- UDOT would visually inspect and maintain stormwater quality BMPs so that they are functioning properly. These BMPs would likely include detention basins; however, other BMPs from UDOT's *Stormwater Quality Design Manual* might be chosen during the final design phase of the project.
    - During construction, inspectors for the project would certify that the BMPs were installed according to contract documents and UDOT standards.
    - After construction, UDOT would document and maintain records of inspections, any deficiencies identified during inspections, and the repairs performed on the BMPs.
- UDOT would comply with the Clean Water Act Section 404 permit, including any required Section 401 Water Quality Certifications and applicable Stream Alteration Permits for activities placing fill into waters of the United States and altering natural stream bed and banks.
- UDOT would maintain wetland hydrology and existing surface water conveyance patterns through the installation of culverts or other engineering alternatives through the roadway embankment.
- UDOT would collaborate with the public water system owners that have drinking water source protection zones in place that might be impacted by the Project during final design and construction to mitigate any impacts to water distribution infrastructure.
- UDOT would coordinate with the owners of any impacted water right points of diversion during final design and construction to protect or replace the impacted points of diversion as necessary.
- UDOT would design and implement countermeasures to mitigate potential impacts to a stream's natural flow pattern, velocity, profile, channel stability, aquatic habitats, streambank vegetation, and riparian habitats that could result from replacing, lining, extending, or repairing conveyance structures for the project.

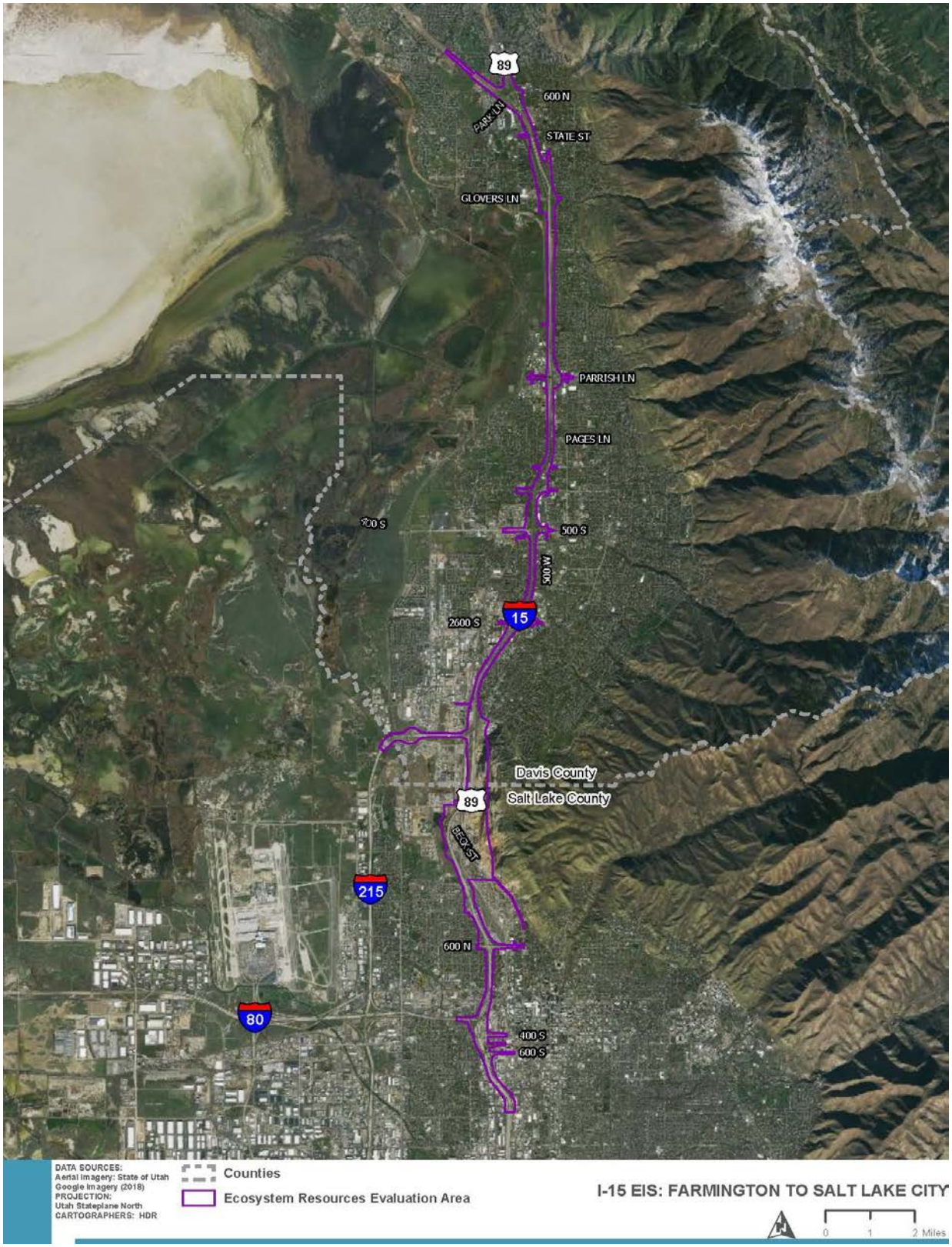
3.12 Ecosystem Resources

3.12.1 Introduction

Section 3.12 describes the ecosystem resources, including the plant species, wildlife species, habitat types, and aquatic resources, in the ecosystem resources evaluation area and how these resources would be directly and indirectly affected by the project alternatives.

Ecosystem Resources Evaluation Area. The ecosystem resources evaluation area is located in Davis and Salt Lake Counties. It measures about 18 miles north-south and extends from the U.S. 89/Legacy Parkway/ Park Lane interchange (I-15 milepost 325) in Farmington to the I-80 West/400 South interchange (I-15 milepost 308) in Salt Lake City (Figure 3.12-1). The width of the evaluation area varies. The boundaries for the evaluation area extend beyond the north and south termini of the project to include ramps that begin or end at these interchanges. In addition, the evaluation area includes each of the I-15 interchanges between the northern and southern termini and extends to the east and west to include the next major intersection. The evaluation area covers about 2,866 acres and ranges in elevation from about 4,210 to 4,710 feet.

Figure 3.12-1. Ecosystem Resources Evaluation Area



3.12.2 Regulatory Setting

3.12.2.1 Threatened and Endangered Species

The Endangered Species Act (ESA; 16 USC Sections 1531–1544) establishes a framework to protect and conserve species listed as threatened or endangered and their habitats. The ESA prohibits the "take" of endangered species except when the take is incidental to, and not the purpose of, carrying out an otherwise lawful activity, or when take is for scientific purposes, or to enhance the propagation or survival of the species.

What is a take of a listed species?

The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect an individual of a species listed as threatened or endangered (16 USC Section 1532).

Under Section 7 of the ESA, federal agencies must consult with the U.S. Fish and Wildlife Service (USFWS) before taking any action that will likely affect a federally listed threatened or endangered species or designated critical habitat for an endangered species. In addition, federal agencies must ensure that their actions are not likely to jeopardize the continued existence of any listed species or to destroy or adversely modify any designated critical habitat.

Under the Memorandum of Understanding described in Section 1.1, *Introduction*, in Chapter 1, *Purpose and Need*, UDOT has been assigned FHWA's responsibilities for compliance with Section 7 requirements as part of the environmental review process for highway projects in Utah. A federal action agency (in this case, UDOT acting in the role of FHWA) makes an effect determination for a proposed action on each listed species in the evaluation area. The following are the three types of effect determinations an action agency could make:

- **"No Effect" Determination.** A "no effect" determination means that the proposed action would not impact listed species or their designated critical habitats and does not require consultation or concurrence from USFWS.
- **"May Affect, but Not Likely to Adversely Affect" Determination.** A "may affect, but not likely to adversely affect" determination means that any effects on listed resources would be beneficial, insignificant, or discountable. If a federal agency makes this determination, it can satisfy its Section 7 consultation responsibilities by obtaining concurrence with its determination from USFWS.
- **"May Affect, Likely to Adversely Affect" Determination.** When listed resources are likely to be exposed to a proposed project's actions and are likely to respond negatively to the exposure, a "may affect, and is likely to adversely affect" determination is made by the federal action agency. This determination requires the federal agency to formally consult with USFWS on the impacts of the proposed action. After formal consultation is completed, USFWS prepares its Biological Opinion on whether the proposed action will jeopardize the continued existence of the species or adversely modify its designated critical habitat.

Through the analysis in this EIS, UDOT has determined that there would be "no effect" on any threatened or endangered species from the Action Alternative and no additional consultation or coordination with USFWS is required under Section 7 of the ESA (UDOT 2023c).

3.12.2.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 USC Sections 703–712) makes it unlawful to pursue, hunt, take, capture, kill, possess, sell, barter, purchase, transport, export, or import any migratory bird, or any part, nest, or egg of any such bird, with the exception of taking game birds during established hunting seasons. Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* (January 10, 2001), directs federal agencies taking actions likely to affect migratory birds to support the implementation of the Migratory Bird Treaty Act.

3.12.2.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC Sections 668–668d) makes it unlawful to take, import, export, sell, purchase, transport, or barter any bald or golden eagle or their parts, products, nests, or eggs. "Take" includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing eagles.

3.12.2.4 Candidate Conservation Agreements

USFWS considers candidate species to be those plants and animals that are candidates for listing under the ESA. These are species for which there is enough information regarding their biological status and threats to propose them as threatened or endangered, but listing is currently precluded by higher-priority listing activities. Candidate species are not subject to the legal protections of the ESA.

A Candidate Conservation Agreement (CCA) is a formal, voluntary agreement among USFWS and one or more parties to address the conservation needs of candidate species or species that could become candidates in the near future. Participants voluntarily commit to implement specific actions designed to remove or reduce threats to the covered species. The development of a CCA is one of the primary ways of identifying appropriate conservation efforts. Proactive conservation efforts for candidate species can, in some cases, eliminate the need to list them under the ESA.

3.12.2.5 Clean Water Act

The 1972 Clean Water Act (33 USC Sections 1251–1387) provides authority for the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers (USACE) to define waters of the United States. *Waters of the United States* are jurisdictional waters, currently defined in 40 CFR Section 120.2.

Section 404 of the Clean Water Act requires authorization from USACE to discharge dredged or fill material into any waters of the United States. Any person, firm, or agency planning to alter or work in waters of the United States, including the discharge of dredged or fill material, must first obtain authorization from USACE under Clean Water Act Section 404 and, if applicable, Section 10 of the Rivers and Harbors Act of 1899 (33 USC Section 403) for work within navigable waters of the United States. Additionally, Executive Order 11990, *Protection of Wetlands*, directs federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in carrying out agency responsibilities.

USACE issues permits to allow discharges into waters of the United States pursuant to the Section 404(b)(1) Guidelines. One of the key requirements in the guidelines is that a Section 404 permit cannot be issued for an alternative if there is another practicable alternative that would cause less adverse impact to aquatic resources, as long as the alternative does not have other significant adverse environmental consequences. This requirement is commonly known as the requirement to select the "least environmentally damaging practicable alternative." In addition, Executive Order 11990 also states that agencies are directed to avoid new construction in wetlands unless an agency determines that there are no practicable alternatives to such construction.

What are aquatic resources?

Aquatic resources include rivers, lakes, streams, creeks, natural ponds, and wetlands.

3.12.3 Affected Environment

3.12.3.1 Methodology

3.12.3.1.1 Data Collection

UDOT used several methods to collect data regarding the ecosystem resources in the ecosystem resources evaluation area that could be affected by the action alternatives. These methods included conducting literature reviews, consulting with resource agency personnel, and interpreting aerial photographs. UDOT also conducted field surveys for wildlife; vegetation; rare, threatened, and endangered species; and aquatic resources during the fall seasons of 2021 and 2022.

UDOT obtained a species list from the USFWS Information, Planning, and Consultation (IPaC) website for federally threatened, endangered, or candidate species that should be evaluated for the project (USFWS 2022a). UDOT also consulted the USFWS Environmental Conservation Online System (ECOS) for a list of species under conservation agreement that are known to occur in Davis and Salt Lake Counties (USFWS 2022b). Additionally, UDOT obtained a species list from the Utah Natural Heritage Program online data request website to determine whether there are records of occurrence for any of the federally listed threatened, endangered, and candidate species or species under conservation agreement in the vicinity of the evaluation area (UDWR 2022). Reports from IPaC and the Utah Natural Heritage Program are provided in Attachment A, *Species Lists,* of the *Biological Resources Evaluation Report* (UDOT 2024a). This report is provided as Appendix 3L of this EIS.

The Utah Species Field Guide (UDWR, no date), NatureServe (no date), Audubon (no date), and Cornell Lab's All About Birds website (Cornell Lab of Ornithology 2019) were referenced for species habitat descriptions.

UDOT identified, mapped, and delineated wetlands and other aquatic resources in the evaluation area using the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual* (Lichvar and McColley 2008), and the *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Curtis and Lichvar 2010). Aquatic resource boundaries were mapped through a combination of global positioning system (GPS)-based field mapping (using ArcGIS Field Maps software and a tablet) and desktop digitization

referencing aerial images. These data were also used to calculate the area, lengths, and widths of aquatic resources in the evaluation area (see Appendix 3M, *Aquatic Resources Delineation Report* [UDOT 2024b).

3.12.3.2 General Overview of the Ecosystem Resources Evaluation Area

The ecosystem resources evaluation area is part of the Moist Wasatch Front Footslopes subregion in the Central Basin and Range Ecoregion (Woods and others 2001). The Moist Wasatch Front Footslopes region supports the majority of Utah's population and commercial activity. This region is fed by perennial streams and aqueducts that originate in the adjacent Wasatch Range.

The evaluation area is located within two watersheds: the Jordan to the south (hydrologic unit code 16020204) and the Lower Weber to the north (hydrologic unit code 16020102) (USGS 2023). The Jordan River originates at Utah Lake; flows north through the Salt Lake Valley, west of the evaluation area; and discharges to the Great Salt Lake. A small portion of the Jordan River is within the evaluation area. The Weber River originates east of the evaluation area in the northwest corner of the Uinta Mountains where it continues west through Echo and Rockport Reservoirs, eventually terminating into the Great Salt Lake. Water in the evaluation area generally flows west toward the Jordan River or the Great Salt Lake. The surface waters in the evaluation area include nine named streams (Shepard Creek, Farmington Creek, Steed Creek, Davis Creek, Ricks Creek, DSB Drain, Barton Creek, Mill Creek, and the Jordan River), two named canals (Oil Drain and 600 North Drain), one unnamed canal, and many ditches. The DSB Drain is the convergence of Deuel Creek, Stone Creek, and Barton Creek converging in the evaluation area. In addition, multiple stream features cross the evaluation area in a culvert or a pipe including Barnard Creek, City Creek, Lone Pine Creek, and Parrish Creek.

In general, the evaluation area consists primarily of roads and road shoulders; commercial, industrial, and residential development; and disturbed uplands. There are several palustrine emergent wetlands in the evaluation area, some of which consist primarily of saltgrass (*Distichlis spicata*), Utah swampfire (*Sarcocornia utahensis*), and burningbush (*Bassia scoparia*) with some standing water. Others consist primarily of common reed (*Phragmites australis*) and saltgrass. Several open-water ponds, canals, and perennial streams were present at the time of the field surveys.

3.12.3.3 Special-status Plant Species

3.12.3.3.1 Threatened, Endangered, and Candidate Species

The IPaC report identified one federally listed threatened plant species, Ute ladies'-tresses (*Spiranthes diluvialis*), that should be evaluated for the project.

UDOT determined that the ecosystem resources evaluation area does not include designated or proposed critical habitat for this species, nor does the evaluation area include potentially suitable habitat for this species. In addition, no known occurrences of Ute ladies'-tresses have been previously mapped in the evaluation area.

3.12.3.4 Special-status Wildlife Species

3.12.3.4.1 Threatened, Endangered, and Candidate Species

The IPaC report identified one federally listed threatened bird species, yellow-billed cuckoo (*Coccyzus americanus*), and one candidate insect species, monarch butterfly (*Danaus plexippus*), that should be evaluated for the project.

UDOT determined that the ecosystem resources evaluation area does not include designated or proposed critical habitat for either species, and potentially suitable habitat does not exist in the evaluation area for yellow-billed cuckoo. Potentially suitable habitat could exist in the evaluation area for monarch butterfly; however, no milkweed plants (*Asclepias* spp.), an essential feature of quality monarch habitat, were observed during the field survey. Monarch butterfly habitat is described below.

Monarch Butterfly. In the spring, summer, and early fall, monarch butterflies can be found wherever there are milkweeds in fields, meadows, and parks. They overwinter in the cool, high mountains of central Mexico and woodlands in central and southern California. Milkweed is an essential feature of quality monarch habitat. Female monarch butterflies lay their eggs on the underside of young leaves or flower buds of milkweed. Common places where milkweed grows include short- and tall-grass prairies, livestock pastures, agricultural margins, roadsides, wetland and riparian areas, sandy areas, and gardens. In addition to milkweed, other nectar sources, trees for roosting, and close proximity to water are key components of monarch habitat (Western Association of Fish and Wildlife Agencies 2019).

3.12.3.4.2 Species under Conservation Agreement

UDOT consulted the USFWS ECOS for a list of species under conservation agreement that are known to occur in Davis and Salt Lake Counties. One amphibian species, Columbia spotted frog (*Rana luteiventris*) and two fish species, Bonneville cutthroat trout (*Oncorhynchus clarkii utah*) and least chub (*Lotichthys phlegethontis*), were identified. There is no suitable habitat in the evaluation area for Bonneville cutthroat trout or least chub. However, potentially suitable habitat exists for Columbia spotted frog in the ecosystem resources evaluation area. Columbia spotted frog habitat is described below.

Columbia Spotted Frog. Columbia spotted frogs are highly aquatic and require permanent quiet water. They usually live at the grassy/sedgy margins of streams, lakes, ponds, springs, and marshes and use stream-side small mammal burrows as shelter. Breeding typically occurs in small pools or ponds with little or no current surrounded by dense aquatic vegetation. The canals, open-water ponds, perennial streams, and ditches with relatively permanent sources of water in the evaluation area provide potentially suitable habitat for Columbia spotted frogs. No Columbia spotted frogs were observed during field surveys.

3.12.3.4.3 Migratory Birds

The IPAC report identified 20 birds of particular concern because they either are on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in the ecosystem resources evaluation area. Potentially suitable breeding or nesting habitat exists in the evaluation area for 4 of the 20 identified species (black tern [*Chlidonias niger*], long-eared owl [*Asio otus*], marbled godwit [*Limosa fedoa*], and willet [*Tringa semipalmata*]). The habitat for these species is described below.

Black Tern. Breeding habitat for black terns includes freshwater marshes, rivers, lakes, and wet meadows. Nests are typically placed near fresh open water with extensive marsh vegetation and sometimes in wet meadows. Tropical coasts provide winter habitat. There is potentially suitable breeding and nesting habitat in the evaluation area in a marsh north of Park Lane between I-15 and U.S. 89 in Farmington (see Figures 2 and 3 in the *Biological Resources Evaluation Report* in Appendix 3L of this EIS). Freshwater marshes consisting of common reed, reed canarygrass (*Phalaris arundinacea*), and broadleaf cattail (*Typha latifolia*) occur near open water in this area.

Long-eared Owl. Long-eared owls are found throughout Utah, especially where woodlands are bordered by open habitats. They roost and nest in deciduous and coniferous woodlands, orchards, parks, and other dense vegetation, and forage in open grasslands or shrublands. Nest sites are usually in a tree, sometimes in a giant cactus or on a cliff ledge, typically in nests abandoned by other birds. There is potentially suitable breeding and nesting habitat in the evaluation area in a woodland north of Park Lane between I-15 and U.S. 89 in Farmington (see Figures 2 and 3 in the *Biological Resources Evaluation Report* in Appendix 3L of this EIS). The woodland is bordered by wet meadow, marsh, and upland habitats as well as Park Lane.

Marbled Godwit. Marbled godwits breed in meadows, short-grass prairies, pastures, and marshes. Nests are placed on the ground, usually in a dry spot in short grass fairly close to water. Winter habitat includes coastal mudflats, estuaries, and beaches. They are common migrants in northern Utah, especially in areas around the Great Salt Lake and Utah Lake. There is potentially suitable breeding and nesting habitat in the evaluation area in a wet meadow complex west of I-15 between about 1800 North and 2300 North in Salt Lake City and in marshes north of Park Lane in Farmington (see Figures 2 and 4 in the *Biological Resources Evaluation Report* in Appendix 3L of this EIS). The wet meadows in Salt Lake City are adjacent to open water and consist of Pursh seepweed (*Suaeda calceoliformis*), Utah swampfire, burningbush, and saltgrass. The marshes in Farmington consist of common reed, reed canarygrass, and broadleaf cattail and occur near open water in this area.

Willet. Willets prefer to inhabit shorelines of marshes, wet meadows, mudflats, coastal beaches, and lakes. Birds nest in salt marshes, barrier islands, and beaches in eastern North America and near marshes, wet meadows, and wet fields in western North America. Nests are built on the ground in marshy areas or in grassland habitat near water. Large expanses of grasslands are required for nesting and foraging. There is potentially suitable breeding and nesting habitat in the evaluation area in a wet meadow complex west of I-15 between about 1800 North and 2300 North in Salt Lake City and in marshes north of Park Lane in Farmington (see Figures 2 and 3 in the *Biological Resources Evaluation Report* in Appendix 3L of this EIS). The wet meadows are adjacent to open water and consist of Pursh seepweed, Utah swampfire, burningbush, and saltgrass. The marshes in Farmington consist of common reed, reed canarygrass, and broadleaf cattail and occur near open water in this area.

Bald Eagles and Golden Eagles. The evaluation area does not provide suitable nesting habitat for bald eagles or golden eagles.

3.12.3.5 Aquatic Resources

A total of 105.20 acres of aquatic resources were delineated in the ecosystem resources evaluation area. These resources consist of 75.69 acres of palustrine emergent wetlands, 5.47 acres of mudflats, 2.28 acres (7,104 linear feet) of perennial stream channels, 0.21 acre (1,733 linear feet) of intermittent stream channels, 4.17 acres (19,798 linear feet) of ditches, 0.96 acre (2,338 linear feet) of canals, and 16.42 acres

of open-water ponds. The characteristics of delineated aquatic resources are summarized in Appendix 3M, *Aquatic Resources Delineation Report* (UDOT 2024b).

The jurisdictional status of delineated aquatic resources is subject to determination by USACE. Aquatic resources in the evaluation area do not have an identifiable connection to interstate or foreign commerce, and they do not include any interstate waters or a traditional navigable waterbody (TNW). Relatively permanent waters in the evaluation area eventually drain to the Great Salt Lake, a TNW.

3.12.3.5.1 Wetlands

Wetlands were delineated in the ecosystem resources evaluation area as 108 separate polygons totaling 75.69 acres (UDOT 2024b). Based on the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin and others 1979), all of these polygons were identified as palustrine emergent wetlands.

Wetland communities in the evaluation area range in hydrologic regime from being inundated temporarily or only seasonally or intermittently saturated to inundated semipermanently or permanently. Common species in these communities include common reed, common spike-rush (*Eleocharis palustris*), hardstem bulrush (*Schoenoplectus acutus*), broadleaf cattail, foxtail barley (*Hordeum jubatum*), mountain rush (*Juncus arcticus* ssp. *littoralis*), sedges (*Carex* spp.), reed canarygrass, saltgrass, three-square (*Schoenoplectus pungens*), Utah swampfire, and western seepweed (*Suaeda occidentalis*).

Wetlands in the evaluation area perform physical, chemical, and biological functions.

- **Physical Functions.** Most wetlands in the evaluation area store surface and subsurface water, and wetlands along surface waters also retain particulates and dissipate energy.
- **Chemical Functions.** All wetlands in the evaluation area cycle nutrients and export organic carbon.
- **Biological Functions.** All wetlands in the evaluation area support wetland vegetation communities and animal communities that use wetland environments to complete life cycle requirements.

The extent to which each wetland provides these functions varies depending on characteristics such as condition, plant community composition, hydrogeomorphology, size, and land use.

3.12.3.5.2 Streams

A total of 2.28 acres (7,104 linear feet) of perennial stream channels and 0.21 acre (1,733 linear feet) of intermittent stream channels were delineated in the ecosystem resources evaluation area (UDOT 2024b). These resources consist of nine named streams: Shepard Creek, Farmington Creek, Steed Creek, Davis Creek, Ricks Creek, DSB Drain, Barton Creek, Mill Creek, and the Jordan River. Davis and Steed Creeks were identified as intermittent streams, and all others were identified as perennial streams.

As described in Section 3.12.3.2, *General Overview of the Ecosystem Resources Evaluation Area*, perennial streams in or near the evaluation area discharge into the Great Salt Lake and are used primarily as stormwater drainage. Most streams in the evaluation area have been straightened and channelized for urban development, although some segments support woody riparian vegetation and some segments maintain natural meanders. Common woody riparian species include boxelder (*Acer negundo*), Fremont cottonwood (*Populus fremontii*), narrowleaf cottonwood (*Populus angustifolia*), and Russian olive (*Elaeagnus angustifolia*).

The Jordan River is the largest stream in the evaluation area. Most of the aquatic resources in the southern portion of the evaluation area drain into the Jordan River. The width of the Jordan River in the evaluation area varies from about 40 to 70 feet, and its condition is moderately degraded with steep banks, high invasive species cover, and adjacent roadway disturbances. The one segment of the Jordan River in the evaluation area maintains natural meanders and supports some woody riparian vegetation.

The other named streams in the evaluation area are smaller perennial or intermittent streams with widths varying from 4 to 18 feet. All of these streams originate east of the evaluation area in the Wasatch Range and were delineated as either perennial or intermittent based on UDOT's review of available resources and observed flow characteristics. These streams have been mostly straightened and channelized for urban development.

The primary functions of stream segments in the evaluation area that maintain natural meanders with low floodplain terraces include supporting riparian and wetland habitats, providing aquatic habitat, slowing runoff, and storing flood water. Channelized areas have limited floodplain functionality and are generally unable to support adjacent wetlands.

3.12.3.5.3 Mudflats

Four mudflats totaling 5.47 acres were delineated in the ecosystem resources evaluation area (UDOT 2024b). These features delineated as mudflats have overall absolute vegetation cover less than 5% and might or might not exhibit an OHWM. The OHWM of mudflats was indicated by physical characteristics including salt crust, lack of vegetation cover, and water marks. Mudflats in the evaluation area generally include a narrow fringe of higher-cover vegetation along the mudflat edges and little to no vegetation farther inside the mudflat. Common species along mudflat fringes include saltgrass, Pursh seepweed, red swampfire (*Salicornia rubra*), and little barley (*Hordeum pusillim*).

3.12.3.5.4 Open-water Ponds

Twenty-one open-water ponds totaling 16.42 acres were delineated in the ecosystem resources evaluation area (UDOT 2024b). Delineated open-water features generally consist of constructed impoundments such as stock ponds and stormwater basins, and some naturally occurring open-water ponds.

3.12.3.5.5 Canals and Ditches

A total of 0.96 acre (2,338 linear feet) of canals and 4.17 acres (19,798 linear feet) of ditches were delineated in the ecosystem resources evaluation area (UDOT 2024b). These resources consist of two named canals (Oil Drain and 600 North Drain) and 59 unnamed features. Of the 56 unnamed features, 1 was delineated as a canal and 58 were delineated as ditches.

All of these features appear to be entirely human-made to provide water delivery or drainage functions. Some segments of these features contain little vegetation, while others are dominated by upland vegetation. Some features contain hydrophytic vegetation along their banks and sometimes within channel features where these features are not regularly maintained. Conversely, drainage features that met all three wetland criteria parameters were delineated as a wetland rather than as a drainage or ditch feature.

3.12.4 Environmental Consequences and Mitigation Measures

This section discusses the direct impacts and indirect effects of the project alternatives on the ecosystem resources in the ecosystem resources evaluation area. Vegetation, wildlife, special-status species, and waters of the United States would continue to be affected by current and future use.

3.12.4.1 Methodology

Impacts to aquatic resources and migratory bird habitat were calculated using GIS software.

3.12.4.2 No-action Alternative

Because the I-15 project would not be implemented with this alternative, there would be no new impacts to resources in the ecosystem resources evaluation area resulting from project development. Vegetation, terrestrial and aquatic wildlife, special-status wildlife species, and waters of the United States would continue to be affected by current and future development.

3.12.4.3 Action Alternative

3.12.4.3.1 Special-status Plant Species

There would be no impacts to special-status plant species from the Action Alternative and segment options. The ecosystem resources evaluation area does not include designated or proposed critical habitat for Ute ladies'-tresses, nor does the evaluation area include potentially suitable habitat for this species.

Through the analysis in this EIS, UDOT has determined that there would be "no effect" on any threatened or endangered species from the Action Alternative and no additional consultation or coordination with USFWS is required under Section 7 of the ESA (UDOT 2023c).

3.12.4.3.2 Special-status Wildlife Species

UDOT identified potentially suitable habitat for one federally listed candidate insect species (monarch butterfly), one species under conservation agreement (Columbia spotted frog), and four migratory birds of particular concern (black tern, long-eared owl, marbled godwit, and willet).

Through the analysis in this EIS, UDOT has determined that there would be "no effect" on any threatened or endangered species from the Action Alternative and no additional consultation or coordination with USFWS is required under Section 7 of the ESA (UDOT 2023c).

Monarch Butterfly. Milkweed is an essential feature of quality monarch habitat. No milkweed plants were observed during the field survey; therefore, impacts to monarch butterflies are unlikely. If possible, milkweed plants should be avoided if they are identified prior to the proposed work.

Columbia Spotted Frog. The canals, open-water ponds, perennial streams, and ditches with relatively permanent sources of water in the evaluation area provide potentially suitable habitat for Columbia spotted frogs. No Columbia spotted frogs were observed during field surveys.

As shown below in Table 3.12-1, *Summary of Impacts to Aquatic Resources in the Ecosystem Resources Evaluation Area by Segment and Option*, all segment options would fill and disturb perennial streams, canals, ditches, and open-water ponds, thereby eliminating these areas as potentially suitable habitat for

Columbia spotted frogs. However, these resources are highly degraded and are surrounded by invasive vegetation species (common reed) and by commercial, highway, and road development. Given the degradation of these resources, the habitat is low quality and is unlikely to support Columbia spotted frog populations. Therefore, impacts to Columbia spotted frogs are unlikely.

Migratory Birds. Potentially suitable habitat was identified for four migratory bird species of particular concern: black tern, long-eared owl, marbled godwit, and willet. There is potentially suitable breeding and nesting habitat for all four species in the evaluation area in the marshes and woodlands north of Park Lane between I-15 and U.S. 89 in Farmington, and there is potentially suitable breeding and nesting habitat for marbled godwits and willets in the evaluation area in a wet meadow complex west of I-15 between about 1800 North and 2300 North in Salt Lake City The habitat north of Park Lane in Farmington would not be impacted by any of the segment options, while both options in the south segment would convert 5.97 acres of the habitat west of I-15 between about 1800 North and 2300 North in Salt Lake City to transportation use.

Construction activities could take migratory birds and displace them from habitat near construction areas. If construction takes place during the nesting season for migratory birds and raptors (April 1 through August 15), birds could lose or abandon their nests. Disturbance by construction workers and equipment might be substantial enough to cause stress to nesting birds and cause birds to abandon their nests and their young to be killed by predators. To mitigate these potential impacts to birds, including those protected by the Migratory Bird Treaty Act and in accordance with Executive Order 13186, UDOT will implement the mitigation measures in Section 3.12.4.4.2, *Mitigation Measures for Terrestrial and Aquatic Wildlife Impacts*.

3.12.4.3.3 Aquatic Resources

All segment options would convert aquatic resources to transportation use. Table 3.12-1 shows the impacts to aquatic resources by segment and option. The aquatic resource impacts with the Action Alternative would be about 32.8 acres. The impacts to palustrine emergent wetlands (the category of aquatic resources with the highest amount of impacts) would be about 21.8 acres. The south segment options would convert the greatest acreages of aquatic resources to transportation use, followed by the north segment options. The south segment options would have the greatest impacts to palustrine emergent wetlands. The differences in impacts between the options in each segment would be minor. Appendix 3K, *Aquatic Resources Impacts*, of this EIS provides a figure series showing the locations and acreages of the impacted aquatic resources.

As discussed in Section 3.12.3.5, *Aquatic Resources*, the jurisdictional status of delineated aquatic resources is subject to determination by USACE and could change during the jurisdictional determination process. Many of the features might be determined to be constructed features (such as ditches, canals, ponds, or detention basins) or might not be considered jurisdictional by USACE during the jurisdictional determination process.

Indirect Effects. Indirect effects on aquatic resources could occur from sediment discharges associated with stormwater, erosion, hydrologic modifications, and the establishment of noxious weeds. Most of these indirect effects could be reduced or eliminated through the mitigation measures listed in Section 3.12.4.4.3, *Mitigation Measures for Aquatic Resources Impacts*.

Table 3.12-1. Summary of Impacts to Aquatic Resources in the Ecosystem Resources Evaluation Area by Segment and Option

Aquatic Resource Type	Impacts by Segment and Option (acres)			
	North		South	
	Farmington 400 West Option	Farmington State Street Option	Salt Lake City 1000 North – Northern Option	Salt Lake City 1000 North – Southern Option
Palustrine emergent wetland	3.42	3.42	18.40	18.38
Perennial stream	0.41	0.41	0.00	0.00
Intermittent stream	<0.01	<0.01	0.00	0.00
Mudflats	0.00	0.00	1.29	1.29
Open-water ponds	0.93	0.93	6.01	6.01
Canals	0.00	0.00	0.05	0.05
Ditches	2.02	2.02	0.28	0.26
Total	6.78	6.78	26.03	26.00

3.12.4.4 Mitigation Measures

UDOT's best practices for project development include the following mitigation measures for ecosystem resources.

3.12.4.4.1 Mitigation Measures for Vegetation Impacts

All of the segment options would remove vegetation and could also introduce noxious species into the surrounding areas. To prevent further, permanent effects, UDOT would mitigate temporary impacts to vegetation once construction is complete and no further disturbance is anticipated. Mitigation would include the following measures:

- All fill materials brought onto the construction site would be required to be clean of any chemical contamination per UDOT's General Standard Specifications, Section 02056, *Embankment, Borrow, and Backfill*. Topsoil used for roadside stabilization or landscaping must meet UDOT's General Standard Specifications, Section 02912, *Topsoil*.
- The contractor would rip and stabilize any compacted soil and reseed it with native seed mixes.
- The contractor would be required to follow noxious weed mitigation and control measures identified in the most recent version of UDOT Special Provision Section 02924S, *Invasive Weed Control*.
- The contractor would stabilize all disturbed areas by following UDOT Standards, including topsoil, seeding, and installation of appropriate erosion-control measures.

3.12.4.4.2 Mitigation Measures for Terrestrial and Aquatic Wildlife Impacts

UDOT would implement the following mitigation measure to conserve and minimize impacts to migratory birds and in furtherance of Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*:

- Trees and shrubs would be removed during the non-nesting season (about August 15 to April 1). If this is not possible, UDOT or its contractor would arrange for preconstruction nesting surveys, to be conducted no more than 10 days before ground-disturbing activities, by a qualified wildlife biologist of the area that would be disturbed to determine whether active bird nests are present. If active nests are found, the construction contractor would coordinate with the UDOT Natural Resources Manager/Biologist to avoid impacts to migratory birds.

3.12.4.4.3 Mitigation Measures for Aquatic Resources Impacts

In order to fill jurisdictional wetlands and other aquatic resources as part of the project, UDOT must prepare a Clean Water Act Section 404 permit application and submit it to USACE for approval before construction. The permit application must contain a compensatory mitigation plan that describes the proposed mitigation efforts and how they would offset the functions and values eliminated by the selected alternatives. Compensatory mitigation could include any one or a combination of the following five methods: restoring a previously existing wetland or other aquatic site, enhancing an existing aquatic site's functions, establishing (that is, creating) a new aquatic site, preserving an existing aquatic site, and/or purchasing credits from an authorized wetland mitigation bank.

Potential temporary construction impacts to aquatic resources would be minimized through consideration of construction methods and use of BMPs such as silt fences and other erosion-control features in areas adjacent to wetlands and streams. Any necessary temporary construction impacts to aquatic resources that are authorized by a Clean Water Act Section 404 permit would be restored through regrading the ground surface to natural contours and revegetating disturbed areas.

3.12.4.4.4 Threatened and Endangered Species Commitments

Since no federally threatened or endangered species and no critical habitat were identified in the ecosystem resources evaluation area, no mitigation is proposed.

3.13 Floodplains

3.13.1 Introduction

Section 3.13 discusses the floodplains in the floodplains evaluation area and the effects of the project alternatives on these floodplains. For a discussion of aquatic resources associated with floodplains, see Section 3.12, *Ecosystem Resources*.

Floodplains Evaluation Area. The floodplains evaluation area is the combined project right-of-way or footprint for all options that are part of the Action Alternative as shown below in Figure 3.13-2 through Figure 3.13-9, *Floodplains in the Floodplains Evaluation Area* (labeled as the impact boundary), beginning on page 3-211.

3.13.2 Regulatory Setting

Two terms that are used in floodplain regulatory guidance (summarized in Section 3.13.2.1, *Federal Emergency Management*, and Section 3.13.2.2, *Executive Order 11988, Floodplain Management*) are *100-year floodplain* and *100-year flood*.

Floods are usually described in terms of their statistical frequency. A 100-year floodplain is the area that would be affected by a 100-year flood. A 100-year flood (also referred to as a *base flood*) is a level of flood water that has a 1% chance of occurring in a given location in any given year.

This concept does not mean that such a flood will occur only once in 100 years. If a 100-year flood occurs during a given year, there would still be a 1% chance of a similar flood occurring in the same location the following year or even later in the same year.

The boundary of the 100-year flood is commonly used in floodplain mitigation programs to identify areas where the risk of flooding is significant. Any other statistical flooding frequency could be chosen for regulation depending on the degree of risk that is considered acceptable.

3.13.2.1 Federal Emergency Management

In response to escalating taxpayer costs for flood disaster relief, Congress established the National Flood Insurance Program (NFIP). This program is a voluntary mitigation program administered by the Federal Emergency Management Agency (FEMA), through which 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. FEMA requirements for land management and use, and for identifying and mapping special flood hazard areas, are described in 44 CFR Parts 60 and 65, respectively.

In the 1970s and 1980s, FEMA performed location hydrologic and hydraulic studies to identify and map the areas with the highest risk of flooding within developed or developing areas of the communities participating in the NFIP. These FEMA studies resulted in Flood Insurance Rate Maps (FIRMs) that show the floodplain for each river, lake, or other surface water resource that was studied.

A *special flood hazard area* (SFHA) is the area that would be inundated by a 100-year flood, also referred to by FEMA as the base flood. NFIP regulations are based on these SFHAs; therefore, this analysis is focused on areas affected by a 100-year flood. Other types of zones representing greater or lesser flood risk may be defined. Special flood hazard areas are given a zone designation based on the level of detail of the FEMA study and the anticipated type of flooding. The following SFHA zones are located within the floodplains evaluation area (FEMA 2023a):

- **Zone A:** Areas that would be flooded by a 100-year flood. Detailed analyses have not been performed; therefore, no depths or base flood elevations (BFEs) have been established.
- **Zone AE:** Areas that would be flooded by a 100-year flood and where BFEs have been established through detailed analyses. Zone AE floodplains might also include a floodway.
- **Zone AH:** Areas that would be flooded by a 100-year flood (usually due to ponding) with average depths between one and three feet. BFEs derived from detailed hydraulic analyses are shown.

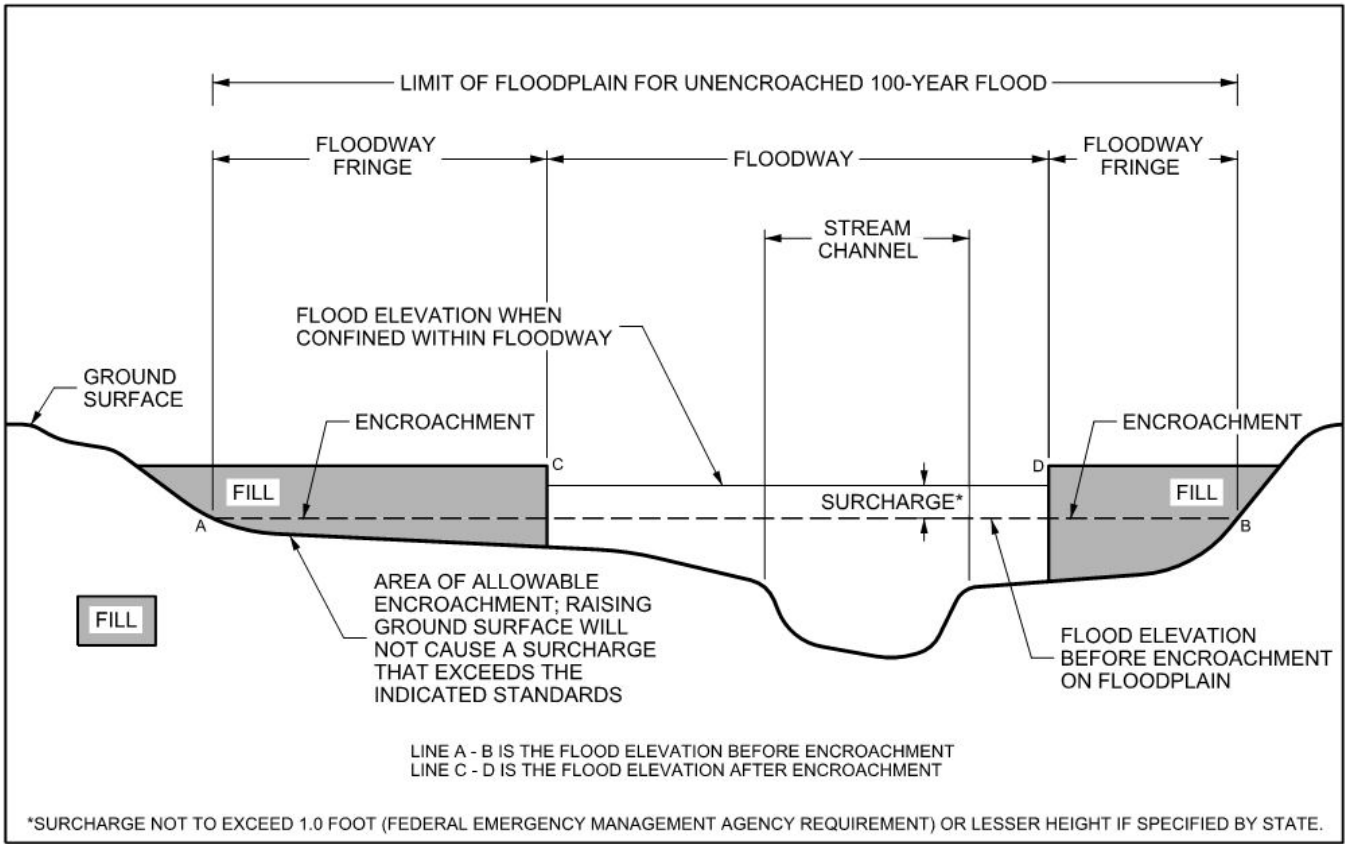
- **Zone AO:** Areas that would be flooded by a 100-year flood (usually due to shallow flooding [sheet flow] from river or stream hazards) with average depths between one and three feet. Flood depths derived from detailed hydraulic analyses are shown.
- **Zone X:** Areas of minimal or moderate flood hazard. Areas of minimal flood hazard are not shaded on the FIRM (indicating the area as being outside of the risk area for the 500-year flood), while areas of moderate flood hazard are shaded to indicate that the risk of flooding is between the 100-year and 500-year floods. This zone is present in the floodplains evaluation area but is not pertinent to impact analysis; therefore, impacts have not been quantified.

