outside the study area. Holmes Reservoir is fed primarily by North Fork Holmes Creek, and Hobbs Reservoir is fed by North Fork Kay's Creek. The Davis-Weber Canal crosses under US-89 in the northern portion of the study area. The local rivers and streams flow to the Great Salt Lake. Existing surface water use designations are described in Table 3-15 for the surface waters listed above.

Table 3-15 Beneficial Use Waterbody Classifications

Water Use Designations	Protections	Surface Waters within Study Area
Class 1	Protected for use as a raw water source for domestic water systems	
Class 1A	Reserved	
Class 1B	Reserved	
Class 1C	Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water	East Bair Creek, Middle Fork Kay's Creek
Class 2	Protected for recreational use and aesthetics	
Class 2A	Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, kayaking, rafting, diving, and water skiing.	
Class 2B	Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.	Bair Creek, Holmes Creek, North Fork Holmes Creek, Snow Creek, Middle Fork Kay's Creek, North Fork Kay's Creek, Corbett Creek, Weber River
Class 3	Protected for use by aquatic wildlife	
Class 3A	Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.	Bair Creek, Middle Fork Kay's Creek, North Fork Kay's Creek, Corbett Creek
Class 3B	Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chains	Bair Creek, Holmes Creek, North Fork Holmes Creek
Class 3C	Protected for nongame fish and other aquatic life including the necessary aquatic organisms in their food chain	Snow Creek, Weber River
Class 3D	Protected for waterfowl, shore birds, and other water-oriented wildlife not included in classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain	Weber River
Class 3E	Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife	
Class 4	Protected for agricultural uses including irrigation of crops and stock watering	Bair Creek, Holmes Creek, North Fork Holmes Creek, Snow Creek, North Fork Kay's Creek, Corbett Creek, Weber River

Haight Creek
Haight Creek is the southernmost naturally flowing stream in the study area. It originates just east of the study area near Nicholls Road and flows under US-89 through a culvert (see Map 3 in Volume 4). This segment of Haight creek is not classified.

Bair Creek
Bair Creek (sometimes spelled "Baer") passes under US-89 through a large concrete box culvert, and continues flowing westerly through Bair Creek Hollow (see Map 4 in Volume 4). This segment of Bair Creek is classified as a 2B, 3B, and 4 water-body west of US-89 and 1C, 2B, 3A, and 4 east of US-89.

Holmes Creek
Holmes Creek is a perennial stream that passes under US-89 via a wide culvert just north of Crestwood Road in Kaysville (see Map 7 in Volume 4). This segment of Holmes Creek is classified as a 2B, 3B, and 4 water-body.

North Fork Holmes Creek
The North Fork of Holmes Creek flows in an westerly direction and passes beneath US-89 through a culvert (see Map 8 in Volume 4). This segment of North Fork Holmes Creek is classified as a 2B, 3B, and 4 water-body.

Snow Creek
Snow Creek is a small intermittent stream crossing under US-89 in Layton (see Maps 9 and 10 in Volume 4). The creek alignment east of the highway appears to be less altered, whereas west of the highway the creek has been diverted along the highway right-of-way and eventually empties into Holmes Reservoir just outside the study area. This segment of Snow Creek is classified as a 2B, 3C, and 4 water-body.

Middle Fork Kay's Creek
Middle Fork Kay's Creek passes underneath US-89 just south of 1975 North (see Map 11 in Volume 4). This segment of Middle Fork Kay's Creek is classified as a 1C, 2B, and 3A water-body.

North Fork Kay's Creek
North Fork Kay's Creek passes underneath US-89 just south of the SR-193 interchange (see Map 13 in Volume 4). This perennial stream flows into Hobbs Reservoir, which is located about ¼ mile west of US-89. This segment of North Fork Kay's Creek is classified as a 2B, 3A, and 4 water-body.

Corbett Creek
Corbett Creek is a perennially flowing stream with only a small portion daylighting within the study area in the median between US-89 and 2725 East (see Map 15 in Volume 4). This segment of Corbett Creek is classified as a 2B, 3A, and 4 water-body.

Weber River
The Weber River passes under US-89 just south the I-84 interchange (see Map 17 in Volume 4). This segment of the Weber River is classified as a 2B, 3C, 3D, and 4 water-body and is on UDWQ's 2016 Section 303(d) list of impaired waters due to sedimentation and low dissolved oxygen.

There are a few unnamed drainages and ponds adjacent to the US-89 corridor, including the Davis-Weber Canal (see Map 15 in Volume 4). The Davis-Weber Canal is fed by the East Canyon Reservoir and is a major irrigation source for the US-89 corridor towns.

View of the Weber River

3.9.2 Environmental Consequences
3.9.2.1 No-action Alternative
Direct Impacts
Under the No-action Alternative, drainage conditions in the study area would remain the same. Storm water would continue to flow through the existing storm drain systems in areas where they are present, and where

they are not, storm water would continue to infiltrate into the ground. It is likely that unmanaged and undetained storm water could decrease water quality. There would be no impacts to groundwater, PODs, or surface water.

Indirect Impacts

There would be no indirect impacts to water resources (stormwater, groundwater, PODs, or surface water) as a result of the No-action Alternative.

3.9.2.2 Preferred Alternative

Direct Impacts

Storm Water

The Preferred Alternative would increase the impervious surface area in the study area by approximately 65 percent and would result in an increase of storm water runoff volumes. Storm water would be collected and enter improved or new storm drain systems via catch basins. Storm drain modifications will be constructed in compliance with current UDEQ and UDWQ standards as well as local discharge rates and regulations. A system of inlets and pipes would convey the storm water to discharge points and detention facilities that would aid in lowering peak flows to near existing conditions. These catch basins will potentially be located near some of the proposed intersections and interchanges along the corridor, which will be determined during final design. Some flow may eventually discharge to reservoirs and creeks in the area. The storm drain system would be designed and managed according to the requirements of UDWQ, including flow management controls, oil skimmers, grease traps, etc., as required in order to minimize negative impacts to water quality. Storm drain systems minimize negative impacts associated with storm water through capturing and conveying its flow. By capturing and conveying storm water flow, flooding and erosion to adjacent properties can be minimized. Storm drain systems also have the capability of incorporating features that help to minimize trash and debris (under low or regular flow conditions) from being carried further down the storm drain system through the use of hoods or snouts in the catch basins.

Groundwater/Aquifers

The Preferred Alternative would increase the impervious surface area in the study area and would likely concentrate infiltration to detention basin locations; however, the quantity and quality of the groundwater would not be impacted because the storm drain system would be designed and managed according to the requirements of UDWQ, including flow management controls, oil skimmers, grease traps, etc., as required in order to minimize negative impacts to water quality.

Points of Diversion

The Preferred Alternative could impact 19 PODs, 9 surface and 10 underground. The PODs are summarized in Table 3-14. Specific impacts would be determined during final design. Impacted water rights would be handled through UDOT's Right-of-Way acquisition process.

Surface Water

Under the Preferred Alternative existing culverts would be replaced and/or extended to allow for the widening of the roadway. Specific impacts to the surface waters described in the Affected Environment section are described in Section 3.10.2. The existing bridges over the Weber River would be replaced, but would likely not result in permanent impacts to the surface water. The Preferred Alternative is unlikely to have impacts on the water use designation class.

Indirect Impacts

Due to compliance with current UDEQ and UDWQ standards and regulations, there would be no indirect impacts to water quality as a result of the Preferred Alternative.

3.9.3 Mitigation

No mitigation required.

3.10 WETLANDS AND WATERS OF THE U.S.

The U.S. Army Corps of Engineers (USACE) administers and enforces Section 404 of the Clean Water Act (33 U.S.C. 1251). Under the Clean Water Act, waters of the U.S. (WOUS) are defined as waters currently or previously used for interstate or foreign commerce, all interstate waters, any waters in which the destruction could affect interstate or foreign commerce, all impoundments and tributaries of the previously mentioned waters, the territorial seas, and wetlands adjacent to WOUS. Wetlands are considered a subset of WOUS and, for the purposes of regulatory guidance, are considered special aquatic sites.

Under Section 404 of the Clean Water Act, no discharge of dredged or fill material is permitted in WOUS, if there is a less environmentally damaging practicable alternative.

3.10.1 Affected Environment

In compliance with Section 404 of the Clean Water Act and USACE policy, a wetland and other waters of the U.S. delineation of the study area was conducted by Horrocks Engineers in May of 2017. The purpose of the report was to identify and map potential wetlands and waters of the U.S. in the delineation study area. Final determinations of wetland boundaries and jurisdictions as waters of the U.S. will be made by the Corps.

3.10.1.1 Wetlands and Other Waters of the U.S.

Eight wetlands and 15 other waters of the U.S. totaling 1.95 acres were identified within the delineation study area. Table 3-16 summarizes the delineated features. Additional information about delineated features is provided in the paragraphs below the table.

Table 3-16 Summary of Waters of the U.S

Feature Name	Cowardin Classification*	Acres	Linear Feet
Wetlands			
Wetland 1	PEM	0.12	NA
Wetland 2	PEM	0.08	NA
Wetland 3a	PEM	0.06	NA
Wetland 3b	PEM	0.10	NA
Wetland 3c	PEM	0.02	NA
Wetland 3d	PEM	0.01	NA
Wetland 4a	PSS	0.03	NA
Wetland 4b	PSS	0.03	NA
Wetland 5	PEM	0.06	NA
Wetland 6	PSS	0.11	NA
Wetland 7	PEM	0.02	NA
Wetland 8	PEM	0.01	NA
Wetland Total		**0.65**	
Other Waters of the U.S.			
Weber River	R2UBH	0.37	166
Corbett Creek	R5UBH	0.003	22
Unnamed Drainage 1		0.02	262
Unnamed Drainage 2		0.001	16
Middle Fork Kays Creek	R4SBC	0.03	136
Snow Creek	R4SBC	0.23	1809
North Fork Holmes Creek	R4SBC	0.29	1326
Holmes Creek	R5UBH	0.04	219

Feature Name	Cowardin Classification*	Acres	Linear Feet
Unnamed Drainage 4		0.07	167
Unnamed Drainage 5		0.001	23
Bair Creek	R4SBC	0.14	1278
Haight Creek	R4SBC	0.002	36
Man-made Pond	PUBH	0.1	167
Unnamed Seep 1	PUBH	0.002	87
Unnamed Seep 2	PUBH	0.002	86
Other WOUS Total		1.30	
WOUS TOTAL		**1.95**	**5,800**

**PEM (Palustrine Emergent) PSS (Palustrine Scrub/Shrub) R2UBH (Riverine Lower Perennial Unconsolidated bottom) R4SBC (Riverine Intermittent Streambed) R5UBH (Riverine Unknown Perennial)*

View of Wetland 1

Wetland 1

Wetland 1, measured at 0.12 acre, occurs in the roadside ditch on the north end of the study area (see Map 16 in Volume 4). Vegetation cover is mainly common reed. The hydrology source for the wetland is an overflow pipe in a storm water detention basin located across the highway. Wetland 1 meets the classification of a palustrine emergent wetland.

Wetland 2

Wetland 2, 0.08 acre in size, is located in portions of the roadside ditch running along the west side of US-89 on the north end of the study area (see Map 15 in Volume 4). The ditch was initially lined with riprap but in some areas has since silted in, allowing vegetation growth. Cattail and Fuller's teasel dominate in these areas. The hydrology source for the roadside ditch wetland appears to be from water diverted from Corbett Creek to a farm pond east of the study area. Wetland 2 is classified as a palustrine emergent wetland.

Wetland 3

Wetland 3 complex (3a, 3b, 3c, and 3d) occurs in the roadside ditch on the north end of the study area and combined is 0.17 acre in size (see Map 14 in Volume 4). Portions of the ditch were initially lined with riprap but have since silted in. This area now supports a mix of reed canary grass, cattail, watercress, and false Solomon seal. The hydrology sources for the wetland are from seep flows in the adjacent western hillside. Wetland 3 is classified as a palustrine emergent wetland.

Wetland 4

Wetland 4a and 4b occur adjacent to a US-89 frontage road on the north end of the study area and combined are 0.06 acre (see Map 14 in Volume 4). The vegetation cover was hydrophytic perennials and a dense coyote willow over story. The hydrology source for the wetland is from seep flow approximately 100 feet to the south. Wetland 4 is classified as a palustrine scrub-shrub wetland.

Wetland 5

Wetland 5 measures 0.06 acres in size and is located east of US-89 in the middle of the study area (see Map 8 in Volume 4). The vegetation cover was dominated by common reed. Wetland 5 is classified as a palustrine emergent wetland. The hydrology source is from stormwater and a small tributary that flows to North Fork Holmes Creek.

Wetland 6

Wetland 6 occurs in the roadside ditch next to US-89 in the southern end of the study area and is 0.11 acre

in size (see Map 4 in Volume 4). The vegetation cover was mainly hydrophytic perennials with a dense coyote willow over story. Wetland 6 meets the classification of a palustrine emergent wetland.

Wetland 7

Wetland 7 is located in an irrigated pasture and is 0.02 acres in size (see Map 13 in Volume 4). Common Spike-Rush dominates the area. A seep up-gradient from the pasture provides the hydrology for this wetland. Wetland 7 is classified as a palustrine emergent wetland. It is anticipated that this wetland will be determined to be isolated and non-jurisdictional.

Wetland 8

Wetland 8, totaling 0.01 acre, is located near a seep on the hillside above a man-made pond (see Map 13 in Volume 4). Boxelder Maple and Water Birch dominate the overstory and field horsetail and red-osier dogwood dominate the understory in this area. The hydrology source for this wetland is seep flow. Wetland 8 is classified as a Plaustrine Emergent Wetland. It is anticipated that this wetland will be determined to be isolated and non-jurisdictional.

Surface Waters

Nine surface waters, Haight Creek, Bair Creek, Holmes Creek, North Fork Holmes Creek, Snow Creek, Middle Fork Kays Creek, North Fork Kays Creek, Corbett Creek, and the Weber River, as well as several other unnamed drainages and seeps (see Maps in Volume 4), were identified in the study area, all which should be considered WOUS. For descriptions of the nine identified surface waters, see Section 3.9.1 of this document. The Davis-Weber Canal travels through a box culvert under US-89 in the northern end of the study area near the Weber River (see Map 15 in Volume 4). The daylighted portions of the canal are outside the study area.

3.10.2 Environmental Consequences

3.10.2.1 No-action Alternative

Direct Impacts

The No-action Alternative would not impact wetlands or waters of the U.S.

Indirect Impacts

The No-action Alternative would not result in any indirect impacts to wetlands or waters of the U.S.

3.10.2.2 Preferred Alternative

Direct Impacts

Wetlands

The Preferred Alternative would involve roadway improvements in wetland areas, impacting approximately 0.26 acres of wetlands within the study area. Impacts from the Preferred Alternative are shown in Table 3-17.

Other Waters of the U.S.

The Preferred Alternative is estimated to impact approximately 2,234 linear feet (0.26 acres) of the identified WOUS. The culverts currently used to carry water under US-89 would need to be extended to allow for construction on the roadway, and Snow Creek would be piped through the majority of the study area. Impacts from the Preferred Alternative are shown in Table 3-17.

Table 3-17 Summary of Impacts to Waters of the U.S.

Feature Name	Cowardin Classification	Acres Impacted	Linear Feet
Wetland 1	PEM	0.01	NA
Wetland 3a	PEM	0.05	NA
Wetland 3b	PEM	0.02	NA
Wetland 5	PEM	0.06	NA
Wetland 6	PSS	0.1	NA
Wetland 7	PEM	0.02	NA

Feature Name	Cowardin Classification	Acres Impacted	Linear Feet
Man Made Pond	PUBH	0.1	167
Unnamed Seep 1	PUBH	0.00019	12
Corbett Creek	R5UBH	0.001	10
Unnamed Drainage 2	NA	0.001	13
Snow Creek	R4SBC	0.12	1,190
North Fork Holmes Creek	R4SBC	0.09	435
Holmes Creek	R5UBH	0.03	194
Unnamed Drainage 4	NA	0.004	104
Unnamed Drainage 5	NA	0.001	25
Bair Creek	R4SBC	0.008	59
Haight Creek	R4SBC	0.002	25
Total		**0.52**	**2,234**

Indirect Impacts

The Preferred Alternative would not result in any indirect impacts to wetlands or other waters of the U.S.

3.10.3 Mitigation

3.10.3.1 Permitting

Impacts to WOUS will be approximately 2,234 linear feet and 0.52 acres in total. While 0.52 acres are being impacted, it is believed that 0.030 acres of wetland and WOUS resources are isolated, specifically Wetland 7, the Man Made Pond, and Unnamed Seep 1. If these isolated resources are not counted due to isolation, the total acres impacted is reduced to 0.49 acres. These impacts would require a USACE Nationwide 14 permit and compensatory mitigation. Impacts to the creeks and unnamed drainages may require a Stream Alteration Permit and the jointly obtained U.S. Army Corps of Engineers (USACE), Programmatic General Permit 10 (PGP 10), which are issued by the Utah Division of Water Rights (UDWR).

3.11 FLOODPLAINS

A floodplain is defined as a normally dry area surrounding a natural lake or river that is occasionally inundated by water and subject to periodic flooding. Floodplain impacts occur when a project encroaches on a 100-year floodplain (the area susceptible to 100-year floods), which in the case of roadways and other linear features, can be parallel or perpendicular crossings. Development in floodplains can reduce flood-carrying capacity and extend the flooding hazard beyond the developed area.

3.11.1 Federal Emergency Management

In response to escalating taxpayer costs for flood disaster relief, Congress established the National Flood Insurance Program (NFIP) as a voluntary mitigation program administered by the Federal Emergency Management Agency (FEMA). Under this program, the federal government makes flood insurance available in those communities that practice sound floodplain management. This incentive encourages state and local governments to develop and implement floodplain management programs.

Participating communities are required to review proposed development projects to determine if they are in identified FEMA floodplains. If a project is located in a mapped Special Flood Hazard Area, the project must obtain a Floodplain Development Permit (FDP) from the community before any proposed construction or development begins to ensure that the project meets the requirements of the NFIP.

If a project will cause changes to the FEMA floodplain, one or more FEMA documents must be updated. A Letter of Map Revision (LOMR) officially revises these documents. A LOMR is generally done after the completion of the project causing the changes. In certain situations, a Conditional Letter of Map Revision (CLOMR) must be obtained from FEMA. A CLOMR is FEMA's comment on a proposed project and how it would affect the existing floodplain.

A CLOMR does not have to be done as part of a FDP, but a community may require it before the permit is issued to show anticipated impacts. Further, a CLOMR is required if a proposed project changes the base flood elevations (BFEs) more than a predetermined amount (based on FEMA's minimum standards or more stringent community-adopted standards). FEMA has set a 1 foot increase in the 100-year-flood elevation as the upper limit of the allowable encroachment caused by a project.

3.11.2 Affected Environment

Farmington, Fruit Heights, Kaysville, Layton, and South Weber are FEMA Flood Insurance Program participating communities (community identification numbers 490044, 490045, 490046, 490047, and 490049, respectively). Many of the floodplains within the study area have been previously altered, but the maps have not been updated. According to FEMA Flood Rate Insurance Maps, the study area contains five regulatory 100-year floodplains that are associated with Bair Creek, Holmes Creek, North Fork Holmes Creek, Snow Creek, and the Weber River (See Maps in Volume 4). A regulatory floodplain is a floodplain that is recognized by FEMA and adopted by the local community (that is, the community agrees to abide by FEMA regulations associated with the floodplain). No other floodplains were identified within the study area.

3.11.3 Environmental Consequences

3.11.3.1 No-action Alternative

Direct Impacts

The No-action Alternative would not impact floodplains.

Indirect Impacts

The No-action Alternative would not impact floodplains.

3.11.3.2 Preferred Alternative

Direct Impacts

The Preferred Alternative would replace or extend the culverts already in place under US-89 at several of the creek crossings (as discussed in Table 3-17), as well as place a new structure over Bair Creek and replace the bridges over the Weber River. Several segments of currently daylighted waterways will also be piped. These activities would involve construction activities within the 100-year floodplain. Because the majority of the floodplains are confined to channels, and many of the exiting floodplains have already been impacted

by development, impacts would be minor. Permanent impacts would be avoided and minimized to the maximum extent practicable. Exact quantities of permanent impacts will be determined during final design. It is anticipated that approximately 0.66 acres of the 100-year floodplains could be impacted.

Indirect Impacts

The Preferred Alternative would not result in any indirect impacts to floodplains.

3.11.4 Mitigation

Hydraulic analyses will be performed at each improved culvert crossing associated with a floodplain to determine if there would be a rise in the BFE. If the rise in the BFE is greater than one foot, proper steps will be taken with local floodplain administrators and FEMA to obtain a LOMR. These steps include the following:

- Coordination with local floodplain administrators during final design
- Local floodplain administrator approval of CLOMR documentation
- Obtain a CLOMR from FEMA
- Obtain an FDP from local floodplain administrators
- Following project completion, obtain an LOMR from FEMA

3.12 WILDLIFE AND THREATENED AND ENDANGERED SPECIES

Wildlife and plant life, as well as their associated habitats, are protected and regulated by law at both the federal and state levels. At the federal level, the United States Fish and Wildlife Service (USFWS) manages and regulates threatened and endangered species under the Endangered Species Act (ESA). At the state level, state sensitive species, game animals, and general wildlife are managed by the Utah Division of Wildlife Resources (UDWR). This section describes plant and animal species and their associated habitats that are known to, or may potentially occur in the study area.

3.12.1 Threatened and Endangered Species

The ESA provides protection for listed threatened and endangered species. Under Section 7 of the ESA, federal agencies are required to consult with the USFWS to ensure that a proposed action is not likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. Under Section 10 of the ESA, an incidental take permit is required when actions by non-federal entities would result in the "take" of a threatened or endangered species. Section 3 of ESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

Although this is a UDOT led SES, Section 7 of the ESA could be applicable because of a federal nexus that would exist if wetland impacts were permitted under Section 404 of the Clean Water Act (see Section 3.10 Wetlands and Waters of the U.S).

Compliance with ESA can be demonstrated through a "No-Effect" documentation, which is generally provided by the applicant, in this case UDOT.

3.12.2 Other Federal Regulations Protecting Wildlife

Federal laws and regulations beyond the ESA that pertain to wildlife include, but are not limited to, the following:

- Migratory Bird Treaty Act – The Migratory Bird Treaty Act (MBTA) makes it unlawful to take, import, export, possess, sell, purchase, or barter any migratory bird, with the exception of the taking of game birds during established hunting seasons. The law also applies to feathers, eggs, nests, and products made from migratory birds.
- Bald and Golden Eagle Protection Act – The Bald and Golden Eagle Protection Act, makes it unlawful to take, import, export, sell, purchase, or barter any bald or golden eagle, their parts, products, nests, or eggs. "Take" includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing the eagles.

3.12.3 State Regulations Protecting Wildlife

The Utah Division of Wildlife Resources (UDWR) manages and conserves over 350 species of wildlife including non-game birds and small mammals, threatened and endangered species, upland game species, furbearers, cougar, bear, big game, and waterfowl. Under UDWR Administrative Rule R657-48, Utah's sensitive species list is inclusive of:

- federally-listed threatened and endangered species, species proposed for federal listing, and candidate species for federal listing;
- state-listed "conservation species," which are wildlife species or subspecies that are currently receiving special management under a conservation agreement developed or implemented by the state to preclude the need for listing under the ESA; and
- state-listed "wildlife species of concern, which are wildlife species or subspecies within the state of Utah for which there is credible scientific evidence to substantiate a threat to continued population viability.

State-listed fish and wildlife species are regulated by UDWR under Title 23 of the Utah Code (Wildlife Resource Code of Utah). Wildlife "take" is defined under state law as actions to hunt, pursue, harass, catch, capture, possess, angle, seine, trap, or kill any protected wildlife; or attempt any such action.

3.12.4 Affected Environment

3.12.4.1 Wildlife Resources

This section provides a brief overview of wildlife habitat and terrestrial species that are known or likely to occur within areas that could be potentially affected by the Preferred Alternative.

Wildlife Habitat

Generally, the study area lies within the Intermountain Semidesert and *Desert Province as described in Description of the Ecoregions of the United States* (Bailey 1995). Lower elevation vegetation communities in this region are dominated by sagebrush (*Artemisia* spp.) while elevations above the sagebrush dominated zone consist primarily of pinyon pine (*Pinus* spp.) and juniper (*Juniperus* spp.). Land uses within 0.5-mile of the study area consist primarily of residential subdivisions and commercial, limited industrial, and recreational (golf courses, etc.) developments. As a consequence, habitat is of marginal quality for wildlife. Habitat is generally configured in a long and very narrow configuration along drainages in between subdivisions and other forms of development. There are, however, two reservoirs (Hobbs and Holmes Reservoirs) in the vicinity of the study area that provide open water habitat for species including ducks and geese.

Although the riparian woodland community surrounding each of the reservoirs is actively used by a variety of species, it is largely unsuitable for the yellow-billed cuckoo (Coccyzus americanus), which is the only federally-listed species for Davis County. The riparian woodland communities lack the vertical structure required by cuckoos and patch sizes are too small to support a breeding community.

Habitat in or within 0.5-mile of the proposed project corridor does not contain any sage (Artemisia spp.) or other habitat features that define suitable habitat for greater sage grouse (Centrocercus urophasianus) and is located in a highly disturbed area. Consequently, habitat affected by the proposed project is unsuitable for the species.

Terrestrial Species

Mammals common to the study area include mule deer (*Odocoileus hemionus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), voles (*Microtus* spp.), and red fox (*Vulpes vulpes*). Other less common species include Townsend's Big-eared Bat (*Corynorhinus townsendii*), which is listed as a state species of concern in Davis County. These mammalian species are likely found across most habitat types.

According to the Utah Division of Wildlife Resources, a residential or year-round mule deer population exists in the neighborhoods and properties adjacent to the US-89 corridor and within the study area. Another population of mule deer migrate into the study area from the nearby mountains during the winter months. Both of these deer populations create a safety hazard on US-89 as evidenced by the number of wildlife vehicle collisions (80) in the past three years.

There are 95 avian species known to occur in the vicinity of the study area, two of which are listed as species of concern by the Utah Department of Wildlife Resources. These are the bald eagle (*Haliaeetus leucocephalus*) and the American white pelican (*Pelecanus erythrorhynchos*). The bald eagle is likely to be found using tall trees and snags as roosting structures while the American white pelican is likely to be found occupying open water habitat at each of the two reservoirs.

Amphibians of the study area may include western toad (*Bufo boreas*) and Columbia Spotted Frog (*Rana luteiventris*), both of which are state-listed species of concern, chorus frog (*Pseudacris triseriata*), and the exotic American bullfrog (*Rana catesbeiana*). Reptile species likely to occur within the study area include gartersnakes (*Thamnophis* spp.).

3.12.4.2 Threatened and Endangered Species

Threatened and endangered species for the study area vicinity (USFWS 2017) are described in Table 3-18. These are the only federally-listed species for the study area (i.e., no plants, reptiles or amphibians, mollusks, or other species were identified for the study area).

Table 3-18 U.S. Fish and Wildlife Service Listed Species for the Study Area

Name	Status	Habitat Requirements	Critical Habitat
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	Western cuckoos in Arizona, New Mexico, s. California, Utah, and w. Texas prefer desert riparian woodlands (Sonoran Zones) comprised of willow, Fremont cottonwood (*Populus fremontii*), alder (*Alnus* sp.), walnut (*Juglans* sp.), box elder (*Acer negundo*), and dense mesquite (*Prosopis* spp.). Nests most frequently placed in willows, but cottonwoods used extensively for foraging. Prefer patches of riparian habitat >81 ha in size and at least 100 m in width; canopy height 5-30 m; understory height 1-6 m. Understory vegetation includes: velvet ash (*Fraxinus pennsylvanica*), netleaf hackberry (*Celtis reticulata*), condalia (*Condalia lycioides*), and whitebrush (*Aloysia* spp.). Also found in orchards adjacent to river bottoms in Utah.	No
Canada lynx (*Lynx canadensis*)	Threatened	The preferred habitat of the Canada lynx is montane coniferous forest.	No

Yellow-billed Cuckoo

The western distinct population segment of the Yellow-billed cuckoo (*Coccyzus americanus*) is a threatened species in Weber and Davis Counties (USFWS 2017). The listing of the species for the study area vicinity is likely based on historic distribution of the species where suitable habitat was present. However, UDWR has not reported any observations in Davis County. To verify whether the species may occur within the study area, potential yellow-billed cuckoo habitat within a 0.5 mile buffer of the study area was analyzed using the most recent (2017) available aerial imagery in a geographic information system (GIS). Once delineated, habitat patches were field verified by a biologist that is permitted through the USFWS to conduct yellow-billed cuckoo surveys. All delineated habitat patches were then classified as either unsuitable for cuckoos, suitable for migrants only, or suitable for both migrants and breeding cuckoo communities.

Based on the field verification, no suitable habitat for breeding yellow-billed cuckoo populations was identified within the study area. It is possible that migrant individual cuckoos may potentially occur on occasion; generally, though, habitat within the study area is lacking the vertical structure that defines suitable cuckoo habitat and most habitat patches are too small (< 5 acres) to support cuckoos. Furthermore, the cottonwood (*Populus* spp.) overstory that would ordinarily define the feeding strata in suitable cuckoo habitat is mostly lacking within the area inventoried. As such, it is unlikely that the yellow-billed cuckoo would occur within 0.5 mile of the study area.

Canada Lynx

The Canada lynx (*Lynx canadensis*) is a medium-sized cat whose preferred habitat is montane coniferous forest. The Canada lynx is a listed species for Weber County, Utah; however, there is no suitable habitat within the study area.

3.12.5 Environmental Consequences

3.12.5.1 No-action Alternative

Direct Impacts

Under the No-action Alternative wildlife habitats, including any wetlands or other waters, would continue to be affected by the current and future development planned for the US-89 corridor. Existing noise generated by vehicles using the highway would continue to disturb wildlife species and the US-89 corridor would continue to fragment existing habitat. Additionally, existing levels of wildlife-vehicle collisions along US-89

would continue without any form of mitigation.

Indirect Impacts

The No-action Alternative would have no indirect impacts on threatened or endangered species, critical habitat, state-sensitive species, or other wildlife.

3.12.5.2 Preferred Alternative

Direct Impacts

The Preferred Alternative would have no direct impacts on threatened or endangered species, critical habitat, or state-sensitive species.

Habitat within the study area that would be impacted by the development of the Preferred Alternative is either already developed or is highly disturbed. Therefore, impacts to wildlife would be minimal (see August 28, 2017 letter in Chapter 4).

Indirect Impacts

The Preferred Alternative would have no indirect impacts on threatened or endangered species, critical habitat, or state-sensitive species.

The Preferred Alternative would increase traffic noise that could minimally effect wildlife. Effects of highway traffic noise on wildlife vary by species and location. It does appear that some species adapt well to increased ambient noise levels. Other species may not have the ability to adapt in such ways (see Appendix A for a more detailed discussion and references). Given existing traffic and noise levels on US-89, wildlife that inhabit the study area at present are likely to be species that are either not adversely affected by noise or species that adapt to elevated noise levels from traffic as well as to marginal habitat quality as described above. Therefore, the effects of increased noise levels are likely to be minimal.

3.12.6 Mitigation

Wildlife crossing strategies were evaluated to minimize wildlife vehicle collisions and promote connectivity on either side of the highway within the study area. Based on an assessment conducted by the Utah Division of Wildlife Resources, it was determined that wildlife crossings are not desirable because they would promote an increase in the size of deer populations in residential communities on the west side of the highway. As a consequence, wildlife fencing without wildlife crossings will be installed along the length of the proposed corridor to minimize wildlife vehicle collisions.

Although the Preferred Alternative would not have a long-lasting negative affect on wildlife when compared against existing conditions, there may be short-term adverse effects to wildlife species such as birds during construction of the project, particularly during the breeding season if nesting within 0.5-mile of the proposed project corridor. Secondary impacts such as construction noise could promote nest abandonment. Species potentially affected by construction during the breeding season include raptors and ground nesting birds such as waterfowl.

The MBTA makes it illegal to "pursue, hunt, take, capture, kill, attempt to take, capture or kill" any migratory bird or their eggs and nests (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755). This includes creating enough disturbances (e.g., noise, vibrations, visual disturbances, etc.) to cause a bird to abandon an active nest or fledglings. To comply with the MBTA, the following mitigation measures could be implemented during construction to avoid potential impacts:

- To the extent possible, clearing of nesting vegetation should be done between the months of September through February. If clearing is performed between March and August, a qualified wildlife biologist should perform a nest clearance survey prior (within seven days) to construction activities if any vegetation clearing is required. (Peak avian nesting season in Utah is April-July, clearing of nesting substrate during this time frame could result in increased risk.)
- If actively nesting and/or brood rearing birds are found within or reasonably near the clearance area, clearance and construction should be suspended and UDOT Environmental Services should be contacted for further direction.

3.13 CULTURAL RESOURCES

Cultural resources include archaeological resources (both prehistoric and historic), architectural or historic resources (buildings and structures), and traditional cultural properties (TCPs). The Advisory Council on Historic Preservation (ACHP) defines a historic resource as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) (i.e., historic properties built 50 years ago or later)." The term includes artifacts, records, and remains related to and located within such properties and includes properties of traditional religious and cultural importance to a Native American tribe that also meets the National Register criteria. The term "eligible for inclusion" in the NRHP includes all properties that meet the National Register criteria, whether or not they are listed on the NRHP, as such.

The Utah Antiquities Act (Utah Code Annotated 9-8-102 et seq (404)) provides protection of "all antiquities, historic and prehistoric ruins, and historic sites, buildings, and objects which, when neglected, desecrated, destroyed, or diminished in aesthetic value, result in an irreplaceable loss to the people of this state."

The UDOT review process requires cultural resources to be evaluated for eligibility for listing on the NRHP based upon whether "the quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association" and whether or not they meet one or more of the criteria in Table 3-19.

Table 3-19 National Register of Historic Places (NRHP) Criteria

NRHP Criterion	Characteristics
A	Associated with events that have made a significant contribution to the broad patterns of our history
B	Associated with the lives of persons significant in our past
C	Embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction
D	Yielded, or may likely yield, information important in prehistory or history

The Utah State Historic Preservation Office (SHPO) has developed a rating system for buildings that allows for a distinction to be made between those buildings individually eligible under the National Register Criterion A or C and those that have been altered, but that may be eligible as part of a historic district or for historical reasons. The rating system also allows for a distinction to be made between those buildings that are ineligible due to loss of integrity and those that are ineligible because they are out-of-period (see Table 3-20).

Table 3-20 Utah State Historic Preservation Office (SHPO) Rating Definitions for Historic Structures

SHPO Rating	Characteristics
ES	**Eligible/Significant:** Built within the historic period and retains integrity; excellent example of a style or type; unaltered or only minor alterations or additions; individually eligible for NRHP under Criterion C; also, buildings of known historical significance
EC	**Eligible/Contributing:** Built within a historic period and retains integrity; good example of a style or type, but not as well-preserved or well-executed as "ES" buildings; more substantial alterations or additions than "ES" buildings, though overall integrity is retained; eligible for NRHP as part of a potential historic district or primarily for historical rather than architectural reasons (which cannot be determined at this point)
NC	**Ineligible/Noncontributing:** Built during the historic period but has had major alterations or additions; no longer retains integrity
OP	**Ineligible/Out-of-Period:** Built during the modern era

3.13.1 Affected Environment

3.13.1.1 Area of Potential Effects (APE)

The Area of Potential Effects (APE) is the same as the SES study area.

3.13.1.2 Determination of Eligibility

UDOT prepared a Determination of Eligibility and Finding of Effect (DOEFOE), which outlines the eligibility determinations for each architectural and archaeological resource. SHPO concurred with the DOEFOE. A copy of the DOEFOE is found in Chapter 4 Comments and Coordination.

