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Environmental Impact Statement

AND SECTIONS 4(F)/6(F) EVALUATION FOR

Little Cottonwood Canyon

S.R. 210 | Wasatch Boulevard to Alta

in Cottonwood Heights, Sandy, the Town of Alta,
and Salt Lake County, Utah

Volume 4: **Chapters 13–31**

Utah Department of Transportation

UDOT Project No. S-R299(281)

Submitted pursuant to

42 USC 4332(2)(c) and 49 USC 303

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by UDOT pursuant to 23 USC 327 and a Memorandum of Understanding dated January 17, 2017, and executed by FHWA and UDOT.

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Chapter 13: Ecosystem Resources

13.1 Introduction

This chapter describes the ecosystem resources, habitat types, and wildlife species in the ecosystem resources impact analysis area and how these resources would be directly and indirectly affected by the project alternatives.

Ecosystem Resources Impact Analysis Area. The ecosystem resources impact analysis area extends along State Route (S.R.) 210 from its intersection with S.R. 190/Fort Union Boulevard in Cottonwood Heights to its terminus in the town of Alta, including the Alta Bypass Road (for a graphic depiction of the impact analysis area, see Figure 13.3-1, Wildlife Habitat Types in the Ecosystem Resources Impact Analysis Area, on page 13-7). It also includes the area around the gravel pit adjacent to Wasatch Boulevard north of Fort Union Boulevard and the existing park-and-ride lot at 9400 South and Highland Drive. For wildlife habitat, the impact analysis area includes the entirety of Little Cottonwood Canyon.

The areas adjacent to Wasatch Boulevard, the gravel pit, and the park-and-ride lot are primarily residential and commercial developments. From North Little Cottonwood Road through the town of Alta, the impact analysis area includes the wildlife, vegetation, and aquatic resources present in addition to a mix of residential and commercial (ski resort) development.

What is the ecosystem resources impact analysis area?

The ecosystem resources impact analysis area extends along S.R. 210 from its intersection with S.R. 190/Fort Union Boulevard in Cottonwood Heights to its terminus in the town of Alta, including the Alta Bypass Road. It also includes the area around the gravel pit and the existing park-and-ride lot at 9400 South and Highland Drive. For wildlife habitat, the impact analysis area includes the entirety of Little Cottonwood Canyon.

13.2 Regulatory Setting

For a discussion of the Utah Division of Water Rights stream alteration permit program for streams that would be affected by the action alternatives, see Chapter 24, Permits, Reviews, Clearances, and Approvals. For a discussion of Executive Order 11988, *Floodplain Management*, see Chapter 14, Floodplains.

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).

13.2.1 Threatened and Endangered Species

The Endangered Species Act (16 United States Code [USC] Sections 1531–1544) provides for the conservation of threatened and endangered species and the ecosystems on which they depend. Section 9 of the Endangered Species Act prohibits the “taking” of any endangered species without a permit, and Section 3 of the Act defines “taking” broadly to include actions that are not necessarily intended to cause harm to the species (an “incidental taking”).

Section 7 of the Endangered Species Act requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) before taking any action that could 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.

What is critical habitat?

Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species.

Under the Memorandum of Understanding described in Section 1.1, Introduction, in Chapter 1, Purpose and Need, the Utah Department of Transportation (UDOT) has been assigned the Federal Highway Administration's (FHWA) responsibilities for compliance with Section 7 requirements as part of the environmental review process for highway projects in Utah.

If UDOT (acting in the role of FHWA) makes a determination that a proposed action would have "no effect" on a threatened or endangered species, no further consultation is required; this determination does not require concurrence from USFWS. In working with the U.S. Department of Agriculture (USDA) Forest Service, UDOT has determined through the analysis in this Environmental Impact Statement (EIS) that there would be "no effect" on any threatened or endangered species from the project alternatives; therefore, the Endangered Species Act is not pertinent to the S.R. 210 Project (UDOT 2021).

13.2.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act makes it unlawful to take, import, export, possess, sell, purchase, or barter any migratory bird, with the exception of the taking of game birds during established hunting seasons. The law also applies to feathers, eggs, nests, and products made from migratory birds. This law is of particular concern when birds nest on bridges, buildings, signs, lighting structures, or ferry dock structures. Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* (signed by President Bill Clinton on January 10, 2001), directs federal agencies taking actions likely to affect migratory birds to support the Migratory Bird Treaty Act, including requiring agencies to evaluate the effects on migratory birds and species of concern in National Environmental Policy Act (NEPA) studies.

13.2.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act 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.

13.2.4 Clean Water Act

The U.S. Army Corps of Engineers (USACE) developed a definition of waters of the United States in the 1972 Clean Water Act (33 USC Section 1251). *Waters of the United States* are jurisdictional waters and are defined in 40 Code of Federal Regulations (CFR) Section 120.2 as (i) the territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide; (ii) tributaries; (iii) lakes and ponds, and impoundments of jurisdictional waters; and (iv) adjacent wetlands. Under Section 404(b)(1) of the Clean Water Act, wetlands are considered special aquatic sites, and when they meet definition of *adjacent wetland* in 40 CFR Section 120.2 they are considered waters of the United States.

As described in 40 CFR Section 230.1, the objective of the Clean Water Act is to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. Pursuant to the Clean Water Act, USACE has jurisdiction over all waters of the United States. Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into wetlands or other “waters of the United States” without a permit. 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 Section 404 permits pursuant to the Section 404(b)(1) Guidelines, which were issued by the U.S. Environmental Protection Agency (40 CFR Part 230). 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. 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.

13.1.1 Riparian Habitat Conservation Areas Defined in the Revised Forest Plan: Wasatch-Cache National Forest

The *Revised Forest Plan: Wasatch-Cache National Forest* (USDA Forest Service 2003) includes guidelines for Riparian Habitat Conservation Areas (RHCAs). RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems by (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams; (2) providing root strength for channel stability; (3) shading the stream; and (4) protecting water quality. This designation still allows for a full range of activities, but it emphasizes the achievement of riparian management objectives that are identified on a site-by-site basis. These objectives should include riparian vegetation and in-stream habitat condition. The RHCAs, by condition, are defined below.

- **Category 1, Fish-bearing streams:** RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to 300 feet slope distance (600 feet, including both sides of the stream channel).
- **Category 2, Permanently flowing, non-fish-bearing streams:** RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to 150 feet slope distance (300 feet, including both sides of the stream channel).
- **Category 3, Ponds, lakes, reservoirs, and wetlands greater than 1 acre:** RHCAs consist of the body of water or wetland and the area to 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond, or lake.
- **Category 4, Seasonally flowing or intermittent streams, wetlands less than 1 acre, landslides, and landslide-prone areas:** This category includes features with high variability in size and site-specific characteristics. At a minimum, the interim RHCAs must include landslides and landslide-prone areas, 100 feet slope distance in watersheds containing Bonneville or Colorado River cutthroat trout, and 50 feet slope distance for watersheds not containing Bonneville or Colorado River cutthroat trout.

13.3 Affected Environment

13.3.1 Methodology

UDOT used several methods to collect data regarding the elements of the ecosystem that could be affected by the action alternatives. These methods included conducting literature reviews, consulting with resource agency personnel, including from the USDA Forest Service; performing field surveys; and interpreting aerial photographs and maps.

UDOT consulted the Environmental Conservation Online System (USFWS 2020a), the NatureServe Explorer (NatureServe, no date), and the Utah Conservation Data Center (Utah Division of Wildlife Resources, no date) for lists of federally threatened, endangered, or candidate species known to be present in Salt Lake County, Utah, and to determine whether there were existing records of occurrence for these species in the ecosystem resources impact analysis area. In addition, UDOT consulted the Utah Natural Heritage Program (UNHP) for lists of either federally listed or state-listed sensitive species known to be present in the impact analysis area. The official letters from USFWS and UNHP are provided in Appendix 13A, Pertinent Correspondence.

UDOT conducted field surveys for wildlife; vegetation; rare, threatened, and endangered species; and aquatic resources during June and July 2018 and July 2019. The surveys focused on the area along S.R. 210 that is most likely to be directly impacted by the action alternatives. The surveys were conducted in the areas accessible by foot within 125 feet on either side of S.R. 210, in addition to some wider portions encompassing specific proposed alternatives. This area that was surveyed is referred to as the *field survey area*.

UDOT identified, mapped, and delineated wetlands and other aquatic resources in the field survey area using the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast (Version 2.0)* (USACE 2010), and *A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States* (Mersel and Lichvar 2014). Aquatic resource boundaries were mapped through a combination of global positioning system (GPS)-based field mapping (using ArcGIS Collector software and an iPad) and desktop digitization referencing aerial images. These data were also used to calculate the area, lengths, and widths of aquatic resources in the field survey area (UDOT 2019).

UDOT identified RHCAs that have the potential to be impacted by the action alternatives. Potential RHCAs were identified using a GIS stream layer from the wetland delineation data to create buffers around aquatic resources depending on aquatic resource categorization. A 300-foot buffer was created on either side of Little Cottonwood Creek, and 100-foot buffers were created around seasonally flowing tributaries to Little Cottonwood Creek. In the GIS software, the alternative alignments were overlaid onto the RHCA buffers to determine where impacts from the action alternatives might occur.

What is NatureServe?

NatureServe is a nonprofit organization that provides proprietary wildlife conservation-related data, tools, and services to private and government clients, partner organizations, and the public.

What is the field survey area?

The field survey area is the area generally within 100 feet on either side of S.R. 210 that was surveyed during June and July 2018 and July 2019.

To address the potential for indirect impacts outside the field survey area and within the impact analysis area, UDOT collected data from the USDA Forest Service, other resource agencies, and existing resource documents referencing Little Cottonwood Canyon. The Gap Analysis Program (GAP)/LANDFIRE National Terrestrial Ecosystems data set (USGS 2016) was used to create a general, canyon-wide habitat map. This data set includes detailed vegetation and land cover patterns for the continental United States. The data set incorporates the Ecological System classification system developed by NatureServe.

13.3.2 General Overview of the Ecosystem Resources Impact Analysis Area

The Wasatch Mountains are part of the Basin and Range Province. Little Cottonwood Canyon was carved by glacial activity, resulting in the distinct “U” shape of the canyon. The ecosystem resources impact analysis area is considered part of the Wasatch and Uinta Mountains Ecoregion, with the higher elevations being part of the distinct Wasatch Mountain Zone and the lower elevations considered Semiarid Foothills. The elevation of the impact analysis area ranges from over 11,000 feet at the peaks adjacent to the canyon to 5,000 feet along Wasatch Boulevard.

Little Cottonwood Canyon is part of the USDA Forest Service’s Central Wasatch Management Area (USDA Forest Service 2003) and is a valuable watershed for Salt Lake City and the surrounding cities along the Wasatch Front. One of the primary needs for this management area is to provide long-term culinary water to the growing population of the Salt Lake Valley while balancing this need with recreation opportunities for both local and international users. Close to 81% of the land in the canyon is considered National Forest System land, specifically the Uinta-Wasatch-Cache National Forest.

13.3.2.1 Vegetation

13.3.2.1.1 General Plant Species

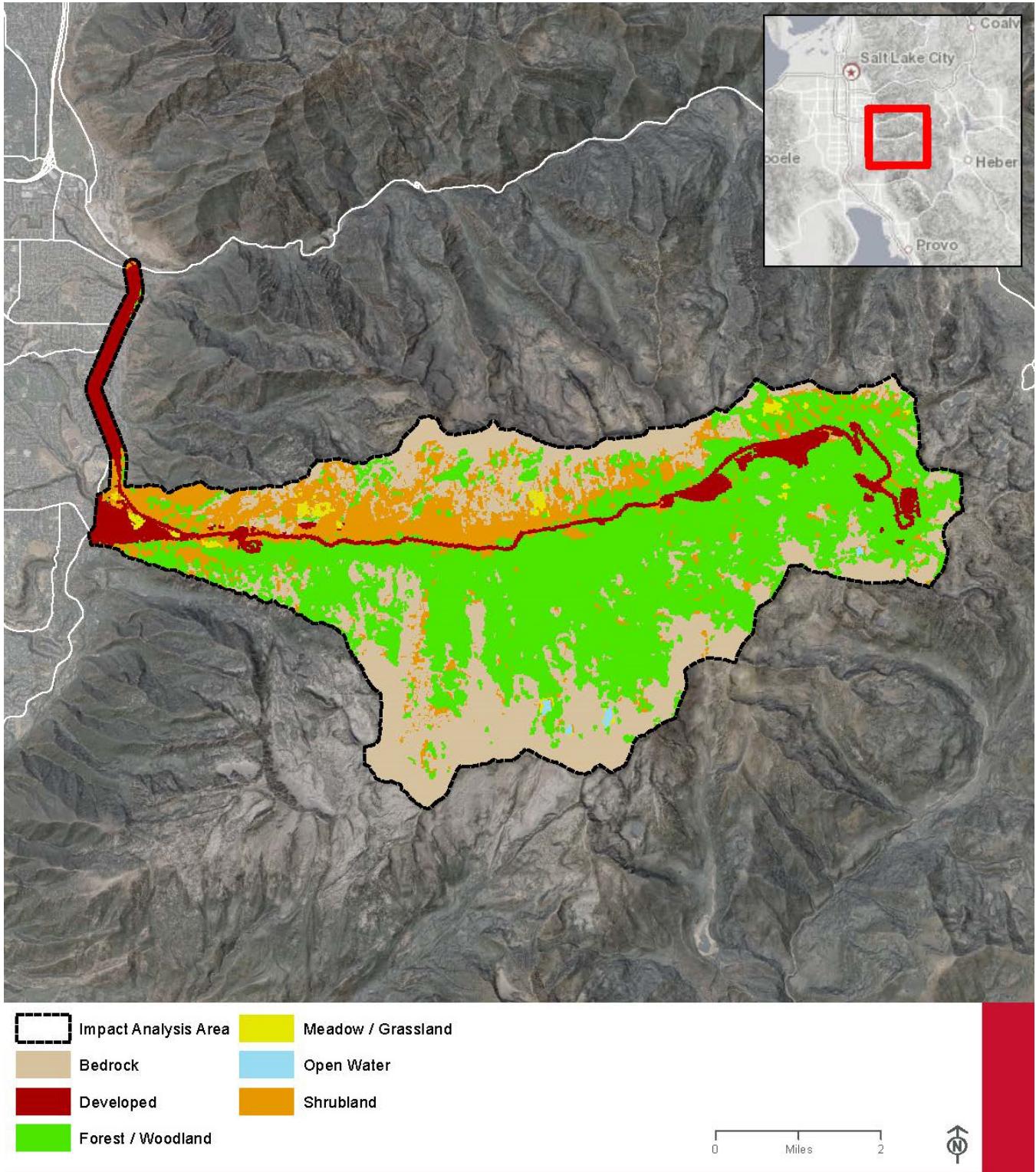
UDOT categorized the ecosystem resources impact analysis area into five broad wildlife habitat types: forest/woodland, shrubland, meadow/grassland, bedrock, and open water. These habitat types, which are based on the GAP/LANDFIRE National Terrestrial Ecosystems data set, make up about 16,926 acres of the 17,802-acre impact analysis area. The remaining 876 acres are developed spaces, which includes existing roads, an aggregate (gravel) mine, business facilities, and residential areas.

Table 13.3-1. Wildlife Habitat Acreage in the Ecosystem Resources Impact Analysis Area

Habitat Type	Acres	Percentage of Existing Habitat
Developed	876.1	5%
Forest/woodland	6,620.5	37%
Shrubland	2,412.0	13%
Meadow/grassland	1,173.7	7%
Bedrock	6,688.6	37%
Open water	31.0	1%
Total	17,801.9	100%

Table 13.3-1 lists, and Figure 13.3-1 below shows, the distribution of these habitat types throughout the impact analysis area. A list of plant species observed in the area is included in the aquatic resources delineation report (UDOT 2019) for the S.R. 210 Project. The five habitat types are described in more detail after the figure.

Figure 13.3-1. Wildlife Habitat Types in the Ecosystem Resources Impact Analysis Area



Forest/woodland Habitat

Forest/woodland habitat totals about 6,620.5 acres and consists of the following GAP land cover types:

- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Bigtooth Maple Ravine Woodland
- Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland
- Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Lodgepole Pine Forest-Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Mountain Mahogany Woodland and Shrubland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

Large areas in the top half of Little Cottonwood Canyon are dominated by quaking aspen (*Populus tremuloides*) forest with an understory of shrubs and/or an herbaceous layer. Some conifer species commonly found with the aspen include subalpine fir (*Abies lasiocarpa*), Engelmann spruce (*Picea engelmannii*), and Douglas fir (*Pseudotsuga menziesii*). Associated shrub species include Saskatoon serviceberry (*Amelanchier alnifolia*), big sagebrush (*Artemisia tridentata*), kinnikinnick (*Arctostaphylos uva-ursi*), western mountain ash (*Sorbus scopulina*), common juniper (*Juniperus communis*), gooseberry currant (*Ribes montigenum*), Wood's rose (*Rosa woodsii*), thimbleberry (*Rubus parviflorus*), mountain snowberry (*Symphoricarpos oreophilus*), and creeping barberry (*Mahonia repens*).

Coniferous forest and woodland is also spread throughout the canyon at higher elevations and on north-facing slopes. Coniferous species include Douglas fir, subalpine fir, white fir (*Abies concolor*), and Engelmann spruce. Quaking aspen is often present as well as kinnikinnick, creeping barberry, Oregon boxleaf (*Paxistima myrsinites*), mountain snowberry, and thimbleberry. Some cooler ravines throughout the canyon are dominated by Rocky Mountain maple (*Acer glabrum*) and bigtooth maple (*Acer grandidentatum*) and also include Gambel oak (*Quercus gambelii*), conifers, and box elder (*Acer negundo*).

Riparian habitat occurs primarily adjacent to Little Cottonwood Creek as well as smaller streams and wetland areas. Riparian tree and shrub species include box elder, water birch (*Betula occidentalis*), narrowleaf cottonwood (*Populus angustifolia*), willow (*Salix*) species, and redosier dogwood (*Cornus sericea*).

Little Cottonwood Creek was identified as an RHCA and is classified as a Class 1 riparian area (USDA Forest Service 2003). The Class 1 rating is defined as the following:

Riparian areas with a high rating should be given special management considerations to protect or enhance the high resource value(s) of the area. This might include exclusion or intensive management of activities such as livestock grazing, concentrated recreation, road construction, dam construction, etc., as appropriate, to maintain or enhance the area for the identified resource values. Any stream with riparian-dependent threatened, endangered, or sensitive species is classified as a Class 1 riparian area.

Shrubland Habitat

Shrubland habitat totals about 2,412.0 acres and includes the following GAP land cover types:

- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Inter-Mountain Basins Big Sagebrush Steppe
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Subalpine-Montane Riparian Shrubland

Much of the north slope of the bottom half of Little Cottonwood Canyon is dominated by shrublands. Gambel oak woodlands are dominated by Gambel oak and can include Saskatoon serviceberry, big sagebrush, alderleaf mountain mahogany (*Cercocarpus montanus*), chokecherry (*Prunus virginiana*), rubber rabbitbrush (*Ericameria nauseosa*), and mountain snowberry. Gambel oak shrublands are common along dry foothills and lower mountain slopes, and they cover much of the south aspect on the bottom half of the canyon. Mountain mahogany woodlands and sagebrush steppe shrublands are intermixed in the Gambel oak shrublands.

Meadow/grassland Habitat

Meadow/grassland habitat totals 1,173.7 acres and consists of the following GAP land cover types:

- Rocky Mountain Subalpine Mesic Meadow
- Southern Rocky Mountain Montane-Subalpine Grassland
- Rocky Mountain Alpine-Montane Wet Meadow
- Invasive Perennial Grassland
- Playa

The meadow/grassland habitat is often found intermixed with forests, woodlands, and shrublands as well as along ponds, lakes, and streams. Some of the canyon's healthiest and most beautiful wildflower communities are in the meadows of Albion Basin (USDA Forest Service, no date). Some of the more conspicuous wildflower species include mountain bluebells (*Mertensia ciliate*), columbine (*Aquilegia* species), western larkspur (*Delphinium occidentale*), blue flax (*Linum perenne*), sticky geranium (*Geranium viscosissimum*), silvery lupine (*Lupinus argenteus*), scarlet gilia (*Ipomopsis aggregate*), paintbrush (*Castilleja*) species, penstemon (*Penstemon*) species, and yarrow (*Achillea millefolium*). Various grasses and graminoid species can be found throughout the meadows and grasslands. Albion Basin is one of the most heavily visited sites during the summer and is the site of an annual wildflower festival.

Bedrock Habitat

Bedrock habitat totals 6,688.6 acres and consists of the following GAP land cover types:

- Rocky Mountain Alpine Bedrock and Scree
- Rocky Mountain Cliff and Canyon

The bedrock habitat is visually conspicuous and occurs at the higher elevations throughout the canyon. Composed of steep cliff faces and rock outcrops, it is largely barren, but some areas are sparsely vegetated with conifers as well as scattered shrubs, forbs, and grasses.

Open Water Habitat

Open water habitat totals 31.0 acres and consists of high alpine lakes located on the south side of Little Cottonwood Canyon. These lakes are Cecret Lake, Lower and Upper Red Pine Lakes, and White Pine Lake. All of these lakes have a high visitation during the summer. Cecret Lake, located in Albion Basin, is easily accessible and has a large number of visitors, especially during wildflower season. Red Pine and White Pine Lakes are accessible via the White Pine Trailhead below the Snowbird resort.

13.3.2.1.2 *Special-status Plant Species*

Threatened, Endangered, and Candidate Species. UDOT's database research and consultation with agencies indicates that no federally listed plant species are known to occur in Salt Lake County.

USDA Forest Service Sensitive Species. Representatives from the Uinta-Wasatch-Cache National Forest provided a list of 16 Forest Service sensitive species that are known or suspected to occur in the Salt Lake Ranger District. These sensitive species are listed in Table 13.3-2 along with information about potentially suitable habitat or documented occurrences in the ecosystem resources impact analysis area. The table also includes 4 additional species from the District's watch list. (A watch list is a list of species that are not currently on a sensitive species list but might be added in the future depending on new information concerning threats to the species, the species' biology, or statewide trends.)

What is potentially suitable habitat?

Potentially suitable habitat has been identified through research and consultation but has not been field-verified as being suitable.

General field surveys did not identify any of the species listed in Table 13.3-2. However, the USDA Forest Service stated that there are documented occurrences of some species in Little Cottonwood Canyon. Therefore, additional site-specific field surveys during the appropriate season will be conducted in 2021, and the results of the surveys will be included in the Final EIS.

Table 13.3-2. USDA Forest Service Sensitive Plant Species and Watch List Species Known or Suspected to Occur in the Salt Lake Ranger District

Common Name ^a	Scientific Name	Preferred Habitat ^b	Potentially Suitable Habitat Present? ^c
Sensitive Species			
Brownie lady's slipper	<i>Cypripedium fasciculatum</i>	Brownie lady's slippers are found on ultrabasic soils, granitics, schists, limestone, and quartz-diorite. Populations have been reported from rocky to loamy soils in damp to dry sites. They are found in mixed evergreen, mixed conifer, and Douglas-fir forests and in pine and black oak stands. Populations are generally found in areas with 60% to 100% shade provided by the tree canopy or shrubs.	Known to occur in Cache, Daggett, Salt Lake, Summit, and Uintah Counties. Not likely to occur in the ecosystem resources impact analysis area.
Burke's draba	<i>Draba burkei</i>	The preferred habitat of Burke's draba includes talus slopes and rocky outcrops of quartzite, limestone, or calcareous shale in Douglas fir, mixed conifer, and maple/oak communities at 5,500 to 9,200 feet elevation.	Endemic to the Wellsville Mountains and northern Wasatch Range in Box Elder, Cache, Morgan, and Weber Counties. Project area is outside this species' known distribution.
Cottam cinquefoil	<i>Potentilla cottamii</i>	Cottam cinquefoils grow in cracks and crevices in quartzite outcrops, often shaded from direct midday sunlight, at 7,500 to 10,400 feet elevation.	Occurs in Box Elder, Juab, and Tooele Counties. Project area is outside this species' known distribution.
Garrett fleabane	<i>Erigeron garrettii</i>	Garrett fleabanes prefer moist cliff faces and crevices, mainly in limestone, at 9,000 to 12,400 feet elevation.	Endemic to the Wasatch Range in Salt Lake and Wasatch Counties. Potentially suitable habitat exists in the ecosystem resources impact analysis area.
Garrett's bladderpod	<i>Lesquerella garrettii</i>	Garrett's bladderpods grow in various subalpine and alpine communities on rocky-gravelly soils of semi-stable, sparsely vegetated talus slopes and basin floors, in crevices along rocky ridges, and (infrequently) in pockets of exposed, coarse soil on patchily vegetated slopes strewn with large rocks and boulders at 8,800 to 12,000 feet elevation.	Occurs in Salt Lake, Utah, and Wasatch Counties. Potentially suitable habitat exists in the ecosystem resources impact analysis area.
Lesser yellow lady's slipper	<i>Cypripedium parviflorum</i>	Lesser yellow lady's slippers grow in a variety of habitats from shady, damp forest understories of mixed deciduous and coniferous forests to open meadows and along streams in acidic soils at about 4,400 to 5,280 feet elevation.	Known to occur in Cache, Salt Lake, and Utah Counties. Potentially suitable habitat exists in the ecosystem resources impact analysis area.
Rockcress draba	<i>Draba globosa</i>	Rockcress drabas grow in rock pockets, open clay areas, swales, talus, alpine tundra, and meadows at 11,000 to 12,500 feet elevation.	Known to occur in Daggett, Duchesne, Juab, Salt Lake, Summit, Uintah, Utah, and Wasatch Counties. Potentially suitable habitat exists in the ecosystem resources impact analysis area.