The 100-year floodplain for streams is the area in and around the stream that would be inundated by a 100-year flood. In AE Zones, this floodplain might consist of both a floodway and floodway fringe, as shown in Figure 3.13-1. The floodway is the defined stream channel and the adjacent areas that must be kept free of encroachment to pass the 100-year flood without increasing the water surface elevation by more than a designated height. This floodway fringe is the area between the floodway and the boundary of the floodplain.

What is a stream?

In Section 3.13, *stream* is used as a general term to describe waterways such as rivers, creeks, canals, and washes.

Figure 3.13-1. FEMA Floodplain Schematic



Source: FEMA 2022, volume I, page 45

3.13.2.2 Executive Order 11988, Floodplain Management

Executive Order 11988, *Floodplain Management* (May 24, 1977), established federal policy "to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." This floodplain evaluation relies on the regulations that FHWA adopted based on Executive Order 11988 which govern the development of projects that could affect floodplains (23 CFR Part 650, Subpart A).

These regulations clearly state that the project must conform to 44 CFR Parts 60 and 65 as well as the floodplain management ordinance of the affected community and require the project proponent (in this case, UDOT) to not approve a project that involves a "significant encroachment" on a floodplain unless the significant encroachment is the "only practicable alternative" (23 CFR Section 650.113). What constitutes a "significant encroachment" is determined on a case-by-case basis by considering adjacent development. FEMA has set a 1-foot increase in the 100-year flood elevation as the upper limit of the allowable encroachment caused by the cumulative (past and future) encroachments from development. If the project impacts exceed the standards defined in the regulations, the project could be subject to conditional approval from FEMA in accordance with 44 CFR Section 65.12.

Under FHWA's regulations, a significant encroachment can arise from any of the following situations:

- A significant potential for interfering with a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route
- A significant risk of upstream flooding
- A significant adverse impact to natural and beneficial floodplain values including flood conveyance, storage, and control; groundwater recharge; water quality function; and wildlife habitat and diversity

In addition, the FHWA regulations require that a hydraulic report be prepared during the final design of the selected alternative to demonstrate that the requirements of 44 CFR Parts 60 and 65 have been met by the project. This hydraulic report would include the results of a detailed hydraulic analysis for each impacted drainage facility to confirm that the proposed bridges and culverts, with the roadway embankments and other features in place, would adequately convey flood waters. Additionally, UDOT would compare the elevations of the designed roadways to the elevations of the surrounding floodplains to determine the potential for floodplains to interfere with the transportation facility. These detailed analyses, together with roadway and drainage plans and profiles, would demonstrate compliance with various regulations, permitting requirements, and design criteria. Overall impacts to the floodplains and beneficial floodplain values would be measured against the impacts and requirements documented in the EIS.

3.13.2.3 Executive Order 14030, Climate Related Financial Risk

Executive Order 14030, *Climate Related Flood Risk* (May 20, 2021) amended Executive Order 11988 and reinstated the Federal Flood Risk Management Standard (FFRMS) that was put in place by Executive Order 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input* (January 30, 2015) and later revoked by Executive Order 13807, *Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects* (August 15, 2017). The FFRMS requires agencies to prepare for and protect federally funded buildings and projects from flood risks. Three approaches may be taken for establishing the flood elevation and flood hazard area used for project siting, design, and construction. These approaches are:

- A climate-informed-science approach from using the best-available, actionable hydrologic and hydraulic data that integrate current and future changes in flooding based on climate science
- A freeboard value approach, where 2 feet are added to the base flood elevation for noncritical actions and 3 feet are added to the base flood elevation for critical actions
- An approach that identifies uses the area subject to flooding by the 0.2%-annual-chance (500-year) flood

3.13.3 Affected Environment

The streams that are located in the floodplains evaluation area originate in the Wasatch Mountains generally to the east of the evaluation area. All streams discharge to the Great Salt Lake or one of its other tributaries downstream of the evaluation area.

Information about the floodplains evaluation area was gathered from a variety of sources including FEMA's Community Status Book (FEMA 2023b), the Davis County flood insurance study (FEMA 2022), the Salt Lake County flood insurance study (FEMA 2021), National Flood Hazard Layer (NFHL) data (FEMA 2024a, 2024b), USGS topographic maps (USGS 2020a, 2020b), and the Utah Geographic Information Systems Portal.

3.13.3.1 Communities Participating in FEMA's National Flood Insurance Program

The floodplains evaluation area includes both incorporated and unincorporated areas of Davis County and Salt Lake County. All of the communities in the evaluation area participate in FEMA's NFIP, which requires communities to enact ordinances to protect natural floodplains, prevent damage to property, and protect the safety of the public. The identification numbers for each community are listed in Table 3.13-1.

Table 3.13-1. Identification Numbers for Communities Participating in the National Flood Insurance Program

Community	FEMA Community Identification Number
Davis County	490038
Farmington City	490044
Centerville City	490040
West Bountiful City	490062
Bountiful City	490039
Woods Cross City	490054
City of North Salt Lake	490048
Salt Lake County	490102
Salt Lake City	490106

Source: FEMA 2023b

3.13.3.2 Floodplains in the Floodplains Evaluation Area

What is a regulatory floodplain?

A water body has a regulatory floodplain if the floodplain has been identified and mapped by FEMA.

Streams and floodplains in the floodplains evaluation area are described below and include named waterways and isolated areas for which regulatory floodplains are defined. All streams (unless otherwise noted) originate in the Wasatch Mountains and foothills to the east of the evaluation area and generally flow from east to west toward the Great Salt Lake. Effective floodplain maps for the evaluation area are based on the latest flood insurance studies performed for Davis County (FEMA 2022) and Salt Lake County (FEMA 2021); the latest Letters of Map Revision in 2011, 2016, and 2023; and Letters of Map Amendment from 2003 through 2023. (A Letter of Map Revision and a Letter of Map Amendment are FEMA's modifications to an effective floodplain map.) Stream names are based on the FEMA data and are consistent with the names found on the USGS Farmington (USGS 2020a) and Salt Lake City North (USGS 2020b) 7.5-minute topographic quadrangles unless otherwise noted.

In the following descriptions (from north to south in the evaluation area), references to Davis County and Salt Lake County refer to unincorporated parts of the county, while incorporated areas are referred to by the community name. Streams and floodplains in the evaluation area are shown in Figure 3.13-2 through Figure 3.13-9. In the figures, NHD refers to the National Hydrography Dataset.

Farmington Creek. Farmington Creek flows through Davis County in Farmington Canyon and through Farmington City mostly in an open channel. Within the floodplains evaluation area, Farmington Creek has Zone AE floodplains, including both a floodway and floodway fringe in Farmington. According to the FIRM, the 0.2%-annual-chance flood discharge (500-year flood) is contained in the existing culvert under I-15.

Steed Creek. Steed Creek flows through Davis County and Farmington mostly in an open channel. Near the floodplains evaluation area, Steed Creek enters a south running culvert east of the floodplains evaluation area that, according to the FIRM, contains the 1%-annual-chance event (100-year flood). At the south end of the culvert, Steed Creek has Zone AH floodplains in the floodplains evaluation area.

Davis Creek. Davis Creek flows through Davis County and Farmington, mostly in an open channel. In the floodplains evaluation area, Davis Creek has Zone AE floodplains, including both a floodway and floodway fringe. The floodway fringe also includes overflow areas along I-15 that flow to the south of the floodway and connect to the Zone A floodplains from Lone Pine Creek. According to the FIRM, there is no specific information for the existing culvert under I-15; however, it can be assumed that the 0.2%-annual-chance flood discharge is contained in this culvert because this flood discharge is contained in several upstream culverts. On the west side of I-15, flows from Davis Creek contribute to Zone AE floodplains.

Great Salt Lake. The Great Salt Lake, one of the largest terminal lakes in the world, receives water from the Bear River, the Weber River, the Jordan River, and numerous streams (including many of the streams in the floodplains evaluation area). Additionally, water is received through direct precipitation and groundwater.

The lake levels of the Great Salt Lake fluctuate due to seasonal differences in precipitation and runoff. Flooding along the shoreline is also influenced by wind and wave action on the lake. Wind and waves on the lake will increase flooding levels in areas along the lake shore; however, the part of the Great Salt Lake floodplain that is in the floodplains evaluation area is beyond the anticipated wave surge zone and is designated as Zone AE (the area associated with a stillwater elevation). The designated base-flood elevation in the evaluation area is 4,217 feet.

Flooding associated with the Great Salt Lake also differs from riverine flooding (flooding associated with a linear water body) in duration. Riverine flooding will typically last for hours at peak stage, but flooding associated with the Great Salt Lake will take months to recede since lake levels will decline only in response to evaporation from the lake surface.

Lone Pine Creek. Lone Pine Creek flows through Davis County and Centerville in both open channels and culverts. In the floodplains evaluation area, Lone Pine Creek has Zone A floodplains in Farmington and Centerville that represent shallow flooding.

Ricks Creek. Ricks Creek flows through Davis County and Centerville in both open channels and culverts. In the floodplains evaluation area, Ricks Creek has Zone AH floodplains. According to the FIRM, the Ricks Creek culvert under I-15 contains the 1%-annual-chance event (100-year flood). On the west side of I-15, flows from Ricks Creek contribute to Zone AE floodplains.

Barnard Creek. Barnard Creek flows through Davis County and Centerville in both open channels and culverts. A short distance downstream of where Barnard Creek enters Centerville, a diversion structure creates a northern segment and a southern segment. In the floodplains evaluation area, Barnard Creek has Zone AH floodplains.

Parrish Creek. Parrish Creek flows through Davis County and Centerville in both open channels and culverts. According to the FIRM, the Parrish Creek culvert under I-15 contains the 1%-annual-chance flood discharge (100-year flood). In the floodplains evaluation area, there are Zone AO floodplains, most likely resulting from potential backup of a debris basin just east of I-15.

Deuel Creek. Deuel Creek flows through Davis County, Centerville, and West Bountiful in both open channels and culverts. According to the FIRM, the Deuel Creek culvert under I-15 contains the 1%-annual-chance flood discharge (100-year flood). There are no floodplains in the floodplains evaluation area on the east side of I-15; however, there are Zone AO floodplains associated with Deuel Creek on the west side of I-15.

Stone Creek. Stone Creek consists of North Fork Stone Creek and Stone Creek, both of which flow through Davis County and Bountiful in open channels and culverts. According to the FIRM, the culvert that conveys Stone Creek across I-15 contains the 1%-annual-chance flood discharge (100-year flood). In the floodplains evaluation area, Stone Creek has Zone AE floodplains with a floodway as Stone Creek flows north along the west side of I-15 before entering a culvert that conveys Stone Creek to the west.

Barton Creek. Barton Creek (shown as Holbrook Creek on the USGS Farmington 15-minute quadrangle [USGS 2020a]) flows through Davis County, Bountiful, and West Bountiful in open channels and culverts. According to the FIRM, the culvert that conveys Barton Creek across I-15 contains the 1%-annual-chance flood discharge (100-year flood). In the floodplains evaluation area, there are Zone AE floodplains on the east side of I-15 and Zone AE floodplains with a floodway on the west side of I-15 as Barton Creek flows northeast before it enters a west-flowing culvert. North of this culvert along the west side of I-15, there are Zone AO floodplains between Barton Creek and Stone Creek.

Mill Creek. Mill Creek flows through Davis County, Bountiful, Woods Cross, and West Bountiful in open channels and culverts. According to the FIRM, the culvert that conveys Mill Creek across I-15 contains the 1%-annual-chance flood discharge (100-year flood). In the floodplains evaluation area, there are Zone AE floodplains on both the east and west sides of I-15.

Floodplain Area near Center Street and I-15. Regulatory floodplains designated as Zone A are located on the south side of Center Street west of I-15 in the floodplains evaluation area. These Zone A floodplains are from an unnamed drainage that generally flows in a culvert along Center Street in North Salt Lake.

Floodplain Area near U.S. 89 and I-215. Regulatory floodplains designated as Zone A that are part of a detention basin are located on the east side of U.S. 89 near the I-215 interchange with I-15 in the floodplains evaluation area. These Zone A floodplains are part of an unnamed tributary in North Salt Lake.

Floodplain Areas near I-215 and Redwood Road. Regulatory floodplains designated as Zone AE with a base flood elevation of 4,217 feet are located on the north and south sides of I-215 east of Redwood Road in North Salt Lake in the floodplains evaluation area. There is an unnamed tributary that begins to the east of this area north of I-215; however, this area also appears to be connected to Zone AE floodplains that are associated with the Jordan River. The Jordan River originates south of the floodplains evaluation area at the outflow from Utah Lake in Utah County and flows generally north through Utah, Salt Lake, and Davis Counties.

Figure 3.13-2. Floodplains in the Floodplains Evaluation Area – North Segment (1 of 7)

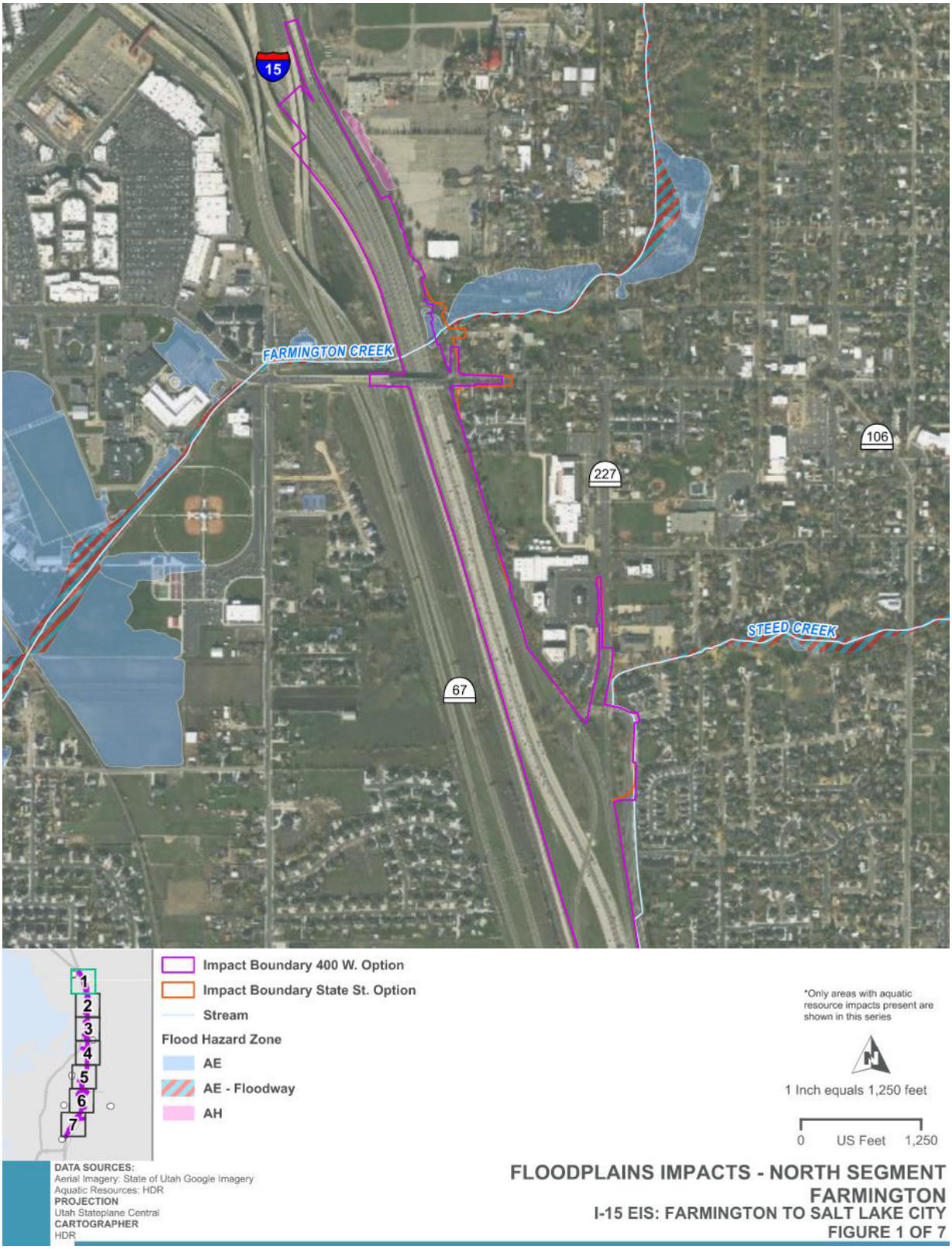


Figure 3.13-3. Floodplains in the Floodplains Evaluation Area – North Segment (2 of 7)

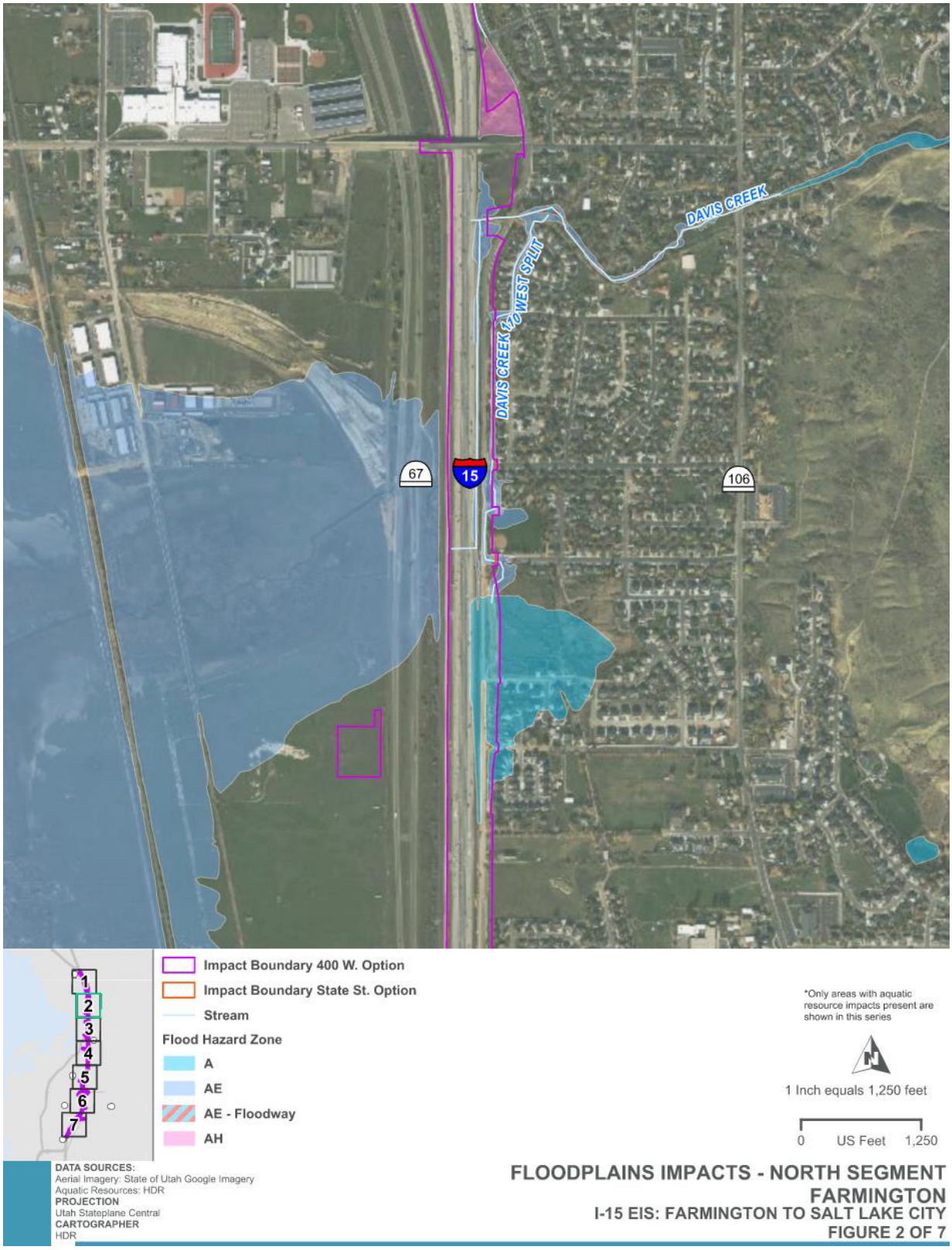


Figure 3.13-4. Floodplains in the Floodplains Evaluation Area – North Segment (3 of 7)

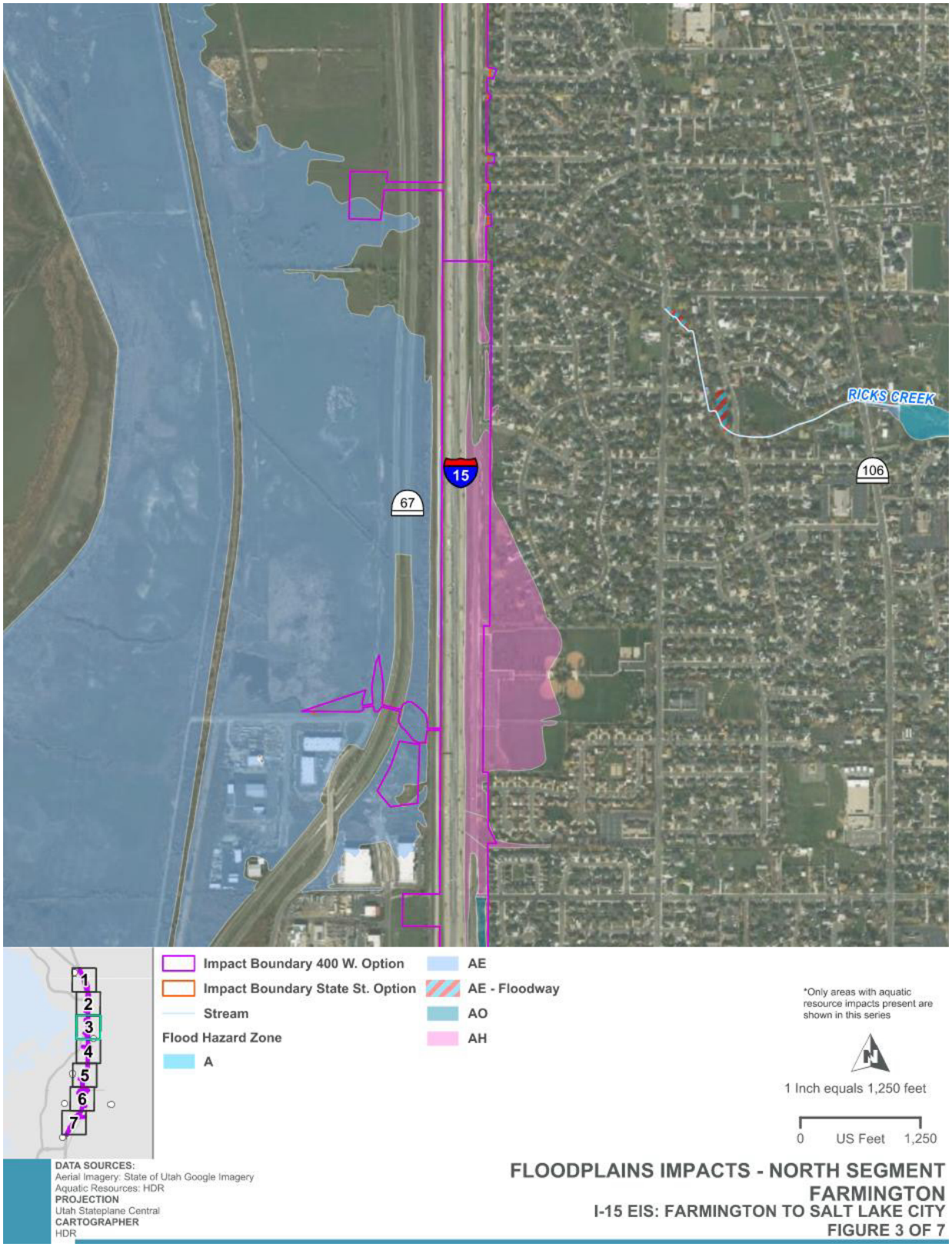


Figure 3.13-5. Floodplains in the Floodplains Evaluation Area – North Segment (4 of 7)

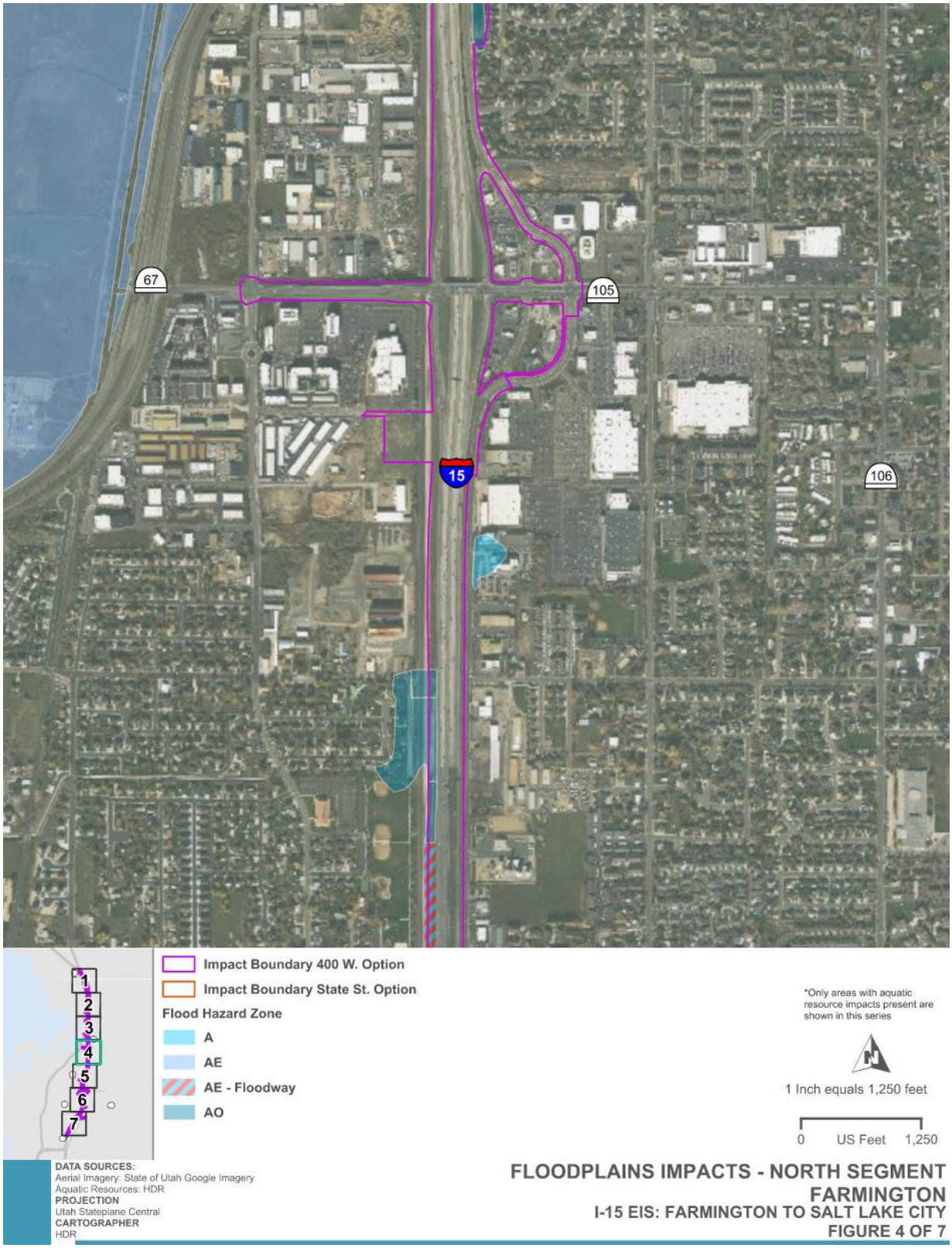


Figure 3.13-6. Floodplains in the Floodplains Evaluation Area – North Segment (5 of 7)

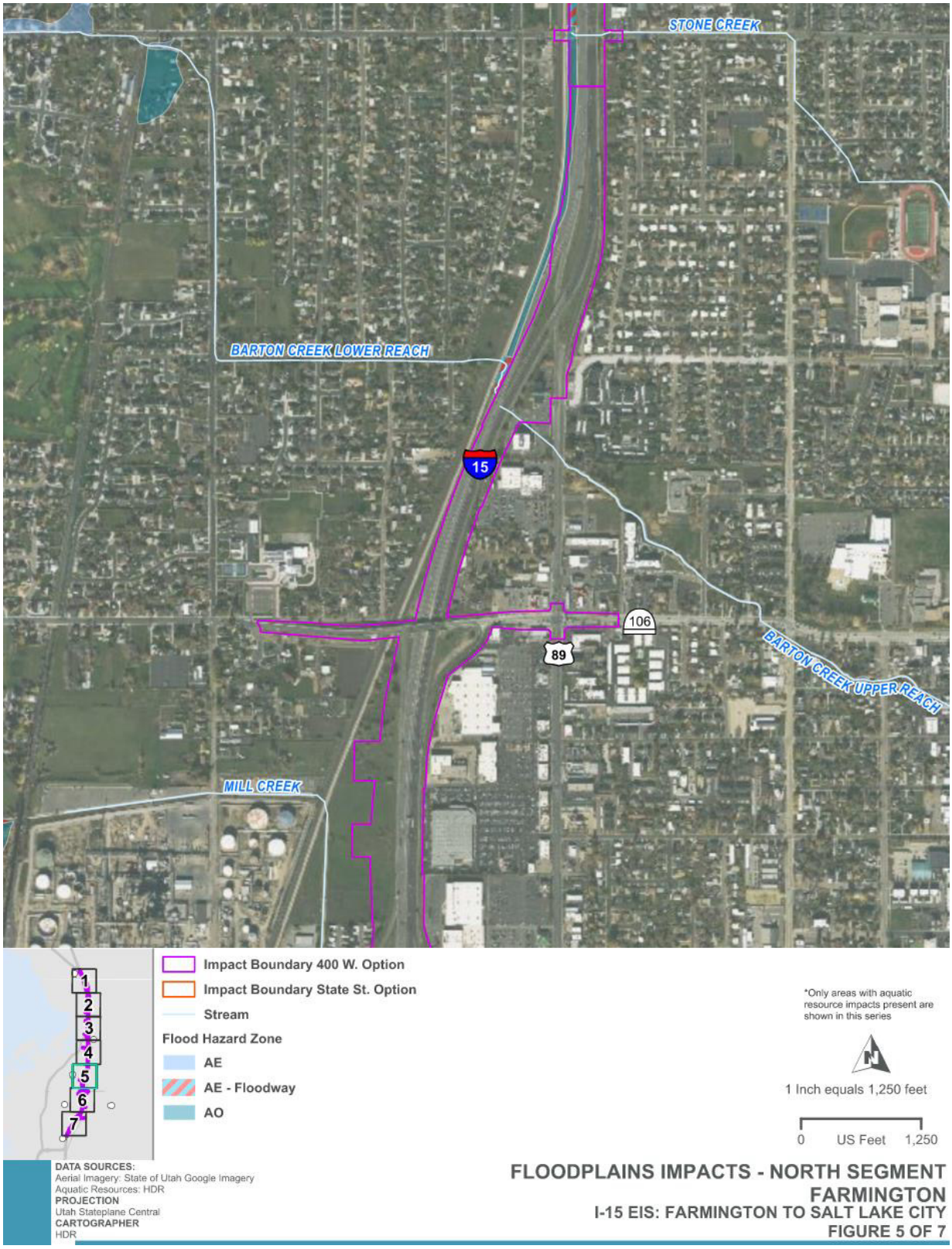


Figure 3.13-7. Floodplains in the Floodplains Evaluation Area – North Segment (6 of 7)

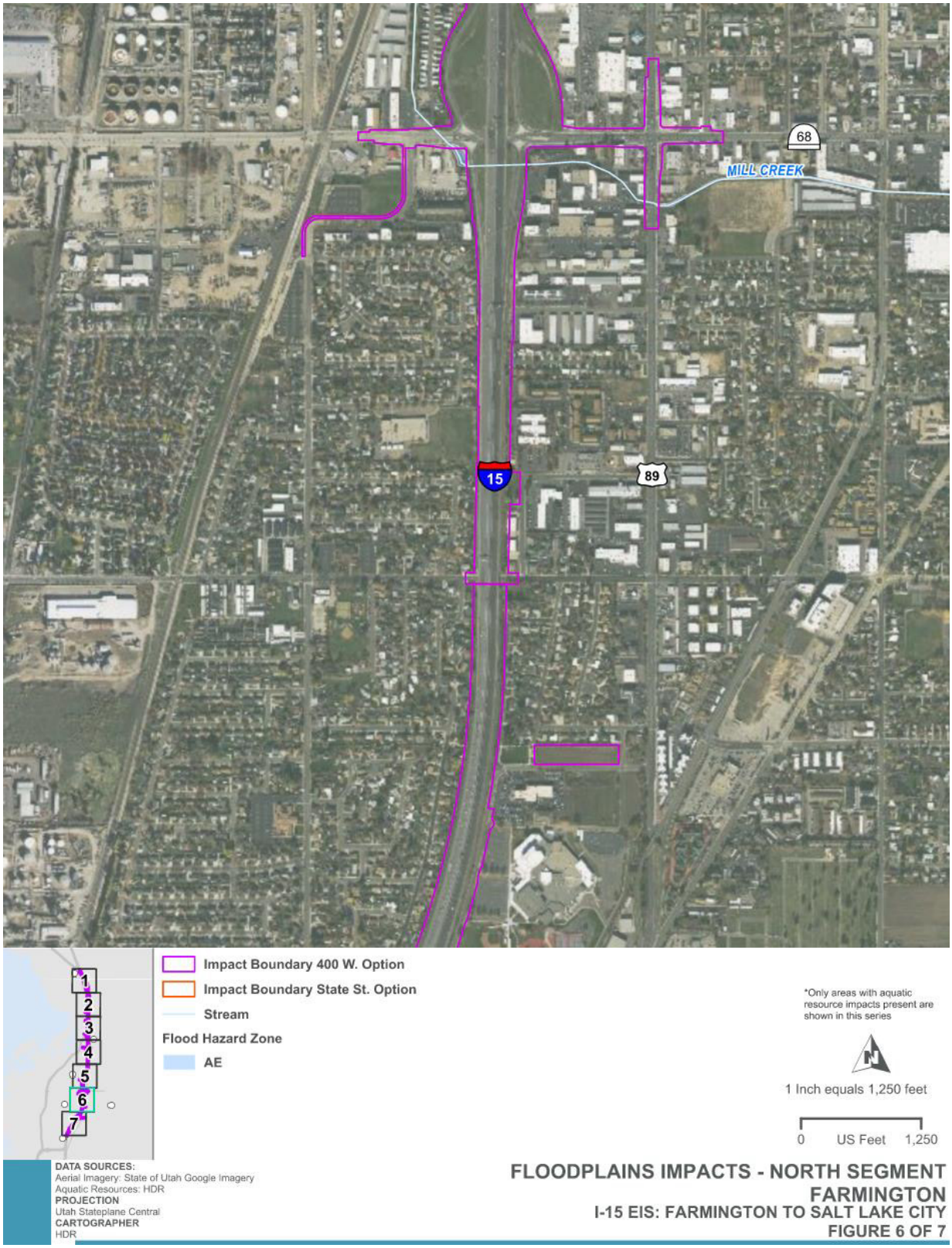
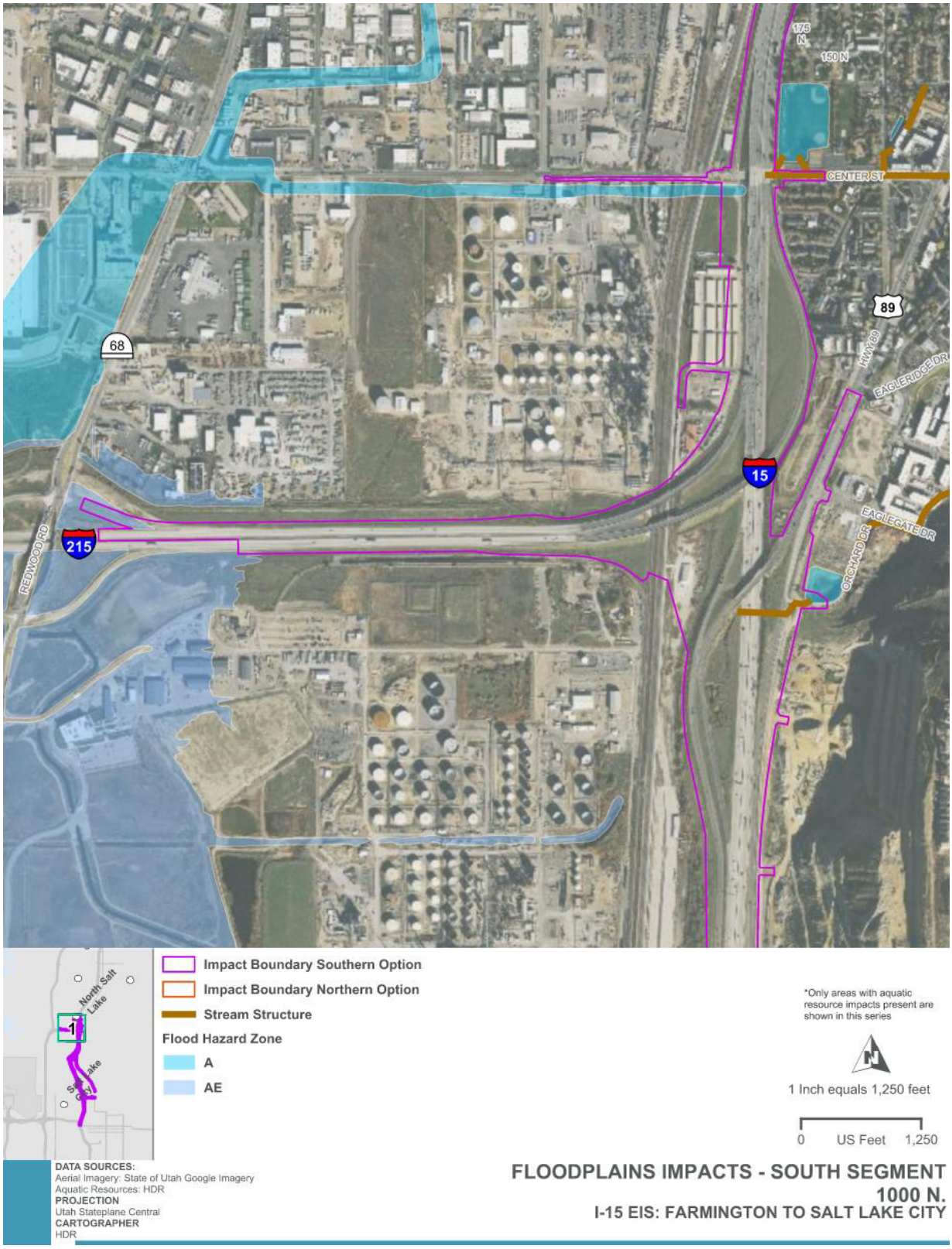


Figure 3.13-8. Floodplains in the Floodplains Evaluation Area – North Segment (7 of 7)

Figure 3.13-9. Floodplains in the Floodplains Evaluation Area – South Segment



3.13.4 Environmental Consequences and Mitigation Measures

This section discusses the floodplain impacts from the Action Alternative based on the footprint for the Action Alternative, which includes the roadway surface, embankment limits, and temporary impacts from construction. In most cases, this area has been approximated as the proposed right-of-way line for the Action Alternative.

3.13.4.1 Methodology

UDOT determined the floodplain impacts from the Action Alternative using a GIS approach by comparing the FEMA NFHL data obtained for Davis County (FEMA 2024a) and Salt Lake County (FEMA 2024b) to the right-of-way footprint of the Action Alternative to identify the locations of regulatory floodplain crossings and to quantify the impacted area. The regulatory analysis is based on current FEMA floodplain maps. Floodplain crossings in the floodplains evaluation area can be transverse or longitudinal based on the impact of the proposed infrastructure to the floodplain.