3.13.1.3 Archaeological Resources

A Class III inventory of the APE was conducted from April 10–13, 2017 by Horrocks Engineers. Previously recorded sites were also revisited within the study area. These inventories were conducted according to the 2010 "UDOT Guidelines for Identifying, Recording, and Evaluating Archaeological and Paleontological Resources" using 15-meter survey transects in undeveloped areas. Ten archaeological sites were recorded or revisited within the APE and, of those, three sites have been determined eligible for inclusion on the NRHP (see Table 3-21).

Table 3-21 Archaeological Resources

Site Number	Description	Previously Recorded	NRHP Eligibility
42DV12	Prehistoric Lithic Scatter and Historic Park	Yes	Not Eligible
42DV46	Unfinished Stone Building	Yes	Not Eligible
42DV47	CCC Stone Walls	Yes	Eligible
42DV48	CCC Water Control Features	Yes	Eligible
42DV120	Davis–Weber Canal	Yes	Eligible
42DV160	Historic Pipeline	Yes	Not Eligible
42DV174	Historic Stockyard/Farmstead	Yes	Not Eligible
42DV180	Historic Power Transmission Line	Yes	Not Eligible
42DV200	Historic Homestead	No	Not Eligible
42DV201	Adams Canyon Reservoir	No	Not Eligible

3.13.1.4 Architectural Resources

A survey of the APE for architectural resources was conducted by Horrocks Engineers in April 2017. Eighty-six historic properties (45 years or older) were identified within the APE (see Table 3–22 and Maps in Volume 4). Forty-six of these properties were determined to be eligible for the NRHP (see DOEFOE in Chapter 4 Comments and Coordination).

Table 3-22 Historic Architectural Resources

Address	Date of Construction	Description	NRHP Eligibility
1351 E 400 South, Fruit Heights	1966	Ranch house with garage.	Not Eligible
350 South Golden Circle Drive, Fruit Heights	1969	Contemporary house.	Eligible
388 South Golden Circle Drive, Fruit Heights	1971	Contemporary house.	Eligible
410 South Golden Circle Drive, Fruit Heights	1966	Split Entry house with garage.	Eligible
420 South Golden Circle Drive, Fruit Heights	1968	Contemporary house.	Eligible

Address	Date of Construction	Description	NRHP Eligibility
430 South Golden Circle Drive, Fruit Heights	1970	Ranch house with garage.	Not Eligible
450 South Golden Circle Drive, Fruit Heights	1968	Ranch house with garage.	Eligible
470 South Golden Circle Drive, Fruit Heights	1969	Contemporary house.	Eligible
491 South Golden Circle Drive, Fruit Heights	1967	Split Entry house with garage.	Eligible
1347 East 500 South, Fruit Heights	1968	Contemporary house.	Not Eligible
112 South US–89, Fruit Heights	1961	Ranch house with garage.	Eligible
153 South 1250 East, Fruit Heights	1954	Other house type.	Not Eligible
179 South 1250 East, Fruit Heights	1966	Ranch house with garage.	Eligible
187 South 1250 East, Fruit Heights	1958	Ranch house with garage.	Not Eligible
1262 East Green Road, Fruit Heights	1955	Ranch house.	Eligible
280 South Florence Circle, Fruit Heights	1969	Ranch house with garage.	Eligible
1275 East Oakmont Lane, Fruit Heights	1954	Ranch house with garage.	Eligible
1325 East Oakmont Lane, Fruit Heights	1971	Split Entry house.	Eligible
1270 East Oakmont Lane, Fruit Heights	1948	Early Ranch/Rambler house.	Not Eligible
1351 East 650 North, Fruit Heights	1965	Split Level house.	Eligible
1210 East Ward Road, Fruit Heights	1971	Ranch house with garage.	Eligible
1211 East 575 North, Fruit Heights	1960	Ranch house with garage.	Eligible
347 North 1300 East, Fruit Heights	1927	Period Cottage house.	Eligible
1587 North US–89, Layton	1961	Unable to view house.	Unevaluated
1193 East Mutton Hollow Road, Layton	1928	Contemporary house.	Not Eligible
1402 North US–89, Kaysville	1940	Basement house.	Eligible
1398 North US–89, Kaysville	1920/1960/1980	Other house type.	Not Eligible

Address	Date of Construction	Description	NRHP Eligibility
1302 North US–89, Kaysville	1940/2002	Other house type.	Not Eligible
1100 North US–89, Kaysville	1927	Period Cottage house.	Not Eligible
1084 North US–89, Kaysville	1950	Early Ranch/Rambler house.	Eligible
1148 North East Side Drive, Layton	1945	Early Ranch/Rambler house.	Eligible
1014 North East Side Drive, Layton	1954	Early Ranch/Rambler house.	Not Eligible
982 North East Side Drive, Layton	1949/1975	Contemporary house.	Eligible
946 North East Side Drive, Layton	1941/1960	Early Ranch/Rambler house.	Eligible
924 North East Side Drive, Layton	1922/1975	Bungalow house.	Not Eligible
798 North East Side Drive, Layton	1952	Early Ranch/Rambler house.	Eligible
718 North East Side Drive, Layton	1963	Ranch house with garage.	Eligible
688 North East Side Drive, Layton	1952	Ranch house with garage.	Not Eligible
598 North East Side Drive, Layton	1950	Early Ranch/Rambler house.	Eligible
538 North East Side Drive, Layton	1970/1985	Contemporary house.	Not Eligible
2825 East Oak Hills Drive, Layton	1969	Split Level House	Eligible
2900 East Oak Hills Drive, Layton	1960	Water Tank	Eligible
1793 North US–89, Layton	1962	Ranch house with garage.	Eligible
1792 North US–89, Layton	1952	Unable to view house.	Undetermined
1783 North US–89, Layton	1953	Other house type.	Not Eligible
1768 North US–89, Layton	1964	Ranch house with garage.	Eligible
1738 North US–89, Layton	1953	Ranch house.	Eligible
1675 North Heather Drive, Layton	1962	Ranch house with carport.	Eligible
1627 North Valley View Drive, Layton	1950	Ranch house with garage.	Eligible

Address	Date of Construction	Description	NRHP Eligibility
1541 North Cherry Lane, Layton	1963	Ranch house with garage.	Eligible
1511 North Cherry Lane, Layton	1954	Ranch house with garage.	Eligible
1508 North US–89, Layton	1966	Service Station.	Not Eligible
2848 East Cherry Lane, Layton	1915	Foursquare (box) house.	Not Eligible
1425 North US–89, Layton	1962	Service Station.	Not Eligible
2225 North Valley View Drive, Layton	1960	Split Level house.	Not Eligible
2244 North US–89, Layton	1968	Split Entry house.	Not Eligible
2211 North Valley View Drive, Layton	1967	Split Entry house with garage.	Not Eligible
2120 North US–89, Layton	1941/1965	Ranch house with carport.	Not Eligible
2044 North 2950 East, Layton	1972	Split Entry house with garage.	Not Eligible
2851 East Oak Lane, Layton	1965	Split Entry house with garage.	Eligible
2004 North 2950 East, Layton	1967	Contemporary house.	Not Eligible
1957 North Valley View Drive, Layton	1963	Ranch house with garage.	Not Eligible
1933 North Valley View Drive, Layton	1967	Ranch house.	Not Eligible
1918 North US–89, Layton	1973	Other house type.	Not Eligible
1849 North Valley View Drive, Layton	1972	Contemporary house.	Eligible
2837 East SR–193, Layton	1960/1970	Warehouse	Not Eligible
3245 North US–89, Layton	1910/1930	Hall-Parlor house.	Eligible
3221 North US–89, Layton	1970	Ranch house with garage.	Not Eligible
3012 East 3050 North, Layton	1953	Unable to view house.	Undetermined
2895 North Hobbs Creek Drive, Layton	before 1963	Unable to view house.	Undetermined
2776 North Valley View Drive, Layton	1863/1913	Hall-Parlor house.	Eligible

Address	Date of Construction	Description	NRHP Eligibility
2778 North Valley View Drive, Layton	1962	Unable to view house.	Undetermined
2550 North US–89, Layton	1939	World War II-Era Cottage	Eligible
7200 South US–89, South Weber	1967	Bridge	Not Eligible
7425 South 2700 East, South Weber	1970	Commercial Building	Not Eligible
7692 South Cornia Drive, South Weber	1970	Late 20th Century building	Not Eligible
7618 South US-89, South Weber	1914/1945	Box Bungalow house.	Eligible
8102 South 2725 East, South Weber	1898	Crosswing house.	Eligible
8386 South US–89, South Weber	1865	Fieldstone cellar.	Eligible
1686 East 1000 North, Layton	1969	Contemporary house.	Not Eligible
1710 East 1000 North, Layton	1971	Ranch house with garage.	Eligible
1934 East Oakridge Drive, Layton	1962	Ranch house with garage.	Eligible
2157 East Oakridge Drive, Layton	1930	Loafing shed.	Eligible
2607 East Gentile Street, Layton	1937	Late 20th Century building	Not Eligible
2733 East Gentile Street, Layton	1945	Late 20th Century Building	Not Eligible
2833 East Gentile Street, Layton	1930	Bungalow	Eligible

3.13.1.5 Consultation

Coordination included correspondence between UDOT and Native American tribes that may have cultural and historical interest within the study area. UDOT sent consultation letters dated June 21, 2017 to the following tribes: The Eastern Shoshone Tribe of the Wind River Reservation, the Shoshone-Bannock Tribes of Fort Hall, The Paiute Indian Tribe of Utah, The Northwestern Band of the Shoshone Nation, The Ute Indian tribe of the Uintah and Ouray Utah Indian Reservation, The Skull Valley Band of the Goshute Indians, The Cedar Band of Paiutes, the Shivwits Band of Paiute Indian Tribe of Utah, and the Confederated Tribes of the Goshute Reservation.

3.13.2 Environmental Consequences

Although compliance with Section 106 of the National Historic Preservation Act (NHPA) does not apply for this SES, UDOT follows the definitions found in Section 106 to determine effects under the Utah Antiquities Act. Effects are defined as "alteration[s] to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register" (36 CFR §800.16(i)). Impacts to historic properties are categorized as No Historic Properties Affected, No Adverse Effect, and Adverse Effect.

A finding of ***No Historic Properties Affected*** is made when "[e]ither there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them as defined in §800.16(i)" (see 36 CFR §800.4(d)(1)).

A finding of ***No Adverse Effect*** is made "[w]hen the undertaking's effects do not meet the criteria of paragraph (a)(1) of this section [see Adverse Effect definition] or the undertaking is modified or conditions are imposed... to ensure consistency with the Secretary's standards for the treatment of historic properties (36 CFR §68) to avoid adverse effects" (see 36 CFR §800.5(b)).

A finding of ***Adverse Effect*** is made "[w]hen an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, and association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative" (see 36 CFR §800.5(a)(1)).

3.13.2.1 Finding of Effect

UDOT prepared a DOEFOE, which outlines the effect determinations for each architectural and archaeological resource. SHPO concurred with the DOEFOE. A copy of the DOEFOE is found in Chapter 4: Comments and Coordination.

3.13.2.2 No-action Alternative

Direct Effects

The No-action Alternative would result in a finding of No Historic Properties Affected.

Indirect Effects

There would be no indirect impacts from the No-action Alternative.

3.13.2.3 Preferred Alternative

Direct Effects

The Preferred Alternative would result in an adverse effect to nine historic buildings and one archaeological site (see Table 3-23). Partial acquisition of properties would result in a finding of No Adverse Effect to an additional 12 historic buildings. See Maps in Volume 4.

Table 3-23 Effects of the Preferred Alternative

Address/Site Number	Description	Effect	Description of Effect	Map
42DV47	CCC Stone Walls	Adverse	Partial or total demolition	N/A
347 North 1300 East	Period Cottage house	Adverse	Demolition of the historic structure	5
1210 East Ward Road	Ranch house with garage	No Adverse	Partial acquisition (0.23 acres)	6
1275 East Oakmont Lane	Ranch house with garage	Adverse	Demolition of the historic structure	6
1084 North US-89	Early Ranch/Rambler house	No Adverse	Partial acquisition of the property (0.27 acres)	6
1402 North US-89	Basement house	Adverse	Demolition of the historic structure	7
1587 North US-89	Unable to view house	No Adverse	Partial acquisition (0.13 acres)	7
2900 East Oak Hills Drive	Water Tank	Adverse	Demolition of the historic structure	8

Address/Site Number	Description	Effect	Description of Effect	Map
2825 East Oak Hills Drive	Split Level House	Adverse	Demolition of the historic structure	8
1148 North East Side Drive	Early Ranch/Rambler house	Adverse	Demolition of the historic structure due to change in access	9
1511 North Cherry Lane	Ranch house with garage	No Adverse	Partial acquisition (0.03 acres)	10
1541 North Cherry Lane	Ranch house with garage	No Adverse	Partial acquisition (0.03 acres)	10
1627 North Valley View Drive	Ranch house with garage	No Adverse	Partial acquisition (0.02 acres)	10
1738 North US-89	Ranch house	Adverse	Demolition of the historic structure due to a loss in access	10
1768 North US-89	Ranch house with garage	Adverse	Demolition of the historic structure due to a loss in access	11
1792 North US-89	Unable to view house	No Adverse	Partial acquisition (0.06 acres)	11
1793 North US-89	Ranch house with garage	No Adverse	Partial acquisition (0.07 acres)	11
1849 North Valley View Drive	Contemporary house	No Adverse	Partial acquisition at rear of the property (0.05 acres)	11
2550 North US-89	World War II-Era Cottage	No Adverse	Partial acquisition (0.12 acres)	12
2157 East Oakridge Drive	Loafing shed	Adverse	Demolition of the historic structure	18
1934 East Oakridge Drive	Ranch house with garage	No Adverse	Partial acquisition (0.66 acres)	18
1710 East 1000 North	Ranch house with garage	No Adverse	Partial acquisition (0.03 acres)	18

Indirect Effects

Commercial and residential development would continue to occur in this area without roadway improvements. However, the Preferred Alternative may induce a more rapid rate of growth due to improvement in overall access to the area. Historic properties may be removed during development or redevelopment, with no additional documentation.

3.13.3 Mitigation

UDOT will mitigate adverse effects to historic properties through completion of a Memorandum of Agreement (MOA) with the SHPO. Mitigation efforts may include the completion of intensive level survey forms for affected homes, research on the history of the area, research on the history of the CCC in the area, detailed floor-plan drawings and photographs, or other measures. Construction will not be allowed to proceed until an approved MOA is in place. The MOA can be found in Chapter 4 Comments and Coordination.

3.14 PALEONTOLOGICAL RESOURCES

Paleontology is the scientific study of life in the geologic past, especially through the study of animal and plant fossils. Before expending state funds or approving an undertaking, a state agency is required to take into account the effect of the undertaking on a specimen that is included in or eligible for inclusion in the State Paleontological Register (U.C.A. 63-73-19). The Memorandum of Understanding (MOU) between the Utah Geological Survey (UGS) and UDOT outlines the process for implementing Utah Code Annotated §63-73-19.

3.14.1 Affected Environment

Horrocks Engineers contacted UGS for information regarding paleontological resources in the study area. The UGS stated that the deposits in the study area have a low potential to yield significant fossil localities, and that the project should have no effect on paleontological resources (see correspondence in Chapter 4 Comments and Coordination).

3.14.2 Environmental Consequences

3.14.2.1 No-action Alternative

The No-action Alternative would have no impact to paleontological resources.

3.14.2.2 Preferred Alternative

The Preferred Alternative would have no impact to paleontological resources.

3.14.3 Mitigation

No mitigation required.

3.15 HAZARDOUS WASTE

Hazardous waste includes any solid, liquid, or gaseous waste materials that, if improperly managed or disposed of, may pose substantial hazards to human health and the environment. A waste is considered hazardous if it exhibits one or more of the following characteristics: ignitability, corrosivity, reactivity, and toxicity.

The Resource Conservation and Recovery Act (RCRA) was enacted in 1976 to regulate the management of solid waste (i.e., garbage), hazardous waste, and underground storage tanks (UST) that hold petroleum products or certain chemicals – including leaking underground storage tanks (LUST). Under RCRA, hazardous wastes are tracked from the time they are generated until the time they are ultimately disposed of or recycled. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) was enacted in 1980. CERCLA provided for the clean-up and remediation of closed and abandoned hazardous waste sites where hazardous waste has been abandoned, accidentally spilled, or illegally dumped and created a "Superfund" to help pay for clean-up costs.

3.15.1 Affected Environment

The study area for hazardous waste sites is situated within 0.5 miles of the study area. The study team reviewed databases from state and federal regulatory agencies to identify generators and facilities that use hazardous waste, accidental releases of hazardous waste, sites contaminated with hazardous waste, and sites that have the potential for contamination in the study area. These regulatory databases include the Utah Division of Environmental Response and Remediation (DERR) interactive maps and the EPA's EnviroMapper and EnviroFacts resources. Once potential sites were identified, sites with no or little contamination and no proximity to the study area were eliminated from further consideration. The review yielded four environmental incidents, one solid waste facility, one used oil facility, and eleven USTs. Table 3-24 lists the hazardous waste sites of potential concern in the study area (see also Maps in Volume 4).

Table 3-24 Hazardous Waste Sites in the Study Area

Name	Address	Type
Quality Carriers	2837 East Highway 193	Environmental Incident
Puertas Enterprise Inc.	2928 Wind River Drive	Environmental Incident
Granite Construction	Highway 89 and Sunset Boulevard	Environmental Incident
South Weber Diesel Spill	N/A	Environmental Incident
Weber Basin Water Treatment	2837 East Highway 193	Solid Waste Facility
Jack B. Parson Companies	2585 East South Weber Drive	Used Oil Facility
Geneva Rock South Weber	2830 East Corina Drive	UST
Former Chevron	1350 South 106 East	UST
Kwick Stop Highway 89	1508 Highway 89	UST
Pritchett Construction Company	1875 North Highway 89	UST
RB's Mountain Road	8062 South Highway 89	UST
Pick and Go Food Marts-Sinclair Gas	1365 North Highway 89	UST
Weber Basin Water Conservancy	2837 East Highway 193	UST
South Weber Building	7636 South Corina Drive	UST
Former Gas Station (FDIC)	3301 North Highway 89 and Highway 139	UST
Abandoned Station	3221 North Highway 89	UST
South Weber Texaco #50	7855 South Highway 89	UST

3.15.2 Environmental Consequences

3.15.2.1 No-action Alternative

Direct Effects

The No-action Alternative would not impact any hazardous waste sites.

Indirect Effects

The No-action Alternative would not indirectly impact any hazardous waste sites.

3.15.2.2 Preferred Alternative

Direct Effects

Construction of the Preferred Alternative would affect the properties where the Pick and Go Food Marts-Sinclair Gas Station at 1365 North Highway 89, Layton (see Map 10 in Volume 4) and the Chevron Gas Station (formerly the Kwik Stop) at 1508 Highway 89, Layton (see Map 10 in Volume 4) are located. Both of these sites contains USTs. If hazardous materials are encountered during construction of the Preferred Alternative, the contractor would follow UDOT Standard Specification 01355. This specification includes requirements to immediately suspend work in the area of the discovery, notify the Engineer and DEQ of the discovery, develop a remediation plan, and dispose of the hazardous materials in accordance to DEQ and EPA requirements and regulations.

Indirect Effects

The Preferred Alternative would not indirectly impact any hazardous waste sites.

3.15.3 Mitigation

No mitigation required.

3.16 VISUAL CONDITIONS

The visual resources of a community or area include the physical features that make up the landscape and include both natural (landforms, waterways, etc.) and other elements (buildings, roads, structures, etc.). The following visual analysis discusses the visual qualities and resources within and nearby the study area and how the No-action and Preferred Alternatives impact those visual resources.

3.16.1 Affected Environment

3.16.1.1 Existing Visual Environment

US-89 is the dominant feature in the study area, which begins just north of Shepard Lane in Farmington and ends at the I-84 interchange. In this segment of the highway, US-89 travels through both rural and suburban sections, several intersections, and is joined by numerous side access roads.

The visual character of the study area is consistent with a mix of rural lands and suburban neighborhoods. Davis County is becoming more suburbanized; however, much of this corridor is lined with neighborhoods and open space. Foothills and mountains line the east side of the corridor, with houses and neighborhoods dotting the landscape. A few commercial properties are found at some intersections. The roadway has a relatively narrow shoulder with gravel, grasses, trees, and shrubs found along the side of the road between intersections. At the northernmost point of the study area, the Weber River leaves Weber Canyon and flows westward towards the Salt Lake and Ogden valleys and then to the Great Salt Lake, all of which can be seen in the distance. Near the I-84 interchange, the gravel pits comprise the main industrial feature of the study area.

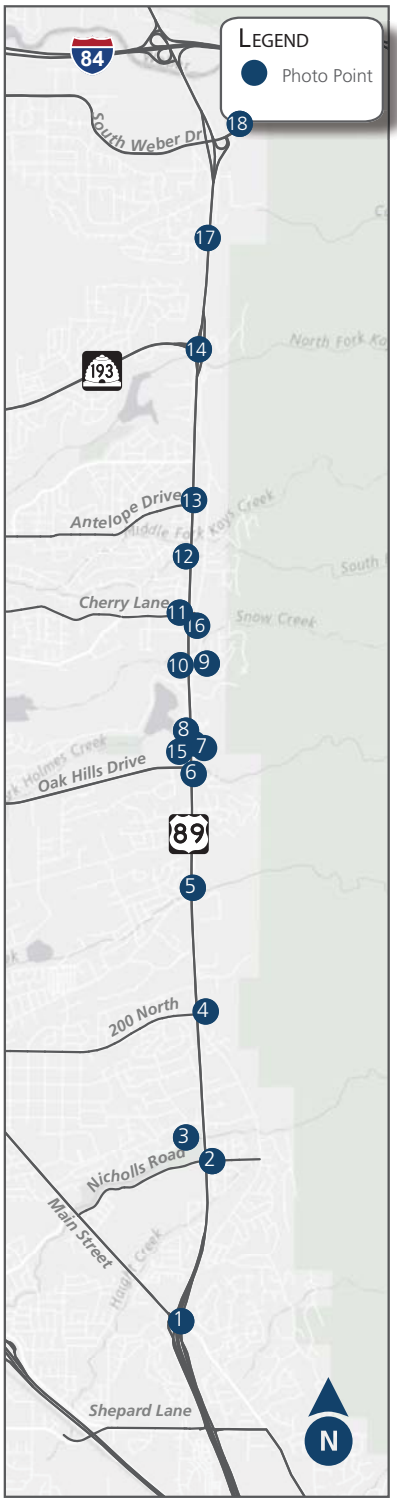
Photo points have been identified along the corridor and detailed descriptions of these areas can be found in Table 3-25.

Typical View of Corridor

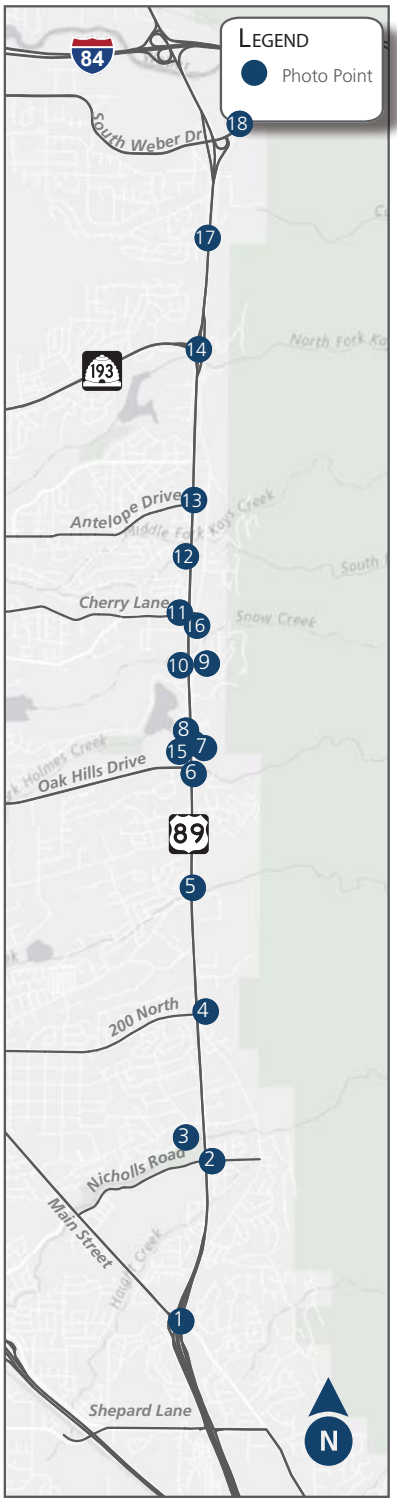
Table 3-25 Visual Characteristics

Location	Photo Point	Description
Main Street/ US-89 Interchange	Photo Point #1 Looking north at US-89	Looking north and south, the immediate and far views are of steady traffic, with few aesthetic treatments to US-89. There are a couple of commercial properties near this interchange, most notably Cherry Hill Water Park. There are very few viewers in this area aside from those who use the interchange.
Nicholls Road	Photo Point #2 Looking east at US-89	The immediate view at this intersection looking east is one of a residential area. Looking west, there are ballparks at the northwest corner and a neighborhood abutting the southwest corner. The middle and far views looking east consists of the neighborhood, with foothills and mountains beyond the houses. The middle views looking west consist of residential areas, with the distant views encompassing the Salt Lake valley and the Great Salt Lake.
Bair Creek Road	Photo Point #3 Looking west in ravine	The existing view consists of trails weaving in and out of the creek bed area with heavy vegetation and an over story of various types of trees. The middle and far views of any surrounding area is obscured by the trees and tall shrubs found here. Few viewers are found in this area, limited to the local residents and visitors that come to access the nature trails.
400 North	Photo Point #4 Looking west at US-89	There are no residents to the east; the immediate, middle, and far views are of the foothills and mountains that extend almost immediately from the roadway. The near view is one of trees and grasses lining the roadway. The middle view encompasses residential areas extending westward, with the far view characterized by the Salt Lake valley and the Great Salt Lake.

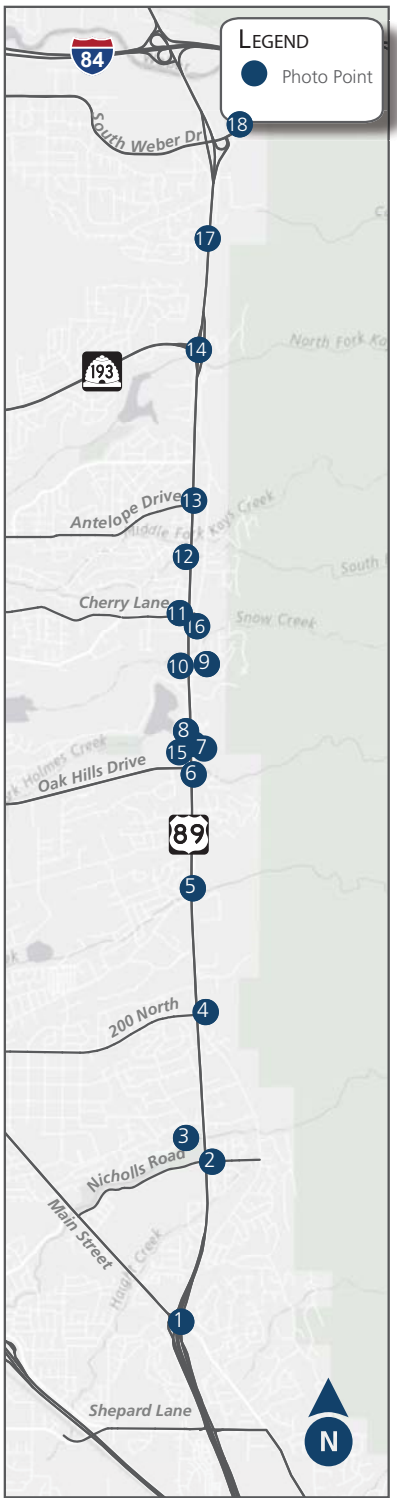
Location	Photo Point	Description
Crestwood Road	Photo Point #5 Looking east	This intersection's immediate view includes a farm with open spaces surrounding it. Looking west from the farm, there is no visual separation from the roadway. The distant view is one of the valley below leading to the Great Salt Lake. Looking eastward from the west side of US-89, viewers that live in the residential areas see the agricultural area, then foothills and mountains beyond in the distance.
Oakhills Drive	Photo Point #6 Looking east at US-89	At the Oak Hills Drive intersection, there is a parking lot and trailhead in the immediate view to the east. The far view includes the foothills rising from the parking lot, and the mountains beyond. The immediate views encompass the open spaces of a vacant lot and a gully surrounding the existing water tank; the far view shows the valley and the Great Salt Lake in the distance. The viewers in this area are limited to drivers along US-89 and the visitors to the trailhead.
670 North Neighborhood	Photo Point #7 Looking east at Woodridge Drive from 670 North	The immediate view is that of a single neighborhood that backs southbound US-89. Looking eastward above and beyond the houses, the middle and distant views are that of the mountains that line the eastern side of this corridor. From the frontage road, the houses obscure the view of the roadway as the roadway is elevated from this vantage point. However, the view from the back areas of these houses is that of US-89, with the only visual disconnect being any fencing and trees that separates the right-of-way.
Holmes Creek Reservoir Ravine	Photo Point #8 Looking west in ravine	Ravines and gullies drop down to Holmes Reservoir. This wilderness area is a public use area. One overgrown dirt road to path leads from the water tank at the south east corner of the area to the reservoir itself. Viewers here are sparse and are limited to those who visit the area.



Location	Photo Point	Description
Gordon Avenue East Side	Photo Point #9 Looking west at US-89	This section of the highway has a rural feel to it as there is little development. The immediate view includes a farm and a few houses, with foothills and mountains encompassing the middle and far views to the east.
Gordon Avenue West Side	Photo Point #10 Looking east at US-89	The west view is completely rural, with a working community garden area making up the immediate view. A residential area is in the middle distant view; this neighborhood is approximately ½ mile from the highway. Open fields and sporadic fencing complete the middle view.
Cherry Lane	Photo Point #11 Looking east at US-89	Immediately, the view south is of open areas. No curb nor gutter exist, which lends to the rural feel.
Frontage Road (1975 North)	Photo Point #12 Looking south at current frontage road dead end	This area includes the frontage road adjacent to US-89 and a residential neighborhood. To the east, the immediate view shows a tree-lined street and farm at the edge of US-89. The far view includes mountain peaks. To the west, a residential area exists immediately at eye-level, with middle view of street openings and distant views of the valley and lake. There is no curb and gutter here as the area is only partially developed.



Location	Photo Point	Description
Antelope Drive	Photo Point #13 Looking east at US-89	Looking west from Antelope Drive, the valley stretches below the immediate view of a park-and-ride lot on the northwest corner of the intersection. On the southwest corner, a residential area sits about 10' below the highway's elevation; open space extends from this neighborhood. Looking eastward, the immediate view shows homes 25' from US-89. This section does not include curb and gutter, and grass and gravel line the roadway. The middle and far views are of foothills and mountains, as typical to this area. A few homes dot the foothills east of US-89 in this area.
SR-193 Interchange	Photo Point #14 Looking north at US-89	The view to the north and south from the SR-193 overpass includes a steady flow of traffic moving in both directions. There is some landscaping in this area of US-89 consisting of gravel and a few shrubs. The easterly view shows a sparsely populated area with homes sprinkled in the foothill area. The western view immediate view is that of the roadway and a few commercial properties, and then on to a water treatment facility on the northwest corner with open land to the southwest.
Typical Residential	Photo Point #15 Looking southwest at Woodridge Drive	Pictures were taken at Woodridge Drive which captures the typical residence outside a newer less common suburban-type neighborhood. There are some older neighborhoods in this corridor; however, many of the homes in this area are found in small groupings or as farmsteads or single properties. The residential feel of the corridor is largely rural when an observer moves from the intersections that currently exist.
Typical Commercial	Photo Point #16 Looking north at commercial properties	The east side of this intersections includes a gas station on the northeast corner and Grounds for Coffee, a local coffee and snack shop, on the southeast corner. Both businesses are well established and are located close (less than 20') to the road way.



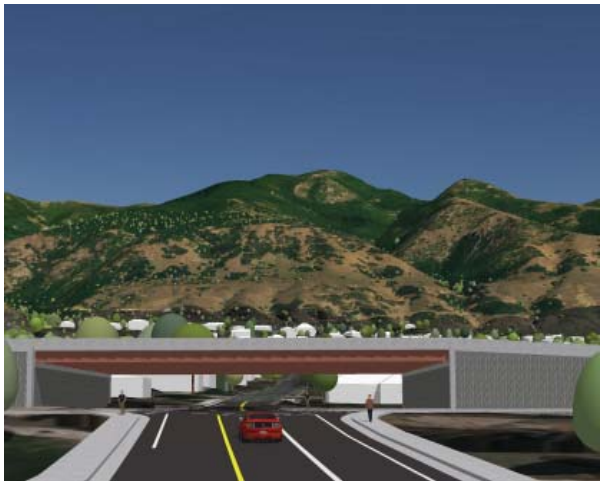
Location	Photo Point	Description
Typical Open Space	Photo Point #17 Looking east from 8075 South	This sampling of typical open space is located just north of Antelope Drive and the southwest corner of the I-193 interchange. The trees and shrubs are indicative of an area that is naturally filled with trees, shrubs, and grasses. Native and non-native species thrive in any given area of this corridor.
Gravel Pits	Photo Point #18 Looking northwest	Large gravel pits lie on both sides of US-89 near the northernmost part of the study area that are visible to north and southbound users. Some areas of these pits are over 150' below grade, which creates a drastic visual contrast with the surrounding areas.

3.16.1.2 Conceptual Renderings

If the Preferred Alternative is selected, viewers using the roadway and viewers of the roadway will note visual changes. Three examples of conceptual designs of visual changes associated with the Preferred Alternative are provided below. These designs represent artistic renderings and do not accurately depict all elements and colors.

Nicholls Road

Existing



Concept

Oak Hills Drive

Existing

Concept

Antelope Drive

Existing

Concept

3.16.2 Environmental Consequences

3.16.2.1 No-action Alternative

Direct Impacts

The No-action Alternative would not make any alterations to the viewshed in the study area.

Indirect Impacts

The No-action Alternative would not have any indirect impacts to visual conditions in the study area.

3.16.2.2 Preferred Alternative

Direct Impacts

Under the Preferred Alternative, there are primarily two viewer groups in the study area that would be impacted: viewers of the roadway and viewers using the roadway. Table 3-26 illustrates and describes the

visual quality of major nodes along the corridor and areas that would have the greater visual change from the Proposed Alternative.

Table 3-26 Visual Impacts

Location	Description	Viewer Impacts
Main Street/US-89 Interchange	Proposed interchange improvements.	Viewers of the roadway – Minimal visual change. Viewers using the roadway – Minimal visual change.
Nicholls Road	Proposed grade-separated interchange. Structure would be 25'-30' high, and would take US-89 travel over Nicholls Road. Possible noise walls in some areas.	Viewers of the roadway – Visually disconnected from the mountains and valley. Distant views would still be intact in some areas depending on the proximity to the structure. Viewers using the roadway – Visually disconnected from the corridor due to change in grade and construction of potential noise walls.
Bair Creek Road	Proposed bridge structure over vegetated ravine for road connection.	Viewers of the roadway – Structure would hinder view of vegetation and ravine. Viewers using the roadway – Minimal visual change.
400 North	Proposed grade-separated interchange. Structure would be 25'-30' high, and would take US-89 over 400 North. Possible noise walls in some areas.	Viewers of the roadway – Visually disconnected from the mountains and valley. Distant views would still be intact in some areas depending on the proximity to the structure. Viewers using the roadway – Visually disconnected from the corridor due to change in grade and construction of potential noise walls.
Crestwood Road	Proposed grade-separated crossing. Structure would be 25'-30' high, and would take US-89 over Crestwood Road. Possible noise walls in some areas.	Viewers of the roadway – Visually disconnected from the mountains and valley. Distant views would still be intact in some areas depending on the proximity to the structure. Viewers using the roadway – Visually disconnected from the corridor due to change in grade and construction of potential noise walls.
Oakhills Drive	Proposed grade-separated interchange. Structure would be 25'-30' high, and would take US-89 over Oakhills Drive. Possible noise walls in some areas.	Viewers of the roadway – Visually disconnected from the mountains and valley. Distant views would still be intact in some areas depending on the proximity to the structure. Viewers using the roadway – Visually disconnected from the corridor due to change in grade and construction of potential noise walls.
670 North Neighborhood	Additional travel lanes on US-89.	Change visual character by the removal of residential houses.
Holmes Creek Reservoir Ravine	Proposed bridge structure over vegetated ravine for frontage road connection.	Viewers of the roadway – Structure would hinder view of vegetation and ravine. Viewers using the roadway – Minimal visual change.