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Table 13.3-2. USDA Forest Service Sensitive Plant Species and Watch List Species Known or Suspected to Occur in the Salt Lake Ranger District

Common Name ^a	Scientific Name	Preferred Habitat ^b	Potentially Suitable Habitat Present? ^c
Slender moonwort	<i>Botrychium lineare</i>	The preferred habitat of slender moonwort is highly variable. Western populations tend to occur at high elevations (about 4,900 to 9,800 feet) in meadows or roadsides with limestone-influenced substrates.	Known only from two historic collections in Utah in Duchesne and Salt Lake Counties. Potentially suitable habitat exists in the ecosystem resources impact analysis area.
Utah ivesia ^d	<i>Ivesia utahensis</i>	Utah ivesias grow on arid, steep, highly eroded and eroding slopes, often in quartzite talus, at 10,500 to 11,800 feet elevation.	Endemic to the central Wasatch Range, including Little Cottonwood Canyon. Documented occurrence in the ecosystem resources impact analysis area.
Wasatch draba ^d	<i>Draba brachystylis</i>	The preferred habit of Wasatch draba includes moist locations on rocky slopes in aspen and white fir/Douglas fir communities at 5,500 to 9,850 feet elevation.	Found in Cache, Duchesne, Juab, Salt Lake, and Utah Counties. Documented occurrence in the ecosystem resources impact analysis area.
Wasatch fitweed ^d	<i>Corydalis caseana</i> ssp. <i>brachycarpa</i>	Wasatch fitweeds grow in or along streams, including gravel bars, at 6,200 to 10,000 feet elevation.	Endemic to Salt Lake, Summit, Utah, Wasatch, and Weber Counties. Documented occurrence in the ecosystem resources impact analysis area.
Wasatch jamesia ^d	<i>Jamesia americana</i> var. <i>macrocalyx</i>	Wasatch jamesias grow in mountain brush and spruce-fir communities, in cracks and crevices of rocky slopes, and often in granite or limestone cliffs at 6,600 to 9,900 feet elevation in the Wasatch Mountains.	Endemic to the Wasatch Mountains in Salt Lake, Utah, and Wasatch Counties as well as the Deep Creek Mountains in Juab and Tooele Counties. Documented occurrence in the ecosystem resources impact analysis area.
Wasatch pepperwort ^d	<i>Lepidium montanum</i> var. <i>alpinum</i>	Wasatch pepperworts are typically found in damp, rocky crevices at high elevations in mountain brush and spruce-fir communities.	Endemic to the Wasatch Mountains in Salt Lake, Utah, and Wasatch Counties as well as Paiute County. Documented occurrence in the ecosystem resources impact analysis area.
Wasatch shooting star	<i>Dodecatheon dentatum</i> ssp. <i>utahense</i>	Wasatch shooting stars prefer shady, moist, mossy places in cracks and crevices of limestone and quartz outcrops on thinly layered soils where water is seeping or flowing, and often in the spray of waterfalls, from 6,600 to 9,500 feet elevation.	Restricted to the Wasatch Range in Salt Lake County. Potentially suitable habitat exists in the ecosystem resources impact analysis area.

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Table 13.3-2. USDA Forest Service Sensitive Plant Species and Watch List Species Known or Suspected to Occur in the Salt Lake Ranger District

Common Name ^a	Scientific Name	Preferred Habitat ^b	Potentially Suitable Habitat Present? ^c
Wheeler's angelica	<i>Angelica wheeleri</i>	Wheeler's angelicas prefer wet areas of riparian communities or in seeps and springs at elevations ranging from 5,000 to 10,000 feet.	Endemic to the Wasatch Front in Cache, Juab, Sevier, Tooele, Utah, and Wasatch Counties. Potentially suitable habitat exists in the ecosystem resources impact analysis area.
Wood aster	<i>Tonestus kingii</i> var. <i>barnebyana</i>	The preferred habitat of wood aster is Douglas fir, mountain brush, and cottonwood communities at 6,000 to 10,000 feet elevation.	Occurs in Juab and Millard Counties. Project area is outside this species' known distribution.
Watch List Species			
Broadleaf beardtongue ^d	<i>Penstemon platyphyllus</i>	Broadleaf beardtongues grow in open, rocky sites in mountain brush communities in canyons and foothills at 4,800 to 8,800 feet elevation.	Known to occur in Davis, Duchesne, Morgan, Salt Lake, Tooele, Utah, Wasatch, and Weber Counties. Documented occurrence in the ecosystem resources impact analysis area.
Sand fleabane ^d	<i>Erigeron arenarioides</i>	Sand fleabanes grow in crevices of limestone and quartzite outcrops in the Wasatch Mountains at 4,200 to 10,000 feet elevation.	Known to occur in Box Elder, Davis, Duchesne, Morgan, Salt Lake, Summit, Tooele, Utah, Wasatch, and Weber Counties. Documented occurrence in the ecosystem resources impact analysis area.
Spruce wormwood	<i>Artemisia norvegica</i>	The preferred habitat of spruce wormwood includes spruce fir, lodgepole pine, and alpine tundra communities at 10,700 to 12,000 feet elevation.	Occurs in the Uinta Mountains in Duchesne and Summit Counties. Potentially suitable habitat exists in the ecosystem resources impact analysis area.
Tower rockcress	<i>Arabis glabra</i> var. <i>furcatipilis</i>	Tower rockcresses grow in aspen and aspen/maple communities in limestone sandy clay at 5,200 to 6,300 feet elevation.	Occurs in Cache and Salt Lake Counties. Potentially suitable habitat exists in the ecosystem resources impact analysis area.

^a Sources: Species lists provided by USDA Forest Service (HDR 2018; also see table note d)

^b Sources: NatureServe, no date; Utah Division of Wildlife Resources, no date

^c Sources: NatureServe, no date; Utah Division of Wildlife Resources, no date; Utah Native Plant Society, no date

^d Information about these sensitive plant species was provided by the USDA Forest Service in October 2020. (These data are considered sensitive and are not available for public review).

13.3.2.2 Terrestrial and Aquatic Wildlife

13.3.2.2.1 General Wildlife Species

Large mammals found in Little Cottonwood Canyon include mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), moose (*Alces alces*), mountain goats (*Oreamnos amreicanus*), coyotes (*Canis latrans*), cougars (*Felis concolor*), and black bears (*Ursus americanus*). Smaller animals include raccoons, skunks, foxes, badgers, marmots, pika, porcupines, beavers, rattlesnakes, lizards, rabbits, squirrels, bats, and mice.

Birds are abundant throughout the ecosystem resources impact analysis area. Table 13.3-3 lists the bird species that were identified in the field survey area during field surveys.

Table 13.3-3. Bird Species Identified in the Field Survey Area during Field Surveys

Common Name	Scientific Name	Common Name	Scientific Name
American dipper	<i>Cinclus mexicanus</i>	Pine siskin	<i>Spinus pinus</i>
American robin	<i>Turdus migratorius</i>	Red-tailed hawk	<i>Buteo jamaicensis</i>
Black-billed magpie	<i>Pica hudsonia</i>	Ruby-crowned kinglet	<i>Regulus calendula</i>
Black-capped chickadee	<i>Poecile atricapillus</i>	Song sparrow	<i>Melospiza melodia</i>
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>	Steller's jay	<i>Cyanocitta stelleri</i>
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>	Swainson's thrush	<i>Catharus ustulatus</i>
Broad-tailed hummingbird	<i>Selasphorus platycercus</i>	Turkey vulture	<i>Cathartes aura</i>
Brown creeper	<i>Certhia americana</i>	Violet-green swallow	<i>Tachycineta thalassina</i>
Chipping sparrow	<i>Spizella passerina</i>	Warbling vireo	<i>Vireo gilvus</i>
Dark-eyed junco	<i>Junco hyemalis</i>	Western kingbird	<i>Tyrannus verticalis</i>
Hermit thrush	<i>Catharus guttatus</i>	Western tanager	<i>Piranga ludoviciana</i>
House wren	<i>Troglodytes aedon</i>	Western wood-pewee	<i>Contopus sordidulus</i>
Lazuli bunting	<i>Passerina amoena</i>	White-crowned sparrow	<i>Zonotrichia leucophrys</i>
MacGillivray's warbler	<i>Geothlypis tolmiei</i>	White-throated swift	<i>Aeronautes saxatalis</i>
Northern flicker	<i>Colaptes auratus</i>	Yellow warbler	<i>Setophaga petechia</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	Yellow-rumped warbler	<i>Setophaga coronata</i>
Orange-crowned warbler	<i>Vermivora celata</i>		

During the agency scoping period, none of the agencies identified the impact analysis area as a critical or high wildlife strike area or as a major wildlife migration corridor. UDOT reviewed crash data from the Utah Wildlife-Vehicle Collision Reporter (UDOT and Utah Division of Wildlife Resources, no date) for a period of 2 years (2017–2018) to determine whether there were clusters of wildlife strikes. During the 2-year period, 14 wildlife strikes occurred in the impact analysis area. Seven of these strikes occurred on Wasatch Boulevard, and 7 occurred in Little Cottonwood Canyon. One of the strikes in the canyon occurred about ½ mile east of the canyon entrance, 3 occurred about 1 mile west of Tanners Flat Campground, and 3 occurred between Tanners Flat Campground and the Alta Bypass Road. All of the reported wildlife strikes involved deer.

13.3.2.2.2 Special-status Wildlife Species

Threatened, Endangered, and Candidate Species. UDOT’s database research and consultation with agencies indicates that two federally listed wildlife species, Canada lynx and June sucker, are known to occur in Salt Lake County (Table 13.3-4). However, no suitable habitat for these species was identified in the field survey area during the field surveys conducted during June and July 2018 and June 2019. In addition, USFWS stated that the ecosystem resources impact analysis area is outside the critical habitat for each of these species (for the consultation letter from USFWS, see Appendix 13A, Pertinent Correspondence).

Table 13.3-4. Federally Listed Wildlife Species Known To Occur in Salt Lake County

Common Name ^a	Scientific Name	Federal Status	Preferred Habitat ^b	Suitable Habitat Present? ^b
Canada lynx	<i>Lynx canadensis</i>	Threatened	The preferred habitat of Canada lynxes is boreal and montane regions dominated by coniferous or mixed forest with thick undergrowth, but lynxes also sometimes enter open forest, rocky areas, and tundra to forage for abundant prey. The major limiting factor is the abundance of snowshoe hares.	There is no suitable habitat in the field survey area.
June sucker	<i>Chasmistes liorus</i>	Threatened	June suckers are endemic to Utah Lake and its tributaries (the Provo and Spanish Fork Rivers).	This species is not found in Little Cottonwood Creek. Additionally, there is no downstream habitat or water withdrawals that would impact downstream habitat.

^a Sources: Species list from USFWS (2020a, 2020b)

^b Sources: NatureServe, no date; Utah Division of Wildlife Resources, no date

USDA Forest Service Sensitive Species. Representatives from the Uinta-Wasatch-Cache National Forest provided a list of 18 Forest Service sensitive wildlife species for the Intermountain Region, 7 of which they stated do not have any habitat in the impact analysis area: bighorn sheep (*Ovis canadensis*), gray wolf (*Canis lupus*), boreal owl (*Aegolius funereus*), greater sage-grouse (*Centrocercus urophasianus*), great gray owl (*Strix nebulosi*), Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*), and Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*). The remaining 11 that are known or suspected to occur in Little Cottonwood Canyon are described in Table 13.3-5. Potentially suitable habitat is present in the canyon for 10 of these 11 species. No habitat is present for northern leatherside chubs. No individuals were identified during the field surveys.

Table 13.3-5. USDA Forest Service Sensitive Wildlife Species Known or Suspected To Occur in Little Cottonwood Canyon

Common Name ^a	Scientific Name	Preferred Habitat ^b	Potentially Suitable Habitat Present? ^b
Amphibians			
Columbia spotted frog	<i>Rana luteiventris</i>	Columbia spotted frogs are highly aquatic and are rarely found far from 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.	Potentially suitable habitat exists in the ecosystem resources impact analysis area, and there are records of individuals within a 2-mile radius of the impact analysis area.
Western toad	<i>Anaxyrus boreas</i>	Western toads are found throughout most of Utah and can be found in a variety of habitats including slow-moving streams, wetlands, desert springs, ponds, lakes, meadows, and woodlands.	Potentially suitable habitat exists in the ecosystem resources impact analysis area, and there are records of individuals within a 2-mile radius of the impact analysis area.
Birds			
American three-toed woodpecker	<i>Picoides tridactylus</i>	Three-toed woodpeckers prefer natural coniferous forests with an abundance of insect-infested snags (dead, upright trees) or dying trees for both nesting and foraging. In Utah, this woodpecker nests and winters in coniferous forests, generally above 8,000 feet in elevation.	Potentially suitable nesting habitat might exist at higher elevations in Little Cottonwood Canyon but outside the ecosystem resources impact analysis area. Several individuals have been observed in the upper part of the canyon, and there are records of individuals within a 2-mile radius of the impact analysis area.
Bald eagle	<i>Haliaeetus leucocephalus</i>	Breeding habitat for bald eagles most commonly includes areas close to coastal areas, bays, rivers, lakes, reservoirs, or other bodies of water that reflect the general availability of primary food sources including fish, waterfowl, or seabirds. Nests usually are in tall trees or on pinnacles or cliffs near water. Winter habitat is commonly associated with open water, though some bald eagles use montane areas if upland food resources such as rabbit or deer carrion if readily available.	There is no breeding habitat in the ecosystem resources impact analysis area. but wintering habitat is available. Several individuals have been observed in the upper part of Little Cottonwood Canyon, and there are records of individuals within a 2-mile radius of the impact analysis area.
Flammulated owl	<i>Psiloscops flammeolus</i>	Flammulated owls prefer to nest in open coniferous forests with large, old trees, scattered thickets or shrubs, and clearings.	Potentially suitable habitat exists in the ecosystem resources impact analysis area.
Northern goshawk	<i>Accipiter gentilis</i>	Northern goshawks nest in mature, old-growth forests with more than 60% closed canopy. They nest in a wide variety of forest types including deciduous, coniferous, and mixed forests. Nests are often built near breaks in the canopy at sites with a creek, pond, or lake nearby.	Potentially suitable habitat exists in Little Cottonwood Canyon. Individuals have been observed throughout the canyon, and there are records of individuals within a 2-mile radius of the ecosystem resources impact analysis area.

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Table 13.3-5. USDA Forest Service Sensitive Wildlife Species Known or Suspected To Occur in Little Cottonwood Canyon

Common Name ^a	Scientific Name	Preferred Habitat ^b	Potentially Suitable Habitat Present? ^b
Peregrine falcon	<i>Falco peregrinus</i>	The preferred habitat of peregrine falcons includes open areas ranging from tundra, moorlands, steppes, and seacoasts, especially where there are suitable nesting cliffs, to mountains, open forested regions, and human population centers. These falcons often nest on ledges or holes on the faces of rocky cliffs or crags.	Potentially suitable nesting habitat exists in the cliffs above the project area but outside the ecosystem resources impact analysis area. Individuals have been observed throughout Little Cottonwood Canyon.
Fish			
Bonneville cutthroat trout	<i>Oncorhynchus clarkii utah</i>	Habitat for Bonneville cutthroat trout ranges from high-elevation streams with coniferous and deciduous riparian trees, to low-elevation streams in sage-steppe grasslands containing herbaceous riparian zones, to lakes.	This species occurs in Little Cottonwood Creek in the ecosystem resources impact analysis area.
Southern leatherside chub	<i>Lepidomeda aliciae</i>	Southern leatherside chubs are found in the southeastern portion of the Bonneville Basin. Preferred habitat includes sluggish pools and backwaters, usually over sand or mud, of creeks and small to medium rivers	This species is not known to occur in Little Cottonwood Creek, and there is no habitat in the ecosystem resources impact analysis area.
Mammals			
Spotted bat	<i>Euderma maculatum</i>	Spotted bats live in various habitats from desert to montane coniferous stands, habitats including open ponderosa pine, pinyon-juniper woodland, canyon bottoms, riparian and river corridors, meadows, open pasture, and hayfields. Roosts, including maternity roosts, generally are in cracks and crevices in cliffs.	Potentially suitable habitat exists in the ecosystem resources impact analysis area.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Throughout much of their known range, Townsend's big-eared bats commonly live in mesic habitats characterized by coniferous and deciduous forests. Caves, mines, and buildings are used for maternity and hibernation.	Potentially suitable habitat exists in the ecosystem resources impact analysis area, and there are records of individuals within a 2-mile radius of the impact analysis area.
Arthropods			
Monarch butterfly	<i>Danaus plexippus plexippus</i>	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 (<i>Asclepias</i> spp.) is an essential feature of quality monarch habitat. Common places milkweed occurs include short and tall grass prairies, livestock pastures, agricultural margins, roadsides, wetland and riparian areas, sandy areas, and gardens.	Potentially suitable habitat exists in the ecosystem resources impact analysis area.

^a Source: Species list provided by USDA Forest Service (HDR 2018)

^b Sources: Cornell Lab of Ornithology, no date; NatureServe, no date; Utah Division of Wildlife Resources, no date

Migratory Birds. Table 13.3-6 lists the bird species included on the USFWS Information for Planning and Conservation (IPAC) website that could occur near the ecosystem resources impact analysis area (for the consultation letter from USFWS with the official list of these species, see Appendix 13A, Pertinent Correspondence). The table also describes the preferred habitat for each species and states whether there is potentially suitable habitat in the impact analysis area.

Table 13.3-6. Migratory Birds Known To Occur near the Ecosystem Resources Impact Analysis Area

Common Name ^a	Scientific Name	Preferred Habitat ^b	Potentially Suitable Habitat Present? ^b
Bald eagle	<i>Haliaeetus leucocephalus</i>	Breeding habitat for bald eagles most commonly includes areas close to coastal areas, bays, rivers, lakes, reservoirs, or other bodies of water that reflect the general availability of primary food sources including fish, waterfowl, or seabirds. Nests usually are in tall trees or on pinnacles or cliffs near water. Winter habitat is commonly associated with open water, though some bald eagles use montane areas if upland food resources such as rabbit or deer carrion if readily available.	There is no breeding habitat in the ecosystem resources impact analysis area, but wintering habitat is available. Several individuals have been observed in the upper part of Little Cottonwood Canyon, and there are records of individuals within a 2-mile radius of the impact analysis area.
Black rosy-finch	<i>Leucosticte atrata</i>	Black rosy-finches breed above the timberline in alpine tundra using barren, rocky, or grassy areas and cliffs among glaciers or at the bases of snow fields.	Potentially suitable breeding habitat exists in the ecosystem resources impact analysis area.
Black swift	<i>Cypseloides niger</i>	Black swifts require waterfalls for nesting; typically the falls are permanent but can be intermittent if they flow throughout the breeding season (June to early September). Nesting sites are typically surrounded by coniferous forests (often mixed conifer or spruce-fir forests), but this varies depending on elevation and aspect, and nest sites can include mountain shrub, aspen, or even alpine components. Streams that create the waterfalls are typically mountain riparian habitats.	Two confirmed breeding locations are known in Utah, neither of which is in Little Cottonwood Canyon. However, there is suitable habitat in the waterfalls in the ecosystem resources impact analysis area, and individuals have been observed in the area.
Brewer's sparrow	<i>Spizella breweri</i>	Brewer's sparrows breed primarily in shrub-steppe habitats in Utah and are considered to be shrub-steppe obligates. They also breed in large sagebrush openings in pinyon-juniper habitat or coniferous forests. Breeding habitats are usually dominated by big sagebrush.	Potentially suitable breeding habitat exists in the lower part of Little Cottonwood Canyon and the foothills above Wasatch Boulevard. Individuals have been observed throughout the canyon.
Brown-capped rosy-finch	<i>Leucosticte australis</i>	Brown-capped rosy-finches prefer barren, rocky, or grassy areas and cliffs among glaciers or above the timberline. This bird usually nests in rock crevices or holes in cliffs. It sometimes nests in mine shafts or old abandoned buildings.	Potentially suitable breeding habitat exists in the ecosystem resources impact analysis area. Individuals have been observed in the area.

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Table 13.3-6. Migratory Birds Known To Occur near the Ecosystem Resources Impact Analysis Area

Common Name ^a	Scientific Name	Preferred Habitat ^b	Potentially Suitable Habitat Present? ^b
Golden eagle	<i>Aquila chrysaetos</i>	Golden eagles generally inhabit open and semi-open country such as prairies, sagebrush, arctic and alpine tundra, savannah or sparse woodland, and barren areas, especially in hilly or mountainous regions, in areas with sufficient mammalian prey base and near suitable nesting sites. Nests are most often on rock ledges of cliffs.	Potentially suitable breeding habitat exists in the cliffs in the ecosystem resources impact analysis area. Individuals have not been observed in the area.
Green-tailed towhee	<i>Pipilo chlorurus</i>	Green-tailed towhees live in dense, shrubby habitat. They usually do not live in unbroken forest but can live in open pinyon-juniper forest or, at high elevations, amid scattered small conifers. They also live in sagebrush shrub-steppe, often intermixed with shrubs and trees such as chokecherry, mountain mahogany, juniper, snowberry, and serviceberry. They can live up to about 10,000 feet elevation.	Potentially suitable breeding habitat exists in the shrubby parts of Little Cottonwood Canyon and the foothills above Wasatch Boulevard. Individuals have been observed throughout the canyon.
Lewis's woodpecker	<i>Melanerpes lewis</i>	The preferred breeding habitat of Lewis's woodpeckers consists of open, park-like Ponderosa pine forests as well as burned-over Douglas-fir, mixed conifer, pinyon-juniper, and riparian and oak woodlands. It also lives in the fringes of pine and juniper stands and deciduous forests, especially riparian cottonwoods. Areas with a good understory of grasses and shrubs to support insect prey populations are preferred. Dead trees or stumps are required for nesting.	Potentially suitable habitat exists in Little Cottonwood Canyon. Several individuals have been observed in the canyon.
Olive-sided flycatcher	<i>Contopus cooperi</i>	Olive-sided flycatchers breed in various forest and woodland habitats—taiga, subalpine coniferous forest, mixed coniferous-deciduous forest, burned-over forest, spruce or tamarack bogs and other forested wetlands—and along the forested edges of lakes, ponds, and streams. Most nesting sites contain dead standing trees, which are used as singing and feeding perches. Nests are placed most often in conifers.	Potentially suitable habitat exists in Little Cottonwood Canyon. Individuals have been observed throughout the canyon.
Rufous hummingbird	<i>Selasphorus rufus</i>	The typical breeding habitat for rufous hummingbirds includes coniferous forests, second-growth forests, thickets, and brushy hillsides, with foraging extending into adjacent scrubby areas and meadows with abundant nectar flowers.	Potentially suitable habitat exists in Little Cottonwood Canyon. Individuals have been observed throughout the canyon.
Virginia's warbler	<i>Oreothlypis virginiae</i>	The preferred breeding habitat for Virginia's warblers is in low, brushy areas on dry mountainsides where an herbaceous or woody understory is well-developed. Lower mountain habitats with dense stands of Gambel oak and a relatively high slope are preferred for breeding, although mountain mahogany woodlands, riparian areas, Ponderosa pine forests, and pinyon-juniper woodlands, all with shrubby understories, are also used for breeding. Breeding occasionally occurs in Douglas-fir and aspen habitats with the required shrubby understory.	Potentially suitable habitat exists in Little Cottonwood Canyon. Individuals have been observed throughout the canyon.