What are transverse and longitudinal crossings?

Transverse crossings are perpendicular or nearly perpendicular to the direction of flow. Longitudinal crossings are parallel or nearly parallel to a stream or the edge of a lake.

The following factors should be considered when reviewing the floodplain impacts described in Sections 3.13.4.2 and 3.13.4.3.

- The analysis presented covers only the impacts to regulatory floodplains. Stream impacts are covered in Section 3.11, *Water Quality and Water Resources*, and Section 3.12, *Ecosystem Resources*.
- The hydraulic design described in this EIS is based on a preliminary roadway design with a sufficient level of detail to conduct the floodplain analysis. During the final design process for the selected alternative, more-detailed hydraulic studies would be conducted to ensure that the roadway and hydraulic design would meet FEMA's and FHWA's regulatory requirements.
- Impacts are reported as being the same if the number of acres impacted when rounded to two decimal places are equal for both options and the impacts occur in the same general location.

3.13.4.2 No-action Alternative

With the No-action alternative, the I-15: Farmington to Salt Lake City Project would not be implemented, and no floodplains would be affected by the Action Alternative. Local floodplain administrators would continue to manage regulatory floodplains according to local ordinance and NFIP requirements.

3.13.4.3 Action Alternative

The Action Alternative has been divided into a north segment and a south segment. Both segments include one I-15 interchange option. For reference, a description of each option is included in Section 2.4.2, *Action Alternative*, in Chapter 2, *Alternatives*. Sections 3.13.4.3.1 and 3.13.4.3.2 discuss the floodplain impacts for each segment. Section 3.13.4.3.3 provides a summary of the floodplain impacts for both segments. The range of possible impacts for the Action Alternative is also provided.

3.13.4.3.1 North Segment Impacts

Farmington 400 West Option Impacts. This option would result in a total of about 42.96 acres of floodplain impacts, as shown in Table 3.13-2.

Table 3.13-2. Farmington 400 West Option Floodplain Impacts

Stream or Flooding Source	FEMA Zone(s)	Type of Impact	Acres of Impact
Farmington Creek	AE	Transverse	0.54
	AE Floodway	Transverse	0.27
Steed Creek	AH	Longitudinal	2.19
Davis Creek	A	Longitudinal	6.29
	AE	Longitudinal	4.85
	AE Floodway	Transverse	0.02
Great Salt Lake	AE	Longitudinal	5.87
Ricks Creek	AH	Longitudinal	16.38
Parrish Creek	AO	Longitudinal	1.53
Stone Creek	AE Floodway	Longitudinal	1.38
	AO	Longitudinal	1.94
Barton Creek	AE	Transverse	0.01
	AE Floodway	Longitudinal	0.01
	AO	Longitudinal	1.61
Mill Creek	AE	Transverse	0.07

Source: FEMA 2024a

As shown above in Table 3.13-2, with the Farmington 400 West Option, the Action Alternative would have both transverse and longitudinal crossings of regulatory floodplains. These crossings include about 6.3 acres of impacts to Zone A floodplains, about 13.0 acres of impacts to Zone AE floodplains (including about 1.7 acres of floodway), about 18.6 acres of Zone AH floodplains, and about 5.1 acres of Zone AO floodplains.

Farmington State Street Option Impacts. This option would result in a total of about 42.81 acres of floodplain impacts, as shown in Table 3.13-3.

Table 3.13-3. Farmington State Street Option Floodplain Impacts

Stream or Flooding Source	FEMA Zone(s)	Type of Impact	Acres of Impact
Farmington Creek	AE	Transverse	0.51
	AE Floodway	Transverse	0.19
Steed Creek	AH	Longitudinal	2.19
Davis Creek	A	Longitudinal	6.29
	AE	Longitudinal	4.81
	AE Floodway	Transverse	0.02
Great Salt Lake	AE	Longitudinal	5.87
Ricks Creek	AH	Longitudinal	16.38
Parrish Creek	AO	Longitudinal	1.53
Stone Creek	AE Floodway	Longitudinal	1.38
	AO	Longitudinal	1.94
Barton Creek	AE	Transverse	0.01
	AE Floodway	Longitudinal	0.01
	AO	Longitudinal	1.61
Mill Creek	AE	Transverse	0.07

Source: FEMA 2024a

As shown above in Table 3.13-3, with the Farmington 400 West Option, the Action Alternative would have both transverse and longitudinal crossings of regulatory floodplains. These crossings include about 6.3 acres of impacts to Zone A floodplains, about 12.9 acres of impacts to Zone AE floodplains (including about 1.6 acres of floodway), about 18.6 acres of Zone AH floodplains, and about 5.1 acres of Zone AO floodplains.

3.13.4.3.2 South Segment Impacts

The impacts to floodplains in the south segment would be the same for both the Salt Lake City 1000 North – Northern Option and the Salt Lake City 1000 North – Southern Option. These options would result in a total of about 1.9 acres of floodplain impacts as shown in Table 3.13-4.

Table 3.13-4. South Segment Floodplain Impacts

Stream or Flooding Source	FEMA Zone(s)	Type of Impact	Acres of Impact
Floodplain area near Center Street and I-15	A	Transverse	0.38
Floodplain area near U.S. 89 and I-215	A	Transverse	0.29
Floodplain areas near I-215 and Redwood Road	AE	Longitudinal	1.18

Source: FEMA 2024a

As shown above in Table 3.13-4, in the south segment, the Action Alternative would have both transverse and longitudinal crossings of regulatory floodplains. These crossings include about 0.7 acre of Zone A floodplains and about 1.2 acres of Zone AE floodplains.

3.13.4.3.3 Summary of Action Alternative Impacts

Table 3.13-5 summarizes the floodplain impacts by flood zone that would result from each option in the north segment and south segment. The impacts are totaled up to provide a minimum, maximum, and range of possible impacts depending on which option is selected for each segment of the Action Alternative.

Table 3.13-5. Summary of Impacts to Floodplains from the Action Alternative

Segment	Option	Impacts by FEMA Zone (acres)				
		A	AE	AE Floodway	AH	AO
North	Farmington 400 West Option	6.29	11.34	1.68	18.57	5.08
	Farmington State Street Option	6.29	11.27	1.60	18.57	5.08
South	Salt Lake City 1000 North – Northern Option	0.67	1.18	—	—	—
	Salt Lake City 1000 North – Southern Option	0.67	1.18	—	—	—
	Minimum impacts (sum of lowest impacts for each segment)	6.96	12.45	1.60	18.57	5.08
	Maximum impacts (sum of highest impacts for each segment)	6.96	12.52	1.68	18.57	5.08
	Range of impacts	6.96	12.45–12.52	1.60–1.68	18.57	5.08

Source: FEMA 2024a
Note: Each option includes floodplain impacts from the whole segment, including those elements that are the same for both options.

As shown above in Table 3.13-5, the Action Alternative would result in about 0.15 acre more floodplain impacts with the Farmington 400 West Option than with the Farmington State Street Option in the north segment. Whichever south segment option is chosen would result in the same net increase of floodplain impacts for the Action Alternative. Even where the footprints for each option vary, the floodplain impacts would occur in generally the same locations. UDOT also anticipates that the impacts would cause similar changes to water surface elevations and floodplain boundaries.

UDOT anticipates that the Action Alternative would not cause an interruption to a transportation facility, a significant risk of upstream flooding, or an adverse impact to natural and beneficial floodplain values since the impacts of the Action Alternative would occur in locations where existing culverts cross the evaluation area. According to FEMA data, these existing culverts contain at least the 100-year (1%-annual-chance) flood. The mitigation measures discussed in Section 3.13.4.4, *Mitigation Measures*, would also be implemented to mitigate impacts in other locations and would apply to all Action Alternative options. The finding of a practicable alternative as required by 23 CFR Part 650, Subpart A, is therefore not required.

3.13.4.4 Mitigation Measures

UDOT and/or its construction contractor would take measures to reduce floodplain impacts and to ensure that, if the Action Alternative is selected, the alternative complies with all applicable regulations (see Section 3.13.2.2, Executive Order 11988, *Floodplain Management*). These mitigation measures would include the following:

- The Action Alternative would require a number of stream and floodplain crossings in the same locations where they presently exist as well as several new stream and floodplain crossings. UDOT would determine whether existing bridges and culverts need to be replaced as a part of the Action Alternative. Where new or rehabilitated bridges and culverts are included in the Action Alternative, the design would follow FEMA requirements and the requirements of UDOT's *Drainage Manual of Instruction*, where applicable. Where no Special Flood Hazard Area is defined, culverts and bridges would be designed to accommodate a 50-year (2%-annual-chance) or greater-magnitude flood. Where regulatory floodplains are defined, hydraulic structures would be designed to accommodate at least a 100-year (1%-annual-chance) flood. In accordance with Executive Order 14030, UDOT would also evaluate the floodplains under the FFRMS during the final design of the drainage and stormwater facilities associated with the Action Alternative.
- Stream alteration permits would be obtained for stream crossings as required by the Utah Division of Water Rights to satisfy state regulations, and in some circumstances might also be used to meet Clean Water Act Section 404 permitting requirements (through use of Army Corps of Engineers Programmatic General Permit 10).
- Floodplain development permits would be obtained for all locations where the proposed roadway embankment or structural elements would encroach on a regulatory floodplain. FEMA requires that construction within a floodway must not increase the base (100-year) flood elevation. FEMA Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) processes would be executed in compliance with 44 CFR Sections 60.3 and 65.12 as necessary based on hydrologic and hydraulic analyses and the nature of anticipated changes in base flood elevation and/or floodplain limits. The LOMR process takes place after construction impacts have occurred to modify and update an effective floodplain map. The CLOMR process (if required) must be completed before

construction impacts take place to receive FEMA's concurrence that, if the selected alternative is constructed as designed, a LOMR could be issued to modify and update the effective floodplain map. The following cases apply:

  - For areas of Zone A floodplain impacts, the approach would be to analyze existing and proposed conditions and design project features such that compliance is achieved, or that a CLOMR is not required, as much as possible. In these areas, FEMA performed floodplain mapping without publishing base flood elevations or delineating a floodway. The absence of this information places the burden on UDOT to perform hydrologic and hydraulic analyses consistent with FEMA standards. These analyses would confirm or refine the FEMA floodplain mapping and could increase or decrease the estimate of affected areas.
  - For areas of Zone AE, AH, and AO floodplain impacts, the approach would be to analyze proposed conditions relative to effective floodplain mapping (with base flood elevations and ponding depths defined) and design project features such that compliance is achieved, or that a CLOMR is not required, as much as possible. Any action that would increase the water surface elevation within a floodway (for the 1%-annual-chance event) would require that a CLOMR is prepared and accepted by FEMA prior to the start of construction and issuance of a floodplain development permit.

- UDOT would obtain flood-control permits from Davis County Public Works for all work that would take place within a county flood-control facility to certify that plans and specifications meet the requirements of the Davis County Flood Control Master Plan. UDOT would also obtain flood-control permits from Salt Lake County for any actions occurring within 20 feet of a Salt Lake County–controlled waterway.
- Roadway elevations would be a minimum of 2 feet above adjacent floodplain elevations, where those elevations are defined, so that flooding would not interfere with a transportation facility needed for emergency vehicles or evacuation.
- Walls would be designed and constructed to minimize longitudinal floodplain impacts.

3.14 Hazardous Materials and Hazardous Waste Sites

3.14.1 Introduction

Section 3.14 describes a screening-level investigation into potentially hazardous sites within or near the Action Alternative that could contain hazardous materials and/or hazardous waste and analyzes the expected effects of the Action Alternative on these sites. Hazardous materials include any solid, liquid, or gaseous materials that, if improperly managed or disposed of, could pose hazards to human health and the environment. A material is considered hazardous if it exhibits one or more of the following characteristics: ignitability, corrosivity, reactivity, and toxicity. Section 3.14 also analyzes possible effects of the Action Alternative on potentially hazardous sites.

Hazardous Materials and Waste Sites Evaluation Area. The hazardous materials and waste sites evaluation area encompasses the area within the footprint of the Action Alternative and adjacent properties (see Figure 3.14-1, *Hazardous Materials Facilities in the Hazardous Materials and Waste Sites Evaluation Area*, on page 3-228). The evaluation area includes parts of Davis and Salt Lake Counties.

3.14.2 Regulatory Setting

Hazardous materials are regulated by the Resource Conservation and Recovery Act (RCRA); by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and by Utah Administrative Code Title 19, *Environmental Quality Code*. The following concerns are raised when a transportation project affects sites with hazardous materials:

- The spread of existing soil or groundwater contamination through construction activities
- The potential for increased construction costs
- The potential for construction delays
- The health and safety of construction workers and people who live near the sites with hazardous materials
- The short-term and long-term liability associated with acquiring environmentally distressed properties

Section 3.14 provides a preliminary identification of known parcels that contain hazardous waste sites. If the Action Alternative is selected, during the final design phase of the project and before any property is acquired, UDOT would conduct more detailed assessments on sites of concern to determine the presence of contamination, if any, and establish the nature and limits of the chemical hazard.

3.14.3 Affected Environment

3.14.3.1 Resource Identification Methods

To determine the presence of potentially hazardous waste sites in the hazardous materials and waste sites evaluation area, UDOT reviewed the following pertinent databases: the Utah Division of Environmental Response and Remediation's (DERR) Interactive Map (DERR 2023b), DERR's leaking underground storage tanks (LUST) and underground storage tanks (UST) databases (DERR 2023c), the Utah Division of Solid and Hazardous Waste's active and closed landfills database (UDSHW 2023), and EPA's EnviroMapper database (EPA 2023).

What are Superfund sites?

Superfund sites are locations polluted with hazardous materials that are being assessed or cleaned up with funds managed by EPA.

Table 3.14-1 describes the hazardous material and hazardous waste sites databases. UDOT used the DERR Interactive Map and the EPA EnviroMapper database to query the databases.

Table 3.14-1. Descriptions of Potentially Hazardous Materials Sites

Site Type	Description
Brownfields	Brownfields are former industrial areas. These site types are contained in EPA's Assessment, Cleanup, and Redevelopment Exchange System database. Voluntary Cleanup Program, which is a database of Utah Brownfield sites that are being redeveloped outside of the federal Brownfield process, was another source of information.
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	CERCLIS contains sites that have chemicals listed under CERCLA but the sites have not been categorized as National Priorities List (NPL) sites. These site types are also listed in EPA's Superfund Enterprise Management System (SEMS) database.
Dry Cleaners	Dry cleaners are locations of past or current dry cleaner companies. Dry cleaners produce waste that potentially could become a hazard.
Environmental Incident	Environmental incidents are locations where a spill or other incident regarding hazardous materials has been reported.
Enforceable Written Assurances (EWA)	EWA sites are properties where the owner has come to an agreement with UDEQ regarding obligations associated with hazardous materials or waste on the site.
Formerly Used Defense (FUD)	FUD sites were once under the jurisdiction of the U.S. Department of Defense and could contain hazardous, toxic, or radioactive wastes in the soil, water, or containers on site. These site types are contained in a database of former military sites that have been identified for environmental restoration by the Department of Defense.
Leaking Underground Storage Tanks (LUST)	LUST sites are UST sites where a leak has been detected. These site types are located in a database of sites in Utah with leaking underground storage tanks whose status is either open (under investigation) or closed (no additional remedial actions are required or ever took place.
National Priorities List (NPL)	NPL sites are those containing listed chemicals under CERCLA and that have been identified as priorities for cleanup.
Solid Waste	Solid waste sites include landfills and transfer stations. These site types are located in a database of active or closed landfill sites in Utah.
Tier II	Tier II sites are sites with documented hazardous chemicals stored on site. No chemical spills or release is implied by the database listing. These site types are contained in a database of sites that either store or release toxic materials specified by the Emergency Planning and Community Right to Know Act.
Toxic Release Inventory (TRI)	TRI sites are sites such as manufacturing or mining facilities that manufacture or process listed chemicals. These site types are located in a database of sites that use, manufacture, treat, transport, or release toxic chemicals into the environment.
Used Oil Facility	Used oil facilities are sites that store, transport, or recycle used oil. These site types are located in a database of permitted sites in Utah that transport, transfer, burn, market, refine, or process used oil.
Underground Storage Tanks (UST)	USTs are sites where underground storage tanks are currently being used or have been used to store petroleum products such as gasoline or diesel fuel. These site types are located in a database of locations in Utah that have underground storage tanks. In Utah, USTs are managed according to Title R311, *Environmental Response and Remediation*, of the Utah Administrative Code and the state Underground Storage Tank Act (Title 19, Chapter 6, Part 4 of the Utah Code).

3.14.3.2 Facilities with Hazardous Materials in the Hazardous Materials and Waste Sites Evaluation Area

The potentially hazardous sites in the hazardous materials and waste sites evaluation area are listed by facility type in Table 3.14-2 and shown in Figure 3.14-1. There are a total of 48 sites in the evaluation area that are known or suspected to contain, or have previously contained, hazardous materials or where a spill or release of a hazardous material occurred. Some sites are listed in multiple databases.

Table 3.14-2. Hazardous Waste Sites in the Hazardous Materials and Waste Sites Evaluation Area

Facility Type	Number of Facilities in the Evaluation Area
Targeted Brownfield sites	0
CERCLA sites	4
Environmental Incidents	36
Toxic Release Inventory sites	0
Tier II sites	0
Formerly Used Defense sites	0
Underground storage tanks	1
Permitted used-oil facilities	0
Solid-waste landfills	0
Leaking underground storage tanks	6
Dry cleaner	1

Sources: DERR 2023b, 2023c; UDSHW 2023

The majority (36) of the sites found in the searched environmental databases were Environmental Incidents. Environmental Incidents are typically locations of accidents (many occurred on I-15) involving a minor spill or chemical release, over a reportable quantity, that were cleaned up without the need for major remedial efforts. These site types do not typically contain residual contamination nor present high risks to construction. Therefore, these site types are not included in Section 3.14.4, *Environmental Consequences and Mitigation Measures*, or in Figure 3.14-1. A summary of information on the other identified sites is included in Section 3.14.4.

Figure 3.14-1. Hazardous Materials Facilities in the Hazardous Materials and Waste Sites Evaluation Area

3.14.4 Environmental Consequences and Mitigation Measures

3.14.4.1 Methodology

UDOT assessed the expected environmental risks to the project by considering the site type and status, reported contamination, reported remedial actions, and the locations of facilities potentially containing hazardous materials in relation to the Action Alternative. For this analysis, the footprint for the Action Alternative is considered to be the right-of-way and temporary construction easement requirements for the alternative as described in Section 3.3, *Right-of-way and Relocations*. The criteria for classifying the risk (high, moderate, or low) of encountering contaminated soil and/or groundwater at each site were defined according to UDOT's *Environmental Process Manual of Instruction* (UDOT 2020c), which are summarized below.

- **High-risk site.** A high-risk site is one with a high potential that contamination exists on site. These site types include CERCLA, NPL, and open LUST sites.
- **Moderate-risk site.** A moderate-risk site is a site with a higher potential to contain contamination. These site types include closed LUST sites, active or closed landfills, and UST sites.
- **Low-risk site.** A low-risk site is a site with a lower potential to contain contamination. These site types include closed UST, Tier II, and TRI sites.

Table 3.14-3 shows the results of the risks analysis based on site type.

Table 3.14-3. Hazardous Waste Sites in the Hazardous Materials and Waste Sites Evaluation Area

Facility Type	Number of Facilities in the Evaluation Area	Risk Analysis
CERCLA sites	4	High-risk site
Closed UST	1	Low-risk site
Closed LUST	6	Moderate-risk site
Dry cleaner	1	Moderate-risk site

Sources: DERR 2023b, 2023c; UDSHW 2023
Note that a site could be listed in multiple databases.

To identify "sites of primary concern," UDOT considered the site's expected risk level and each site's location relative to the anticipated footprint for the Action Alternative. Sites of primary concern are high- and moderate-risk sites directly impacted by the Action Alternative footprint or located on adjacent property close to the Action Alternative footprint where contaminated soil or groundwater could have migrated into the footprint and affect construction.

3.14.4.2 No-action Alternative

With the No-action Alternative, the improvements associated with the I-15 project would not be made, so no impacts to or disturbances of hazardous materials sites would occur as a result of the project. Existing sites would continue to be managed in accordance with state and federal regulations, and other projects in the hazardous materials and waste sites evaluation area might disturb hazardous materials sites during construction, or other projects could result in site clean-up activities.

3.14.4.3 Action Alternatives

There are 48 known hazardous materials facilities in the hazardous materials impact analysis area (see Table 3.14-2, *Hazardous Waste Sites in the Hazardous Materials and Waste Sites Evaluation Area*, above). Twelve sites that present a high or moderate risk of containing contamination were investigated further by researching information in environmental databases and inspecting the site location relative to the Action Alternative. Eleven sites were retained as sites of primary concern and are listed below along with one site (UDOT Intersection 400 North 500 West) that, based on information in the DERR database, poses a low risk to construction and is not a site of primary concern.

3.14.4.3.1 North Segment Impacts

The options in the north segment would have impacts to 1 UST site, 6 LUST/UST sites, 1 dry cleaner site, and 1 CERCLA site. The impacts would be the same for both options.

- **UDOT Intersection 400 North 500 West Bountiful** (ID# 3000533) is listed as a UST site. The USTs were removed and considered closed in 2016 and in 2017. According to DERR records, the site was cleaned up by removal of contaminated soil and it was determined to not to contain residual hazardous chemicals (DERR 2023b), making this site a **low** risk site to construction and is not a site of primary concern.
- **Chevron 828** (ID# 3000012) is listed in the UST and LUST site database. The site has had multiple LUST occurrences which were closed in 2017, 2006, and 1993. UDEQ recommended that no further corrective action was needed because any detectable petroleum from these releases was not a threat to human health or the environment (DERR 2023b). The site is currently an active UST site and is an open Shell gas station. This site poses a **moderate** risk to construction and is a site of primary concern.
- **Sunmart #875** (ID# 3000046) is a UST and LUST site located at 391 North 500 West in West Bountiful. The LUST occurrence was closed in 2001 after corrective actions cleaned up the site to regulatory standards (Utah Administrative Code R311-211) (DERR 2023b); however, the site is an active gas station, making this site pose a **moderate** risk to construction and making the site a site of primary concern.
- **Woods Cross 800 West Plume** (ID# UTD003807930) is a CERCLA site containing a chlorinated solvent contamination. This site consists of a former truck terminal operation including a wash rack and fueling station. It was determined that the chlorinated solvent contamination is isolated to the area where the wash rack and fueling station were located (DERR 2023b). However, contamination could have migrated away from this main source. This site extends into both the north segment options. This site is considered **high** risk to construction and is a site of primary concern.

- **Super Stop Texaco** (ID#3000200) is a LUST/UST site located at 560 West 500 South in West Bountiful. The LUST was closed in 2003 after corrective actions in 1999 cleaned up the site to regulatory standards (Utah Administrative Code R311-211) by the removal of contaminated soil, and the site was determined not to contain residual hazardous chemicals (DERR 2023b). The site is an active Shell gas station. This site poses a **moderate** risk to construction and is a site of primary concern.
- **Family Cleaners** (ID# 221) is a dry cleaner located at 461 West 500 South in Bountiful. This site is an inactive dry cleaner that was closed in the 1980s (DERR 2023b). These site types can contain residual contamination, and the site is considered a **moderate** risk to construction and is a site of primary concern.
- **Circle K Store #7951** (ID# 3000117) is a UST/LUST located at 495 South 500 West in Bountiful. The LUST was closed in 1992. DERR determined that any detectable petroleum contamination that remained at the site complies with UST rules (DERR 2023d), and there appeared to not be a threat to human health or the environment (DERR 2023b). Due to the potential for residual contamination, this site presents a **high** risk to construction and is a site of primary concern.
- **Rainbo #41** (ID# 3000295) is a UST/LUST site located at 515 South 500 West in Bountiful. The LUST was closed in 2000. Based on information in DERR records, it was determined that any detectable petroleum contamination at the site complies with UST rules (DERR 2023d), and there appeared to not be a threat to human health or the environment (DERR 2023b) and the UST was closed in 1999, making this site a **moderate** risk to construction and a site of primary concern.
- **Gas-N-Go #7** (ID# 3000016) is a LUST/UST site located at 1085 Overland Road in Woods Cross. The LUST occurrences were closed in 1998 and 2022 (DERR 2023b). Based on information in DERR's database, it was determined that any detectable petroleum contamination at the site complies with UST rules (DERR 2023d), and there appeared to not be a threat to human health or the environment (DERR 2023b). This site is considered **moderate** risk to construction and is a site of primary concern.

3.14.4.3.2 South Segment Impacts

The impacts to hazardous materials in the south segment would be the same for both the Salt Lake City 1000 North – Northern Option and the Salt Lake City 1000 North – Southern Option. These options would affect 3 CERCLA sites.

- **1700 North Beck Street Plume** (ID# UT0001909407) is a CERCLA site located at 1700 N. Beck Street in Salt Lake City. The plume consisted of groundwater contaminated with a variety of chlorinated hydrocarbons (DERR 2023b). This site is considered **high** risk to construction and is a site of primary concern.
- **Chevron USA, Inc. – Site I, IIIA, IIIB** (ID# UTD092029768) is a CERCLA site located at 2351 North 1100 West in North Salt Lake. According to DERR, this plume contains heavy metals, spent caustics, phenols, hydrochloric acid, spent catalyst leads, sulfuric acid sludges, heavy oil sludges, and other petroleum byproducts (DERR 2023b). This site is considered **high** risk to construction and is a site of primary concern.
- **Beck Street Salvage** (ID# UTD988066049) is a CERCLA site located at 1225 N. Beck Street in Salt Lake City. This site is a Superfund site (DERR 2023b). Cleanup for PCB-, lead-, and chromium-contaminated soils began in 1987. An analytical results report in DERR's database states that soil contamination is present at nearby residences, and contaminated groundwater might have migrated off site. This site is considered **high** risk to construction and is a site of primary concern.

3.14.4.3.3 Summary of Action Alternative Impacts

Table 3.14-4 shows there are 12 sites of primary concern in the hazardous materials and waste sites evaluation area. These sites consist of 4 CERCLA sites, 1 dry cleaner site, 6 UST/LUST sites, and 1 UST site.This page is intentionally left blank

Table 3.14-4. Hazardous Material Sites of Concern within the I-15 Evaluation Area

Site Type	Site Name	Address or UTM	Identification (ID) Number(s)	Option(s)	Site Status	Risk to Construction
CERCLA	1700 North Beck Street Plume	1700 N. Beck Street, Salt Lake City	UT0001909407	Both south segment options	Active	High
CERCLA	Woods Cross 800 West Plume	643 South 800 West, Woods Cross	UTD003807930	Both north segment options	Active	High
CERCLA	Chevron USA, Inc. – Site I, IIIA, IIIB	2351 North 1100 West, North Salt Lake	UTD092029768	Both south segment options	Active	High
CERCLA	Beck Street Salvage	1225 N. Beck Street, Salt Lake City	UTD988066049	Both south segment options	Active	High
Dry cleaner	Family Cleaners	461 West 500 South, Bountiful	221	Both north segment options	Inactive	Moderate
UST/LUST	Chevron 828	504 West 400 North, Bountiful	3000012	Both north segment options	LUST closed 3/21/2017; LUST closed 7/31/2006; LUST closed 5/14/1993	Moderate
UST/LUST	Gas-N-Go #7	1085 Overland Road, Woods Cross	3000016	Both north segment options	LUST closed 11/08/2022; LUST closed 1998	Moderate
UST/LUST	Sunmart #875	391 North 500 West, West Bountiful	3000046	Both north segment options	LUST closed 2/08/2001; UST still open	Moderate
UST/LUST	Circle K Store #7951	495 South 500 West, Bountiful	3000117	Both north segment options	LUST closed 1/31/1992; UST closed 1/09/1992	High
UST/LUST	Super Stop Texaco	560 West 500 South, West Bountiful	3000200	Both north segment options	LUST closed 5/06/2003 and 2/3/1999; UST still open	Moderate
UST/LUST	Rainbo #41	515 South 500 West, Bountiful	3000295	Both north segment options	LUST closed 2/23/2000; UST closed 12/1999	Moderate
UST	UDOT Intersection 400 North 500 West Bountiful	400 North 500 West, Bountiful	3000533	Both north segment options	UST closed 12/12/2016	Low

Sources: DERR 2023b, 2023c; UDSHW 2023

Table 3.14-5 summarizes the impacts of the segment options to hazardous material sites in the evaluation area.

Table 3.14-5. Summary of Impacts to Hazardous Material Sites in the Hazardous Materials and Waste Sites Evaluation Area

Facility Type	North Segment		South Segment	
	Farmington 400 West Option	Farmington State Street Option	Salt Lake City 1000 North – Northern Option	Salt Lake City 1000 North – Southern Option
CERCLA	1	1	3	3
Dry Cleaners	1	1	0	0
LUST/UST	7	7	0	0

As shown above in Table 3.14-5, all options are the same with respect to impacts to potentially hazardous waste sites. The north segment options would both impact 1 CERCLA site, 1 historic dry cleaner site, and 7 LUST/UST sites. The south segment options would both impact 3 high-risk CERCLA sites

Because the impacts would be the same for each option, the impacts to potentially hazardous waste sites are not a major distinguishing factor for evaluating the Action Alternative options.

3.14.4.4 Mitigation Measures

UDOT's best practices for project development include the following mitigation measures for hazardous materials and hazardous waste sites.

If the Action Alternative is selected, site investigations would be conducted by UDOT during the final design phase of the project to confirm the presence of contamination and determine potential risks to construction, if any, and the appropriate remedial measures. In the case of an identified chemical hazard, UDOT would negotiate the site remedy with the property owner before property is acquired and disturbed by construction and through possible coordination with EPA and DERR.

Previously unidentified sites or contamination could be encountered during construction. The construction contractor would implement measures to prevent the spread of contamination and to limit worker exposure. In such a case, all work would stop in the area of the contamination according to UDOT Standard Specifications, and the contractor would consult with UDOT and DERR to determine the appropriate remedial measures. Hazardous materials would be handled according to UDOT Standard Specifications and the requirements and regulations of DERR.

During construction, coordination would take place with UDOT, EPA, and/or DERR, the construction contractor, and the appropriate property owners. This coordination would involve determining the status of the sites of concern, identifying newly created sites, identifying the nature and extent of remaining contamination (if any), and minimizing the risk to all parties involved. Environmental site assessments might be conducted at the sites of concern to further evaluate the nature and extent of contamination and to better identify the potential risks of encountering hazardous materials when constructing the selected alternative.

Engineering controls (such as dust mitigation, temporary soil covers, and groundwater extraction) and personal protective equipment for construction workers would be used to reduce the potential for public or worker exposure to hazardous materials as determined necessary by UDOT.

3.15 Visual Resources

3.15.1 Introduction

Visual resources are the components of the natural, cultural, or project environments that are capable of being seen. The visual and aesthetic resources of a community or area include the physical features that make up the visible landscape and vistas, features including land, water, vegetation, topography and human-made features such as buildings, roads, utilities, and structures, combined with the viewer sensitivity to the area. Viewer sensitivity is a combination of viewer exposure and viewer awareness. Viewer exposure is a function of the number of viewers, the number of views seen, the distance of the viewers, and the viewing duration. Viewer awareness relates to the extent of the public's attention, focus, and concern for a particular viewshed.

Section 3.15 identifies the visual resources, the typical viewer groups that would view those resources, and the effects, or viewer response, of the Action Alternative on those resources in the visual resources evaluation area.

Visual Resources Evaluation Area. The visual resources evaluation area is defined as all areas where physical changes associated with the Action Alternative could be seen. The views include both looking outward from the alternative and looking toward the alternative from key viewpoints. The visual resources evaluation area is shown in Figure 3.15-7, *Key Views in the Visual Resources Evaluation Area*, on page 3-247.

3.15.2 Regulatory Setting

UDOT considers aesthetic values during project development. The Council on Environmental Quality's regulations for implementing NEPA (40 CFR Section 1508.8) also state that aesthetic effects should be considered.

To consider the aesthetic effects of the Action Alternative, UDOT performed a visual analysis for the EIS. An analysis of visual impacts is required in an EIS by FHWA's Technical Advisory T 6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents* (FHWA 1987).

This section was also prepared with reference to guidance from FHWA's *Guidelines for the Visual Impact Assessment for Highway Projects* (FHWA 2015) to assess visual impacts. In accordance with these guidelines, the existing visual character and quality of the affected environment (or the area of visual effect), as well as the viewer response to those resources, provide the framework for assessing the change in visual character that would occur as a result of the I-15: Farmington to Salt Lake City Project.

3.15.2.1 Visually Sensitive Resources

In addition to following the standard regulatory guidance above, UDOT reviewed local plans for evidence of the community's visual preferences and scenic resources. There are four historic districts in the visual resources evaluation area: the Salt Lake City Northwest Historic District, the Salt Lake City Warehouse Historic District, the Capitol Hill Historic District in Salt Lake County, and the Clark Lane Historic District in Davis County. The general plans and land use plans for cities in the evaluation area and the Salt Lake City historic districts have several aesthetic and preservation guidelines that might apply to the I-15 cross streets during the final design phase of the project. The Clark Lane Historic District in Davis County specifically mentions the streetscape along State Street in its National Register of Historic Places Registration Form. The form describes the trees on State Street as a unifying element of the historic district and states that the trees have been maintained and replanted over time (Utah Department of Cultural and Community Engagement 2017). For more information regarding State Street in Farmington, see Section 3.10, *Historic and Archaeological Resources*, and Chapter 4, *Section 4(f) Analysis*.

3.15.3 Methodology

Based on FHWA's *Guidelines for the Visual Impact Assessment for Highway Projects* (FHWA 2015), UDOT conducted a Visual Impact Assessment (VIA) to analyze the visual resources and visual character in the visual resources evaluation area (the area of visual effect) and of the Action Alternative. The VIA was conducted in four phases, which are described below.

- **Establishment Phase**
  - This phase provides the regulatory context, identifies sensitive visual resources from local plans, defines the area of visual effect, identifies static and dynamic viewsheds, identifies key views, and describes the existing visual landscape.
  - This phase is both a desktop and field review of visual resources.
- **Inventory Phase**
  - This phase is an assessment of the visual quality of the existing visual resources in the affected environment summarized by key view.
    - A component of visual quality is visual character. Visual character is a description of the visible attributes of a scene or object, typically using artistic terms such as form, line, color, and texture.
    - Visual quality is an assessment (what viewers like and dislike) of the composition of the character-defining features of the landscape and its aesthetics. Under the FHWA VIA guidelines, visual quality is determined by evaluating the viewed landscape's characteristic in terms of natural harmony, cultural order, and project coherence (FHWA 2015).
    - This information provides the baseline for analysis of the action alternatives in the analysis phase and is summarized by key view identified in the establishment phase.

What is a key view?

A key view is a topographic position that encompasses views both of and from the highway and represents the range of views that are affected by the project. Key views are meant to represent the visual character of either the environment or the project.

- This phase also identifies the locations of the two main user groups associated with a transportation network within the visual resource evaluation area: *those using the network* (who have views from the road, also known as "travelers") and *those looking at the transportation network* (who have views of the road, also known as "neighbors").

- **Analysis Phase**
  - This phase is an assessment of the impact of the visual change of the action alternatives within the area of visual effect.
    - The visual impacts of the action alternatives are the combined assessment of the visual compatibility of the action alternative and viewer sensitivity at each key view to determine the degree of visual impact. Impacts to visual quality can be adverse, beneficial, or neutral.
  - Photo simulations are prepared in this phase to illustrate what an action may look like from a key view. Not every key view or option will be represented as a simulation.
- **Mitigation Phase**
  - This phase describes the visual resource mitigation measures that could be implemented to lessen any adverse effects of the action alternatives.

3.15.4 Affected Environment

This section describes the existing visual character of the visual resources evaluation area for assessing visual resources. The information in this section comes from the tasks in the establishment and inventory phases of the analysis methodology described in Section 3.15.3, *Methodology*. This section provides information about the character of the regional landscape and the land use patterns that have modified the natural landscape.

3.15.4.1 Geographic Setting and Topography

The visual resources evaluation area and the I-15 corridor are on the "front side" of the Wasatch Mountains, an area known locally as the "Wasatch Front." In Utah, the Wasatch Front metropolitan area is home to the majority of the state's population. The Wasatch Front is defined by several unique geographic features including the internationally famous, snow-covered Wasatch Mountains range to the east and the expansive Great Salt Lake to the west. These beautiful yet imposing features pose unique transportation and land use challenges for the five counties that comprise the Wasatch Front (Box Elder, Weber, Davis, Salt Lake, and Utah Counties) by constraining the overall transportation network and suburban and urban development to a narrow swath of land between the lake and mountains. Because of these constraints, the valley floor is heavily developed and is visually different than the undeveloped and natural-appearing landscapes of the lake and mountains.

3.15.4.2 Affected Viewers and Sensitivity

For a visual analysis, two basic user groups are associated with a transportation network: neighbors and travelers. People using the road see some of the same views as people looking at the road. The visual sensitivity of these user groups depends on the number and type of viewers and the frequency and duration of views. Visual sensitivity is also affected by viewer activity, awareness, and visual expectations in regard to the views.

What are travelers and neighbors?

For this visual analysis, travelers are those using the transportation network (who have views from the road), and neighbors are those looking at the transportation network (who have views of the road).

3.15.4.2.1 Neighbors

Neighbors are a viewer group that consists of owners and renters of single-family homes, multifamily homes, apartments, condominiums, and other dwelling units used primarily by permanent residents. Residential neighbors are the most sensitive viewers to visual change. Along I-15, residential areas are directly adjacent to the interstate and the Action Alternative. On the eastern bench of the Wasatch Mountains in Davis County, residents have elevated views across I-15.

3.15.4.2.2 Travelers

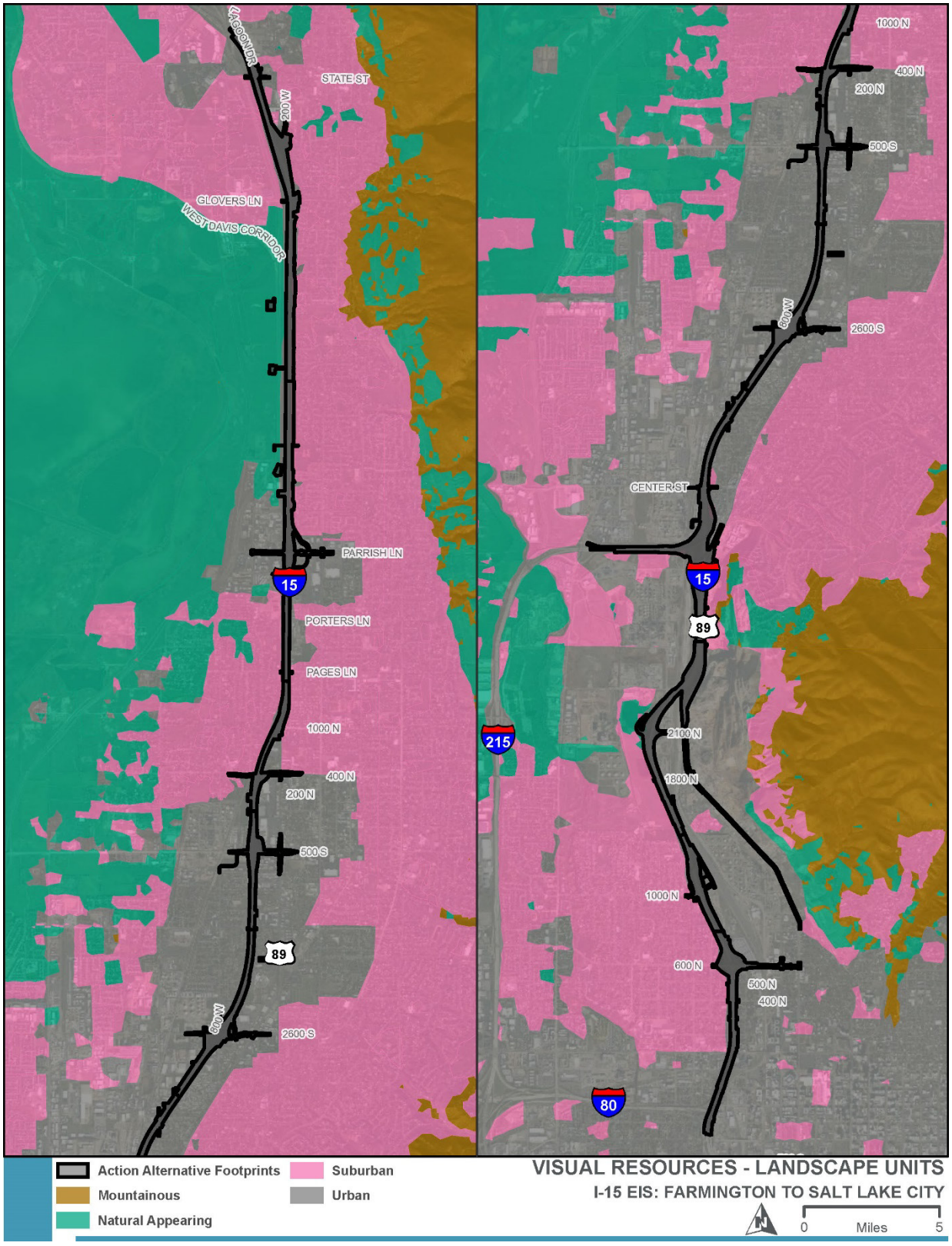
Travelers are a viewer group that consists of those who are traveling on and across I-15 and have views of the road in the visual resources evaluation area. Because of the nature of dynamic viewsheds, travelers are typically not as sensitive to visual change as are neighbors.

3.15.4.3 Visual Character and Landscape Units

Visual character is the description of the visible attributes of a view or object typically using artistic terms such as form, line, color, and texture. The visual character of an area can be divided among the natural, developed, and roadway settings in the landscape. I-15 is a major corridor that provides the first glimpse of the Salt Lake Valley from the north and the first glimpse of the Great Salt Lake from the south. For these reasons, this highway provides an opportunity to showcase Utah.