Location	Description	Viewer Impacts
Gordon Avenue	Proposed grade-separated interchange. Structure would be 25'-30' high, and would take US-89 over Gordon Avenue. Possible noise walls in some areas. New road alignment running east west.	Viewers of the roadway – Visually disconnected from the mountains and valley. Distant views would still be intact in some areas depending on the proximity to the structure. Viewers using the roadway – Visually disconnected from the corridor due to change in grade.
Cherry Lane	New frontage road to be constructed south of Cherry Lane on west side of US-89. Possible noise walls in some areas.	Viewers of the roadway – New road alignment would be seen. Viewers using the roadway – Visually disconnected from the corridor due to construction of potential noise walls.
Antelope Drive	Proposed grade-separated interchange. Structure would be 25'-30' high, and would take US-89 over Antelope Drive, which would connect to Valley View Drive. Possible noise walls in some areas.	Viewers of the roadway – Visually disconnected from the mountains and valley. Distant views would still be intact in some areas depending on the proximity to the structure. Viewers using the roadway – Visually disconnected from the corridor due to change in grade and construction of potential noise walls.

During the design phase, a plan would be developed that is consistent with the UDOT aesthetics policy.

Indirect Impacts

The Preferred Alternative would not have any indirect impacts to visual conditions in the study area.

3.16.3 Mitigation

No mitigation required.

3.17 ENERGY

3.17.1 Affected Environment

In the context of transportation projects, energy is consumed during both the construction and the operational phases of the project. For construction, it is used to manufacture and transport materials and to operate construction machinery. During operation of the facility, energy is primarily related to vehicle fuel consumption, which is dependent upon vehicle miles traveled (VMT) and travel conditions, i.e. vehicle type, speed, weather conditions, and roadway conditions such as vertical grade, roadway geometry, and the type and condition of the pavement.

Construction energy requirements were analyzed on a qualitative basis as to what types of construction activities (if any) would be required. Operational energy requirements were analyzed on a quantitative basis, as well as a qualitative basis.

This analysis consisted of dividing the average daily VMT in the study area under the No-action and Preferred Alternatives by an average vehicle fuel efficiency estimate obtained from the Annual Energy Outlook 2016 with projections to 2040, (U.S. Energy Information Administration, April 2016). The report includes average fuel economy for light duty vehicles (LDV), which includes passenger cars, light-duty trucks and commercial light-duty trucks. For existing conditions, an average vehicle fuel efficiency of 21.9 miles per gallon (mpg) (as of 2013) was used. For 2040 conditions, an average vehicle fuel efficiency of 37.0 mpg was used (see Table 3-27).

Table 3-27 Comparison of 2016 and 2040 Operational Energy Consumption in the Study Area

Scenario	Daily VMT	Change in Daily VMT	Percent Change in Daily VMT	Fuel Consumption (gallons)	Percent Changes in Fuel Consumption
2016 Travel Demand	352,000	NA	NA	16,073	NA
2040 Travel Demand No-action Alternative	461,000	109,000	31%	12,460	-22.5%
2040 Travel Demand Preferred Alternative	596,000	244,000	69%	16,108	0.02%
Difference between 2040 Alternatives		135,000	29%	3,648	29.2%

3.17.2 Environmental Consequences

3.17.2.1 No-action Alternative

The No-action Alternative would not have energy demands during construction. In terms of operational energy requirements, the 2040 Preferred Alternative travel demand was approximately 135,000 VMT greater than the 2040 No-action travel demand, or a 29% increase. The No-action Alternative would result in less vehicle miles traveled in the study area. However, this analysis does not take into account the increase in congestion leading to stop-and-go traffic with a lower LOS on US-89 and other nearby roadways, reducing vehicle efficiency and increasing fuel consumption.

3.17.2.2 Preferred Alternative

The Preferred Alternative would have energy demands during construction. In terms of operational energy requirements, the 2040 travel demand varied between the No-action and the Preferred Alternatives. Fuel consumption under the Preferred Alternative would be higher than under the No-action Alternative due to increases in VMT, but would be comparable to existing conditions due to the expected increase in fuel economy standards. The Preferred Alternative would convert US-89 into a freeway, replacing existing intersections with interchanges, which would in turn reduce congestion and allow traffic to flow more smoothly. The reduction in traffic congestion would enable vehicles to maintain a more optimum speed, thereby improving vehicle efficiency and reducing fuel consumption.

3.17.3 Mitigation

No mitigation is required.

3.18 INVASIVE SPECIES

Non-native flora and fauna can cause substantial changes to ecosystems, upset the ecological balance, and cause economic harm to our nation's agricultural and recreational sectors. Since roadway corridors provide opportunities for the movement of invasive species through the landscape, it is important that roadway projects include measures to combat the introduction and spread of invasive species. The State of Utah Department of Agriculture and Food maintains a Utah Noxious Weeds list.

3.18.1 Affected Environment

Land uses and degrees of development vary widely throughout the study area. There are highly developed areas that are well maintained and would provide little opportunity for the movement of invasive species. There are also areas of vacant and undeveloped land that is not well maintained. These areas provide the greatest opportunity for movement and the spread of invasive species. The study team observed the following noxious weeds within the study area:

- Phragmites (Common reed) – *Phragmites australis* ssp
- Hoary cress – *Cardaria* spp.
- Scotch thistle (Cotton thistle) – *Onopordum acanthium*
- Field bindweed (Wild Morning-glory) – *Convolvulus* spp.
- Puncturevine (Goathead) – *Tribulus terrestris*
- Russian olive – *Elaeagnus angustifolia*
- Dyers woad – *Isatis tinctoria*

3.18.2 Environmental Consequences

3.18.2.1 No-action Alternative

The No-action Alternative would not provide opportunities for movement of invasive species.

3.18.2.2 The Preferred Alternative

Direct Impacts

The Preferred Alternative would include roadway construction and would provide opportunities for the movement of invasive species. The construction of the Preferred Alternative has the potential to introduce or spread invasive species included on the noxious weeds lists of the State of Utah. To minimize the movement of invasive species, the Contractor will be required to comply with UDOT's Special Provision 02924S - Invasive Weed Control.

Indirect Impacts

No indirect impacts are anticipated.

3.18.3 Mitigation

No mitigation is required.

3.19 GEOLOGY

3.19.1 Affected Environment

The study area is located along the western edge of the Wasatch Mountain range, in an area of moderately to highly faulted, high-grade metamorphic stone known as the Farmington Canyon Complex. The western edge of the Wasatch Range is also the location of the Wasatch Fault Zone, which runs roughly north-to-south along the front of the range. Soils in the area were mostly deposited by Lake Bonneville, a large Pleistocene-era lake, and by alluvial actions from mountain streams.

3.19.1.1 Seismic Risks

The study area is located along the Weber segment of the Wasatch Fault, which runs 38 miles from North Ogden to North Salt Lake. Major earthquakes cause surface fault ruptures, leading to scarps (steps or offsets on the ground surface) in excess of six feet, on average. Ruptures occur at an estimated interval of between every 300 to every 3,000 years. The most recent rupture in the study area occurred between 700 and 1,000 years ago. Additional faults of a more minor nature may be present adjacent to the main trace (or intersection of the fault with the ground surface).

The main trace of the fault approaches or crosses US-89 in the following three locations: 400 North in Kaysville, between Mutton Hollow Road and SR-109, and between Antelope Drive and SR-193.

An additional seismic risk is tectonic subsidence, where the ground level drops during an earthquake. The area of expected subsidence runs ten miles west from the fault, with the majority of deformation within three miles. Subsidence will be at its greatest at the fault, gradually decreasing to the west.

The southern portion of the study area, around Farmington Main Street, has a high water table. This increases the potential for liquefaction (when saturated, sandy soils behave as a liquid during an earthquake).

3.19.1.2 High Water Table

The southern portion of the study area, around Farmington Main Street generally has a high water table, although the actual level fluctuates over time with rates of precipitation and groundwater withdrawal. In 2017, USGS groundwater monitoring wells in the area show levels ranging from well below normal to normal. The monitoring well at Bair Creek and US-89 shows levels at 198 feet below land surface. The monitoring well at Valley View Drive and US-89 shows levels at 111 feet below land surface. The monitoring well on Glover's Lane in Farmington (south of the study area) shows levels of 6 feet below land surface.

3.19.1.3 Landslides

Landslides are the movement of substantial amounts of earth, mud, or rock and can be caused by earthquakes, heavy precipitation, or other causes. Within the study area, landslides, including lateral spread, flow failure, and debris flows have historically occurred in natural drainages, particularly along the Weber River.

3.19.2 Environmental Consequences

3.19.2.1 No-action Alternative

There would be no direct impacts to the study area geology as a result of the No-action.

3.19.2.2 Preferred Alternative

Direct Impacts

There would be no direct impacts to the study area geology as a result of the Preferred Alternative.

Indirect Impacts

No indirect impacts are anticipated.

3.19.3 Mitigation

During final design geotechnical investigations of the study area will be required to mitigate for the effects of geologic hazards.

3.20 CONSTRUCTION IMPACTS

3.20.1 Environmental Consequences

3.20.1.1 No-action Alternative

There would be no construction impacts under the No-action Alternative.

3.20.1.2 Preferred Alternative

Social Conditions

Local residents as well as those traveling through the study area would experience traffic congestion, delays, and detours during the construction period. In addition, some residents who live or work in close proximity to the study corridor may experience disturbance effects from noise and dust generated by construction activities. Access to all properties would be maintained; however, there may be some temporary construction impacts.

Economic Conditions

Commuters who work in the study area would experience traffic congestion, delays, and detours during the construction period, as well as disturbance effects from noise and dust generated by construction activities. Access to all businesses would be maintained; however, there may be some temporary construction impacts.

Pedestrian and Bicyclist

The Preferred Alternative could require the temporary closure of bike and pedestrian facilities. Alternative pedestrian routes would be provided for any facilities closed temporarily.

Air Quality

Construction of the Preferred Alternative would result in temporary negative effects to air quality in the study area due to increased dust and particulates. PM_{10} emissions from construction activities are usually local and short-term and last only for the duration of the construction period. Construction activity may also generate a temporary increase in MSAT emissions, especially for construction projects of a longer duration. A permit for air quality impacts during construction would be obtained from the Utah Department of Air Quality (UDAQ) by the contractor.

Fugitive dust during construction would be mitigated and controlled in accordance with a fugitive dust control plan to be developed in coordination with UDAQ. This plan would include measures to minimize the extent of disturbed surface areas and restrict construction activities during high-wind periods.

Noise

Area residents would experience temporary construction noise impacts. Extended disruption of normal activities is not anticipated, since no one receptor is expected to be exposed to construction noise of long duration. Construction noise impacts would be minimized through adherence to UDOT Standard Specification 01355, Section 3.6 – Noise Control. The contractor would also be required to abide by any and all local noise ordinances.

Water Quality

During construction, there is the potential for temporary soil erosion and sediment/siltation impacts. Construction-related erosion and sedimentation would be managed through obtaining a Utah Pollution Discharge Elimination System (UPDES) permit from the Utah Department of Environmental Quality (UDEQ). Short-term impacts to water quality would be minimized through implementation of UDOT's BMPs from the Temporary Erosion and Sediment Control Manual.

Wetlands and Waters of the U.S.

There would be impacts to wetlands and waters of the U.S. during construction. Prior to construction, Nationwide and PGP 10 permits would be required.

Cultural and Paleontological Resources

It is not expected than any previously unidentified cultural or paleontological resources would be encountered during construction. However, in the event that any such resources are discovered, the contractor would be required to abide by UDOT Standard Specification 01355 – Environmental Compliance, Part 3.8, in relation to the discovery of any historical, archaeological, or paleontological objects, features, sites, and human remains.

Hazardous Waste

It is not expected that any hazardous materials would be encountered during construction activities. However, if hazardous waste material is encountered during construction, mitigation would be coordinated in accordance with UDOT Standard Specification 03155, which directs the contractor to stop work and notify the project engineer of any discovery of hazardous material. Disposition of any hazardous material would take place under the guidelines set by the UDEQ.

Visual Conditions

There would be some temporary visual impacts to the study area with the addition of construction signs, barricades, exposed earth, and construction equipment during construction.

Invasive Species

The Preferred Alternative would provide opportunities for the movement of invasive species. The contractor would abide by UDOT's Special Provision 02926S – Invasive Weed Control to minimize the spread and introduction of invasive species.

Energy

The Preferred Alternative would involve construction activities and would therefore directly consume energy to operate machinery, provide construction lighting, and produce and transport materials used in the construction of the project, such as asphalt.

Utilities

The Preferred Alternative would impact the following major utilities and other minor utilities:

- Bureau of Reclamation (BOR) 78" aqueduct
- Weber Basin Water Conservancy District's (WBWCD) 30" culinary water line
- Plains Pipeline 16" petroleum line

The study team met with the BOR, the WBWCD, and Plains Pipeline to adjust the Preferred Alternative to minimize impacts to the above utilities. Potential impacts to these utilities will be further coordinated during the design phase of the project.

3.20.2 Mitigation

No mitigation is required for construction impacts, as such impacts are temporary in nature.

During the design process, UDOT will form a Community Coordination Team (CCT) to provide opportunities for stakeholder input on the project design. The CCT would include 12-15 members, representing neighborhoods, cities, and other interests, who would provide input on design elements such as roadway profile, traffic related noise, aesthetic treatments, and other matters of concern. This team would help UDOT explore ways to minimize project impacts while meeting engineering standards and budgetary constraints.

3.21 CUMULATIVE IMPACTS

3.21.1 Introduction

Cumulative impacts are defined as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. Cumulative impacts include the direct and indirect impacts of a project, together with the reasonably foreseeable future actions of other projects

Cumulative impact analysis is focused on the sustainability of the environmental resource in light of all the forces acting upon it and can result from individually minor but collectively significant actions taking place over time. For a project to have a cumulative effect, however, it must first have a direct or indirect effect on the resource in question.

3.21.2 Methodology and Time Frame for Determining Cumulative Impacts

The geographic scope of the cumulative impacts analysis is Davis County. The time frame for the cumulative impacts analysis includes past action and extends to the 2040 design year. The cumulative impact issues to be analyzed, based on the concerns expressed during scoping and the impact analysis, are the following:

- Land Use
- Cultural Resources
- Air Quality
- Wetlands and Waters of the U.S.

3.21.3 Past, Present, and Reasonably Foreseeable Future Actions

This section provides a brief overview of the past, present, and reasonably foreseeable actions that either have contributed or will likely contribute to cumulative impacts on the previously mentioned resources.

3.21.3.1 Past Actions

Past actions that have impacted the development of Davis County Include the following:

- Settlement of the Davis County creeks and establishment of agriculture in the 1850s
- Construction of the Mountain Road in the 1860s, then US-89 in the 1930s
- Incorporation of towns to construct water systems in the 1930s
- Post-World War II suburban development greatly expanding the number of homes in Davis County
- Commercial development around I-15 and Shepard Lane

3.21.3.2 Present and Reasonably Foreseeable Future Actions

The study area is located in a suburban, mostly built-out area so there is less likelihood that there would be major changes in the land use and social composition of the area in the foreseeable future. There are still areas devoted to agriculture which are expected to continue to develop as residential or commercial land in the future. Present and reasonably foreseeable future plans for transportation in the study area include the following roadway and transit projects (see Table 3-28):

Table 3-28 Present and Reasonably Foreseeable Transportation Projects in the Study Area

Street/Project Name	Project Limits	Existing No. of Lanes	Future No. of Lanes	Type
East-West Facilities				
SR-193	Hill Field Road to US-89	4	4	Operational
North-South Facilities				
I-15 Managed Motorways	Weber County Line to Davis County Line	-	-	Operational
US-89	Harrison Boulevard to I-84	4	6 (Freeway)	Widening

Street/Project Name	Project Limits	Existing No. of Lanes	Future No. of Lanes	Type
West Davis Corridor	I-15 to Weber County Line	-	4 (Freeway)	New Construction
Church Street Extension	I-84 to SR-193	0	2	New Construction
Transit Facilities				
North Ogden to Salt Lake Corridor	Layton FrontRunner Station to US-89	-	-	BRT
North Ogden to Salt Lake Corridor	US-89 to Farmington Front-Runner Station	-	-	BRT

3.21.4 Cumulative Impact Analysis

3.21.4.1 Land Use

Changes in land use can be expected as a cumulative impact. The Preferred Alternative would provide improved access to proposed retail, office, and residential land uses within the study area. In particular, Layton City has zoned a currently agricultural area around the proposed Gordon Avenue interchange for commercial development. This development would be larger than other commercial sites in the area. If the Preferred Alternative is constructed, it is expected that the conversion of land use to commercial may happen sooner than would otherwise be the case.

The cumulative impact of land use changes that are anticipated by the reasonably foreseeable actions, both public and private, are in agreement with the land use plans of each city and Davis County.

3.21.4.2 Cultural Resources

The study area contains both archaeological and historic architectural resources that are considered to be eligible for listing in the NRHP. The Preferred Alternative would directly impact one eligible archaeological site and nine eligible architectural properties. Reasonably foreseeable future actions have not yet been evaluated for impacts to historic properties. It can be anticipated that they may result in adverse effects to additional historic buildings and archaeological sites in the general area of, but not within, the Area of Potential Effects. Additional residential and commercial development or redevelopment may also result in impacts to cultural resources, but these cannot be identified with any certainty.

The impacted archaeological site is considered eligible because of its construction by the CCC during the Great Depression. Although the CCC and other New Deal programs constructed many buildings and other sites throughout Utah, some of these buildings and sites have been demolished. The number of remaining buildings and sites numbers at least in the dozens.

Most historic structures that would be affected by future actions are residential homes that are considered historic primarily for their ability to contribute to a hypothetical future National Register District. The age and architectural styles are not unique, but are typical of many residential homes in the area.

The impacts to archaeological and historic resources would not collectively have a significant impact to the historic resources of Davis County and therefore there is not a significant cumulative impact.

3.21.4.3 Air Quality

Air Quality Standard Status

In the 1990s, Davis, Salt Lake, and Utah Counties failed to attain the NAAQS for ozone, particulate matter, carbon monoxide, and sulfur dioxide. Salt Lake and Davis Counties were officially re-designated to attainment status for ozone by the EPA in 1997; Salt Lake, Ogden, and Provo Cities were re-designated to attainment for carbon monoxide in 1999, 2001, and 2006 respectively. Requests to re-designate Salt Lake County and part of Tooele County to attainment for sulfur dioxide, and to re-designate Salt Lake and Utah Counties and Ogden City to attainment for PM_{10} were submitted to the EPA in 2005.

On September 21, 2006, the EPA issued revisions to the NAAQS for particle pollution. The EPA strengthened the 24-hour $PM_{2.5}$ standard from the 1997 level of 65 µg/m^3 (micrograms per cubic meter of air) to 35 µg/m^3,

On September 21, 2006, the EPA issued revisions to the NAAQS for particle pollution. The EPA strengthened the 24-hour $PM_{2.5}$ standard from the 1997 level of 65 µg/m^3 (micrograms per cubic meter of air) to 35 µg/m^3, and retained the current annual fine particle standard at 15 µg/m^3.

In October 2008, the EPA strengthened the NAAQS for lead to increase protection of public health and the environment. The ambient air lead standards—both the primary (health-based) and secondary (environment-based) standards—have been revised to 0.15µg/m^3.

In October 2016 (effective December 28, 2016), the EPA issued its Final Rule on ozone, which lowered the primary and secondary 8-hour ozone standards to 0.070 ppm.

$PM_{2.5}$

In 2013, a D.C. Circuit Court of Appeals ruling against the EPA interpretation of the Clean Air Act (CAA) required the agency to publish a new schedule for $PM_{2.5}$ State Implementation Plan (SIP) submissions. Utah had to resubmit its three $PM_{2.5}$ plans and demonstrate that each area would either attain the new standard by December 31, 2015, or that it would be impracticable to do so even after applying all reasonable control measures. The State was unable to attain the $PM_{2.5}$ standard by the deadline. On December 1, 2016, the EPA reclassified these areas as "Serious" rather than "Moderate", which requires that Utah must complete new SIP revisions for these three nonattainment areas by December 31, 2017 and demonstrate attainment of the $PM_{2.5}$ standard by December 31, 2019. If the State shows that the 2019 deadline is impracticable, it can petition for an extension of up to five years, but an extension would require the SIP to employ Most Stringent Measures (MSM), which include any technologies that have been implemented in another state's SIP or achieved in practice, regardless of cost.

Reclassification of Utah's nonattainment areas to "serious" will impact point, area, and mobile sources. Point sources specifically identified in the Moderate area SIPs will need to ensure that their controls meet Best Available Control Measures (BACM), including Best Available Control Technology (BACT). In Serious nonattainment areas, sources that emit 70 tons per year (tpy) or more of $PM_{2.5}$ or any $PM_{2.5}$ precursors are subject to BACT, which would affect more point sources than under the previous 100 tpy cutoff under the Moderate area SIPs. For transportation conformity, $PM_{2.5}$-related emission goals known as Motor Vehicle Emission Budgets (MVEDs) will be included in each SIP and the MPO will need to demonstrate conformity with the MVEBs as part of the SIP's transportation-planning requirements.

According to WFRC, $PM_{2.5}$ and $PM_{2.5}$ precursor (NOx and VOC) emissions will continue to decrease in the near future and are expected to be within the new standards by the design year.

With support from WFRC, the UDAQ has been developing a new plan to reduce $PM_{2.5}$ related emissions to the point that the Wasatch Front Region will once again be in compliance with national $PM_{2.5}$ standards. The improved vehicle emission technology and national standards enacted in 2004 and 2007 respectively will be instrumental in the UDAQ plan to achieve the new $PM_{2.5}$ standard. The WFRC Regional Transportation Plan will also aid in the emission reduction effort by reducing pollution that comes from traffic congestion and by improving transit service (bus, light rail, and commuter rail) to reduce dependence on private automobiles. According to the WFRC, vehicle emissions from transportation sources are projected to decline by 52% from 2008 – 2019, due to improvements in auto technology, transit utilization, and other travel choices.

Ozone

The UDAQ has recommended three ozone nonattainment areas, which include:

- Portions of Utah County currently in nonattainment for PM2.5
- Portions of Weber, Davis, Tooele, and Salt Lake counties currently in nonattainment for PM2.5
- Portions of the Uinta Basin that are 6,000 feet or lower in elevation and within jurisdictions subject to state air-quality regulations

EPA is expected to publish its final designations and classifications in October 2017.

Utah, along with other western states, has elevated background ozone from wildfires, stratospheric intrusions, and domestic and intercontinental ozone transport. The EPA has indicated that it will work closely with Utah to find ways to comply with the new standard while taking in to account exceedances potentially caused by background ozone.

Davis County is in attainment for the 8-hour standard, so the original SIP for Davis County has been replaced by a plan to maintain ozone related emissions at or below current levels to maintain compliance with the new standard.

MSAT

Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (such as airplanes), area sources (such as dry cleaners), and stationary sources (such as factories or refineries). MSAT's, which are compounds emitted from highway vehicles and non-road equipment, are a subset of the 188 air toxics defined by the Clean Air Act. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead federal agency for administering the Clean Air Act and has specific responsibilities for determining the health effects of MSATs. On April 29, 2014, the EPA published a final rule adopting new emission standards and fuel requirements for motor vehicles and for motor vehicle fuels (79 FR 23414). The final rule included Tier 3 emission standards to reduce exhaust and evaporative emissions from light-duty vehicles, light-duty trucks, and heavy duty vehicles up to 14,000 pounds GVWR.

The Tier 3 program is part of a comprehensive approach to reducing the impacts of motor vehicles on air quality and public health. The program considers the vehicle and its fuel as an integrated system, setting new vehicle emissions standards, and lowering the sulfur content of gasoline beginning in 2017. The new vehicle standards will reduce both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. The gasoline sulfur standard will enable more stringent vehicle emissions standards and will make emissions control systems more effective. According to the EPA, the new Tier 3 vehicle emissions standards, combined with the reduction of gasoline sulfur content, will significantly reduce motor vehicle emissions, including nitrogen oxides (NOX) volatile organic compounds (VOC), direct particulate matter (PM2.5), carbon monoxide (CO), and air toxics (see Table 3-29).

Table 3-29 Example of Estimated Emission Reductions from the Final Tier 3 Standards (Annual U.S. Short Tons)

Pollutant	2018		2030	
	Tons	Percent of On-road Inventory	Tons	Percent of On-road Inventory
No_x	264,369	10%	328,509	25%
VOC	47,504	3%	167,591	16%
CO	278,879	2%	3,458,041	24%
Direct $PM_{2.5}$	130	0.1%	7,892	10%
Benzene	1,916	6%	4,762	26%
SO_2	14,813	56%	12,399	56%
1,3-Butadiene	257	5%	677	29%
Formaldehyde	513	2%	1,277	10%
Acetaldehyde	600	3%	2,067	21%
Acrolein	40	3%	127	15%
Ethanol	2,704	2%	19,950	16%

Due to the new Tier 3 standards, overall emissions from motor vehicles would be reduced in the design year.

Future residential growth could also affect future ozone levels due to an increase in non-road sources, such as lawn mowers, paints, and consumer products, which emit pollutants such as NO2 and/or VOCs, other this is expected to be minimal in the study area.

Conclusion

With ongoing improvements to vehicle emissions, including Tier 3 standards, and more stringent air quality controls, it is expected that air quality will continue to improve within the Wasatch Front airshed through the 2040 planning period, even with anticipated increases in vehicle miles traveled. Due to the new Tier 3 standards, overall emissions from motor vehicles would be reduced in the design year. The Preferred Alternative involves converting US-89 to a limited access freeway and is intended to improve traffic flow and address congestion and delays from existing and anticipated future travel demand in the study area.

Vehicle emissions have continued to decrease substantially over time as the EPA has imposed a series of tighter emission-control requirements on engine emissions. As the region's vehicle fleet becomes newer and the older, higher-emitting vehicles are gradually replaced, it is expected that the tighter emission standards will more than offset the anticipated increase in vehicle miles traveled.

Based on the air quality conformity analysis conducted by the WFRC for the 2040 Regional Transportation Plan and the draft Air Quality Memorandum dated June 20, 2017, all the transportation projects in the 2015-2040 RTP conform to the SIP or the EPA interim conformity guidelines.

Regional modeling conducted by the WRFC for the 2015-2040 transportation conformity analysis demonstrated that all regionally significant transportation projects included in the RTP would be in compliance with the NAAQS. Further, vehicle emissions have continued to decrease substantially over time as the EPA has imposed tighter emission-control requirements on engine emissions. As the region's vehicle fleet becomes newer and the older, higher-emitting engines are gradually replaced, it is expected that the tighter emission standards will substantially offset the expected growth in vehicle miles traveled in the area that would occur under either scenario, but which would be greater under the Preferred Alternative.

3.21.4.4 Wetlands and Waters of the U.S.

Wetlands and waters of the U.S. have been extensively altered or lost as a result of urban and agricultural development. Many of the streams that flow to the Great Salt Lake have been altered for water supplies, control of stormwater, agricultural uses, and urban development.

The Preferred Alternative would impact approximately 0.50 acres and 2,200 linear feet of wetlands and waters of the U.S. It is reasonably foreseeable that wetlands and waters of the U.S. will continue to be impacted as growth and development continue to occur. However, all projects are subject to Section 404 of the Clean Water Act permitting which requires the identification of the least environmentally damaging practicable alternative. In addition, permitting requires mitigation through wetland creation, restoration, or enhancement. It is expected that wetland and waters of the U.S. impacts will be permitted and mitigated through the U.S. Army Corps of Engineers regulatory program.

3.22 MITIGATION AND PROJECT COMMITMENTS SUMMARY

All UDOT Standard Specifications and BMPs will be followed.

3.22.1 Land Use

3.22.1.1 Land Use and Zoning

No mitigation required.

3.22.1.2 Recreation

UDOT, in coordination with Layton City, will reestablish the Adams Canyon Trail parking area and connect it to the existing trail facility (see Map 8 in Volume 4).

3.22.1.3 Public Use Facilities

During final design, the park-and-ride lot at Antelope Drive will be reconfigured to maximize the remaining space.

3.22.1.4 Section 6(f) of the Land and Water Conservation Fund

The conversion of the land from outdoor recreational use to transportation use would require compliance with the conversion procedures of the LWCFA, including obtaining substitution recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location. UDOT will comply with all required LWCFA procedures pertaining to the conversion of the property within Nicholls Park from outdoor

recreational use to transportation use. No construction activities would proceed in relation to the land acquired from Nicholls Park without prior approval from the SLO.

3.22.2 Farmlands

No mitigation required.

3.22.3 Social Conditions and Environmental Justice

No mitigation required.

3.22.4 Relocations and Right-of-way Acquisition

No mitigation required.

3.22.5 Economics

No mitigation required.

3.22.6 Pedestrian and Bicyclist Considerations

UDOT will work with the local municipalities during final design to designate potential bike routes that parallel US-89.

3.22.7 Air Quality

No mitigation required.

3.22.8 Noise

Noise Wall 1

Noise Wall 1 would be located on the west side of US-89 (as shown in Maps 14 and 15) and would be 3,370 feet long. This area includes 16 platted subdivision lots which were vacant on the aerial photography. These lots were checked for building permits on August 8, 2017. It was found that two of the lots had completed homes and 10 more had been issued building permits. This information was used in considering whether the noise wall met the UDOT Noise Abatement Policy requirements.

A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA or more for 35% of the front row receptors and is not considered reasonable. A 16-foot wall would reduce noise levels by 7 dBA for 80% of front-row receptors and would be cost-effective at $15,859 per benefited receptor. This wall is reasonable and feasible.

Noise Wall 6

Noise Wall 6 consists of Wall 6A (2,100 feet long) and Wall 6B (785 feet long) as shown in Maps 11 and 12. A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for 35% of the front row receptors. A 16-foot wall would reduce noise levels by 7 dBA for 50% of front-row receptors and would be cost-effective at $25,928 per benefited receptor. This wall is reasonable and feasible.

Noise Walls 8 and 9

Noise Walls 8 and 9 consist of a 4,275-foot-long wall along the west side of US-89 between Antelope Drive and Cherry Lane and a 610-foot long wall where the Antelope Drive southbound entrance ramp merges onto mainline US-89 (as shown in Maps 10 and 11. A 6-foot to 8-foot wall would not reduce noise levels by 7 dBA for 35% of the front row receptors. A 10-foot to 16-foot wall would reduce noise levels by 7 dBA for at least 35% of front row receptors and would be cost-effective at $24,420 or less per benefited receptor. In this case, more than one wall height (12 ft, 14 ft, or 16 ft) would meet the feasibility and reasonability requirements. Walls 8 and 9 are reasonable and feasible.

Noise Wall 12

Noise Wall 12 would be located on the west side of US-89 (as shown in Maps 8 and 9 of Volume 4) and would be 3,090 feet long. A 6-foot to 10-foot wall would not be cost-effective at over $61,700 per benefited receptor. A 12-foot to 16-foot wall would reduce noise levels by 7 dBA for at least 54% of front-row receptors and would be cost-effective. In this case, more than one wall height (12 ft, 14 ft, or 16 ft) would meet the feasibility and reasonability requirements. This wall is reasonable and feasible.

Noise Wall 14

Noise Wall 14 consists of Wall 14A (4,165 feet long) on the west side of US-89 and continuing along the southbound entrance ramp, and Wall 14B (670 feet long), which overlaps the ramp wall (as shown in Maps 7 and 8 of Volume 4). A 6-foot to 14-foot wall would not reduce noise levels by 7 dBA for 35% of the front row receptors. A 16-foot wall would reduce noise levels by 7 dBA for 44% of front row receptors and would be cost-effective at $28,658 per benefited receptor. This wall is reasonable and feasible.

Noise Wall 17

Noise Wall 17 consists of Wall 17A (2,750 feet long) and Wall 17B (1,195 feet long) on the west side of US-89 (as shown in Maps 4 and 5 of Volume 4). A 6-foot to 10-foot wall would not be cost-effective. A 14-foot or 16-foot wall would reduce noise levels by 7 dBA for at least 65% of front row receptors and would be cost-effective at $26,860 or less per benefited receptor. In this case, more than one wall height (14 ft or 16 ft) would meet the feasibility and reasonability requirements. This wall is reasonable and feasible.

Noise Walls 18, 19, and 20

Noise Walls 18, 19, and 20 would be located on the east side of US-89 (as shown in Maps 3, 4, and 5). The total length of these three walls would be approximately 7,400 feet. A 6-foot to 12-foot wall would not be cost-effective. A 14-foot to 16-foot wall would reduce noise levels by 7 dBA for at least 75% of front-row receptors and would be cost-effective at $26,022 or less per benefited receptor. In this case, more than one wall height (14 ft or 16 ft) would meet the feasibility and reasonability requirements. These three walls are reasonable and feasible.

Noise Wall 22

Noise Wall 22 would be located on the east side of US-89 (as shown in Maps 2 and 3) and would be 3,000 feet long. A 6-foot to 14-foot wall would not be cost-effective. A 16-foot wall would reduce noise levels by 7 dBA for 93% of front-row receptors and would be cost-effective at $27,259 per benefited receptor. This wall is reasonable and feasible.

Viewpoints of Property Owners and Residents

Once the final design for the Preferred Alternative is complete, UDOT will re-evaluate and finalize the noise analysis and potential location of noise walls. If the proposed noise abatement measures are still feasible and reasonable, UDOT will then consider the viewpoints of property owners and residents to determine whether the proposed noise abatement measures are desired. Balloting will be conducted consistent with the procedures described in UDOT's Noise Abatement Policy.

3.22.9 Water Resources

No mitigation required.

3.22.10 Wetlands and Waters of the U.S.

Impacts to WOUS will be approximately 2,234 linear feet and 0.52 acres in total. While 0.52 acres are being impacted, it is believed that 0.030 acres of wetland and WOUS resources are isolated, specifically Wetland 7, the Man Made Pond, and Unnamed Seep 1. If these isolated resources are not counted due to isolation, the total acres impacted is reduced to 0.49 acres. These impacts would require a USACE Nationwide 14 permit and compensatory mitigation. Impacts to the creeks and unnamed drainages may require a Stream Alteration Permit and the jointly obtained U.S. Army Corps of Engineers (USACE), Programmatic General Permit 10 (PGP 10), which are issued by the Utah Division of Water Resources (UDWR).

3.22.11 Floodplains

Hydraulic analyses will be performed at each improved culvert crossing associated with a floodplain to determine if there would be a rise in the BFE. If the rise in the BFE is greater than one foot, proper steps will be taken with local floodplain administrators and FEMA to obtain a LOMR. These steps include the following:

- Coordination with local floodplain administrators during final design
- Local floodplain administrator approval of CLOMR documentation
- Obtain a CLOMR from FEMA

- Obtain an FDP from local floodplain administrators
- Following project completion, obtain an LOMR from FEMA

3.22.12 Wildlife and Threatened and Endangered Species

Wildlife crossing strategies were evaluated to minimize wildlife vehicle collisions and promote connectivity on either side of the highway within the study area. Based on an assessment conducted by the Utah Division of Wildlife Resources, it was determined that wildlife crossings are not desirable because they would promote an increase in the size of deer populations in residential communities on the west side of the highway. As a consequence, wildlife fencing without wildlife crossings will be installed along the length of the proposed corridor to minimize wildlife vehicle collisions.