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Table 13.3-6. Migratory Birds Known To Occur near the Ecosystem Resources Impact Analysis Area

Common Name ^a	Scientific Name	Preferred Habitat ^b	Potentially Suitable Habitat Present? ^b
Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>	Breeding habitat for Williamson's sapsuckers includes middle- to high-elevation montane and subalpine coniferous forests—including spruce-fir, Douglas-fir, western larch, lodgepole pine, and Ponderosa pine—and also mixed deciduous-coniferous forest with quaking aspens. Nests are usually in dead or decaying pine, fir, larch, or aspen trees.	Potentially suitable habitat exists in Little Cottonwood Canyon. Several individuals have been observed in the upper part of the canyon.
Willow flycatcher	<i>Empidonax traillii</i>	Willow flycatchers are associated with dense riparian deciduous shrub cover separated by open areas. The presence of water (running water, pools, or saturated soils) and willow, alder, or other deciduous riparian shrubs are essential habitat elements. Nests are primarily near slow streams, standing water or seeps, or swampy thickets (especially of willow and buttonbush, but also dogwood, elderberry, hawthorn, rose, tamarisk, and others).	Potentially suitable habitat exists in Little Cottonwood Canyon. Several individuals have been observed in the upper part of the canyon.

^a Source: Species list from USFWS (2020b)

^b Sources: Cornell Lab of Ornithology, no date; NatureServe, no date; Utah Division of Wildlife Resources, no date

13.3.2.3 Waters of the United States

This section summarizes all aquatic resources identified in the area surveyed for aquatic resources. Section 13.3.2.3.4, Jurisdictional Status of Aquatic Resources, identifies which of the delineated aquatic resources are subject to USACE's jurisdiction as waters of the United States. A total of 45 aquatic resource features were identified in the area surveyed for aquatic resources: 13 palustrine wetlands that total 0.84 acre, 4,989 linear feet (2.80 acres) of perennial stream segments (these values include Little Cottonwood Creek and two unnamed perennial streams), 2,820 linear feet (0.44 acre) of intermittent stream segments, two seeps that total 0.01 acre, and 2,129 linear feet (0.25 acre) of ephemeral stream segments.

Table 13.3-7 lists each of the aquatic resource features delineated. Figure 13.3-2 and Figure 13.3-3 show the locations of the aquatic resource features. These resource features are described in detail after the table and figures.

Table 13.3-7. Aquatic Resource Features Summary

Aquatic Resource Feature	Aquatic Resource Feature Type	Cowardin Classification ^a	Waters Type Code ^b	Size (acres)	Length (feet)
Wetlands					
WET-1	Wet meadow	PEM	RPWWN	0.015	—
WET-2	Wet meadow	PEM	RPWWN	0.008	—
WET-3	Wet meadow	PEM	RPWWN	0.075	—
WET-4a	Wet meadow	PEM	RPWWN	0.020	—
WET-4b	Emergent marsh	PEM	RPWWN	0.097	—
WET-4c	Wet meadow	PEM	RPWWN	0.009	—
WET-4d	Shrub-scrub	PSS	RPWWN	0.047	—
WET-4e	Wet meadow	PEM	RPWWN	0.134	—
WET-4f	Wet meadow	PEM	RPWWN	0.011	—
WET-4g	Emergent marsh	PEM	RPWWN	0.018	—
WET-4h	Emergent marsh	PEM	RPWWN	0.009	—
WET-4i	Emergent marsh	PEM	RPWWN	0.310	—
WET-5	Emergent marsh	PEM	RPWWN	0.090	—
Streams					
Little Cottonwood Creek (P-1a to P-1i)	Perennial stream	R3	RPW	2.798	4,989
P-2	Perennial stream	R3	RPW	0.070	166
P-3	Perennial stream	R3	RPW	0.113	323
I-1	Intermittent stream	R4SB	RPW	0.021	133
I-2	Intermittent stream	R4SB	RPW	0.026	142
I-3	Intermittent stream	R4SB	RPW	0.015	90
I-4	Intermittent stream	R4SB	RPW	0.080	427
I-5	Intermittent stream	R4SB	RPW	0.059	545
I-6	Intermittent stream	R4SB	RPW	0.023	284
I-7	Intermittent stream	R4SB	RPW	0.012	329
I-8	Intermittent stream	R4SB	RPW	0.001	45
I-9	Intermittent stream	R4SB	RPW	0.027	168
I-10	Intermittent stream	R4SB	RPW	0.057	304
I-11	Intermittent stream	R4SB	RPW	0.078	169
Deaf Smith Canyon Creek (I-12)	Intermittent stream	R4SB	RPW	0.037	186
E-1	Ephemeral stream	R6	NRPW	0.035	331
E-2	Ephemeral stream	R6	NRPW	0.011	77
E-3	Ephemeral stream	R6	NRPW	0.044	209

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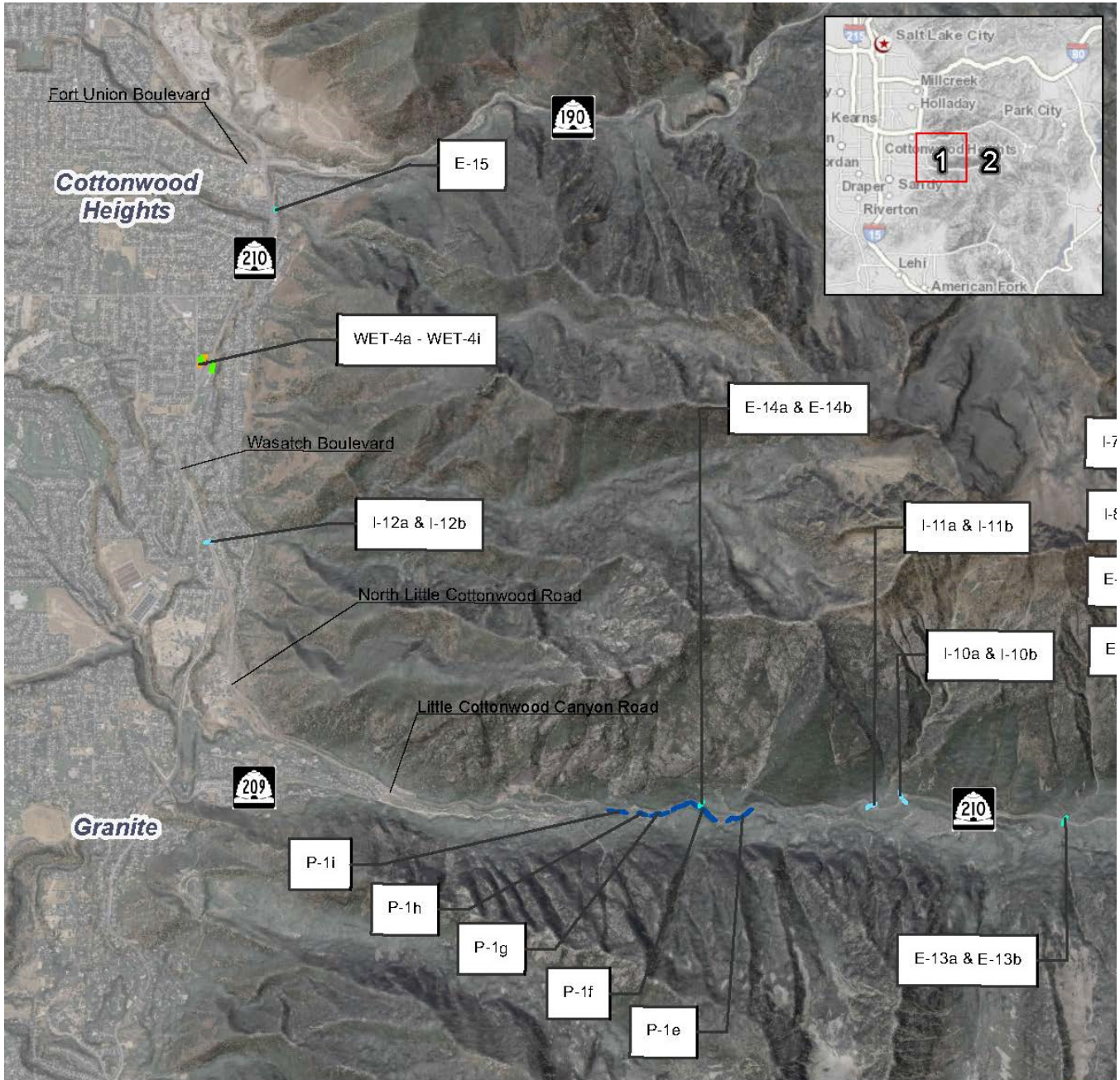
Table 13.3-7. Aquatic Resource Features Summary

Aquatic Resource Feature	Aquatic Resource Feature Type	Cowardin Classification ^a	Waters Type Code ^b	Size (acres)	Length (feet)
E-4	Ephemeral stream	R6	NRPW	0.019	164
E-5	Ephemeral stream	R6	NRPW	0.021	236
E-6	Ephemeral stream	R6	NRPW	0.025	196
E-7	Ephemeral stream	R6	NRPW	0.005	85
E-8	Ephemeral stream	R6	NRPW	0.008	87
E-9	Ephemeral stream	R6	NRPW	0.014	109
E-10	Ephemeral stream	R6	NRPW	0.009	106
E-11	Ephemeral stream	R6	NRPW	0.015	98
E-12	Ephemeral stream	R6	NRPW	0.003	76
E-13	Ephemeral stream	R6	NRPW	0.021	180
E-14	Ephemeral stream	R6	NRPW	0.010	119
E-15	Ephemeral stream	R6	NRPW	0.011	57
Seeps					
S-1	Seep	R4SB	RPW	0.010	157
S-2	Seep	R4SB	RPW	0.0001	5

^a Codes from *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin and others 1979): PEM (palustrine emergent wetland), PSS (palustrine shrub scrub), R3 (upper perennial, riverine), R4SB (intermittent streambed), and R6 (ephemeral water).

^b USACE Sacramento District, Aquatic Resources Spreadsheet "Waters_Type" codes (USACE 2016): RPWWN (wetlands adjacent to but not directly abutting relatively permanent waters [RPWs] that flow directly or indirectly into traditionally navigable waters [TNWs]), RPW (relatively permanent waters that flow directly or indirectly into TNWs), and NRPW (non-RPWs that flow directly or indirectly into TNWs).

Figure 13.3-2. Aquatic Resource Locations in the Ecosystem Resources Impact Analysis Area (1 of 2)

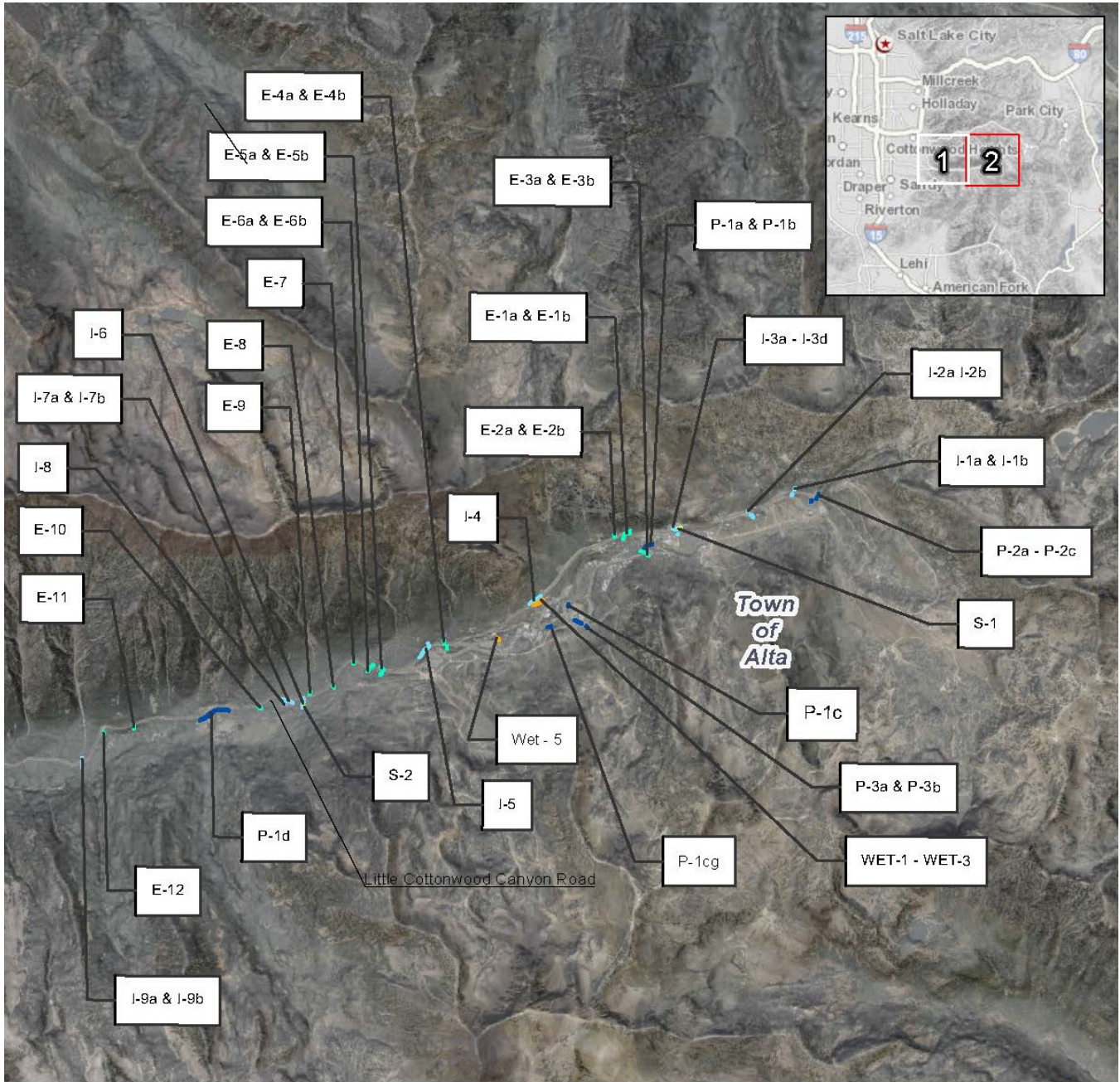


LEGEND

- Emergent Marsh
- Seep
- Ephemeral Stream
- Shrub-Scrub
- Intermittent Stream
- Wet Meadow
- Perennial Stream



Figure 13.3-3. Aquatic Resource Locations in the Ecosystem Resources Impact Analysis Area (2 of 2)



LEGEND

- Emergent Marsh
- Seep
- Ephemeral Stream
- Shrub-Scrub
- Intermittent Stream
- Wet Meadow
- Perennial Stream



13.3.2.3.1 Wetlands

Three general wetland areas were identified during the aquatic resources survey. One area is located toward the upper extent of the field survey area on a slope just below S.R. 210 near Snowbird Resort, the second is located near Snowbird Resort, and the third is in a stormwater drainage basin at the park-and-ride lot at about 3500 East and Wasatch Boulevard. Based on the observed wetland characteristics and on the Cowardin Classification System (Cowardin and others 1979), all delineated wetlands are classified as palustrine.

13.3.2.3.2 Streams

Perennial streams that were delineated include Little Cottonwood Creek (segments P-1a to P-1i), which is formed by its headwater tributaries toward the top of Little Cottonwood Canyon. This creek flows down the canyon into the Salt Lake Valley and is a tributary to the Jordan River. In addition, perennial stream P-2 is a tributary to Little Cottonwood Creek that drains Grizzly Gulch in the upper part of the canyon, and perennial stream P-3 runs near Snowbird and passes under the Alta Bypass Road into Little Cottonwood Creek.

Segments of 12 intermittent and 15 ephemeral streams were also delineated. All but one ephemeral stream are tributaries to Little Cottonwood Creek. Most of the delineated streams cross S.R. 210, and a segment was delineated on each side of S.R. 210 with a culvert in between. One of the 12 delineated intermittent streams is a named stream, and none of the 15 delineated ephemeral streams are named streams.

Deaf Smith Canyon Creek (also known as Little Willow Creek) is a named intermittent tributary to Little Cottonwood Creek that drains Deaf Smith Canyon, which is located between Big Cottonwood Canyon and Little Cottonwood Canyon. Deaf Smith Canyon Creek crosses S.R. 210/Wasatch Boulevard 1 mile north of the entrance to Little Cottonwood Canyon near Golden Hills Avenue.

The other 11 intermittent streams are located in Little Cottonwood Canyon. Fourteen of the 15 delineated ephemeral streams are located in Little Cottonwood Canyon. One ephemeral stream (E-15) is located near the northern end of the field survey area in a drainage below Ferguson Canyon. This ephemeral stream is a tributary to Big Cottonwood Creek. The other 14 ephemeral streams are tributaries to Little Cottonwood Creek.

13.3.2.3.3 Seeps

Two seeps (S-1 and S-2) were delineated in the field survey area. Seep S-1 begins where it discharges from the toe of a slope just north of S.R. 210 and flows along the northern edge of this road for about 157 linear feet until it joins intermittent stream I-3 at a culvert that crosses under the road. Seep S-2 is small feature that begins southeast of intermittent stream I-6 and drains into Little Cottonwood Creek. Seep S-2 is 5 linear feet (0.0001 acre) within the ecosystem resources impact analysis area.

13.3.2.3.4 Jurisdictional Status of Aquatic Resources

All perennial and intermittent streams in the ecosystem resources impact analysis area eventually drain to the Jordan River, which drains to the Great Salt Lake. The Great Salt Lake is a traditional navigable water (TNW). USACE would assert jurisdiction over these delineated waterways as waters of the United States because they meet the definition of *tributaries*, per 40 CFR Section 120.2, as a river or stream that contributes surface water to jurisdictional waters. Based on the Navigable Waters Protection Rule definition of *waters of the United States* in 33 CFR Part 328 and 40 CFR Section 120.2:

- Ephemeral streams are non-jurisdictional waters.
- Seeps that do not pertain to tributaries or adjacent wetlands are non-jurisdictional waters because groundwater is non-jurisdictional.
- Only wetlands that meet the definition of *adjacent wetlands* are considered jurisdictional waters of the United States. The two wetland areas located near Snowbird would not be considered jurisdictional because they are not adjacent to a TNW or tributary.
- The wetland area in the stormwater drainage basin would not be considered jurisdictional because (1) it does not meet the definition of *adjacent wetland* and (2) it is situated with a stormwater control feature that is constructed in upland and designed to manage stormwater runoff.

The official jurisdictional status of delineated aquatic resources is determined by USACE. If an approved jurisdictional determination is requested, USACE would decide the jurisdictional status of delineated aquatic resources under the regulations and guidance that are in effect when the request is made. Once an alternative is selected in the Record of Decision, UDOT will work with USACE regarding appropriate permit requirements and jurisdiction determination.

13.3.2.4 Riparian Habitat Conservation Areas

In September 2020, UDOT conducted a field verification and assessment of RHCAs within the footprints of the action alternatives. To identify RHCA areas, UDOT used stream delineation data and buffered each resource based on the RHCA categories described in Section 13.3.1, Methodology. These resources included Little Cottonwood Creek (a Category 1 stream), which was buffered 300 feet on either side of the stream; Category 2 streams, which were buffered 150 feet on either side of the stream; Category 3 features, which were buffered 150 feet from the edge of the feature; and Category 4 features, which were buffered 100 feet on either side of the feature.

Based on the field survey, 43.09 acres of RHCAs intersect the footprints of the action alternatives. Of these 43.09 acres, 2.30 acres contain riparian habitat and qualify as RHCA habitat. These habitats were generally dominated by Bebb's willow (*Salix bebbiana*), narrow-leaf cottonwood, and dogwood. Riparian areas appeared to be in good condition and undisturbed, except where near the S.R. 210 road shoulder and road crossings. These areas often contained boulders and gravel from road stabilization projects (for more information, see Appendix 13B, Riparian Habitat Conservation Areas Assessment Memorandum).

13.4 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 impact analysis area.

13.4.1 No-Action Alternative

This section describes the impacts to ecosystem resources from the No-Action Alternative in the Wasatch Boulevard segment of S.R. 210, in the segment of S.R. 210 from North Little Cottonwood Road to the town of Alta, at the gravel pit, and at the park-and-ride lot at 9400 South and Highland Drive.

13.4.1.1 S.R. 210 – Wasatch Boulevard

With the No-Action Alternative, there would be no impacts to ecosystem resources in the Wasatch Boulevard segment of S.R. 210 as a result of the project. Vegetation, terrestrial and aquatic wildlife, special-status wildlife species, and waters of the United States would continue to be affected by current and future use of the roadway. These impacts would include the effects of road noise on wildlife and wildlife-vehicle collisions on the existing roadway.

13.4.1.2 S.R. 210 – North Little Cottonwood Road to Alta

With the No-Action Alternative, there would be no impacts to the ecosystem resources in the North Little Cottonwood Road to Alta segment of S.R. 210 as a result of the project. Vegetation, terrestrial and aquatic wildlife, special-status wildlife species, waters of the United States, and RHCA's would continue to be affected by current and future use of the roadway and by roadside parking. These impacts would include the effects of road noise on wildlife and wildlife-vehicle collisions on the existing roadway.

During the hour with the 30th-highest hourly traffic demand, the number of vehicles is projected to increase from 1,061 in 2018 to 1,555 in 2050 with the No-Action Alternative. This increase in the number of vehicles could increase the number of collisions with large mammals and increase the barrier effect of S.R. 210, whereby the road restricts the movements of wildlife.

With increased traffic and recreation use, soils would be more disturbed, which could increase the spread of noxious weeds. With the continuation of roadside parking, vegetation, terrestrial and aquatic wildlife, special-status wildlife species, and waters of the United States would continue to be affected by activities (such as hiking or parking on the roadside) that disturb wildlife, trample vegetation, and increase soil disturbance and the spread of noxious weeds.

What is the 30th-highest hourly traffic demand?

The 30th-highest hourly traffic demand refers to the hour over an entire year with the projected 30th-highest traffic volume on S.R. 210 in Little Cottonwood Canyon. For more information, see Section 7.2.1.2, S.R. 210 – North Little Cottonwood Road to Alta, in Chapter 7, Traffic and Transportation.

13.4.1.3 Mobility Hubs

13.4.1.3.1 Gravel Pit

The gravel pit is an aggregate mine and consists mostly of disturbed dirt. With the No-Action Alternative, the area currently being used for aggregate mining would likely be developed with commercial and residential uses. Currently, Cottonwood Heights City is revising zoning to allow a mix of commercial and residential uses. There are no ecosystem resources at this site.

What is the gravel pit?

The gravel pit is an existing aggregate (gravel) mine located on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard.

13.4.1.3.2 9400 South and Highland Drive

With the No-Action Alternative, the existing park-and-ride lot at 9400 South and Highland Drive would continue to operate as it does currently. There are no ecosystem resources at this site.

13.4.2 Enhanced Bus Service Alternative

This section describes the impacts to ecosystem resources from the Enhanced Bus Service Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

13.4.2.1 S.R. 210 – Wasatch Boulevard

This section describes the impacts to ecosystem resources from the Imbalanced-lane Alternative and the Five-lane Alternative, which would both widen the Wasatch Boulevard segment of S.R. 210.

13.4.2.1.1 Imbalanced-lane Alternative

Vegetation

The Imbalanced-lane Alternative would convert about 35 acres of mostly developed and/or disturbed and agricultural land to transportation use. Vegetation would be converted as a result of clearing, excavating, and grading to widen Wasatch Boulevard from two travel lanes to three travel lanes. The habitat that would be converted is primarily disturbed roadside habitat that has already been degraded and provides little habitat value to wildlife.

Construction equipment could disturb soils and create favorable conditions for noxious weeds to become established. Noxious weeds that are present in the disturbed areas of the ecosystem resources impact analysis area could spread into areas affected by roadway construction.

Table 13.4-1. Impacts to Vegetation in the Ecosystem Resources Impact Analysis Area from the Imbalanced-lane Alternative with the Enhanced Bus Service Alternative

Habitat Type	Acres in Impact Analysis Area	Acres Converted
Developed	876.1	34.73
Forest/woodland	6,620.5	0.00
Shrubland	2,412.0	0.02
Meadow/grassland	1,173.7	0.00
Bedrock	6,688.6	0.00
Open water	31.0	0.00
Total	17,801.9	34.75

There is no suitable habitat for USDA Forest Service sensitive species in this segment of S.R. 210.

Table 13.4-1 above summarizes the impacts to vegetation from the Imbalanced-lane Alternative.

Terrestrial and Aquatic Wildlife

The Imbalanced-lane Alternative would widen Wasatch Boulevard from two to three travel lanes and add a center median from Fort Union Boulevard to North Little Cottonwood Road. This alternative would convert about 35 acres of mostly developed and agricultural land to transportation use. Impacts to terrestrial and aquatic wildlife would be minor since this segment of S.R. 210 is already highly developed. The wider road would slightly increase noise and visual disturbance to wildlife near the road. The wider road would also increase the barrier to wildlife crossing Wasatch Boulevard and increase their avoidance of the highway. The Utah Wildlife-Vehicle Collision Reporter documents seven wildlife-vehicle collisions on Wasatch Boulevard during a 2-year period (UDOT and Utah Division of Wildlife Resources, no date). The wider roadway could increase the number of wildlife-vehicle collisions in this segment of S.R. 210.