To develop and delineate landscape units (LUs), this analysis implemented an approach consistent with FHWA's *Guidelines for the Visual Impact Assessment for Highway Projects* (FHWA 2015); LUs are defined by viewsheds and landscape type. These LUs were refined in the visual resources evaluation area to better represent the current landscape character that could be affected by the Action Alternative (Figure 3.15-1). The remainder of Section 3.15.4.3 describes the existing LUs.

Figure 3.15-1. Landscape Units in the Visual Resources Evaluation Area



3.15.4.3.1 Industrial LU

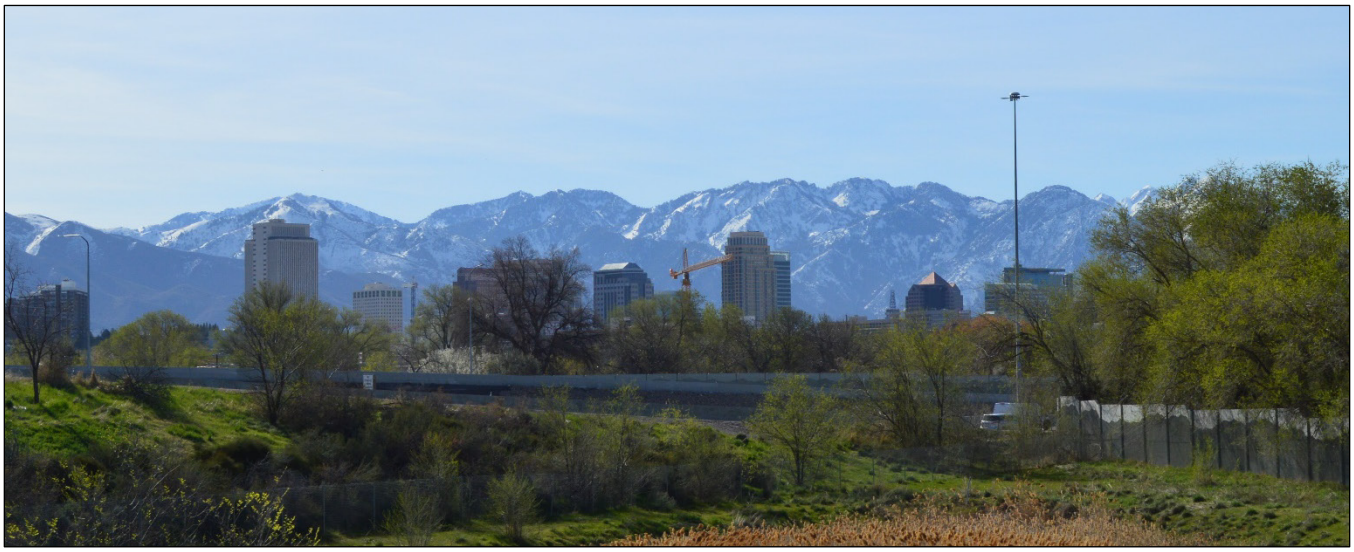
The industrial LU consists of the refineries, quarry, railyards, and associated retail and business operations that are generally adjacent to I-15 and the Union Pacific and FrontRunner railroad tracks. The existing landscape character in this LU is influenced by direct human activities, is heavily altered, and appears disorderly and inharmonious to most viewers. The industrial pattern elements include a combination of angular and structural linear forms with gray, brown, and black undertones (Figure 3.15-2).

Figure 3.15-2. Industrial Area West of I-15 in North Salt Lake

3.15.4.3.2 Mountainous LU

The mountainous LU includes the surrounding mountains and foothills in Davis and Salt Lake Counties. For a representative picture, see the background views in Figure 3.15-3. Views of the mountains are prized by residents, recreationists, and tourists. The existing landscape character in this LU is influenced by direct and indirect human activities but appears natural to most viewers. Natural elements include forests, shrublands, grass lands, and the peaks and rock faces above the tree line. Mountain pattern elements (angular forms, clean lines, dark green and natural undertones, and rocky textures) currently dominate the LU. Human influence in this LU includes dirt roads, off-highway-vehicle trails, foot trails, road cuts, road pullouts, and power lines. These human influences are typically obscured from view by topography or vegetation depending on the vantage point and distance. The mountainous LU is the most intact—meaning the least altered by development—of all the LUs in the visual resources evaluation area.

Figure 3.15-3. Mountainous LU in the Background and Urban LU in the Middle Ground Looking East across Salt Lake City from 600 North



3.15.4.3.3 Natural Appearing LU

The natural appearing LU consists of the Great Salt Lake, its wetlands, and Antelope Island, which is located generally north-south along the west side of I-15. For a representative picture, see the middle and background views in Figure 3.15-4. This area has not been as heavily altered for residential and industrial purposes as the neighboring LUs, industrial and suburban. Natural elements include the lake, its surrounding wetlands, and native shrubs and grasses. Natural pattern elements (rolling and flat forms, soft lines, sage green and natural undertones, and natural textures) currently dominate the LU. Human elements include trails, dirt roads, causeways, canals, and recreation access for boating. These human influences are typically obscured from view by topography or vegetation depending on the vantage point and distance.

Figure 3.15-4. Natural Appearing LU Surrounding the Great Salt Lake West of the Evaluation Area

3.15.4.3.4 Suburban LU

The suburban LU is the predominantly single-family residential developments on either side of I-15 and on the foothills and on the outer edges of some of the urban and industrial LUs. This existing landscape character is heavily influenced by human activities; however, it has more green spaces and separation of buildings than does the urban LU. Suburban pattern elements include roads, fences, single-family homes, power lines, and ornamental landscaping (Figure 3.15-5). The suburban pattern elements include a combination of linear urban forms and colors (structural lines and warm gray, tan, and red brick undertones) as well as softer, rolling forms of the landscaping and greenspaces (soft lines and green and natural undertones). These human influences can range in appearance from disorderly and inharmonious to orderly and harmonious depending on the vantage point, the age of the structure, and the level of upkeep of the properties.

Figure 3.15-5. Suburban LU

3.15.4.3.5 Urban LU

The urban LU includes both high-density residential and urban developments adjacent to I-15 in Farmington, Centerville, West Bountiful, Bountiful, Woods Cross, North Salt Lake, and Salt Lake City. The existing landscape character is heavily influenced by human activities and includes commercial and retail areas, multistory buildings, large parking lots, and high-density residential areas of the incorporated cities. For representative pictures, see Figure 3.15-6 and the middle ground of Figure 3.15-3.

What are high-density residential developments?

The term *high-density residential developments* refers to apartment complexes, townhouses, condos, and other multifamily homes. It does not refer to single-family homes.

Urban pattern elements include roads, fences, parking lots, buildings, power lines, and ornamental landscaping. Urban pattern elements (linear and concrete forms, more-dominant highway and structural lines, gray and black undertones, and concrete and pavement textures) create a strong change in visual character compared to the mountainous and natural appearing LUs. The vegetated elements of the urban LU consist of ornamental landscaping and park strips that are more clearly altered by human activities.

Figure 3.15-6. Urban LU with High-density Residential Housing and Commercial Areas

3.15.4.4 Overview of the Viewsheds

A viewshed is all of the surface area visible from a particular location such as an overlook or a sequence of locations such as a road or trail. The geography and topography of the visual resources evaluation area can be represented in both static and dynamic viewsheds. Static viewsheds are what *neighbors* of a road see from a stationary location. Dynamic viewsheds are what *travelers* on the road see as they move through the landscape. Static and dynamic viewsheds were identified with the selection of key views and are listed below in Table 3.15-1.

The most dominant natural features in the viewsheds in the visual resources evaluation area are the Wasatch Mountain Range to the east and southeast, the Great Salt Lake and Antelope Island to the west, and the Oquirrh Mountains to the southwest. The dominant human-made or human-altered features in the viewshed include the transportation system; I-15, I-215, U.S. 89, and the numerous associated state and local roads; railroad tracks for Union Pacific freight rail and FrontRunner commuter rail; industrial areas that include refineries, railyards, manufacturing, rock quarry, and retail operations; and the single-family homes, apartment complexes, townhomes, and the surrounding neighborhoods in the cities of Farmington, Centerville, West Bountiful, Bountiful, Woods Cross, North Salt Lake, and Salt Lake City. Human alteration and dense urban development are dominant on the lower elevations on the valley floors along I-15.

3.15.4.4.1 Identify Key Views

A key view is a location from which a viewer (traveler or neighbor) can see either iconic or representative landscapes, with or without the project. The existing visual character and the visual impact analysis are documented to or from key viewpoints. The key views discussed in Section 3.15 were chosen by UDOT to help provide context from the visual quality of the area near the alignment for the Action Alternative and the views of those using the road network and those looking at the road network in the viewsheds. The key views were selected based on the field review and are summarized in Table 3.15-1.

Table 3.15-1. Key Views and Rationales for Their Locations

Key View	Address	Viewer / Viewshed Type	Rationale for Location
1	State Street, Farmington	Traveler / dynamic	The Action Alternative would reconfigure the overpass and consolidate the two structures into one.
2	Centerville Community Park, Centerville	Neighbor / static	The Action Alternative would construct a new, elevated pedestrian and bicyclist crossing of I-15 that connects the park with the Legacy Parkway Trail west of I-15.
3	Parrish Lane interchange, Centerville	Aerial	The Action Alternative would reconfigure the interchange and add a new northbound underpass.
4	800 West and 2600 South, Woods Cross	Neighbor / static Traveler / dynamic	The Action Alternative would reconfigure the interchange and add a new underpass for Wildcat Way.
5	Sunset Ridge, North Salt Lake	Neighbor / static	The Action Alternative would reconfigure the interchange and add new access to I-215 and U.S. 89.
6	Warm Springs and Beck Street Connection, Salt Lake City	Traveler / dynamic	The Action Alternative would construct a new, full-access interchange.
7	600 North, Salt Lake City	Aerial	The Action Alternative would reconfigure the interchange.

Figure 3.15-7 below shows the location and direction of each of the seven key views listed in Table 3.15-1 above.

3.15.4.4.2 Assess Visual Quality of the Landscape by Key View

Visual quality is an assessment (what viewers like and dislike) of the composition of the character-defining features of the landscape and its aesthetics. Under the FHWA VIA guidelines, visual quality is determined by evaluating the viewed landscape's characteristic in terms of natural harmony, cultural order, and project coherence (FHWA 2015).

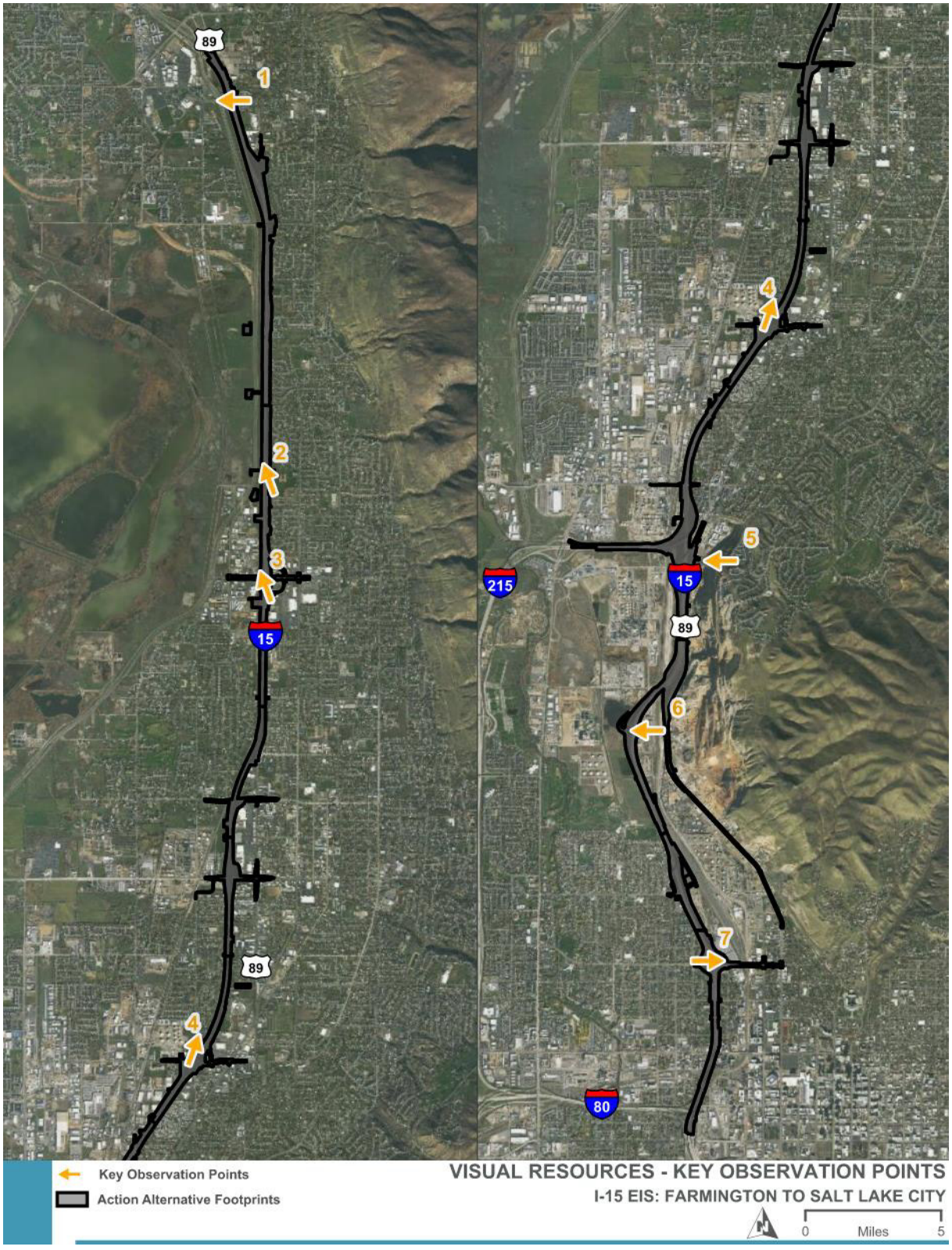
Natural Harmony. Viewing the visual resources of the natural environment creates a sense of natural harmony in people. People interpret the visual resources of the natural environment as being harmonious or inharmonious. Harmony is considered desirable; disharmony (or inharmoniousness) is undesirable. Natural environments with high visual quality are typically those with interesting or varying topography, colors, forms, and vegetation that come together in a vivid or memorable scene for a viewer. These scenes are typically devoid of human-made elements or obvious modifications to the landscape. The greater the degree to which the natural visual resources of the area meet the viewer's preferred concept of natural harmony, the higher value the viewer places on those visual resources.

Cultural Order. Viewing the visual resources of the cultural environment creates in people a sense of cultural order. People interpret the visual resources of the cultural environment as being orderly or disorderly. Orderly is considered desirable; disorderly is undesirable. High visual quality consists of areas that are well-planned and -designed; landscaping is manicured; buildings and infrastructure are in good repair; and parcels are devoid of clutter. High visual quality means that the overall composition of the area leaves a vivid impression and gives the viewer a sense of place. Crumbling infrastructure, dilapidated or vacant buildings, incompatible building styles, and unkempt landscaping can diminish the visual quality of the cultural environment and appear disorderly. The greater the degree to which the visual resources meet the viewer's preferred concept of cultural order, the higher value the viewer places on those visual resources.

Project Coherence. Viewing the visual resources of the project environment creates in people a sense of project coherence. People interpret the visual resources of the project environment as being either coherent or incoherent. Coherent is considered desirable; incoherent is undesirable. Project environments with high visual quality generally present highway elements, such as geometry, striping, and signs, in an understandable, clean, and predictable manner. The greater the degree to which the visual resources of the project environment meet the viewer's preferred concept of project coherence, the higher value the viewer places on those visual resources.

Natural harmony, cultural order, and project coherence combine to form the landscape composition and describe the vividness of the view. Vividness is how memorable or scenic the view is. In this chapter, the baseline visual quality is described in terms of natural harmony and cultural order. The visual impacts of the Action Alternative is described in terms of project coherence with the natural harmony and cultural order.

Figure 3.15-7. Key Views in the Visual Resources Evaluation Area



3.15.4.5 Existing Visual Quality at Key Views

This section summarizes the visual quality of the key views in the visual resources evaluation area. Visual quality is an assessment (what viewers like and dislike) of the composition of the character-defining features of the landscape and its aesthetics. Under FHWA's VIA guidelines, visual quality is determined by evaluating the viewed landscape's characteristic in terms of natural harmony, cultural order, and project coherence (FHWA 2015). The visual quality at these key views serves as the baseline for analyzing the Action Alternative.

3.15.4.5.1 Key View 1

Key View 1 is the view that travelers see looking west along State Street in Farmington (Figure 3.15-8).

Visual Character. The foreground views are of the pavement and linear markings of State Street and streetscape that includes the sidewalk, arching trees, and soft vegetative shoulders. The middleground views are of the hardscaped pedestrian and State Street overpass that arch over I-15. The foreground and middleground views are of the suburban LU. The background views are of the residential and commercial development west of I-15, and in the distance the natural appearing LU is visible. The visual character is a suburban street bordered by new and older residential and commercial development (on the west side of I-15). Building architecture and age of construction vary greatly and are typical of an area that is growing in population. Some landscaping on the edge of the road is not maintained.

Visual Quality. The foreground and middleground views of State Street and residential development are compatible and expected for the views within a fully developed city. The views of the overpass are inharmonious and disorderly—that is, the views of the overpass do not leave the viewer with a vivid, memorable view. However, the streetscape of State Street itself is harmonious, orderly, and well kept. The background views are mostly obscured by the overpass and traffic signal.

Figure 3.15-8. Key View 1 Looking West along State Street and Its Overpass of I-15

3.15.4.5.2 Key View 2

Key View 2 is the view that recreationists see as they walk along the sidewalk of Centerville Community Park and North Frontage Road (Figure 3.15-9). This view is looking north-northwest towards I-15. In this picture, the noise wall is being replaced due to the construction of the West Davis Corridor overpass to the north of this location.

Visual Character. The foreground and middleground views are of the Centerville Community Park, North Frontage Road, I-15, construction, and the power line corridor. The background views are of the Wasatch Mountains and residential development on the east benches of the mountains. The foreground and middleground views are representative of the suburban LU, and the background views are representative of the mountainous LU. In this location, the soft green forms of the park and rolling brown forms of the mountains abut the gray concrete and asphalt and the vertical and horizontal forms of the road and noise walls. The visual character is a suburban park along a transportation corridor.

Visual Quality. The foreground and middleground views of I-15 and North Frontage Road contrast in form, texture, and color with the manicured vegetation and visual qualities of the park. The views are generally inharmonious and disorderly; however, views will be more orderly when the noise wall is complete. The background views are also inharmonious and disorderly due to the interrupting features of the power line, the noise wall, and other features in the middle ground.

Figure 3.15-9. Key View 2 Looking North-northwest at I-15, North Frontage Road, and Centerville Community Park

3.15.4.5.3 Key View 3

Key View 3 is an aerial view of Parrish Lane and I-15 interchange looking north in Centerville (Figure 3.15-10). This image was captured by drone and does not represent what travelers or neighbors see; however, it provides a better vantage point of the interchange.

Visual Character. The foreground and middleground views are of the I-15, Parrish Lane, the Union Pacific and FrontRunner railroad tracks, and commercial development surrounding the interchange. The background views are of the Wasatch Mountains and residential development on the east benches of the mountains. All LUs are visible from this aerial view. The interstate corridor comprises long, linear, gray forms. Surrounding the interstate are a mix of buildings that vary in size, shape, and colors and include ornamental vegetation indicative of urban and suburban development in Utah. The background views are of the mountainous and natural appearing LUs and have softer forms and muted green and tan colors. The visual character is an urban interstate and rail corridor bordered by commercial and residential development.

Visual Quality. The foreground and middleground views are compatible and expected for the views in a fully developed city. The urban interstate and rail corridor is orderly and coherent. The background views of the mountainous LU are scenic.

Figure 3.15-10. Key View 3 Looking North over the Parrish Lane and I-15 Interchange

3.15.4.5.4 Key View 4

Key View 4 is the view that recreationists and travelers see as they walk or drive along 800 West in Woods Cross (Figure 3.15-11).

Visual Character. The foreground and middleground views are of the pavement, sidewalk, and landscaping along 800 West. Commercial and industrial development are obscured by the traffic signal and landscaping in the middle ground. The foreground and middleground views are dominated by soft, vibrant ornamental landscaping typical of the suburban and urban LUs. The background views are of the Wasatch Mountains and the mountainous LU. The visual character is a landscaped city street.

Visual Quality. The form, texture, and colors of the foreground and middleground views of the manicured landscaping are harmonious, orderly, and compatible for the location. The background views, where visible, are scenic.

Figure 3.15-11. Key View 4 Looking North-northwest at 800 West in Woods Cross

3.15.4.5.5 Key View 5

Key View 5 is the view that residents of Sunset Ridge in North Salt Lake see looking west over U.S. 89, I-15, the Union Pacific and FrontRunner railroad tracks, I-215, the industrial LU, the Great Salt Lake, and Antelope Island (Figure 3.15-12).

Visual Character. The foreground views are of the soft-sage-green vegetation and rolling landscape of the natural appearing LU. This key view includes the east bench of the Wasatch Mountains, in which the residential development is located, and new residential construction east of U.S. 89. The middleground views are of the urban LU and its development, highway and railroad infrastructure, and the industrial LU that includes a refinery. The middleground views have a variety of building shapes, heights, and colors. The background views are of the Great Salt Lake, its wetlands, and Antelope Island and the natural appearing LU. The natural appearing LU surrounding the lake has a lot of horizontal flat forms and neutral colors. The visual character is a combination of urban and industrial development and a natural appearing landscape.

Visual Quality. The foreground and middleground views of the highway and railroad infrastructure and urban and industrial development contrast in form, texture, and color with the natural vegetation and background visual qualities. The foreground and middleground views are inharmonious and disorderly. The background views are scenic, harmonious, and orderly, which creates a vivid and memorable view. Background views are intact.

Figure 3.15-12. Key View 5 Looking West across U.S. 89, I-15 and I-215 in North Salt Lake

3.15.4.5.6 Key View 6

Key View 6 is the view that travelers see as they turn west on 2100 North to merge onto I-15 northbound (Figure 3.15-13).

Visual Character. The foreground views are of the pavement for Warm Springs Road and the I-15 northbound on-ramp at 2100 North. The middleground views are of phragmites (a wetland plant species) and industrial development. The landscape, including the phragmites, has a coarse texture and is predominantly brown. The background views are of industrial development obscured by distance and the flat topography. The background views include several vertical and angular forms of the streetlights, I-15, and the buildings. This key view is of the industrial LU. The landscape character is of an industrial area and a freeway entrance.

Visual Quality. The foreground, middleground, and background views are inharmonious and disorderly. The form, texture, and color of the buildings contrast with the with unkempt landscaping. However, the views are compatible and expected with the land use of this location.

Figure 3.15-13. Key View 6 Looking West at the 2100 North On/off-ramp in Salt Lake City

3.15.4.5.7 Key View 7

Key View 7 is an aerial view of 600 North and I-15 interchange looking east in Salt Lake City (Figure 3.15-14). This image was captured by drone and does not represent what travelers or neighbors see; however, it provides a better vantage point of the interchange.

Visual Character. The foreground and middleground views are of the I-15 on- and off-ramps and 600 North. The background views are of an industrial area, downtown Salt Lake City, the Wasatch Mountains, and residential development on the east benches of the mountains. The foreground and middleground views are dominated by smooth, gray concrete, linear pavement striping, and cylindrical sign and light posts. In the background are softer green forms of the landscaping and street trees of downtown Salt Lake City, interspersed by the rectangular buildings of the downtown skyline. The Wasatch Mountains in the background behind the downtown skyline have soft, angular forms and muted green and blue colors. This area is a transitional zone between the urban, industrial, and suburban LUs. The Union Pacific and FrontRunner railroad corridor is parallel to I-15 and just out of view. The visual character is an urban interchange.

Visual Quality. The foreground and middleground views are compatible and expected for the views in a fully developed city. The urban interstate corridor is orderly and coherent; however, the landscaping and sidewalk are unkempt at the street level. The background views are of the mountainous LU and the downtown skyline and are scenic.

Figure 3.15-14. Key View 7 Looking East over the 600 North and I-15 Interchange in Salt Lake City

3.15.5 Environmental Consequences and Mitigation Measures

This section describes the visual changes from the No-action and Action Alternatives and potential measures to mitigate these changes. The information in this section comes from the tasks in the analysis and mitigation phases of the analysis methodology described in Section 3.15.3, *Methodology*.

The visible features of the Action Alternative and the visual change in the landscape are summarized for each key view. The visual impacts of the Action Alternative are the combined assessment of the visual compatibility of the Action Alternative and viewer sensitivity at each key view to determine the degree of visual impact. Impacts to visual quality are a function of the visual compatibility of the Action Alternative and viewer sensitivity to visual changes at each key view.

Visual Compatibility. Visual compatibility is a comparison of the visual character of the Action Alternative and the visual character of the existing view from the key view location. Compatibility is described in terms of project scale, form, materials, and overall visual character compared to the existing natural and cultural environment. The Action Alternative can be considered compatible (not contrasting) or incompatible (contrasting).

Viewer Sensitivity. Viewer sensitivity to visual change is a function of exposure and awareness. Viewer exposure to the Action Alternative is described in terms of proximity (distance to a view), extent (the number of viewers), and duration (how long viewers can see the view in the context of dynamic viewsheds). Viewer awareness of the Action Alternative is described in terms of attention (uniqueness of the view), focus (focal points within the viewshed), and protection (legal protections or local values). Viewers are either sensitive or insensitive to visual impacts.

Impacts to Visual Quality. Impacts to visual quality are a function of the visual compatibility of the Action Alternative and viewer sensitivity to visual changes at each key view. Impacts to visual quality can be **adverse**, **beneficial**, or **neutral**. An adverse impact refers to the degradation in visual quality due to the incompatibility of action in the landscape or by obstructing or altering desired views. A beneficial impact is visually compatible or results in an improvement or enhancement to the visual quality or a view. A neutral impact is either not perceptible to a viewer or the change will not detract or enhance the visual quality or view.

3.15.5.1 No-action Alternative

3.15.5.1.1 Construction Impacts

With the No-action Alternative, the changes associated with the I-15: Farmington to Salt Lake City Project would not be made, and I-15, its interchanges, and cross streets would remain in their current condition. The visual nature of the visual resources evaluation area would be similar to that described in Section 3.15.4.5, *Existing Visual Quality at Key Views*. Because no major roadway improvements would be made, there would be no topographic changes or soil disturbances or associated construction equipment from roadway construction–related cuts and fills.

3.15.5.1.2 Long-term Impacts

With the No-action Alternative, I-15 would remain in its current configuration, and no widening, new interchange configurations, or pedestrian over- or underpasses would be constructed in the I-15 corridor. The current types of land use and development would continue in the area with or without the I-15: Farmington to Salt Lake City Project. The long-term impacts of the No-action Alternative are summarized by LU below.

Industrial LU. The industrial LU would look mostly the same with the No-action Alternative because the majority of the LU is developed and there is limited free land within the LU.

Mountainous LU. The mountainous LU is mostly protected land under jurisdiction of the U.S. Forest Service. These areas will not be developed and will visually stay the same. The bench east of I-15 is private land and will continue to fill in with residential development where there are undeveloped parcels. Much of the development is already approved and constructed. See Section 3.1, *Land Use*, for more information regarding future development.

Natural Appearing LU. The natural appearing LU would look mostly the same with the No-action Alternative because the majority of the LU is part of the Great Salt Lake and its wetland fringes and will not be developed. Some of the natural appearing LU that is on private land could transition to suburban LU as allowed by zoning and as population growth continues to add to the need for housing in Davis and Salt Lake Counties.

Suburban LU. The suburban LU will continue to expand in the visual resources evaluation area consistent with zoning and approved development plans. Some land currently in the natural appearing LU or on the foothills in the mountainous LU might transition to a suburban LU as private property changes ownership.

Urban LU. The urban LU will continue to expand around the core of the cities consistent with zoning and approved development plans. A portion of the suburban LU might transition to an urban LU in the future as the cities add density to accommodate more housing and retail space.

Given these assumptions, with the No-action Alternative the views in the visual resources evaluation area would be similar to the existing conditions, and visual change will be the result of the development and growth that is currently occurring and that is consistent with adopted land use plans.

3.15.5.2 Action Alternative

3.15.5.2.1 Construction Impacts

With the Action Alternative, short-term, construction-related impacts would include construction vehicle activity and accompanying staging areas, stockpiling of excavated material, and construction-related dust which would be visible during construction. The excavation and grading work to widen I-15 would minimally contrast with the existing conditions. Once the road construction is complete, the areas outside the road alignment would be revegetated, and visual quality would be similar to the existing conditions.

3.15.5.2.2 Long-term Impacts

With the Action Alternative, the overall long-term visual changes to visual quality would be **neutral** to **beneficial** compared to the existing conditions, depending on the vantage point and existing LU. In locations of neutral visual impacts, the alternative would maintain a similar level of natural harmony, cultural order, and landscape composition compared to the existing conditions. That is, in urban areas, areas of existing interchanges, or where I-15 is viewed from a great distance and blends in with the existing development, the visual impact of the Action Alternative would be **neutral**. Where the alternative would enhance the transportation and improve the streetscape, the visual impact would be **beneficial**. The main visual changes with the Action Alternative are described below from north to south. An assessment of the visual changes by key view is provided in *Visual Impacts of the Action Alternative by Key View* starting on page 3-260.

Main Elements of the Action Alternative That Would Have Visual Impacts

I-15 Mainline. Adding an additional lane in each travel direction of I-15 mainline will widen the overall footprint of I-15. This extra width would make the interstate more prominent in the viewshed; however, the views would be consistent with the existing conditions and landscape character.

State Street in Farmington (Farmington 400 West Option). This option is similar to the existing conditions. This option would retain the underpass at State Street for Lagoon Drive. Lagoon Drive would parallel I-15, and both I-15 and Lagoon Drive would remain below State Street. The intersection of State Street and 400 West would be a similar three-way intersection as it is today; however, both roads would have improved pedestrian and bicyclist infrastructure. With the wider footprint of I-15, Lagoon Drive would be moved farther to the east, and one home would be removed. 400 West would remain in its current location. State Street would be 6 feet wider to accommodate vehicle turning movements at the intersection with 400 West and new bike lanes. The separate pedestrian overpass structure would be removed, and improved pedestrian and bicyclist infrastructure would be added to the north and south sides of State Street. The overall visual character of the street would look similar to how it does today.

State Street in Farmington (Farmington State Street Option). This option is similar to the Farmington 400 West Option; however, Lagoon Drive would not pass underneath State Street. This option would construct a new four-way intersection at State Street and 400 West for Lagoon Drive. Lagoon Drive would be elevated to meet 400 West and State Street at the same grade to create a standard four-leg intersection. State Street would be 10 to 16 feet wider near the intersection with 400 West and would then taper to the original width east of the intersection. This option would impact more street trees than would the Farmington 400 West Option. The remainder of the Farmington State Street Option is the same as the Farmington 400 West Option.

200 West in Farmington. The 200 West interchange would be reconstructed with a modified design that includes a new signalized intersection and maintains the free-flow movement to Lagoon Drive. The signalized intersection would be a visual change that would introduce a new traffic signal where one does not currently exist. The location of the new 200 West/Frontage Road/Lagoon Drive intersection would be aligned farther to the southwest away from the residential areas and closer to I-15, and the intersection would be most visible to travelers. The reconstructed interchange would add sidewalks on the west side of 200 West, thereby improving the streetscape over the existing conditions.

Centerville Community Park Pedestrian Overpass in Centerville. A new pedestrian overpass would be constructed over I-15 connecting the Centerville Community Park with the regional trail network west of I-15. The pedestrian overpass would add a new vertical structure that does not currently exist.

Parrish Lane in Centerville. The I-15 and Parrish Lane interchange would be converted from a diamond interchange to a single-point urban interchange (SPUI). This new configuration would alter the on- and off-ramp configuration, and the number of traffic signals would be reduced. The new interchange would also feature a new underpass for northbound traffic exiting I-15 that is traveling to the commercial area on the northeast corner of the interchange. The streetscape would be enhanced for pedestrians and bicyclists. A new pedestrian overpass would be constructed over I-15 south of Parrish Lane near 200 North in Centerville. The pedestrian overpass would add a new vertical structure that does not currently exist.

500 West in Bountiful. The 500 West southbound exit of I-15 would be reconstructed as a right-hand exit (instead of the current left-hand exit) that would cross underneath I-15 in a new underpass under the both the northbound and southbound lanes. An underpass currently exists underneath the northbound lanes. The new underpass would have similar visual character as the existing conditions.

400 North in Bountiful. The new partial diamond interchange at 400 North would be similar to the existing conditions, but it would include one additional travel lane on the north side of the street as well as bike lanes, a sidewalk on the south side of the street, and an SUP on the north side of the street. With this option, the wider footprint of 400 North would require one building on the south side of 400 North to be removed and the business relocated to accommodate the wider footprint. There is also one potential relocation of a business on the north side of 400 North. The relocation of businesses would be a visual change.

500 South in Bountiful. This option would reconstruct the existing diverging diamond interchange at 500 South and I-15 as a tight diamond interchange and add additional width for turn lanes to 500 South. The proposed tight diamond interchange at 500 South would be visually different than the existing diverging diamond interchange, but the views would be consistent with the existing conditions and landscape character. 500 South would be wider than the existing conditions due to the additional turn lanes on 500 South. Three buildings on the north side of 500 South and two buildings on the south side of 500 South would need to be removed and the businesses relocated to accommodate the wider footprint. The relocation of businesses would be a visual change.

Braided Ramps between 400 North and 500 South in Bountiful. The Action Alternative would have braided ramps between 400 North and 500 South. Braided ramps are highway ramps that cross over each other and are vertically separated. Braided ramps would be a visual change since new bridges would be added to separate traffic merging onto and exiting I-15. The structures would be most visible to residents of Wood Haven, from vantage points not obscured by trees, and from the back sides of the commercial buildings east of I-15. An example of braided ramps near the project area is in Farmington on U.S. 89 between Main Street and Shepard Lane (Figure 3.15-15).

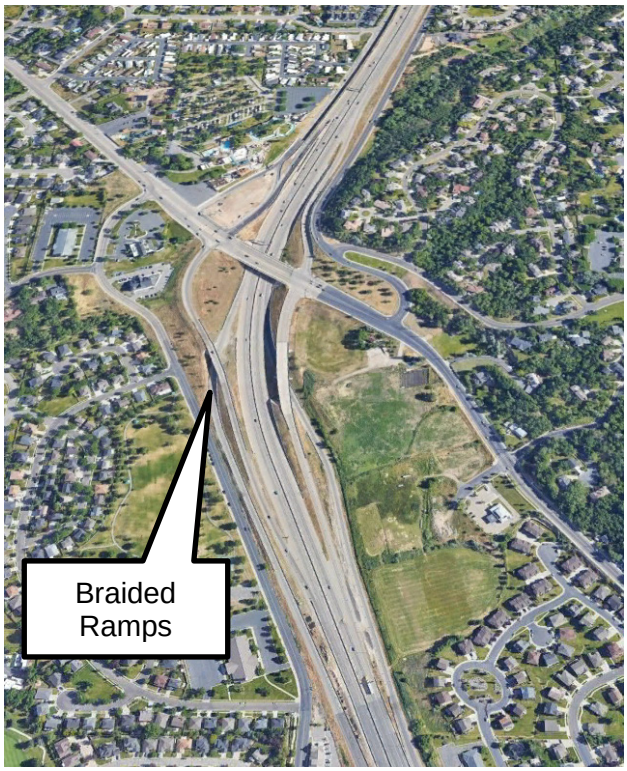
2600 South in Woods Cross. The proposed SPUI at 2600 South would be visually different than the existing interchange with changes to the ramp locations and lane locations under I-15, but the views would be consistent with the existing conditions and landscape character. The streetscape would be enhanced for pedestrians and bicyclists.

800 West in Woods Cross. North of 2600 South, a new underpass of I-15 would be constructed connecting 800 West with Wildcat Way on the east side of I-15. This underpass would include a new SUP.

I-215 and I-15 in North Salt Lake. The existing interchange would be reconfigured to connect eastbound I-215 with southbound I-15 and connect northbound I-15 with westbound I-215. These two movements between I-215 and I-15 currently do not exist, and the reconfigured interchange would result in additional pavement, structures, and signals. The reconfigured interchange would also increase access to both I-15 and I-215 from U.S. 89 in North Salt Lake. The full-access interchange at I-215, I-15, and U.S. 89 in North Salt Lake would be visually different than the existing conditions, but the views would be consistent with the existing conditions and landscape character.

2100 North in Salt Lake City. The existing partial-access interchange at 2100 North would be reconfigured to include an overpass of I-15, Warm Springs Road, and the Union Pacific and FrontRunner railroad tracks that would allow traffic from U.S. 89/Beck Street, 2300 North, and Warm Springs Road access to all directions of travel on I-15. This overpass would add a new vertical structure and urban form in an industrial area.

Figure 3.15-15. Braided Ramp Example on U.S. 89



1000 North in Salt Lake City (Salt Lake City 1000 North – Northern Option). This option would align a connection to I-15 and the 600 North collector and distributor system near 1100 North. The existing southbound on-ramp to I-15 would be reconstructed as part of a collector and distributor system parallel to I-15. These changes would alter the existing intersection at 1000 North and 900 West and would require acquiring the Salt City Motel property on the northwest side of the intersection and relocating the business. The relocation of the business would be a visual change.

1000 North in Salt Lake City (Salt Lake City 1000 North – Southern Option). This option is similar to the Salt Lake City 1000 North – Northern Option except that 1000 North would extend underneath I-15 close to the existing 1000 North alignment. Visually, this option would extend views underneath I-15 to the east side of the interstate that are not currently visible. These changes would alter the existing intersection at 1000 North and 900 West, but this option would be less impactful to the businesses on the northwest corner of the intersection and result in less visual change at this corner.

600 North in Salt Lake City. The proposed tight diamond interchange at 600 North would be visually different than the existing SPUI, but the views would be consistent with the existing conditions and landscape character. The streetscape would be enhanced for pedestrians and bicyclists.

Long-term Impacts by LU

Land use patterns are well established in the visual resources evaluation area, and I-15 and its interchanges would remain with or without the Action Alternative. The Action Alternative is visually compatible with the existing conditions, and most viewers are not likely to be sensitive to the change. The long-term impacts by

LU at a landscape-level from the Action Alternative would be similar to those impacts from the No-action Alternative (see Section 3.15.5.1.2, *Long-term Impacts*). Specific impacts to LUs as represented by the key views are discussed below.

Visual Impacts of the Action Alternative by Key View

Key View 1

The foreground and middleground views would change slightly with the Action Alternative. Background views would not change. The north segment Farmington 400 West and Farmington State Street Options would look similar at this location; however, have minor differences described below.

Compatibility. With the north segment Farmington 400 West Option, the home at 399 W. State Street would be removed, and State Street would be widened to accommodate the turning movements at 400 West. About five street trees on State Street closest to I-15 and near 400 West may need to be removed. With the north segment Farmington State Street Option, the same home would be removed, and State Street would be widened to accommodate the turning movements at 400 West and Lagoon Drive. As many as 21 street trees on State Street might be removed with this option.

For both options, the pedestrian overpass for I-15 would be removed and pedestrian and bicyclist facilities would be constructed on the north and south sides of a new State Street overpass of I-15. Within the foreground and middleground views, the Action Alternative would have low contrast with existing conditions. The form, materials, and visual character would be compatible with the existing conditions. The Action Alternative would not affect background views.

Viewer Sensitivity. The viewers would be predominantly the travelers and residents along State Street. Travelers on State Street would be less sensitive to the visual change because the route and travel patterns are similar. Consolidating the two I-15 overpasses into one would improve coherence for travelers (that is, pedestrians and bicyclists expect sidewalks and bike lanes to continue). Residents along State Street would be more sensitive to visual changes in the landscape such as the removal of street trees.

Visual Quality. Overall, the visual impact would be **neutral** because the streetscape would be compatible to the existing conditions, and the street trees, if removed, could be replanted.

Key View 2

Key View 2. The foreground and middleground views would change with the Action Alternative and the addition of a new pedestrian overpass at Centerville Community Park. Background views would be obscured by the pedestrian overpass from this vantage point. The Action Alternative is the same for all options at this location.

Compatibility. With the Action Alternative, a new pedestrian overpass would be highly visible from this key view and would introduce a new urban form, obscuring some background views when looking north. The form, materials, and visual character would be compatible with the existing conditions, but the structure would change views at this vantage point.

Viewer Sensitivity. The viewers would be predominantly the travelers along North Frontage Road and recreationists at the park. Travelers on North Frontage Road would be less sensitive to the visual change because a pedestrian overpass is an expected structure in a developed, urban environment. Recreationists

might be more sensitive to the visual change due to time spent in the viewshed and to the change in background views when looking north.

Visual Quality. Overall, the visual impact would be **neutral** because the pedestrian overpass is a visually expected structure along a developed interstate corridor.

Key View 3

Key View 3. The foreground and middleground views would change with the Action Alternative. Background views would not change. The interchange and photo simulation shown in Figure 3.15-16 is the same for all options at this location. The original image is included in Figure 3.15-17 for comparison.

Compatibility. With the Action Alternative, the I-15 and Parrish Lane interchange would be converted from a diamond configuration to a SPUI. The area is an interchange under the existing conditions and would remain an interchange with the Action Alternative. The form, materials, and visual character would be compatible with the existing conditions. The Action Alternative would maintain a similar level of cultural order and would not contrast with the existing conditions.

Viewer Sensitivity. Viewer sensitivity of travelers along the reconfigured interchange and neighbors near the interchange would be low. The new features of the interchange and the underpass would complement the existing urban development and roadway configuration; therefore, the natural harmony and cultural order would be compatible with the existing conditions, and viewers would not be sensitive to these changes.