Although the Preferred Alternative would not have a long-lasting negative affect on wildlife when compared against existing conditions, there may be short-term adverse effects to wildlife species such as birds during construction of the project, particularly during the breeding season if nesting within 0.5-mile of the proposed project corridor. Secondary impacts such as construction noise could promote nest abandonment. Species potentially affected by construction during the breeding season include raptors and ground nesting birds such as waterfowl.

The MBTA makes it illegal to "pursue, hunt, take, capture, kill, attempt to take, capture or kill" any migratory bird or their eggs and nests (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755). This includes creating enough disturbances (e.g., noise, vibrations, visual disturbances, etc.) to cause a bird to abandon an active nest or fledglings. To comply with the MBTA, the following mitigation measures could be implemented during construction to avoid potential impacts:

- To the extent possible, clearing of nesting vegetation should be done between the months of September through February. If clearing is performed between March and August, a qualified wildlife biologist should perform a nest clearance survey prior (within seven days) to construction activities if any vegetation clearing is required. (Peak avian nesting season in Utah is April-July, clearing of nesting substrate during this time frame could result in increased risk.)
- If actively nesting and/or brood rearing birds are found within or reasonably near the clearance area, clearance and construction should be suspended and UDOT Environmental Services should be contacted for further direction.

3.22.13 Cultural Resources

UDOT will mitigate adverse effects to historic properties through completion of a Memorandum of Agreement (MOA) with the SHPO. Mitigation efforts may include the completion of intensive level survey forms for affected homes, research on the history of the area, research on the history of the CCC in the area, detailed floor-plan drawings and photographs, or other measures. Construction will not be allowed to proceed until an approved MOA is in place. The MOA can be found in Chapter 4 Comments and Coordination.

3.22.14 Paleontology

No mitigation required.

3.22.15 Hazardous Waste

No mitigation required.

3.22.16 Visual Conditions

No mitigation required.

3.22.17 Energy

No mitigation required.

3.22.18 Invasive Species

No mitigation required.

3.22.19 Geology

During final design geotechnical investigations of the study area will be required to mitigate for the effects of geologic hazards.

3.22.20 Construction

During the design process, UDOT will form a Community Coordination Team (CCT) to provide opportunities for stakeholder input on the project design. The CCT would include 12-15 members, representing neighborhoods, cities, and other interests, who would provide input on design elements such as roadway profile, traffic related noise, aesthetic treatments, and other matters of concern. This team would help UDOT explore ways to minimize project impacts while meeting engineering standards and budgetary constraints.

Chapter 4: Comments and Coordination

This chapter describes the ongoing coordination activities, summarizes key issues, and outlines pertinent information received from the public and agencies involved in this project. All agencies and persons that were consulted are listed here. Chapter 4 is organized in the following manner:

- **Section 4.1 Public and Agency Coordination** lists key meetings and gives a general outline of the material attendees discussed
- **Section 4.2 Agency Correspondence** shows correspondence letters and emails from agencies

Public involvement activities included the following:

- Postcards, public notices, study website, and hotline
- Agency and public meetings
- Neighborhood and individual meetings as requested

4.1 PUBLIC AND AGENCY COORDINATION

The following is a list of meetings held as part of the coordination process for this State Environmental Study (SES), including a brief summary of the notes. Agency meetings were scheduled individually, while regular study team meetings were held approximately every other week.

December 13, 2016: Project Kickoff Meeting

In this initial meeting, the study team members met to discuss study roles and responsibilities, scheduling, scoping activities, and agency coordination.

January 31, 2017: Stakeholder Meeting with Utah Division of Wildlife Resources (UDWR)

Representatives from Horrocks Engineers and the UDOT project manager met with UDWR representative Pam Kramer. Those in attendance considered the following:

- Wildlife crossing at Bair Creek/Nicholls Road
- Need for wildlife crossings along the US-89 corridor
- Construction of wildlife fence along US-89 corridor

January 31, 2017: Stakeholder Meeting with Utah Division of Wildlife Resources (UDWR)

Representatives from Horrocks Engineers and the UDOT project manager met with UDWR representative Pam Kramer. Those in attendance considered the following:

- Wildlife crossing at Bair Creek/Nicholls Road
- Need for wildlife crossings along the US-89 corridor
- Construction of wildlife fence along US-89 corridor

The study team and UDWR decided that build alternatives should not include wildlife crossings within the study area.

February 16, 2017: Public Scoping Meeting

Representatives from UDOT, Horrocks Engineers, Frontline, and the public were in attendance at this open house. Notices were published in the major state newspapers on February 5 and 12, 2017, a mailer was sent to 4,000 residents and businesses within the study area, and fliers were given to the public libraries and to the cities. Additionally, an email invitation was sent to approximately 50,000 recipients. A total of 285 people attended the public scoping meeting and over 200 comments were received. Items discussed were displayed on posters at the open house and included the following:

- Purpose of the study
- Study area
- Transportation and environmental considerations
- Schedule and environmental process
- Invitation for public input

March 2, 2017: Stakeholder Meeting with the Weber Basin Water Conservancy District (WBWCD) and Bureau of Reclamation (BOR)

Representatives from UDOT, Horrocks Engineers, the Weber Basin Water Conservancy District (WBWCD), and the Bureau of Reclamation (BOR) met to discuss the environmental study and potential impacts to water resources. The meeting attendees discussed the following:

- Upcoming Weber Basin projects, including the need to:
  - Increase the existing Davis aqueduct pipe size at or near SR- 193
  - Relocate the Layton City water tank at Gordon Avenue
  - Assist with Kaysville City's new tank plans near Green Road
- Potential shut downs of the existing 30" water line from Cherry Lane to 400 North in Kaysville that parallels US-89
- Location of the Davis Aqueduct (84" north of SR-193 and 74" south of SR-193)
- Permission/permits to complete test holes within the existing Davis Aqueduct easement
- Potential schedule for ongoing coordination meetings throughout the study process

March 22, 2017: Stakeholder Meeting with the Davis Chamber of Commerce Transportation Committee

Representatives from UDOT, Horrocks Engineers, Frontline, and the Davis Chamber of Commerce Transportation Committee were in attendance. Items discussed in the meeting included the following:

- Environmental study process and schedule
- Purpose and need for the study
- Study team contact information

March 29, 2017: Stakeholder Meeting With Davis County Sheriff's Office

Representatives from UDOT, Horrocks Engineers, Frontline, the Davis County Sheriff's Office, and the Kaysville Fire Department were in attendance. Items discussed in the meeting included the following:

- Current emergency response times
- Primary routes used to access neighborhoods east of US-89, particularly in Fruit Heights

May 3, 2017: Stakeholder Meeting with the Utah Trucking Association

UDOT and Horrocks Engineers representatives met with the Utah Trucking Association members to discuss an overview of the environmental study and potential improvements to the roadway. Items discussed included the following:

- Negative feedback regarding roundabouts
- Existing high-load truck limitations on US-89
- Effects on normal commercial traffic
- Primary trucking routes from Salt Lake City, Utah to Evanston, Wyoming (I-80 through Parley's Canyon and US-89)
- Positive feedback regarding improvements to US-89, including benefits to the trucking industry and the decrease in use of "jake" brakes

May 3, 2017: Stakeholder Meeting with the Utah Transit Authority (UTA)

Representatives from UTA and the Davis County Service Planner met with UDOT and Horrocks Engineers to discuss the following items:

- Study overview and proposed improvements
- Potential impacts to the 400 North and Antelope Drive park-and-ride lots
- Possible expansion of park-and-ride lots
- Importance of park-and-ride locations
- Pedestrian access across US-89
- Existing bus stops on US-89
- Bus operations

May 4, 2017: Stakeholder Meeting with the WBWCD and BOR

Representatives from UDOT, Horrocks Engineers, WBWCD, and the BOR met to discuss the environmental study and existing resources in the area. Items discussed included the following:

- Existing Davis Aqueduct/easement, which partially parallels US-89 through the study area
- Operations of the Aqueduct
- BOR National Environmental Policy Act (NEPA) process and timing

May 22, 2017: Alternatives Screening Workshop

Representatives from UDOT, Horrocks Engineers, and Frontline met to evaluate a wide range of alternatives. Items discussed in the meeting included:

- Screening for placement of interchanges/crossings, including the importance of reasonable access, travel demand, and compatibility with the roadway network classification
- Screening for US-89 system alternatives and criteria, including purpose and need and environmental impacts
- Screening for cross-street concepts and criteria, including engineering feasibility, purpose and need, environmental impacts, cost, and other screening factors

May 23, 2017: Coordination Meeting with Layton City

UDOT and Horrocks team members met with Layton City to discuss topics specific to their City. The team covered the following topics:

- Utilities (Oak Hills water tank, Oak Hills Water System, Valley View tank, Oakridge tank, storm drain replacement at Cherry Lane, and water line connection under US-89 at Antelope Drive)
- Potential trail connection south of SR-193 and Antelope Drive
- Pedestrian crossings at each interchange
- Potential 10-ft multi-use path along east side of US-89
- Floodplain updates for Kays Creek, South Fork, and North Fork
- Full interchanges versus partial interchanges at Oak Hills and Gordon Avenue
- Fire station at Gordon Avenue
- Road network connectivity at Antelope Drive

June 8, 2017: Stakeholder Meeting with the WBWCD and BOR

Representatives from UDOT, Horrocks Engineers, WBWCD, and the BOR met to discuss the environmental study and potential impacts to water resources. Items discussed in the meeting included:

- Potential impacts to the Davis Aqueduct
    - Allowable temporary and permanent impacts within the Davis Aqueduct easement
    - Construction timing (limitations, restrictions, water needs, etc.)
- Need and timing to complete an Environmental Assessment (EA) with the BOR as the lead federal agency
- Need to avoid impacts (to the extent possible) to the existing water storage pond and its associated dam located east of Oak Hills

June 14, 2017: Coordination Meeting with Layton City

UDOT and Horrocks team members met with Layton City staff to discuss progress and to answer the city's questions on the study. Attendees discussed the following items:

- Potential improvements, including converting US-89 to a freeway with limited access
- Purpose and Need
- Current emergency response times
- General plan update for Layton City
- Potential impacts to Adams Canyon trail head and parking area
- Initial interchange concepts at Oak Hills Drive, Gordon Avenue, and Antelope Drive
- Underpass for pedestrians near Sunset Drive
- Need to accommodate pedestrians and bicyclists with sidewalks, multi-use path, shoulders, etc.
- Study schedule

June 19, 2017: Stakeholder Meeting with Fruit Heights Council Members

Representatives from UDOT, Horrocks Engineers, and Kimley-Horn met with two Fruit Heights Council members at Fruit Heights City Hall. Items discussed in the meeting included:

- Residential concern regarding the proposed grade-separated overpass at Nicholls Road

June 20, 2017: Alternatives Open House

Representatives from UDOT, Horrocks Engineers, Frontline, and the public were in attendance at this open house. A mailer was sent to 5,000 residents and businesses within the study area, and fliers were given to public libraries and the cities. Additionally, an email invitation was sent to approximately 50,000 recipients. Over 640 people attended the public open house and over 100 comments were received. Items discussed were displayed on large banners and on posters in the meeting. Topics presented included the following:

- Purpose of the study
- Study area
- Transportation and environmental considerations
- Schedule and environmental process
- Alternatives at each crossing location
- Alternatives screening criteria (primary, secondary, and tertiary levels)
- Invitation for public input

June 27, 2017: Coordination Meeting with Layton City

Layton City staff members met with UDOT and Horrocks representatives to discuss the study progress. The following topics were covered at this monthly meeting:

- Summary of public open house (comments received will be posted to the website)
- Potential solutions to accommodate the Adam's Canyon trail head
- Interchange concepts for Gordon Avenue and Oak Hills Drive
- Concern that a one-way frontage road could place more traffic near homes
- Placement of the proposed Gordon Avenue interchange and the associated roadway network (Layton City believes this area has the potential to be commercially developed in the future)

June 27, 2017: Coordination Meeting with Kaysville City

Representatives from Horrocks Engineers and UDOT met with Kaysville City staff members to discuss the following items:

- Summary of public open house (comments received will be posted to the website)
- Existing 30" waterline near US-89, which provides 100% of the City's water
- Potential impacts to the 30" waterline
- Potential water supply options in the event of a temporary shutdown of the 30" waterline
- Plans to build a water tank east of US-89
- Interchange concepts at 400 North and Crestwood Road

June 27, 2017: Coordination Meeting with Fruit Heights City

Fruit Heights City staff met with UDOT and Horrocks study team members to discuss the following topics:

- Summary of public open house (comments received will be posted to the website)
- Possible drainage opportunities under potential build alternatives
- Build options at Nicholls Road
- Efforts by the study team to update potential build concepts based on concerns expressed by residents

July 10, 2017: Screening Workshop Part II and Risk Workshop

UDOT, Horrocks Engineers, HDR Engineering, and Frontline study team members met to work on the final screening of the alternatives and to perform a risk assessment. The team discussed the following topics:

- Screening Workshop Part II
  - Regional alternatives and screening criteria (primary purpose and need)
  - Interchange location alternatives and screening criteria (operations)
  - US-89 system alternatives and screening criteria (secondary purpose and need, environmental impacts, and cost)
  - Selection of the freeway alternative
  - Cross-Street concepts and screening criteria at Main Street, Nicholls Road, 400 North, Oak Hills Drive, Gordon Avenue, Antelope Drive, and SR-193
- Risk Assessment Workshop:
  - Initial cost and schedule estimates
  - Identifiable risks that can be clearly understood and managed
  - Key events in a build project scenario that could cause deviation to cost and/or schedule
  - Monte Carlo simulation analysis to model the collective impact of base and risk issues to produce an estimate of a reasonable range and distribution for cost and schedule
  - Assumptions and constraints that were used in developing the estimated project cost and schedule range

July 13, 2017: Coordination meeting with Cherry Hill Management

UDOT, Horrocks Engineers, Frontline, and Cherry Hill Management met to discuss design concepts. The following topics were covered at this meeting:

- Potential access changes
- Design concepts for Lloyd Road and Main Street

July 20 2017: Stakeholder Meeting with Fruit Heights Council Members

Representatives from UDOT, Horrocks Engineers, and Kimley-Horn met with two Fruit Heights Council members at the home of a Fruit Heights Council member. Items discussed in the meeting included:

- Clarification regarding design concepts of Nicholls Road and 400 North
- SES Schedule
- Response to public hearing comments

July 25, 2017: Coordination meeting with Layton City

Layton City, UDOT, and Horrocks representatives met at the Layton City offices to discuss the following topics:

- Screening process results
- Study schedule to complete a draft document and hold a Public Hearing

July 25, 2017: Coordination Meeting with Kaysville City

UDOT and Horrocks study team members met with Kaysville City staff members to discuss items relating to the US-89 project progress.

- Screening process results
- Study schedule to complete a draft document and hold a Public Hearing
- Possible collaboration with the City's proposed water tank site to include stormwater detention
- Existing connection on the west side of US-89 between 450 North and Elias Road

July 25, 2017: Coordination Meeting with Fruit Heights

Representatives from UDOT, Horrocks, and Fruit Heights City met to discuss the following items:

- Screening process results
- Study schedule to complete a draft document and hold a Public Hearing

July 26, 2017: Neighborhood Meeting – Hobbs Creek Area

Representatives from UDOT, Horrocks, and Frontline met with approximately 160 residents at the Layton Christian Academy to discuss the ongoing study, address specific concerns, and answer individual questions. The following topics were discussed:

- Overview of the June 20th public meeting
- One-way frontage road concept
- Study schedule to complete a draft document and hold a Public Hearing

July 27, 2017: Neighborhood Meeting – Mutton Hollow Area

Representatives from UDOT, Horrocks, and Frontline met with approximately 60 residents at the Kaysville City Police Station to discuss the ongoing study and address specific concerns. The following topics were discussed:

- Overview of the June 20th public meeting
- Proposed alternatives at 400 North and Crestwood Road
- Study schedule to complete a draft document and hold a Public Hearing

August 9, 2017: Neighborhood Meeting – Valley View Residents

Representatives from UDOT, Layton City, State Representative Handy, Horrocks, and Frontline met with Valley View residents to discuss the ongoing study and address specific concerns. The following topics were discussed:

- Antelope Drive to Valley View connection
- Minimization of noise and view impacts
- Right-of-Way impacts to residences
- Design issues related to potential one-way frontage roads, connection to SR-193, and municipal sidewalk improvements

September 7, 2017: Public Hearing

Representatives from UDOT, Horrocks Engineers, Frontline, and the public were in attendance at this open house-style public hearing. Notices were published in the major state newspapers on August 24 and 31, 2017, a mailer was sent to 12,000 residents and businesses within the study area, and fliers were given to the public libraries and to the cities along the corridor. Additionally, an email invitation was sent to approximately 50,000 recipients. A total of approximately 700 people attended the public hearing and over 550 comments were received. Items discussed were displayed on posters at the open house and included the following:

- Purpose of the study
- Alternatives Screening Process
- Preferred Alternative and Effects
- Schedule and process
- Invitation for public input

September 21, 2017: Stakeholder Meeting with the Wasatch Front Regional Council (WFRC)

Representatives from UDOT, Horrocks Engineers, and Representative Steve Handy met to discuss the travel demand model with the WFRC.

October 18, 2017: Coordination Meeting with Layton City

Representatives from UDOT, Horrocks Engineers, and Layton City met to discuss mitigation for adverse effects to cultural resources.

November 9, 2017: Stakeholder Meeting with ReVU89

Representatives from UDOT, Frontline, ReVU89 and Metro Analytics met to discuss the ongoing study and Preferred Alternative Design. The following topics were discussed:

- WFRC forecast model calibration
- Does a four vs. six lane configuration (including overpasses)
- Corridor aesthetics enhancement if four lane configuration is built using the remaining 6 lane configuration budget
- Review where growth is occurring along corridor
- Adjustment to final design roadway elevation to reduce noise and visual impact; elevations to remain as is due to utility relocations.
- General utility coordination
- Speed limit reduction for Preferred Alternative
- General schedule

November 13, 2017: Coordination Meeting with the State Historic Preservation Office (SHPO)

Representatives from UDOT, Horrocks Engineers, Layton City, and the State Historic Preservation Office (SHPO) met to discuss mitigation for adverse effects to cultural resources.

December 7, 2017: Coordination Meeting with South Weber City

Representatives from UDOT and South Weber City and Fruit Heights met to discuss the ongoing study and the Preferred Alternative.

December 7, 2017: Coordination Meeting with ReVU89

Representatives from UDOT, Horrocks Engineers, and ReVU89 met to discuss the US-89 SES Traffic Analysis. The following topics were discussed:

- Traffic analysis process
- Data collection
- Traffic tools, including the WFRC Travel Demand Model, McTrans Highway Capacity Software (Freeplan Module), and PTV Vissim Software
- Refinements to the WFRC Travel Demand Models Traffic Analysis Zones (TAZ) and roadway network
- US-89 travel demand
- 2040 Arterial Traffic Analysis
- 2040 Freeway Traffic Analysis
- US-89 Freeway Capacity, HCS Freeplan Module results
- Sensitivity Analysis
- Autonomous vehicles

December 12, 2017: Coordination Meeting with Fruit Heights City

Representatives from UDOT, Fruit Heights City, and residents from Fruit Heights City met to discuss the ongoing study and the Preferred Alternative.

January 3, 2018: Stakeholder Meeting with Fruit Heights City

Representatives from UDOT, Fruit Heights City, and Senator Stuart Adams met to discuss access at Nicholls Road.

January 16, 2018: Public Hearing

Representatives from UDOT, Horrocks Engineers, Frontline, and the public were in attendance at this open house-style public hearing. Notices were published in the major state newspapers on January 2 and 9, 2018, a mailer was sent to 12,000 residents and businesses within the study area, and fliers were given to the public libraries and to the cities along the corridor. Additionally, an email invitation was sent to approximately 50,000 recipients. A total of approximately 350 people attended the public hearing and we received 191 comments during the public comment period. Information provided included updated maps of the study corridor and printed documents for review in the lobby. Attendees were encouraged to comment verbally or by submitting written comments.

January 18, 2018: Stakeholder Meeting with Fruit Heights City
Representatives from UDOT and Fruit Heights City met to discuss access at Nicholls Road.

February 6, 2018: Stakeholder Meeting with Kaysville City
Representatives from UDOT and Kaysville City met to discuss the Kaysville City water tank.

If requested, the study team also met with individual residential stakeholders to address specific concerns. These meetings are summarized in Table 4-1.

Table 4-1 Residential Stakeholder Meetings

Date	Stakeholder	Project Team Representative	Subject
07/13/17	Dan and Megan Davidson	Mike Romero and Marty Asay	Design concepts
07/13/17	David Beck	Mike Romero and Marty Asay	Additional design concepts
07/31/17	Mike Canfield, Darius LaDart, and Joyce Nelson	Dian McGuire and Marty Asay	Right-of-Way impacts, property acquisition process, and property values
08/09/17	Gwen Herring	Dian McGuire and Marty Asay	Property acquisition process
08/09/17	Gary Bradshaw, Harv Larsen Eyvonne Larsen, and Flint Barber	Dian McGuire and Marty Asay	Property acquisition process
08/09/17	Dave and Aldean Wixom	Michael Romero and Marty Asay	Design concepts and potential property acquisition
08/29/17	John and Sheri Chambers, and Ryan McDonald	Michael Romero	Design of US-89 and SR-193 Interchange and Valley View Drive Connection
09/25/17	Sue and Clif Card	Michael Romero, Marty Asay, and Brian Atkinson	Design concepts and right-of-way impacts
10/2/17	Mike and Roy Rigby	Michael Romero	Right-of-Way impacts
11/9/17	Mr. and Ms. House	Michael Romero	Impacts to Adams Trail head and right-of-way
01/26/18	Paul Day and others	Randy Jeffries and Marty Asay	Study process and current design
02/15/2018	Mike Rigby	Michael Romero	Property impacts

4.2 AGENCY CORRESPONDENCE

Table 4-2 Correspondence

Date	To	From	Subject
01/26/17	Mayor Jim Talbot Farmington City	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Chad Boshell Farmington City	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Mayor Don Carroll Fruit Heights City	Michael Romero UDOT Project Manager	Agency Scoping

Date	To	From	Subject
01/26/17	Darren Frandsen Fruit Heights City	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Mayor Steve A. Hiatt Kaysville City	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Andy Thompson Kaysville City	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Mayor Bob Stevenson Layton City	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Woody Woodruff Layton City	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Mayor Tamara Long South Weber City	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Mayor Lawrence Flitton Uintah City	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Jason Gipson US Army Corps of Engineers	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Larry Crist US Fish and Wildlife Service	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Dave Whittekiend US Forest Service	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Elisha Hornung US Forest Service	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Brad Westwood State Historic Preservation Office	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Kathleen Clarke Utah Resource Development Coordinating Committee	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Brent Rhees Bureau of Reclamation	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Ed Buchanan Utah Transit Authority	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Andrew Gruber Wasatch Front Regional Council	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Adam Wright Davis County Public Works	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Jared Anderson Weber County Engineering	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Rick Grover Weber County Engineering	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Sindy Smith Utah Resource Development Coordinating Committee	Michael Romero UDOT Project Manager	Agency Scoping
01/26/17	Robert Osborne South Weber City	Michael Romero UDOT Project Manager	Agency Scoping

Date	To	From	Subject
01/26/17	Gordon Cutler Uintah City	Michael Romero UDOT Project Manager	Agency Scoping
02/08/17	Michael Romero UDOT Project Manager	Chad Boshell Farmington City	Scoping Comments
02/10/17	Michael Romero UDOT Project Manager	Matt Wilson US Army Corps of Engineers	Scoping Comments
02/21/17	Michael Romero UDOT Project Manager	Elisha Hornung US Forest Service	Scoping Comments
02/24/17	Stan Jorgensen Horrocks Engineers	Wayne Bennion Wasatch Front Regional Council	Scoping Comments
03/01/17	Stan Jorgensen Horrocks Engineers	Woody Woodruff Layton City Engineer	Scoping Comments
03/28/17	Andrea Moser Bio-West	Pam Kramer Utah Division of Wildlife Resources	Concurrence with Meeting Minutes
04/04/17	Amalia Andrews UDOT	Todd Richardson Davis County Sheriff	Letter of Support and EMS Response Times
06/21/17	Ms. Dorena Martineau Paiute Indian Tribe of Utah	Jonathan Dugmore UDOT Environmental	Native American Consultation
06/21/17	Mr. Darwin St. Clair Jr., Chairman Eastern Shoshone Tribe of the Wind River Reservation	Jonathan Dugmore UDOT Environmental	Native American Consultation
06/21/17	Mr. Blaine Edmo, Chair Shoshone-Bannock Tribes of Fort Hall	Jonathan Dugmore UDOT Environmental	Native American Consultation
06/21/17	Ms. Tami Slayton, Chairperson Paiute Indian Tribe of Utah	Jonathan Dugmore UDOT Environmental	Native American Consultation
06/21/17	Mr. Shane Warner, Chairman Northwestern Band of Shoshone Nation	Jonathan Dugmore UDOT Environmental	Native American Consultation
06/21/17	Mr. Shaun Chapoose, Chairperson Ute Indian Tribe of the Uintah and Ouray Ute Indian Reservation	Jonathan Dugmore UDOT Environmental	Native American Consultation
06/21/17	Ms. Candace Bear, Chairwoman Skull Valley Band of Goshute Indians	Jonathan Dugmore UDOT Environmental	Native American Consultation
06/21/17	Ms. Lora Tom, Band Chairwoman Cedar Band of Paiutes	Jonathan Dugmore UDOT Environmental	Native American Consultation
06/21/17	Mr. Patrick Charles, Band Chairwoman Shivwits Band of Paiute Indian Tribe of Utah	Jonathan Dugmore UDOT Environmental	Native American Consultation

Date	To	From	Subject
06/21/17	Mr. Virgil Johnson, Chairman Confederated Tribes of the Goshute Reservation	Jonathan Dugmore UDOT Environmental	Native American Consultation
06/27/17	Jonathan Dugmore UDOT Environmental	Ms. Dorena Martineau Paiute Indian Tribe of Utah	Native American Consultation
6/28/17	Martha Hayden Utah Geological Survey	Peter Steele Horrocks Engineers	Paleontological Resources
6/28/17	Peter Steele Horrocks Engineers	Martha Hayden Utah Geological Survey	Paleontological Resources
8/01/17	Kris Peterson UDOT Region One Director	James "Woody" Woodruff	Letter of Support
8/02/17	Cory Jensen SHPO	Liz Robinson Cultural Resource Program Manager UDOT Environmental Services Elizabeth Giraud UDOT Architectural Historian	Determination of Eligibility and Finding of Adverse Effect and Concurrence (8/15/2017)
8/07/17	Harris Adams Layton Certified Local Government	Elizabeth Giraud UDOT Architectural Historian	Notification of Adverse Effects
8/07/17	Kent Andersen Layton Certified Local Government	Elizabeth Giraud UDOT Architectural Historian	Notification of Adverse Effects
8/28/17	Andrea Moser Bio-West, Inc.	Paul West UDOT Wildlife Biologist	Wildlife Concurrence
11/21/17	Cory Jensen SHPO	Liz Robinson Cultural Resource Program Manager UDOT Environmental Services Elizabeth Giraud UDOT Architectural Historian	Addendum Determination of Eligibility and Finding of Adverse Effect and Concurrence (11/27/17)
08/16/2017	Mayor Tamara Long	Kris T. Peterson Region One Director Utah Department of Transportation	Request for a trail system that crosses under US-89 at the Weber River.
12/15/2017	Clayton Booth	Kris T. Peterson Region One Director Utah Department of Transportation	Bicycle and mass transit infrastructure along the US-89; Farmington to I-84 corridor.

Date	To	From	Subject
02/05/2018	Ellen Sanchez	Kris T. Peterson Region One Director Utah Department of Transportation	Nicholls Road Access
02/05/2018	Eric Buckley	Kris T. Peterson Region One Director Utah Department of Transportation	Nicholls Road Access
02/05/2018	James and Jenelle Frazier	Kris T. Peterson Region One Director Utah Department of Transportation	Nicholls Road Access
02/05/2018	Mayor John M. Pohlman	Kris T. Peterson Region One Director Utah Department of Transportation	Nicholls Road Access
02/05/2018	Tara Arnold	Kris T. Peterson Region One Director Utah Department of Transportation	Nicholls Road Access
02/05/2018	Lisa Meyer	Kris T. Peterson Region One Director Utah Department of Transportation	Nicholls Road Access
02/07/2018	Caryn Thompson	Kris T. Peterson Region One Director Utah Department of Transportation	Highway 89 Improvements
02/20/2018			Memorandum of Agreement
02/20/2018	JoEllen Grady	Liz Robinson Cultural Resources Program Director Utah Department of Transportation	Transmittal Letter for Executed MOA

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Mayor Jim Talbot
Farmington City
160 South Main Street
Farmington, UT 84025

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mayor Talbot:

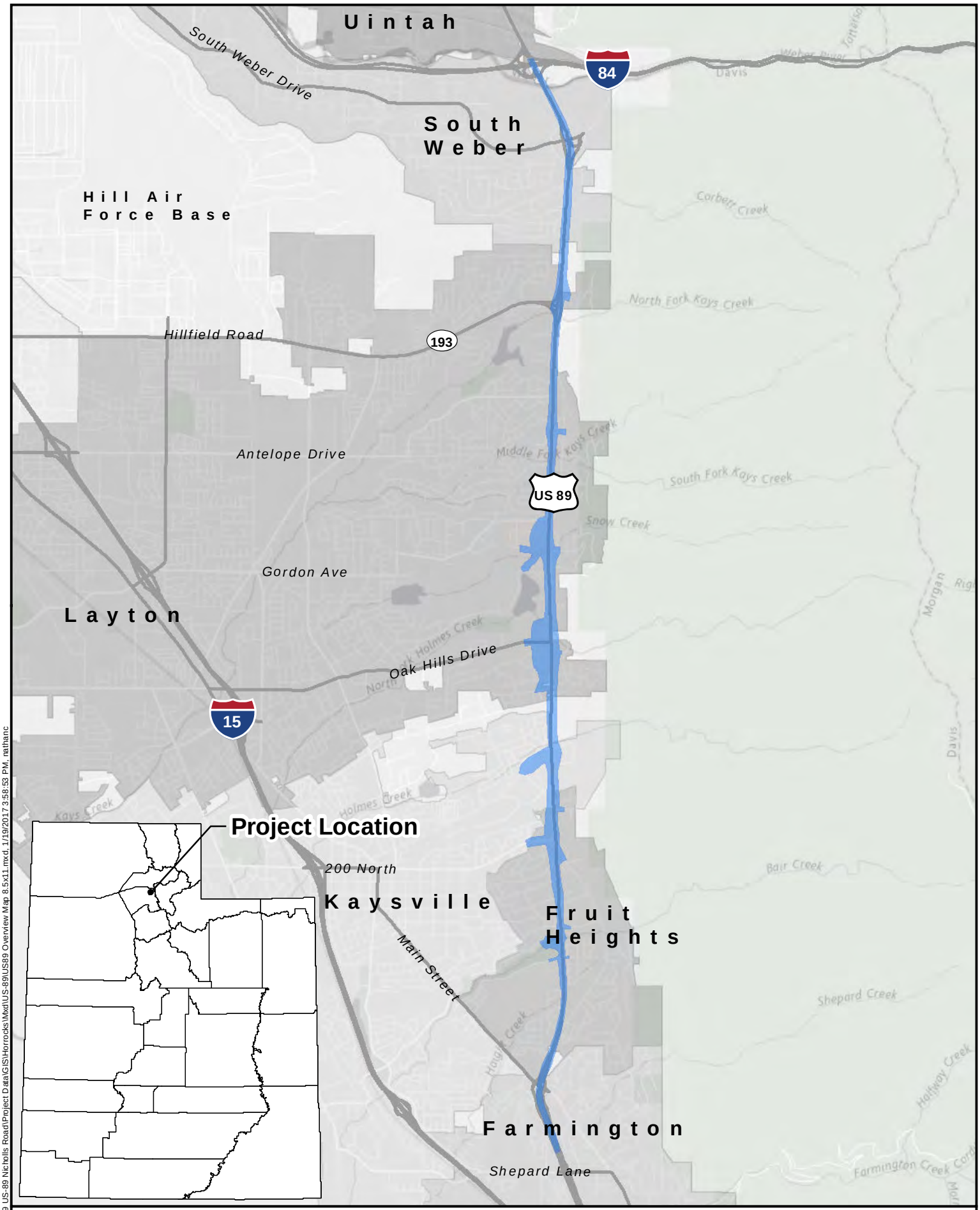
The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager



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Study Area

US-89; Farmington to I-84

Project Overview Map

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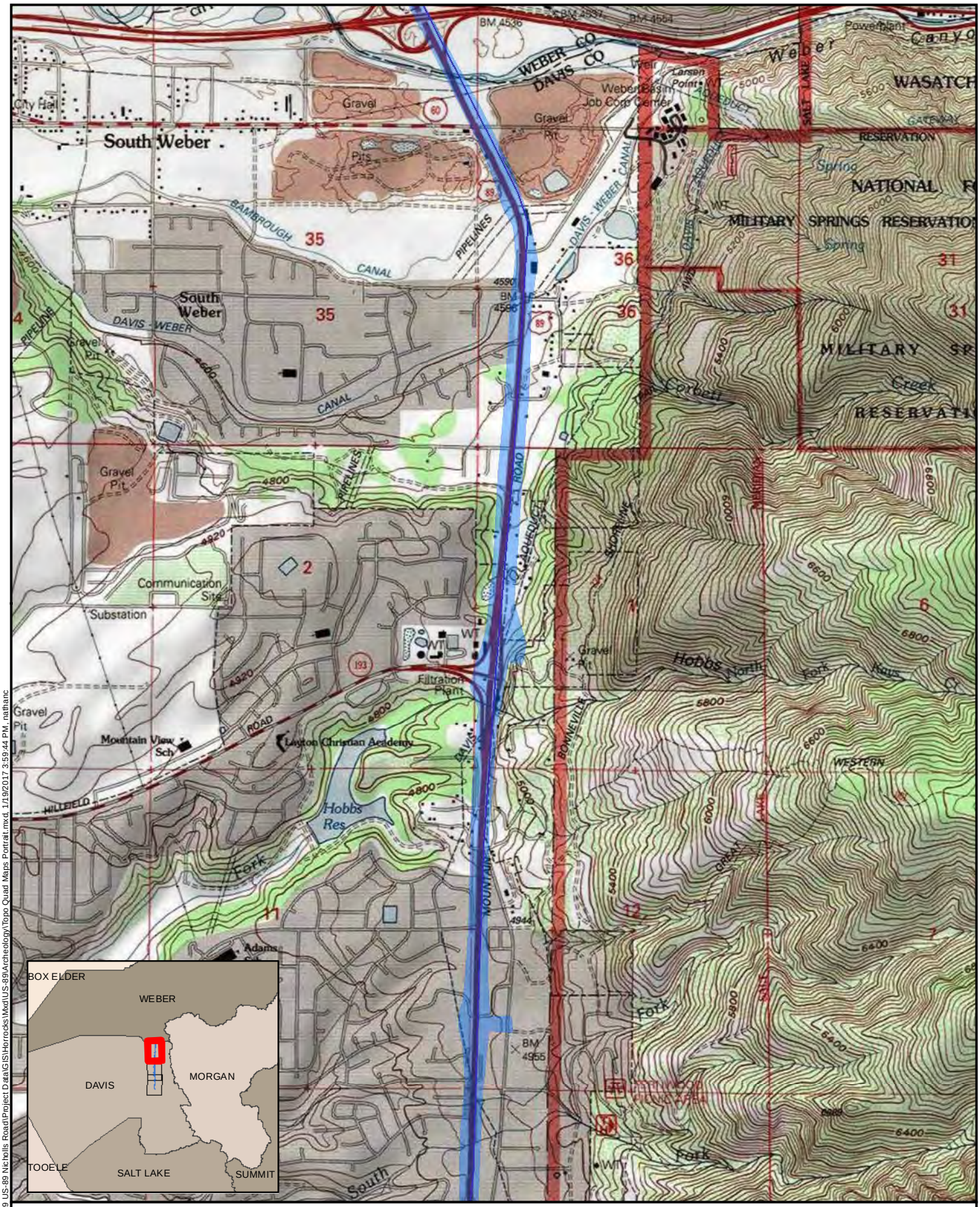