No federally threatened, endangered, or candidate species or habitat was identified in the ecosystem resources impact analysis area; therefore, no impacts to threatened and endangered species would occur as a result of the Imbalanced-lane Alternative. UDOT has determined there would be no effect on threatened and endangered species from the action alternatives due to the lack of suitable habitat. A copy of the consultation letter from USFWS is included in Appendix 13A, Pertinent Correspondence. There is no suitable habitat for USDA Forest Service sensitive species in this segment of S.R. 210.

Short-term, local impacts to wildlife would occur during construction of any of the action alternatives. Removal of vegetation and increased noise and activity from construction could temporarily and/or permanently displace individual animals from these areas. Project construction could temporarily displace wildlife from the active construction areas because of increased noise, construction lighting, and human activity during construction. However, wildlife that currently occupies the area or uses the adjacent areas for foraging is likely habituated to noise and human disturbance due to the disturbed nature of the area, so the impacts from construction noise and lighting and displacement would be minor.

Impacts to migratory birds and raptors would include a minor loss of disturbed roadside habitat and increased noise and visual disturbance. Construction activities could take migratory birds and displace birds 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 13.4.7, Mitigation Measures.

Impacts to aquatic species from constructing the Imbalanced-lane Alternative would be minor because there would be few aquatic impacts (0.02 acre) from this alternative, the habitat impacts would be mostly in existing channelized areas next to the existing road, and the duration of construction would be short. The impacts from construction could include increased sedimentation and reduced water quality. Implementing water quality best management practices (BMPs) during construction would reduce these short-term impacts. As part of the Imbalanced-lane Alternative, UDOT would build a stormwater drainage and collection system, which would improve water quality compared to the conditions with the No-Action Alternative (see Section 12.4.3.1, S.R. 210 – Wasatch Boulevard, in Chapter 12, Water Resources). The long-term impacts

to aquatic species from increased sedimentation and reduced water quality as a result of the increased amount of impervious surface should be minor with the implementation of BMPs to reduce sedimentation.

Waters of the United States

The Imbalanced-lane Alternative would convert 0.02 acre of intermittent stream segments I12-a and I-12b to transportation use [see Figure 13.3-2 above, Aquatic Resource Locations in the Ecosystem Resources Impact Analysis Area (1 of 2)]. Widening Wasatch Boulevard would require replacing or extending the culvert carrying Deaf Smith Canyon Creek under Wasatch Boulevard. No other aquatic resources would be affected. The design of this alternative avoids or minimizes impacts to aquatic resources whenever possible while still allowing the alternative to meet the purpose of and need for the project. The cross section includes a wall at this location to reduce the roadway footprint (for details about the roadway plans, see Appendix 2B, Wasatch Boulevard Imbalanced-lane Alternative Plans, for Chapter 2, Alternatives).

Indirect Effects. Indirect effects on waters of the United States 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 13.4.7, Mitigation Measures.

Riparian Habitat Conservation Areas

Wasatch Boulevard is located outside National Forest System lands, and no riparian areas are classified for this segment of S.R. 210.

13.4.2.1.2 Five-lane Alternative

The Five-lane Alternative would add one additional travel lane, or about 12 feet more pavement, on Wasatch Boulevard compared to the Imbalanced-lane Alternative. Overall, the impacts from the Five-lane Alternative to vegetation, terrestrial and aquatic wildlife, and waters of the United States would be similar to those from the Imbalanced-lane Alternative. With the Five-lane Alternative, about 35.32 acres of vegetation would be converted to transportation use versus 34.75 acres with the Imbalanced-lane Alternative. The Five-lane Alternative would have the same impacts to waters of the United States, with 0.02 acre of impacts to intermittent streams. Wasatch Boulevard is located outside National Forest System lands, and riparian areas are not classified for this segment of S.R. 210.

13.4.2.2 S.R. 210 – North Little Cottonwood Road to Alta

With the Enhanced Bus Service Alternative, S.R. 210 would not be widened from North Little Cottonwood Road to the town of Alta. The impacts in this segment would be similar to those from the No-Action Alternative, except that tolling (including the tolling gantry) and the enhanced bus service would be implemented. As a result, the number of vehicles using this segment of S.R. 210 in 2050 would decrease by about 30% during the winter from late November through mid-April. This reduction in vehicle use could decrease the number of vehicle collisions with large mammals compared to the No-Action Alternative.

13.4.2.3 Mobility Hubs Alternative

The Enhanced Bus Service Alternative includes two mobility hubs: a mobility hub at the gravel pit and a mobility hub at the park-and-ride lot at 9400 South and Highland Drive.

13.4.2.3.1 Gravel Pit

With the gravel pit mobility hub, a 1,500-space parking structure would be built at the gravel pit along with other commercial and residential development planned by Cottonwood Heights City. The parking structure would be located at the site of a previous aggregate mine that is proposed for commercial development; therefore, the gravel pit mobility would have the same impacts to vegetation, terrestrial and aquatic wildlife, and waters of the United States as the No-Action Alternative.

What is a mobility hub?

A mobility hub is a location where users can transfer from their personal vehicle to a bus.

13.4.2.3.2 9400 South and Highland Drive

With the mobility hub at 9400 South and Highland Drive, the existing park-and-ride lot would continue to function as a mobility hub, but UDOT would transform the existing lot with 275 parking spaces to a parking structure with about 1,000 parking spaces. Since the mobility hub would be within the footprint of the existing park-and-ride lot, the 9400 South and Highland Drive mobility hub would have the same impacts to vegetation, terrestrial and aquatic wildlife, and waters of the United States as the No-Action Alternative.

13.4.2.4 Avalanche Mitigation Alternatives

The Enhanced Bus Service Alternative includes two alternatives for avalanche mitigation: the Snow Sheds with Berms Alternative and the Snow Sheds with Realigned Road Alternative.

13.4.2.4.1 Snow Sheds with Berms Alternative

Vegetation

The Snow Sheds with Berms Alternative would convert about 15 acres of mostly disturbed habitat to transportation use for the construction of the snow sheds with berms. The areas where the snow sheds are proposed are regularly disturbed by avalanches and avalanche mitigation measures, which has removed much of the vegetation along these steep slopes.

Construction equipment could disturb soils and create favorable conditions for noxious weeds to become established. Noxious weeds that are present in the disturbed areas of the ecosystem resources impact analysis area could spread into areas affected by snow shed construction. During construction, vegetation would be temporarily disturbed by movement of equipment, storage of materials, and disturbance of staging areas. These areas would be restored to preconstruction conditions as described in Section 13.4.7.1, Mitigation Measures for Vegetation Impacts.

No USDA Forest Service sensitive plant species were found during field surveys. Therefore, it is unlikely that any impacts to sensitive plant species would occur. However, because individuals of these species might have been missed during field surveys or might be present adjacent to disturbed areas, undetected plants could be removed during construction of the snow sheds. If plants are present, the impacts would be local and not intense or large enough to cause a substantial effect or loss of species viability.

Table 13.4-2 summarizes the impacts to vegetation from the Snow Sheds with Berms Alternative.

Table 13.4-2. Impacts to Vegetation in the Ecosystem Resources Impact Analysis Area from the Snow Sheds with Berms Alternative with the Enhanced Bus Service Alternative

Habitat Type	Acres in Impact Analysis Area	Acres Converted
Developed	876.1	9.65
Forest/woodland	6,620.5	2.40
Shrubland	2,412.0	3.23
Meadow/grassland	1,173.7	0.00
Bedrock	6,688.6	0.00
Open water	31.0	0.00
Total	17,801.9	15.28

Terrestrial and Aquatic Wildlife

The Snow Sheds with Berms Alternative would require three separate snow sheds over three main avalanche paths totaling 2,465 feet of new snow shed. Snow sheds can create barriers to wildlife movements if they are located along a wildlife movement corridor. Movement corridors for big game and other wildlife are typically located along riparian corridors and stream crossings. There are no stream crossings or riparian areas immediately adjacent to the proposed snow sheds, and the sheds would be located along steep avalanche paths with cut banks leading to the road. These areas already present a barrier to most wildlife movement. Therefore, the addition of snow sheds would only slightly increase the barrier effect of an area that is likely already avoided by most wildlife.

The Snow Sheds with Berms Alternative would reduce the need for active avalanche mitigation, such as using artillery to trigger avalanches. Under UDOT's the current avalanche-mitigation program, from 2004 to 2017, an average of 153 artillery shells per ski season were fired into the avalanche paths where the snow sheds would be placed. UDOT anticipates that, with the Snow Sheds with Berms Alternative, artillery use in the avalanche paths protected by the snow sheds could be reduced by 80% to about 31 artillery shells per season (Dynamic Avalanche Consulting 2019). Although wildlife in the area is likely acclimated to the artillery noise and disturbance, reducing the use of artillery would benefit wildlife in the area.

No federally threatened, endangered, or candidate species or habitat was identified in the ecosystem resources impact analysis area; therefore, no impacts to threatened and endangered species would occur as a result of the Snow Sheds with Berms Alternative.

Suitable habitat for several USDA Forest Service sensitive bird species including flammulated owl, northern goshawk, and peregrine falcon (foraging habitat only) might be present in the impact analysis area. If suitable habitat is present, sensitive species could be temporarily displaced during construction of the snow sheds, but no long-term impacts would occur.

The snow sheds would be constructed during the summer. Therefore, bald eagles using the canyon for wintering habitat would not be disturbed while the snow sheds are being constructed. No winter roosting habitat for bald eagles would be affected.

Impacts to migratory birds and raptors would include a loss of 2.40 acres of forested habitat and 3.23 acres of shrubland. However, the habitat that would be converted to transportation use is disturbed roadside habitat on a steep slope. Construction activities could take migratory birds and displace birds from habitat near construction areas. If construction takes place during the nesting season for migratory birds and raptors (March 15 through July 31), 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 13.4.7, Mitigation Measures.

Short-term, local impacts to wildlife would occur during construction of the snow sheds. Removal of vegetation and increased noise and activity from construction could temporarily and/or permanently displace individual animals from these areas. Project construction could temporarily displace wildlife from the active construction areas because of increased noise and human activity during construction. However, wildlife that currently occupies the area or uses the adjacent areas for foraging is likely habituated to noise and human disturbance due to the presence of S.R. 210 and heavy recreation in the area, so the impacts of construction noise and disturbance and displacement of wildlife would be minor.

Water quality impacts to aquatic species from constructing the snow sheds would be minor and brief. These impacts from construction include increased sedimentation and reduced water quality. Implementing water quality BMPs during construction would reduce these impacts.

Waters of the United States

The Snow Sheds with Berms Alternative would convert 0.01 acre of ephemeral stream segments E-10 and E-11 to transportation use [see Figure 13.3-2 above, Aquatic Resource Locations in the Ecosystem Resources Impact Analysis Area (1 of 2)]. Constructing the snow sheds would require placing or extending the culverts carrying both ephemeral streams under S.R. 210. However, ephemeral streams are exempt from jurisdiction as waters of the United States under the Navigable Waters Protection Rule. No other aquatic resources would be affected. The design of this alternative avoids or minimizes impacts to aquatic resources whenever possible while still allowing the alternative to meet the purpose of and need for the project.

Indirect Effects. Indirect effects on waters of the United States 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 13.4.7, Mitigation Measures.

Riparian Habitat Conservation Areas

The Snow Sheds with Berms Alternative would permanently convert 0.23 acre of riparian habitat classified as RHCA to transportation use. Effects on riparian areas would occur only at culvert crossings. Once the culverts are installed, disturbed areas around the culverts would be revegetated.

13.4.2.4.2 *Snow Sheds with Realigned Road Alternative*

The impacts from the Snow Sheds with Realigned Road Alternative would be similar to those from the Snow Sheds with Berms Alternative except that realigning S.R. 210 would remove curves in the snow sheds and thus improve vehicle safety. With the Snow Sheds with Realigned Road Alternative, about 18.5 acres of mostly developed habitat would be permanently converted to transportation use versus 15.28 acres with the Snow Sheds with Berms Alternative. The impacts to waters of the United States would be the same. This alternative would convert 0.14 acre of riparian habitat classified as RHCA to transportation use.

13.4.2.5 **Trailhead Parking Alternatives**

The Enhanced Bus Service Alternative includes three alternatives to address trailhead parking:

- Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative
- Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative
- No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

13.4.2.5.1 *Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative*

Vegetation

This alternative would reduce the number of parking spaces in Little Cottonwood Canyon from 528 to 511. This alternative would convert about 7 acres of forest/woodland, shrubland, and developed and/or disturbed habitat to transportation use. All of the trailhead parking areas except the Bridge Trailhead (that is, the Lisa Falls, Gate Buttress, and White Pine Trailheads) would be expanded immediately adjacent to the existing trailhead parking lots. The Bridge Trailhead would include a new parking area away from the existing trailhead but immediately adjacent to S.R. 210. With improved parking, the appropriate number of restrooms would be installed for the number of spaces. In addition, the “spider web” trails caused by roadside parking would be eliminated, thereby reducing vegetation trampling along the roadside parking areas.

Construction equipment could disturb soils and create favorable conditions for noxious weeds to become established. Noxious weeds that are present in the disturbed areas of the ecosystem resources impact analysis area could spread into areas affected by roadway construction. During construction, the construction contractor would store materials and locate staging areas on previously disturbed areas, and these practices would reduce the spread of noxious weeds.

Construction equipment could disturb soils and create favorable conditions for noxious weeds to become established. Noxious weeds that are present in the disturbed areas of the ecosystem resources impact analysis area could spread into areas affected by trailhead improvements. During construction, vegetation would be temporarily disturbed by movement of equipment, storage of materials, and disturbance of staging areas. These areas would be restored to preconstruction conditions as described in Section 13.4.7.1, Mitigation Measures for Vegetation Impacts.

No USDA Forest Service sensitive plant species were found during field surveys. Therefore, it is unlikely that any impacts to sensitive plant species would occur. However, because individuals of these species might have been missed during field surveys or might be present adjacent to disturbed areas, undetected plants could be removed during construction activities for the trailhead improvements. If plants are present, the impacts would be local and not of sufficient intensity or scale to cause a significant effect or loss of viability.

Improving trailhead parking and eliminating roadside parking would benefit the vegetation communities near these trails because it would reduce trampling of vegetation from recreationists walking off trail to get from roadside parking areas to the trails.

Table 13.4-3. Impacts to Vegetation in the Ecosystem Resources Impact Analysis Area from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative with the Enhanced Bus Service Alternative

Habitat Type	Acres in Impact Analysis Area	Acres Converted
Developed	876.1	3.81
Forest/woodland	6,620.5	1.71
Shrubland	2,412.0	1.54
Meadow/grassland	1,173.7	0.00
Bedrock	6,688.6	0.00
Open water	31.0	0.00
Total	17,801.9	7.06

Table 13.4-3 summarizes the impacts to vegetation from this alternative.

Terrestrial and Aquatic Wildlife

This alternative would eliminate roadside parking within ¼ mile of trailheads and construct trailhead improvements, thereby converting 7 acres of wildlife habitat immediately adjacent to the existing trailhead parking lots to transportation use. These impacts to terrestrial and aquatic wildlife would be minor, since the areas surrounding the existing parking lots are already disturbed due to high recreational use.

Roadside parking can create an additional barrier and disturbance to wildlife trying to cross the roadway. Therefore this alternative would have a net beneficial effect on terrestrial wildlife movement by creating formal parking areas. Concentrating recreationists at formal parking areas would reduce the amount of roadside trash that could attract wildlife to the road and contribute to wildlife-vehicle collisions.

No federally threatened, endangered, or candidate species or habitat was identified in the ecosystem resources impact analysis area; therefore, no impacts to threatened and endangered species would occur as a result of this alternative.

Suitable habitat for several USDA Forest Service sensitive bird species including flammulated owl, northern goshawk, and peregrine falcon (foraging habitat only) might be present in the impact analysis area. If suitable habitat is present, sensitive species could be temporarily displaced during construction of the improved trailhead parking lots, but no long-term impacts would occur.

The improved trailhead parking lots would be constructed during the summer. Therefore, bald eagles using the canyon for wintering habitat would not be disturbed while the parking lots are being constructed. No winter roosting habitat for bald eagles would be affected.

Impacts to migratory birds and raptors would include a loss of 1.71 acres of forested habitat and 1.54 acres of shrubland. However, the habitat that would be converted to transportation use is disturbed roadside habitat that is already used as parking areas and is heavily disturbed by people. Construction activities could

take migratory birds and displace birds 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 13.4.7, Mitigation Measures.

Short-term, local impacts to wildlife would occur during construction of the improved trailhead parking lots. Removal of vegetation and increased noise and activity from construction could temporarily and/or permanently displace individual animals from these areas. Project construction could temporarily displace wildlife from the active construction areas because of increased noise and human activity during construction. However, wildlife that currently occupies the area or uses the adjacent areas for foraging is likely habituated to noise and human disturbance due to the presence of S.R. 210 and recreation in the area, so the impacts of construction noise and disturbance and displacement of wildlife would be minor.

Impacts to aquatic species from constructing the improved trailhead parking lots would be minor and brief and will be minimized through construction BMPs identified in a stormwater pollution prevention plan. These impacts from construction include increased sedimentation and reduced water quality. Implementing permanent water quality buffers and BMPs at the trailheads would improve water quality compared to the conditions with the No-Action Alternative.

Waters of the United States

This alternative would convert 0.07 acre of an intermittent stream to transportation use. Expanding the Lisa Falls Trailhead would require replacing or extending the culvert and would convert 0.04 acre of an intermittent stream [segments I-10a and I-10b; see Figure 13.3-3 above, Aquatic Resource Locations in the Ecosystem Resources Impact Analysis Area (2 of 2)]. Expanding the White Pine Trailhead would require placing segments of intermittent streams I-6, I-7a, I-7b, and I-8 in culverts and would convert a total of 0.03 acre. Improvements at the Bridge and Gate Buttress Trailheads would not affect aquatic resources. No other aquatic resources would be affected. The design of this alternative avoids and minimizes impacts to aquatic resources whenever possible while still allowing the alternative to meet the purpose of and need for the project.

Indirect Effects. Indirect effects on waters of the United States could occur from sediment discharges associated with stormwater, erosion, hydrologic modifications, and the establishment of noxious weeds. Most these indirect effects could be reduced or eliminated through the mitigation measures listed in Section 13.4.7, Mitigation Measures.

Riparian Habitat Conservation Areas

This alternative would permanently convert 0.60 acre of riparian habitat classified as RHCA to transportation use. Effects on riparian areas would occur as a result of placing segments of an intermittent stream in culverts at the White Pine Trailhead area. Once the culverts are installed, disturbed areas around the culverts would be revegetated.

13.4.2.5.2 Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

This alternative would reduce the number of parking spaces in Little Cottonwood Canyon from 528 to 221. The impacts to vegetation, terrestrial and aquatic wildlife, and waters of the United States from this alternative would be the same as the impacts from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative except that fewer people would have access into the adjacent wilderness areas and National Forest. By formalizing trailhead parking areas and eliminating roadside parking, this alternative would have multiple benefits including eliminating “spider web” trails from roadside parking areas to access the trails and National Forest, reducing roadside trash that could contribute to wildlife-vehicle collisions and the attraction of nuisance wildlife, and installing permanent water quality buffers and BMPs at the trailheads with the effect of improving water quality.

13.4.2.5.3 No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

This alternative would reduce the number of parking spaces in Little Cottonwood Canyon from 528 to 99. Eliminating roadside parking along S.R. 210 in the canyon would reduce the barrier to wildlife crossing the roadway, prevent wildlife from being attracted to the right of way by trash and food, and allow fewer people access into the adjacent wilderness areas and National Forest. Therefore, this alternative would have the same impacts related to no roadside parking as the Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative including net beneficial effects on vegetation and terrestrial and aquatic wildlife and no change to waters of the United States.

13.4.2.6 No Winter Parking Alternative

With the No Winter Parking Alternative, about 230 roadside parking spots that are used near the ski resorts during the winter would be eliminated. The elimination of these parking spots would reduce the barrier to wildlife crossing the roadway and would prevent wildlife from being attracted to the right of way by trash and food. With the elimination of winter roadside parking, there would be a minor benefit to vegetation, terrestrial and aquatic wildlife, and waters of the United States because less sediment would be generated in the watershed as a result of less erosion of the highway shoulders.

13.4.3 Enhanced Bus Service in Peak-period Shoulder Lane Alternative

This section describes the impacts to ecosystem resources from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 from North Little Cottonwood Road to the town of Alta, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

13.4.3.1 S.R. 210 – Wasatch Boulevard

The impacts from the improvements to Wasatch Boulevard with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

13.4.3.2 S.R. 210 – North Little Cottonwood Road to Alta

Vegetation

The Enhanced Bus Service in Peak-period Shoulder Lane Alternative would convert about 85 acres of shrubland, forest/woodland, and developed and/or disturbed habitat to transportation use for the peak-period shoulder lanes. The habitat that would be converted is primarily disturbed habitat immediately adjacent to the roadway that is degraded from roadside parking and other disturbance. It provides slight habitat value to wildlife.

Construction equipment could disturb soils and create favorable conditions for noxious weeds to become established. Noxious weeds that are present in the disturbed areas of the ecosystem resources impact analysis area could spread into areas affected by roadway construction. During construction, vegetation would be temporarily disturbed by movement of equipment, storage of materials, and disturbance of staging areas. These areas would be restored to preconstruction conditions as described in Section 13.4.7.1, Mitigation Measures for Vegetation Impacts.

No USDA Forest Service sensitive plant species were found during field surveys. However, the USDA Forest Service provided information regarding known occurrences of some species, as listed in Table 13.3-2 above, USDA Forest Service Sensitive Plant Species and Watch List Species Known or Suspected to Occur in the Salt Lake Ranger District. Although the information provided by the USDA Forest Service showed that the occurrences were outside the construction area, additional surveys for sensitive plant species will occur in the summer of 2021 and will be documented in the Final EIS.

Table 13.4-4. Impacts to Vegetation in the Ecosystem Resources Impact Analysis Area from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

Habitat Type	Acres in Impact Analysis Area	Acres Converted
Developed	876.1	52.75
Forest/woodland	6,620.5	6.27
Shrubland	2,412.0	26.56
Meadow/grassland	1,173.7	0.29
Bedrock	6,688.6	0.00
Open water	31.0	0.00
Total	17,801.9	85.86

UDOT does not expect that any impacts to sensitive plant species would occur. However, because individuals of these species might have been missed during the field surveys or might be present adjacent to disturbed areas, undetected plants could be

removed during construction. If plants are present, the impacts would be local and not intense or large enough to cause a substantial effect or loss of species viability.

Table 13.4-4 above summarizes the impacts to vegetation from the improvements to S.R. 210 from North Little Cottonwood Road to the town of Alta with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative.

Terrestrial and Aquatic Wildlife

This alternative would convert about 85 acres of roadside habitat to transportation use. The wider roadway also would increase the barrier to wildlife crossing S.R. 210, increase its avoidance of the roadway, and increase the number of wildlife-vehicle collisions in this segment of S.R. 210.

With the addition of peak-period shoulder lanes, three traffic lanes would be in operation during peak traffic days (weekends, holidays, and busy ski days during the winter season) in the winter from late November through mid-April. The lanes would not be open to vehicles during the summer but would be available to cyclists and pedestrians. As with the Enhanced Bus Service Alternative, a toll would be added on S.R. 210 in Little Cottonwood Canyon with the goal of reducing personal vehicle use by about 30%. Traffic volumes are already high during the peak winter season, and the buses in the peak-period shoulder lanes would have little effect on mammals, which are already limited from moving across the roadway at these times.

However, the additional lanes could increase the number of vehicle collisions with large mammals. As stated in Section 13.3.2.2.1, General Wildlife Species, seven wildlife-vehicle collisions occurred in Little Cottonwood Canyon over the 2-year period from 2017 to 2018, and the USDA Forest Service did not identify Little Cottonwood Canyon as a high-wildlife-strike area or a major wildlife migration corridor. As part of this alternative, UDOT would install lighted signs to indicate when the peak-period shoulder lane is open, and these signs might further increase the barrier effect as wildlife seeks to avoid these lighted areas.

The peak-period shoulder lanes would be intended for buses only, not personal vehicles, and would operate from late November to mid-April. The lanes would not increase vehicle traffic during the winter. UDOT expects that the noise levels adjacent to the roadway would be similar to existing conditions (59.4 A-weighted decibels [dBA] at Tanners Flat Campground) and would have similar impacts to wildlife as the existing noise conditions along S.R. 210 (UDOT 2020). During the summer, the peak-period shoulder lanes would not be used by vehicles, so the noise and wildlife strike impacts from vehicles would be similar to the existing summer conditions.