Visual Quality. Overall, the visual impact would be **neutral** because the interchange is consistent with the existing conditions.

Figure 3.15-16. Key View 3 with Simulation of the Action Alternative at the Parrish Lane and I-15 Interchange

Figure 3.15-17. Original Key View 3 Image for Comparison with Simulation Above

Key View 4

Key View 4. The foreground and middleground views would change with the Action Alternative. Background views would not change. The Action Alternative is the same for all options at this location.

Compatibility. With the Action Alternative, the sidewalk visible in Key View 4 would be replaced with a 12-foot-wide SUP. All other features of 800 West visible from this vantage point would be similar to the existing conditions. 800 West would remain a road or would become a private driveway to maintain access for the business to the west. The form, materials, and visual character would be compatible with the existing conditions. The Action Alternative would maintain a similar level of cultural order and would not contrast with the existing conditions.

Viewer Sensitivity. Viewer sensitivity of travelers along 800 West and recreationists along the SUP would be low. The new SUP would complement the existing development and roadway configuration; therefore, the harmony and cultural order would be similar to the existing conditions, and viewers would not be sensitive to these changes.

Visual Quality. Overall, the visual impact would be **neutra**l because the Action Alternative is similar to the existing conditions.

Key View 5

Key View 5. The foreground and middleground views would change with the Action Alternative. Background views would not change. The interchange and simulation shown in Figure 3.15-18 is the same for all options at this location. The original image is included in Figure 3.15-19 for comparison.

Compatibility. With the Action Alternative, the additional on- and off-ramps between I-215 and I-15 would result in additional pavement, structures, and signals in the middleground views. All other features visible from this vantage point would be similar to the existing conditions. The form, materials, and visual character would be compatible with the existing conditions.

Viewer Sensitivity. Viewer sensitivity of residents to changes in the middleground viewshed would be low. The new on- and off-ramps would be placed between existing I-15, I-215, and railroad infrastructure in an industrial area. These new on- and off-ramps are compatible with the existing development and roadway configuration; therefore, the harmony and cultural order would be similar to the existing conditions, and viewers would not be sensitive to these changes. Viewers would be sensitive to changes in background views of the natural appearing landscapes surrounding the Great Salt Lake, but background views would not change.

Visual Quality. Overall, the visual impact would be **neutral** because the Action Alternative is similar to the existing conditions.

Figure 3.15-18. Key View 5 with Simulation of the Action Alternative at the New U.S. 89, I-215, and I-15 Interchange

Figure 3.15-19. Original Key View 5 Image for Comparison with the Simulation Above

Key View 6

Key View 6. The foreground and middleground views would change with the Action Alternative. Background views would not change. The Action Alternative is the same for all options at this location.

Compatibility. With the Action Alternative, the new overpass at 2100 North would result in additional pavement, structures, and signals in the foreground and middleground views. The form, materials, and visual character would be compatible with the existing conditions.

Viewer Sensitivity. Viewer sensitivity of travelers to changes in the foreground and middleground viewshed would be low. The new overpass would complement the existing industrial development and roadway configuration; therefore, the harmony and cultural order would be similar to the existing conditions, and viewers would not be sensitive to these changes. Background views are not highly visible under existing conditions and would be even more obscured with the overpass.

Visual Quality. Overall, the visual impact would be **neutral** because the Action Alternative is compatible with the existing conditions and viewer sensitivity would be low.

Key View 7

Key View 7. The foreground and middleground views would change with the Action Alternative. Background views would not change. The interchange and simulation shown in Figure 3.15-20 is the same for all options at this location. The original image is included in Figure 3.15-21 for comparison.

Compatibility. With the Action Alternative, the existing SPUI would be converted to a tight diamond configuration and an additional traffic signal would be added. There would be curb separation between bike lanes and vehicle lanes. The area is an interchange under the existing conditions and would remain an interchange with the Action Alternative. The form, materials, and visual character would be compatible with the existing conditions.

Viewer Sensitivity. Viewer sensitivity of travelers along the reconfigured interchange and neighbors near the interchange would be low. The new features of the interchange and improved pedestrian and bicyclist facilities would complement the existing urban development and roadway configuration; therefore, the natural harmony and cultural order would be similar to the existing conditions, and viewers would not be sensitive to these changes. The improved pedestrian and bicyclist infrastructure might be seen by residents as a visual improvement that enhances the harmony and order of the streetscape. The existing pedestrian and bicyclist infrastructure has less separation from traffic and requires users to cross four more intersections at the 600 North interchange compared to the Action Alternative.

Visual Quality. Overall, the visual impact would be **beneficial** due to a more coherent streetscape for pedestrians and bicyclists.

Figure 3.15-20. Key View 7 with Simulation of the Action Alternative at the 600 North and I-15 Interchange

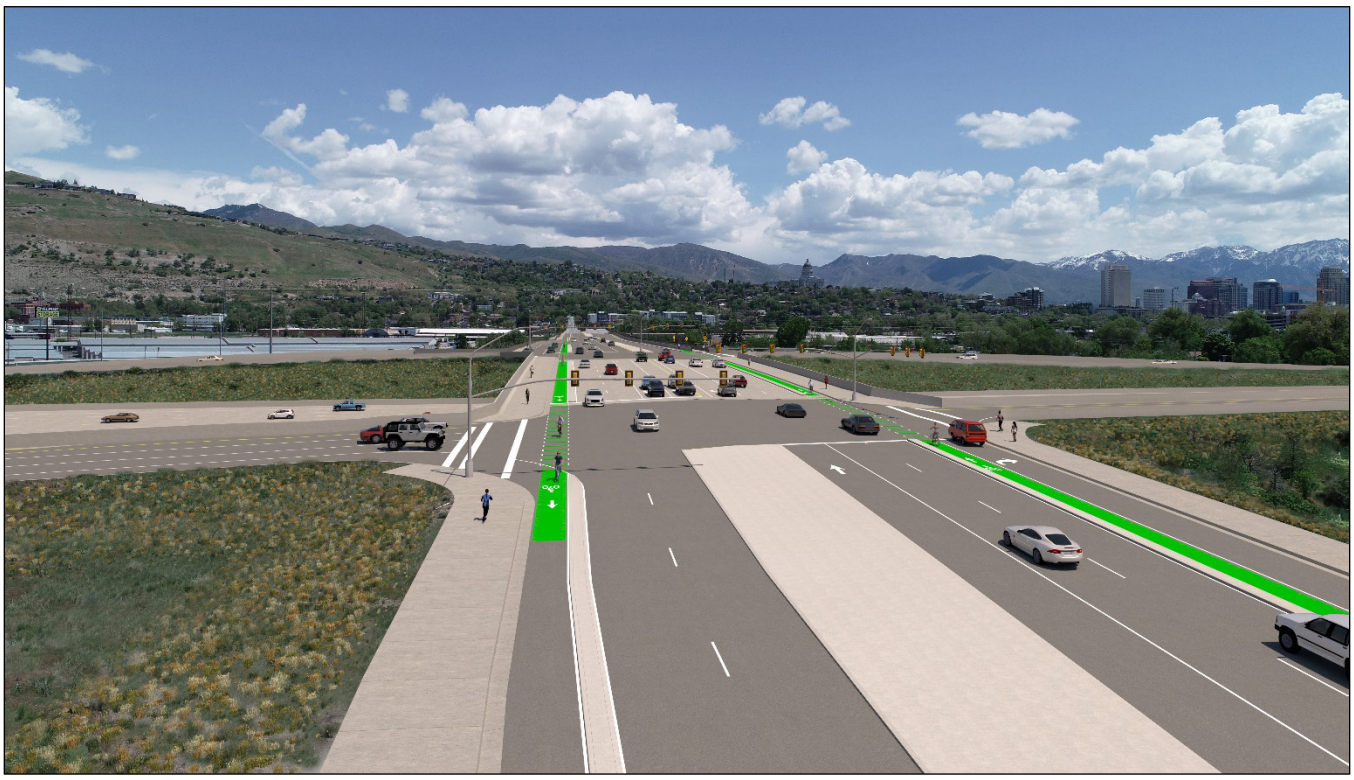


Figure 3.15-21. Original Key View 7 for Comparison with the Simulation Above

3.15.5.2.3 Summary of Action Alternative Impacts

Table 3.15-2 summarizes the impacts by key view for the Action Alternative.

Table 3.15-2. Summary of Visual Impacts by Key View for the Action Alternative

	Location and Key View						
	State Street	Centerville Community Park	Parrish Lane	800 West / 2600 South	Sunset Ridge	2100 North / Warm Springs Road	600 North
Alternative	1	2	3	4	5	6	7
No-action	N	N	N	N	N	N	N
Action Alternative	N	N	N	N	N	N	B

Definitions: B = beneficial visual impacts, N = neutral visual impacts

3.15.5.3 Mitigation Measures

UDOT proposes to implement mitigation to include the following. All aesthetic treatments would be completed in accordance with UDOT Policy 08A-03, *Project Aesthetics and Landscaping Plan Development and Review* (UDOT 2014a), and UDOT's *Aesthetics Guidelines* (UDOT 2014b). UDOT's policy is to set a budget for aesthetics and landscape enhancements based on the aesthetics guidelines. The aesthetic features considered during the final design phase of a project could include lighting; vegetation and plantings (such as street trees); the color of bridges, structures, and retaining walls; and other architectural features such as railings.

Aesthetic treatments are typically evaluated during the final design phase of the project after an alternative is selected in the project's Record of Decision and funding has been allocated for the project. UDOT would coordinate with the local municipalities to determine whether the desired aesthetics can be implemented.

3.16 Energy

3.16.1 Introduction

Section 3.16 describes how energy demands would be affected in the short and long terms with the No-action and Action Alternatives. Energy is evaluated primarily in the form of vehicle fuel consumption.

Fuel consumption varies with traffic characteristics. The primary traffic characteristics are traffic flow (average vehicle speed), driver behavior, the geometric configuration of the roadway, the vehicle mix (cars versus trucks), and climate and weather. Of all the traffic-related factors, average vehicle speed accounts for most of the variability in fuel consumption and is a good predictor of fuel economy for most travel. Fuel efficiency under steady-flow, "cruising" driving conditions peaks at 45 to 60 miles per hour (mph) and then rapidly declines as speeds increase. At lower speeds, fuel efficiency is reduced by engine friction, underinflated tires, use of powered accessories (such as power steering and air conditioning), and repeated braking and acceleration (Davis and Diegel 2003).

Energy Evaluation Area. The energy evaluation area includes I-15 and the cross streets within the right-of-way of the Action Alternative. This same area is evaluated for the No-action Alternative.

3.16.2 Regulatory Setting

Under 40 CFR Section 1502.16 and FHWA Technical Advisory T 6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents*, UDOT is required to consider the energy requirements and conservation potential for each project alternative.

3.16.3 Methodology

To determine existing energy use, UDOT used the WFRC travel demand model, version 8.3.2, to determine the average daily VMT in the energy evaluation area with and without the Action Alternative. This methodology does not account for 2019 or projected 2050 vehicle speeds and how vehicle speeds affect energy use.

For existing (2019) conditions, an average vehicle fuel efficiency of 23.8 miles per gallon (mpg) was used based on information from the U.S. Energy Information Administration (EIA 2020); this number includes on-the-road estimates for both cars and light trucks. The average on-the-road fuel efficiency of 23.8 mpg was divided into the average daily VMT to determine the total daily fuel consumption for the No-action and Action Alternatives.

For future (2050) conditions, an average vehicle fuel efficiency of 36.1 mpg was used (EIA 2023); this number includes on-the-road estimated for both cars and light trucks. The average on-the-road fuel efficiency of 36.1 mpg was divided into the predicted daily average VMT to determine the total daily fuel consumption for the No-action and Action Alternatives for comparison.

3.16.4 Environmental Consequences and Mitigation Measures

Table 3.16-1 summarizes the existing (2019) and projected (2050) conditions with the No-action and Action Alternatives in the energy evaluation area. Overall, energy requirements (that is, fuel consumption) are expected to decrease in 2050 because vehicles are expected to become more fuel-efficient over time.

Table 3.16-1. Average Daily VMT and Fuel Consumption for Existing Conditions and Forecasts for 2050

Conditions or Alternative	Average Daily VMT[a]	Fuel Consumption			
		Average (gallons/day)	% Change from Existing Conditions	Change from No-action Alternative (gallons)	% Change from No-action Alternative
Existing conditions (2019)	1,389,642,965	58,388,360	NA	NA	NA
2050 Estimates					
No-action Alternative	1,784,512,740	49,432,486	–15.3%	NA	NA
Action Alternative	1,994,497,240	55,249,231	–5.4%	+5,816,745	+11.8%

[a] Average daily VMT information was obtained from a review of the WFRC travel demand model, version 8.3.2, for I-15 and its cross streets with and without the Action Alternative.

3.16.4.1 No-action Alternative

3.16.4.1.1 Construction-related Energy Impacts

With the No-action Alternative, the changes associated with the I-15: Farmington to Salt Lake City Project would not be made. The only construction-related energy impacts would be caused by roadway maintenance and resurfacing and any roadway work that occurs as part of ongoing commercial and residential development near I-15.

3.16.4.1.2 Direct Energy Impacts

With the No-action Alternative, VMT would increase due to higher travel demand and population growth; however, overall energy requirements would decrease compared to the existing conditions because vehicles are expected to become more fuel-efficient (Table 3.16-1 above).

3.16.4.2 Action Alternative

3.16.4.2.1 Construction-related Energy Impacts

Constructing the Action Alternative, regardless of its geographic subarea options, would involve the operation of heavy machinery with a resulting increase in energy use, since fuel would be consumed as part of the construction activities. In addition, traffic congestion could increase during construction, so more fuel would be used. The construction-related energy consumption would be temporary.

3.16.4.2.2 Direct Energy Impacts

With the Action Alternative, regardless of its geographic subarea options, congestion would be reduced, which would increase average vehicle speeds and fuel efficiency in the energy evaluation area. Based on the results of travel demand modeling, the Action Alternative would reduce travel time by 49% to 55% and increase average speeds by 95% to 125% during both the morning and evening peak periods compared to the 2050 no-action conditions. The Action Alternative would increase VMT by more than 200 million miles over the No-action Alternative because more traffic would be served by the added capacity on I-15. Even

with this added capacity, the energy used would be slightly less than with the existing conditions due to improved fuel economy (Table 3.16-1 above). The improved vehicle speeds with the Action Alternative would also benefit overall vehicle fuel efficiencies (see Section 3.16.1, *Introduction*).

3.16.4.3 Mitigation Measures

Due to improved fuel economy in the future, the energy used with the Action Alternative would be less than the energy used with the existing conditions. No mitigation measures for energy impacts are proposed.

3.17 Construction Impacts

3.17.1 Introduction

Reconstructing I-15 and its interchanges in a wider footprint would cause a number of temporary impacts from disturbing the ground and operating construction equipment. Construction could affect property, land use, public services and utilities, public safety, travel patterns, economics (businesses), pedestrian and bicyclist facilities, air quality, noise levels, water quality, noxious weeds, aquatic resources (wetlands), wildlife, cultural resources, Section 4(f) resources, Section 6(f) resources, hazardous materials sites, and visual resources. In addition, construction could cause impacts from the use of sand and gravel pits and from hauling these materials by truck to and from the construction staging and material borrow areas and the construction site.

The nature and timing of these impacts would be related to the project's construction methods. Most construction-related impacts to the public would be associated with travel delays during construction.

Section 3.17 describes the construction impacts associated with the Action Alternative for each of the environmental resources analyzed in the EIS.

3.17.2 Environmental Consequences

3.17.2.1 No-action Alternative

With the No-action Alternative, the improvements associated with the I-15 project would not be made; therefore, there would be no construction-related impacts.

3.17.2.2 Action Alternative

Construction of the Action Alternative could affect property, land use, public services and utilities, public safety, travel patterns, economics (businesses), pedestrian and bicyclist facilities, air quality, noise levels, water quality, noxious weeds, wetlands, wildlife, cultural resources, Section 4(f) resources, Section 6(f) resources, hazardous materials sites, and visual resources. Construction could cause impacts from trucks hauling materials to and from the construction staging and material borrow areas and the construction site. Overall, construction-related impacts from the Action Alternative would be temporary.

3.17.2.2.1 Construction Phasing

In general, the alternatives analysis in a NEPA study for a federal-aid transportation project focuses on the impacts and benefits of the alternatives in a single future year—often called the *design year*—which is usually 25 to 30 years in the future, or, in the case of the I-15 EIS, the year 2050. The analysis of project impacts assumes construction of the entire Action Alternative (including segment options) and assumes that construction is completed before the 2050 design year. The analysis of project benefits also assumes full construction by 2050. A delay in completing the project could reduce the estimated safety and travel time benefits to a shorter period. Similarly, the benefits of the project are defined as the benefits that would result from full construction of the project in the design year.

At the end of the NEPA process for a project, UDOT issues a Record of Decision (ROD) for the project. Once the ROD has been issued, and if UDOT selects an action alternative in the ROD, UDOT often implements the project through a series of separate contracts for individual sections of the project. Unless otherwise specified in the ROD, UDOT has the flexibility to determine the appropriate construction phasing.

The I-15 EIS is included in WFRC's 2019–2050 RTP for construction in Phase 1 (2019–2030). If only partial funding were allocated for construction, UDOT would construct portions of the project based on the amount of the funding while considering safety and operational benefits.

The main impact to the traveling public from constructing the project in phases would be traffic congestion. Constructing the project in phases would likely prolong construction-related congestion over a longer period and could potentially result in the loss of sales by businesses over a longer period during construction. The economic impacts would likely be the greatest to the business areas directly accessed from I-15 (Parrish Lane, 400 North Bountiful, 500 South Bountiful, and 1100 North/2600 South North Salt Lake/Woods Cross).

Phased construction could result in more air quality impacts because of multiple construction mobilization and demobilization periods and because the full congestion relief of the project, which would reduce traffic-related emissions, would not be realized earlier in the project.

3.17.2.2.2 Property and Land Use Impacts from Construction

UDOT would need to obtain construction easements for some properties in order to construct the Action Alternative. Current estimates on the properties requiring easements are included in the right-of-way analysis in Section 3.3, *Right-of-way and Relocations*. Construction easements would be required for properties that are outside the right-of-way but would be affected by the cuts or fills during construction, would be used by equipment during construction, would be necessary for utility relocations, or would accommodate property access modifications. UDOT would temporarily use these properties during construction and would provide compensation to the landowner for this temporary use.

3.17.2.2.3 Social Impacts from Construction

Public Services and Utilities

Utilities and services could be temporarily disrupted or relocated during construction. UDOT would coordinate with utility providers to minimize disruption of these services.

Public Safety

Lane closures, detours, increased congestion, and reduced travel speeds in construction zones could increase emergency response times.

Travel Patterns

Area residents and commuters could experience temporary impacts with the Action Alternative on I-15 and at the interchanges. Traffic impacts would likely include temporary changes or detours to business and residential access, traffic delays, rerouting, and temporary lane closures. Although all access on affected travel routes would likely be maintained during construction, some accesses to businesses and residences could be altered during construction—for example, a business access could be rerouted to another side of a parking lot or accessed through a side street.

3.17.2.2.4 Economic Impacts from Construction

The congestion associated with construction could cause increased travel delays and lost worker productivity where the construction would affect existing roads. The areas of potential construction delay or congestion impacts are I-15 and the primary cross streets at each interchange. These impacts would affect both commuters and businesses that rely on these roads.

Temporary adverse impacts could also occur if business accessibility is reduced during construction. The businesses most likely to be affected are convenience businesses—those that cater to impulse shopping or "in-route" shopping such as gas stations and convenience stores. Construction impacts would be temporary but could substantially affect individual businesses depending on the length of construction—that is, travelers might decide to bypass the businesses in favor of businesses located in less-congested areas not affected by construction. Destination businesses—those that customers plan to visit in advance of their trip such as grocery stores and sit-down restaurants—would experience moderate impacts.

3.17.2.2.5 Pedestrian and Bicyclist Impacts from Construction

Several pedestrian and bicycle facilities would be reconstructed by the Action Alternative at every interchange and at the locations of dedicated pedestrian and bicycle crossings of I-15. All trails and the road shoulders and sidewalks of active construction zones could be temporarily closed during construction.

3.17.2.2.6 Air Quality Impacts from Construction

Air quality impacts during construction would be limited to short-term increases in fugitive dust, particulates, and local air pollutant emissions from construction activities, equipment, and production of materials. Construction would generate air pollutant emissions from the following activities:

- Excavation activities related to cut and fill
- Demolition of existing pavement and structures
- Mobile emissions from construction workers' vehicles as they travel to and from the project site, or vehicle idling at the project site

- Mobile emissions from delivering and hauling construction supplies and debris to and from the project site
- Stationary emissions and mobile emissions from on-site construction equipment
- Mobile emissions from vehicles using I-15 and connected roads whose speeds are slowed because of increased congestion caused by construction
- Emissions, including GHG emissions, related to the production and placement of asphalt, concrete, road base, steel and other construction materials

Because construction would be local and short-term, impacts to individual air quality receptors would also be short-term. The most common air pollutant caused by construction would be particulate matter 10 microns in diameter or less (PM_{10}).

3.17.2.2.7 Noise Impacts from Construction

Land uses that are sensitive to traffic noise are also sensitive to construction noise and could be affected by construction. Constructing roads causes a substantial amount of temporary noise. Noise during construction could be a nuisance to nearby residents and businesses. The Action Alternative would generate some noise that would occur sporadically in different locations throughout the construction period.

The most common noise source in construction areas would be from engine-powered machinery such as earth-moving equipment (bulldozers), material-handling equipment (cranes), and stationary equipment (generators). Mobile equipment (such as trucks and excavators) operates in a sporadic manner, while stationary equipment (generators and compressors) generates noise at fairly constant levels. The loudest and most disruptive construction activity would be pile driving (including driving sheet pile).

For the Action Alternative, pile driving would likely be necessary at all new bridge locations associated with each interchange and crossing of I-15. An additional source of construction noise would be the demolition and removal of old concrete pavement along the I-15 mainline. The equipment to break up the pavement would be a source of noise and vibration, as would the loading of concrete into trucks to haul away.

Typical noise levels from construction equipment range from 74 to 101 dBA at 50 feet from the source; however, the majority of typical construction activities fall within the 75-to-85-dBA range at 50 feet. Peak noise levels from pile driving associated with structures such as interchanges and overpasses are about 101 dBA at 50 feet (FHWA 2006). Generally, noise at 70 dBA is intrusive and noise at 80 dBA is annoying. At 100 dBA, people must shout to be heard (CEQ 1970). As an example, typical vacuum cleaners have a noise level of about 80 dBA.

Construction noise at locations farther away than 50 feet would decrease by 6 to 8 dBA for each doubling of the distance from the source. For example, if the noise level from a jackhammer is 89 dBA at 50 feet, it would decrease to about 83 dBA at 100 feet and about 76 dBA at 200 feet. Noise impacts to adjacent residential areas during construction would vary based on the proximity to the construction zone throughout the construction area. Some residential properties directly abut the existing noise walls along I-15, and some residences have some separation due to the locations of frontage roads and vacant parcels.

3.17.2.2.8 Water Quality Impacts from Construction

Construction could temporarily reduce surface water quality during the construction phase for the selected alternative. Construction activities—such as clearing and grubbing, grading, stockpiling, and material staging—disturb vegetation and increase the potential for erosion. Runoff from disturbed areas could temporarily increase the amount of sediment and pollutants (oil, gasoline, lubricants, cement, and so on) discharged into receiving waters. Discharges of pollutants—which would be mostly sediment—could be minimized with the use of BMPs, which would keep soil from leaving the construction site.

3.17.2.2.9 Noxious Weeds Impacts from Construction

Construction operations would remove the existing hard surfaces and established vegetation, which would expose the underlying soils to the risk of being invaded by noxious and invasive weeds. Materials and equipment delivered to the job site could introduce noxious and invasive weeds into the area if seeds are present in imported soil or on equipment that is not properly cleaned.

3.17.2.2.10 Aquatic Resources Impacts from Construction

Construction-related impacts and mitigation to aquatic resources, such as wetlands and streams, are identified in Section 3.12, *Ecosystem Resources*. During construction, some erosion might occur outside the specific roadway construction zone, and this erosion might increase sediment levels in adjacent aquatic resources, thereby placing fill in those resources. BMPs such as silt fences and other erosion-control features would be used in areas adjacent to aquatic resources. In addition, aquatic resources outside of but adjacent to the construction footprint would be fenced to prevent pedestrian and vehicle access. If any construction activities would affect aquatic resources through increased sediments or fill, the construction contractor would be required to identify the additional amount of aquatic resources that would be affected. The contractor would also be responsible for obtaining the necessary authorization from USACE and all other environmental clearances before affecting these areas.

3.17.2.2.11 Impacts to Migratory Birds from Construction

Construction activities could disrupt the feeding, nesting, and reproductive activities of migratory birds in or near the right-of-way because of higher noise levels, construction equipment activity, and lights. These temporary construction activities are of particular concern during nesting periods for migratory birds near the right-of-way because the activities could disrupt nesting or cause birds to flee the nest. During construction, some habitat could be temporarily disturbed by movement of equipment, storage of materials, and disturbance of staging areas. For more information, see Section 3.12, *Ecosystem Resources*.

3.17.2.2.12 Cultural Resources Impacts from Construction

During construction, ground-disturbing activities could result in the discovery of additional archaeological or historical resources other than those identified during the cultural resources surveys (see Section 3.10, *Historic and Archaeological Resources*).

3.17.2.2.13 Section 4(f) Resource Impacts from Construction

Temporary construction easements would be required for Section 4(f) properties. For more information, see Chapter 4, *Section 4(f) Analysis*.

3.17.2.2.14 Section 6(f) Resource Impacts from Construction

Temporary construction easements would be required for Section 6(f) properties. For more information, see Chapter 5, *Section 6(f) Analysis*.

3.17.2.2.15 Hazardous Materials Impacts from Construction

Contaminated soil and/or groundwater could be encountered during excavation on or near properties that are known to have stored hazardous materials or that have documented releases of hazardous materials. Coordination with UDEQ might be needed if a discovery is made.

3.17.2.2.16 Visual Impacts from Construction

During construction, the work zone would be cleared of vegetation, and the exposed bare ground would contrast visually with the surrounding agricultural, recreational, and residential areas that viewers of the area are accustomed to seeing. Construction equipment operating in the roadway, lane closures and lane shifts, construction signs, modifications to business access, and potential detours during construction could temporarily and adversely affect the visual quality of the project environment. Construction equipment (such as cranes) and dust would be visible from a distance and would modify views of the surrounding landscape. In addition, the movement of equipment and materials would be noticeable and would detract from neighboring views of the surrounding landscape. Any construction-specific impacts to visual resources would be short-term.

3.17.2.2.17 Traffic Impacts from Construction

The primary traffic impacts related to construction of the Action Alternative include the following:

- Traffic detours and some temporary road closures could occur throughout construction. Changes in roadway conditions could include rerouting of traffic onto other roads, temporary closure of lanes or sections, and temporary lane shifts. Detours and road closures could temporarily increase travel times, fuel use, and air pollutant emissions.
- The properties and communities located near the roads used as detours could experience temporary increases in traffic. The temporary increases in traffic could cause longer travel time for the residents and patrons of businesses on these roads and have temporary impacts related to more noise and vehicle emissions due to the higher traffic volumes during construction.
- Access to commercial properties could be temporarily disrupted or have detours, which could cause longer travel times for employees and customers of these businesses, and a potential loss of revenue for some commercial businesses.

3.17.2.2.18 Construction Staging and Material Borrow Areas

During construction, the contractor would establish staging areas for equipment and would obtain fill material for improvements. Because a contractor has not yet been selected, the exact locations of staging areas and sources of fill material are not known.

3.17.3 Mitigation Measures

The following mitigation measures are currently proposed to be implemented during construction.

3.17.3.1 Mitigation Measures for Construction Phasing

No specific mitigation has been identified for construction phasing. If a phased approach is taken, the project mitigation identified in this EIS is proposed to be implemented for the specific design for each phase. Future mitigation for subsequent phases would take into account the final design for that phase and any changes in regulations or potential improvements to BMPs at the time of implementation.

3.17.3.2 Mitigation Measures for Property and Land Use Impacts from Construction

To the extent possible, the contractor would be required to ensure that irrigation systems remain intact and fully functional. Fencing could be altered during project construction. The contractor would be required to maintain fences and gate operations to protect construction crews and the traveling public during the construction phase. In locations of temporary easements where UDOT would temporarily use private property during construction, UDOT would provide compensation to the landowner for the temporary use.

3.17.3.3 Mitigation Measures for Social Impacts from Construction

Public Safety

A thorough public information program would be implemented to inform the public about construction activities and to reduce impacts. Information would include work hours and alternate routes. Construction signs would be used to notify drivers about work activities and changes in traffic patterns. Construction sequencing and activities would be coordinated with emergency service providers to minimize delays and response times during construction.

Public Services and Utilities

Utility agreements would be completed to coordinate utility relocations. The project specifications would require the contractor to coordinate with the utility companies to plan work so that utility disruptions to a business occur when the business is closed or during off-peak times. Before beginning work, the contractor would be required to contact Blue Stakes to identify the locations of all utilities. The contractor would be required to use care when excavating to avoid unplanned utility disruptions. If utilities are unintentionally disrupted, UDOT would work with the contractor and the utility companies to restore service as quickly as possible.

Travel Patterns

The contractor would be required to develop a maintenance of traffic plan that defines measures to reduce construction impacts to traffic. A general requirement of this plan is that, to the extent reasonably practical, safe access to businesses and residences must be maintained and existing roads must be kept open to traffic unless alternate routes are provided.

Even with the implementation of the maintenance of traffic plan, short-term increases in traffic congestion would occur in the construction area. Road closures would be limited to what is specified in the maintenance of traffic plan as approved by UDOT before the start of construction.

3.17.3.4 Mitigation Measures for Economic Impacts from Construction

Access to businesses would be maintained during the construction and post-construction phases of this project. For each phase of the project, UDOT would coordinate with property owners and businesses to evaluate ways to maintain access while still allowing efficient construction operations. This coordination could entail sharing a temporary access or identifying acceptable timeframes when access is not needed. Adequate signs would be placed in construction areas to direct drivers to businesses. Other potential mitigation measures for construction impacts include:

- A traffic access management plan developed and implemented by the construction contractor that maintains the public's access to the business during normal business hours
- A frequent newsletter provided to all businesses in the construction area describing the progress of construction and upcoming construction events
- Business access signs that identify business access points within the construction limits
- Meetings with business representatives to inform them of upcoming construction activities and to provide a forum for the representatives to express their concerns with the project

3.17.3.5 Mitigation Measures for Pedestrian and Bicyclist Impacts from Construction

All existing pedestrian and bicyclist facilities including shoulder ways that would be temporarily impacted during construction would be reconstructed as part of the project. The trails and sidewalks and the road shoulders of active construction zones could be closed temporarily during construction. Closures would be limited in duration and construction detours would accommodate pedestrians and bicyclists as well as vehicles. Detours for pedestrians and bicyclists would be as direct as possible to minimize lengthy route deviations.

3.17.3.6 Mitigation Measures for Air Quality Impacts from Construction

Air quality impacts would be generated by a variety of sources during construction. This section describes air quality impact mitigation measures by source.

Construction Materials. Producing and placing construction materials, such as asphalt and concrete, will generate particulate and GHG emissions. The quantification of the lifecycle emissions of materials is based on a number of details not known during the EIS process. The source of specific materials, and their mode of transport to the project site, are not known, and, therefore, the Action Alternative's air quality and GHG

impacts are not reasonably quantifiable. As an alternative to the use of new materials, UDOT will consider, during the final design phase of the project, locally derived recycled cement or asphalt materials if they meet UDOT's standards and are cost-effective. Depending on current technology available when the Action Alternative would be constructed, alternative types and sources of materials might be available.

Fugitive Dust. Construction would generate fugitive dust from demolition, excavation, pile driving, paving, dirt on construction vehicle tires, and other construction activities. Measures will be taken by UDOT or its contractor to reduce fugitive dust generated by construction when controlling dust is necessary for the protection and comfort of motorists or area residents. Dust-suppression techniques, such as watering or chemical stabilization of exposed soil, opacity observations and checks, washing vehicle tires, or other dust minimization techniques approved by the Utah Division of Air Quality, would be applied by UDOT or its contractor during construction in accordance with UDOT's Standard Specifications for Road and Bridge Construction, Section 01355, *Environmental Protection*, Part 1.11, *Fugitive Dust* (UDOT 2022b).

Mobile Emissions. Mobile emission sources would occur from the use of construction equipment at the project site, construction vehicles traveling to and from the project site, and vehicles delivering materials or equipment to the project site. Construction vehicle emission impacts could be mitigated through implementing a comprehensive maintenance of traffic control plan, enforcing emissions standards for fuel and fuel types (for example, low-sulfur fuels), enforcing emissions standards for vehicles and machinery, and retrofitting off-road diesel equipment with diesel-emission control devices. UDOT will consider including measures for mobile emissions on a voluntary or mandatory basis during the final design phase of the project.

3.17.3.7 Mitigation Measures for Noise Impacts from Construction

To reduce temporary noise impacts associated with construction, the contractor would comply with all state and local regulations relating to construction noise, including UDOT's 2023 Standard Specification 00555 for nighttime construction work to reduce the impacts of construction noise on the surrounding community.

3.17.3.8 Mitigation Measures for Water Quality Impacts from Construction

Because more than 1 acre of ground would be disturbed, a UPDES permit and an SWPPP, consistent with UDOT's Standard Specifications for Road and Bridge Construction, Section 01355, *Environmental Protection,* Part 1.9, *Water Resource Permits*, and Part 1.14, *Stormwater Management Compliance*, would be required. The SWPPP would identify measures to reduce impacts to receiving waters from construction activities including site grading, materials handling and storage, fueling, and equipment maintenance. In addition, BMPs could include such measures as silt fences, erosion-control fabric, fiber mats, straw bales, silt drains, detention basins, mulching, and revegetation.

3.17.3.9 Mitigation Measures for Noxious Weeds Impacts from Construction

The contractor would be required to follow UDOT Special Provision 02924S, *Invasive Weed Control*, to minimize construction impacts. To mitigate the possible introduction of noxious and invasive weeds due to construction activities, the contractor will:

- Be required to follow the noxious weed mitigation and control measures identified in UDOT's Standard Specifications for Invasive Weed Control.
- Strictly follow the BMPs to reduce the potential for weed infestations.
- Reseed disturbed areas.

3.17.3.10 Mitigation Measures for Aquatic Resource Impacts from Construction

The Action Alternative would convert aquatic resources to transportation use. In order to fill jurisdictional wetlands and other aquatic resources as part of the project, UDOT must prepare a Clean Water Act Section 404 permit application and submit it to USACE for approval before construction. The permit application must contain a compensatory mitigation plan that describes the proposed mitigation efforts and how they would offset the functions and values eliminated by the selected alternative.

In addition, BMPs such as silt fences and other erosion-control features would be used in areas adjacent to wetlands to mitigate potential temporary construction impacts to wetlands and other waters of the United States. For more information, see Section 3.12, *Ecosystem Resources*.

3.17.3.11 Mitigation Measures for Impacts to Migratory Birds from Construction

Trees and shrubs would be removed during the non-nesting season (about August 15 to April 1). If this is not possible, UDOT or its contractor would arrange for preconstruction nesting surveys, to be conducted no more than 10 days before ground-disturbing activities by a qualified wildlife biologist, of the area that would be disturbed to determine whether active bird nests are present. If active nests are found, the construction contractor would coordinate with the UDOT Natural Resources Manager or biologist to avoid impacts to migratory birds.

For more proposed mitigation measures, see Section 3.12.4.4, *Mitigation Measures*.

3.17.3.12 Mitigation Measures for Cultural Resources Impacts from Construction

In accordance with UDOT's Standard Specifications for Road and Bridge Construction, Section 01355, *Environmental Protection,* Part 1.13, *Discovery of Historical, Archaeological, or Paleontological Objects, Features, Sites or Human Remains*, if cultural resources are discovered during construction, activities in the area of the discovery would immediately stop. The construction contractor would notify UDOT of the nature and exact location of the finding and would not damage or remove the resource. Work in the area of the discovery would be delayed until UDOT evaluates the extent and cultural significance of the site in consultation with the Utah SHPO. The course of action and the construction delay would vary depending on the nature and location of the discovery. Construction would not resume until the contractor receives written authorization from UDOT to continue.

3.17.3.13 Mitigation Measures for Section 4(f) Resource Impacts from Construction

Any Section 4(f) property approved for temporary use during construction would be regraded and revegetated when construction is complete or when the use of the property is no longer required.

3.17.3.14 Mitigation Measures for Section 6(f) Resource Impacts from Construction

Any Section 6(f) property approved for temporary use during construction would be regraded and revegetated when construction is complete or when the use of the property is no longer required.

3.17.3.15 Mitigation Measures for Hazardous Materials Impacts from Construction

If contamination is discovered during construction, mitigation measures would be coordinated according to UDOT Standard Specification 01355, *Environmental Compliance,* Part 1.7, *Hazardous Waste*, which directs the construction contractor to stop work and notify the engineer of the possible contamination. Coordination with UDEQ might be necessary if a discovery is made. Any hazardous materials would be disposed of according to applicable state and federal guidelines.

3.17.3.16 Mitigation Measures for Visual Impacts from Construction

The contractor would prepare and implement an appropriate seeding vegetation and/or landscaping plan to restore or enhance aesthetics after the project is completed.

3.17.3.17 Mitigation Measures for Traffic Impacts from Construction

The contractor would be required to develop a maintenance of traffic plan that defines measures to reduce construction impacts on traffic. A general requirement of this plan is that, to the extent reasonably practical, safe access to businesses and residences must be maintained and existing roads must be kept open to traffic unless alternate routes are provided.

Even with the implementation of the maintenance of traffic plan, short-term increases in traffic congestion would occur in the construction area. Road closures would be limited to what is specified in the maintenance of traffic plan as approved by UDOT before the start of construction. Additional considerations are listed in Section 3.17.3.4, *Mitigation Measures for Economic Impacts from Construction*.

3.17.3.18 Mitigation Measures for Construction Staging and Material Borrow Areas

Because the exact locations of staging areas and sources of fill material are not known, no mitigation is proposed for construction staging and material borrow areas.

3.18 Indirect and Cumulative Effects

UDOT conducted this indirect and cumulative effects (ICE) assessment in accordance with the regulations of the Council on Environmental Quality (CEQ). The ICE analysis considers the effects of the Action Alternative in the context of general population, employment, and development trends in the cities in the ICE analysis area. It also considers the effects of other previous, ongoing, and anticipated future actions to determine the significance of the overall effect of the combined actions on natural and human resources.

- **Indirect effects** are defined by the CEQ regulations as "effects which are caused by the [proposed] action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate…" Typically, for highway improvement projects, the primary indirect effect would be changes to land use and their consequent environmental impacts. This type of indirect effect involves changes in the rate, intensity, location, and/or density of land development. For the I-15 project, an example of an indirect effect could be urban development converting farmland or filling wetlands as a result of any new access provided by the project.
- **Cumulative effects** are defined by the CEQ regulations in 40 CFR Section 1508.7 as "… the impact on the environment which results from the incremental impact of the [proposed] action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time." The effects of a proposed action include direct impacts (impacts that are caused by the action and occur at the same time and place) and indirect effects. For the I-15 project, examples of past actions in the project study area include past transportation projects and commercial and residential development in the cities crossed by the Action Alternative. For the I-15 project, reasonably foreseeable future projects include other planned transportation projects and large commercial or residential developments.

3.18.1 Analysis Approach and Methodology

This section describes the general methodology used to conduct the ICE analysis. UDOT's methodology for determining the indirect and cumulative effects of the I-15 project is based on the FHWA, National Cooperative Highway Research Program (NCHRP), and CEQ guidance that is referenced in the *UDOT Environmental Process Manual of Instruction* (UDOT 2020c). The ICE assessment approach uses elements of these guidance documents. UDOT conducted the following general steps for the ICE assessment:

- Conduct background research and collect data
- Define the geographic scope for the analysis (ICE analysis area)
- Determine the timeframe of the analysis
- Identify potentially affected resources
- Prepare the ICE analysis for the project

3.18.1.1 Research and Data Collection

The first step in the ICE analysis reflected research into past and reasonably foreseeable trends concerning human and natural resources in the ICE analysis area. References included those about the history of development in Davis and Salt Lake Counties, historic information on population growth and the resulting land uses, and, where data exists, information about the past conditions and trends related to the extents or quality of the natural environment. UDOT also considered scoping comments and the direct impacts of the Action Alternative in the context of potential indirect and meaningful cumulative effects on the ICE analysis area's human and natural resources.

3.18.1.2 Geographic Scope for the Analysis

The geographic scope (ICE analysis area) for the ICE analysis for the I-15 project was determined by establishing the area of project impacts and determining the geographic areas occupied by each affected resource that are surrounded by the Wasatch Mountains on the east and the Great Salt Lake on the west. For this analysis, the geographic scope for the analysis is the same for all affected resources.

The six cities in Davis County (Farmington, Centerville, West Bountiful, Bountiful, Woods Cross, and North Salt Lake) are primarily mature, suburban cities that are surrounded by the Wasatch Mountains on the east sides of the cities and the Great Salt Lake. These cities in Davis County were originally settled in the late 1800s but experienced more rapid suburban development in the late 1900s. The primary transportation infrastructure in the six Davis County cities includes I-15, Legacy Parkway, the UTA FrontRunner commuter rail tracks, and U.S. 89. The geographic scope for the ICE analysis includes the entire extent of the six cities in Davis County along I-15. The full city extents are included in the ICE analysis area because I-15 is the largest-volume roadway transportation facility in these cities and would have the most transportation-related influence on any land use development in these cities.