Study Area

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US-89; Farmington to I-84
ESRI 7.5' Topographic Map

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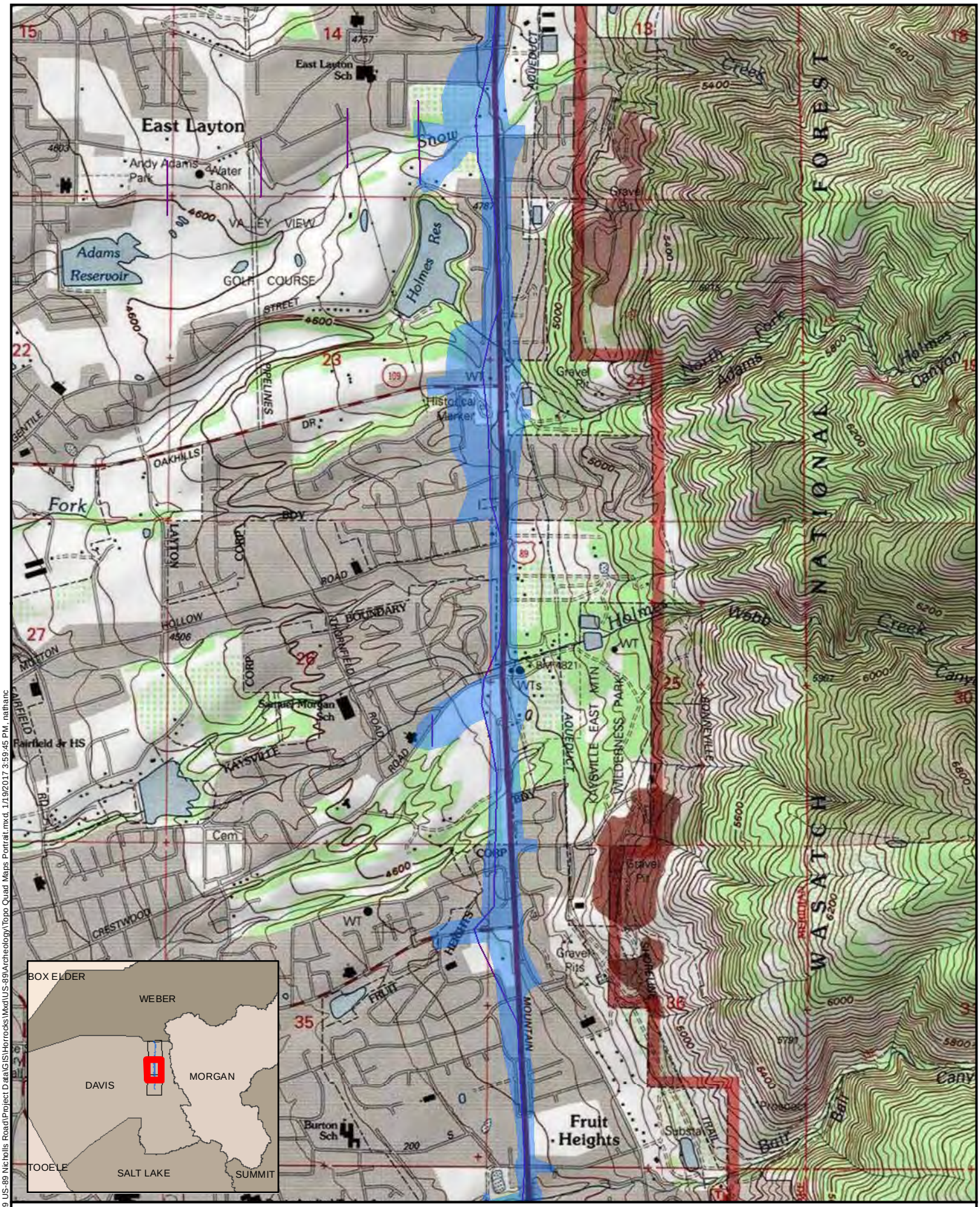

Study Area

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US-89; Farmington to I-84
ESRI 7.5' Topographic Map

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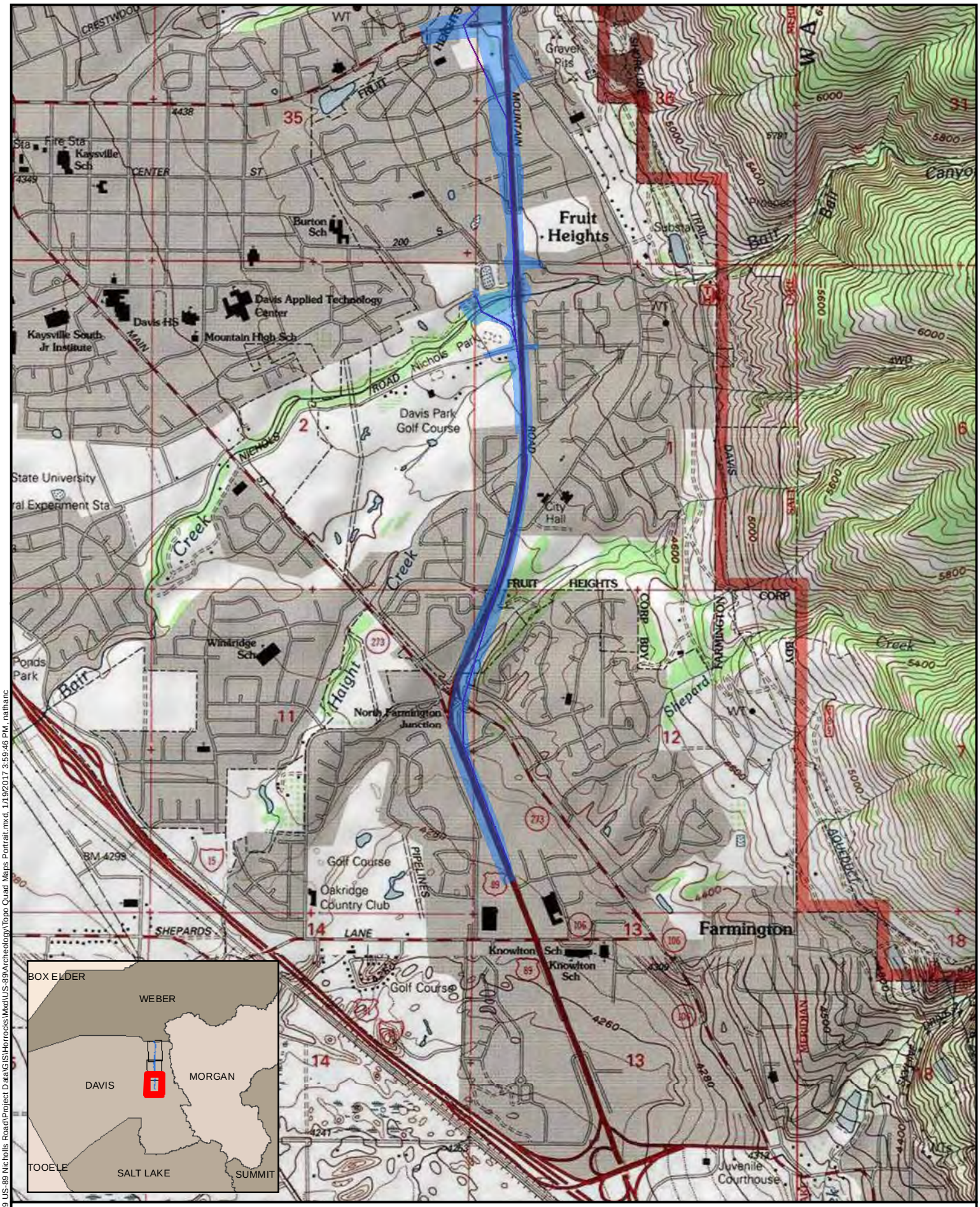

Study Area

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US-89; Farmington to I-84

ESRI 7.5' Topographic Map

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State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Chad Boshell
City Engineer
Farmington City
729 West 100 North
Farmington, UT 84025

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Boshell:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Mayor Don Carroll
Fruit Heights City
910 S. Mountain Road
Fruit Heights, UT 84037

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mayor Carroll:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Darren Frandsen
Public Works Superintendent
Fruit Heights City
1299 East Nicholls Road
Fruit Heights, UT 84037

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Frandsen:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Mayor Steve A. Hiatt
Kaysville City
697 North 240 East
Kaysville, UT 84037

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mayor Hiatt:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Andy Thompson
City Engineer
23 East Center Street
Kaysville, UT 84037

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Thompson:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Mayor Bob Stevenson
Layton City
437 North Wasatch Drive
Layton, UT 84041

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mayor Stevenson:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Woody Woodruff
City Engineer
Layton City
437 North Wasatch Drive
Layton, UT 84041

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Woodruff:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Mayor Tamara Long
South Weber City
1600 East South Weber Drive
South Weber, UT 84405

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mayor Long:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Mayor Lawrence Flitton
Uintah City
2191 East 6550 South
Uintah, UT 84405

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mayor Flitton:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Jason Gipson
Intermountain Representative
US Army Corps of Engineers
533 West 2600 South
Bountiful, UT 84010

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Gipson:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Larry Crist
Utah Field Office Supervisor
US Fish and Wildlife Service
2369 West Orton Circle
West Valley City, UT 84119-7603

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Crist:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Dave Whittekiend
Forest Supervisor Dave Whittekiend
US Forest Service
857 West South Jordan Parkway
South Jordan, UT 84095

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Whittekiend:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Elisha Hornung
NEPA Coordinator
US Forest Service
6944 South 3000 East
Salt Lake City, UT 84121

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Ms. Hornung:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

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Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Brad Westood
State Historic Preservation Office
300 South Rio Grande Street
Salt Lake City, UT 84101

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Westwood:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Director Kathleen Clarke
Utah Resource Development Coordinating Committee
E-210 State Capitol Complex
Salt Lake City, UT 84114

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Ms. Clarke:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Brent Rhees
Regional Director
Bureau of Reclamation
Upper Colorado Regional Office
Salt Lake City, UT 84138-1102

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Rhees:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Ed Buchanan
Safety and Environmental Protection Manager
Utah Transit Authority
PO Box 30810
Salt Lake City, UT 84130

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Buchanan:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Andrew Gruber
Wasatch Front Regional Council
295 Jimmy Doolittle Road
Salt Lake City, UT 84116

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Gruber:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Adam Wright
Director of Engineering
Davis County Public Works
1500 East 650 North
Fruit Heights, UT 84037

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Wright,

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Jared Anderson
Director of Engineering
Weber County Engineering
2380 Washington Blvd.
Ogden, UT 84401

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Anderson:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Rick Grover
Director of Planning
Weber County Engineering
2380 Washington Blvd.
Ogden, UT 84401

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Grover:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Sindy Smith
Acting RDCC Director
Utah Resource Development Coordinating Committee
E-210 State Capitol Complex
Salt Lake City, UT 84114

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Ms. Smith:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Robert Osborne
Planning Commissioner
South Weber City
1600 East South Weber Drive
South Weber, UT 84405

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Mr. Osborne:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

26 January 2017

Gordon Cutler
Council Member on Planning
Uintah City
2191 East 6550 South
Uintah, UT 84405

Re: Initiation of Scoping
US-89 to I-84 State Environmental Study, Davis County, Utah
UDOT Project No. S-0084(406)398; PIN No. 13821

Dear Council Member Cutler:

The Utah Department of Transportation (UDOT) has initiated a State Environmental Study (SES), Type B for the proposed improvements to US-89 between Farmington City and I-84. The purpose of this project is to address existing highway capacity and improve safety in this important north-south corridor.

At this time, we request your assistance in identifying potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations that you may have in relation to the proposed project. You are also invited to contact Stan Jorgensen at Horrocks Engineers to arrange an in-person meeting time to discuss the proposed project. Please contact Stan at stan@horrocks.com within 30 days of the receipt of this letter to lend your assistance on the proposed project and/or to set up a meeting.

We appreciate your participation on this study and look forward to the opportunity to work with you. In the meantime, if you have any questions or comments regarding this letter, please contact Stan Jorgensen at Horrocks Engineers at 801-763-5160.

Sincerely,

Michael Romero
Project Manager

Ryan Pitts

From: Stan Jorgensen
Sent: Tuesday, February 14, 2017 2:15 PM
To: Ryan Pitts; Nicole Tolley
Subject: FW: HWY-89 SES Comments

Follow Up Flag: Follow up
Flag Status: Flagged

Scoping comments from Farmington:

From: Michael Romero [mailto:michaelromero@utah.gov]
Sent: Thursday, February 9, 2017 11:47 AM
To: Stan Jorgensen <Stan@horrocks.com>
Subject: Fwd: HWY-89 SES Comments

fyi
---------- Forwarded message ----------
From: **Chad Boshell** <cboshell@farmington.utah.gov>
Date: Wed, Feb 8, 2017 at 11:34 AM
Subject: HWY-89 SES Comments
To: michaelromero@utah.gov

Michael,

Thank you for the letter asking for comments regarding the SES fro HWY-89. Below is a list of concerns that may be relevant:

1. The north bound on ramp from Shepard Lane onto HWY-89 has a ditch along the east side of it. This ditch collects storm water and spring water from the adjacent property and also storm water from UDOT's detention basin located at the corner of SR 106 and HWY-89 overpass. This should be piped to prevent flooding that has occurred in this area.
2. The detention basin described in comment 1 is plugged and has a lot of sediment build up occur in the bottom. It is hard to see because the grass has grown through the build up but the catch basins which allow water to enter the basin are approximately 2' below the surround grass now, it should be cleaned to ensure designed capacity.
3. The City has a waterline that crosses HWY-89 just south of above mentioned detention basin, the City has received approval from the State to drill a well in the this location. The well will be located south of the basin and east of HWY89 100 to 200 feet.

Thanks for the opportunity to give input on this. Contact me if you have any questions.

Sincerely,

Chad Boshell, P.E.
City Engineer
720 West 100 North

Farmington, Utah 84025
801-939-9287
cboshell@farmington.utah.gov

--
Michael Romero
Region One Project Management
Cell: (801) 618-7746
Office: (801) 620-1685

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

February 13, 2017

Regulatory Division (SPK-2017-00104-UO)

Utah Department of Transportation
Attn: Michael Romero
166 West Southwell Street
Ogden, Utah 84404

Dear Mr. Romero:

We are responding to your February 2, 2017 request for the U.S. Army Corps of Engineers (Corps) to assist with your State Environmental Study (SES) for the proposed improvements to United States Route 89 between Shepherd Lane in Farmington, Utah and Interstate 84 near South Weber, Utah, by helping to identify potential resources that might occur in the study area, as well as any concerns, requirements, or recommendations we may have in relation to the study.

The project has been assigned Corps project identification number SPK-2017-00104. Please refer to this project number in any future correspondence regarding this project.

Our jurisdiction within the study area is under the authority of Section 404 of the Clean Water Act for the discharge of dredged or fill material into waters of the United States. Waters of the United States include, but are not limited to, rivers, perennial or intermittent streams, lakes, ponds, wetlands, vernal pools, marshes, wet meadows, and seeps. Project features that result in the discharge of dredged or fill material into waters of the United States will require Department of the Army authorization prior to starting work.

Preliminary review of your project area suggests the presence of waters of the United States within the corridor, which may be affected by your proposed activity. To ascertain the extent of waters on the project site, the applicant should prepare a wetland delineation, in accordance with the "Minimum Standards for Acceptance of Preliminary Wetlands Delineations" and "Final Map and Drawing Standards for the South Pacific Division Regulatory Program" under "Jurisdiction" on our website at the address below, and submit it to this office for verification. A list of consultants that prepare wetland delineations and permit application documents is also available on our website at the same location.

The range of alternatives considered for this project should include alternatives that avoid impacts to wetlands or other waters of the United States. Every effort should be made to avoid project features which require the discharge of dredged or fill material into waters of the United States. In the event it can be clearly demonstrated there are no practicable alternatives to filling waters of the United States, mitigation plans should be developed to compensate for the unavoidable losses resulting from project implementation.

Please refer to identification number SPK-2017-00104-UO in any correspondence concerning this project. If you have any questions, please contact me by mail at the Bountiful Regulatory Office, 533 West 2600 South, Suite 150, Bountiful, Utah 84010, email *Matthew.S.Wilson@usace.army.mil*, or by telephone at 801-295-8380, ext 11. For more information about our program, visit our website at *www.spk.usace.army.mil/Missions/Regulatory.aspx*.

Sincerely,

Matt Wilson
Senior Project Manager, Nevada-Utah Section
Regulatory Division

cc:

Stan Jorgensen – Horrocks Engineers (stan@horrocks.com)

Ryan Pitts

From: Stan Jorgensen
Sent: Tuesday, February 21, 2017 9:37 AM
To: Larry Reasch; Nicole Tolley; Ryan Pitts
Subject: FW: US-89 State Environmental Study

From: Hornung, Elisha - FS [mailto:ehornung@fs.fed.us]
Sent: Tuesday, February 21, 2017 9:28 AM
To: Michael Romero <michaelromero@utah.gov>
Cc: Stan Jorgensen <Stan@horrocks.com>; Hotze, Rebecca - FS <rhotze@fs.fed.us>
Subject: RE: US-89 State Environmental Study

Hi Mike,

Thank you for the opportunity to provide comments. Below is the feedback that I received from our team.

Regarding signage:

- If any existing USFS signs are affected, please replace to our standards.
- If new signs will be placed, would it be possible for UDOT to add signs directing the public to USFS facilities and trailheads (e.g. Fernwood Picnic Area and Trailhead)?

Regarding Botany and Noxious Weeds:

- Ensure all equipment and vehicles used for the project work are cleaned and noxious and invasive weed free, (avoids bringing in soil or other material contaminated with weed seeds or plants from other locations).
- Treat existing noxious and invasive weed treatments for existing infestations should occur both pre and post project, (post project as long as necessary to remove and prevent existing infestations from spreading further).
- Monitor for new weed invaders for minimum of 3 years, (or longer depending on the length of seed viability in the soil, which is different for each weed species), and treat immediately if any are found, (along with any remaining previously existing weed infestations).
- Obtain noxious and invasive weed free gravel for all project work.
- Use only certified noxious and invasive weed free seed mixes and reseed all disturbed areas.
- Follow all State of Utah regulations related to noxious weeds in the state, and obtain the new list of Utah State listed noxious weeds for their use, (noxious weed booklets can be obtained from Utah State University, Office of Research, Logan Utah.)
- Prioritize use of native plant species verses non-native species that are weedy and that have potential for spread.
- Contact US Fish & Wildlife Service regarding federally listed plant species to determine if any have potential to be within the project area and for threatened and endangered species laws and policies.
- Contact the Utah Natural Heritage Program and the Utah Native Plant Society concerning rare plants of Utah to determine if any have potential to be within the project area.

Please let me know if you have any questions.

Elisha

Elisha Hornung
NEPA Coordinator

Forest Service
Uinta-Wasatch-Cache National Forest

p: 801-733-2679
f: 801-733-2684
ehornung@fs.fed.us

6944 S. 3000 E.
Salt Lake City, UT 84121
www.fs.fed.us

Caring for the land and serving people

From: Michael Romero [mailto:michaelromero@utah.gov]
Sent: Monday, February 06, 2017 1:31 PM
To: Hornung, Elisha - FS <ehornung@fs.fed.us>
Cc: Stan Jorgensen <stan@horrocks.com>
Subject: Re: US-89 State Environmental Study

Elisha,
We would like to have any scoping related items in by the end for February and your continued input throughout the State Environmental Study.

Thanks,
Mike

On Mon, Feb 6, 2017 at 7:08 AM, Hornung, Elisha - FS <ehornung@fs.fed.us> wrote:

> Thanks, Michael. I'll reach out to our team of resource specialists. When do you need our comments back?

Elisha Hornung
NEPA Coordinator

Forest Service

Uinta-Wasatch-Cache National Forest

p: 801-733-2679
f: 801-733-2684
ehornung@fs.fed.us

6944 S. 3000 E.
Salt Lake City, UT 84121
www.fs.fed.us

Caring for the land and serving people

From: Michael Romero [mailto:michaelromero@utah.gov]
Sent: Thursday, February 02, 2017 3:22 PM
To: Hornung, Elisha - FS <ehornung@fs.fed.us>
Cc: Stan Jorgensen <stan@horrocks.com>
Subject: US-89 State Environmental Study

Dear Mrs. Hornung:

UDOT has initiated a State Environmental Study (SES) for proposed transportation improvements to US-89 between Shepherd Lane and I-84. A letter and project location maps are included.

At this time, we request your assistance in identifying potential resources, concerns, requirements, or recommendations you may have relating to the study.

To provide scoping comments or if you would like an in-person meeting to discuss the study further, please contact either me (801-620-1685 michaelromero@utah.gov) or Stan Jorgensen at Horrocks Engineers (801-763-5160 stan@horrocks.com).

Please forward this email to staff, as appropriate.

We appreciate your involvement.

Thanks,

--

Michael Romero

Region One Project Management

Cell: (801) 618-7746

Office: (801) 620-1685

This electronic message contains information generated by the USDA solely for the intended recipients. Any unauthorized interception of this message or the use or disclosure of the information it contains may violate the law and subject the violator to civil or criminal penalties. If you believe you have received this message in error, please notify the sender and delete the email immediately.

--
Michael Romero
Region One Project Management
Cell: (801) 618-7746
Office: (801) 620-1685

Ryan Pitts

From: Stan Jorgensen
Sent: Saturday, February 25, 2017 7:26 AM
To: Larry Reasch; Mike Romero (michaelromero@utah.gov); Ryan Pitts; Nicole Tolley; Brian Atkinson; Marty Asay
Subject: FW: US-89 State Environmental Study

Here is a Scoping comment from WFRC.

Stan

From: Wayne Bennion [mailto:wbennion@wfrc.org]
Sent: Friday, February 24, 2017 5:10 PM
To: Stan Jorgensen <Stan@horrocks.com>
Subject: RE: US-89 State Environmental Study

Stan,

In response to Mr. Michael Romero's January 26, 2017 letter to Mr. Andrew Gruber, we provide the following comments: Thank you for the opportunity to identify recommendations related to this study. WFRC supports the inclusion of a multi-use, multi-direction bicycle and pedestrian facility on each of the frontage roads in the US-89 corridor between Farmington City and I-84. An above-curb, separate path would provide a safe route for bicyclists and pedestrians in this popular cycling corridor.

Wayne

Wayne Bennion
Director of Short Range Planning and Programming
Wasatch Front Regional Council
801.363.4250 ext.1112
wbennion@wfrc.org

Highway 89 Layton City Comments

Transportation

I am concerned about how the interchange will interact with the proposed commercial center on Gordon Avenue. Due to its proximity to the interchange, further study will be needed to determine if a signalized entrance is appropriate. Placing a signal too close to the interchange will affect the efficiency of the interchange. The access point will be determined either by the UDOT Access Management Program or by Layton City's development review process. The stacking length may become an issue for any development on the South side of Gordon near the interchange.

Community Development

CED's biggest issue is that UDOT understands the intensity of the future land uses indicated at the Gordon Avenue Interchange as illustrated in our map. That should be incorporated in their traffic modeling, not an agricultural field. Secondly, the importance of excellent design in accommodating the pedestrian and cyclist at the interchanges for crossing east/west over Highway 89, again illustrated on our map.

Police/Fire

1- Emergency access to neighborhoods should not get unduly compromised
2- Our future fire station location needs to be secured- South East of Gordon and Highway 89
3- Any signal interchanges need to have pre-emption installed

Ryan Pitts

From: Andrea Moser <amoser@bio-west.com>
Sent: Tuesday, March 28, 2017 9:02 AM
To: Ryan Pitts
Subject: Fwd: US-89 Wildlife Crossing Discussion

Ryan,
UDWR concurs with the meeting notes.
Thanks,
Andrea

---------- Forwarded message ---------
From: Pam Kramer <pamkramer@utah.gov>
Date: Tue, Mar 28, 2017 at 5:00 AM
Subject: Re: US-89 Wildlife Crossing Discussion
To: Andrea Moser <amoser@bio-west.com>

Sorry and thanks for the reminder!!! I opened the email on my phone and it "disappeared" from my inbox the next time I logged in so it was "gone" from my radar.

I think you captured the discussion well and UDWR concurs with the meeting notes. Thanks for writing these up.

Pam

On Mon, Mar 27, 2017 at 4:56 PM, Andrea Moser <amoser@bio-west.com> wrote:

> Hi Pam,
> Just checking to be sure you received this and if we captured the notes correctly from our discussion.
> Thanks,
> Andrea
>
> ---------- Forwarded message ---------
> From: Andrea Moser <amoser@bio-west.com>
> Date: Thu, Mar 16, 2017 at 12:47 PM
> Subject: US-89 Wildlife Crossing Discussion
> To: Pam Kramer <pamkramer@utah.gov>
>
> Hi Pam,
> Based on our discussion on Monday, could you please review the attached meeting minutes from our meeting a few weeks ago and let us know if we captured the discussion correctly and if you approve of them?
> Thanks,
> Andrea
>
> Andrea Moser

BIO-WEST, Inc.
435.232.2237 | amoser@bio-west.com | www.bio-west.com

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Andrea Moser
BIO-WEST, Inc.
435.232.2237 | amoser@bio-west.com | www.bio-west.com

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Pam Kramer
Wildlife Habitat Biologist
Utah Division of Wildlife Resources
515 East 5300 South
Ogden, Utah 84405
801-476-2775 (office)
801-725-8537 (cell)

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Andrea Moser
BIO-WEST, Inc.
435.232.2237 | amoser@bio-west.com | www.bio-west.com

Davis County
SHERIFF'S Office

TODD RICHARDSON
SHERIFF

BRENT E. PETERS
UNDERSHERIFF

KEVIN P. FIELDING
CHIEF DEPUTY

April 4, 2017

Utah Department of Transportation
US-89 State Environmental Study
ATTN: Amalia Andrews
Salt Lake City, UT 84114

Dear Ms. Andrews:

The Davis County Sheriff's Office is supportive of a project sponsored by the Department of Transportation for the State of Utah that aids or allows us to continue to provide a quality service to the citizens of Davis County. Specifically, to include the city limits of Fruit Heights where our current average response time is 4:57 minutes. The national Emergency Medical Service response times is 9:00 minutes or less.

Respectively,

Todd Richardson
Sheriff

800 WEST STATE STREET, P.O. BOX 618
FARMINGTON, UTAH 84025
801-451-4120 FAX 801-451-4110
DAVISCOUNTYUTAH.GOV/SHERIFF

State of Utah

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Governor

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Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Tribal Notification Form, Section 106 Consultation

Federally funded projects classified as delegated categorical exclusions are processed in accordance with Stipulation II, Part A and Appendix B of the *Memorandum of Understanding, State Assumption of Responsibility for Categorical Exclusions (23 USC §326)*, by which the UDOT assumes responsibility, assigned by the FHWA, for ensuring compliance with Section 106 of the NHPA and with Section 4(f). This form is submitted on behalf of the FHWA. Direct government-to-government consultation can be conducted upon request.

This project is being conducted pursuant to the *Second Amended Programmatic Agreement among the FHWA, the Utah SHPO, the ACHP, the USACE Sacramento District, and the UDOT Regarding Section 106 Implementation for Federal-Aid Transportation Projects in the State of Utah*, and the *Programmatic Agreement between the UDOT and the Utah SHPO Regarding Implementation of U.C.A. 9-8-404 for State Funded Transportation Projects in Utah.*

UDOT Project: S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah (PIN 13821).
Contact Name: Jonathan Dugmore Date: June 21, 2017
Address: 2010 South 2760 West, Salt Lake City, UT 84104
Telephone: 385-414-2066 Email: jdugmore@utah.gov

Project Description:
The proposed project area extends from Shepherd Lane to I-84, a distance of about 11.3 miles (see the enclosed study area map). Safety and transportation improvements are needed to address current identified design deficiencies and current and projected 2040 travel demand along the existing U.S.-89 highway. The improvements may include roadway widening, improved intersections and grade-separated interchanges with local roads.

Archaeological Potential (Prehistoric or Historic Sites):

- ☐ Known prehistoric sites in the project area
- ☒ Known historic sites in the project area
- ☐ Likely to find prehistoric sites in the project area
- ☐ Likely to find historic sites in the project area
- ☒ Unlikely to find prehistoric sites in the project area
- ☐ Unlikely to find historic sites in the project area
- ☐ No expected ground disturbance
- ☐ Other:

Additional Information/Comments
The area has been surveyed for cultural resources. Three historic NRHP-eligible sites fall within the project area of potential effect – 42DV47, CCC Stone Walls; 42DV48, CCC Water Control Features; and 42DV120, the Davis-Weber Canal.

Tribal Information
«AddressBlock»

Copies to: «cc_1»
«cc_2»
«cc_3»
«cc_4»

Comments:

1. Do you wish to be a Section106 consulting party on this project?	☐ Yes	☐ No	☐ Not Sure
2. If you do not wish to be a Section 106 consulting party, do you wish to continue to be involved in the development of this project?	☐ Yes	☐ No	☐ Not Sure

Note: If your answer is "Not Sure," UDOT will continue to provide information.

3. Are you aware of any traditional religious or culturally important places in or near the project area? ☐Yes ☐No ☐Not Sure

4. If yes, can you share details about the place (e.g., location and other characteristics) and any concerns you may have? ☐Yes ☐No

5. Is this information sensitive? ☐Yes ☐No

Additional Comments:

Name of person completing this form, if different from above:

Signature: Date:

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

Tribal Notification Form, Section 106 Consultation

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This project is being conducted pursuant to the *Second Amended Programmatic Agreement among the FHWA, the Utah SHPO, the ACHP, the USACE Sacramento District, and the UDOT Regarding Section 106 Implementation for Federal-Aid Transportation Projects in the State of Utah*, and the *Programmatic Agreement between the UDOT and the Utah SHPO Regarding Implementation of U.C.A. 9-8-404 for State Funded Transportation Projects in Utah.*

UDOT Project: S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah (PIN 13821).
Contact Name: Jonathan Dugmore Date: June 21, 2017
Address: 2010 South 2760 West, Salt Lake City, UT 84104
Telephone: 385-414-2066 Email: jdugmore@utah.gov

Project Description:
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Archaeological Potential (Prehistoric or Historic Sites):

- ☐ Known prehistoric sites in the project area
- ☒ Known historic sites in the project area
- ☐ Likely to find prehistoric sites in the project area
- ☐ Likely to find historic sites in the project area
- ☒ Unlikely to find prehistoric sites in the project area
- ☐ Unlikely to find historic sites in the project area
- ☐ No expected ground disturbance
- ☐ Other:

Additional Information/Comments
The area has been surveyed for cultural resources. Three historic NRHP-eligible sites fall within the project area of potential effect – 42DV47, CCC Stone Walls; 42DV48, CCC Water Control Features; and 42DV120, the Davis-Weber Canal.

Tribal Information
Ms. Dorena Martineau
Paiute Indian Tribe of Utah
440 North Paiute Drive
Cedar City, UT 84721

Copies to: Ms. Corrina Bow, Chairwoman

Comments:

1. Do you wish to be a Section106 consulting party on this project? ☐Yes ☒No ☐Not Sure
2. If you do not wish to be a Section 106 consulting party, do you wish to continue to be involved in the development of this project? ☐Yes ☒No ☐Not Sure
   Note: If your answer is "Not Sure," UDOT will continue to provide information.
3. Are you aware of any traditional religious or culturally important places in or near the project area? ☐Yes ☒No ☐Not Sure
4. If yes, can you share details about the place (e.g., location and other characteristics) and any concerns you may have? ☐Yes ☐No
5. Is this information sensitive? ☐Yes ☐No

Additional Comments:

Name of person completing this form, if different from above:

Signature: Donna Martineau

Date: June 27, 2017

Identical copies of the Project Notification Form sent to the following recipients:

Original to:	CC to:
Mr. Darwin St. Clair Jr., Chairman Eastern Shoshone Tribe of the Wind River Reservation P.O. Box 538/15 North Fork Rd Fort Washakie, WY 82514	Ms. Glenda Trosper, Director, Cultural Center Eastern Shoshone Tribe of the Wind River Reservation P.O. Box 538/15 North Fork Rd Fort Washakie, WY 82514
	Mr. Wilfred Ferris, THPO Eastern Shoshone Tribe of the Wind River Reservation P.O. Box 538/15 North Fork Rd Fort Washakie, WY 82514
Mr. Blaine Edmo, Chair Shoshone-Bannock Tribes of Fort Hall P.O. Box 306 Pima Drive Fort Hall, ID 83203	Ms. Carolyn Smith, Cultural Resource Director Shoshone-Bannock Tribes of Fort Hall P.O. Box 306 Pima Drive Fort Hall, ID 83203
Ms. Tami Slayton, Tribal Chairperson Paiute Indian Tribe of Utah 440 North Paiute Drive Cedar City, UT 84721	Ms. Dorena Martineau, Cultural Resources Manager Paiute Indian Tribe of Utah 440 North Paiute Drive Cedar City, UT 84721
Mr. Shane Warner, Chairman Northwestern Band of Shoshone Nation 707 North Main Street Brigham City, UT 84302	Ms. Patty Timbimboo-Madsen, Cultural Specialist Northwestern Band of Shoshone Nation 707 North Main Street Brigham City, UT 84302
Mr. Shaun Chapoose, Chairperson Ute Indian Tribe of the Uintah and Ouray Ute Indian Reservation P.O. Box 190 Fort Duchesne, UT 84026	Ms. Betsy Chapoose, Director, Cultural Rights and Protection Ute Indian Tribe of the Uintah and Ouray Ute Indian Reservation P.O. Box 190 Fort Duchesne, UT 84026
Ms. Candace Bear, Chairwoman Skull Valley Band of Goshute Indians P.O. Box 448 Grantsville, UT 84029	None

Original to:	CC to:	Email to:
Ms. Lora Tom, Band Chairwoman Cedar Band of Paiutes 4655 North Utah Trail Enoch, UT 84720	Ms. Vala Parashonts, Cultural Resources Representative Cedar Band of Paiutes 533 South 640 West Cedar City, UT 84721	lora.tom@ihs.gov (Lora Tom)
Mr. Patrick Charles, Band Chairman Shivwits Band of Paiute Indian Tribe of Utah 6060 West 3650 North Ivins, UT 84738	Ms. Sabrina Redfoot, Cultural Resources Director Shivwits Band of Paiute Indian Tribe of Utah 6060 West 3650 North Ivins, UT 84738	
Mr. Virgil Johnson, Chairman Confederated Tribes of the Goshute Reservation P.O. BOX 6104 195 Tribal Center Rd. Ibapah, UT 84034	Ms. Mary Pete-Freeman, Cultural Resources Coordinator Confederated Tribes of the Goshute Reservation P.O. BOX 6104 195 Tribal Center Rd. Ibapah, UT 84034	virgilwjohnson@yahoo.com marypete@goshutetribe.com

From:	Peter Steele
To:	"marthahayden@utah.gov"
Subject:	Paleontological Review Request
Date:	Wednesday, June 28, 2017 12:29:00 PM
Attachments:	US-89 APE Maps_Architecture_Reduced.pdf

Martha,

I'm writing to request a paleontological review of a UDOT project in Davis County. The project is evaluating the conversion of US-89 between Farmington Main Street and I-84 to a freeway facility. I've attached maps of the project area. Please let me know if you have any questions.