No federally threatened, endangered, or candidate species or habitat was identified in the ecosystem resources impact analysis area; therefore, no impacts to threatened and endangered species would occur as a result of the Enhanced Bus Service in Peak-period Shoulder Lane Alternative.

Suitable habitat for several USDA Forest Service sensitive bird species and monarch butterflies could be present in the impact analysis area. The loss of 33 acres of shrubland and forested/woodland habitat would reduce habitat for these sensitive species. However, the habitat that would be converted is disturbed roadside habitat that is degraded and provides little habitat value. If suitable habitat is present, sensitive bird species and monarch butterflies could be displaced during construction, but no long-term impacts would occur. Wintering bald eagles using the canyon would not be disturbed by summer construction noise. No winter roosting habitat for bald eagles would be affected.

Impacts to migratory birds and raptors would include a loss of 33 acres of shrubland and forested/woodland habitat, which would reduce habitat and prey availability. However, the habitat that would be converted is disturbed roadside habitat that is already degraded and is heavily affected by human disturbance.

Construction activities could take migratory birds and displace birds from habitat near construction areas. If construction takes place during the nesting season for migratory birds and raptors (March 15 through July 31), 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 13.4.7, Mitigation Measures.

Short-term, local impacts to wildlife would occur during construction of the peak-period shoulder lanes. Removal of vegetation and increased noise and activity from construction could temporarily and/or permanently displace individual animals from these areas. Project construction could temporarily displace wildlife from the active construction areas because of increased noise and human activity during construction. However, wildlife that currently occupies the area or uses the adjacent areas for foraging is likely habituated to noise and human disturbance due to the presence of S.R. 210 and heavy recreation in the area, so the impacts associated with construction noise and disturbance and displacement of wildlife would be minor.

Impacts to aquatic species from constructing the peak-period shoulder lanes would be minor and brief. These impacts from construction include increased sedimentation and reduced water quality. Implementing water quality BMPs would improve water quality compared to the conditions with the No-Action Alternative. The long-term impacts to aquatic species from increased sedimentation and reduced water quality as a result of the increased amount of impervious surface should be minor with the implementation of BMPs to reduce sedimentation.

Waters of the United States

The Enhanced Bus Service in Peak-period Shoulder Lane Alternative would convert 0.19 acre of intermittent stream, 0.02 acre of perennial stream, and 0.08 acre of ephemeral stream habitat to transportation use, as listed in Table 13.4-5. The affected stream segments generally cross under S.R. 210 in culverts. The culverts would be extended to accommodate the wider roadway. No other aquatic resources would be affected. The design of this alternative avoids or minimizes impacts to aquatic resources whenever possible while still allowing the alternative to meet the purpose of and need for the project. Generally, the roadway would be widened to the north for the peak-period shoulder lanes, away from Little Cottonwood Creek. The design of the alternatives and incorporation of applicable BMPs would reduce project impacts to aquatic resources, and most potential residual impacts to aquatic habitat functions would not be substantial. Ephemeral streams are exempt from jurisdiction as waters of the United States under the Navigable Waters Protection Rule.

Indirect Effects. Indirect effects on waters of the United States could occur from sediment discharges associated with stormwater, erosion, hydrologic modifications, and the establishment of noxious weeds. However, with the roadway widening, UDOT would perform a hydrology analysis for all culverts to reduce flow rates and associated sedimentation into Little Cottonwood Creek compared to the conditions with the No-Action Alternative, which would likely result in a minor benefit.

Table 13.4-5. Impacts to Aquatic Resources in the Ecosystem Resources Impact Analysis Area from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

Aquatic Resource Feature	Aquatic Resource Type	Impact (acres)	Impact (feet)
I-10	Intermittent stream	0.02	60
I-4	Intermittent stream	0.08	870
I-5	Intermittent stream	0.04	980
I-9	Intermittent stream	<0.01	40
I-11	Intermittent stream	0.04	180
Total Intermittent stream impacts		0.19	2,120
P-1d	Perennial stream	<0.01	40
P-1f	Perennial stream	0.02	60
Total perennial stream impacts		0.02	100
E-4	Ephemeral stream	0.01	210
E-5	Ephemeral stream	0.02	330
E-6	Ephemeral stream	0.02	180
E-7	Ephemeral stream	<0.01	40
E-8	Ephemeral stream	<0.01	70
E-9	Ephemeral stream	<0.01	30
E-10	Ephemeral stream	<0.01	20
E-11	Ephemeral stream	<0.01	60
E-12	Ephemeral stream	<0.01	20
E-13	Ephemeral stream	<0.01	190
E-14	Ephemeral stream	<0.01	120
Total ephemeral stream impacts		0.08	1,220

Riparian Habitat Conservation Areas

The Enhanced Bus Service in Peak-period Shoulder Lane Alternative would permanently convert 1.44 acres of riparian habitat classified as RHCA to transportation use. Effects on riparian areas would occur as a result extending culverts to accommodate the wider roadway. Once the culverts are installed, disturbed areas around the culverts would be revegetated.

13.4.3.3 Mobility Hubs Alternative

The impacts to ecosystem resources from the mobility hubs with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

13.4.3.4 Avalanche Mitigation Alternatives

The impacts to ecosystem resources from the avalanche mitigation alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative. Although the roadway would be about 10 feet wider with the peak-period shoulder lanes than the existing roadway, with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, the tieback anchors and backfill would still cover the same construction footprint to reach the hillside.

13.4.3.5 Trailhead Parking Alternatives

The impacts to ecosystem resources from the trailhead parking alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

13.4.3.6 No Winter Parking Alternative

The impacts to ecosystem resources from the No Winter Parking Alternative with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

13.4.4 Gondola Alternative A (Starting at Canyon Entrance)

This section describes the impacts to ecosystem resources from Gondola Alternative A, which includes a gondola alignment from the entrance to Little Cottonwood Canyon to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

13.4.4.1 S.R. 210 – Wasatch Boulevard

The impacts to ecosystem resources along Wasatch Boulevard from Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

13.4.4.2 S.R. 210 – North Little Cottonwood Road to Alta

Vegetation

Gondola Alternative A would convert about 12 acres of forest/woodland, shrubland, and developed and/or disturbed habitat to transportation use for the terminal stations (base station and destination stations), towers, access and haul roads, and angle station. Some of the habitat that would be converted for the gondola towers and angle station is undisturbed habitat outside the roadway corridor.

Construction equipment could disturb soils and create favorable conditions for noxious weeds to become established. Noxious weeds that are present in the disturbed areas of the ecosystem resources impact analysis area could spread into areas affected by roadway construction. During construction, vegetation would be temporarily disturbed by movement of equipment, storage of

What are base, angle, and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's gondola trip. Passengers board and disembark the gondola cabins at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

The gondola alternatives also include *angle stations*, which are needed to adjust the horizontal direction of the cabin; passengers remain in the cabin as it passes through an angle station.

A *tower* supports the gondola cable.

materials, and disturbance of staging areas. These areas would be restored to preconstruction conditions as described in Section 13.4.7.1, Mitigation Measures for Vegetation Impacts.

No USDA Forest Service sensitive plant species were found during field surveys. However, the USDA Forest Service provided information regarding known occurrences of some species, as listed in Table 13.3-2 above, USDA Forest Service Sensitive Plant Species and Watch List Species Known or Suspected to Occur in the Salt Lake Ranger District. Although the information provided by the USDA Forest Service showed that the occurrences were outside the construction area for Gondola Alternative A, additional surveys for sensitive plant species will occur in the summer of 2021 and will be documented in the Final EIS.

UDOT does not expect that any impacts to sensitive plant species would occur. However, because individuals of these species might have been missed during field surveys or might be present adjacent to disturbed areas, undetected plants could be removed during construction for the gondola towers and stations. UDOT will conduct additional surveys between the release of the Draft and Final EISs to determine the presence of sensitive plant species. If plants are present, any impacts would be local and not intense or large enough to cause a substantial effect or loss of species viability.

Table 13.4-6. Impacts to Vegetation in the Ecosystem Resources Impact Analysis Area from Gondola Alternative A

Habitat Type	Acres in Impact Analysis Area	Acres Converted
Developed	876.1	8.07
Forest/woodland	6,620.5	2.13
Shrubland	2,412.0	2.19
Meadow/grassland	1,173.7	0.00
Bedrock	6,688.6	0.00
Open water	31.0	0.00
Total	17,801.9	12.40

Table 13.4-6 summarizes the impacts to vegetation the improvements to S.R. 210 from North Little Cottonwood Road to the town of Alta from Gondola Alternative A.

Terrestrial and Aquatic Wildlife

Gondola Alternative A would convert about 12 acres of forest/woodland, shrubland, and developed and/or disturbed habitat to transportation use, or less than 0.5% of the habitat in the ecosystem resources impact analysis area. The loss of 12 acres of habitat would reduce habitat availability for terrestrial wildlife. Little Cottonwood Canyon is not considered a wildlife migration corridor; however, the presence of gondola towers and the increase in activity from gondola cabins moving overhead could slightly increase the barrier effect for terrestrial mammals that use the canyon. Terrestrial mammals would eventually acclimate to the presence of the gondola.

No federally threatened, endangered, or candidate species or habitat was identified in the impact analysis area; therefore, no impacts to threatened and endangered species would occur as a result of construction of the gondola.

Suitable habitat for USDA Forest Service sensitive wildlife would be affected by removal of vegetation and disturbance from the operation of the gondola. The loss of 12 acres of habitat would reduce habitat availability for sensitive wildlife species. If suitable habitat is present, sensitive species could be temporarily displaced during construction, but no long-term impacts to populations would occur. The gondola towers and stations would be constructed during the summer, so construction would have no impact on wintering bald eagles. No winter roosting habitat for bald eagles would be affected. Although the gondola alignment would

be located near potential bald eagle winter habitat, the gondola towers have a very limited disturbance footprint. As a result, no bald eagle wintering habitat would be affected by this alternative.

Impacts to migratory birds and raptors would include a loss of 12 acres of habitat, displacement during construction, increased habitat fragmentation, and potential destruction of nests during summer construction. 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 preconstruction nesting surveys as described in Section 13.4.7, Mitigation Measures.

Birds might strike the gondola cables or towers. No data are available regarding the frequency of bird deaths due to striking gondola cables. A study of electrical transmission lines (many including red aircraft warning lights) found between 0 and 20 dead birds per kilometer (0.6 mile) of transmission line per year (Avian Conservation and Ecology 2013). Because there are many variables such as habitat type, bird type, and bird density, it is difficult to apply other studies to the specifics of Little Cottonwood Canyon. Nonetheless, it is likely that some birds would be killed by striking the gondola cables.

The studies also found that red aircraft warning lights that are permanently on (always red) could attract birds and contribute to birds striking the towers or cables. The gondola towers might require aircraft obstruction lighting. The light system would be either flashing red lights or short-duration flashing red lighting that is activated only when an aircraft enters the canyon (this is infrequent and typically associated with emergency response helicopters). The flashing red lights have been shown to reduce bird fatalities by between 50% and 70% (Audubon, no date).

UDOT would use helicopters to place some of the gondola towers, and this construction technique might displace, and temporarily disrupt the foraging behavior of, wildlife in the area, including special-status species. Helicopter flights during construction of the gondola system could disturb by noise and visual cues cliff-nesting raptors that fly within the flight path. UDOT expects that the gondola towers would be constructed spring through fall (as weather conditions allow). Although birds would be temporarily disturbed by helicopter noise and activity, the effect would be short-term and temporary. UDOT would coordinate with the USDA Forest Service before helicopter flights to determine whether there are any known raptor nests in the flight path. These nests would be avoided.

If rock blasting is required to construct the gondola towers, it would likely disrupt nearby nesting or roosting birds and special-status species and permanently disrupt their foraging behaviors, resulting in reduced foraging.

The gondola might operate year-round and would have destination stations at the Snowbird and Alta ski resorts only. Little Cottonwood Canyon is not a known calving or wintering area for ungulates or a major mammal migration corridor; therefore, gondola operation would not affect most terrestrial mammals beyond the current level of disturbance in the area. The visual movement of the gondola cabins and human activity from summer gondola operation might disrupt nesting birds adjacent to the gondola alignment. This impact would likely be minor considering that most of the gondola alignment is adjacent to the existing S.R. 210 roadway and trails, which currently have high levels of human activity. Gondola Alternative A would not increase access to backcountry areas or add capacity to trails, but it would concentrate recreation at existing high-use recreation areas at and around the ski resorts.

Noise from the gondola operation could have a detrimental effect on the behavior of some sensitive wildlife species. For example, noise could cause birds to abandon nests or roosts that are otherwise suitable; noise can be stressful and interfere with foraging, sleeping, and other activities; intense noise can cause permanent damage to an animal's auditory system; and noise can interfere with acoustic communication by masking important sounds or sound components. Multiple bird studies have documented changes in song characteristics, reproduction, abundance, stress hormone levels, and species richness at levels at or over 45 dBA. Terrestrial mammals exhibited increased stress levels and decreased reproductive efficiency at noise levels between 52 and 68 dBA (Shannon and others 2016).

Noise monitoring was conducted in June 2020 at Snowbird Tram tower 1 to document baseline noise levels before and during the operation of the tram. The operation of the gondola is assumed to have similar noise levels as the tram when in operation. When the tram was not in operation, the monitored noise conditions ranged from 42 to 45 dBA, with an average reading of 44 dBA (HDR 2020). When the tram was in operation, there was a slight increase in noise levels and a hum as the tram cables went over the tram tower. The monitored noise conditions ranged from 49 to 55 dBA, with an average reading of 50 dBA. On average, the tram operation increased noise by about 6 dBA compared to noise conditions without the tram in operation, with most noise occurring at the tower locations. Based on the noise monitoring for the tram, the operational noise of the gondola is expected to average 50 dBA, which is within the range that affects bird behavior but is not at a level likely to affect terrestrial mammals.

The measured existing background noise levels along S.R. 210 in Little Cottonwood Canyon ranged from about 48 dBA to about 59 dBA. Since the gondola alignment would be mostly adjacent to the existing roadway where the maximum noise level was 59 dBA, the noise impacts from the gondola operation are expected to be minor (UDOT 2020).

Some raptors in Little Cottonwood Canyon start nesting in February and March and could be affected by gondola noise and visual disturbance if they are nesting or foraging near the towers. Migratory songbirds might initially avoid the gondola alignment area due to the increased human presence and visual impact of the towers and gondola, but these birds are expected to acclimate to the presence of the gondola quickly. Most of the wildlife that currently occupies the ecosystem resources impact analysis area is likely habituated to noise and human disturbance due to the disturbed nature of the area and high recreational use, and therefore the impacts associated with operation of the gondola year-round would be minor.

Impacts to aquatic species from constructing Gondola Alternative A would be minor and brief. These impacts from construction include increased sedimentation and reduced water quality. Implementing water quality BMPs during construction would reduce these impacts. Aquatic species would not be affected during operation of the gondola system.

Waters of the United States

Gondola Alternative A would not affect any waters of the United States. This alternative was designed to avoid impacts to aquatic resources.

Indirect Effects. Indirect effects on waters of the United States could occur from sediment discharges associated with stormwater, erosion, hydrologic modifications, and the establishment of noxious weeds. The indirect impacts could result in reduced water quality and changes in hydrology. Most of these indirect effects could be reduced or eliminated through the mitigation measures listed in Section 13.4.7, Mitigation Measures.

Riparian Habitat Conservation Areas

Gondola Alternative A would not affect any riparian habitat classified as RHCA.

13.4.4.3 Mobility Hubs Alternative

The impacts to ecosystem resources from the mobility hubs with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

13.4.4.4 Avalanche Mitigation Alternatives

The impacts to ecosystem resources from the avalanche mitigation alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

13.4.4.5 Trailhead Parking Alternatives

The impacts to ecosystem resources from the trailhead parking alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

13.4.4.6 No Winter Parking Alternative

The impacts to ecosystem resources from the No Winter Parking Alternative with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

13.4.5 Gondola Alternative B (Starting at La Caille)

This section describes the impacts to ecosystem resources from Gondola Alternative B, which includes a gondola alignment from La Caille to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative

13.4.5.1 S.R. 210 – Wasatch Boulevard

The impacts to ecosystem resources along Wasatch Boulevard from Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

13.4.5.2 S.R. 210 – North Little Cottonwood Road to Alta

The impacts from Gondola Alternative B to vegetation, terrestrial and aquatic wildlife, and waters of the United States would be the same as those from Gondola Alternative A from the S.R. 209/S.R. 210 intersection to the town of Alta.

With Gondola Alternative B, the base station improvements and the three additional towers (compared to Gondola Alternative A) would not affect waters of the United States, riparian areas, threatened or endangered species, or special-status species.

Vegetation

With Gondola Alternative B, more vegetation would be disturbed compared to Gondola Alternative A because the 1,500-stall parking structure, three additional gondola towers, and road improvements to North Little Cottonwood Road would affect developed and undeveloped areas adjacent to S.R. 210 and existing residential development (Table 13.4-7). Gondola Alternative B from the base station to the destination station in Alta would convert about 41 acres of mostly developed and/or disturbed and shrubland to transportation use. Vegetation would be converted as a result of clearing, excavating, and grading. The habitat that would be converted is primarily disturbed roadside habitat that has already been degraded and provides little habitat value to wildlife.

Table 13.4-7. Impacts to Vegetation in the Ecosystem Resources Impact Analysis Area from Gondola Alternative B

Habitat Type	Acres in Impact Analysis Area	Acres Converted
Developed	876.1	17.0
Forest/woodland	6,620.5	0.00
Shrubland	2,412.0	10.77
Meadow/grassland	1,173.7	0.81
Bedrock	6,688.6	0.00
Open water	31.0	0.00
Total	17,801.9	28.58

Construction equipment could disturb soils and create favorable conditions for noxious weeds to become established. Noxious weeds that are present in the disturbed areas of the ecosystem resources impact analysis area could spread into areas affected by roadway construction. During construction, the construction contractor would store materials and locate staging areas on previously disturbed areas, and these practices would reduce the spread of noxious weeds.

There is no suitable habitat for USDA Forest Service sensitive species in this segment of S.R. 210.

Table 13.4-7 summarizes the impacts to vegetation the improvements to S.R. 210 from North Little Cottonwood Road to the town of Alta from Gondola Alternative B.

Terrestrial and Aquatic Wildlife

Gondola Alternative B would convert about 29 acres of mostly developed and shrubland habitat to transportation use along North Little Cottonwood Road. Impacts to terrestrial and aquatic wildlife would be minor since this segment of S.R. 210 is already highly developed. With this alternative, the road would be wider because an extra southbound lane would be added from the intersection of North Little Cottonwood Road and Wasatch Boulevard to the gondola base station. The wider road and the base station area at La Caille (compared to Gondola Alternative A) would slightly increase noise and visual disturbance to wildlife near the road. The wider road and base station area would also increase the barrier to wildlife crossing North Little Cottonwood Road and increase their avoidance of the highway. The Utah Wildlife-Vehicle Collision Reporter documents seven wildlife-vehicle collisions on S.R. 210 from Fort Union Boulevard to the S.R. 209/S.R. 210 intersection during a 2-year period (UDOT and Utah Division of Wildlife Resources, no date). The wider roadway and base station could increase the number of wildlife-vehicle collisions in this segment of S.R. 210.

Short-term, local impacts to wildlife would occur during construction of Gondola Alternative A. Removing vegetation and increased noise and activity from construction could temporarily and/or permanently displace individual animals from these areas. Project construction could temporarily displace wildlife from the active construction areas because of increased noise, construction lighting, and human activity during construction.

However, wildlife that currently occupies the area or uses the adjacent areas for foraging is likely habituated to noise and human disturbance due to the disturbed nature of the area, so the impacts from construction noise and lighting and displacement would be minor.

Impacts to migratory birds and raptors would include a minor loss of disturbed roadside habitat and increased noise and visual disturbance. Construction activities could take migratory birds and displace birds 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 13.4.7, Mitigation Measures.

Impacts to aquatic species from constructing Gondola Alternative B would be minor and brief. These impacts from construction include increased sedimentation and reduced water quality. Implementing water quality BMPs during construction would reduce these short-term impacts. As part of Gondola Alternative B, UDOT would build a stormwater drainage and collection system, which would improve water quality compared to the conditions with the No-Action Alternative (see Section 12.4.3.1, S.R. 210 – Wasatch Boulevard, in Chapter 12, Water Resources). The long-term impacts to aquatic species from increased sedimentation and reduced water quality as a result of the increased amount of impervious surface would be minor with the implementation of BMPs to reduce sedimentation.

13.4.5.3 Mobility Hubs Alternative

With Gondola Alternative B, the mobility hubs at the gravel pit and at 9400 South and Highland Drive would require about 600 and 400 parking spaces, respectively. This is less than proposed numbers with the enhanced bus service alternatives and Gondola Alternative A, which would be 1,500 parking spaces at the gravel pit and 1,000 at 9400 South and Highland Drive. The fewer number of parking spaces at these two locations would not reduce the construction footprint of the parking structures but would reduce the height of the structures—from three to four stories to two to three stories at the gravel pit and from three to four stories to two stories at 9400 South and Highland Drive. Because the construction footprint would be the same, the impacts to ecosystem resources from the mobility hubs with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

13.4.5.4 Avalanche Mitigation Alternatives

The impacts to ecosystem resources from the avalanche mitigation alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

13.4.5.5 Trailhead Parking Alternatives

The impacts to ecosystem resources from the trailhead parking alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

13.4.5.6 No Winter Parking Alternative

The impacts to ecosystem resources from the No Winter Parking Alternative with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

13.4.6 Cog Rail Alternative (Starting at La Caille)

This section describes the impacts to ecosystem resources from the Cog Rail Alternative, which includes a cog rail alignment from La Caille to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 on North Little Cottonwood Road, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

13.4.6.1 S.R. 210 – Wasatch Boulevard

The impacts to ecosystem resources from the Imbalanced-lane Alternative and the Five-lane Alternative would be the same as with the Enhanced Bus Service Alternative.

13.4.6.2 S.R. 210 – North Little Cottonwood Road to Alta

Vegetation

The Cog Rail Alternative would convert about 122.00 acres of forest/woodland, shrubland, and developed and/or disturbed habitat to transportation use for the cog rail base station and rail alignment.

Construction equipment could disturb soil and create favorable conditions for noxious weeds to become established. Noxious weeds that are present in the disturbed areas of the ecosystem resources impact analysis area could spread into areas affected by roadway construction. During construction, vegetation would be temporarily disturbed by movement of equipment, storage of materials, and disturbance of staging areas. These areas would be restored to preconstruction conditions as described in Section 13.4.7.1, Mitigation Measures for Vegetation Impacts.

No USDA Forest Service sensitive plant species were found during field surveys. However, the USDA Forest Service provided information regarding known occurrences of some species, as listed in Table 13.3-2 above, USDA Forest Service Sensitive Plant Species and Watch List Species Known or Suspected to Occur in the Salt Lake Ranger District. Although the information provided by the USDA Forest Service showed that the occurrences were outside the construction area,

What are cog rail base and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's cog rail trip. Passengers board and disembark the cog rail vehicles at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

Table 13.4-8. Impacts to Vegetation in the Ecosystem Resources Impact Analysis Area from the Cog Rail Alternative

Habitat Type	Acres in Impact Analysis Area	Acres Converted
Developed	876.1	56.15
Forest/woodland	6,620.5	15.80
Shrubland	2,412.0	47.52
Meadow/grassland	1,173.7	2.56
Bedrock	6,688.6	0.00
Open water	31.0	0.00
Total	17,801.9	122.03

additional surveys for sensitive plant species will occur in the summer of 2021 and will be documented in the Final EIS.

UDOT does not expect that any impacts to sensitive plant species would occur. However, because individuals of these species might have been missed during the field surveys or might be present adjacent to disturbed areas, undetected plants could be removed during construction. If plants are present, the impacts would be local and not intense or large enough to cause a significant effect or loss of species viability.

Table 13.4-8 above summarizes the impacts to vegetation from the improvements to S.R. 210 from North Little Cottonwood Road to the town of Alta with the Cog Rail Alternative.

Terrestrial and Aquatic Wildlife

The Cog Rail Alternative would convert about 122.00 acres of forest/woodland, grassland, shrubland, and developed and/or disturbed habitat to transportation use. The rail alignment would be constructed immediately adjacent to S.R. 210 in Little Cottonwood Canyon and would require constructing a 3-foot-high, cast-in-place concrete barrier between S.R. 210 and the cog rail tracks for the entire length of the rail alignment in the canyon. This concrete barrier would increase the barrier effect of the road for wildlife crossing S.R. 210. The concrete barrier and rail line would generally be located along steep slopes on the north side of S.R. 210. Little Cottonwood Canyon is not a migratory corridor for any terrestrial wildlife because it has steep slopes and frequent avalanches. Thus, the addition of a rail alignment and concrete barrier would increase the barrier effect in an area that already has many barriers to wildlife movement, resulting in a minor impact to wildlife movement.