As shown in the *Mobility Memorandum for the I-15 Environmental Impact Statement from Farmington to Salt Lake City* (Horrocks 2022b), in 2019 in Farmington, I-15 accommodated an average of 170,000 person-trips per day (83%) of the 204,000 total regional trips. In 2050 with the Action Alternative, I-15 is projected to accommodate 227,000 (68%) of the 335,000 total regional trips in Farmington. The decrease in percentage in 2050 is due to planned increased capacity on Legacy Parkway, the West Davis Corridor, and FrontRunner.

From a natural resources perspective, these cities are located in the watersheds of the streams that originate in the Wasatch Mountains east of the cities and flow west through these cities before terminating in the Great Salt Lake. These cities have a similar setting with respect to potential natural resource impacts. Therefore, including the entire extent of the six cities in Davis County would capture areas where the indirect and cumulative effects are reasonably foreseeable.

Salt Lake City is primarily a mature, urban city that is surrounded by the Wasatch Mountains on the north and east sides of the city and the Great Salt Lake on the northwest side of the city. Salt Lake City was also the first city in Utah to develop and has the highest density of urban development and transportation infrastructure. The entire extent of Salt Lake City was considered when evaluating the appropriate ICE analysis area based on data availability regarding past growth and future growth projections. However, the geographic scope for the reasonably foreseeable indirect and cumulative effects would be centered on the Salt Lake City neighborhoods (Capitol Hill, Northwest, West Salt Lake, Gateway, Rose Park, and Beck Street) in or near the I-15 project's land use evaluation area presented in Section 3.1, *Land Use*.

The majority of Salt Lake City is in the City Creek watershed (culverted along North Temple from State Street to the Jordan River) and the much larger and hydrologically distinct Jordan River watersheds. All areas in Salt Lake City would have a similar setting with respect to potential human and natural resource impacts. UDOT's research focused on the reasonably foreseeable future actions in these Salt Lake City neighborhoods, not the entirety of Salt Lake City's large municipal boundary. The neighborhoods of Salt Lake City were mostly built out by about 2010 (WFRC 2023c) and lack the same remaining natural areas (National Forest and Great Salt Lake) that exist in the Davis County part of the ICE analysis area.

In Salt Lake City, I-15 is one of several major transportation facilities. Other major transportation facilities include I-80, State Route (S.R.) 201, I-215, Redwood Road, U.S. 89/State Street, 700 East, 1300 East, and Foothill Boulevard. I-15 is the primary transportation facility that has the most transportation-related influence on any land use development in the neighborhoods immediately east or west of I-15 and north of 1300 South. As one goes farther west and south, I-215, I-80, and/or S.R. 201 become the primary transportation facilities for which changes could potentially affect land use development. As one goes farther east and south, U.S. 89/State Street, I-80, 700 East, 1300 East, and/or Foothill Boulevard become the primary transportation facilities. As shown in the *Mobility Memorandum*, in 2019 at the Davis County–Salt Lake County border, I-15 accommodated an average of 170,000 person-trips per day (55%) of the 304,000 total regional trips in this location. In 2050 with the Action Alternative, I-15 is projected to accommodate 220,000 (52%) of the 335,000 total regional trips at the county border. The small decrease in percentage in 2050 is due to planned increased capacity on I-215, Redwood Road, and FrontRunner.

3.18.1.3 Timeframe for the Analysis

The timeframe for the ICE analysis includes past and future periods. The period for the past impacts analysis can vary by resource depending on the timeframe in which past actions contributed to effects and the availability of historical data. However, for this analysis, the timeframe focuses on historical information beginning in the early 20th century (early 1900s) when the region started the more rapid urban development. The period for the future potential impacts extends from the present day to the project design year of 2050. The 2050 design year is also consistent with WFRC's 2019–2050 RTP (WFRC 2019a) and supporting land use and economic data forecasts.

3.18.1.4 Resources for the ICE Analysis

The I-15 project could affect resources either directly or indirectly. Resources can be elements of the physical environment, species, habitats, ecosystem parameters and functions, cultural resources, recreation opportunities, the structure of human communities, traffic patterns, or other economic and social conditions. The analyses of direct impacts, which are provided in the appropriate resource sections of this chapter, help inform the resources for the ICE analysis.

Highway improvement projects often result in potential indirect effects involving changes to land use and their consequent environmental impacts. This type of indirect effect involves changes in the rate, intensity, location, and/or density of land development due to changes in access to the highway or changes to travel patterns in the surrounding areas.

According to CEQ's cumulative effects guidance, the cumulative effects analysis should be narrowed to focus on important issues at a national, regional, or local level. The degree to which cumulative effects need to be addressed depends on the potential for the effects to be adverse. The analysis should look at other

actions that could have similar effects and whether a particular resource has been historically affected by cumulative actions.

As mentioned, UDOT also relied on scoping input and an analysis of the direct impacts of the project to identify resources needing detailed ICE analysis. Public and agency scoping meetings were held to help identify issues to be analyzed. UDOT reviewed the comments received during the public and agency scoping periods to determine whether issues were identified related to indirect and cumulative effects.

The following are the main resources that UDOT assessed for indirect and cumulative effects:

- Social and community resources
- Residential and commercial properties
- Environmental justice (impacts to low-income and minority groups) (see Section 3.4, *Environmental Justice Populations*)
- Regional air quality and greenhouse gases
- Future noise levels
- Stormwater drainage and associated degradation of water quality
- Floodplains
- Wetlands and aquatic resources

3.18.2 Affected Environment

3.18.2.1 Past and Current Actions

3.18.2.1.1 Past Growth and Land Use

Past population growth in Davis and Salt Lake Counties has led to the current land uses in the two counties. A brief history of development is provided below.

In the early 1900s, the majority of land use in the land use evaluation area was dedicated to farming and raising livestock to serve Salt Lake City and other towns established early in the state's history. The expansion of farming and grazing required early settlers to divert water from the rivers and streams going to the Great Salt Lake and to drain wetland areas around the Great Salt Lake floodplain fringe and those formed by, or supplemented by, shallow groundwater (for example, around Farmington Bay and around Warm Springs in northern Salt Lake City).

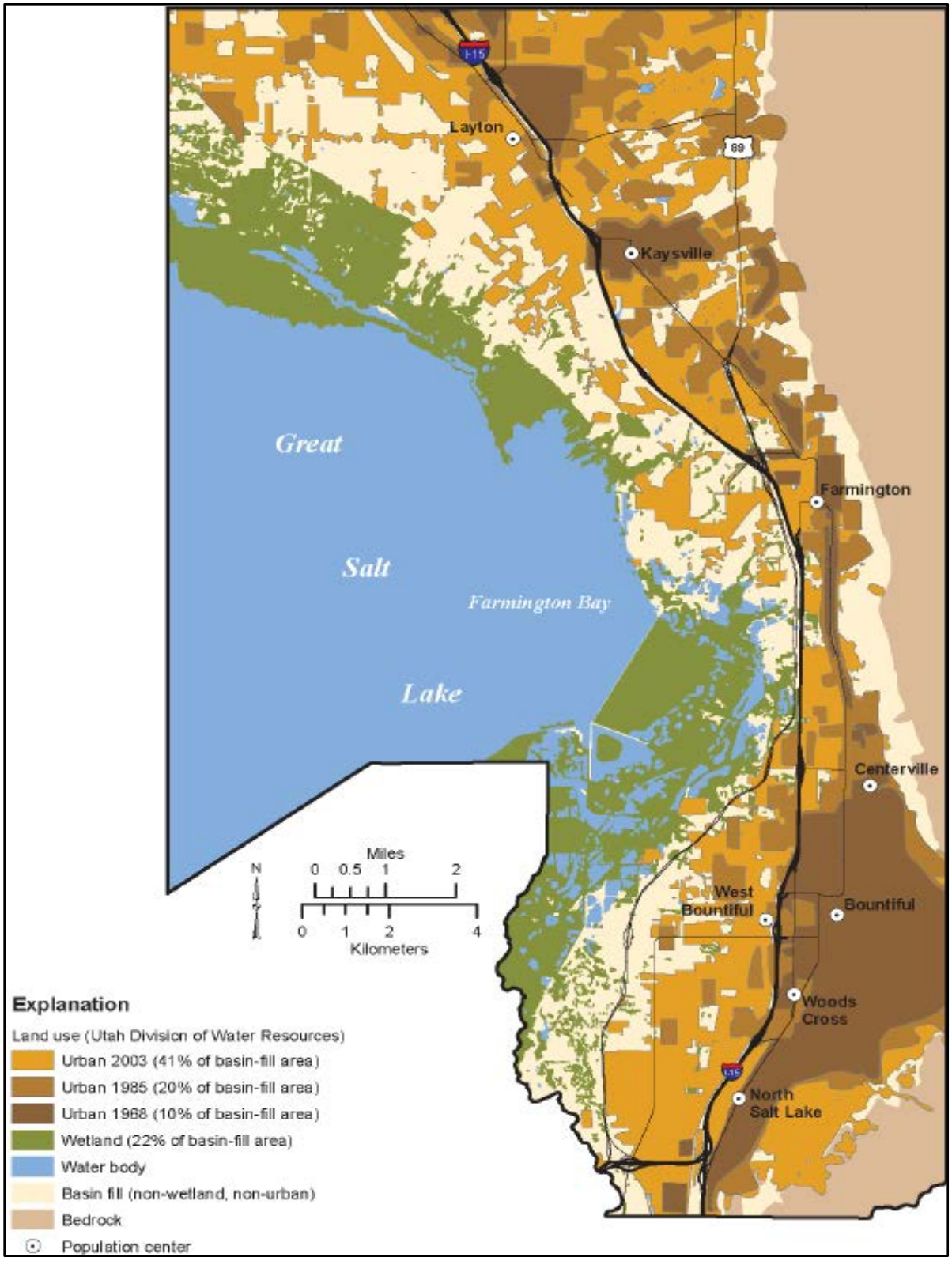
The completion of the transcontinental railroad (in 1869) spurred the development of north-south-running railways (Bamberger [later called Salt Lake & Ogden], Utah Central, and Union Pacific) between Salt Lake City and Ogden. These railway connections led to more industrial development and suburban growth throughout the early to mid-20th century. Between 1890 and 1920, Utah's population more than doubled, from 210,779 to 449,396 (OnlineUtah.com, no date). However, most of that growth was still in the urban areas. By 1940, the population of Davis County was only about 16,000. The small family farms and local businesses could not support greater population increases (Davis County, no date).

By the mid-20th century, local roads were constructed, and the expanded use of interurban railways continued suburban development, mainly on the Wasatch foothills, supported by the faster-growing Salt Lake City and Ogden urbanized areas but also into the western portions of south Davis County. After World War II, the establishment of Hill Air Force Base in northern Davis County and other defense-

supporting businesses nearby created a surge of civilian employment. Davis County doubled in population between 1940 and 1950 and doubled again in the next decade. Between 1960 and 1980, the population more than doubled again, from 65,000 to 147,000 people. The initial construction of I-15, I-80, and I-215 in the 1960s greatly improved accessibility in Salt Lake County and northern Davis County and helped facilitate the spread of suburban and industrial development along both interstates, particularly in Davis County.

By 1990, the population of Davis County had reached 188,000 and the 2000 U.S. Census recorded 238,994 people, making the county the fastest-growing of the four major urban communities along the Wasatch Front. Figure 3.18-1 shows the urban expansions for 20-year periods from the late 1960s to the early 2000s in Davis County.

Figure 3.18-1. Urban Expansion in Davis County between 1968 and 2003



3.18.2.1.2 Recent Growth and Current Land Use

Since the Great Recession ended in 2009, Utah's state economy was among the 10 fastest growing in the country. The availability of jobs led to in-migration which compounded the natural population growth rate. Between 2010 and 2020, Salt Lake County's and Davis County's populations grew 15% and 18%, respectively. Most cities in the ICE analysis area experienced near-double-digit growth rates over this 10-year period. As shown in Table 3.18-1, the near-term growth rates (2019–2025) for the cities in the ICE analysis are projected to range from 2.8% in Salt Lake City to 10.7% in North Salt Lake.

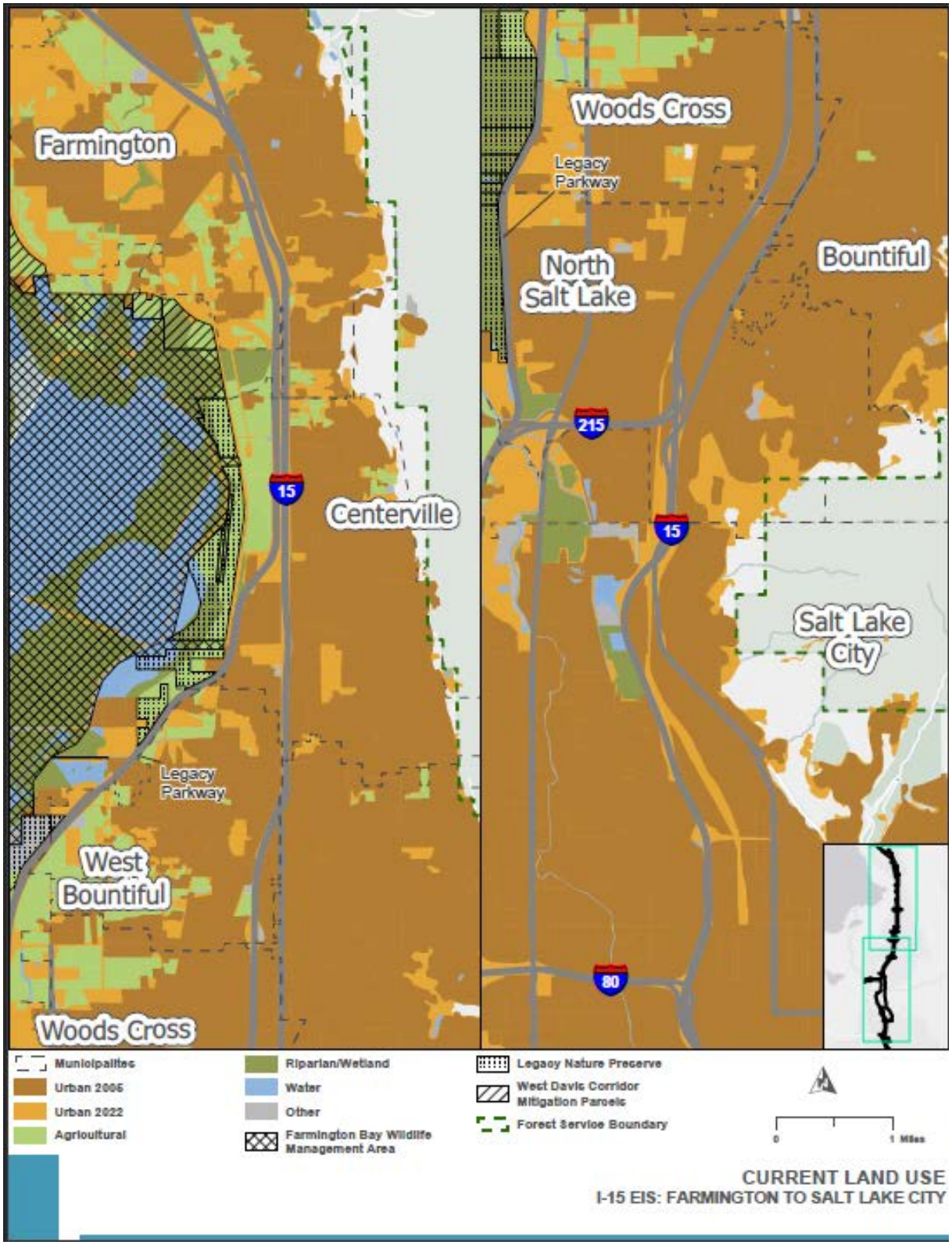
Table 3.18-1. Recent Population Growth Rates and Near-term Growth Rate Forecasts

County or City	2010–2020	2019–2025 [a]
Davis County [b]	17.6%	7.4%
Farmington	22.5%	9.7%
Centerville	16.1%	6.5%
West Bountiful	8.5%	7.8%
Bountiful	4.5%	4.7%
Woods Cross	18.0%	8.3%
North Salt Lake	24.3%	10.7%
Salt Lake County [c]	15.1%	6.4%
Salt Lake City [d]	9.3%	2.8%

[a] To determine an approximate 10-growth rate that is equivalent to the 2010 to 2020 10-year period, add about 5% to Davis County and its cities and about 3% to Salt Lake County and Salt Lake City.
[b] Source: Information for Davis County and its communities is from the Davis County Community and Economic Development's 2020 Demographic Overview (Davis County 2020).
[c] Source: Kem C. Gardner Policy Institute 2020b
[d] Source: Salt Lake City 2023b

Although the cities in the ICE analysis are projected to continue to grow, the near-term growth rates (2019–2025) for all of the cities except West Bountiful and Bountiful are projected to be 50% less than the growth rates from 2010 to -2020. There was and is limited remaining developable land in Salt Lake City and the south Davis County cities. The south Davis County cities are situated in a relatively narrow land corridor constrained by the Wasatch Mountains and U.S. Department of Agriculture Forest Service land on the east and Great Salt Lake and its floodplain and fringe wetlands on the west, especially through Centerville, West Bountiful, Woods Cross, and North Salt Lake. Smaller areas in western Farmington, West Bountiful, Woods Cross, and North Salt Lake had land converted from agriculture and/or open space to urban land uses (mainly residential developments) between 2005 and 2022. Legacy Parkway, the Legacy Nature Preserve, the Farmington Bay Waterfowl Management Area, and West Davis mitigation properties (north of the ICE analysis area along western parts of Farmington and Kaysville) have limited and will continue to limit further western expansion for south Davis County communities. Figure 3.18-2 shows the urban development in the ICE analysis area during the last 17 years.

Figure 3.18-2. Current Land Use and 2006–2022 Urban Expansion in the ICE Analysis Area



3.18.2.1.3 Growth Forecasts

As described in Chapter 1, *Purpose and Need*, Davis and Salt Lake Counties are both projected to have large increases in population, employment, and households by 2050. Davis County's population was about 356,000 in 2019 and is expected to grow by 37% to 488,000 by 2050. Salt Lake County's population was about 1,144,000 in 2019 and is expected to grow by 31% to 1,502,000 by 2050. These projected increases are expected to result in continued increased travel demand for all modes of transportation in 2050, including on I-15 and its interchanges. There is limited remaining developable land in Salt Lake City and the south Davis County cities. The county population forecasts anticipate larger percentages of population increases in the areas where there are still large areas of developable land.

In Davis County, the northern Davis County communities (primarily Layton, Syracuse, Clearfield, Clinton, and West Point, which are outside the ICE analysis area) are projected to experience about 71% of the total county growth by 2050. The southern Davis County communities in the ICE analysis area are projected to experience about 29% of the total county growth to 2050. In Salt Lake County, population growth is expected along the west edge (Oquirrh Mountains foothills) and southern parts of Salt Lake County (West Jordan, South Jordan, Draper, and Herriman). These areas are projected to experience about 46% of the total county population growth by 2050. Salt Lake City is projected to experience about 15% of the total county growth. The remaining 12 Salt Lake County communities (located generally in the central and eastern parts of the county) are projected to experience about 39% of the expected total county growth by 2050.

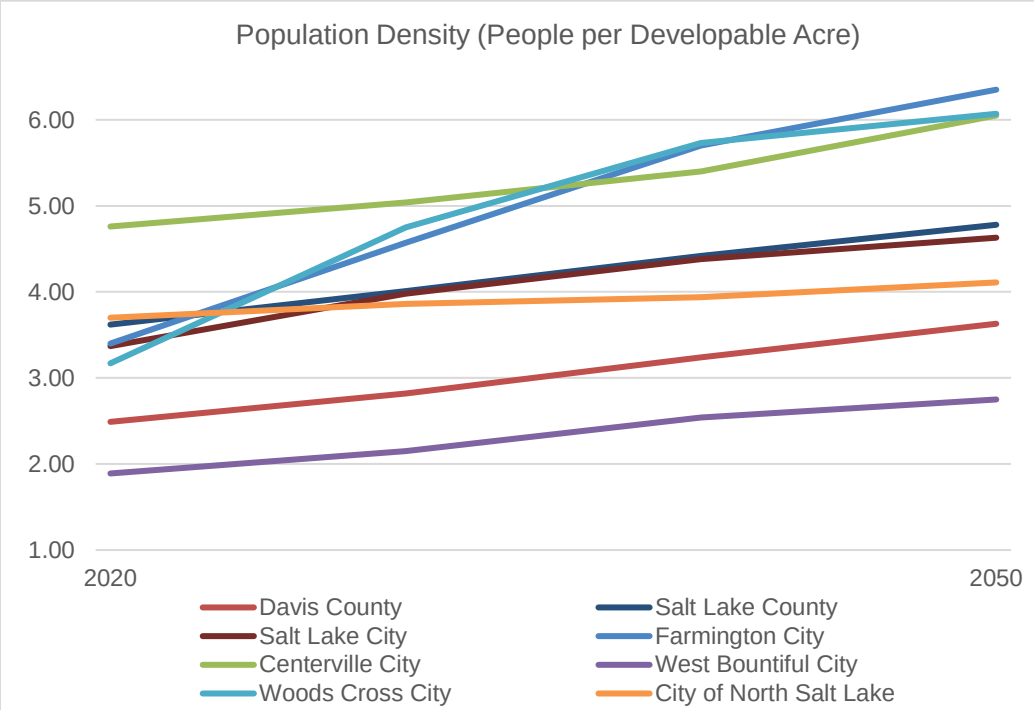
3.18.2.1.4 Future Land Use

Existing urban-related land uses are consistent with a mature metropolitan area, including a mix of residential, commercial, and industrial centers along I-15 and major cross streets. As described in Section 3.1, *Land Use*, cities in the ICE analysis area along I-15 are mostly fully developed, with new developments typically replacing existing development. In Davis County, some open space and agricultural lands remain, predominantly in Farmington, Centerville, and West Bountiful. Legacy Parkway, the Legacy Nature Preserve, the Farmington Bay Waterfowl Management Area, and West Davis mitigation properties limit further western expansion for south Davis County communities.

The northwestern areas of Salt Lake City (north of I-80 and west of the Salt Lake City International Airport) are the only large areas of incorporated Salt Lake City that are not currently developed. Most of these northwestern areas are undevelopable due to sensitive ecology including wetlands and/or proximity to the Salt Lake City International Airport. Because most of the city's developable land in the communities in the ICE analysis area is already built out and has existing transportation access, the I-15 project would not change planned land uses (City of North Salt Lake 2013; Salt Lake City 2023b; Woods Cross City 2019). Expected population growth in all of the cities will likely be accommodated by infill redevelopment, which will create higher densities in existing urbanized areas. None of the cities in the ICE analysis area have land use plans that identify large, new developments in currently undeveloped geographic areas (WFRC 2023a, 2023d).

Figure 3.18-3 shows the projected development density trends for communities in the ICE analysis area.

Figure 3.18-3. Population Density (People per Developable Acre)



3.18.3 Environmental Consequences

3.18.3.1 Indirect Effects

3.18.3.1.1 Indirect Effects Methodology

This section evaluates the potential indirect effects of the Action Alternative. Typically, for highway improvement projects, indirect effects are defined as effects that could result from the project's action alternatives beyond direct impacts to property and resources within the project's proposed right-of-way and the construction footprint. In this analysis, indirect effects are primarily the effects of land development that could occur from improved accessibility and mobility in the ICE analysis area that is influenced by the Action Alternative. Indirect effects on natural resources would typically be caused when undeveloped and partially developed land with such natural resources is converted to residential, industrial, commercial, or government land uses.

Land use patterns are the product of interdependent decisions by numerous parties including local elected officials, local planning staff, developers, citizens, regional planning authorities, transportation agencies, and many other public and private entities. Moreover, land use patterns are strongly affected by economic and demographic forces that are beyond the control of government authorities and by an area's access to utilities such as power, water, and sewer.

UDOT based the indirect effects analysis on a review of existing and proposed future development patterns, existing and future improvements to the existing transportation network, travel time improvements from the Action Alternative, and future city and county land use plans to determine the potential indirect effects of the I-15 project.

3.18.3.1.2 Potential Indirect Effects

Because land use and transportation are connected, improvements in the transportation system can result in changes in land use near transportation improvements. The initial construction of I-15, I-80, and I-215 in the 1960s greatly improved accessibility in Davis and Salt Lake Counties and most likely helped facilitate the spread of development along both interstates, particularly in Davis County.

The Action Alternative would convert certain existing land uses to transportation use through the purchase of property adjacent to the Action Alternative. However, because I-15 is an existing freeway, and because the land uses around I-15 are already developed and are part of a large urban area with a mature transportation network, UDOT does not expect the Action Alternative to cause any meaningful changes to local zoning or induce land use changes in the areas adjacent to the Action Alternative. The following paragraphs describe the main reasons why UDOT does not expect the improvements to I-15 as proposed in this EIS to induce development in Davis or Salt Lake Counties.

Access. The existing I-15 corridor in Davis and Salt Lake Counties is part of a mature regional transportation system that already has a high degree of accessibility. Research has shown that the extent of indirect effects is influenced by the maturity of the regional transportation system. Greater effects are associated with the development of new roads on new alignments compared with the expansion of existing roads (Haughwout and Boarnet 2000; NCHRP 2002).

One new interchange location is proposed as part of the I-15 project: the I-215/U.S. 89 interchange in North Salt Lake. Although this new interchange would improve access to North Salt Lake and reduce out-of-direction travel to 2600 South, it would not provide new access to any areas that do not currently have access to the regional transportation network. The rest of the project would improve the existing accesses to I-15, improve safety, and reduce congestion. Therefore, no new access to undeveloped areas would be provided by the Action Alternative.

Travel Demand. The I-15 project is intended primarily to improve safety, better connect communities, strengthen the economy, and improve mobility along the I-15 corridor. Because the cities in and adjacent to the project study area are mostly developed, the projected beneficial travel-time savings during peak hours associated with the Action Alternative would likely not be of such magnitude as to trigger meaningful changes to either regional land use patterns or to shift future development from one part of the region to another. In addition, adding new travel lanes would not shorten the distances between destinations, nor would it serve land that does not already have access to the freeway.

Land Use Patterns. Land use patterns and development have already established themselves in Davis and Salt Lake Counties around the existing transportation network, including I-15. The region currently has a high level of transportation accessibility, the cities in the ICE analysis area are mostly built out, and employment centers are already well established. In addition, as described in Section 3.18.2.1.2, *Recent Growth and Current Land Use*, the amount of undeveloped land in the cities in the ICE analysis area is limited. The small areas that have undeveloped, vacant land are generally in environmentally sensitive areas (for example, unincorporated areas near the Great Salt Lake) and would not be suitable for new, higher-density developments.

As summarized in Section 3.1, *Land Use*, because I-15 is an existing freeway and the land uses around I-15 are already developed and part of a large urban area with a mature transportation network, UDOT does not expect the Action Alternative to change any local zoning or land use in the areas adjacent to the Action

Alternative that are not purchased for roadway use. Additionally, the Action Alternative would be consistent with the planned land uses and zoning for all of the cities in the ICE analysis area. The existing travel patterns likely would not be altered or expanded with the Action Alternative.

The human environment has been built out for years. Because it would not induce growth or have any other causal relationship to changes in land use patterns or traffic demand, the Action Alternative would not cause indirect effects to social and community facilities, residential or commercial properties, environmental justice, air quality, or noise in the ICE analysis area.

Because it would not induce growth or have any other causal relationship to changes in land use patterns or traffic demand, the Action Alternative would also not cause indirect effects to open lands or natural areas from increased stormwater runoff and its potential effects on water quality, it would not induce significant encroachments on floodplain areas, and it would not indirectly cause filling of wetlands or diverting of or culverting of other aquatic resources in the ICE analysis area.

The Action Alternative could result in indirect effects on aquatic resources outside the project footprint due to sediment and other pollutant discharges associated with stormwater from additional impervious areas, from stream erosion caused by hydrologic modifications at existing stream crossings, and from the potential establishment of noxious weeds. Most of these indirect effects could be reduced or avoided by implementing the mitigation measures listed in Section 3.12.4.4.3, *Mitigation Measures for Aquatic Resources Impacts,* which would apply to the project.

3.18.3.1.3 Indirect Effects Summary

Based on the above factors, the Action Alternative would not induce development or growth in Davis and Salt Lake Counties and thereby cause substantial indirect effects. Because induced land use is not expected, indirect effects on the human environment (social and community facilities, residential or commercial properties, air quality, and noise levels) and natural resources (wetlands and aquatic resources, floodplains, water quality) are also not expected.

3.18.3.2 Cumulative Effects

3.18.3.2.1 Cumulative Effects Methodology

This section describes the methodology used to conduct the cumulative effects analysis. The specific analyses of direct resource impacts are discussed in the appropriate resource sections in this EIS (see the cross-references in Section 3.18.3.2.3, *Potential Cumulative Effects*). UDOT's methodology for determining the cumulative effects of the I-15 project is based on the CEQ guidance *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997b) and the *UDOT Environmental Process Manual of Instruction* (UDOT 2020). Elements of this guidance are described in more detail below.

Examples of reasonably foreseeable future actions include transportation projects on the long-range transportation plan and planned commercial and residential developments in the ICE analysis area. These reasonably foreseeable future actions are independent of the proposed I-15 project but are considered as part of the cumulative effects analysis.

3.18.3.2.2 Present and Reasonably Foreseeable Future Actions

Davis and Salt Lake Counties are both projected to have large increases in population, employment, and households by 2050. These projected increases are included in WFRC's 2019–2050 RTP and are expected to result in continued increases in travel demand for all modes of transportation in 2050, including I-15 and its interchanges.

To determine the potential reasonably foreseeable actions to consider in the cumulative effects analysis, UDOT reviewed WFRC's 2019–2050 RTP to identify transportation projects (roadway, transit, and nonmotorized) and coordinated with Cities and Counties with jurisdiction in the ICE analysis area to identify development that could result in cumulative effects when combined with the I-15 project. UDOT also reviewed other environmental documents for developments, transit, and transportation projects that were recently completed or are in progress. Lastly, UDOT reviewed city, county, and regional general plans and transportation plans in the analysis area to identify planned future actions.

Table 3.18-2 lists the present and reasonably foreseeable future actions to be considered in the context of the potential incremental cumulative effect of the I-15 project on area resources.

3.18.3.2.3 Potential Cumulative Effects

The CEQ guidance document *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997b) states that not all potential cumulative effects issues need to be analyzed in a project's EIS. Some cumulative effects might be irrelevant or inconsequential to decisions about the project alternatives. The cumulative effects analysis should "count what counts," not produce superficial analyses of a long "laundry list" of issues that have little relevance to the effects of the project alternatives or to the eventual decision.

Section 3.18.3.2.3 discusses resources that have a potential to experience incremental cumulative effects from the I-15 project in the context of the impacts from past and reasonably foreseeable future actions.

The analysis of a project's potential EJ impacts, by definition, takes into consideration cumulative effects on certain disadvantaged communities based on historical pollution and/or socioeconomic trends. Therefore, for a detailed discussion of impacts to low-income or minority groups, see Section 3.4, *Environmental Justice Populations*.

Table 3.18-2. Present and Reasonably Foreseeable Future Actions

Project or Activity (and RTP ID No., if applicable [a])	Description	Project Status
Development Projects		
Salt Lake City new development or redevelopment areas	Kozo House six-story apartment building (242 units) with ground-floor retail space in Salt Lake City on 169 North 600 West east of I-15. Redevelopment of existing residential properties.	Planning
	The Flats at Folsom seven-story apartment building (188 units) located in Salt Lake City at 16 South 800 West west of I-15. Redevelopment of existing commercial properties.	Construction
	The Vue Apartments (218 units) located in Salt Lake City at 816 West 200 South west of I-15. Redevelopment of existing residential properties.	Construction
	Studios Squared four-story apartment building (64 units) with ground-floor retail space in Salt Lake City at 767 W. North Temple east of I-15. Redevelopment of existing commercial properties.	Construction
	Entry Note eight-story apartment building (171 units) in Salt Lake City at 735 W. North Temple east of I-15. Redevelopment of existing commercial properties.	Construction
North Salt Lake new development or redevelopment areas	Williamsburg apartment complex (246 units) in North Salt Lake around 200 South and east of I-15. Redevelopment of existing commercial properties.	Planning
	Eaglewood Plaza office building and commercial property in North Salt Lake on Eagle Ridge Road and U.S. 89. Redevelopment of existing industrial properties.	Construction
	Village Station apartment complex (226 units) on Eagle Ridge Road and U.S. 89. Redevelopment of existing industrial properties.	Construction
Lakeview Rock Gravel Quarry	Plan is to phase out mining activities on 147 acres, reclaim the property, and convert it to mixed-use commercial and residential development. This development is anticipated occur in 10 to 20 years.	Planning
Woods Cross Station mixed-use development	Retail, residential, commercial, and office space located at 750 South 800 West in Woods Cross.	Planning
Transportation Projects		
I-15 widening (R-D-41)	I-15 Widening: Weber County Line to 300 North	Planning, funded for 2019 to 2030
West Davis Corridor (R-D-30)	New 16-mile, four-lane highway on the west side of Davis County	Completed and opened in January 2024
U.S. 89 widening (R-D-56)	Widen to six lanes between I-15 and U.S. 89 in Davis County	Completed and opened in 2023
Shepard Lane widening (R-D-21)	Construct Shepard Lane as a five-lane local minor arterial from the new West Davis Corridor to I-15 in Farmington	Planning, funded for 2019 to 2030
Farmington Frontage Road (R-D-54)	Farmington Frontage Road Connection: Lagoon Drive to 200 West (S.R. 227)	Planning, funded for 2041 to 2050
Park Lane overpass improvement (A-D-153 and A-D-154)	Improvements to the Park Lane overpass of I-15, U.S. 89, Legacy Parkway, and the Union Pacific Railroad (UP)/UTA rail corridor in Farmington	Planning, funded for 2019 to 2030

(*Continued on next page*)

Table 3.18-2. Present and Reasonably Foreseeable Future Actions

Project or Activity (and RTP ID No., if applicable [a])	Description	Project Status
I-15/Parrish Lane Improvement (R-D-73)	Interchange improvement crossing at I-15 Parrish Lane interchange in Centerville	Planning, funded for 2031 to 2040
500 South grade-separated crossing of railroad tracks (R-D-75)	New grade-separated crossing at 500 South crossing of rail line at 800 West	Planning, funded for 2019 to 2030
1500 South grade-separated crossing of railroad tracks (R-D-76)	New grade-separated crossing at 1500 South crossing of rail line at 900 West	Planning, funded for 2031 to 2040
2600 South/1100 North grade-separated crossing (R-D-77)	New grade-separated crossing at 2600 South/1100 North rail crossing at 1050 West	Planning, funded for 2031 to 2040
Center Street grade-separated crossing of railroad tracks (R-D-78)	New grade-separated crossing at Center Street overpass rail crossing at 300 West	Planning, funded for 2031 to 2040
I-215/Legacy Parkway interchange improvement (R-D-79)	I-215/Legacy Parkway interchange improvement to make interchange accommodate all movements	Planning, funded for 2041 to 2050
I-15 expansion – Salt Lake County to Utah County (R-S-136)	Widening I-15 HOT ramps and reversible lanes	Planning, funded for 2019 to 2030
Legacy Parkway widening (R-D-42)	Legacy Parkway from I-15/U.S. 89 to I-215 widening in Bountiful	Planning, funded for 2031 to 2040
500 South operations (R-D-23)	500 South operations improvements from I-15 to Main Street in Bountiful	Planning, funded for 2031 to 2040
500 West (U.S. 89) operations (R-D-57)	500 West (U.S. 89) operations improvements from I-15 to 2600 South in Bountiful	Planning, funded for 2031 to 2040
Transit, bicycle, and automobile corridor	U.S. 89 from 1800 South to Salt Lake City in Bountiful	Planning
New residential street	Proposed 220 North/650 West alignment in West Bountiful	Planning
New road construction	Proposed 1450 West alignment in West Bountiful	Planning
Road realignment	700 West/800 West alignment in West Bountiful	Planning
New residential street	Proposed 220 North/650 West alignment in West Bountiful	Planning
1250 West/650 West (R-D-52)	New road at 1250 West/650 West – Glovers Lane to 1275 North in Woods Cross	Planning, funded for 2019 to 2030
200 East operations (R-D-54)	200 East operations improvements from Glovers Lane to Tuscany Cove Drive in Centerville	Planning
Center Street operations (R-D-24)	Center Street operations improvements from Jordan River Parkway to U.S. 89 in North Salt Lake	Planning, funded for 2019 to 2030
400 West operations (R-D-59)	400 West operations improvements from Center Street to 2600 South in North Salt Lake	Planning

(*Continued on next page*)

Table 3.18-2. Present and Reasonably Foreseeable Future Actions

Project or Activity (and RTP ID No., if applicable [a])	Description	Project Status
600 North operations (R-S-13)	600 North/700 North operations improvements from 2200 West to 300 West in Salt Lake City	Planning
Redwood Road widening (R-D-46)	Redwood Road widening from 500 South to 2600 South in Woods Cross	Planning, funded for 2041 to 2050
I-215/I-15/U.S. 89 interchange improvement (R-D-79)	I-215/I-15/U.S. 89 interchange improvement in Salt Lake City	Planning, unfunded
S.R. 201 widening (R-S-14)	Widen to six lanes plus HOT lanes from S.R. 85 to I-15	Planning
S.R. 108 operations (R-D-11)	Interchange upgrade at S.R. 108 in Davis County	Planning, funded for 2031 to 2040
I-80 widening (R-S-6)	Widen to six lanes from 1300 East to I-215 (east)	Planning, funded for 2041 to 2050
Transit Projects		
FrontRunner (T-D-1/T-S-1)	Upgrade Double Track FrontRunner: Davis and Salt Lake Counties	Planning, funded for 2031 to 2040
Bus (T-D-3)	Davis–Salt Lake City Community Connector Core Route from Davis County border to Research Park	Planning, funded for 2019 to 2030
Bus (T-D-9)	Clearfield Station to Woods Cross Station	Planning, funded for 2031 to 2040
Bus (T-S-28)	200 South Core Route Salt Lake Central Station to 1300 East	Planning, funded for 2019 to 2030
Bus (T-S-15)	500 East Corridor Core Route from Power Station TRAX Station to Murray North TRAX Station in Salt Lake City	Planning, funded for 2019 to 2030
Light rail (T-S-18)	Salt Lake Loop (S-Line extension) Center Point Station to U Street	Planning, funded for 2041 to 2050
Bus (T-D-3/T-S-3)	Davis–Salt Lake City Community Connector Bus Rapid Transit	Planning, funded for 2019 to 2030
Bus (T-D-9)	Clearfield to Woods Cross Core Service	Planning, funded for 2031 to 2040
Bus (T-D-4)	North Redwood Corridor Core Service	Planning, funded for 2031 to 2040
Bus (T-D-5/T-S-5)	East Davis Express Bus: Weber County to Salt Lake County	Planning, unfunded
Bus (T-T-1)	Tooele Corridor express bus service from Vine Street in Tooele to 200 East in Salt Lake City	Planning, funded for 2041 to 2050

(*Continued on next page*)

Table 3.18-2. Present and Reasonably Foreseeable Future Actions

Project or Activity (and RTP ID No., if applicable [a])	Description	Project Status
Pedestrian and Bicyclist Projects		
Main Street widening, bike lanes, and sidewalks	Widening, bike lanes, and sidewalks on Main Street and U.S. 106 in Farmington	Planning
200 East widening, bike lanes, and sidewalks	200 East/U.S. 206 in Farmington	Planning
Legacy Parkway Trail North Extension (A-D-42)	Extend existing Legacy Parkway Trail 1 mile farther north to connect with Shepard Lane in Farmington	Planning, funded for 2019 to 2030
Legacy Parkway Trail	Add SUP in West Bountiful at Millcreek Canal and 400 North, add SUP in Centerville and 1250 West, and add bike lane in West Bountiful and Centerville at Porter Lane	Planning
Shepard Lane I-15 crossing improvements	Bike path/pedestrian path improvements on the Shepard Lane/I-15 crossing in Farmington	Planning
Creekside Trail	Urban and single-track hike connecting Creekside Park crossing both Davis and Bountiful Boulevards	Planning

Sources: Bountiful City 2009a, 2009b; Centerville City, no date; City of North Salt Lake 2013; Farmington City 2016; Salt Lake City 2015; UDOT 2017a; UTA 2022; WFRC 2019a
Definitions: HOT = high-occupancy/toll; SUP = shared-use path; UP = Union Pacific Railroad
[a] Projects included in the WFRC 2019–2050 RTP Phased Project List include their corresponding RTP identification number.

Social and Community Impacts

Past and present growth has led to the construction of community facilities (parks and community services) and transportation infrastructure (roadways and trails) that were implemented to serve the growing communities in the ICE. As described in Section 3.2, *Social Environment*, the Action Alternative would have beneficial impacts to several attributes or amenities that define the surrounding communities, including improved community cohesion and benefits to the quality of life. The planned redevelopments would increase housing densities from lower densities to higher-density residential and mixed-use developments. The Action Alternative would improve public safety by improving operations on I-15. Other planned projects in the ICE analysis area, such as minor residential roads, grade-separated rail crossings, grade-separated bike and pedestrian paths, operations improvements on I-15, and pedestrian and bicyclist projects, would have beneficial impacts to communities.

Overall, the impacts from the Action Alternative would be negligible to parks and beneficial to trails when combined with other reasonably foreseeable projects. The Action Alternative's proposed pedestrian and bicyclist facility improvements would help improve regional mobility and network connectivity for pedestrians and bicyclists and would support other planned pedestrian and bicyclist improvements in adjacent communities. Therefore, the I-15 project would not result in adverse cumulative effects on social or community resources.

Residential and Commercial Property Impacts

As described in Section 3.3, *Right-of-way and Relocations*, the Action Alternative would have impacts to certain residential and commercial properties. When combined with the other reasonably foreseeable projects listed above in Table 3.18-2, *Present and Reasonably Foreseeable Future Actions*, impacts to

residential properties and businesses due to relocations could be compounded. As described in Section 1.2.2, *Projected Growth in Population, Employment, and Households*, in Chapter 1, *Purpose and Need*, Davis and Salt Lake Counties are projected to have an increase in the number of households and employment opportunities.