Thanks,
Peter

Peter Steele, MA, RPA
HORROCKS ENGINEERS
2162 W. Grove Parkway, Suite 400 | Pleasant Grove, Utah 84062
Work 801 763 5202 | **Fax** 801 763 5101 | **Mobile** 801 845 0489
Email peters@horrocks.com www.horrocks.com

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Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Utah Geological Survey
RICHARD G. ALLIS
State Geologist/Division Director

June 28, 2017

Peter Steele
Horrocks Engineers
2162 West Grove Parkway, Suite 400
Pleasant Grove UT 84062

RE: Paleontological File Search and Recommendations for the UDOT US-89; Farmington to I-84 freeway conversion project, Davis County, Utah
U.C.A. 79-3-508 (Paleontological) Compliance; Request for Confirmation of Literature Search according to the UDOT/UGS Memorandum of Understanding.

Dear Peter:

I have conducted a paleontological file search for the US-89; Farmington to I-84 Study Area in response to your email of June 28, 2017. This project qualifies for treatment under the UDOT/UGS executed Memorandum of Understanding.

There are no paleontological localities recorded in our files for this project area. Quaternary and Recent alluvial and lacustrine deposits that are exposed along this project right-of-way have a low potential for yielding significant fossil localities (PFYC 2). Unless fossils are discovered as a result of construction activities, this project should have no impact on paleontological resources.

If you have any questions, please call me at (801) 537-3311.

Sincerely,

Martha Hayden

Martha Hayden
Paleontological Assistant

1594 West North Temple, Suite 3110, PO Box 146100, Salt Lake City, UT 84114-6100
telephone (801) 537-3300 • facsimile (801) 537-3400 • TTY (801) 538-7458 • *geology.utah.gov*

Layton
Community • Prosperity • Choice

Mayor • Bob J Stevenson
City Manager • Alex R. Jensen

• Public Works – Engineering •
Terry R. Coburn • Director
James Woodruff • City Engineer
Telephone: (801) 336-3700
Fax: (801) 336-3713

August 1, 2017

Mr. Kris Peterson
Region One Director
UDOT Region One
166 West Southwell Street
Ogden, Utah 84404-4194

Re: Highway 89 Improvements in Layton City

Dear Mr. Peterson,

Thank you for coordinating with Layton City regarding the future improvements for Highway 89. Layton City supports the UDOT project to increase capacity of Highway 89 by adding additional lanes and replacing existing traffic signals with full interchanges located at Oak Hills Drive, 1200 North (Gordon Interchange), and Antelope Drive. These improvements will improve safety, mobility for vehicles, bicycles and pedestrians, and improve connectivity within our community.

We reviewed the concepts of each of the proposed interchanges and support the concepts of grade-separated interchanges with direct connections to Layton City local streets including East Side Drive, Valley View Drive, and Hobbs Creek Drive. The new interchanges spaced at approximately (1) one mile or less will provide the necessary access for emergency response for our public safety.

Thank you for your coordination and we look forward to a great project.

Sincerely,

James "Woody" Woodruff, P.E.
Layton City Engineer

17-1381

State of Utah

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Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

August 2, 2017

Mr. Cory Jensen
Senior Historic Preservation Specialist
Utah Division of State History
300 Rio Grande
Salt Lake City, UT 84101-1182

RE: UDOT Project No. S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah (PIN 13821).
Determination of Eligibility and Finding of Adverse Effect.

Dear Mr. Jensen:

The Utah Department of Transportation (UDOT) is preparing to undertake the subject state-aid project. In accordance with the *Programmatic Agreement between the UDOT and the Utah State Historic Preservation Officer Regarding Implementation of U.C.A. 9-8-404 for State Funded Transportation Projects in Utah* (executed March 19, 2008), the UDOT has taken into account the effects of this undertaking on historic properties and is affording the Utah State Historic Preservation Officer (SHPO) an opportunity to comment on the undertaking.

PROJECT DESCRIPTION

The proposed project includes improvements on US-89 from from Shepherd Lane to I-84, in Davis and Weber Counties (see the enclosed study area map). Safety and transportation improvements are needed to address current identified design deficiencies and current and projected 2040 travel demand along the existing U.S.-89 highway. The improvements may include roadway widening, improved intersections and grade-separated interchanges with local roads, extending Lloyd Rd. and Gordon Ave. to increase connectivity. Bridge replacements or modifications may be necessary on the US-89 bridge over the Weber River and at the I-84 interchange.

The area of potential affects (APE) has been defined as the proposed footprint of all active alternatives as well as all adjoining parcels (see attached map). The APE for the roadway is approximately 12 miles long and includes the parcels to the east and west of the roadway and larger areas around the intersections for the modified connections. The APE also includes a corridor along the proposed Gordon Ave. extension and interchange. The APE serves as the survey area for both archaeology and historic architecture.

The APE has been surveyed for cultural resources by Horrocks Engineers, under State Antiquities Project Number U-17-HX-0243. An intensive level pedestrian survey for archaeology was conducted using 15 meter transects and the results are reported in *An Archaeological Inventory for the US-89; Farmington to I-84 Project* (see enclosed report). A reconnaissance selective level survey was conducted to record architectural properties, and the results are reported in *Reconnaissance Level Survey US-89; Farmington to I-84* (see enclosed report).

The survey has resulted in the identification of 10 archaeological sites and 83 architectural properties. Of these, 3 archaeological sites and 44 architectural properties are eligible to the National Register of Historic Places (NRHP).

One previously recorded archaeological site is located in the APE and is not eligible to the NRHP. No known traditional cultural properties or paleontological resources are located in the APE. The Determinations of Eligibility and Findings of Effects are provided in Table 1 for archaeological resources and in Table 2 for architectural properties.

ARCHAEOLOGICAL RESOURCES

Table 1. Determinations of Eligibility and Findings of Effect for Archaeological Resources

Site	Name or Description	NRHP Eligibility	Finding of Effect
42DV12	Prehistoric lithic scatter and historic park	Not Eligible	No Historic Properties Affected
42DV46	Unfinished Stone Building	Not Eligible	No Historic Properties Affected
42DV47	CCC Stone Walls	Eligible (Criterion A and C)	Adverse Effect
42DV48	CCC Water Control Feature	Eligible (Criterion A)	No Historic Properties Affected
42DV120	Davis-Weber Canal	Eligible (Criterion A)	No Historic Properties Affected
42DV160	Historic Pipeline	Not Eligible	No Historic Properties Affected
42DV174	Historic Farmstead/Stockyard	Not Eligible	No Historic Properties Affected
42DV180	Historic Transmission Line	Not Eligible	No Historic Properties Affected
42DV200	Historic Farmstead	Not Eligible	No Historic Properties Affected
42DV201	Historic Reservoir	Not Eligible	No Historic Properties Affected

Description of Effect to Site 42DV47: The proposed project will acquire approximately half of the sites area for construction of the frontage road. As a result, approximately 66% of the wall features will be removed, with remaining portions in the northeast and southwest quadrants of the site, on either side of the frontage road. Since the project will affect a large portion of the site and remove elements contributing to its eligibility for the NRHP. Thus, the proposed project will result in a finding of Adverse Effect for this property.

ARCHITECTURAL PROPERTIES

Table 2. Determinations of Eligibility and Findings of Effect for Architectural Properties

Address	Date	Style	NRHP Eligibility/SHPO Rating	Finding of Effect
491 S Golden Circle Drive, Fruit Heights	1967	Split Entry house with garage constructed of rock-faced brick.	Eligible/Contributing under Criterion A	No Historic Properties Affected
1347 E 500 South, Fruit Heights	1968	Contemporary house constructed of brick, a pitched roof has been constructed over the original flat roof	Inelig./Non-contributing	No Historic Properties Affected
470 S Golden Circle Drive, Fruit Heights	1969	Contemporary house constructed of brick and shingle siding	Eligible/Contributing under Criterion A	No Historic Properties Affected

450 S Golden Circle Drive, Fruit Heights	1968	Ranch with garage constructed of regular brick with weeping mortar and ship-lap siding.	Eligible/Contributing under Criterion A	No Historic Properties Affected
430 S Golden Circle Drive, Fruit Heights	1970	Ranch with garage constructed of rock-faced brick and ship-lap siding. Windows centered on the primary façade have been altered.	Inelig./Non-contributing	No Historic Properties Affected
420 S Golden Circle Drive, Fruit Heights	1968	Contemporary house constructed of regular brick. Wood trim has been replaced with vinyl siding.	Eligible/Contributing under Criterion A	No Historic Properties Affected
410 S Golden Circle Drive, Fruit Heights	1966	Split Entry house with garage constructed of regular brick with original wood trim replaced with vinyl siding.	Eligible/Contributing under Criterion A	No Historic Properties Affected
388 S Golden Circle Drive, Fruit Heights	1971	Contemporary house constructed of rock-faced brick with board and batten siding.	Eligible/Contributing under Criterion A	No Historic Properties Affected
350 S Golden Circle Drive, Fruit Heights	1969	Contemporary house constructed of brick with original wood trim covered with vinyl siding	Eligible/Contributing under Criterion A	No Historic Properties Affected
1351 E 400 South, Fruit Heights	1966	Ranch with garage. Original siding replaced with vinyl siding. Windows replaced with vinyl as well.	Inelig./Non-contributing	No Historic Properties Affected
280 S Florence Circle, Fruit Heights	1969	Ranch with garage clad with Board and Batten siding and stone veneer.	Eligible/Contributing under Criterion A	No Historic Properties Affected
1262 E Green Road, Fruit Heights	1955	Ranch style house constructed of Roman Brick and stone veneer.	Eligible/Contributing under Criterion A	No Historic Properties Affected
187 S 1250 East, Fruit Heights	1958	Ranch with garage has altered materials of vinyl and imitation stone.	Inelig./Non-contributing	No Historic Properties Affected
179 S 1250 East, Fruit Heights	1966	Ranch with garage constructed of regular brick. Vinyl porch railing added.	Eligible/Contributing under Criterion A	No Historic Properties Affected
153 S 1250 East, Fruit Heights	1954	Other residential type building has been altered with additions and synthetic stucco.	Inelig./Non-contributing	No Historic Properties Affected
112 S US-89, Fruit Heights	1961	Ranch with garage constructed of striated brick.	Eligible/Contributing under Criterion A	No Historic Properties Affected
347 N 1300 East, Fruit Heights	1927	Period Cottage clad with stone and Board and batten siding. Possible alteration of front window.	Eligible/Contributing under Criterion A	Adverse Effect

1211 E 575 North, Fruit Heights	1960	Ranch with garage constructed of striated brick. Addition of RV garage separated by breezeway.	Eligible/Contributing under Criterion A	No Historic Properties Affected
1210 E Ward Road, Fruit Heights	1971	Ranch with garage constructed of regular brick.	Eligible/Contributing under Criterion A	No Adverse Effect
1351 E 650 North, Fruit Heights	1965	Split Level house constructed of roman brick.	Eligible/Contributing under Criterion A	No Historic Properties Affected
1270 E Oakmont Lane, Fruit Heights	1948	Early Ranch type house is clad with the altered materials of vinyl siding.	Inelig./Non-contributing	No Historic Properties Affected
1275 E Oakmont Lane, Fruit Heights	1954	Ranch with garage is constructed of regular brick. Eaves are clad in vinyl siding.	Eligible/Contributing under Criterion A	Adverse Effect
1325 E Oakmont Lane, Fruit Heights	1971	Split Entry residence constructed of oversized brick.	Eligible/Contributing under Criterion A	No Historic Properties Affected
1084 N US-89, Kaysville	1950	Early Ranch type house construceted of striated brick with ship lap siding in the gables.	Eligible/Contributing under Criterion A	No Adverse Effect
1100 N US-89, Kaysville	1927	Period cottage with additions and alterations to materials (vinyl siding)	Inelig./Non-contributing	No Historic Properties Affected
1302 N US-89, Kaysville	1940	Large upper story additions alter the style of this house to an early 21st Century type house.	Inelig./Non-contributing	No Historic Properties Affected
1398 N US-89, Kaysville	1920	This residence has the appearance of a late 20th century type house with altered materials and an addition.	Inelig./Non-contributing	No Historic Properties Affected
1402 N US-89, Kaysville	1940	This formed concrete basement house is abandoned with several of the windows broken out.	Eligible/Contributing under Criterion A	Adverse Effect
1193 E Mutton Hollow Road, Layton	1928	This house has been altered to a contemporary type house with additions, altered roof pitch, and vinyl siding.	Inelig./Non-contributing	No Historic Properties Affected
1587 N US-89, Layton	1961	Unable to view this house from public space due to heavy vegetation.	Undetermined	No Adverse Effect
2900 E Oak Hills Drive, Layton	1960	Layton City steel water tank	Eligible/Contributing under Criterion A	Adverse Effect
2825 E Oak Hills Drive, Layton	1969	Split Level house clad in vinyl siding that imitated the original siding.	Eligible/Contributing under Criterion A	Adverse Effect
538 N East Side Drive, Layton	1970	Contemporary residence constructed of multi-colored brick with board and batten siding.	Inelig./Non-contributing	No Historic Properties Affected

598 N East Side Drive, Layton	1950	An early ranch type house clad in Masonite siding. The south wing was added prior to 1970.	Eligible/Contributing under Criterion A	Adverse Effect
688 N East Side Drive, Layton	1952	The garage has been enclosed on this Ranch with garage type house. It is constructed of striated and regular brick and the foundation and garage are clad in flagstone.	Inelig./Non-contributing	No Historic Properties Affected
718 N East Side Drive, Layton	1963	Ranch with garage type house constructed of regular brick with weeping mortar and Masonite siding.	Eligible/Contributing under Criterion A	No Historic Properties Affected
798 N East Side Drive, Layton	1952	Early Ranch type house clad with asbestos siding.	Eligible/Contributing under Criterion A	No Historic Properties Affected
924 N East Side Drive, Layton	1922	Brick bungalow moved to this location between 1975 and 1985.	Inelig./Non-contributing	No Historic Properties Affected
946 N East Side Drive, Layton	1941	Early Ranch type house with in-period addition on south. House is clad with Masonite siding and vinyl siding on gable ends.	Eligible/Contributing under Criterion A	No Historic Properties Affected
982 N East Side Drive, Layton	1949	Contemporary type house constructed of cobbleston and wood. This was likely a basement house during the historic period.	Inelig./Non-contributing	No Historic Properties Affected
1014 N East Side Drive, Layton	1954	Early Ranch type house clad with aluminum siding. Windows replaced with vinyl.	Eligible/Contributing under Criterion A	No Historic Properties Affected
1148 N East Side Drive, Layton	1945	Early ranch type house constructed of striated brick. This house was altered to a duplex prior to 1970.	Eligible/Contributing under Criterion A	Adverse Effect
1425 N US-89, Layton	1962	Service station has altered style with addition and synthetic stucco and wood sheet.	Inelig./Non-contributing	No Historic Properties Affected
2848 E Cherry Lane, Layton	1915	Foursquare Bungalow is clad with aluminum siding and has a large garage addition on the northwest corner.	Inelig./Non-contributing	No Historic Properties Affected
1508 N US-89, Layton	1966	Service station has altered style with addition and synthetic stucco and imitation stone.	Inelig./Non-contributing	No Historic Properties Affected
1511 N Cherry Lane, Layton	1954	Ranch with garage type house constructed with fieldstone.	Eligible/Contributing under Criterion A	No Adverse Effect

1541 N Cherry Lane, Layton	1963	Ranch with garage type house constructed of striated brick with vinyl siding on the gable ends.	Eligible/Contributing under Criterion A	No Adverse Effect
1627 N Valley View Drive, Layton	1950	Ranch with garage type house clad with stone veneer and wood sheet.	Eligible/Contributing under Criterion A	No Adverse Effect
1675 N Heather Drive, Layton	1962	Ranch with carport type house constructed of striated brick.	Eligible/Contributing under Criterion A	No Historic Properties Affected
1738 N US-89, Layton	1953	Ranch type house clad with stone veneer and wood.	Eligible/Contributing under Criterion A	Adverse Effect
1768 N US-89, Layton	1964	Ranch with garage type house clad with fieldstone and vinyl siding. Fieldstone is dominant material.	Eligible/Contributing under Criterion A	Adverse Effect
1783 N US-89, Layton	1953	This residence has the appearance of an early 21st century type house with altered materials of synthetic stucco and an addition.	Inelig./Non-contributing	No Historic Properties Affected
1792 N US-89, Layton	1952	Unable to view the house, up hill past no trespassing sign.	Undetermined	No Adverse Effect
1793 N US-89, Layton	1962	Ranch with garage type house constructed of slump block with board and batten siding.	Eligible/Contributing under Criterion A	No Adverse Effect
1849 N Valley View Drive, Layton	1972	Contemporary residence constructed of slump block. Windows have been replaced with vinyl.	Eligible/Contributing under Criterion A	No Adverse Effect
1918 N US-89, Layton	1949	Brick residence is several homes moved to this site and brought together by an addition at the northwest corner. Some of the windows have been altered.	Inelig./Non-contributing	No Historic Properties Affected
1933 N Valley View Drive, Layton	1967	Ranch type house clad with regular brick and stone veneer, which are not original materials. There is a large garage addition and windows have been altered.	Inelig./Non-contributing	No Historic Properties Affected
1957 N Valley View Drive, Layton	1963	Ranch with garage type house is clad with vinyl siding, which is the dominant material, and regular brick.	Inelig./Non-contributing	No Historic Properties Affected
2004 N 2950 East, Layton	1967	Contemporary type house constructed of slump block and wood. The original carport has been enclosed for living space.	Inelig./Non-contributing	No Historic Properties Affected

2851 E Oak Lane, Layton	1965	Split entry with garage type house constructed of regular brick.	Eligible/Contributing under Criterion A	No Historic Properties Affected
2044 N 2950 East, Layton	1972	Split Entry with garage type house constructed of slump block has several additions clad in aluminum siding.	Inelig./Non-contributing	No Historic Properties Affected
2120 N US-89, Layton	1951	Ranch with carport type house constructed of regular brick with weeping mortar. The carport has been enclosed with vinyl siding.	Inelig./Non-contributing	No Historic Properties Affected
2211 N Valley View Drive, Layton	1966	Split entry type house constructed of regular brick. An addition above the garage is clad in vinyl siding.	Inelig./Non-contributing	No Historic Properties Affected
2244 N US-89, Layton	1968	Split entry type house has altered materials of vinyl siding and stone veneer, also a large rear addition.	Inelig./Non-contributing	No Historic Properties Affected
2225 N Valley View Drive, Layton	1960	Split level type house is clad in vinyl siding and has a large rear addition.	Inelig./Non-contributing	No Historic Properties Affected
2550 N US-89, Layton	1939	World War II-Era Cottage is clad in clapboard siding and retains original windows.	Eligible/Contributing under Criterion A	No Adverse Effect
2776 N Valley View Drive, Layton	1863	Hall-parlor type house constructed of Fieldstone in 1863. Crosswing addition at the rear constructed in 1913 is clad in drop siding.	Eligible/Significant under Criteria A & C	No Historic Properties Affected
2778 N Valley View Drive, Layton	1962	This house is not visible from the public space due to its distance from the road.	Undetermined	No Historic Properties Affected
2895 N Hobbs Creek Drive, Layton	1963	This house is not visible from the public space due to its distance from the road.	Undetermined	No Historic Properties Affected
3012 E 3050 North, Layton	1953	This house is not visible from the public space due to its distance from the road.	Undetermined	No Historic Properties Affected
3221 N US-89, Layton	1970	Ranch with garage type house clad with vinyl siding and stone veneer.	Inelig./Non-contributing	No Historic Properties Affected
3245 N US-89, Layton	1910	Hall-parlor type house constructed of regular brick with Victorian Eclectic elements.	Eligible/Contributing under Criterion A	No Historic Properties Affected
2837 E SR-193, Layton	1960	Weber Water District warehouse and water tank. Warehouse has been altered with non-historic materials.	Inelig./Non-contributing	No Historic Properties Affected

8386 S US-89, South Weber	1865	Cellar constructed of fieldstone c.1865. Adjacent is a 1950 three-bay garage constructed of concrete block.	Eligible/Significant under Criterion A	No Historic Properties Affected
8102 S 2725 East, South Weber	1898	Double crosswing type house constructed of brick with Victorian Eclectic elements. The house is on an intact farmstead with multiple contributing outbuildings.	Eligible/Significant under Criterion A	No Historic Properties Affected
7618 S US-89, South Weber	1914	Box Bungalow altered in the 1940s to Minimal Traditional style and clad with asbestos siding.	Eligible/Contributing under Criterion A	No Historic Properties Affected
7425 S 2700 East, South Weber	1970	Commercial Offices for gravel pit constructed of regular brick with a large addition on north clad in wood sheet.	Inelig./Non-contributing	No Historic Properties Affected
7692 S Cornia Dr., South Weber	1970	This residence has been altered in style and materials to a Late 20th Century Other type building.	Inelig./Non-contributing	No Historic Properties Affected
7200 N US-89, South Weber	1967	Pre-stressed concrete girder bridge does not have an exception skew of 54 degrees.	Inelig./Non-contributing	No Historic Properties Affected
2157 E Oakridge Drive, Layton	1920	Historic Residence (1880) has been demolished. This shed, corral and another building remain which are visible on the 1937 aerial image.	Eligible/Contributing under Criterion A	Adverse Effect
1934 E Oakridge Drive, Layton	1962	Ranch with garage type residence constructed of striated brick has vinyl siding on eaves and gable ends.	Eligible/Contributing under Criterion A	No Adverse Effect
1710 E 1000 North, Layton	1971	Ranch with garage type house constructed of regular brick.	Eligible/Contributing under Criterion A	No Adverse Effect
1686 E 1000 North, Layton	1969	Contemporary type house appears to be recently clad with board and batten siding.	Inelig./Non-contributing	No Historic Properties Affected

Description of Effects: This proposed project requires complete right of way acquisitions of ten eligible properties, and partial acquisition of twelve eligible properties, consisting of strip takes. The partial acquisitions affect a relatively small portion of the properties and will not substantially impact or alter any contributing elements of the properties or any of the character-defining features for which each were determined eligible for the NRHP.

CONSULTATION EFFORTS

Native American consultation was initiated through letters sent to the Uintah and Ouray Ute Tribes, Shoshone-Bannock Tribes, Northwestern Band of Shoshone Nation, Eastern Shoshone Tribe of the Wind River Reservation, Skull Valley Goshute, Paiute Indian Tribe of Utah and the Cedar and Shivwits Bands of Paiutes (sent June 21, 2017). UDOT will notify the Layton Certified Local Government, informing the city of the adverse effects on seven

properties in that community and requesting their participation in developing mitigation measures. The UDOT Cultural Resources staff could not identify historic preservation organizations in Fruit Heights or Kaysville. An open house was held and the public was notified of the impacts to cultural resources. Information was also included in the project website. No responses or comments were received concerning cultural resources.

SUMMARY

To summarize, the project will result in a finding of **Adverse Effect** for one archaeological site and ten architectural properties, a finding of **No Adverse Effect** for twelve architectural properties, and a finding of **No Historic Properties Affected** for all remaining architectural properties and archaeological sites. Therefore, the Finding of Effect for the proposed UDOT Project No. S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah, is **Adverse Effect**.

Please review this document and, providing you agree with the findings contained herein, sign and date the signature line at the end of this letter. Should you have any questions or need additional information, please feel free to contact Liz Robinson at 801-910-2035 or lizrobinson@utah.gov; or Elizabeth Giraud at 801-965-4917 or egiraud@utah.gov.

Sincerely,

Liz Robinson

Liz Robinson, M.A., RPA
Cultural Resources Program Manager
UDOT Environmental Services

Elizabeth Giraud

Elizabeth Giraud, AICP
Architectural Historian
UDOT Environmental Services

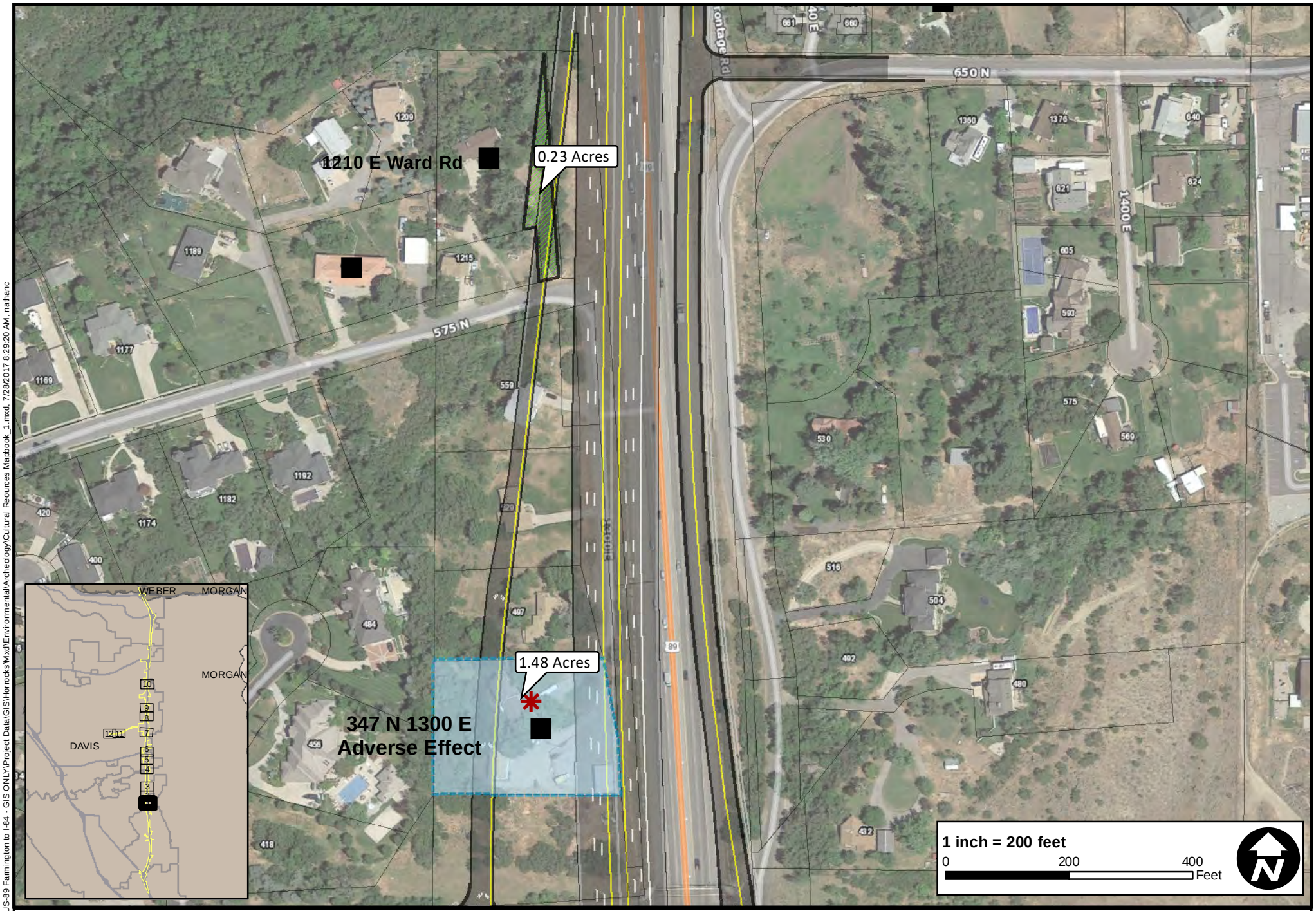
Enclosures

cc: Michael Romero, Project Manager
Chris Lizotte, Environmental Manager

Regarding UDOT Project No. S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah, I concur with the Determination of Eligibility and Finding of Effect, submitted to the Utah State Historic Preservation Office in accordance with the *Programmatic Agreement* and U.C.A. 9-8-404, which states that the UDOT has determined that the finding is **Adverse Effect.**

Cory Jensen
Senior Historic Preservation Specialist

8/15/2017
Date



Adverse Effect
Eligible/Contributing
Partial Aquisition
Full Aquisition
UDOT Owned Property
42DV47
Undetermined
Eligible/Significant

US-89 Cultural Resources
Historic Structures Impact Mapbook
Map 1 of 12

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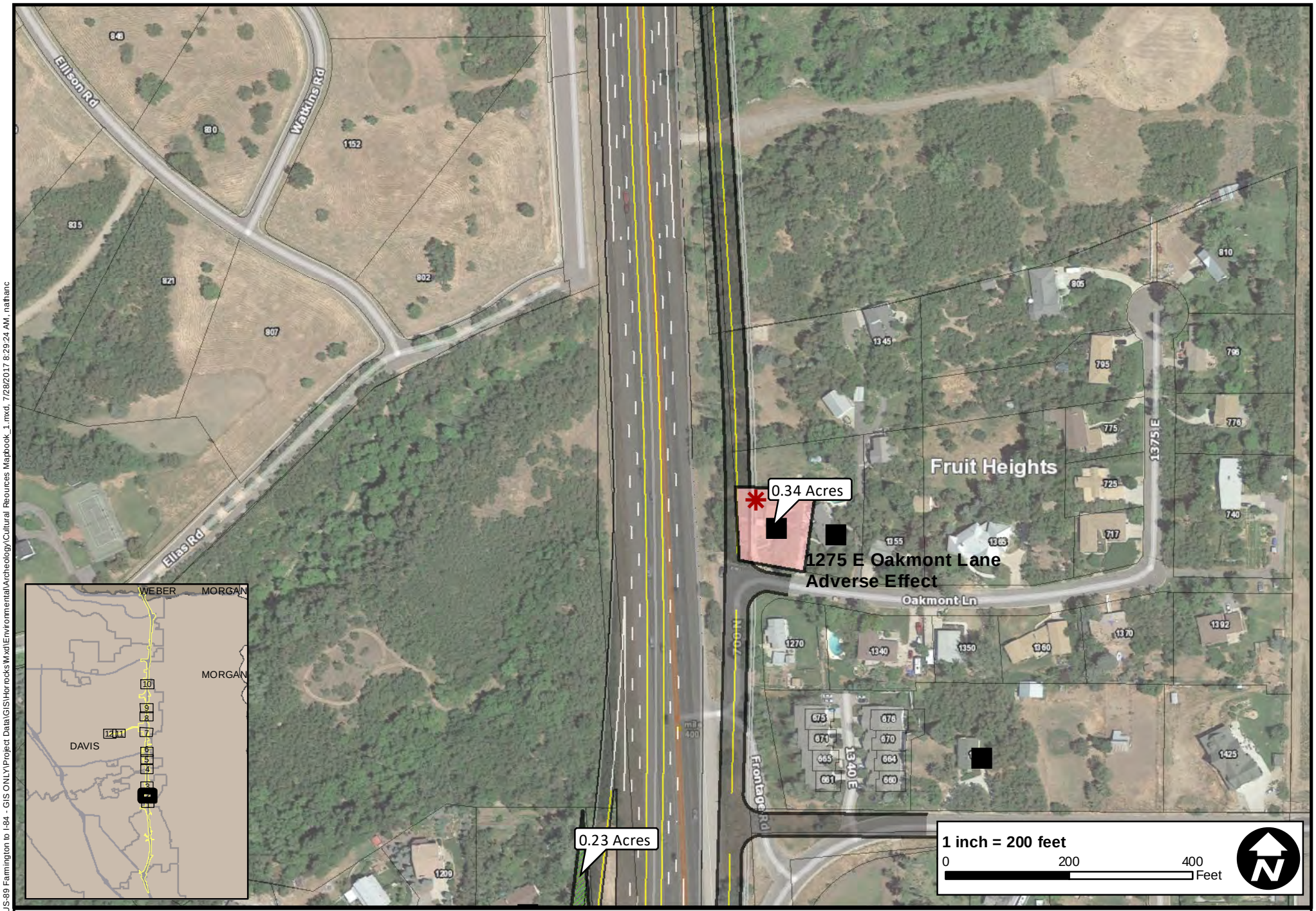

Adverse Effect
Eligible/Contributing
Partial Aquisition
Full Aquisition
UDOT Owned Property
42DV47
Undetermined
Eligible/Significant

US-89 Cultural Resources
Historic Structures Impact Mapbook
Map 2 of 12

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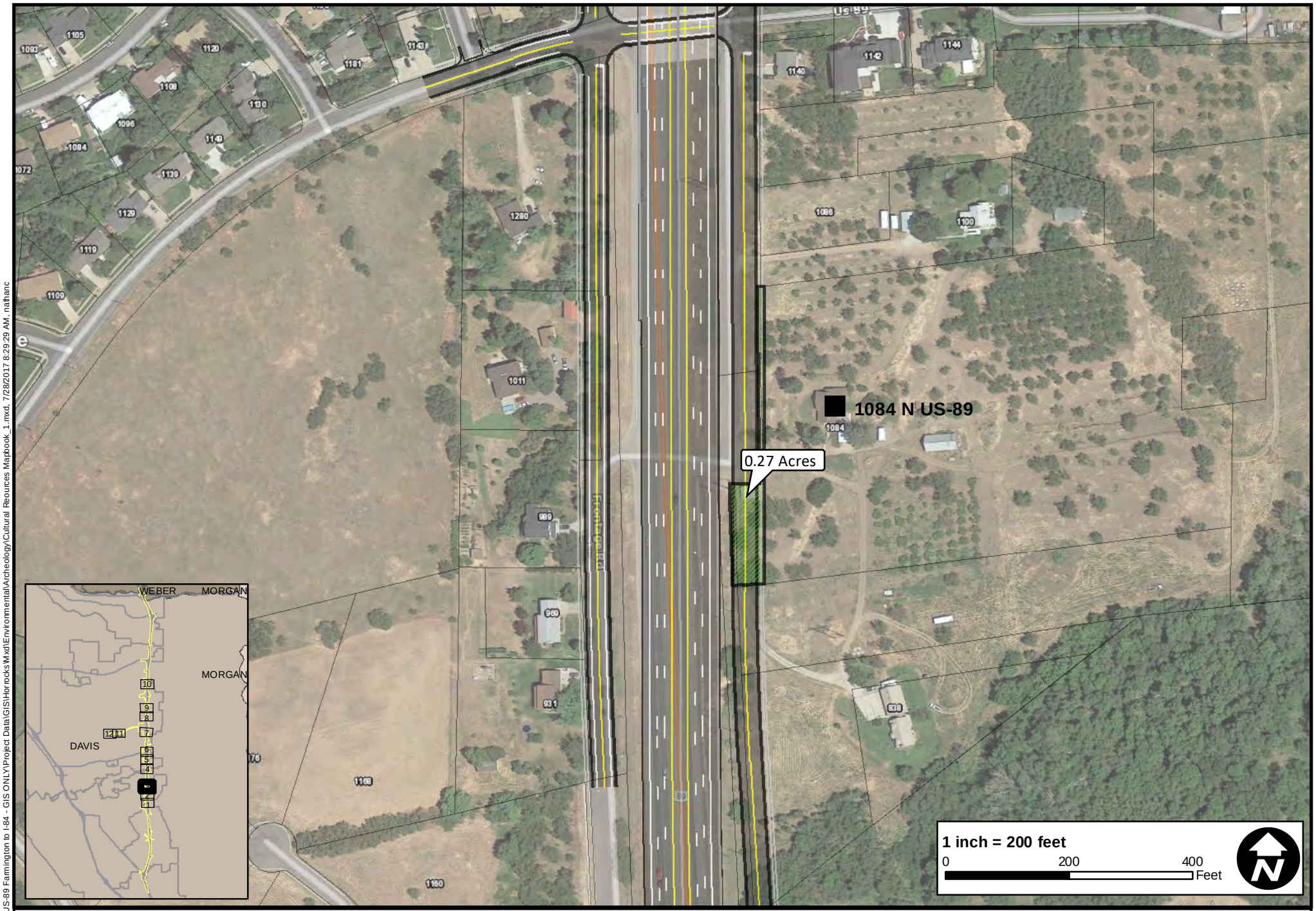

Adverse Effect
Eligible/Contributing
Partial Aquisition
Full Aquisition
UDOT Owned Property
42DV47
Undetermined
Eligible/Significant