The cog rail could operate year-round and would have destination stations at the Snowbird and Alta ski resorts only. The cog rail system would use diesel-electric locomotives and therefore would not require an overhead catenary. As with the Enhanced Bus Service Alternative, a toll would be put in place to incentivize travelers to the ski resorts to use the cog rail with the goal of reducing personal vehicle use in the canyon by about 30%. Traffic volumes in the canyon are already high during the peak winter season, and therefore the addition of a rail service immediately adjacent to S.R. 210 would have little effect on mammals, which are already limited from moving across the road at these times. Due to the slow speed of the cog rail in the canyon (slower than personal vehicles), it is unlikely that the number of wildlife-vehicle collisions would increase with operation of the cog rail. Little Cottonwood Canyon is not a known calving or wintering area for ungulates or a major mammal migration corridor; therefore, year-round rail operations would not affect most terrestrial mammals beyond the current level of disturbance in the area.

What is an overhead catenary?

An overhead catenary is a system of overhead wires used to supply electricity to a locomotive, tram (streetcar), or light-rail vehicle.

Noise from the rail operation could have a detrimental effect on the behavior of some sensitive wildlife species. Cog rail noise consists of wayside noise, locomotive noise, additional noise when the cog is in use, crossing signals, noise at crossovers, noise at embedded tracks, and the noise from idling diesel multiple-unit vehicles at cog rail stations. UDOT evaluated cog rail noise using the Federal Transit Administration's (FTA) General Noise Assessment equations. The cog rail vehicle was modeled using FTA's reference sound exposure level for a diesel multiple-unit vehicle and railcars (for the diesel unit and each individual passenger car, respectively). The noise modeling for the Cog Rail Alternative concluded that, at a distance of 105 feet from the rail line, cog rail noise levels would be 65 dBA. The measured existing background

noise levels along S.R. 210 in Little Cottonwood Canyon ranged from about 48 dBA to about 59 dBA. The rail alignment would be immediately adjacent to the existing roadway where the maximum noise level was 59 dBA; therefore, background noise levels would increase slightly when the cog rail is in operation (UDOT 2020).

Minor increases in noise could cause birds to abandon nests or roosts that are otherwise suitable; noise can be stressful and interfere with foraging, sleeping, and other activities; intense noise can cause permanent damage to an animal's auditory system; and noise can interfere with acoustic communication by masking important sounds or sound components. Multiple bird studies have documented changes in song characteristics, reproduction, abundance, stress hormone levels, and species richness at levels at or over 45 dBA. Terrestrial mammals exhibited increased stress levels and decreased reproductive efficiency at noise levels between 52 and 68 dBA (Shannon and others 2016). Most of the wildlife that currently occupies the ecosystem resources impact analysis area is likely habituated to noise due to the presence of S.R. 210, and therefore the noise impacts associated with operation of the cog rail would be minor.

No federally threatened, endangered, or candidate species or habitat was identified in the impact analysis area; therefore, no impacts to threatened and endangered species would occur as a result of the Cog Rail Alternative.

Suitable habitat for several USDA Forest Service sensitive bird species could be present in the impact analysis area. The loss of about 16 acres of forested/woodland and 50 acres of shrubland habitat would reduce habitat for sensitive bird species. However, the habitat that would be converted is adjacent to disturbed roadside habitat that is degraded and provides little habitat value. If suitable habitat is present, sensitive bird species could be displaced during construction, but no long-term impacts would occur. Wintering bald eagles using the canyon would not be disturbed by summer construction noise. No winter roosting habitat for bald eagles would be affected.

Some raptors in Little Cottonwood Canyon start nesting in February and March and could be affected by rail operation noise and visual disturbance if they are nesting or foraging near the rail alignment. Migratory songbirds might initially avoid the habitat near the rail alignment area due to the increased noise and visual disturbance, but most birds are expected to acclimate to the presence of the rail line quickly due to its proximity to the busy roadway corridor. Most of the wildlife that currently occupies the impact analysis area is likely habituated to noise and human disturbance due to the disturbed nature of the area and high recreational use, and therefore the impacts associated with operation of the rail year-round would be minor.

Impacts to migratory birds and raptors would include a loss of about 66 acres of shrubland and forested/woodland habitat, which would reduce habitat and prey availability. However, the habitat that would be converted is disturbed roadside habitat that is already degraded and is heavily affected by human disturbance. Construction activities could take migratory birds and displace birds from habitat near construction areas. If construction takes place during the nesting season for migratory birds and raptors (March 15 through July 31), 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 13.4.7, Mitigation Measures.

Impacts to aquatic species from constructing the rail alignment would be minor and brief. These impacts from construction include increased sedimentation and reduced water quality. Implementing water quality BMPs would improve water quality compared to the conditions with the No-Action Alternative. The long-term impacts to aquatic species from increased sedimentation and reduced water quality as a result of the increased amount of impervious surface would be minor with the implementation of BMPs to reduce sedimentation.

Waters of the United States

The Cog Rail Alternative would convert 0.16 acre of intermittent stream, less than 0.01 acre of perennial stream, 0.11 acre of ephemeral stream, and less than 0.01 acre of seep habitat to transportation use, as listed in Table 13.4-9. The affected stream segments generally cross under S.R. 210 in culverts. The design of this alternative avoids or minimizes impacts to aquatic resources whenever possible while still allowing the alternative to meet the purpose of and need for the project. All of the rail alignment components would be constructed on the north side of S.R. 210 away from Little Cottonwood Creek. The design of the alternatives and incorporation of applicable BMPs would reduce project impacts to aquatic resources, and most potential residual impacts to aquatic habitat functions would not be substantial. Ephemeral streams are exempt from jurisdiction as waters of the United States under the Navigable Waters Protection Rule.

Indirect Effects. Indirect effects on waters of the United States could occur from sediment discharges associated with stormwater, erosion, hydrologic modifications, and the establishment of noxious weeds. The indirect impacts could result in reduced water quality and changes in hydrology. Most of these indirect effects could be reduced or eliminated through the mitigation measures listed in Section 13.4.7, Mitigation Measures.

Table 13.4-9. Impacts to Aquatic Resources in the Ecosystem Resources Impact Analysis Area from the Cog Rail Alternative

Aquatic Resource Feature	Aquatic Resource Type	Impact (acres)	Impact (feet)
I-10a	Intermittent stream	0.03	354
I-10b	Intermittent stream	<0.01	79
I-11a	Intermittent stream	0.04	278
I-3b	Intermittent stream	<0.01	83
I-3c	Intermittent stream	<0.01	28
I-4	Intermittent stream	<0.01	556
I-5	Intermittent stream	0.06	1,105
I-9a	Intermittent stream	<0.01	160
I-9b	Intermittent stream	<0.01	48
Total Intermittent stream impacts		0.16	2,691
P-1e	Perennial stream	<0.01	39
Total perennial stream impacts		<0.01	39
E-13a	Ephemeral stream	0.01	187
E-13b	Ephemeral stream	<0.01	56
E-14a	Ephemeral stream	<0.01	118
E-1a	Ephemeral stream	0.03	447
E-2a	Ephemeral stream	<0.01	67
E-2b	Ephemeral stream	<0.01	122
E-4a	Ephemeral stream	0.01	196
E-5a	Ephemeral stream	0.01	277
E-5b	Ephemeral stream	<0.01	27
E-6a	Ephemeral stream	0.01	207
E-6b	Ephemeral stream	<0.01	49
E-9	Ephemeral stream	0.01	195
Total ephemeral stream impacts		0.11	1,948
S-1	Seep	<0.01	141
Total seep impacts		<0.01	141

Riparian Habitat Conservation Areas

The Cog Rail Alternative would permanently convert 0.48 acre of riparian habitat classified as RHCA to transportation use. Effects on riparian areas would occur only at culvert crossings. Once the culverts are installed, disturbed areas around the culverts would be revegetated.

13.4.6.3 Mobility Hubs Alternative

The impacts to ecosystem resources from the mobility hubs with the Cog Rail Alternative would be the same as with Gondola Alternative B.

13.4.6.4 Avalanche Mitigation Alternatives

13.4.6.4.1 Snow Sheds with Berms Alternative

The overall ecosystem resources impacts from the Snow Sheds with Berms Alternative for the mid-canyon snow sheds would be the same as with the Enhanced Bus Service Alternative except that an additional 1 acre of developed habitat and 2 acres of shrubland habitat would be impacted by construction.

Two additional upper-canyon snow sheds would cover the cog rail alignment only, not the road. The snow sheds would be constructed during the summer. Constructing the two additional snow sheds would convert about 9 acres of mostly developed and forested habitat to transportation use. The areas where the snow sheds are proposed are regularly disturbed by avalanches and avalanche-mitigation measures, which have removed much of the vegetation along these steep slopes.

Waters of the United States

The two additional upper-canyon snow sheds would convert 0.03 acre of ephemeral stream segments E-1a and E-2b to transportation use [see Figure 13.3-2 above, Aquatic Resource Locations in the Ecosystem Resources Impact Analysis Area (1 of 2)]. However, ephemeral streams are exempt from jurisdiction as waters of the United States under the Navigable Waters Protection Rule.

Riparian Habitat Conservation Areas

The two additional upper-canyon snow sheds would permanently convert 0.13 acre of riparian habitat classified as RHCA to transportation use.

13.4.6.4.2 Snow Sheds with Realigned Road Alternative

The overall ecosystem resources impacts from the Snow Sheds with Realigned Road Alternative for the mid-canyon snow sheds would be the same as with the Enhanced Bus Service Alternative except that an additional 1 acre of mostly developed habitat would be impacted by construction. The ecosystem resources impacts from the upper-canyon snow sheds would be the same as with the Snow Sheds with Berms Alternative and the Cog Rail Alternative.

13.4.6.5 Trailhead Parking Alternatives

With the Cog Rail Alternative, the Gate Buttress, Grit Mill, and Lisa Falls Trailheads would be reconstructed as part of the cog rail design. These impacts are discussed in in Section 13.4.6.2, S.R. 210 – North Little Cottonwood Road to Alta. Only the White Pine and Bridge Trailheads would be reconstructed as part of the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative and the Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative.

13.4.6.5.1 Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative

The overall type of impacts to ecosystem resources from this trailhead parking alternative would be similar to those from the Enhanced Bus Service Alternative except that 3 acres of developed habitat and about 1 acre of shrubland habitat would be impacted. In addition, this alternative would impact about 0.03 acre of an intermittent stream and about 0.6 acre of riparian habitat described as an RHCA.

13.4.6.5.2 Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The impacts from this trailhead parking alternative to ecosystem resources would be the same as those from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative and the Cog Rail Alternative.

13.4.6.5.3 No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The impacts from this trailhead parking alternative to ecosystem resources would be the same as with the Enhanced Bus Service Alternative.

13.4.6.6 No Winter Parking Alternative

The impacts from the No Winter Parking Alternative to ecosystem resources would be the same as with the Enhanced Bus Service Alternative

13.4.7 Mitigation Measures

13.4.7.1 Mitigation Measures for Vegetation Impacts

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

- All fill materials brought onto the construction site will be required to be clean of any chemical contamination per UDOT's General Standard Specifications, Section 02056, *Embankment, Borrow, and Backfill*. Topsoil for landscaping must also be free of weed seeds per UDOT's General Standard Specifications, Section 02912, *Topsoil*.
- Compacted soils will be ripped, stabilized, and reseeded with native seed mixes.
- The contractor will 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*.
- Reseeding with native plants, followed by monitoring seedlings and invasive species until the vegetation has re-established, will mitigate direct-disturbance impacts and reduce the potential for weed invasions. UDOT will be responsible for monitoring and determining when vegetation becomes re-established.
- UDOT will comply with USDA Forest Service requirements by continuing to treat noxious and other invasive weeds on areas disturbed by this project for a period of three growing seasons.
- UDOT will coordinate with the USDA Forest Service to determine the proper methods for disposing of any vegetation slash generated from the Selected Alternative.
- UDOT will coordinate with the USDA Forest Service and follow Salt Lake County Watershed Protection Ordinances regarding the use of any herbicides in Little Cottonwood Canyon.

13.4.7.2 Mitigation Measures for Wildlife Impacts

UDOT will implement the following mitigation measures 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 will be removed during the non-nesting season (about August 15 to April 1). If this is not possible, UDOT or its contractor will 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 will coordinate with the UDOT Natural Resources Manager/Biologist to avoid impacts to migratory birds.
- Coordination with the USDA Forest Service will be conducted to determine any known raptor nests in the helicopter flight path or in areas that could be disturbed by construction activities and to determine when and where preconstruction raptor nest surveys should occur. If active nests are found, UDOT will coordinate with the USDA Forest Service and USFWS regarding protocols to protect the active nests.
- To the extent practicable, gondola towers and lighting design should consider recommendations from the *Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning* (USFWS 2018). Tower lighting should be implemented only if required by FAA, and flashing red lights and an aircraft detection lighting system should be used if allowed.

13.4.7.2.1 Mitigation Measures for Aquatic Resources Impacts

UDOT must submit a preconstruction notification to USACE prior to construction if (1) the loss of waters of the United States exceeds 0.1 acre or (2) there is a discharge in a special aquatic site, including wetlands. Currently, the Enhanced Bus Service in Peak-period Shoulder Lane Alternative is the only alternative that would cause an impact to streams greater than 0.1 acre. The action alternatives would not cause any impacts to wetlands. For the impacts to the streams that require preconstruction notification, USACE may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects.

If preconstruction notification is required by USACE and if compensatory mitigation is required, UDOT will prepare a mitigation plan during the Clean Water Act Section 404 permitting phase of the project. UDOT will discuss mitigation concepts with USACE and the USDA Forest Service that might include the restoration or enhancement, maintenance, and legal protection (for example, through a conservation easements) of riparian areas next to streams that would be affected.

13.4.7.2.2 Mitigation Measures for Impacts to USDA Forest Service Sensitive Species

To comply with USDA Forest Service requirements for sensitive plant species, a preconstruction survey will be completed for all alternatives in areas of ground disturbance and/or where impacts to vegetation would occur. The surveys will be completed during the growing season in 2021. The results of the surveys will be included in the Final EIS and in a separate technical memorandum to the Forest Service.

13.4.7.3 Threatened and Endangered Species Commitments

Because no federally threatened or endangered species and no critical habitat was identified in the ecosystem resources impact analysis area, no mitigation is proposed.

13.4.7.4 Mitigation Measures for Impacts to Riparian Habitation Conservation Areas

Up to about 2.5 acres of riparian habitat within the RHCAs would be converted to transportation use. In accordance with the 2003 *Revised Forest Plan: Wasatch-Cache National Forest*, the following Riparian Management Objectives have been developed for alternatives being analyzed by UDOT for the Little Cottonwood Canyon EIS that would be constructed within, or otherwise impact, RHCAs as defined in the *Forest Plan*. UDOT will implement the following mitigation measures to minimize impacts to riparian habitat:

- Establish vegetation cover and stem density equal to or greater than 90% of preconstruction conditions in disturbed, nonhardened areas.
 - Use only USDA Forest Service–approved seed mixes.
 - In some areas, the USDA Forest Service may reduce re-established tree stand density requirements to improve forest health.
- Structural changes to a stream channel or bed will not induce significant changes in stream velocities.
 - Removing trees outside RHCAs, in areas that are otherwise not hardened, might be subject to Riparian Management Objectives.
 - In some areas, the USDA Forest Service may reduce re-established tree stand density requirements to improve forest health.
- Restore a minimum of 80% of preconstruction effective stream shading within ¼ mile of riparian canopy disturbances along streams.
- Obtain USDA Forest Service approval of BMPs and a stormwater pollution prevention plan prior to submission for Utah Division of Water Quality permitting.
- Follow USDA Forest Service guidelines and requirements for performing inspections of equipment and vehicles for invasive plant and noxious weed species.

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APPENDIX 13A

Pertinent Correspondence



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Utah Ecological Services Field Office
2369 West Orton Circle, Suite 50
West Valley City, UT 84119-7603
Phone: (801) 975-3330 Fax: (801) 975-3331
<http://www.fws.gov>
<http://www.fws.gov/utahfieldoffice/>

In Reply Refer To:

June 15, 2018

Consultation Code: 06E23000-2018-SLI-0419

Event Code: 06E23000-2018-E-01193

Project Name: LCC EIS

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Utah Ecological Services Field Office
2369 West Orton Circle, Suite 50
West Valley City, UT 84119-7603
(801) 975-3330

Project Summary

Consultation Code: 06E23000-2018-SLI-0419

Event Code: 06E23000-2018-E-01193

Project Name: LCC EIS

Project Type: TRANSPORTATION

Project Description: The Utah Department of Transportation (UDOT) is preparing an Environmental Impact Statement (EIS) to study proposed improvements to State Route (S.R.) 210 from Fort Union Boulevard to the town of Alta in Little Cottonwood Canyon in Salt Lake County, Utah. Transportation improvements are needed to improve the reliability, mobility, and safety for residents, visitors, and commuters who use S.R. 210. To address these needs, UDOT is proposing to make operational improvements, introduce demand-management measures, and support increased transit service in the project area. There is the potential for the project alternatives to have impacts to undeveloped areas around Parley's Creek and on the north and south sides of I-80 east of the interchange.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/40.59497048919678N111.79654188267602W>



Counties: Salt Lake, UT

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Canada Lynx <i>Lynx canadensis</i> Population: Wherever Found in Contiguous U.S. There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened

Birds

NAME	STATUS
Yellow-billed Cuckoo <i>Coccyzus americanus</i> Population: Western U.S. DPS There is proposed critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
June Sucker <i>Chasmistes liorus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4133	Endangered

Flowering Plants

NAME	STATUS
Ute Ladies'-tresses <i>Spiranthes diluvialis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2159	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.



Memorandum

Environmental Services

DATE: January 20, 2021
TO: Carissa Watanabe, UDOT Environmental Performance Manager
FROM: Matt Howard, Natural Resources Manager
SUBJECT: Little Cottonwood Canyon Fort Union Boulevard to Alta PIN 16092

Carissa,

I have reviewed the Ecosystem Resources section for the Little Cottonwood Canyon Fort Union Boulevard to Alta project concerning potential impacts to threatened and endangered species and concur with its findings. The proposed improvements would not negatively impact federally listed species due to the extensive development in the area and a lack of suitable habitat. If tree or tree limb removal is proposed to begin after April 1 or before August 15, a UDOT-approved biologist would need to assess any affected trees to ensure that no nesting birds would be impacted. If this measure is followed, the project would not result in direct or incidental take under the BGEPA and MBTA. I have evaluated the project for impacts to greater sage-grouse. The project does not take place within a SGMA, nor does it take place within mapped habitat for sage-grouse and would therefore have no impact on sage-grouse or its habitat.

Sincerely,

Matt Howard
Natural Resource Manager

APPENDIX 13B

Riparian Habitat Conservation Areas Assessment Memorandum

Memo

Date: Wednesday, September 30, 2020

Project: Little Cottonwood Canyon EIS

To: Project files

From: HDR, Inc.

Subject: Riparian Habitat Conservation Areas Assessment

Introduction

The Utah Department of Transportation (UDOT) is preparing an Environmental Impact Statement (EIS) to study proposed transportation solutions to State Route (S.R.) 210 from its intersection with S.R. 190/Fort Union Boulevard through the town of Alta in Little Cottonwood Canyon in Salt Lake County, Utah. Transportation improvements are needed to improve the safety, reliability, and mobility on S.R. 210 for residents, visitors, and commuters who use this highway. The Little Cottonwood Canyon Project is intended to address existing safety, reliability, and mobility associated with both commuter traffic and winter recreational traffic in Little Cottonwood Canyon.

The Little Cottonwood Canyon EIS alternatives have the potential to impact riparian habitat conservation areas (RHCAs). With coordination from the United States Department of Agriculture (USDA) Forest Service, HDR conducted a field assessment of RHCAs within the Little Cottonwood Canyon EIS alternative footprints. This memorandum discusses background, methodology, and results of these RHCA assessments.

Background

According to the revised forest plan for the Wasatch-Cache National Forest ¹, “RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems by (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams, (2) providing root strength for channel stability, (3) shading the stream, and (4) protecting water quality.”

The revised forest plan defines RHCA’s by the following four categories which are further described below:

- Category 1. Fish-Bearing Stream
- Category 2. Permanently Flowing Non-Fish Bearing Stream
- Category 3. Ponds, Lakes, Reservoirs, and Wetlands Greater Than 1 Acre

¹ United States Department of Agriculture Forest Service, Intermountain Region 2003. Revised Forest Plan – Wasatch-Cache National Forest. February.

- Category 4. Seasonally Flowing or Intermittent Streams, Wetlands Less Than 1 Acre, Landslides, and Landslide-Prone Areas

Category 1. Fish-Bearing Stream

Category 1 RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to 300 feet slope distance (600 feet total, including both sides of the stream channel).

Category 2. Permanently Flowing Non-Fish Bearing Stream

Category 2 RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to 150 feet flow distance (300 feet total, including both sides of the stream).

Category 3. Ponds, Lakes, Reservoirs, and Wetlands Greater Than 1 Acre

Category 3 RHCAs consist of the body of water or wetland and the area to 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond or lake,.

Category 4. Seasonally Flowing or Intermittent Streams, Wetlands Less Than 1 Acre, Landslides, and Landslide-Prone Areas

At a minimum, the interim Category 4 RHCAs must include landslides and landslide-prone areas, 100 feet slope distance in watersheds containing Bonneville or Colorado River cutthroat trout, and 50 feet slope distance for watersheds not containing Bonneville or Colorado River cutthroat trout. This category includes features with high variability in size and site-specific characteristics.

Methodology

The objective of this assessment was to characterize the composition and condition of vegetation and aquatic habitat in RHCAs situated within the Little Cottonwood Canyon EIS alternative footprints. The survey area for this study included areas where RHCAs and the Little Cottonwood Canyon EIS alternative footprints overlap. To identify RHCA areas, HDR used aquatic resource delineation data collected for the Little Cottonwood Canyon EIS and buffered each resource based on the RHCA categories described above. These resources included Little Cottonwood Creek (a Category 1 stream) which was buffered 300 feet on either side of the stream and 14 Category 4 features which were buffered 100 feet on either side of the feature (Bonneville cutthroat trout occur in Little Cottonwood Creek). HDR then overlaid the Little Cottonwood Canyon EIS alternative footprints onto the RHCAs to identify locations where they overlap and riparian habitat field verification and assessments would occur.

A total of 43.09 acres of RHCAs were determined to overlap the Little Cottonwood Canyon EIS alternative footprints (the survey area). Prior to field evaluation, HDR established locations of 54 survey plots to visit throughout the 43.09 acres for riparian habitat verification and assessment. The plots were placed semi-systematically in order to collect representative data throughout the survey area. Tablets equipped with the ESRI data collection application Collector were prepared for use in both field navigation and data entry. In order to characterize vegetation within RHCAs and identify the presence or absence of riparian habitat and assess the condition of vegetation

and aquatic habitat, the following information was collected at each field plot, limited to a 30 foot radius from plot center (see Attachment A for a map series showing the survey areas and survey plot locations):

- Surveyor(s) Name and Date
- General Notes (observations of anthropogenic disturbance and general condition within plot)
- Riparian Community (Yes/No)
- Successional Stage (Early/Mid/Late)
- Canopy Cover (0%, Trace-5%, 5-25%, 25-50%, 50-75%, 75-95%, 95-100%)
- Dominant Canopy Species Observed
- Shrub/Sapling Cover (0%, Trace-5%, 5-25%, 25-50%, 50-75%, 75-95%, 95-100%)
- Dominant Shrub/Sapling Species Observed
- Herbaceous Cover (0%, Trace-5%, 5-25%, 25-50%, 50-75%, 75-95%, 95-100%)
- Dominant Herbaceous Species Observed
- Invasive/Weedy Species Cover (0%, Trace-5%, 5-25%, 25-50%, 50-75%, 75-95%, 95-100%)
- Invasive/Weedy Species Observed
- Percent ground (0%, Trace-5%, 5-25%, 25-50%, 50-75%, 75-95%, 95-100%)
- Stream Conditions (observations of anthropogenic disturbance and general condition within stream channel within or near plot)
- Representative photographs in the four cardinal directions (North, South, East, and West)

Given that some locations did not exhibit riparian vegetation, HDR mapped the survey areas based on whether the site consisted of a riparian vegetation community, a non-riparian vegetation community, or if the site was unvegetated. Informal trails and small areas with naturally rocky substrates were not excluded from vegetated categories.

Results

Overall, HDR identified 2.30 acres of riparian habitat in the survey area. Dominant plant species observed within riparian communities include boxelder (*Acer negundo*), water birch (*Betula occidentalis*), narrowleaf cottonwood (*Populus angustifolia*), willow (*Salix*) species, and redosier dogwood (*Cornus sericea*). RCHA plots in riparian habitat were most frequently dominated by Bebb's willow (*Salix bebbiana*), narrow-leaf cottonwood, and dogwood. Riparian areas generally appeared to be in good condition and undisturbed, except where immediately adjacent to the S.R. 210 road shoulder and road crossings. These areas often contained boulders and gravel from road and drainage stabilization measures.