UDOT's acquisition of project right-of-way is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Compliance with the Act also requires that UDOT would fully compensate property owners and provide relocation assistance in accordance with the law. See Section 3.3, *Right-of-way and Relocations*, for a full discussion of relocation impact mitigation consistent with the requirements of the Uniform Act.

Because acquisition and relocation policies provide full and just compensation, property impacts would be mitigated. Therefore, the I-15 project would not result in adverse cumulative effects on residential and commercial properties.

Air Quality Impacts

Air quality issues and concerns are multivariate and have been an ongoing issue in Salt Lake City since Mormon pioneers settled in Utah in 1847 (Mitchell and Zajchowski 2022; University of Utah, J. Willard Marriott Library, no date). In addition to the multiple sources of emissions (industry, transportation, and residential and commercial emissions from heating and appliances), the Wasatch Front also has valleys that trap air during winter inversions. In the late 1800s and early 1900s, most winter heat was produced by burning wood or charcoal, which produce high rates of particulate matter emissions, carbon monoxide, and other air quality pollutants. Salt Lake City passed its first air quality ordinance in 1893 and has made ongoing efforts, along with the State of Utah, to continue to look at ways to improve air quality, especially during winter inversions.

As summarized in the Utah Division of Air Quality's *2022 Annual Report* (UDAQ 2022), air quality along the Wasatch Front during the winter shows a clear trend of continued improvement over the past two decades, even with the large population and economic growth in the region during this period. The Division also notes that summertime ozone is now the primary air quality concern along the Wasatch Front.

From a historical perspective, the current air quality in Utah is much improved from historical levels, even with a much higher population, and continues to get better due to stricter air quality standards, better industrial and vehicle emission technologies, cleaner-burning fuels, and energy-efficiency measures. Consistent with this recent trend, transportation-related air quality pollutants are projected to continue to decrease in the future due to even-better emissions technologies and fuel efficiency (WFRC 2019b).

Air quality in a given area depends on several factors such as the area itself (size, nature of existing development, and topography), the prevailing weather patterns (meteorology and climate), and the pollutants released into the air. All state governments are required to develop an SIP for each pollutant for which an area is in nonattainment or maintenance status. The SIP explains how the State will comply with the requirements of the Clean Air Act. The 2019–2050 conforming RTP and TIP include the I-15 project (widening I-15 from five lanes to six lanes in each direction) from Farmington to the Salt Lake County border (2019–2050 RTP project: R-D-45) and other transportation projects.

As described in Section 3.8, *Air Quality*, the Action Alternative would help reduce regional traffic congestion, which would reduce idling emissions of CO and volatile organic compounds. Although the I-15 project would

increase the annual VMT by 12% compared to the No-action Alternative in 2050, resulting in an associated increase in atmospheric CO_2 emissions through 2050 in the air quality evaluation area, the amounts of all other pollutants are projected to decrease in future years due to improved fuel and emissions standards.

Regional air quality modeling conducted by WFRC for the 2050 transportation conformity determination (WFRC 2019b) used existing ambient air quality conditions which capture to current air quality conditions in the ICE analysis area. The modeling demonstrated that all regionally significant transportation projects, including the Action Alternative and all other planned projects listed above in Table 3.18-2, *Present and Reasonably Foreseeable Future Actions*, would be in compliance with the National Ambient Air Quality Standards. Additionally, the hot-spot analysis conducted for the I-15 project demonstrated that the Action Alternative would not contribute to any new local violations, increase the frequency or severity of any existing violation, or delay timely attainment of the $PM_{2.5}$ or PM_{10} NAAQS. Therefore, the I-15 project meets the conformity rule's hot-spot requirements and would not cause an exceedance of the $PM_{2.5}$ or PM_{10} NAAQS.

Major new fixed sources of air pollutants are not anticipated in the highly urbanized ICE analysis area. Future air quality sources would need to apply to the Utah Division of Air Quality for an approval order, which would address compliance with the SIP. Therefore, the I-15 project would not result in adverse cumulative effects on air quality.

Greenhouse Gas Impacts

Background information and emissions modeling for greenhouse gases for the Action Alternative are discussed in Section 3.8, *Air Quality*. As discussed in Section 3.8, the annual on-road CH_4 emissions from the Action Alternative are expected to increase by about 6%, N_2O emissions are expected to increase by about 4%, and CO_2 emissions are expected to increase by about 11% compared to the No-action Alternative. Although fuel economy and engine technology are improving, they are not improving enough to offset the increase in emissions from the increase in total VMT.

From a cumulative effects perspective, there are multiple sources of greenhouse gases, including transportation (cars, trucks, planes, boats, and trains); electric power generation; industrial, residential, and commercial (heating, cooling, and appliances); and agriculture (EPA 2023c).

From a quantitative perspective, GHG emissions can contribute to global climate change through the cumulative result of numerous and varied emissions sources (in terms of both absolute numbers and types), each of which makes a relatively small addition to global atmospheric GHG concentrations.

In contrast to broad-scale actions such as those involving an entire industry sector or very large geographic areas, it is difficult to isolate and understand the impacts of GHG emissions for a particular transportation project. Furthermore, there is currently no scientific methodology for attributing specific climatological changes to a particular transportation project's emissions.

Because GHGs and climate change are global issues, the small changes to GHG emissions estimated with the Action Alternative would not be considered a substantial increase or decrease to the total worldwide GHG emissions. The most meaningful reductions in GHG reductions will come from large-scale (national and international) programmatic changes to the primary GHG sources listed above. Meaningful reductions to transportation-related GHG emissions would occur from improved vehicle-emission-reduction technologies (including the expanded use of electric vehicles), cleaner fuels, and/or improved fuel efficiency. The United

States and other countries are actively pursuing these types of strategies with the goals of decreasing future transportation-related GHG emissions. Therefore, the I-15 project would not result in adverse cumulative effects on GHG emissions.

Future Noise Levels

As discussed in Section 3.9, *Noise*, an increase in traffic, changes in traffic patterns, or changes in travel speeds can affect noise levels at adjacent properties. Noise is logarithmic, and different sources of noise do not have a linear additive relationship. If there are two noise sources, one cannot simply add the noise levels from the two noise sources to arrive at the total noise level. In most cases, the noise level of the louder noise source dominates the quieter noise source, and the total noise level is close to the noise level of the louder noise source (NoiseMeters Inc., no date). For example, if a 40-decibel (dB) background noise level were added to a 60-dB noise level from a road, the total noise level would be 60 dB.

The noise modeling conducted for the Action Alternative is based on the worst-case LOS C traffic volumes, which provide a conservative (that is, high) estimate of the amount of traffic associated with the anticipated growth and development and the planned future road network. Therefore, the noise modeling for the I-15 project is inherently cumulative, adding the worst-case project-related noise to existing background noise levels. The LOS C traffic volumes assume free-flow conditions with high traffic volumes in both directions at the same time. In reality, during most hours of the day, the traffic volumes would be lower than the LOS C volumes, and the noise levels would be lower. Overall, the noise modeling for the project is conservative and represents worst-case noise levels.

The Action Alternative would generally increase noise levels throughout the noise evaluation area and near sensitive noise receivers. Noise mitigation is also being recommended as part of the Action Alternative to mitigate for noise impacts. Based on the analysis in this EIS, UDOT determined that the expected noise impacts of the Action Alternative would reasonably predict the cumulative effects analysis for noise, and would not result in adverse cumulative effects on noise.

Stormwater and Water Quality Impacts

Past actions have led to the existing surface water and groundwater quality conditions in the ICE analysis area as described in Section 3.11, *Water Quality and Water Resources*. The Action Alternative would involve constructing an additional travel lane in each direction from Farmington to Salt Lake City and reconstructing several interchanges. This would result in a net increase of impervious area and an increased amount of highway stormwater runoff that could impact water resources. However, with the stormwater controls that would be integrated into the project design to address water quality, there would not be impacts to surface and groundwater resources.

When combined with other reasonably foreseeable transportation, residential, and commercial development projects, the risk of impacts to surface and groundwater resources could be compounded. However, precipitation that would fall on the additional impervious areas would be treated through the use of BMPs to control runoff quantities and quality in compliance with each community's existing stormwater management plans and other regulatory controls. With implementation of BMPs and coordination with owners of drinking water source systems, the I-15 project would not have adverse impacts to water quality or water resources. Therefore, the I-15 project would not result in adverse cumulative effects on water quality or water resources.

Floodplains

As described in Section 3.13, *Floodplains*, the Action Alternative would have a maximum of 44.81 acres of impacts on 100-year floodplains from transverse and longitudinal crossings. Most of the floodplains that would be impacted by the Action Alternative are already crossed by I-15, so the Action Alternative would primarily modify, widen, or extend the existing I-15 floodplain crossings and would not cause new impacts to floodplains that are not already crossed by I-15. With the Action Alternative, culverts and bridges in regulatory floodplains would be designed to accommodate a 100-year flood in accordance with FEMA and local floodplain ordinance criteria. These design standards, together with the proper placement of structures and walls, would avoid or reduce the risk that the I-15 project would exacerbate flooding. The Action Alternative's impact would be insignificant to the overall function of the floodplain and stormwater systems. Other reasonably foreseeable projects listed above in Table 3.18-2, *Present and Reasonably Foreseeable Future Actions*, could compound impacts from floodplains in the floodplains evaluation area. However, if these other reasonably foreseeable projects would impact floodplains, they would also be required to meet the FEMA and local floodplain ordinance criteria. Therefore, the I-15 project would not result in adverse cumulative effects on floodplains.

Wetlands and Aquatic Resources Impacts

The past total amount of wetlands in the project study area is unknown due to large past natural fluctuations of the Great Salt Lake, which fluctuates on longer time scales (typically 10-year or longer timeframes). Similarly, it is not well understood what impact past actions have had on wetlands and aquatic resources. Past actions include conservation and mitigation lands developed to minimize future impacts to these sensitive resources.

As described in Section 3.12, *Ecosystem Resources*, the Action Alternative would convert aquatic resources to transportation use, and this conversion would have a maximum of about 32.8 acres of impacts to aquatic resources. In order to fill jurisdictional wetlands and other resources as part of the I-15 project, UDOT must prepare and submit a Clean Water Act Section 404 permit to USACE. The permit application must contain a compensatory mitigation plan that describes the proposed mitigation efforts and how they would offset the functions and values eliminated by the selected alternative. Other reasonably foreseeable projects listed above in Table 3.18-2, *Present and Reasonably Foreseeable Future Actions*, could compound impacts from aquatic resources in the ICE analysis area. If the other reasonably foreseeable projects would impact jurisdictional aquatic resources, they would also be required to obtain a Clean Water Act Section 404 permit and provide mitigation for these impacts with the goal of no net loss of this resource.

With implementation of this mitigation, the I-15 project would not have adverse impacts to aquatic resources and would not result in adverse cumulative effects on aquatic resources.

3.18.3.2.4 Cumulative Effects Summary

In making these cumulative effects determinations, UDOT considered the planned projects and development listed above in Table 3.18-2, *Present and Reasonably Foreseeable Future Actions*, as well as the past and present conditions of the resources near I-15. UDOT determined that, because none of the resources evaluated in this EIS would experience substantial adverse direct or indirect impacts and because none of the reasonably foreseeable future actions are anticipated to have substantial impacts on resources in the ICE analysis area, there would not be substantial cumulative effects from the Action Alternative.

3.19 Short-term Uses versus Long-term Productivity

3.19.1 Regulatory Setting

The Council on Environmental Quality's regulations for implementing NEPA require an EIS to address the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity (40 CFR Section 1502.16). FHWA's guidelines for environmental documents state that an EIS should discuss in general terms the proposed action's relationship of local short-term impacts and use of resources, and the maintenance and enhancement of long-term productivity, including recognition that transportation improvements are based on state and/or local planning that considers the need for present and future traffic requirements within the context of present and future land use development (FHWA 1987).

3.19.2 Short-term Uses versus Long-term Productivity

The Action Alternative would be consistent with local land use and transportation plans, which demonstrate a need for more capacity on I-15 to accommodate planned growth and regional population projections. The short-term use of environmental resources versus preserving their long-term productivity relates to converting the productivity of the land, viewed as a long-term and renewable use, to a developed transportation use that has a relatively short economic life. Almost all of the I-15: Farmington to Salt Lake City EIS study area is developed and has been previously affected by development. Overall, the I-15: Farmington to Salt Lake City Project would improve the long-term economic productivity of the area by providing a more efficient transportation network.

3.20 Irreversible and Irretrievable Commitment of Resources

3.20.1 No-action Alternative

There would not be any irreversible or irretrievable commitment of resources with the No-action Alternative.

3.20.2 Action Alternative

Implementing the Action Alternative would involve a commitment of a range of natural, physical, human, and fiscal resources. Land used for constructing the Action Alternative would be considered an irreversible commitment of these resources during the time that the land is used for the interstate and its interchanges. However, if a greater need for use of the land arises, or if the interstate or its interchanges are no longer needed, the land could be converted to another use. At present, such a conversion is not reasonably foreseeable.

A considerable amount of fossil fuels, labor, and roadway construction materials such as cement, aggregate, and bituminous material would be expended. Additionally, large amounts of labor and natural resources would be necessary for fabricating and preparing the construction materials. These materials are generally not retrievable, but they are not in short supply, and their use would not have an adverse effect on the continued availability of these resources.

Constructing the Action Alternative would also require a substantial expenditure of irretrievable funds. The commitment of these resources is based on the premise that residents in the area, the state, and the region would benefit from the improved quality of the transportation system. These economic benefits would consist of improved accessibility and mobility, increased safety, and savings in travel time, all of which are economic benefits that are anticipated to outweigh the commitment of these financial resources.

Wetlands in the study area would be lost as discussed in Section 3.12, *Ecosystem Resources*, though the loss of these wetlands would be mitigated.

Historic buildings would be affected by the Action Alternative as described in Section 3.10, *Historic and Archaeological Resources*. The demolition of historic buildings as part of construction is an irreversible commitment of resources.

3.21 Permits, Reviews, Clearances, and Approvals

3.21.1 Introduction

Section 3.21 discusses the permits, reviews, clearances, and approvals that would be required to construct the Action Alternative. Section 3.21 applies to any of the area options unless specified otherwise.

3.21.2 Federal Permits, Reviews, Clearances, and Approvals

3.21.2.1 Individual Permit under Section 404 of the Clean Water Act (USACE)

Project applicants are required to obtain a Clean Water Act Section 404 permit if a proposed action would discharge dredged or fill materials in waters of the United States, including wetlands. The Action Alternative would place fill material in waters of the United States and would require an individual permit. The agency responsible for issuing a Section 404 permit is USACE. As a condition of the required Section 404 permit, a Section 401 water quality certification must be obtained from the state water quality agency [see Section 3.21.3.1, *Water Quality Certification under Section 401 of the Clean Water Act (Utah Division of Water Quality)*].

UDOT has been coordinating throughout the EIS process with USACE. UDOT will continue to work with the USACE on information needed for the 404 permit process.

UDOT anticipates that USACE would issue a Section 404 permit or permits for the selected alternative at some point after the ROD is issued for the I-15 project. UDOT could implement the project in phases based on available funds. Section 404 permitting also could be phased. UDOT would be responsible for any required changes or additions to the Section 404 permit due to design changes or construction activities.

3.21.2.2 Approval of Addition of Modification of Access Points (FHWA)

Changing access points to the interstate highway system requires approval from FHWA. The Action Alternative would require modifications to I-15 accesses. An interchange design/justification report would need to be prepared and approved by FHWA for each modified access. UDOT anticipates that the required interstate access point approval would be issued after the ROD for the I-15 EIS.

UDOT has had meetings with FHWA throughout the EIS process to discuss the proposed interchange designs included with the Action Alternative. UDOT will continue to coordinate with FHWA regarding the information needed for the interstate access point approvals after the ROD for the I-15 EIS is completed.

3.21.2.3 Migratory Bird Treaty Act (USFWS and Utah Division of Wildlife Resources)

The Action Alternative could affect nests of migratory birds during construction through vegetation removal. If protected species are found nesting in the construction zone or buffer zone before or during construction, UDOT will coordinate with USFWS and the Utah Division of Wildlife Resources to ensure compliance with the Migratory Bird Treaty Act. See Section 3.12, *Ecosystem Resources*, for potential mitigation measures for impacts to migratory birds.

3.21.2.4 Air Conformity Requirements under the Clean Air Act (FHWA)

Section 3.8, *Air Quality*, provides a detailed analysis of air conformity requirements related to the I-15 project. In summary, the Clean Air Act requires that all regionally significant highway and transit projects in air quality non-attainment areas be included in a "conforming" transportation plan and transportation improvement program.

Counties in the air quality evaluation area (Davis and Salt Lake Counties) are in air quality nonattainment status for certain criteria pollutants. A "conforming" plan is one that has been analyzed regionally for emissions of controlled air pollutants and is found to be within the emission limits established in the state implementation plan. Transportation projects are said to conform if, both alone and in combination with other planned projects included in that transportation improvement program, the project would not result in any of the following:

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

For the I-15 project, WFRC, which is the metropolitan planning organization for the project study area, conducted the regional conformity analyses and submitted them to FHWA for a conformity determination. Based on the most recent regional conformity analyses, the project conforms to the state implementation plan for all pollutants in applicable nonattainment or maintenance areas.

The Air Quality Interagency Coordination Team (ICT) determined that the I-15 project was a POAQC and that a project-level conformity determination was required from FHWA.

UDOT conducted hot-spot analyses for PM2.5 and PM10 for this project following the transportation conformity procedures (see Section 3.8, *Air Quality* and Appendix 3N: *Air Quality Technical Report: Hot-spot Analysis*). The results of the hot-spot analysis modeling showed that predicted pollutant concentrations at all receptors in the hot-spot evaluation areas do not exceed the 24-hour PM_{10}, 24-hour $PM_{2.5}$, or annual $PM_{2.5}$ NAAQS for the Action Alternative. Therefore, the I-15 project meets all conformity requirements.

UDOT conducted the PM_{10} and $PM_{2.5}$ analysis according to 40 CFR Section 93.123, *Procedures for Determining Localized CO, PM_{10} or $PM_{2.5}$ Concentrations*. The project-level conformity determination process requires interagency consultation to develop a process to evaluate and choose models and associated methods and assumptions to be used in the hot-spot analysis. UDOT coordinated extensively

with both FHWA and EPA on the models and associated methods and assumptions to be used in the hot-spot analysis. UDOT prepared and submitted a Draft Air Quality Technical Report (see Appendix 3N: *Air Quality Technical Report: Hot-spot Analysis*) to FHWA and EPA for review and comment in August 2024. Approval of the final project-level conformity determination was made by FHWA on October 2, 2024. A copy of the project-level air quality conformity determination is included in Attachment I*, FHWA Project-level Conformity Determination*, of Appendix 3N: *Air Quality Technical Report: Hot-spot Analysis*.

3.21.2.5 Section 106, National Historic Preservation Act (Utah SHPO and ACHP)

For this EIS, UDOT is the lead agency under the Section 106 process. Section 106 of the NHPA requires agencies to take into account the effects of their actions on historic properties and to give the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. Any property that is included or eligible for listing in the NRHP is considered a historic property. For projects that could affect a historic property, the federal agency must consult with the relevant SHPO.

UDOT submitted its Determinations of Eligibility report for historic architectural and archaeological properties to the Utah SHPO on March 17, 2023. The Utah SHPO concurred with all determinations in a letter dated March 22, 2023. UDOT submitted its Findings of Effect report for historic architectural and archaeological properties to the Utah SHPO on July 25, 2023. The Utah SHPO concurred with all findings in a letter dated July 31, 2023. UDOT submitted an amended Findings of Effect (FOE) report for historic architectural and archaeological properties for the Final EIS to the Utah SHPO on March 21, 2024. The Utah SHPO concurred with all findings in a letter dated March 22, 2024. UDOT also developed a MOA with the Utah SHPO to mitigate for adverse effects to historic properties. The MOA was signed on April 18, 2024. Copies of the correspondence between UDOT and the Utah SHPO are provided in Appendix 3I, *Cultural Resources Correspondence*.

3.21.2.6 Section 4(f) of the Department of Transportation Act

The Section 4(f) regulation (23 CFR Section 774.3) states that UDOT may not approve the use of a Section 4(f) property unless:

(a) FHWA determines that (1) there is no feasible and prudent avoidance alternative to the use of the property and (2) the action includes all possible planning to minimize harm to the property resulting from such use; or

(b) FHWA determines that the use of the property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) committed to by the applicant, would have a *de minimis* impact on the property.

What is a Section 4(f) property?

Section 4(f) properties are publicly owned parks, recreation areas, wildlife and waterfowl refuges, or historic sites.

For historic sites, a *de minimis* impact means UDOT has determined that no historic property would be affected by the project or that the project would have no adverse effect on the historic property in question. For parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* impact means that FHWA has determined that the project would not adversely affect the activities, features, or attributes of the park, recreation area, or wildlife or waterfowl refuge eligible for protection.

Chapter 4, *Section 4(f) Analysis*, provides a detailed analysis of the Section 4(f) requirements related to the project. This evaluation found that the Action Alternative would require use of Section 4(f) properties.

3.21.2.7 Section 6(f) of the Land and Water Conservation Funds Act (National Park Service and Utah Division of Outdoor Recreation)

Two Section 6(f) properties, Centerville Community Park and Hatch Park, would be affected by the Action Alternative. Chapter 5, *Section 6(f) Analysis*, provides a detailed analysis of the Section 6(f) requirements related to the project. This evaluation found that the Action Alternative would require use of Section 6(f) properties. UDOT is coordinating mitigation for these impacted Section 6(f) properties with the local owners (Centerville City and the City of North Salt Lake), the U.S. National Park Service, and the Utah Division of Outdoor Recreation.

What is a Section 6(f) property?

A Section 6(f) property is any area or facility for which Land and Water Conservation Fund assistance has been obtained, regardless of the extent of participation of the program in the assisted area or facility and consistent with the contractual agreement between the National Park Service and the State (36 CFR Section 59.1).

3.21.2.8 Impacts to Bureau of Reclamation Lands, Easements, or Facilities

The Action Alternative would cross federal land, easements, or facilities owned by the U.S. Bureau of Reclamation (USBR). Prior to highway construction, UDOT would need to finalize agreements with the USBR to protect or replace lands, easements, or facilities impacted by the Action Alternative. These actions affecting USBR lands, easements, or facilities are actions requiring compliance with NEPA. The I-15: Farmington to Salt Lake City EIS would be adopted by USBR to fulfill its NEPA compliance requirements pertaining to the protection or replacement of federal lands, easements, or facilities impacted by the Action Alternative. USBR would need to approve its own NEPA decision document based on the findings of this EIS. To ensure that this EIS meets USBR's NEPA requirements, USBR is a cooperating agency in the I-15 EIS NEPA process.

3.21.3 State Permits, Reviews, Clearances, and Approvals

3.21.3.1 Water Quality Certification under Section 401 of the Clean Water Act (Utah Division of Water Quality)

Section 401 of the Clean Water Act requires that before a federal agency issues a permit authorizing a discharge into waters of the United States, it must obtain certification from the state that the discharge will not violate water quality standards. For the I-15 project, UDOT must obtain a certification from the Utah Division of Water Quality before USACE issues a Clean Water Act Section 404 permit for the project. The Action Alternative would require a Section 404 permit [as discussed in Section 3.21.2.1, *Individual Permit under Section 404 of the Clean Water Act (USACE)*], due to placement of fill material in waters of the United States and therefore would require a water quality certification in accordance with Section 401 of the Clean Water Act from the Division of Water Quality.

3.21.3.2 Utah Pollutant Discharge Elimination System Permit under Section 402 of the Clean Water Act (Utah Division of Water Quality)

Section 402 of the Clean Water Act regulates discharges of pollutants to surface waters. Construction projects that disturb 1 or more acres of land must be covered under the statewide UPDES stormwater permit. The Action Alternative would disturb 1 or more acres of land and would require coverage under the UPDES stormwater permit.

Additionally, UDOT might be required to obtain a UPDES Construction Dewatering or Hydrostatic Testing General Permit during construction if construction dewatering activities discharge project water to surface waters. UDOT would coordinate with the Utah Division of Water Quality to obtain this permit if it is required.

As described in Section 3.11, *Water Quality and Water Resources*, UDOT would address postconstruction stormwater runoff from the selected alternative in accordance with its statewide MS4 permit. UDOT would also coordinate with the Utah Division of Water Quality to ensure that MS4 permit conditions are met. Additionally, UDOT would coordinate with local municipalities, as appropriate, to ensure that stormwater runoff or stormwater facilities from the selected alternative would not affect any municipal MS4 permits.

3.21.3.3 Utah State Stream Alteration Permit (Utah Division of Water Rights)

As part of its Stream Alteration Program, the Utah Division of Water Rights requires that any state agency, County, City, corporation, or person may not relocate any natural stream channel or alter the beds and banks of any natural stream without first obtaining the written approval of the state engineer (Utah Code 73-3-28). Construction of any new highway or drainage feature or associated alteration to a natural stream will require a stream alteration permit. UDOT anticipates that stream alteration permits would be required for the Action Alternative.

3.21.3.4 Air Quality Approval Order (Utah Division of Air Quality)

An air quality approval order is required to build, own, or operate a facility that pollutes the air, including the Action Alternative. To obtain an air quality approval order, a notice of intent must be submitted to the Utah Division of Air Quality describing the construction activities and emissions that would be associated with operating construction equipment. The permit applicant must include provisions for controlling dust and emission sources, and the permit might require other construction approvals depending on the sources and locations of aggregate, asphalt, combustion, and/or fuel storage facilities. This permit would be obtained by the contractor before construction.

3.21.3.5 Approval of Remediation Work Plan (UDEQ or EPA)

Several hazardous waste sites are within the vicinity of the Action Alternative as described in Section 3.14, *Hazardous Materials and Hazardous Waste Sites*. Sites of primary concern (sites that represent a high or moderate risk to construction) are located in the north and south segments of the Action Alternative. UDOT would conduct site investigations or screening-level soil and groundwater testing within the Action Alternative's right-of-way near the sites of concern. UDOT would conduct additional research and site investigations, if warranted, for the lower-risk sites.

If a hazardous site is found during construction, a remediation work plan would be submitted and approved by the regulatory agency (either UDEQ or EPA) if construction activities would occur on existing hazardous waste sites. The remediation work plan would define clean-up levels and protective measures for construction workers.

3.21.4 Local Permits and Clearances

3.21.4.1 Floodplain Development Permit (Local Jurisdictions)

Floodplain development permits would be required from local jurisdictions if construction, including placement of highway fill and drainage structures at stream crossings, is required within the FEMA 100-year floodplain boundary.

The Cities and Counties in the I-15 project study area have adopted FEMA's National Flood Insurance Program. This program includes the preparation of flood insurance rate maps that show the 100-year floodplain boundaries within a community.

The Action Alternative would cross several floodplains, washes, rivers, and creeks as described in Section 3.13, *Floodplains*. The Action Alternative would overlap several 100-year floodplains. In accordance with Executive Order 11988, coordination with FEMA would be required during the construction phase to ensure that local jurisdictions' flood design standards are met and to obtain floodplain development permits from the local jurisdictions.

3.21.4.2 Construction-related Permits and Clearances (Various Agencies)

The construction contractor would be responsible for obtaining all construction-related permits and other environmental clearances for activities occurring outside the right-of-way, such as activities in construction staging areas, and batch plant sites.

3.21.5 Summary of Permits, Reviews, Clearances, and Approvals

Table 3.21-1 lists the permits and clearances that would be required for the Action Alternative. To make sure the contractor follows environmental commitments, UDOT would include commitments in contract documents.

Table 3.21-1. Permits, Reviews, Clearances, and Approvals Likely To Be Required for the I-15 Project

Permit, Review, or Approval	Granting Agency(ies)	Applicant	Application Time	Granting Time	Applicable Portion of Project
Federal Permits, Reviews, and Approvals					
Individual Permit under Section 404 of the Clean Water Act	USACE	UDOT	After the Final EIS	Before construction	Impacts to aquatic resources such as wetlands and streams
Approval of additional or modification of access points	FHWA	UDOT	During the EIS	After the ROD	Interstate access changes
Compliance with Section 106 of the NHPA	Utah SHPO and ACHP	FHWA	Concurrent with the EIS	Final EIS	Considerations of impacts to historic properties; includes consultation between agencies and interested parties
USBR approval for impacts to federal facilities	USBR	UDOT	After the Final EIS	Before construction	Portions of the project that cross USBR lands, easements, or facilities.
Section 6(f) conversion and replacement property for impacts Centerville Community Park; temporary non-conforming use for Hatch Park	U.S. National Park Service	UDOT	After the Final EIS	Before construction	Section 6(f) parks, specifically Centerville Community Park and Hatch Park in North Salt Lake
State Permits, Reviews, and Clearances					
Water quality certification under Section 401 of the Clean Water Act	Utah Division of Water Quality	UDOT	Concurrent with Section 404 Individual Permit	Concurrent with Section 404 Individual Permit	Required if the project could discharge fill into navigable waters
UPDES permit under Section 402 of the Clean Water Act	Utah Division of Water Quality	Contractor	Construction phase	Before construction	Stormwater quality during construction phase
Stream alteration permit	Utah Division of Water Rights	UDOT	Final design phase	Before construction	Required for new or modified stream crossings proposed as part of the preferred alternative
Local Permits and Clearances					
Floodplain development permit	Local jurisdictions	UDOT	Final design phase	Final design phase	Portions of roadway or structure in FEMA floodplain
Construction-related permits	Various agencies	Contractor	Construction phase	Before construction	Impacts associated with off-site activities such as activities in construction staging areas, borrow areas, batch plant sites, and so on

3.22 Mitigation Summary

Section 3.22 summarizes the mitigation measures developed to avoid, minimize, rectify, reduce, or compensate impacts from the Action Alternative for the I-15: Farmington to Salt Lake City Project.

The mitigation items listed in Section 3.22 are the same items that are listed in Sections 3.1 through 3.21 of this EIS. For consistency, the mitigation measures are listed in the same order as they are organized in Chapter 3.

The mitigation measures include standard UDOT best practices, expected permit conditions, legal requirements, and other measures specifically targeted to mitigate for unique impacts. UDOT does not typically propose mitigation for resources that are anticipated to have negligible or beneficial impacts from the Action Alternative.

For this Final EIS, the mitigation measures listed below include additional detail and commitment regarding mitigation measures based on permitting processes, public comments on the Draft EIS, and continued coordination with agencies, Cities, and other stakeholders.

Funding for mitigation will be included in the cost of construction; UDOT will have the final responsibility for implementation.

UDOT or its designated contractor will implement a mitigation and monitoring tracking system to ensure that all mitigation identified in this EIS is performed and that appropriate monitoring for effectiveness takes place. If a mitigation measure is determined to not be effective, the contractor will consult with UDOT to develop other appropriate mitigation.

3.22.1 Mitigation Measures for Impacts to Land Use

Because the Action Alternative would have no impacts to land use or zoning, no mitigation is proposed.

3.22.2 Mitigation Measures for Impacts to the Social Environment

As discussed above, the social impacts are generally beneficial or would be temporary during construction. No mitigation is necessary because there would be no disproportionate impact to any particular social group. More information is provided below about UDOT's best practices for project development.

3.22.2.1 Community Cohesion

The Action Alternative would benefit the communities and neighborhoods in the social environment evaluation area. No mitigation is proposed.

3.22.2.2 Quality of Life

The Action Alternative would benefit the communities and neighborhoods in the social environment evaluation area. No mitigation is proposed.

3.22.2.3 Recreation Resources

Mitigation for impacts to recreation resources typically includes replacing or relocating impacted amenities (for example, trails, pavilions, or playgrounds) or providing other items that can enhance the recreation use of the recreation resource. During the final design of the selected segment options of the Action Alternative, UDOT would work with the local municipalities with jurisdiction over the public parks and recreation areas to evaluate opportunities to further mitigate impacts. For all temporary construction impacts, the disturbed land would be restored and revegetated.

3.22.2.4 Community Facilities

There would be no impacts to community facilities from the Action Alternative. No mitigation is proposed.

3.22.2.5 Public Safety and Security

The Action Alternative would benefit public safety providers by improving the operations on I-15 and the I-15 interchanges in the social environment evaluation area. No mitigation is proposed.

3.22.2.6 Utilities

All impact to utilities would be temporary. The UDOT document *Accommodation of Utilities and the Control and Protection of State Highway Rights-of-Way* (Utah Administrative Code Rule R930-6) would be followed. The construction contractor would contact local businesses and residences if any loss of utility service is required during construction. UDOT would work with the utility companies during final design or the design-build process if utilities need to be relocated.

UDOT would also identify and obtain all appropriate permits from state and local government agencies, as necessary, related to relocating and modifying utilities. UDOT would comply with all permit conditions.

3.22.3 Mitigation Measures for Right-of-way and Relocation Impacts

No mitigation is proposed beyond the requirements of federal and state relocation assistance acts.

During the final design process, UDOT will look at measures that could avoid needing to acquire properties. Where necessary, UDOT would acquire all property according to the federal Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970 (as amended July 2008) and the Utah Relocation Assistance Act. These regulations require fair compensation for property owners and qualified renters to offset or eliminate any financial hardship that private individuals or entities could experience as a result of acquiring property for public purposes. No individual or family would be required to relocate until adequate, decent, safe, and sanitary housing is available.

Relocation resources will be available to all residents and businesses that are relocated, and the process for acquiring replacement housing and other sites will be fair and open.

3.22.4 Mitigation Measures for Impacts to Environmental Justice Populations

Although decision-making relevant to the proposed Action Alternative cannot remedy many of these past transportation and industrial decisions, UDOT intends to continue to work collaboratively with the community to address past impacts to the extent that they are related to I-15 and can be addressed with the current I-15 project. By actively involving the community in the process and considering their feedback, UDOT is committed to working with the community to identify and incorporate those ideas into the project that will have lasting benefits for all members of the community.

3.22.5 Mitigation Measures for Impacts to Economic Conditions

UDOT proposes to implement mitigation to include the following.

3.22.5.1 Construction

To mitigate short-term access and visibility impacts to businesses during construction, a traffic access management plan would be developed and implemented by the construction contractor that maintains public access to impacted businesses during normal business hours. Following completion of the construction phase, UDOT would install appropriate roadway directional signs consistent with UDOT policy.

3.22.5.2 Operation

When acquisition of a right-of-way is necessary, it is done in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. This mitigation measure is discussed in more detail in Section 3.3, *Right-of-way and Relocations*. Compliance with the Act ensures that all persons regardless of race, color, religion, sex, national origin, disability, or age will be fairly and equitably treated.

Mitigation is not provided to local governments that are adversely affected when land is removed from their tax base. Over the long term, property values are expected to increase as a result of improved regional transportation access to businesses. The revenues generated from this would offset any short-term impacts from the I-15 project on local government revenues.

3.22.6 Mitigation Measures for Impacts to Transportation

The Action Alternative would be an improvement over the no-action conditions. No mitigation for impacts to the roadway network is proposed.

Each existing pedestrian and bicyclist facility that would be closed and removed during construction would be replaced with a similar or improved facility near its current location. Project construction for pedestrian and bicyclist facilities would be phased to minimize disruptions to the public to the extent feasible. UDOT would also coordinate with the Counties and Cities during the final design of the Action Alternative to mitigate disruptions to pedestrian and bicyclist facility users. Potential mitigation for disruption would include providing signed on-road detours where feasible, closing facilities during low-use seasons (winter), and providing information to the public about closures.

3.22.7 Mitigation Measures for Joint Development Impacts

No mitigation measures for joint development impacts are proposed because no adverse impacts are expected. UDOT will continue to work with the Counties and Cities to make the Action Alternative compatible with the planned projects listed above in Table 3.7-1, *Potential Joint Development Projects*.

3.22.8 Mitigation Measures for Impacts to Air Quality

Regional modeling conducted by WFRC for the 2050 transportation conformity analyses demonstrated that all regionally significant transportation projects (including the I-15 project) would not adversely affect local compliance with the NAAQS. Atmospheric CO_2 and PM_{10} emissions are projected to increase in 2050 with the Action Alternative due to the projected increase in VMT in the air quality evaluation area. The amounts of all other pollutants are projected to decrease in future years due to improved fuel and emissions standards. Therefore, no mitigation is proposed related to the project operations. See Section 3.17.3.6, *Mitigation Measures for Air Quality Impacts from Construction*, for the proposed air quality mitigation related to construction.

3.22.9 Mitigation Measures for Impacts to Noise

According to UDOT's noise-abatement policy, specific conditions must be met before traffic noise abatement is implemented. Noise abatement must be considered both feasible and reasonable.

The factors considered when determining whether abatement is feasible are:

- **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 would not exceed 10 feet in height measured from the top of deck or roadway to the top of the noise wall. Noise walls would not be installed on structures that require retrofitting to accommodate the noise-abatement measure. Noise-abatement measures would be considered if the project meets the criteria established in this policy if structure replacement is included as part of the project. Abatement measures shall be consistent with general American Association of State Highway and Transportation Officials (AASHTO) design principles.
- **Safety on Urban Non-access-controlled Roads.** To avoid a damaged barrier from becoming a safety hazard, in the event of a failure, barrier height must be no greater than the distance from the back-of-curb to the face of the proposed barrier. Because the distance from the back-of-curb to the face of a proposed barrier varies, barrier heights that meet this safety requirement might also vary.
- **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 receivers.

The following factors are considered when determining whether abatement is reasonable:

- **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 receivers.
- **Cost-effectiveness.** The cost of a noise-abatement measure must be deemed reasonable in order for it to be included in a project. Noise-abatement costs are based on a fixed unit cost of $20 per square foot, multiplied by the height and length of the wall, in addition to the cost of any other item associated with the abatement measure that is critical to safety. The fixed unit cost is based on the historical average cost of noise walls installed on UDOT projects and is reviewed at regular intervals, not to exceed 5 years. The cost-effectiveness of abatement is determined by analyzing the cost of a wall that would provide a noise reduction of 5 dBA or more for a benefited receiver. A reasonable cost is considered to be a maximum of $30,000 per benefited receiver for activity category B and $360 per linear foot for activity categories A, C, D, or E. If the anticipated cost of the noise-abatement measure is less than the allowable cost, then the abatement is deemed reasonable.

  The cost-effectiveness calculation also takes into account the cost of any items associated with the abatement measure that is critical to safety, such as snow storage and safety barriers where applicable.
- **Viewpoints of Property Owners and Residents.** As part of the final design phase for the Action Alternative, balloting would take place if noise-abatement measures meet the feasible criteria and reasonable noise-abatement design goal and cost-effectiveness criteria (listed above) in UDOT's noise-abatement policy.

  Section C.2I of UDOT's noise-abatement policy requires balloting for all benefited receivers (property owners or tenants that would receive a 5-dBA or greater reduction in noise from the noise-abatement measure) or receivers whose property would abut the proposed noise-abatement measures. Balloting approval is contingent on at least 75% of the total ballots being returned and 75% of the returned ballots being in favor of the proposed noise-abatement measure.

The Final EIS noise analysis includes the preliminary results based on an evaluation of all three feasibility factors and the reasonable noise-abatement design goal and cost-effectiveness factors. The evaluation of the reasonableness factor for the "viewpoints of property owners and residents" would take place as part of the final design phase for the Action Alternative.

3.22.9.1 Noise Barriers

For a noise barrier to be effective, it must be high enough and long enough to block the view of the noise source from the receiver's perspective. FHWA's *Highway Traffic Noise: Analysis and Abatement Guidance* states that a good "rule of thumb" is that the noise barrier should extend 4 times as far in each direction as the distance from the receiver to the barrier. For instance, if the receiver is 50 feet from the proposed noise barrier, the barrier needs to extend at least 200 feet on either side of the receiver in order to shield the receiver from noise traveling past the ends of the barrier.

Openings in noise barriers for driveway and cross street access greatly reduce the effectiveness of noise barriers. Therefore, impacted receivers with direct access onto local streets do not qualify for noise barriers.

The anticipated cost of each wall was calculated by multiplying the wall area and the wall cost per square foot ($20). The allowable cost was calculated using two variables: (1) activity category B allowable cost and (2) activity category C allowable cost. The category B allowable cost was calculated by multiplying the allowable cost per benefited receiver ($30,000) by the number of receivers benefited by the wall. The category C allowable cost was calculated by multiplying the length of the wall associated with category C land use by the allowable cost for category C land ($360 per linear foot). These two variables, activity category B allowable cost and activity category C allowable cost, were combined to produce the allowable cost for each wall (for detailed wall analyses, see Appendix 3F, *Noise Technical Report*).

For areas with noise impacts that do not have an existing noise wall, in an effort to provide an objective analysis of traffic noise reduction at impacted receivers, a variety of noise wall heights were considered. If multiple wall heights would meet noise-abatement requirements, the shortest wall height found to be both feasible and reasonable would be recommended for balloting.

UDOT's *noise-abatement policy* requires the replacement "in kind" of any existing noise wall. For areas with noise impacts that have an existing noise wall, UDOT evaluated only noise wall heights as tall as or taller than the existing noise wall height. For some replacement walls, UDOT also evaluated extensions to the replacement walls if the Action Alternative would have noise impacts to receivers beyond the ends of the existing walls. More details are included in Appendix 3F.

A total of 26 noise barriers were considered for the Action Alternative. See the noise wall maps in Appendix 3F.

3.22.9.2 Noise-abatement Evaluation for the Action Alternative

UDOT evaluated 21 noise barriers at locations where noise impacts would occur with the Action Alternative. Eight of the 21 noise barriers were new noise barriers, and 13 of the 21 noise barriers were replacement noise barriers consistent with UDOT's noise-abatement policy. Three of the 8 new noise barriers met UDOT's feasibility and reasonableness acoustic and cost criteria with the Action Alternative. Maps showing the locations of the noise walls evaluated for the Action Alternative and more detailed information is available for each barrier in Appendix 3F, *Noise Technical Report*.