US-89 Cultural Resources
Historic Structures Impact Mapbook
Map 3 of 12

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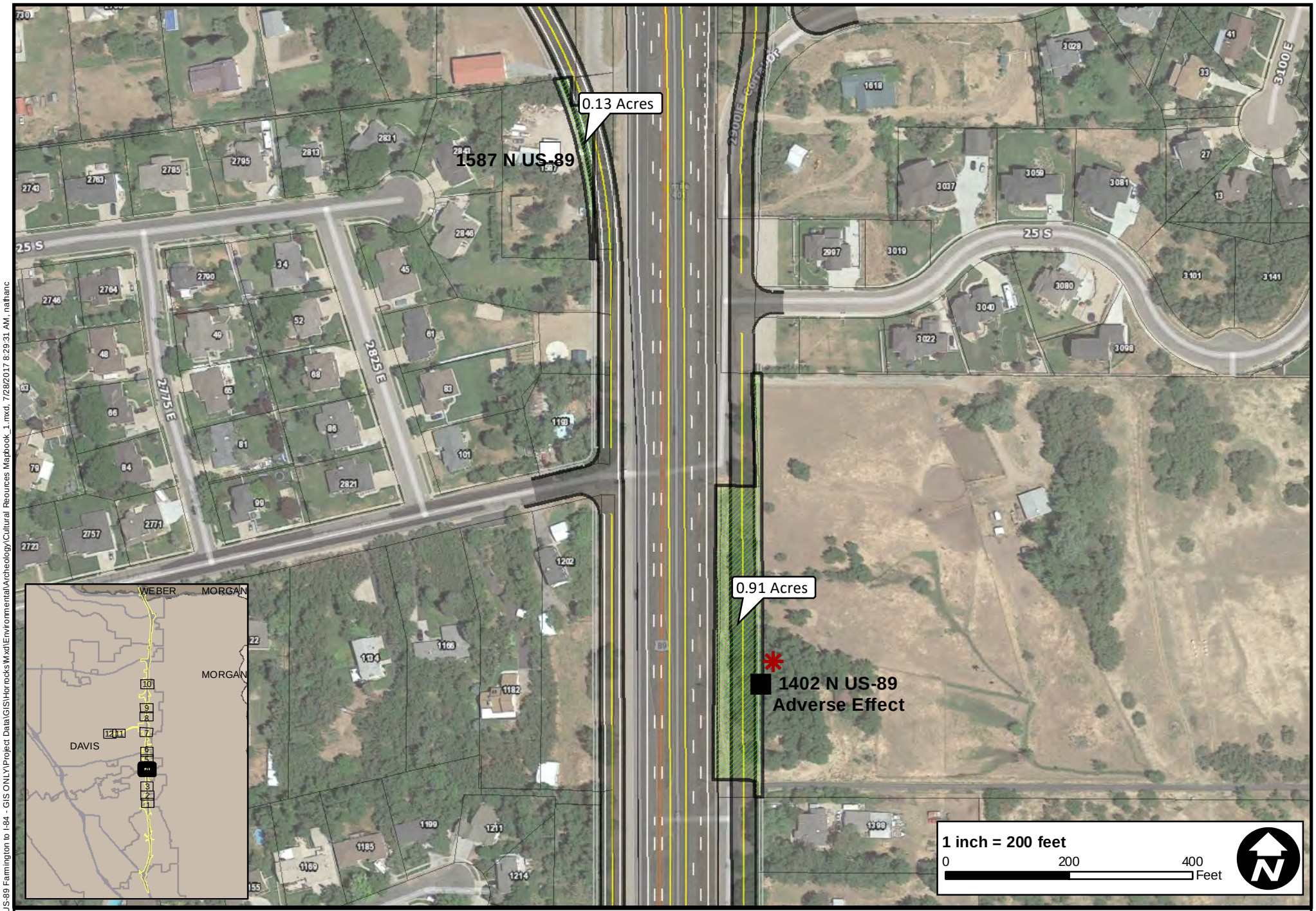

Adverse Effect

Eligible/Contributing

Partial Aquisition

Full Aquisition

UDOT Owned Property

42DV47

Undetermined

Eligible/Significant

US-89 Cultural Resources

Historic Structures Impact Mapbook

Map 4 of 12

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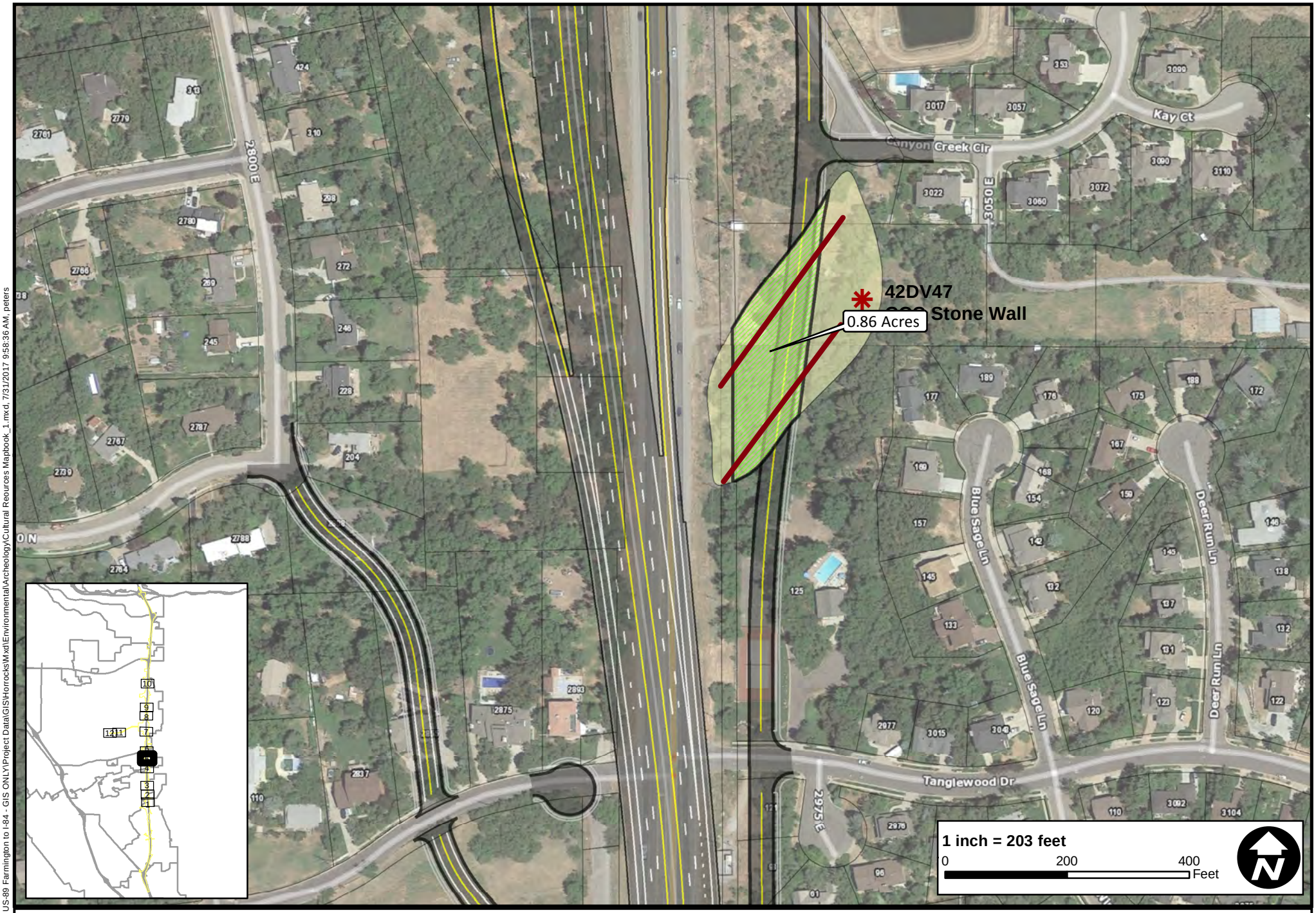

Adverse Effect

Eligible/Contributing

Partial Aquisition

Full Aquisition

UDOT Owned Property

42DV47

42DV47_Walls

US-89 Cultural Resources

Historic Structures Impact Mapbook

Map 5 of 12

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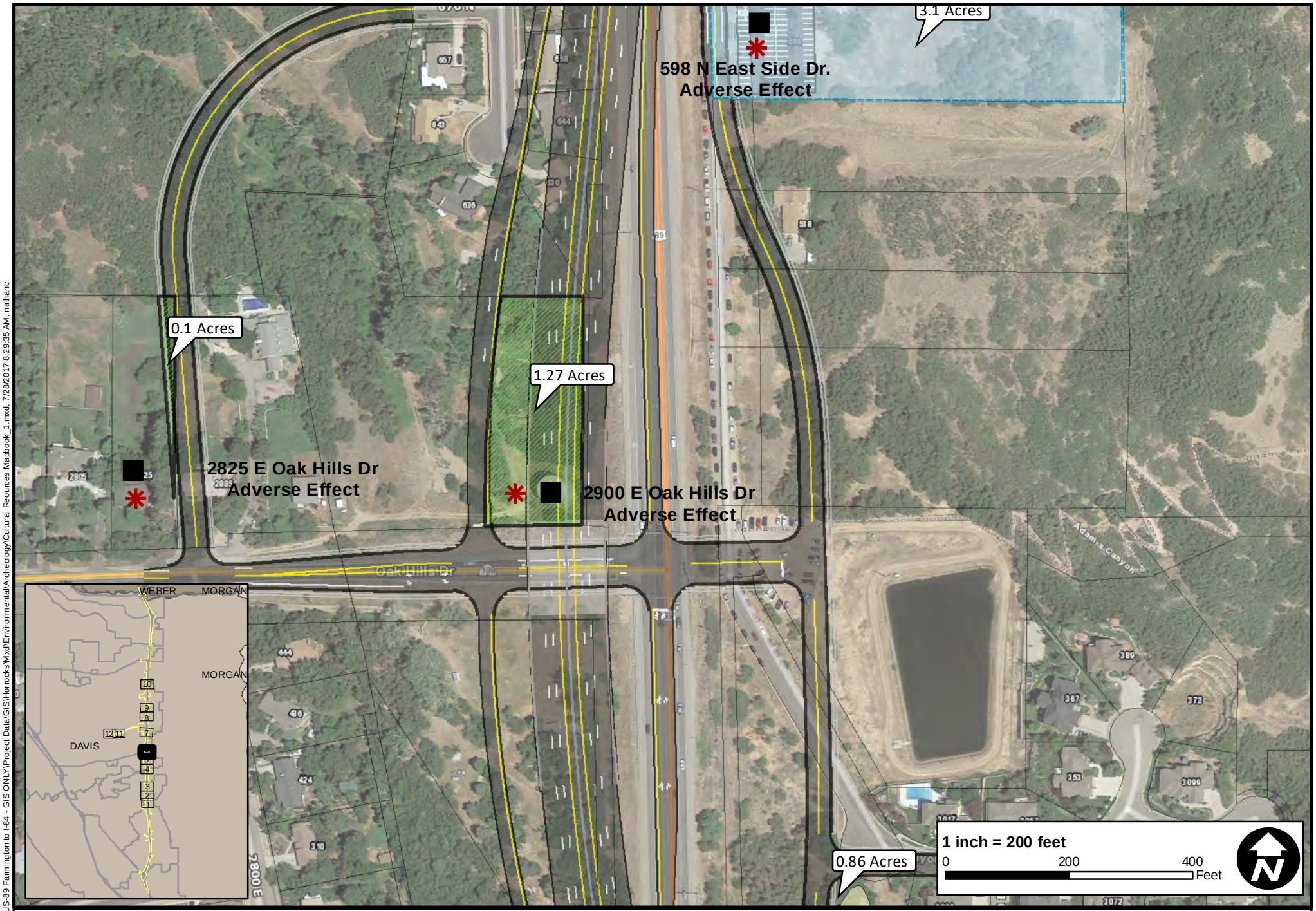

Adverse Effect

Eligible/Contributing

Partial Aquisition

Full Aquisition

UDOT Owned Property

42DV47

Undetermined

Eligible/Significant

US-89 Cultural Resources

Historic Structures Impact Mapbook

Map 6 of 12

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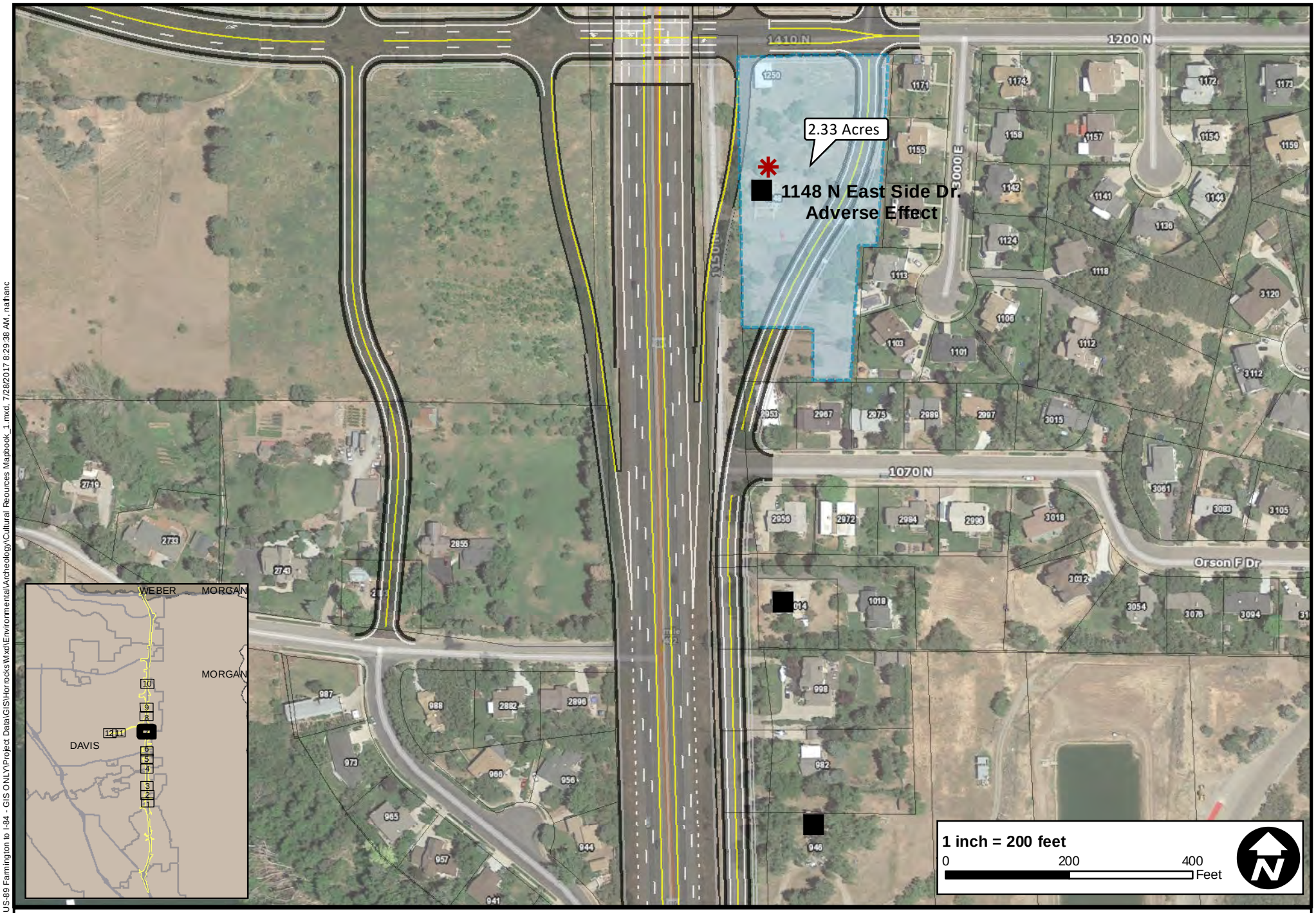

Adverse Effect
Eligible/Contributing
Partial Aquisition
Full Aquisition
UDOT Owned Property
42DV47
Undetermined
Eligible/Significant

US-89 Cultural Resources
Historic Structures Impact Mapbook
Map 7 of 12

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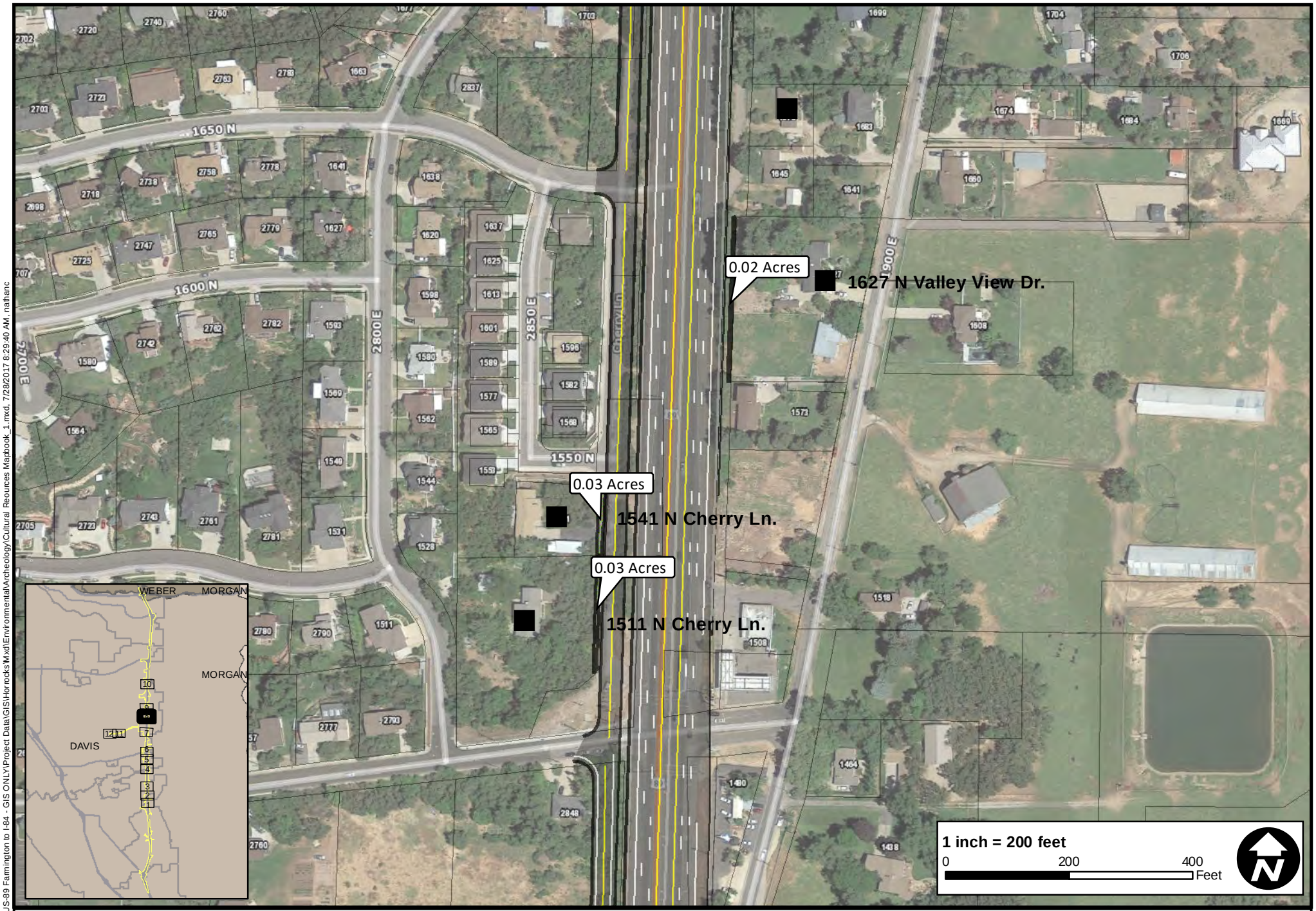

Adverse Effect

Eligible/Contributing

Partial Aquisition

Full Aquisition

UDOT Owned Property

42DV47

Undetermined

Eligible/Significant

US-89 Cultural Resources

Historic Structures Impact Mapbook

Map 8 of 12

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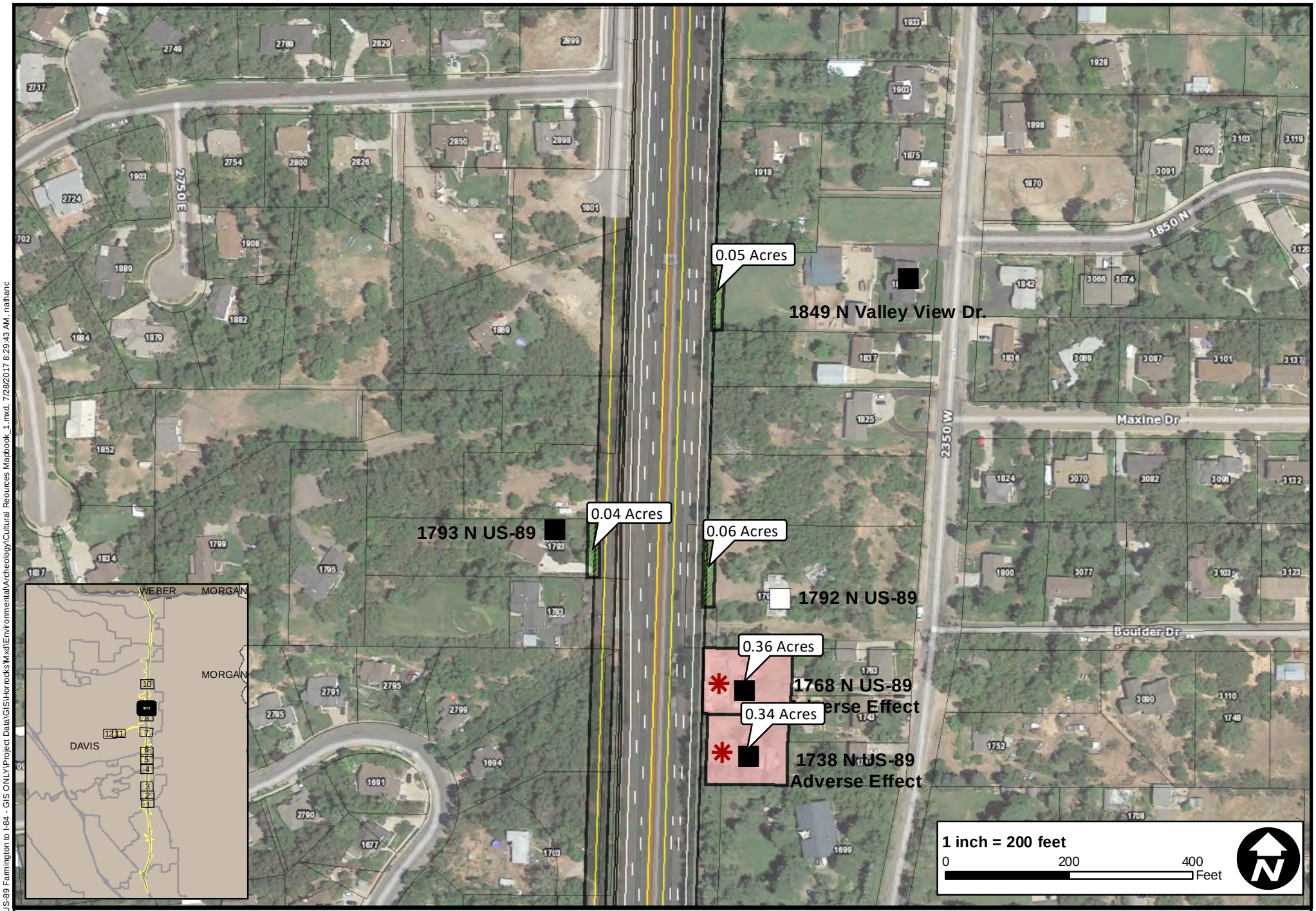

Adverse Effect
Eligible/Contributing
Partial Aquisition
Full Aquisition
UDOT Owned Property
42DV47
Undetermined
Eligible/Significant

US-89 Cultural Resources
Historic Structures Impact Mapbook
Map 9 of 12

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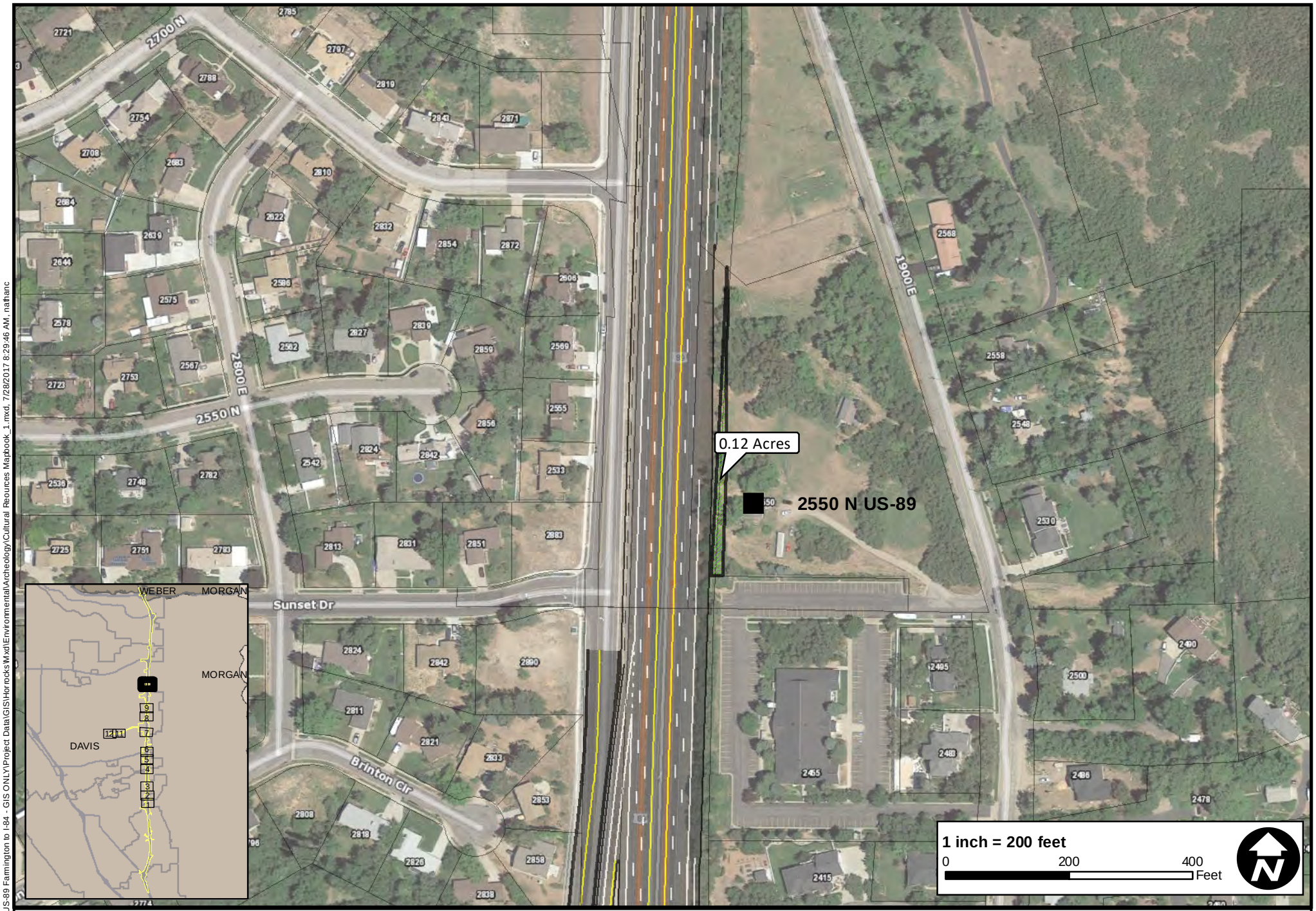

Adverse Effect

Eligible/Contributing

Partial Aquisition

Full Aquisition

UDOT Owned Property

42DV47

Undetermined

Eligible/Significant

US-89 Cultural Resources

Historic Structures Impact Mapbook

Map 10 of 12

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Adverse Effect

Eligible/Contributing

Partial Aquisition

Full Aquisition

UDOT Owned Property

42DV47

Undetermined

Eligible/Significant

US-89 Cultural Resources

Historic Structures Impact Mapbook

Map 11 of 12

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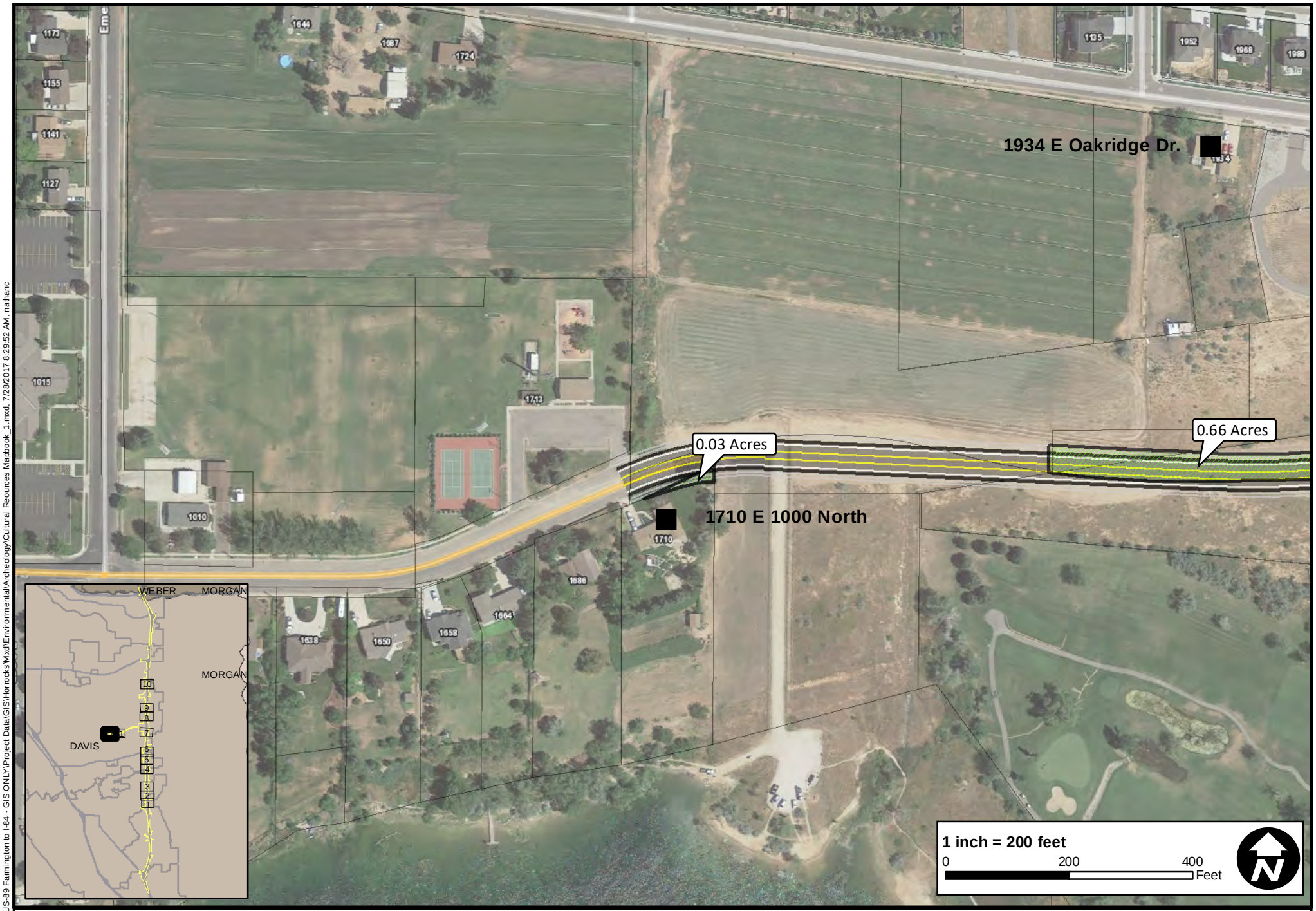

Adverse Effect
Eligible/Contributing
Partial Aquisition
Full Aquisition
UDOT Owned Property
42DV47
Undetermined
Eligible/Significant

US-89 Cultural Resources
Historic Structures Impact Mapbook
Map 12 of 12

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State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

August 7, 2017

Mr. Harris Adams
437 N. Wasatch Drive
Layton, Utah 84041

RE: UDOT Project No. S-0084(406)398; U.S. 89 State Environmental Study, Davis County, Utah, (PIN 13821)
Notification of Adverse Effects under Section 106 of the National Historic Preservation Act and Request for Consultation

Dear Mr. Adams,

The Utah Department of Transportation (UDOT) proposes to use state funds to improve regional transportation mobility in western Davis and Weber counties. The proposed project includes improvements on US-89 from Shepherd Lane to I-84, in Davis and Weber Counties (see the enclosed study area map). Safety and transportation improvements are needed to address current identified design deficiencies and current and projected 2040 travel demand along the existing U.S.-89 highway. The improvements may include roadway widening, improved intersections and grade-separated interchanges with local roads, extending Lloyd Rd. and Gordon Ave. to increase connectivity. Bridge replacements or modifications may be necessary on the US-89 bridge over the Weber River and at the I-84 interchange.

The purpose of this letter to update you, as a representative of the Layton Certified Local Government, of the adverse effect of the preferred alternative on historic sites in Layton that may be eligible for the National Register of Historic Places. The adverse effects will require acquisition by UDOT for the project. The UDOT and the Utah State Historic Preservation Office (USHPO) will sign a memorandum of agreement in compliance with Section 404 of the Utah State Antiquities Act, stipulating mitigation measures UDOT will undertake to resolve the adverse effects. Layton City may participate in this consultation process by providing suggestions for mitigation measures that may further historic preservation efforts in your community as well as signing the memorandum of agreement as an invited signatory.

As part of the environmental study, UDOT hired the cultural resources staff of Horrocks Engineers, Inc. to undertake a historic resources study to determine if any historic buildings or archaeological sites potentially eligible for the National Register would be impacted by any of the alternatives under consideration. The study identified historic resources in South Weber, Fruit Heights, Kaysville and Layton. The consultants identified 83 architectural resources constructed prior to 1972 within the entire study area, as well as 10 archaeological sites. As the environmental process progressed 45 potentially eligible properties were identified for the entire project corridor, 27 of which are located in Layton. The UDOT finds that eight of the 27 historic properties will need to be acquired and will be adversely affected. They are described in the table below:

Address	Style and Date	Photo of property
598 N. East Side Dr.	An Early Ranch style house clad in Masonite siding. 1950	
1148 N. East Side Dr.	An Early Ranch/Rambler house constructed of striated brick. 1945	
1738 N. US 89	Ranch type house clad with stone veneer and wood. 1953	
1768 N. US 89	Ranch w/garage type house clad with fieldstone and vinyl siding (fieldstone is the dominant material). 1964	
2157 E. Oakridge Dr.	Loafing shed, one of a grouping of outbuildings that remain on the property. The house associated with the property was constructed in 1880, but is no longer standing. 1920	

2825 E. Oak Hills	Split-level house clad in vinyl siding that imitates the original. 1969	
2900 E. Oak Hills	Layton City steel water tank. 1960	
Archaeological Site 42DV47	CCC-era retaining walls constructed about 1931	

The UDOT and SHPO will be considering measures that the agency can fund or undertake to mitigate the loss of these properties. I would appreciate any thoughts that preservation-minded Layton citizens might provide that the UDOT could use as mitigation stipulations. In the past, the UDOT has funded National Register nominations and survey activity; educational materials, such as walking tour brochures, websites or plaques; or historic structure reports, as was done in the case of the former O.S.L. Depot in Layton, successfully renovated as Café Sabor. Recently, the UDOT agreed to move the Joseph Hill Cabin to a city park as part of mitigation for the West Davis Corridor project. The agency is open to any suggestions.