A total of 30.08 acres of non-riparian vegetation was identified in the survey area. Non-riparian vegetation was generally dominated by the following plan species: quacking aspen (*Populus tremuloides*), Gambel oak (*Quercus gambelii*), Douglas fir (*Pseudotsuga menziesii*), bigtooth maple (*Acer grandidentatum*), chokecherry (*Prunus virginiana*), mountain snowberry (*Symphoricarpos oreophilus*), Saskatoon serviceberry (*Amelanchier alnifolia*), big sagebrush (*Artemisia tridentata*), rubber rabbitbrush (*Ericameria nauseosa*), and creeping barberry (*Mahonia repens*) among others, and smooth brome (*Bromus inermis*).

A total of 10.71 acres of the survey area were considered unvegetated and mainly consisted of S.R. 210 and its surrounding shoulder.

Data collected at each RHCA survey plot is provided in Attachment B, RHCA Plot Data and photographs for each RHCA survey plot are provided in Attachment C, RHCA Survey Plot Representative Photographs.

Attachments

Attachment A. RHCA Survey Area and Survey Plots Maps

Attachment B. RHCA Survey Plot Data

Attachment C. RHCA Survey Plot Representative Photographs

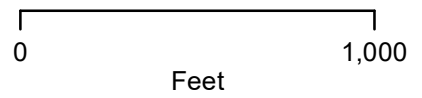
ATTACHMENT A

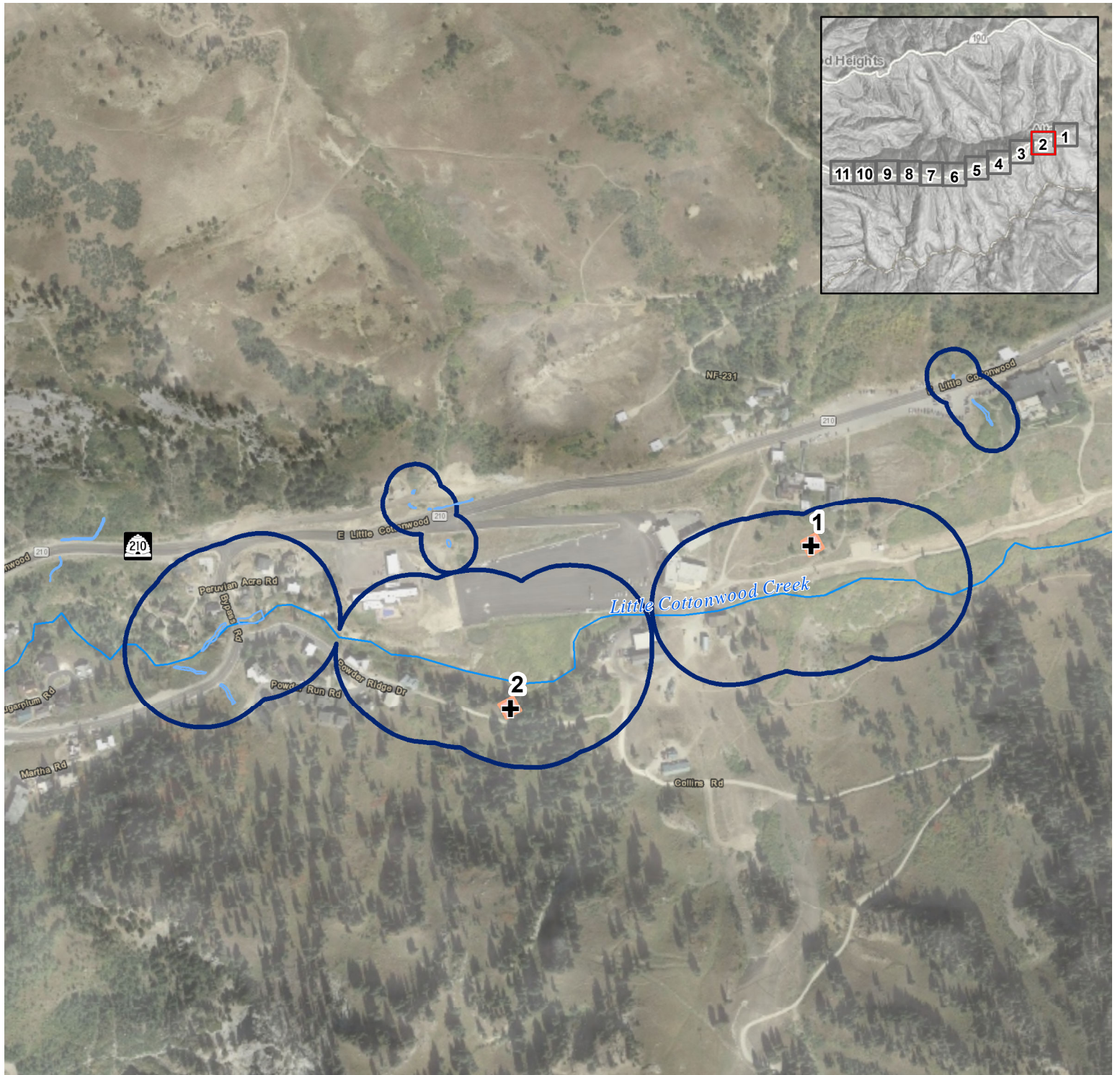
RHCA Survey Area and Survey Plot Maps



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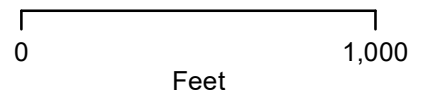
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- RHCA Buffers
- Vegetation Category**
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- Riparian Vegetation
- Unvegetated
- Wetlands and Seasonal Streams
- ~ Little Cottonwood Creek

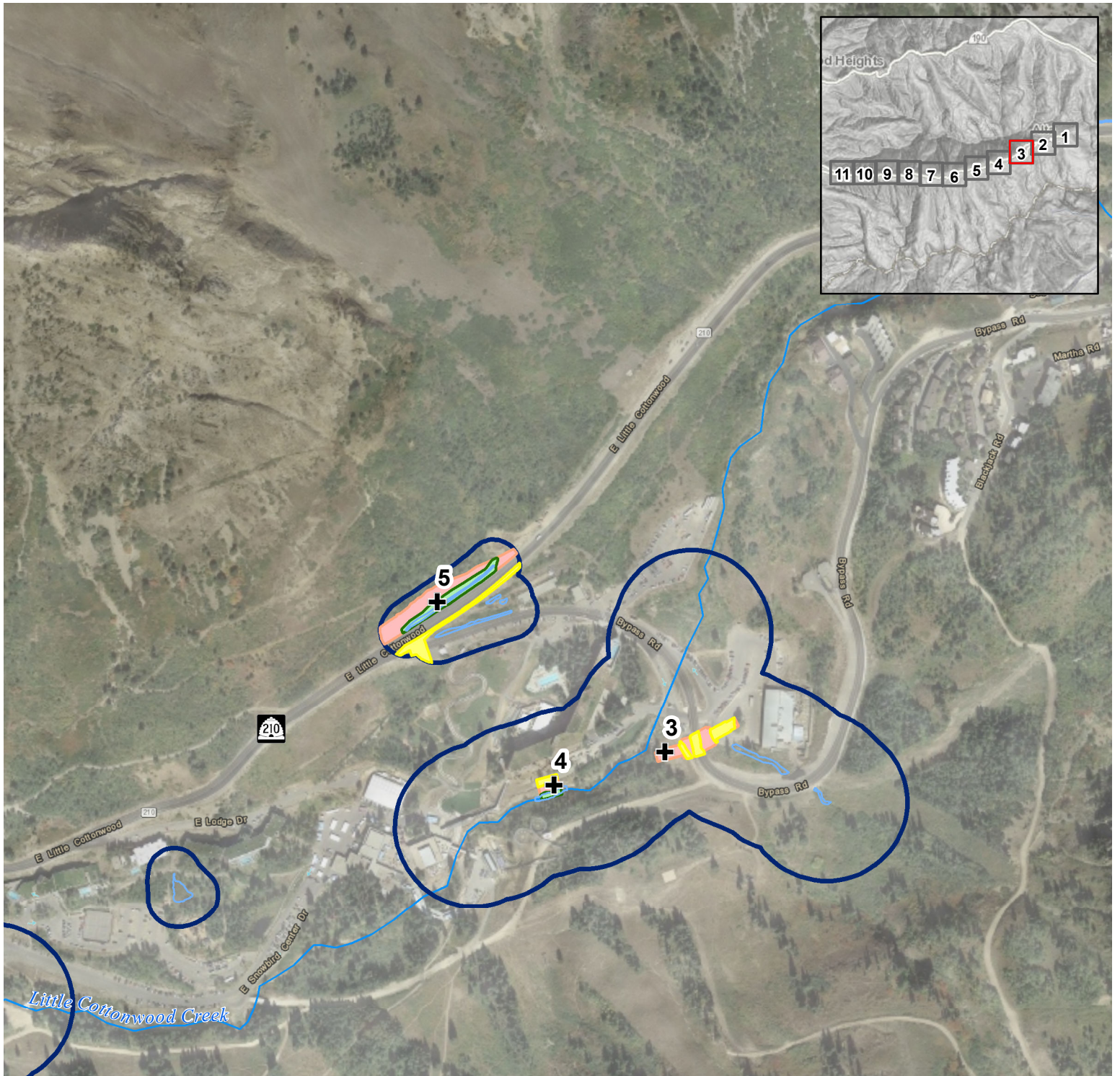




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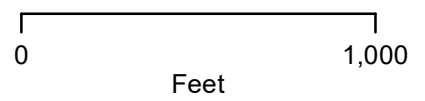
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- Unvegetated
- Wetlands and Seasonal Streams
- ~ Little Cottonwood Creek

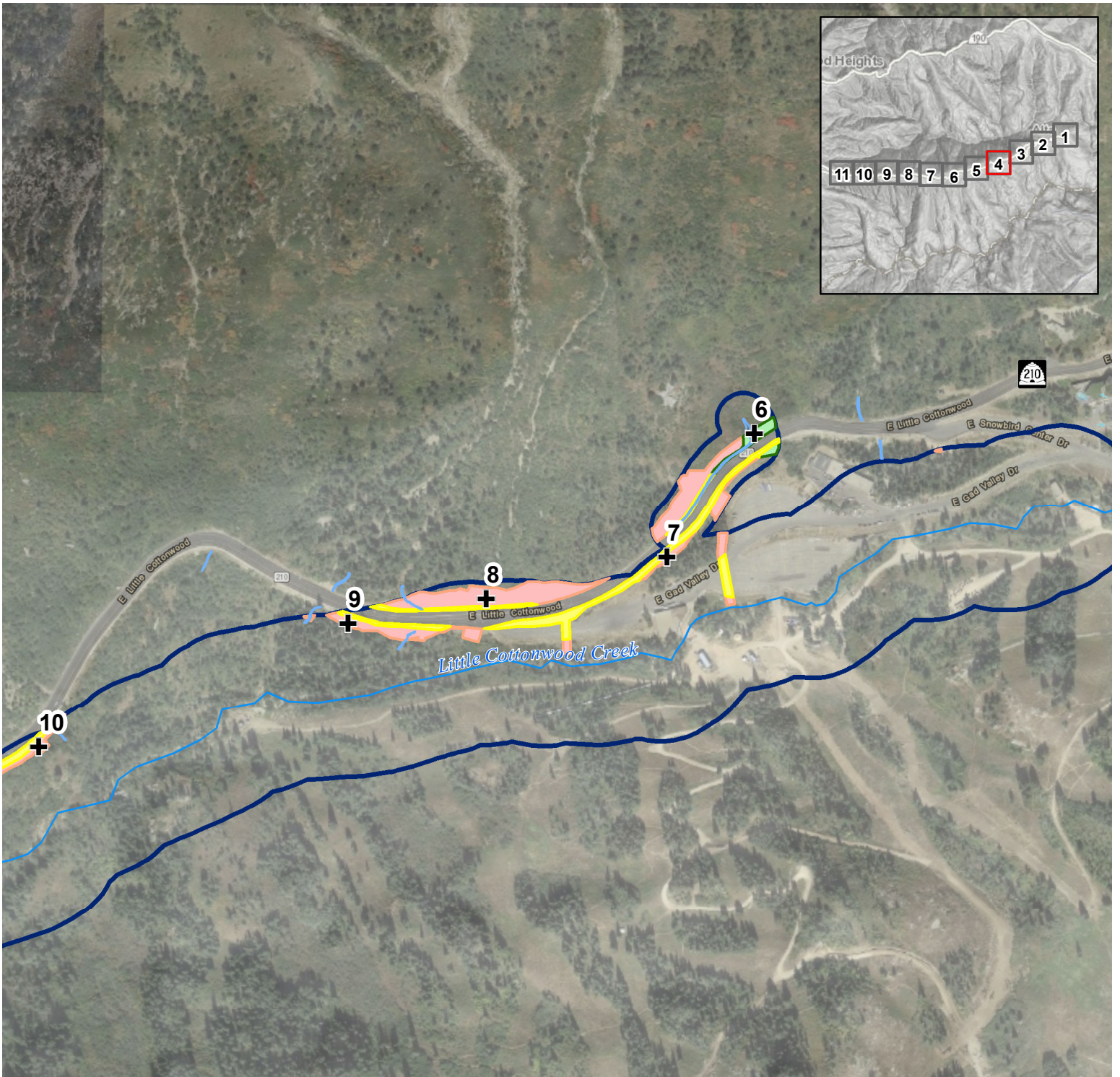




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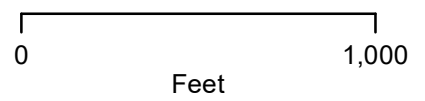
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 - Unvegetated
- RHCA Buffers
 - Wetlands and Seasonal Streams
 - Little Cottonwood Creek

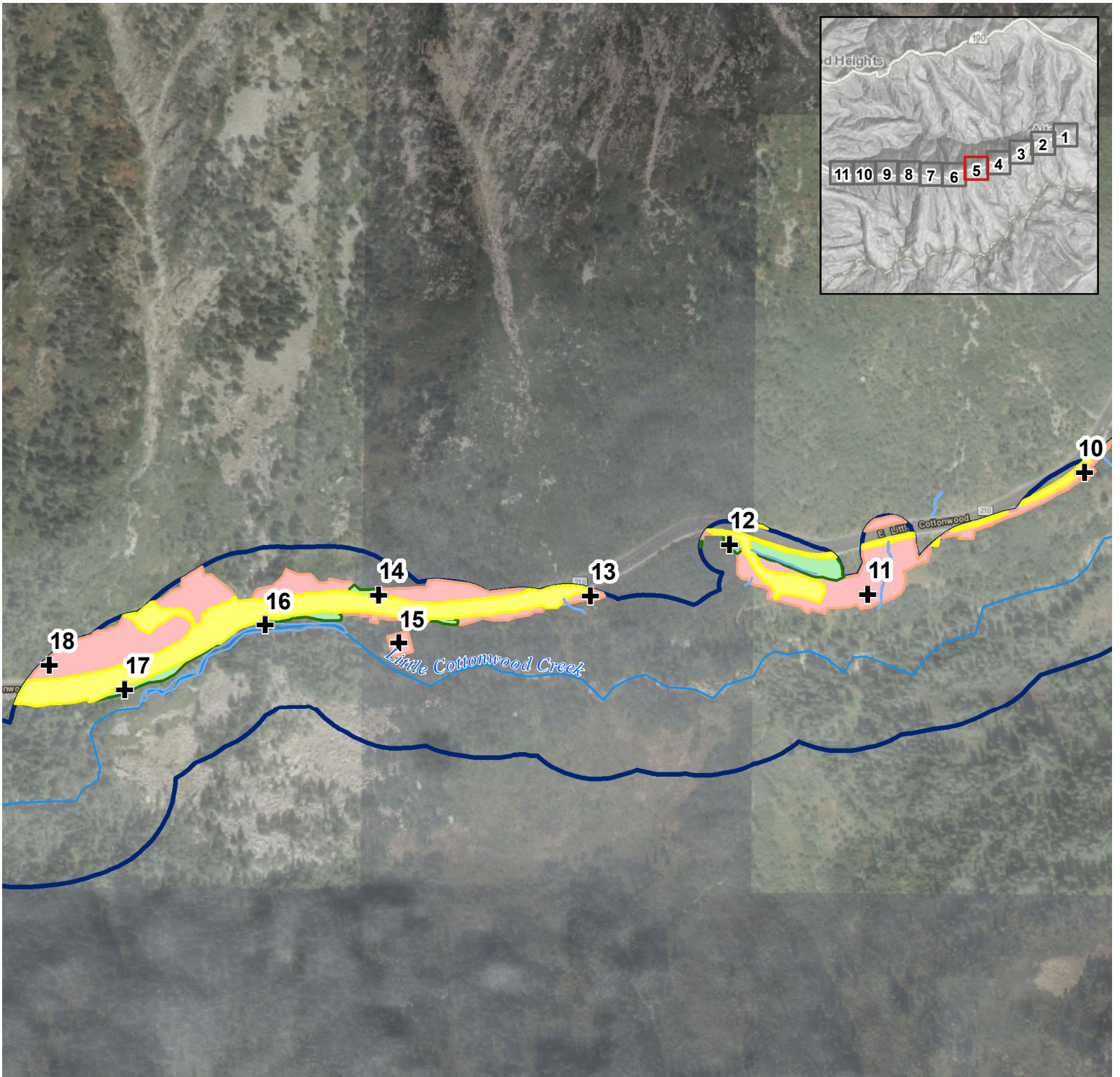




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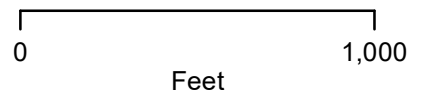
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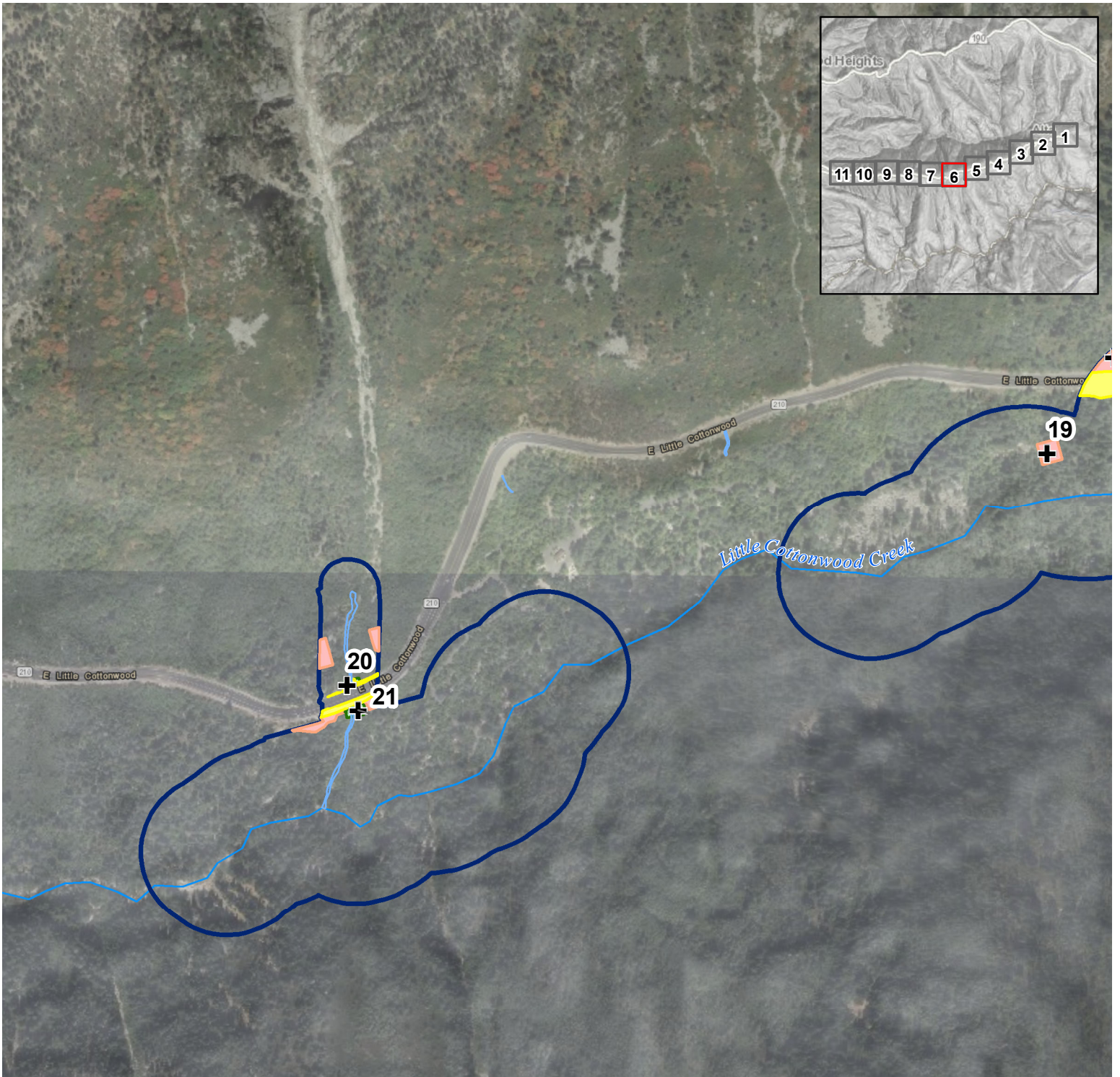




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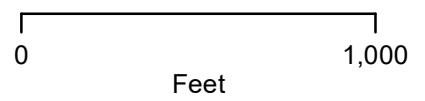
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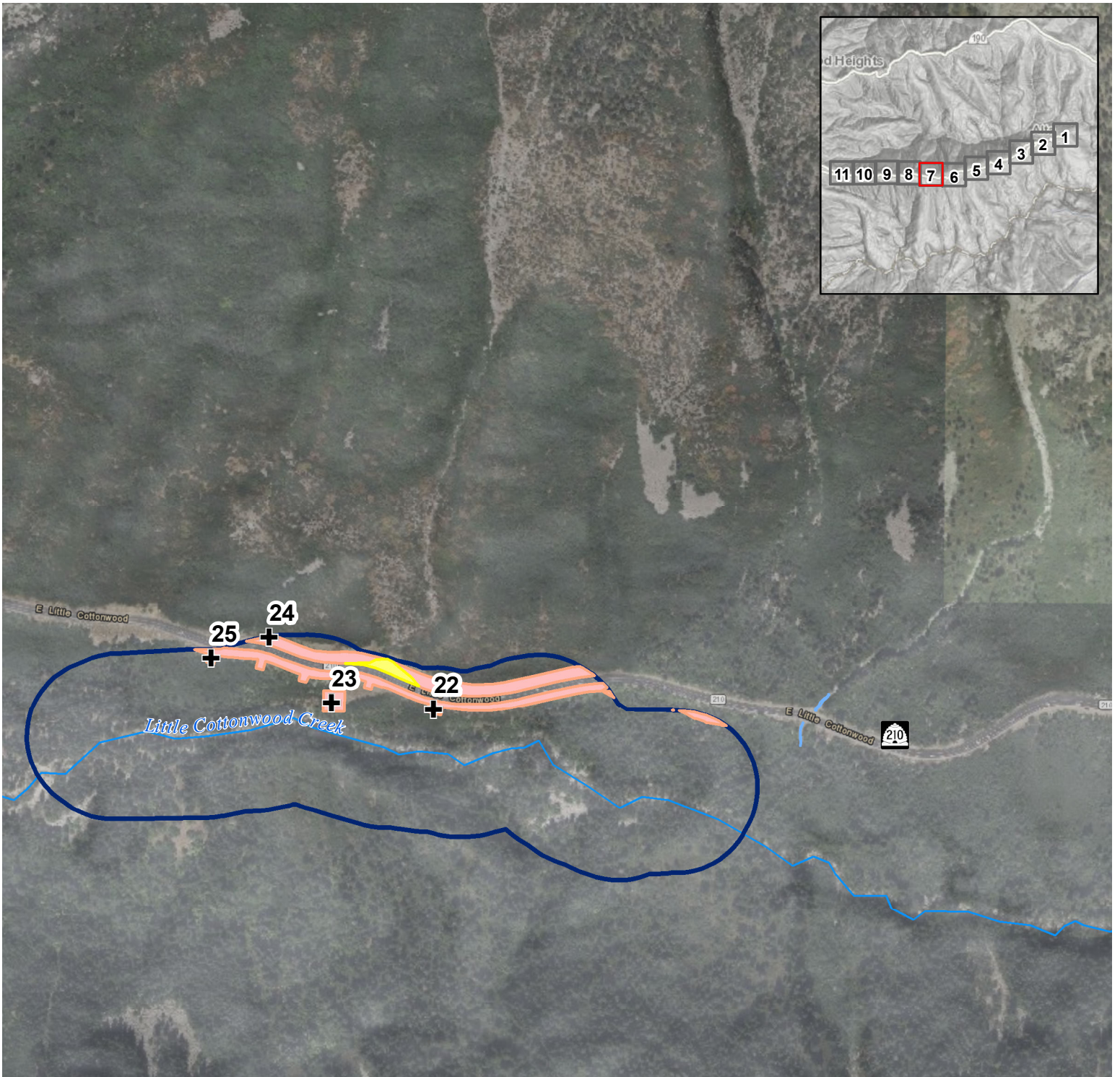