Table 3.22-1 summarizes the analyzed noise barriers and the results of the noise barrier analysis for the Action Alternative. The locations of the noise barriers are shown in Figure 3.22-1 through Figure 3.22-3 and in Attachment D, *Noise Wall Maps*, of Appendix 3F.

The 3 new noise barriers and 13 replacement noise barriers recommended in this analysis would provide a benefit (at least a 5-dBA reduction) to 1,568 to 1,647 receivers.

Noise-abatement Consideration during Final Design. Recommended noise walls in the noise evaluation area that met the requirements of UDOT's noise-abatement policy are summarized in Table 3.22-1. A barrier identified as recommended for balloting is a barrier that has been shown to meet the feasible criteria and reasonable design goal and cost-effectiveness criteria as defined in UDOT's noise-abatement policy. However, that finding is not a commitment to build a barrier.

Noise barriers shown in this analysis include replacement noise barriers for areas with existing noise walls and new or extended noise walls for locations modeled to have noise impacts from the Action Alternative. The final height for replacement noise barriers would be at least equal to the existing height. The new noise barriers are preliminary and must meet the feasibility and reasonableness requirements of the UDOT noise-abatement policy.

The final lengths and heights for any of the noise barriers identified in the environmental study phase are still subject to final design and the feasibility and reasonable criteria as defined in the UDOT noise-abatement policy (and summarized in Section 3.9.4.4, *Mitigation Measures*). UDOT would not make a decision whether to construct the proposed noise barrier until the project design is completed and refined utility relocation and right-of-way costs are available. Reasonableness would be evaluated using refined costs based on the final design.

UDOT will conduct balloting for the proposed noise-abatement measures with the final design engineering considerations and costs that meet the feasibility criteria and reasonable design goal and cost-effectiveness criteria as defined in UDOT's noise-abatement policy. As described above, Section I(c) of UDOT's noise-abatement policy requires balloting for all benefited receivers (property owners or tenants that would receive a 5-dBA or greater reduction in noise from the noise-abatement measure) or receivers whose property would abut the proposed noise-abatement measures. Balloting approval is contingent on at least 75% of the total ballots being returned and 75% of the returned ballots being in favor of the proposed noise-abatement measure.

Table 3.22-1. Barrier Analysis Summary

Proposed Barrier	Segment/Options	New Barrier or Replacement of Existing Barrier?	Is Barrier Feasible, Reasonable, and Recommended for Balloting? (applicable to new walls only)	Recommended Barrier Height, Length
1	North – Farmington State Street Option	New	No	NA
1	North – Farmington 400 West Option	New	No	NA
2	North – Farmington State Street Option	New	Yes	16 feet, 1,651 feet
2	North – Farmington 400 West Option	New	Yes	16 feet, 1,400 feet
3	North/both options	New	No	NA
4	North/both options	Replacement	NA	16 feet, 4,199 feet
5	North/both options	Replacement	NA	17 feet, 12,345 feet
6	North/both options	Replacement	NA	16 feet, 4,481 feet
7	North/both options	Replacement	NA	13 feet, 986 feet
8	North/both options	New	No	NA
9	North/both options	New	No	NA
10	North/both options	Replacement	NA	13 feet, 3,381 feet
11	North/both options	Replacement	NA	14 feet, 1,880 feet
12	North/both options	Replacement	NA	12 feet, 4,343 feet
13	North/both options	Replacement	NA	14 feet, 1,370 feet
14	North/both options	New	Yes	15 feet, 1,557 feet
15	North/both options	New	No	NA
16	North/both options	New	Yes	11 feet, 650 feet
17	North and South/both options	Replacement	NA	16 feet, 9,243 feet
18	South/1000 North Northern Option	Replacement	NA	12 feet, 1,726 feet
18	South/1000 North Southern Option	Replacement	NA	12 feet, 1,372 feet
19	South/1000 North Northern Option	Replacement	NA	16 feet, 3,282 feet
19	South/1000 North Southern Option	Replacement	NA	16 feet, 4,442 feet
20	South/both options	Replacement	NA	14 feet, 4,250 feet
21	South/both options	Replacement	NA	14 feet, 4,524 feet

Figure 3.22-1. Noise Wall Evaluation (1 of 3)

Figure 3.22-2. Noise Wall Evaluation (2 of 3)

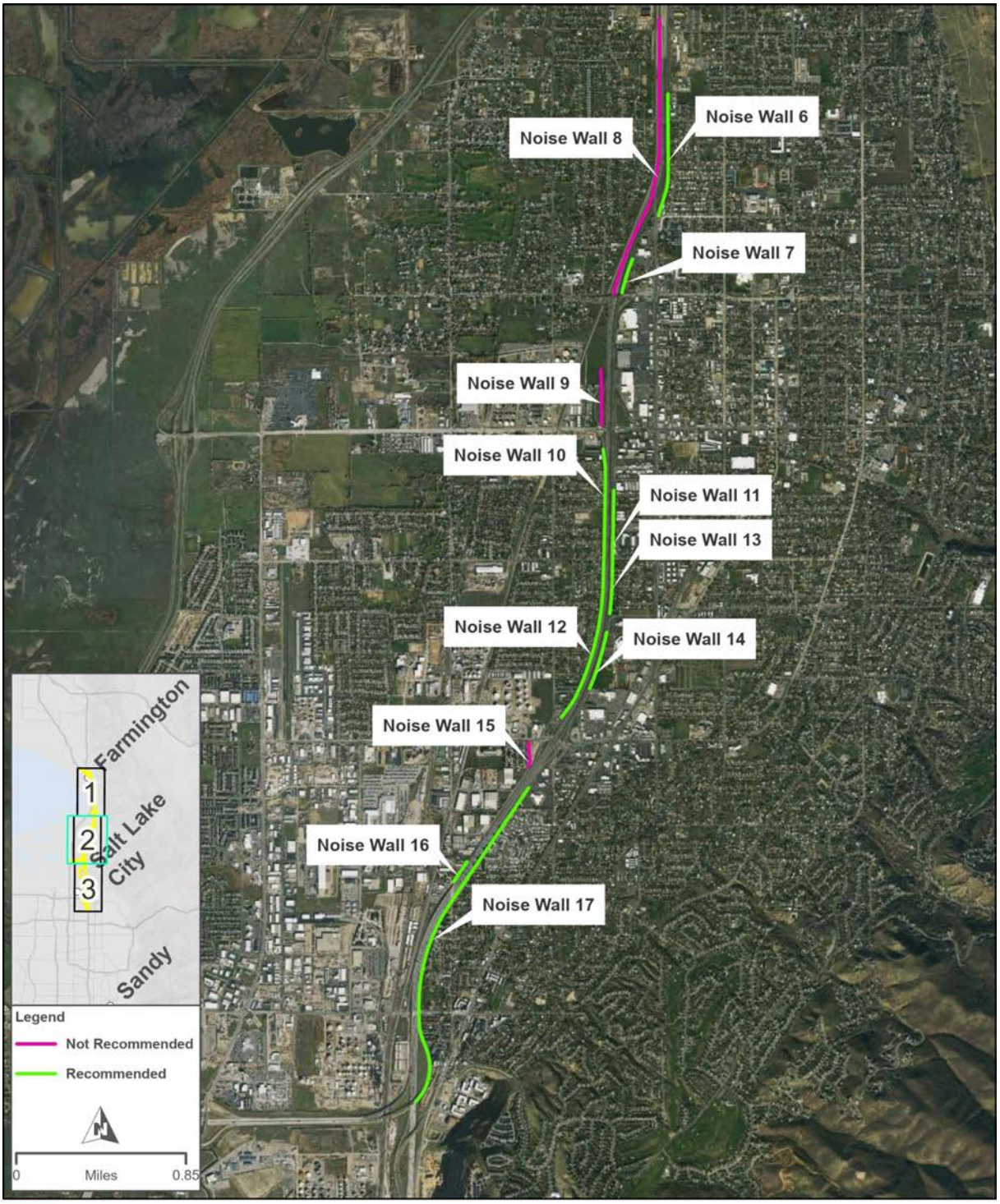
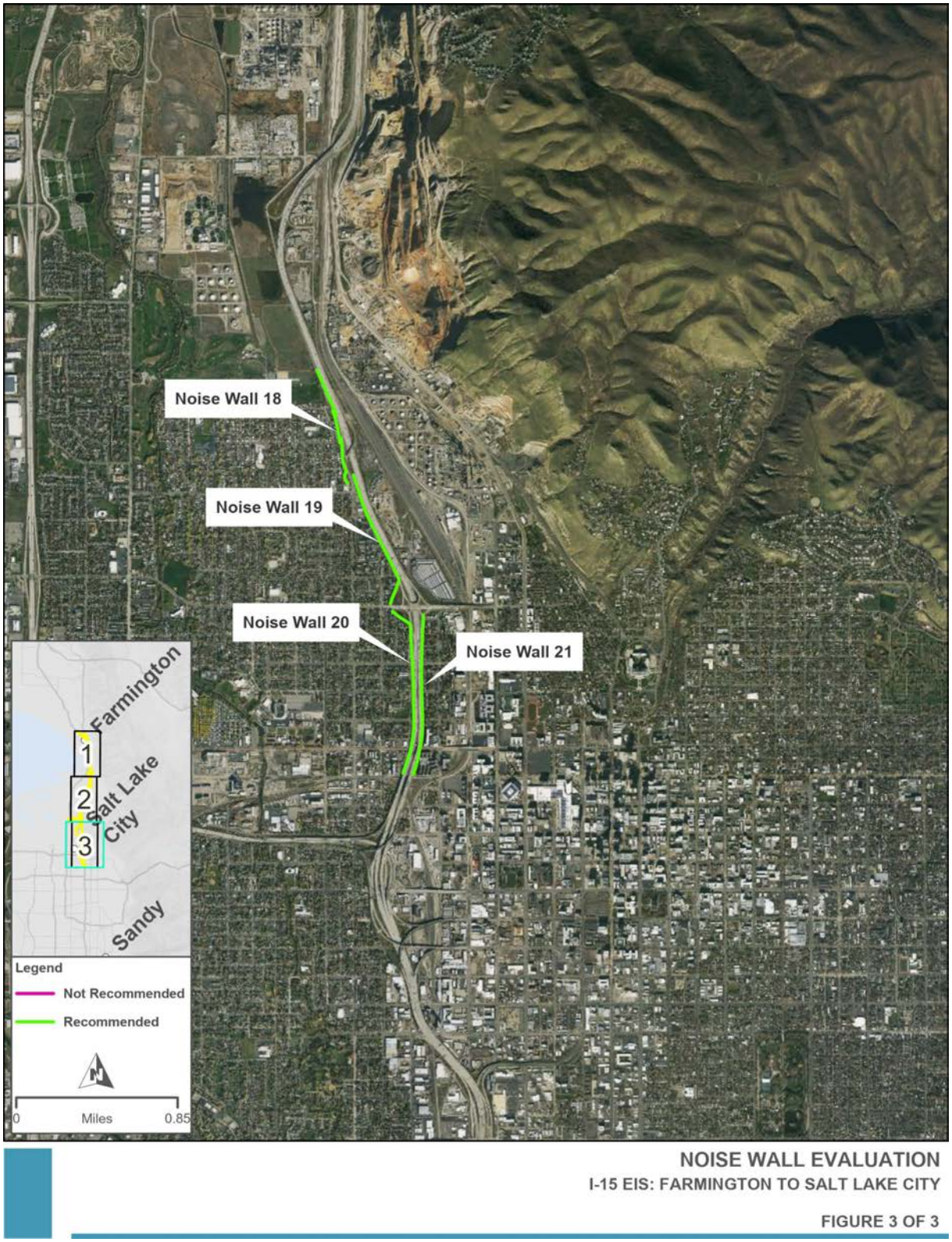


Figure 3.22-3. Noise Wall Evaluation (3 of 3)



3.22.10 Mitigation Measures for Impacts to Historic and Archaeological Resources

3.22.10.1 Mitigation Measures for Impacts to Eligible Historic Architecture Resources

The Action Alternative would have an **adverse effect** on architectural resources. UDOT coordinated with the Utah SHPO, the Farmington Historic Commission, the Clark Lane Historical Preservation Association, the Salt Lake County CLG, tribes, and other consulting parties, as appropriate, to develop specific mitigation measures for the architectural resources that would have adverse effects from the project. These mitigation measures are documented in the MOA, which is included in Appendix 3I, *Cultural Resources Correspondence,* of this EIS.

The following mitigation measures for adversely affected historic buildings will be implemented:

- UDOT will be responsible for documenting the following buildings: 399 W. State Street in Farmington, 409 South 500 West in Bountiful, 1090 North 500 East in North Salt Lake, and 825 N. Warm Springs Road in Salt Lake City. The buildings will be documented according to the Utah State Intensive-level Survey Standards (ILS) as required by the Utah SHPO. Documentation will include completed historic site forms, which will be based partly on title searches and obituary research, photographs of the exterior of the buildings, a sketch map of the property layout, aerial photograph maps indicating the location of the buildings, and a U.S. Geological Survey map (scale: 1:24,000) showing the location of the buildings. The detailed documentation will also include the history of its occupants and uses since it was constructed.
- UDOT will develop an addendum to the Farmington Main Street Historic District nomination to include properties located between the Main Street and Clark Lane Historic Districts along State Street from Main Street to 200 West in Farmington. The addendum will include a reconnaissance-level survey of the properties to be added to the district, research to determine significance, and completion of the National Register of Historic Places nomination form.
- UDOT will contribute $8,000 to the Farmington Historic Museum to support digitization, archival, and exhibit efforts. Digitization may include scanning documentation of historic properties in the historic districts, family histories, or photographs and the archival digital storage of these documents.

UDOT will replant all trees along State Street in Farmington and in the Clark Lane National Register District that are removed as part of the Action Alternative.

3.22.10.2 Mitigation Measures for Impacts to Archaeological Sites

The Union Pacific Railroad tracks, the Denver & Rio Grande Western Railroad tracks, and a historic trolley line are the eligible archaeological sites that would be impacted by the project. The project proposes to bridge most of the railroad crossings and the historic trolley crossing. The project's two at-grade railroad crossings already exist. Because the Action Alternative has been designed to have **no adverse effect** on archaeological sites, no specific mitigation measures are necessary.

3.22.11 Mitigation Measures for Impacts to Water Quality and Water Resources

UDOT proposes the following mitigation measures to help ensure that surface water and groundwater quality is maintained.

- UDOT or its design consultants would follow all applicable requirements of UDOT's *Stormwater Quality Design Manual* (UDOT 2021) for the design of BMPs to meet MS4 permit and groundwater permit-by-rule requirements.
- UDOT or its design consultants would follow UDOT's *Drainage Manual of Instruction* for the design of stream crossings and culverts.
- UDOT or its construction contractors would prepare SWPPPs and obtain a UPDES permit for stormwater discharges associated with construction activities. Restoration efforts would also be monitored to ensure successful revegetation as typically required by an SWPPP.
- If construction activities require dewatering that would discharge project water to surface waters, UDOT or its construction contractors would obtain a UPDES Construction Dewatering or Hydrostatic Testing General Permit.
- UDOT would visually inspect and maintain stormwater quality BMPs so that they are functioning properly. These BMPs would likely include detention basins; however, other BMPs from UDOT's *Stormwater Quality Design Manual* might be chosen during the final design phase of the project.
    - During construction, inspectors for the project would certify that the BMPs were installed according to contract documents and UDOT standards.
    - After construction, UDOT would document and maintain records of inspections, any deficiencies identified during inspections, and the repairs performed on the BMPs.
- UDOT would comply with the Clean Water Act Section 404 permit, including any required Section 401 Water Quality Certifications and applicable Stream Alteration Permits for activities placing fill into waters of the United States and altering natural stream bed and banks.
- UDOT would maintain wetland hydrology and existing surface water conveyance patterns through the installation of culverts or other engineering alternatives through the roadway embankment.
- UDOT would collaborate with the public water system owners that have drinking water source protection zones in place that might be impacted by the Project during final design and construction to mitigate any impacts to water distribution infrastructure.
- UDOT would coordinate with the owners of any impacted water right points of diversion during final design and construction to protect or replace the impacted points of diversion as necessary.
- UDOT would design and implement countermeasures to mitigate potential impacts to a stream's natural flow pattern, velocity, profile, channel stability, aquatic habitats, streambank vegetation, and riparian habitats that could result from replacing, lining, extending, or repairing conveyance structures for the project.

3.22.12 Mitigation Measures for Impacts to Ecosystem Resources

UDOT's best practices for project development include the following mitigation measures for ecosystem resources.

3.22.12.1 Mitigation Measures for Vegetation Impacts

All of the segment options would remove vegetation and could also introduce noxious species into the surrounding areas. To prevent further, permanent effects, UDOT would mitigate temporary impacts to vegetation once construction is complete and no further disturbance is anticipated. Mitigation would include the following measures:

- All fill materials brought onto the construction site would be required to be clean of any chemical contamination per UDOT's General Standard Specifications, Section 02056, *Embankment, Borrow, and Backfill*. Topsoil used for roadside stabilization or landscaping must meet UDOT's General Standard Specifications, Section 02912, *Topsoil*.
- The contractor would rip and stabilize any compacted soil and reseed it with native seed mixes.
- The contractor would be required to follow noxious weed mitigation and control measures identified in the most recent version of UDOT Special Provision Section 02924S, *Invasive Weed Control*.
- The contractor would stabilize all disturbed areas by following UDOT Standards, including topsoil, seeding, and installation of appropriate erosion-control measures.

3.22.12.2 Mitigation Measures for Terrestrial and Aquatic Wildlife Impacts

UDOT would implement the following mitigation measure to conserve and minimize impacts to migratory birds and in furtherance of Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*:

- Trees and shrubs would be removed during the non-nesting season (about August 15 to April 1). If this is not possible, UDOT or its contractor would arrange for preconstruction nesting surveys, to be conducted no more than 10 days before ground-disturbing activities, by a qualified wildlife biologist of the area that would be disturbed to determine whether active bird nests are present. If active nests are found, the construction contractor would coordinate with the UDOT Natural Resources Manager/Biologist to avoid impacts to migratory birds.

3.22.12.3 Mitigation Measures for Aquatic Resources Impacts

In order to fill jurisdictional wetlands and other aquatic resources as part of the project, UDOT must prepare a Clean Water Act Section 404 permit application and submit it to USACE for approval before construction. The permit application must contain a compensatory mitigation plan that describes the proposed mitigation efforts and how they would offset the functions and values eliminated by the selected alternatives. Compensatory mitigation could include any one or a combination of the following five methods: restoring a previously existing wetland or other aquatic site, enhancing an existing aquatic site's functions, establishing (that is, creating) a new aquatic site, preserving an existing aquatic site, and/or purchasing credits from an authorized wetland mitigation bank.

Potential temporary construction impacts to aquatic resources would be minimized through consideration of construction methods and use of BMPs such as silt fences and other erosion-control features in areas adjacent to wetlands and streams. Any necessary temporary construction impacts to aquatic resources that are authorized by a Clean Water Act Section 404 permit would be restored through regrading the ground surface to natural contours and revegetating disturbed areas.

3.22.12.4 Threatened and Endangered Species Commitments

Since no federally threatened or endangered species and no critical habitat were identified in the ecosystem resources evaluation area, no mitigation is proposed.

3.22.13 Mitigation Measures for Impacts to Floodplains

UDOT and/or its construction contractor would take measures to reduce floodplain impacts and to ensure that, if the Action Alternative is selected, the alternative complies with all applicable regulations (see Section 3.13.2.2, Executive Order 11988, *Floodplain Management*). These mitigation measures would include the following:

- The Action Alternative would require a number of stream and floodplain crossings in the same locations where they presently exist as well as several new stream and floodplain crossings. UDOT would determine whether existing bridges and culverts need to be replaced as a part of the Action Alternative. Where new or rehabilitated bridges and culverts are included in the Action Alternative, the design would follow FEMA requirements and the requirements of UDOT's *Drainage Manual of Instruction*, where applicable. Where no Special Flood Hazard Area is defined, culverts and bridges would be designed to accommodate a 50-year (2%-annual-chance) or greater-magnitude flood. Where regulatory floodplains are defined, hydraulic structures would be designed to accommodate at least a 100-year (1%-annual-chance) flood. In accordance with Executive Order 14030, UDOT would also evaluate the floodplains under the FFRMS during the final design of the drainage and stormwater facilities associated with the Action Alternative.
- Stream alteration permits would be obtained for stream crossings as required by the Utah Division of Water Rights to satisfy state regulations, and in some circumstances might also be used to meet Clean Water Act Section 404 permitting requirements (through use of Army Corps of Engineers Programmatic General Permit 10).
- Floodplain development permits would be obtained for all locations where the proposed roadway embankment or structural elements would encroach on a regulatory floodplain. FEMA requires that construction within a floodway must not increase the base (100-year) flood elevation. FEMA Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) processes would be executed in compliance with 44 CFR Sections 60.3 and 65.12 as necessary based on hydrologic and hydraulic analyses and the nature of anticipated changes in base flood elevation and/or floodplain limits. The LOMR process takes place after construction impacts have occurred to modify and update an effective floodplain map. The CLOMR process (if required) must be completed before construction impacts take place to receive FEMA's concurrence that, if the selected alternative is

constructed as designed, a LOMR could be issued to modify and update the effective floodplain map. The following cases apply:

  - For areas of Zone A floodplain impacts, the approach would be to analyze existing and proposed conditions and design project features such that compliance is achieved, or that a CLOMR is not required, as much as possible. In these areas, FEMA performed floodplain mapping without publishing base flood elevations or delineating a floodway. The absence of this information places the burden on UDOT to perform hydrologic and hydraulic analyses consistent with FEMA standards. These analyses would confirm or refine the FEMA floodplain mapping and could increase or decrease the estimate of affected areas.
  - For areas of Zone AE, AH, and AO floodplain impacts, the approach would be to analyze proposed conditions relative to effective floodplain mapping (with base flood elevations and ponding depths defined) and design project features such that compliance is achieved, or that a CLOMR is not required, as much as possible. Any action that would increase the water surface elevation within a floodway (for the 1%-annual-chance event) would require that a CLOMR is prepared and accepted by FEMA prior to the start of construction and issuance of a floodplain development permit.

- UDOT would obtain flood-control permits from Davis County Public Works for all work that would take place within a county flood-control facility to certify that plans and specifications meet the requirements of the Davis County Flood Control Master Plan. UDOT would also obtain flood-control permits from Salt Lake County for any actions occurring within 20 feet of a Salt Lake County–controlled waterway.
- Roadway elevations would be a minimum of 2 feet above adjacent floodplain elevations, where those elevations are defined, so that flooding would not interfere with a transportation facility needed for emergency vehicles or evacuation.
- Walls would be designed and constructed to minimize longitudinal floodplain impacts.

3.22.14 Mitigation Measures for Impacts to Hazardous Materials and Hazardous Waste Sites

UDOT's best practices for project development include the following mitigation measures for hazardous materials and hazardous waste sites.

If the Action Alternative is selected, site investigations would be conducted by UDOT during the final design phase of the project to confirm the presence of contamination and determine potential risks to construction, if any, and the appropriate remedial measures. In the case of an identified chemical hazard, UDOT would negotiate the site remedy with the property owner before property is acquired and disturbed by construction and through possible coordination with EPA and DERR.

Previously unidentified sites or contamination could be encountered during construction. The construction contractor would implement measures to prevent the spread of contamination and to limit worker exposure. In such a case, all work would stop in the area of the contamination according to UDOT Standard Specifications, and the contractor would consult with UDOT and DERR to determine the appropriate

remedial measures. Hazardous materials would be handled according to UDOT Standard Specifications and the requirements and regulations of DERR.

During construction, coordination would take place with UDOT, EPA, and/or DERR, the construction contractor, and the appropriate property owners. This coordination would involve determining the status of the sites of concern, identifying newly created sites, identifying the nature and extent of remaining contamination (if any), and minimizing the risk to all parties involved. Environmental site assessments might be conducted at the sites of concern to further evaluate the nature and extent of contamination and to better identify the potential risks of encountering hazardous materials when constructing the selected alternative.

Engineering controls (such as dust mitigation, temporary soil covers, and groundwater extraction) and personal protective equipment for construction workers would be used to reduce the potential for public or worker exposure to hazardous materials as determined necessary by UDOT.

3.22.15 Mitigation Measures for Impacts to Visual Resources

UDOT proposes to implement mitigation to include the following. All aesthetic treatments would be completed in accordance with UDOT Policy 08A-03, *Project Aesthetics and Landscaping Plan Development and Review* (UDOT 2014a), and UDOT's *Aesthetics Guidelines* (UDOT 2014b). UDOT's policy is to set a budget for aesthetics and landscape enhancements based on the aesthetics guidelines. The aesthetic features considered during the final design phase of a project could include lighting; vegetation and plantings (such as street trees); the color of bridges, structures, and retaining walls; and other architectural features such as railings.

Aesthetic treatments are typically evaluated during the final design phase of the project after an alternative is selected in the project's Record of Decision and funding has been allocated for the project. UDOT would coordinate with the local municipalities to determine whether the desired aesthetics can be implemented.

3.22.16 Mitigation Measures for Energy Impacts

Due to improved fuel economy in the future, the energy used with the Action Alternative would be less than the energy used with the existing conditions. No mitigation measures for energy impacts are proposed.

3.22.17 Mitigation Measures for Construction Impacts

The following mitigation measures are currently proposed to be implemented during construction.

3.22.17.1 Mitigation Measures for Construction Phasing

No specific mitigation has been identified for construction phasing. If a phased approach is taken, the project mitigation identified in this EIS is proposed to be implemented for the specific design for each phase. Future mitigation for subsequent phases would take into account the final design for that phase and any changes in regulations or potential improvements to BMPs at the time of implementation.

3.22.17.2 Mitigation Measures for Property and Land Use Impacts from Construction

To the extent possible, the contractor would be required to ensure that irrigation systems remain intact and fully functional. Fencing could be altered during project construction. The contractor would be required to maintain fences and gate operations to protect construction crews and the traveling public during the construction phase. In locations of temporary easements where UDOT would temporarily use private property during construction, UDOT would provide compensation to the landowner for the temporary use.

3.22.17.3 Mitigation Measures for Social Impacts from Construction

Public Safety

A thorough public information program would be implemented to inform the public about construction activities and to reduce impacts. Information would include work hours and alternate routes. Construction signs would be used to notify drivers about work activities and changes in traffic patterns. Construction sequencing and activities would be coordinated with emergency service providers to minimize delays and response times during construction.

Public Services and Utilities

Utility agreements would be completed to coordinate utility relocations. The project specifications would require the contractor to coordinate with the utility companies to plan work so that utility disruptions to a business occur when the business is closed or during off-peak times. Before beginning work, the contractor would be required to contact Blue Stakes to identify the locations of all utilities. The contractor would be required to use care when excavating to avoid unplanned utility disruptions. If utilities are unintentionally disrupted, UDOT would work with the contractor and the utility companies to restore service as quickly as possible.

Travel Patterns

The contractor would be required to develop a maintenance of traffic plan that defines measures to reduce construction impacts to traffic. A general requirement of this plan is that, to the extent reasonably practical, safe access to businesses and residences must be maintained and existing roads must be kept open to traffic unless alternate routes are provided.

Even with the implementation of the maintenance of traffic plan, short-term increases in traffic congestion would occur in the construction area. Road closures would be limited to what is specified in the maintenance of traffic plan as approved by UDOT before the start of construction.

3.22.17.4 Mitigation Measures for Economic Impacts from Construction

Access to businesses would be maintained during the construction and post-construction phases of this project. For each phase of the project, UDOT would coordinate with property owners and businesses to evaluate ways to maintain access while still allowing efficient construction operations. This coordination could entail sharing a temporary access or identifying acceptable timeframes when access is not needed.

Adequate signs would be placed in construction areas to direct drivers to businesses. Other potential mitigation measures for construction impacts include:

- A traffic access management plan developed and implemented by the construction contractor that maintains the public's access to the business during normal business hours
- A frequent newsletter provided to all businesses in the construction area describing the progress of construction and upcoming construction events
- Business access signs that identify business access points within the construction limits
- Meetings with business representatives to inform them of upcoming construction activities and to provide a forum for the representatives to express their concerns with the project

3.22.17.5 Mitigation Measures for Pedestrian and Bicyclist Impacts from Construction

All existing pedestrian and bicyclist facilities including shoulder ways that would be temporarily impacted during construction would be reconstructed as part of the project. The trails and sidewalks and the road shoulders of active construction zones could be closed temporarily during construction. Closures would be limited in duration and construction detours would accommodate pedestrians and bicyclists as well as vehicles. Detours for pedestrians and bicyclists would be as direct as possible to minimize lengthy route deviations.

3.22.17.6 Mitigation Measures for Air Quality Impacts from Construction

Air quality impacts would be generated by a variety of sources during construction. This section describes air quality impact mitigation measures by source.

Construction Materials. Producing and placing construction materials, such as asphalt and concrete, will generate particulate and GHG emissions. The quantification of the lifecycle emissions of materials is based on a number of details not known during the EIS process. The source of specific materials, and their mode of transport to the project site, are not known, and, therefore, the Action Alternative's air quality and GHG impacts are not reasonably quantifiable. As an alternative to the use of new materials, UDOT will consider, during the final design phase of the project, locally derived recycled cement or asphalt materials if they meet UDOT's standards and are cost-effective. Depending on current technology available when the Action Alternative would be constructed, alternative types and sources of materials might be available.

Fugitive Dust. Construction would generate fugitive dust from demolition, excavation, pile driving, paving, dirt on construction vehicle tires, and other construction activities. Measures will be taken by UDOT or its contractor to reduce fugitive dust generated by construction when controlling dust is necessary for the protection and comfort of motorists or area residents. Dust-suppression techniques, such as watering or chemical stabilization of exposed soil, opacity observations and checks, washing vehicle tires, or other dust minimization techniques approved by the Utah Division of Air Quality, would be applied by UDOT or its contractor during construction in accordance with UDOT's Standard Specifications for Road and Bridge Construction, Section 01355, *Environmental Protection*, Part 1.11, *Fugitive Dust* (UDOT 2022b).

Mobile Emissions. Mobile emission sources would occur from the use of construction equipment at the project site, construction vehicles traveling to and from the project site, and vehicles delivering materials or equipment to the project site. Construction vehicle emission impacts could be mitigated through

implementing a comprehensive maintenance of traffic control plan, enforcing emissions standards for fuel and fuel types (for example, low-sulfur fuels), enforcing emissions standards for vehicles and machinery, and retrofitting off-road diesel equipment with diesel-emission control devices. UDOT will consider including measures for mobile emissions on a voluntary or mandatory basis during the final design phase of the project.

3.22.17.7 Mitigation Measures for Noise Impacts from Construction

To reduce temporary noise impacts associated with construction, the contractor would comply with all state and local regulations relating to construction noise, including UDOT's 2023 Standard Specification 00555 for nighttime construction work to reduce the impacts of construction noise on the surrounding community.

3.22.17.8 Mitigation Measures for Water Quality Impacts from Construction

Because more than 1 acre of ground would be disturbed, a UPDES permit and an SWPPP, consistent with UDOT's Standard Specifications for Road and Bridge Construction, Section 01355, *Environmental Protection,* Part 1.9, *Water Resource Permits*, and Part 1.14, *Stormwater Management Compliance*, would be required. The SWPPP would identify measures to reduce impacts to receiving waters from construction activities including site grading, materials handling and storage, fueling, and equipment maintenance. In addition, BMPs could include such measures as silt fences, erosion-control fabric, fiber mats, straw bales, silt drains, detention basins, mulching, and revegetation.

3.22.17.9 Mitigation Measures for Noxious Weeds Impacts from Construction

The contractor would be required to follow UDOT Special Provision 02924S, *Invasive Weed Control*, to minimize construction impacts. To mitigate the possible introduction of noxious and invasive weeds due to construction activities, the contractor will:

- Be required to follow the noxious weed mitigation and control measures identified in UDOT's Standard Specifications for Invasive Weed Control.
- Strictly follow the BMPs to reduce the potential for weed infestations.
- Reseed disturbed areas.

3.22.17.10 Mitigation Measures for Aquatic Resource Impacts from Construction

The Action Alternative would convert aquatic resources to transportation use. In order to fill jurisdictional wetlands and other aquatic resources as part of the project, UDOT must prepare a Clean Water Act Section 404 permit application and submit it to USACE for approval before construction. The permit application must contain a compensatory mitigation plan that describes the proposed mitigation efforts and how they would offset the functions and values eliminated by the selected alternative.

In addition, BMPs such as silt fences and other erosion-control features would be used in areas adjacent to wetlands to mitigate potential temporary construction impacts to wetlands and other waters of the United States. For more information, see Section 3.12, *Ecosystem Resources*.

3.22.17.11 Mitigation Measures for Impacts to Migratory Birds from Construction

Trees and shrubs would be removed during the non-nesting season (about August 15 to April 1). If this is not possible, UDOT or its contractor would arrange for preconstruction nesting surveys, to be conducted no more than 10 days before ground-disturbing activities by a qualified wildlife biologist, of the area that would be disturbed to determine whether active bird nests are present. If active nests are found, the construction contractor would coordinate with the UDOT Natural Resources Manager or biologist to avoid impacts to migratory birds.

For more proposed mitigation measures, see Section 3.12.4.4, *Mitigation Measures*.

3.22.17.12 Mitigation Measures for Cultural Resources Impacts from Construction

In accordance with UDOT's Standard Specifications for Road and Bridge Construction, Section 01355, *Environmental Protection,* Part 1.13, *Discovery of Historical, Archaeological, or Paleontological Objects, Features, Sites or Human Remains*, if cultural resources are discovered during construction, activities in the area of the discovery would immediately stop. The construction contractor would notify UDOT of the nature and exact location of the finding and would not damage or remove the resource. Work in the area of the discovery would be delayed until UDOT evaluates the extent and cultural significance of the site in consultation with the Utah SHPO. The course of action and the construction delay would vary depending on the nature and location of the discovery. Construction would not resume until the contractor receives written authorization from UDOT to continue.

3.22.17.13 Mitigation Measures for Section 4(f) Resource Impacts from Construction

Any Section 4(f) property approved for temporary use during construction would be regraded and revegetated when construction is complete or when the use of the property is no longer required.

3.22.17.14 Mitigation Measures for Section 6(f) Resource Impacts from Construction

Any Section 6(f) property approved for temporary use during construction would be regraded and revegetated when construction is complete or when the use of the property is no longer required.

3.22.17.15 Mitigation Measures for Hazardous Materials Impacts from Construction

If contamination is discovered during construction, mitigation measures would be coordinated according to UDOT Standard Specification 01355, *Environmental Compliance,* Part 1.7, *Hazardous Waste*, which directs the construction contractor to stop work and notify the engineer of the possible contamination. Coordination with UDEQ might be necessary if a discovery is made. Any hazardous materials would be disposed of according to applicable state and federal guidelines.

3.22.17.16 Mitigation Measures for Visual Impacts from Construction

The contractor would prepare and implement an appropriate seeding vegetation and/or landscaping plan to restore or enhance aesthetics after the project is completed.

3.22.17.17 Mitigation Measures for Traffic Impacts from Construction

The contractor would be required to develop a maintenance of traffic plan that defines measures to reduce construction impacts on traffic. A general requirement of this plan is that, to the extent reasonably practical, safe access to businesses and residences must be maintained and existing roads must be kept open to traffic unless alternate routes are provided.

Even with the implementation of the maintenance of traffic plan, short-term increases in traffic congestion would occur in the construction area. Road closures would be limited to what is specified in the maintenance of traffic plan as approved by UDOT before the start of construction. Additional considerations are listed in Section 3.17.3.4, *Mitigation Measures for Economic Impacts from Construction*.

3.22.17.18 Mitigation Measures for Construction Staging and Material Borrow Areas

Because the exact locations of staging areas and sources of fill material are not known, no mitigation is proposed for construction staging and material borrow areas.

3.22.18 Mitigation Measures for Section 4(f) Resources

Table 3.22-2 lists the measures to minimize harm to Section 4(f) Public Parks and Recreation Areas

Table 3.22-2. Measures to Minimize Harm to Section 4(f) Public Parks and Recreation Areas

Park or Recreation Resource	Option(s) with Effect	Avoidance, Minimization, and Mitigation Measures
Ezra T. Clark Park	• Farmington 400 West Option	• Minimizes harm by requiring only partial acquisition of the park on its western edge and avoiding impacts to park features (pavilion, parking lot, and historic monument). • All disturbed areas would be revegetated.
Ezra T. Clark Park	• Farmington State Street Option	• Would require full acquisition; mitigation would be determined through coordination with Farmington City.

(*Continued on next page*)

Table 3.22-2. Measures to Minimize Harm to Section 4(f) Public Parks and Recreation Areas

Park or Recreation Resource	Option(s) with Effect	Avoidance, Minimization, and Mitigation Measures
Farmington Creek Trail	• Farmington 400 West Option	• Trail would be replaced to provide the same connectivity to the segments of the Farmington Creek Trail on the north and south sides of Ezra T. Clark Park. • UDOT would include a new box culvert under 400 West that would be sized to include both the Farmington Creek Trail and Farmington Creek. The 400 West Option will also include a new trail connection for the Farmington Creek Trail in Ezra T. Clark Park to connect to the existing Farmington Creek Trail. If a grade-separated crossing is determined to not be feasible, UDOT would work with Farmington City to identify ways to improve the at-grade crossing of 400 West. Farmington City would be responsible for the new trail connection on the east side of 400 West between the new box culvert and the existing Farmington Creek Trail. UDOT does not consider a potential new grade-separated crossing a Section 4(f) mitigation measure since the Farmington 400 West Option would not require a new crossing of the Farmington Creek Trail. UDOT considers adding a new 400 West grade-separated crossing as a betterment to the existing trail system that can be accommodated with the Farmington 400 West Option. Per discussions with Farmington City staff, UDOT anticipates that, in lieu of UDOT providing funding to Farmington City for impacted properties at Ezra T. Clark Park or other city-owned properties that could be affected by the Action Alternative with the 400 West Option, Farmington City would allow UDOT to direct these funds toward a new grade-separated trail crossing for the Farmington Creek Trail at 400 West up to the cost of the new grade-separated crossing. • UDOT would revegetate any disturbed areas adjacent to the Farmington Creek Trail.
Farmington Creek Trail	• Farmington State Street Option	• Trail would be replaced on the east side of 400 West between 100 North and State Street to provide the same connectivity to the segments of the Farmington Creek Trail on the north and south sides of Ezra T. Clark Park. Signal-controlled crossings at the State Street and 400 West intersection would provide safe crossings of both roads for pedestrians and bicyclists. • UDOT would revegetate any disturbed areas adjacent to the Farmington Creek Trail.
Farmington Junior High School playing fields	• Both north segment options	• All disturbed areas would be revegetated. • Temporary construction easement would be acquired, and UDOT would coordinate with the Davis School District during construction to minimize any impacts to or closures of the playing fields.

(*Continued on next page*)

Table 3.22-2. Measures to Minimize Harm to Section 4(f) Public Parks and Recreation Areas

Park or Recreation Resource	Option(s) with Effect	Avoidance, Minimization, and Mitigation Measures
South Park	• Both north segment options	• Impacts to park recreational features besides the skate park would be avoided. • Any disturbed areas would be revegetated, and irrigation systems would be modified, repaired, or replaced as necessary to ensure that the irrigation system functions comparable to existing conditions. • UDOT would work with Farmington City to provide funding to replace the skate park at a different recreational location in Farmington. • If final design of the Action Alternative results in additional encroachment that would make the softball field unusable in its current location, UDOT would work with Farmington City to determine the distance needed to move the backstop, fencing, diamond, irrigation, play surface, etc., so the softball field would continue to be usable.
Centerville Community Park	• Both north segment options	• Beneficial impact due to new trail overpass of I-15, railroad tracks, and Legacy Parkway that connects to the Legacy Parkway Trail and Denver and Rio Grande Western Trail. • Impacts to park features would be avoided. • All disturbed areas would be revegetated. • UDOT would coordinate with Centerville City to provide replacement property pursuant to Section 6(f) requirements (see Chapter 5, *Section 6(f) Analysis*).
Woods Cross Elementary School playing fields and walking path	• Both north segment options	• All disturbed areas would be revegetated. • Temporary construction easement would be acquired, and UDOT would coordinate with the Davis School District during construction to minimize any impacts or closures to the playing fields and walking path.
Woods Cross High School playing fields	• Both north segment options	• Chain link fence south of the baseball field would be replaced. • UDOT would work with Davis School District to minimize any closures or detours on Wildcat Way when school is in session. • Impacts would be minimized to affect only landscaping and sidewalk on the west edge of the playing fields. UDOT would work with Davis School District to reconfigure baseball fields if the fencing replacement causes spacing issues for the baseball fields. • All disturbed areas would be revegetated.
Hatch Park	• Both south segment options	• UDOT would construct a new sidewalk and bike lane on City-owned property on the north side of Center Street. • No permanent conversion of right-of-way would be needed. • All disturbed areas would be revegetated.
North Gateway Park	• Both south segment options	• Driveway to parking lot would be reconstructed. • Temporary construction easement would be acquired, and UDOT would coordinate Salt Lake City during construction to minimize any closures of the park during construction.
Warm Spring Park	• Both south segment options	• Driveway to parking lot would be reconstructed. • Temporary construction easement would be acquired, and UDOT would coordinate Salt Lake City during construction to minimize any closures of the park during construction.

3.22.19 Mitigation Measures for Section 6(f) Resources

UDOT proposes to implement mitigation to include the following. Converting Section 6(f) land from recreation use to transportation use requires complying with the conversion procedures of the LWCF Act as described in 36 CFR Part 59, *Land and Water Conservation Fund Program of Assistance to States; Post-completion Compliance Responsibilities*, including obtaining substitution recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location. UDOT would comply with all required LWCF Act procedures pertaining to the conversion of Section 6(f) land from outdoor recreation use to transportation use. No construction activities would occur on Section 6(f) land without prior approval from NPS.

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