If you would like me or a member of the project team familiar with the U.S. 89 project to meet with you or other interested parties, I would be happy to arrange a meeting. I would appreciate it if you could respond within 15 days should you wish to be an invited party and to share any mitigation ideas you may have. Please feel free to contact me at (801) 633-8484, or via email at egiraud@utah.gov, if you have any questions or need any additional information.

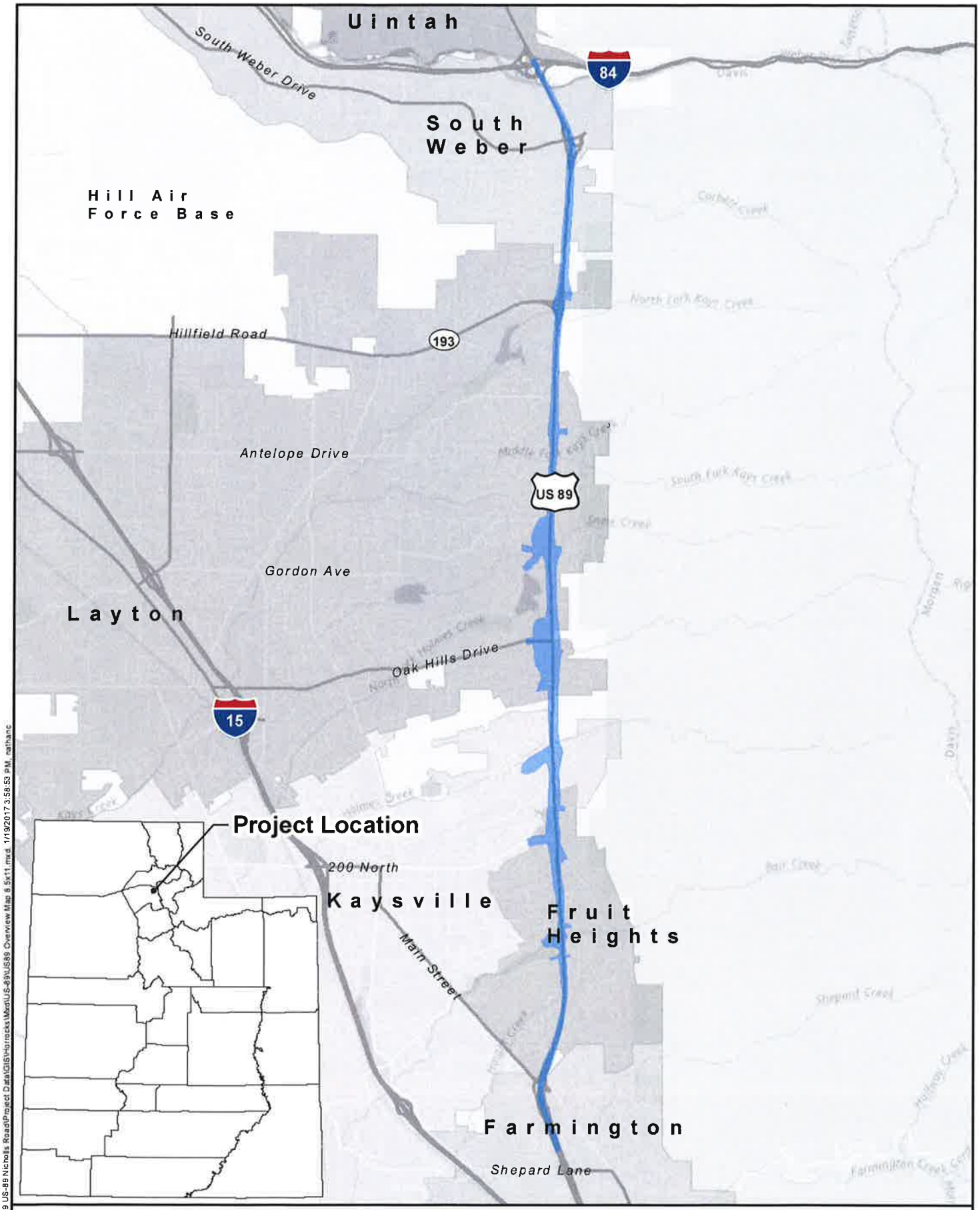
Thank you for your attention to this project update and for any comments you may have.

Sincerely,

Elizabeth Giraud

Elizabeth Giraud, AICP
Architectural Historian, Utah Department of Transportation

Cc: Mike Romero, UDOT Project Manager/R-1
Chris Lizotte, UDOT Environmental Manager/R-1
Liz Robinson, UDOT Cultural Resources Manager/Complex
Stan Jorgensen, Horrocks Engineers, Inc., Environmental Manager



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Study Area

US-89; Farmington to I-84

Project Overview Map

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FW: Updated US-89 Memo

Ryan Pitts

Thu 8/31/2017 12:35 PM

To: Nicole Tolley <NicoleT@horrocks.com>;

From: Andrea Moser [mailto:amoser@bio-west.com]
Sent: Tuesday, August 29, 2017 8:50 AM
To: Ryan Pitts <RyanP@horrocks.com>
Subject: Fwd: Updated US-89 Memo

FYI...

---------- Forwarded message ---------
From: Paul West <paulwest@utah.gov>
Date: Mon, Aug 28, 2017 at 3:56 PM
Subject: Re: Updated US-89 Memo
To: Andrea Moser <amoser@bio-west.com>

Hi Andrea,

Thank you for letting me review this. I agree with your assessment of T&E species and migratory bird, including Greater Sage-grouse.

This email should suffice for your environmental documentation.

Thanks for letting me review it,
Paul

On Tue, Aug 22, 2017 at 7:07 PM, Andrea Moser <amoser@bio-west.com> wrote:

> Hi Paul,
> Here is an updated memo with all comments received to date. Please let me know if you concur with the findings.
> Just as a quick reference - sage grouse are addressed on p. 3 under wildlife habitat and migratory birds are addressed at the end of the document in the avoidance and mitigation section.
> Thanks,
> Andrea
>
> Andrea Moser
> **BIO-WEST, Inc.**
> 435.232.2237 | amoser@bio-west.com | www.bio-west.com

--

Paul W. West, Wildlife Program Manager
Utah Department of Transportation
4501 S. 2700 West, Box 148450
Salt Lake City, Utah 84114-8450

Phone: 801-633-8747
email: paulwest@utah.gov

--

Andrea Moser
BIO-WEST, Inc.
435.232.2237 | amoser@bio-west.com | www.bio-west.com

17-1381

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

November 21, 2017

Mr. Cory Jensen
Senior Historic Preservation Specialist
Utah Division of State History
300 Rio Grande
Salt Lake City, UT 84101-1182

RE: UDOT Project No. S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah (PIN 13821).
Addendum Determination of Eligibility and Finding of Adverse Effect.

Dear Mr. Jensen:

The Utah Department of Transportation (UDOT) is preparing to undertake the subject state-aid project. In accordance with the *Programmatic Agreement between the UDOT and the Utah State Historic Preservation Officer Regarding Implementation of U.C.A. 9-8-404 for State Funded Transportation Projects in Utah* (executed March 19, 2008), the UDOT has taken into account the effects of this undertaking on historic properties and is affording the Utah State Historic Preservation Officer (SHPO) an opportunity to comment on the undertaking.

PROJECT DESCRIPTION

The proposed project includes improvements on US-89 from Shepherd Lane to I-84, in Davis and Weber Counties (see the enclosed study area map). Safety and transportation improvements are needed to address current identified design deficiencies and current and projected 2040 travel demand along the existing U.S.-89 highway. The improvements may include roadway widening, improved intersections and grade-separated interchanges with local roads, extending Lloyd Rd. and Gordon Ave. to increase connectivity. Bridge replacements or modifications may be necessary on the US-89 bridge over the Weber River and at the I-84 interchange.

UDOT submitted the original Determination of Eligibility and Finding of Effect (DOE/FOE) to the SHPO on August 2, 2017 (UDSH Case No. 17-1381) and this addendum presents information regarding additional areas not reviewed under the original documentation.

The area of potential affects (APE) has been defined as the proposed footprint of all additional project areas and adjoining parcels (see attached map). The total area of this additional APE is 27.4 acres and includes 9 parcels. The APE serves as the survey area for both archaeology and historic architecture.

The APE has been surveyed for cultural resources by Horrocks Engineers, under State Antiquities Project Number U-17-HX-0243. An intensive level pedestrian survey for archaeology was conducted using 15 meter transects and the results are reported in *A Supplemental Archaeological Investigation for the US-89; Farmington Main Street to I-84 Project* (see enclosed report). A reconnaissance selective level survey was conducted to record architectural properties, and the results are reported in *Addendum to the Reconnaissance Level Survey US-89; Farmington to I-84* (see enclosed report).

The survey has resulted in the identification of no archaeological sites and 3 architectural properties. Of these, 1 architectural property is eligible to the National Register of Historic Places (NRHP). No known traditional cultural properties or paleontological resources are located in the APE. The Determinations of Eligibility and Findings of Effects are provided in Table 1 for architectural properties.

ARCHITECTURAL PROPERTIES

Table 1. Determinations of Eligibility and Findings of Effect for Architectural Properties

Address	Date	Style	NRHP Eligibility/SHPO Rating	Finding of Effect
2706 E. Gentile St., Layton	1937	Late 20th Century: Other	Inelig./Non-contributing	No Historic Properties Affected
2733 E. Gentile St., Layton	1945	Late 20th Century: Other	Inelig./Non-contributing	No Historic Properties Affected
2833 E. Gentile St., Layton	1930	Bungalow	Eligible/Contributing under Criterion A	No Historic Properties Affected

Description of Effects to 2833 E. Gentile: The project will avoid impacts to this property and therefore will result in No Historic Properties Affected for this parcel.

CHANGES TO PREVIOUS FINDING OF EFFECTS

Description of Effects to 598 N. East Side Dr., Layton: As the project design progressed, it was determined that this property will be avoided and will no longer be adversely affected, as reported in the original DOE/FOE. Therefore, the updated finding of effect for this property is No Historic Properties Affected.

CONSULTATION EFFORTS

Native American consultation was initiated through letters sent to the Uintah and Ouray Ute Tribes, Shoshone-Bannock Tribes, Northwestern Band of Shoshone Nation, Eastern Shoshone Tribe of the Wind River Reservation, Skull Valley Goshute, Paiute Indian Tribe of Utah and the Cedar and Shivwits Bands of Paiutes (sent June 21, 2017). UDOT notified the Layton Certified Local Government on August 3, 2017, informing the city of the adverse effects on seven properties in that community and is currently in consultation to develop mitigation measures. The UDOT Cultural Resources staff could not identify historic preservation organizations in Fruit Heights or Kaysville. A hearing will be held where the public will be notified of the impacts to cultural resources included in this addendum. Project information was also included in the project website and presented at previous public open house events. No responses or comments were received concerning cultural resources.

SUMMARY

To summarize, the project will result in a finding of **No Historic Properties Affected** for all architectural properties included in this addendum. However, the project as a whole continues to result in a finding of **Adverse Effect**. Therefore, the Finding of Effect for the proposed UDOT Project No. S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah, remains **Adverse Effect**.

Please review this document and, providing you agree with the findings contained herein, sign and date the signature line at the end of this letter. Should you have any questions or need additional information, please feel free to contact Liz Robinson at 801-910-2035 or lizrobinson@utah.gov; or Elizabeth Giraud at 801-965-4917 or egiraud@utah.gov.

Sincerely,

Liz Robinson, M.A., RPA
Cultural Resources Program Manager
UDOT Environmental Services

Elizabeth Giraud, AICP
Architectural Historian
UDOT Environmental Services

Enclosures

cc: Michael Romero, Project Manager
Chris Lizotte, Environmental Manager

Regarding UDOT Project No. S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah, I concur with the Determination of Eligibility and Finding of Effect, submitted to the Utah State Historic Preservation Office in accordance with the *Programmatic Agreement* and U.C.A. 9-8-404, which states that the UDOT has determined that the finding is **Adverse Effect** for the project as a whole and **No Adverse Effect** for the findings presented herein..

Cory Jensen
Senior Historic Preservation Specialist

11/27/2017
Date

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

August 16, 2017

Mayor Tamara Long
Members of the South Weber City Council.
1600 East South Weber Drive
South Weber, UT 84405

Dear Mayor Long and South Weber City Council:

Thank you for your recent letter regarding South Weber's plans for a trail system that crosses under Highway 89 at the Weber River. We understand the importance of these trails and the positive impacts they have on the surrounding communities.

I have asked the project team working on the US-89 State Environmental Study (SES) to coordinate with your community to try and accommodate this trail, if possible. At the Weber River crossing location, as you have indicated, the proposed trail would require the existing bridges to be replaced. At this point, we have not determined if the bridges will be replaced or if they will just need to be modified and rehabilitated. The project team is currently evaluating how the work on Highway 89 ties into the existing roadway section at the I-84 Interchange and what impacts that has on the bridges over the river.

We will continue to work with South Weber through the SES and the design process in an effort to accommodate the proposed trail as the details become clearer. If you have further questions, feel free to contact me directly, or contact Michael Romero, US-89 Project Manager, at 801-620-1685 or **michaelromero@utah.gov**.

Sincerely,

Kris T. Peterson, P.E.
Region One Director

MR/KTP:jkm

CC: Randy Jefferies, Program Director
Michael Romero, US-89 Project Director

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

December 15, 2017

Mr. Clayton Booth
1419 Darling Street #5
Ogden, UT 84403-0528

Dear Mr. Booth:

RE: US-89; Farmington to I-84

The Governor's Office has asked me to review and respond to you recent message regarding bicycle and mass transit infrastructure along the US-89 corridor. The Utah Department of Transportation (UDOT) understands the importance of active transportation facilities along its state roads. Removing the signalized intersection and replacing them with interchanges along the mainline of US-89 introduces a safety hazard to cyclists so we need to provide an alternate path.

The unique nature of the US-89 Corridor poses some challenges to the installation of bike lanes. To overcome these challenges, UDOT is committed to working with the local municipalities to designate a Class III bike route between Farmington Main Street and South Weber Drive. This bike route will include existing bike lanes, shoulders suitable for cyclist on newly constructed roadways, and existing surface streets between Farmington Main Street and Layton Ridge Drive along with a shared-use path between Layton Ridge Drive and 2715 East. This layout is consistent with the region priority routes designated by the Wasatch Front Regional Council.

There is currently a feasibility study evaluating the US-89 & I-84 interchange, this study will include evaluating options to continue the bike route from the South Weber interchange up the hill. During the State Environmental Study (SES), UDOT has been coordinating with the Utah Transit Authority (UTA) on ways to improve mass transit. UTA stated the best way to improve mass transit in this area is to run busses every fifteen minutes between Weber State University and Farmington Station. The preferred alternative accommodates the increased buss traffic and includes additional park and ride lots to make accessing the bus system easier.

If you have any additional comments or concerns about the project, please contact Michael Romero. His email address is michaelromero@utah.gov or he can be reached by phone at 801-618-7746.

Sincerely,

Kris T. Peterson, P.E.
Region One Director

MR/KTP/jkm

CC: Constituent Services
Carlos Braceras, Executive Director
Michael Romero, US-89 Project Director ✓

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

February 5, 2018

Ellen Sanchez
elnsanchez@yahoo.com>

Dear Ms. Sanchezr.

RE: Nicholls Road Access

Thank you for reaching out to us to express your concerns about the proposed access change at Nicholls Road. Adding an interchange would require additional property to be acquired, including up to three relocations. Anytime UDOT has to acquire property through Eminent Domain we are required by state and federal law to provide a justification for that acquisition. That justification is outlined in the Purpose and Need (chapter 1) and the screening criteria (chapter 2) of the State Environmental Study (SES).

The screening criteria used to justify interchange locations in the SES are: the travel demand (5000 vehicle per day), cross street roadway classification (arterial) and interchange spacing. While an interchange at Nicholls Road did meet the criteria for interchange spacing, it did not meet the criteria for travel demand (4300 vpd) or the cross street roadway classification (collector) and that is why it was eliminated. Similarly, an interchange at Crestwood Road was eliminated due to its roadway classification.

We understand that limiting access onto US-89 to interchanges at 400 North and Cherry Hill will change travel patterns within Fruit Heights City. The UDOT relies on the SES process and believes the preferred alternative will provide reasonable access to US-89 from Fruit Heights residents.

Thank you once again for being involved. If you have any additional comments or concerns about the project please contact the Project Director Mike Romero at michaelromero@utah.gov or at 801-618-7746.

Sincerely,

Kris T. Peterson, P.E.
Region One Director

KTP:jkm

Cc: Carlos Braceras, Executive Director
Constituent Services

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

February 5, 2018

Eric Buckley
ericbuckley@yahoo.com

Dear Mr. Buckley:

RE: Nicholls Road Access

Carlos Braceras, Utah Department of Transportation (UDOT) Executive Director, has asked me to review and respond to your email regarding access to US-89 at Nicholls Road.

Thank you for reaching out to us to express your concerns about the proposed access change at Nicholls Road. Adding an interchange would require additional property to be acquired, including up to three relocations. Anytime UDOT has to acquire property through Eminent Domain we are required by state and federal law to provide a justification for that acquisition. That justification is outlined in the Purpose and Need (chapter 1) and the screening criteria (chapter 2) of the State Environmental Study (SES).

The screening criteria used to justify interchange locations in the SES are: the travel demand (5000 vehicle per day), cross street roadway classification (arterial) and interchange spacing. While an interchange at Nicholls Road did meet the criteria for interchange spacing, it did not meet the criteria for travel demand (4300 vpd) or the cross street roadway classification (collector) and that is why it was eliminated. Similarly, an interchange at Crestwood Road was eliminated due to its roadway classification.

We understand that limiting access onto US-89 to interchanges at 400 North and Cherry Hill will change travel patterns within Fruit Heights City. The UDOT relies on the SES process and believes the preferred alternative will provide reasonable access to US-89 from Fruit Heights residents.

Thank you once again for being involved. If you have any additional comments or concerns about the project please contact the Project Director Mike Romero at michaelromero@utah.gov or at 801-618-7746.

Sincerely,

Kris T. Peterson, P.E.
Region One Director

KTP:jkm

Cc: Carlos Braceras, Executive Director
Constituent Services

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

February 5, 2018

James and Jenelle Frazier
jrfrazier2@msn.com

Dear James and Jenelle :

RE: Nicholls Road Access

Carlos Braceras, Utah Department of Transportation (UDOT) Executive Director, has asked me to review and respond to your email regarding access to US-89 at Nicholls Road.

Thank you for reaching out to us to express your concerns about the proposed access change at Nicholls Road. Adding an interchange would require additional property to be acquired, including up to three relocations. Anytime UDOT has to acquire property through Eminent Domain we are required by state and federal law to provide a justification for that acquisition. That justification is outlined in the Purpose and Need (chapter 1) and the screening criteria (chapter 2) of the State Environmental Study (SES).

The screening criteria used to justify interchange locations in the SES are: the travel demand (5000 vehicle per day), cross street roadway classification (arterial) and interchange spacing. While an interchange at Nicholls Road did meet the criteria for interchange spacing, it did not meet the criteria for travel demand (4300 vpd) or the cross street roadway classification (collector) and that is why it was eliminated. Similarly, an interchange at Crestwood Road was eliminated due to its roadway classification.

We understand that limiting access onto US-89 to interchanges at 400 North and Cherry Hill will change travel patterns within Fruit Heights City. The UDOT relies on the SES process and believes the preferred alternative will provide reasonable access to US-89 from Fruit Heights residents.

Thank you once again for being involved. If you have any additional comments or concerns about the project please contact the Project Director Mike Romero at michaelromero@utah.gov or at 801-618-7746.

Sincerely,

Kris T. Peterson, P.E.
Region One Director

KTP:jkm

Cc: Carlos Braceras, Executive Director
Constituent Services

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

February 5, 2018

Mayor John M. Pohlman
jpohlman@fruitheightscity.com

Dear Mayor Pohlman:

RE: Nicholls Road Access

Carlos Braceras, Utah Department of Transportation (UDOT) Executive Director, has asked me to review and respond to your email regarding your request for interchange access to US-89 at Nicholls Road. Thank you for reaching out to us to express your concerns about the proposed changes at Nicholls Road.

The screening criteria used to justify interchange locations in the SES are: the travel demand (5000 vehicle per day), cross street roadway classification (arterial), and interchange spacing. While an interchange at Nicholls Road did meet the criteria for interchange spacing, it did not meet the criteria for travel demand (4300 vpd) or the cross street roadway classification (collector) and that is why it was eliminated from further consideration. Similarly, an interchange at Crestwood Road was eliminated due to its roadway classification.

Further, adding an interchange at Nicholls Road would require additional property to be acquired including displacing up to 3 residences. Anytime UDOT has to acquire property through Eminent Domain we are required by state and federal law to provide a justification for that acquisition. That justification is outlined in the Purpose and Need (chapter 1) and the screening criteria (chapter 2) of the State Environmental Study (SES).

We understand that limiting access onto US-89 to interchanges at 400 N and Cherry Hill will change travel patterns within Fruit Heights City. The UDOT relies on the SES process and believes the preferred alternative will provide reasonable access to US-89 from Fruit Heights residents.

Thank you once again for being involved. We are committed to continue to coordinate diligently with your community as the project moves forward. If you have any additional comments or concerns about the project please contact me or the Project Director, Mike Romero, at michaelromero@utah.gov or at 801-618-7746.

Sincerely,

Kris T. Peterson, P.E.
Region One Director

KTP:jkm

Cc: Carlos Braceras, Executive Director
Constituent Services

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

February 5, 2018

Tara Arnold
btarnold@aol.com

Dear Ms. Arnold:

RE: Nicholls Road Access

Carlos Braceras, Utah Department of Transportation (UDOT) Executive Director, has asked me to review and respond to your email regarding access to US-89 at Nicholls Road.

Thank you for reaching out to us to express your concerns about the proposed access change at Nicholls Road. Adding an interchange would require additional property to be acquired, including up to three relocations. Anytime UDOT has to acquire property through Eminent Domain we are required by state and federal law to provide a justification for that acquisition. That justification is outlined in the Purpose and Need (chapter 1) and the screening criteria (chapter 2) of the State Environmental Study (SES).

The screening criteria used to justify interchange locations in the SES are: the travel demand (5000 vehicle per day), cross street roadway classification (arterial) and interchange spacing. While an interchange at Nicholls Road did meet the criteria for interchange spacing, it did not meet the criteria for travel demand (4300 vpd) or the cross street roadway classification (collector) and that is why it was eliminated. Similarly, an interchange at Crestwood Road was eliminated due to its roadway classification.

We understand that limiting access onto US-89 to interchanges at 400 North and Cherry Hill will change travel patterns within Fruit Heights City. The UDOT relies on the SES process and believes the preferred alternative will provide reasonable access to US-89 from Fruit Heights residents.

Thank you once again for being involved. If you have any additional comments or concerns about the project please contact the Project Director Mike Romero at michaelromero@utah.gov or at 801-618-7746.

Sincerely,

Kris T. Peterson, P.E.
Region One Director

KTP:jkm

Cc: Carlos Braceras, Executive Director
Constituent Services

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

February 5, 2018

Lisa Meyer
lisa.hmeyer8@gmail.com

Dear Ms. Meyer:

RE: Nicholls Road Access

Carlos Braceras, Utah Department of Transportation (UDOT) Executive Director, has asked me to review and respond to your email regarding access to US-89 at Nicholls Road.

Thank you for reaching out to us to express your concerns about the proposed access change at Nicholls Road. Adding an interchange would require additional property to be acquired, including up to three relocations. Anytime UDOT has to acquire property through Eminent Domain we are required by state and federal law to provide a justification for that acquisition. That justification is outlined in the Purpose and Need (chapter 1) and the screening criteria (chapter 2) of the State Environmental Study (SES).

The screening criteria used to justify interchange locations in the SES are: the travel demand (5000 vehicle per day), cross street roadway classification (arterial) and interchange spacing. While an interchange at Nicholls Road did meet the criteria for interchange spacing, it did not meet the criteria for travel demand (4300 vpd) or the cross street roadway classification (collector) and that is why it was eliminated. Similarly, an interchange at Crestwood Road was eliminated due to its roadway classification.

We understand that limiting access onto US-89 to interchanges at 400 North and Cherry Hill will change travel patterns within Fruit Heights City. The UDOT relies on the SES process and believes the preferred alternative will provide reasonable access to US-89 from Fruit Heights residents.

Thank you once again for being involved. If you have any additional comments or concerns about the project please contact the Project Director Mike Romero at michaelromero@utah.gov or at 801-618-7746.

Sincerely,

Kris T. Peterson, P.E.
Region One Director

KTP:jkm

Cc: Carlos Braceras, Executive Director
Constituent Services

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

February 7, 2018

Caryn Thomson
caryn.thomson@gmail.com

Dear Ms. Thomson:

RE: Highway 89 Improvements

Carlos Braceras, Utah Department of Transportation (UDOT) Executive Director, has asked me to review and respond to your email regarding the proposed improvements to Highway 89.

Thank you for reaching out to us to express your concerns about the proposed improvements to Highway 89. I wanted to let you know that during the design process, UDOT will form a Community Coordination Team (CCT) to provide opportunities for stakeholder input on the project design. The CCT would include 12-15 members, representing neighborhoods, cities, and other interests, who would provide input on design elements such as roadway profile, traffic related noise, aesthetic treatments, and other matters of concern. This team would help UDOT explore ways to minimize project impacts while meeting engineering standards and budgetary constraints.

Thank you once again for being involved. If there are any specific questions you would like to have answered contact the Project Director Mike Romero, at michaelromero@utah.gov or at 801-618-7746.

Sincerely,

Kris T. Peterson, P.E.
Region One Director

KTP:mr

CC: Carlos Braceras, Executive Director
Michael Romero, Project Director

MEMORANDUM OF AGREEMENT
AMONG
THE UTAH DEPARTMENT OF TRANSPORTATION
AND THE UTAH STATE HISTORIC PRESERVATION OFFICER

REGARDING

PROJECT #: S-0084(406)398; U.S. 89 State Environmental Study,
Davis and Weber Counties, Utah

WHEREAS, the Utah Department of Transportation (UDOT) proposes to use state funds to undertake **PROJECT #: S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah**, which proposes to convert US-89 from Shepherd Lane to I-84 into a freeway; and

WHEREAS, in accordance with the *Programmatic Agreement between the UDOT and the Utah State Historic Preservation Officer Regarding Implementation of U.C.A. 9-8-404 for State Funded Transportation Projects in Utah* (renewed January 22, 2018), the UDOT is taking into account the effects of **PROJECT #: S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah,** on historic properties and has determined that this undertaking will have an adverse effect on 10 historic residential properties and 1 archaeological site eligible for inclusion in the National Register of Historic Places, UDOT has consulted with the Utah State Historic Preservation Officer (SHPO) pursuant to U.C.A. 9-8-404 to resolve the adverse effects; and

WHEREAS, the UDOT has consulted with the Confederated Tribes of the Goshute Reservation, Skull Valley Band of the Goshute Indians, the Eastern Shoshone Tribe of the Wind River Reservation, the Shoshone-Bannock Tribes of Fort Hall, the Paiute Indian Tribe of Utah, the Northwestern Band of the Shoshone Nation, the Uintah and Ouray Ute Indian Reservation, the Cedar Band of the Paiutes, and the Shivwits Band of Paiute Indians; and the Tribes have been afforded an opportunity to review the project and have not responded with objections; and

WHEREAS, the UDOT has consulted with the Layton City Certified Local Government and it has not responded with objections; and

WHEREAS, Layton City (the City) has participated in the preparation of this Memorandum of Agreement and has been asked by UDOT to be an invited signatory to this agreement; and

NOW, THEREFORE, the UDOT and the Utah SHPO agree that upon UDOT's decision to proceed with the undertaking, UDOT shall ensure that the following stipulations are implemented in order to take into account the effects of the undertaking on historic properties, and the stipulations shall govern the undertaking and all of its parts until this MOA expires or is terminated.

STIPULATIONS

The UDOT shall ensure that the following measures are carried out:

I. MITIGATION OF HISTORIC BUILDINGS

A. Mitigation for adverse effects on historic architecture shall include Intensive Level Survey and additional research on post-World War II historic buildings in the Layton area.

B. UDOT shall be responsible for the documentation of the following buildings:

- 347 N. 1300 East, Fruit Heights
- 1270 E. Oakmont Ln., Fruit Heights
- 1402 N. US-89, Kaysville
- 598 N. East Side Dr., Layton
- 1148 N. East Side Dr., Layton
- 1738 N. US 89, Layton
- 1768 N. US 89, Layton
- 2157 E. Oakridge Dr., Layton
- 2825 E. Oak Hills, Layton
- 2900 E. Oak Hills, Layton

1. The buildings will be documented according to the Utah State Intensive Level Survey Standards (ILS) as required by SHPO. Documentation will include a completed ILS Historic Site Forms, which will be based partly on title searches and obituary research, photographs of the exterior of the buildings, photographs burned onto a gold CD, a sketch map of the property layout, aerial photograph maps indicating the location of the buildings, and a U.S. Geological Survey may (scale: 1:24,000) indicating the location of the buildings.

C. UDOT will develop a historic context of post-World War II development in Layton. The context will discuss how Layton developed after WWII, identify areas of growth in the city and the impetus behind that growth, and using information gleaned from subdivision plats, identify the size of the subdivision and the developers associated with post-war growth.

II. MITIGATION OF SITE 42DV47

A. UDOT will salvage an appropriate amount the stone from the wall structures and reconstruct a segment of the wall at the future Snow Canyon Nature Park location. This facility will be used by Layton City in historic interpretation efforts to inform the public about the role of CCC projects in the Layton area.

1. UDOT's responsibilities shall include:
    a. Documenting the historical walls during and after demolition activities; according to the standards of the Utah Archaeological Site Form. This documentation shall include information on the construction techniques, materials, and dimensions of the two walls. A completed Site Form will be submitted to SHPO when documentation is complete.
    b. Coordinate with Layton City to ensure that any structure or facility constructed from the salvaged material does not adversely affect any archeological or other historic property occupying the proposed location.
        i. UDOT will provide the Utah SHPO with an opportunity to comment on the location; however, ultimately, Layton City will determine the location and form of the facility.

c. In coordination with Layton City and SHPO, develop the design and construction method of the reconstructed wall.

d. Conduct research and produce a summary report on CCC activities in the Layton area in support of an interpretive signage. This research will also be provided to the Heritage Museum of Layton to support future exhibits on the CCC.

e. Transfer funds of $1,200 to Layton City for the development of signage at the interpretive facility.

f. Stabilize the remaining portions of the wall structures not impacted by this project, to prevent further deterioration. UDOT will consult with the SHPO on stabilization efforts.

2. Layton City's responsibilities shall include:

a. Participate in the location, design and project management of the interpretive facility.

b. Install the interpretive signage as the Snow Canyon Nature Park is constructed.

c. Maintain and care for the interpretive facility in perpetuity.

III. REPORTING: The UDOT shall ensure that any/all reports on activities carried out pursuant to this agreement are provided to the SHPO, the signatories to this MOA, and upon request, to any other interested parties.

IV. PERSONNEL QUALIFICATIONS: The UDOT shall ensure that all historic work carried out pursuant to this agreement is completed by or under the direct supervision of a person or persons meeting or exceeding the Secretary of the Interior's Historic Preservation Professional Qualification Standards for History (36 CFR 61 Appendix A).

V. DURATION: This agreement will be null and void if its terms are not carried out within five (5) years from the date of its execution. Prior to such time, the UDOT may consult with the other signatories to reconsider the terms of the agreement and amend it in accordance with Stipulation VII below.

VI. DISCOVERY: The following measures regarding inadvertent discoveries of historic properties, archaeological sites, and paleontological resources will be implemented:

A. UDOT Standard Specifications Section 01355, Part 3.8, Discovery of Historical, Archaeological or Paleontological Objects, Features, Sites, or Human Remains, will be enforced during this project. This specification stipulates procedures to be followed should any archaeological, historic, or paleontological resources be discovered during construction of the project. These procedures are as follows:

1. Immediately suspend construction operations in the vicinity of the discovery if a suspected historic, archeological or paleontological item, feature, or site is encountered or if suspected human remains or encountered.
2. Verbally notify the engineer of the nature and exact location of the findings.
3. The Engineer contacts the UDOT region staff archaeologist, who will assess the nature of the discovery and determine the necessary course of action.
4. Protect the discovered objects or features and provide written confirmation of the discovery to the Engineer within two calendar days.
5. The Engineer keeps the Contractor informed concerning the status of the restriction: 1) the time necessary for the Department to handle the discovered item, feature, or site is variable, dependent on the nature and condition of the

discovered item; and 2) the Engineer will provide written confirmation when work may resume in the area.

B. Should a discovery occur, the UDOT will consult with the SHPO toward developing and implementing an appropriate treatment plan prior to resuming construction.

VII. DISPUTE RESOLUTION: Should any party to this agreement object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, the UDOT shall consult with the objecting parties to resolve the objection. If the UDOT determines, within 30 days, that the objection(s) cannot be resolved, the UDOT will:

A. The UDOT may render a decision regarding the dispute. In reaching its decision, the UDOT will take into account all comments regarding the dispute from the parties to the MOA.
B. The UDOT's responsibilities to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged. The UDOT will notify all parties of its decision in writing before implementing that portion of the undertaking subject to dispute under this stipulation. The UDOT's decision will be final.
C. Further, at any time during implementation of the measures stipulated in this agreement should an objection to any such measure be raised by a member of the public, the UDOT shall take the objections into account and consult as needed with the objecting party or the SHPO to resolve the objection.

VIII. AMENDMENTS AND NONCOMPLIANCE: If any signatory to this MOA, including any invited signatory, determines that its terms will not or cannot be carried out or that an amendment to its terms must be made, that party shall immediately consult with the other parties to develop an amendment to this MOA. The amendment will be effective on the date a copy signed by all of the original signatories is filed with the SHPO. If the signatories cannot agree to appropriate terms to amend the MOA, any signatory may terminate the agreement in accordance with Stipulation VIII, below.

IX. TERMINATION: If an MOA is not amended following the consultation set out in Stipulation VI and Stipulation VII, it may be terminated by any signatory or invited signatory. Within 30 days following termination, the UDOT shall notify the signatories if it will initiate consultation to execute an MOA with the signatories and proceed accordingly.

X. EXECUTION: Execution of this Memorandum of Agreement by the UDOT and the Utah SHPO and the submission of documentation and filing of this Memorandum of Agreement with the Utah SHPO in accordance with U.C.A. 9-9-404 prior to UDOT's approval of this undertaking, and implementation of its terms, evidence that the UDOT has taken into account the effects of this undertaking on historic properties, and has afforded the State Historic Preservation Office an opportunity to comment on **PROJECT#: S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah.**

SIGNATORIES:

UTAH DEPARTMENT OF TRANSPORTATION

2-17-18

Kris Peterson, UDOT Region Director — Date

UTAH STATE HISTORIC PRESERVATION OFFICE

8/20/18

Chris Merritt, Deputy Utah SHPO — Date

INVITED SIGNATORIES:

LAYTON CITY

Robert Stevenson, Mayor — Date

Appendix A

Future Snow Canyon Nature Park, Layton

Parcel Boundary

0 0.05 0.1 0.2 Miles

Date: 2/1/2018

N

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

February 20, 2018

JoEllen Grandy
Parks Planner, Layton City
465N. Wasatch Dr.
Layton, UT 84041

RE: UDOT Project No. S-0084(406)398; U.S. 89 State Environmental Study, Davis and Weber Counties, Utah (PIN 13821).
Memorandum of Agreement

Dear Ms. Grandy:

Please find attached one executed copy of the US-89 Memorandum of Agreement (MOA) for your files. Should you have any questions or need any additional information, please feel free to contact me at (801) 910-2035 or at lizrobinson@utah.gov.

Sincerely,

Liz Robinson

Liz Robinson, M.A., R.P.A
Cultural Resources Program Director
UDOT Central Environmental