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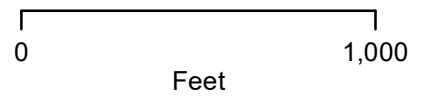
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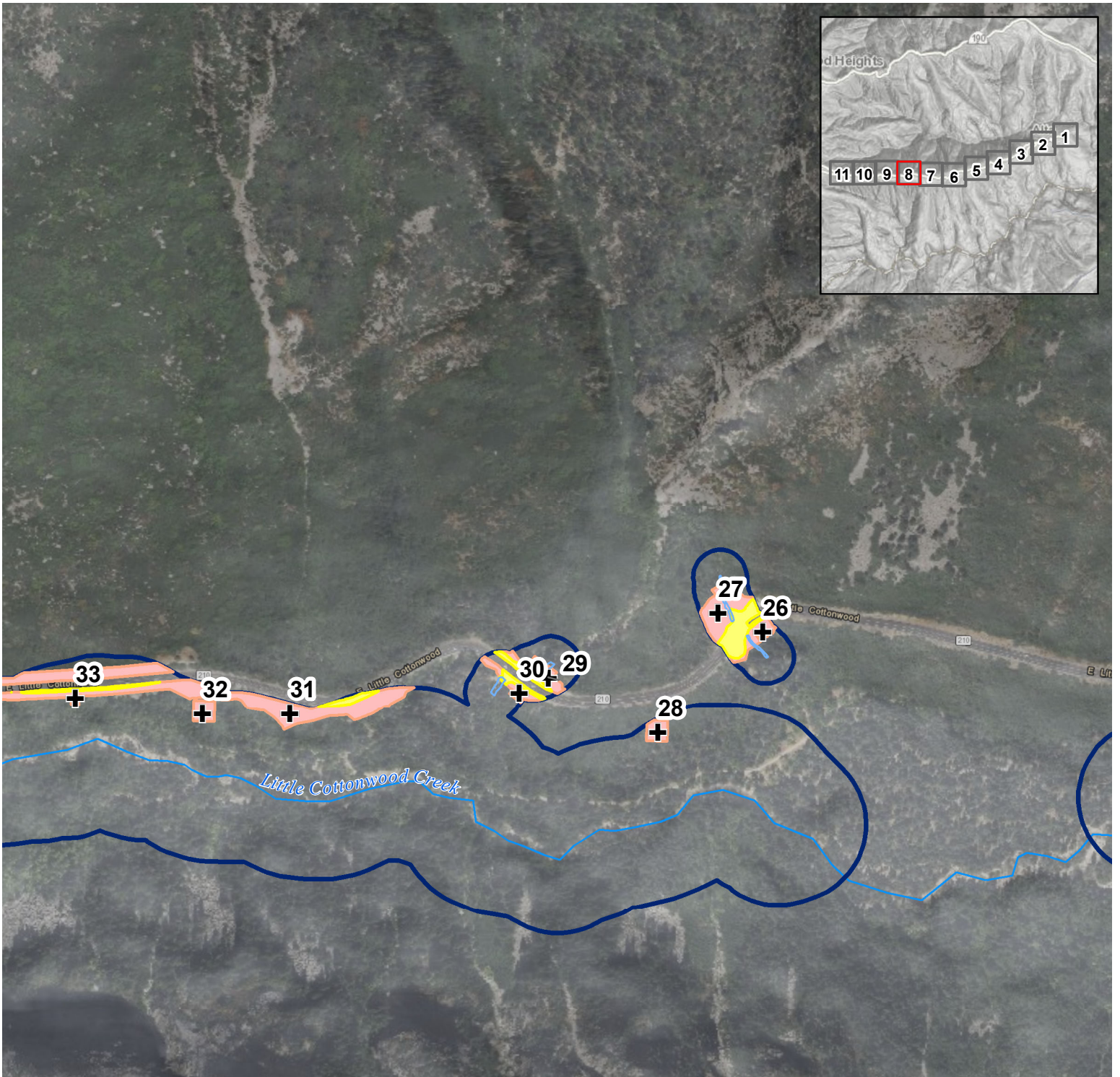




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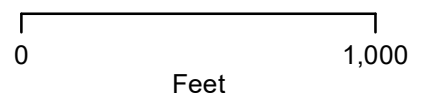
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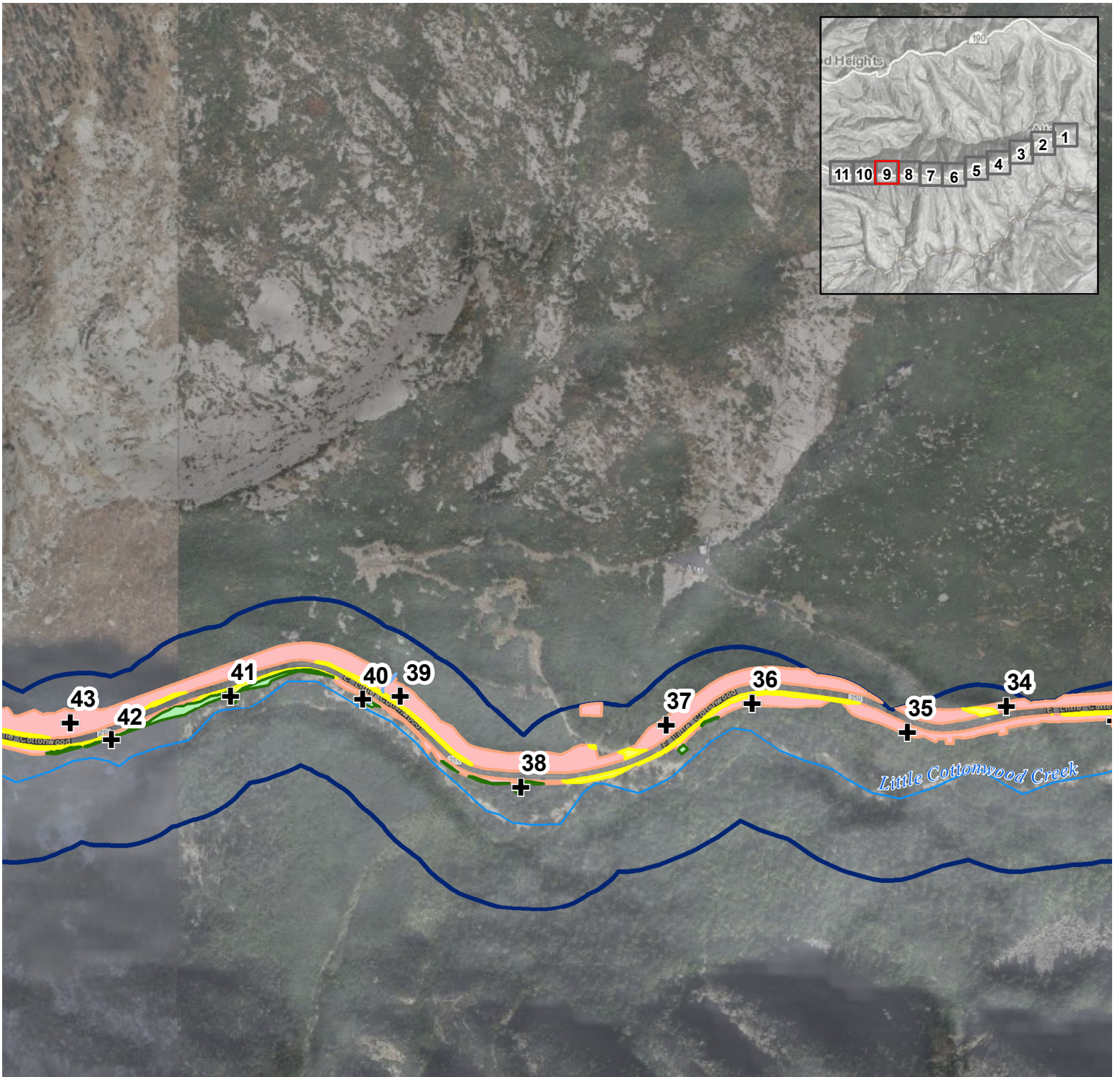




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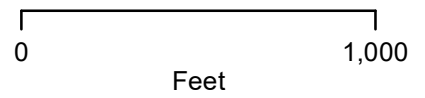
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- Wetlands and Seasonal Streams
- ~ Little Cottonwood Creek

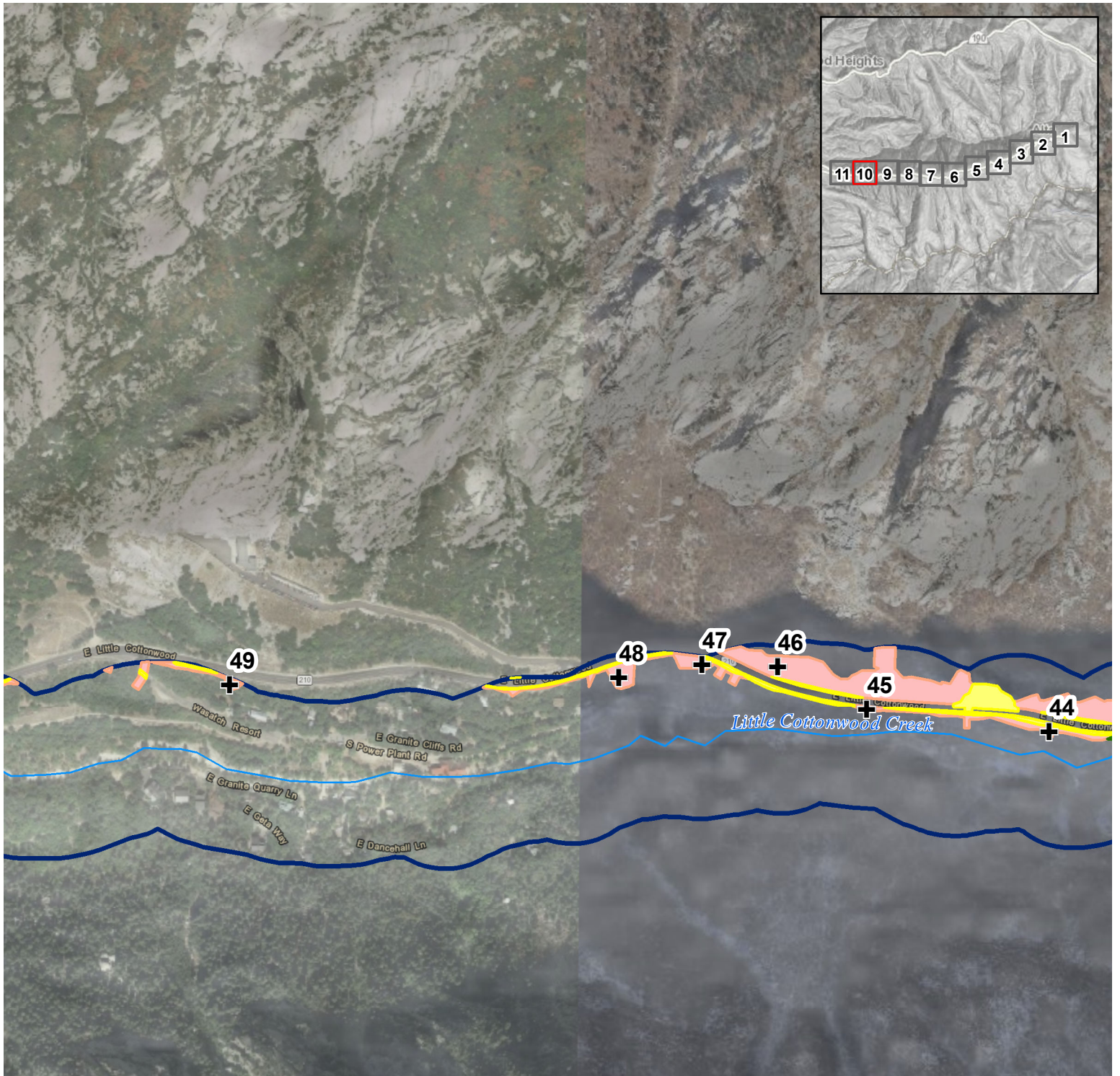




LEGEND

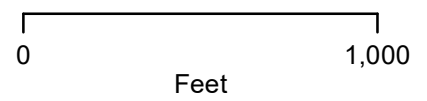
- RHCA Field Points
- RHCA Buffers
- Vegetation Category**
- Nonriparian Vegetation
- Riparian Vegetation
- Unvegetated
- Wetlands and Seasonal Streams
- Little Cottonwood Creek

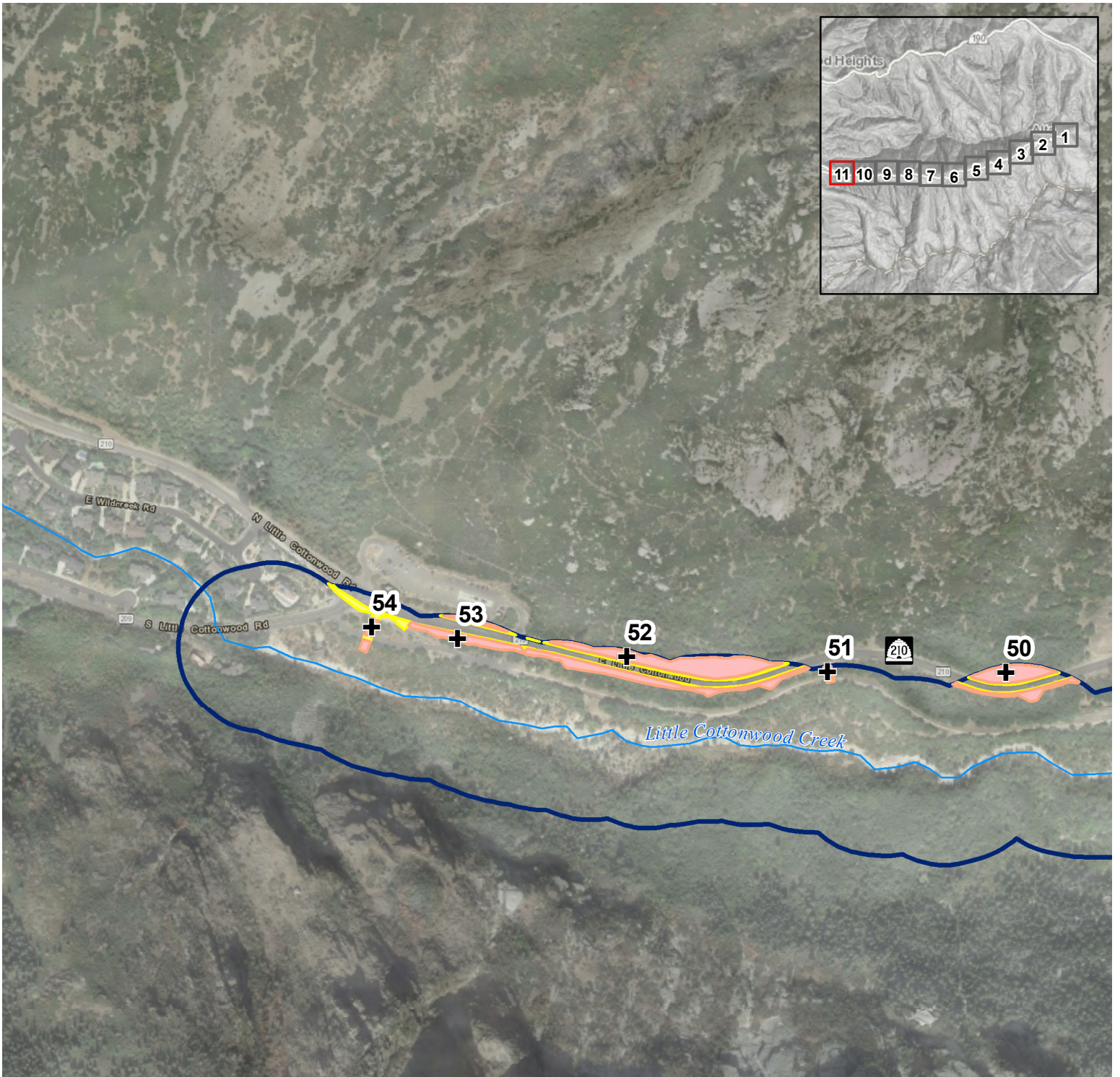




LEGEND

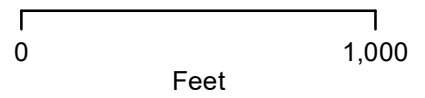
- RHCA Field Points
- RHCA Buffers
- Vegetation Category**
- Nonriparian Vegetation
- Riparian Vegetation
- Unvegetated
- Wetlands and Seasonal Streams
- Little Cottonwood Creek





LEGEND

- + RHCA Field Points
- RHCA Buffers
- Vegetation Category**
- Nonriparian Vegetation
- Riparian Vegetation
- Unvegetated
- Wetlands and Seasonal Streams
- ~ Little Cottonwood Creek



ATTACHMENT B

RHCA Survey Plot Data

Table 1. Riparian RHCA Survey Plot Data

RHCA ID	Surveyor	Date	General Notes	Riparian	Successional Stage	Canopy Cover	Dominant Canopy Species	Shrub-Sapling Cover	Dominant Shrub/Sapling Species	Herbaceous Cover	Dominant Herbaceous Species	Invasive/Weedy Species Cover	Dominant Invasive/Weedy Species	Percent Ground Cover	Stream Condition
4	JM	9/24/2020	Disturbance from rock slides from trail above.	Yes	Late	5-25%	<i>Populus tremuloides</i> , <i>Pseudotsuga menziesii</i>	5-25%	<i>Salix bebbiana</i> , <i>Cercocarpus ledifolius</i> Nutt.	5-25%	<i>Solidago canadensis</i>	0%	NA	25-50%	Stream is in relatively good condition with some disturbance from trail. Thin riparian layer on each side of the stream approximately 5 feet.
5	JM	9/24/2020	Cottonwood stand above roadside drainage.	Yes	Late	5-25%	<i>Populus tremuloides</i>	25-50%	<i>Salix bebbiana</i> , <i>Cercocarpus ledifolius</i> Nutt.	25-50%	<i>Solidago canadensis</i>	5-25%	<i>Phragmites australis</i>	50-75%	Riparian vegetation along drainage. No riparian layer on south side of road.
6	JM	9/24/2020	Site doesn't appear to be disturbed.	Yes	Late	5-25%	<i>Populus tremuloides</i> , <i>Acer negundo</i>	50-75%	<i>Salix bebbiana</i> , <i>Acer negundo</i>	25-50%	<i>Bromus inermis</i>	5-25%	<i>Cirsium</i> sp.	75-95%	Stream doesn't appear to be disturbed. Small intermittent channel. Somewhat channelized.
12	JM	9/24/2020	Site doesn't appear to be disturbed.	Yes	Late	50-75%	<i>Populus tremuloides</i> , <i>Populus angustifolia</i>	25-50%	<i>Cercocarpus ledifolius</i> Nutt.	25-50%	NA	0%	NA	50-75%	Intermittent stream channel with a few cottonwoods. Stream appears to be in good condition.
14	JM	9/24/2020	Plot is undisturbed.	Yes	Late	50-75%	<i>Populus angustifolia</i> , <i>Populus tremuloides</i>	25-50%	<i>Populus tremuloides</i> , <i>Symphoricarpos oreophilus</i> , <i>Prunus virginiana</i>	5-25%	<i>Bromus inermis</i>	0%	NA	75-95%	Riparian area in depression near intermittent stream, riparian area is not along the stream itself.
16	JMMP	9/24/2020	Stabilized for road shoulder and informal trail within plot.	Yes	Late	25-50%	<i>Pseudotsuga menziesii</i>	5-25%	<i>Salix bebbiana</i> , <i>Lonicera involucrata</i> , <i>Ribes aureum</i>	5-25%	<i>Bromus inermis</i> , <i>Solidago canadensis</i>	0%	NA	25-50%	Some disturbance from road stabilization boulders. Aside from that, stream appears to be in good condition.

17	MP	9/24/2020	Plot in riparian area, into base of road shoulder whereas upper shoulder is non-riparian.	Yes	Mid	0%	NA	75-95%	<i>Fraxinus americana</i> , <i>Populus angustifolia</i> , <i>Prunus virginiana</i> , <i>Symphoricarpos oreophilus</i> , <i>Populus tremuloides</i>	5-25%	<i>Solidago canadensis</i> , <i>Bromus inermis</i> , <i>Grindelia squarrosa</i>	0%	NA	5-25%	Appears undisturbed just south of plot.
20	MP	9/24/2020	Evidence of ground disturbance from road shoulder and channel work.	Yes	Late	25-50%	<i>Acer negundo</i> , <i>Populus angustifolia</i> , <i>Pseudotsuga menziesii</i>	50-75%	<i>Symphoricarpos oreophilus</i> , <i>Acer negundo</i> , <i>Pseudotsuga menziesii</i>	25-50%	<i>Solidago canadensis</i>	0%	NA	5-25%	Intermittent, currently dry. Evidence of channel work from storm flooding to repair road drainage.
21	MP	9/24/2020	No cottonwoods. Somewhat disturbed as plot is at toe of road slope. Informal trail.	Yes	Late	50-75%	<i>Acer negundo</i> , <i>Pseudotsuga menziesii</i>	25-50%	<i>Salix wolfii</i> , <i>Acer negundo</i>	25-50%	<i>Bromus inermis</i>	0%	NA	5-25%	Relatively new road drainage culverts.
38	JM	9/25/2020	Site is disturbed by large intermittent stream.	Yes	Late	50-75%	<i>Pseudotsuga menziesii</i> , <i>Populus angustifolia</i>	5-25%	<i>Acer grandidentatum</i> , <i>Cornus sericea</i>	0%	NA	0%	NA	50-75%	Disturbance and debris from runoff area.
40	JM	9/25/2020	Disturbance from road stabilization.	Yes	Late	5-25%	<i>Acer negundo</i>	5-25%	<i>Paxistima myrsinites</i>	5-25%	<i>Thimopyrum ponticum</i>	0%	NA	25-50%	Stream is disturbed from road stabilization. Thin riparian layer about 10 feet north of the stream.
41	JM	9/25/2020	The stream has eroded the banks within the plot.	Yes	Late	25-50%	<i>Acer grandidentatum</i> , <i>Populus angustifolia</i> , <i>Acer negundo</i>	25-50%	<i>Cornus sericea</i> , <i>Paxistima myrsinites</i>	Trace-5%	<i>Thimopyrum ponticum</i>	0%	NA	50-75%	Stream has eroded banks, but is in good condition aside from that.
42	JM	9/25/2020	Plot near roadside, some road disturbance.	Yes	Late	50-75%	<i>Populus angustifolia</i> , <i>Acer grandidentatum</i>	50-75%	<i>Cornus sericea</i>	5-25%	<i>Bromus inermis</i> , <i>Grindelia squarrosa</i>	0%	NA	50-75%	Stream is in good condition aside from eroded banks.

Table 2. Non-Riparian RHCA Survey Plot Data

RHCA ID	Surveyor	Date	General Notes	Riparian	Successional Stage	Canopy Cover	Dominant Canopy Species	Shrub-Sapling Cover	Dominant Shrub/Sapling Species	Herbaceous Cover	Dominant Herbaceous Species	Invasive/Weedy Species Cover	Dominant Invasive/Weedy Species	Percent Ground Cover	Stream Condition
1	JM	9/24/2020	Some nearby disturbance from trails.	NO	Late	5-25%	<i>Populus tremuloides</i> , <i>Pseudotsuga menziesii</i>	5-25%	<i>Artemisia tridentata</i> , <i>Lonicera involucrata</i> , <i>Prunus virginiana</i>	25-50%	<i>Asclepias syriaca</i> , <i>Solidago canadensis</i>	0%	NA	50-75%	NA
2	JM	9/24/2020	No disturbance within the plot.	NO	Late	25-50%	<i>Picea engelmannii</i> , <i>Pseudotsuga menziesii</i>	0%	NA	50-75%	<i>Erigeron sp.</i>	0%	NA	50-75%	NA
3	JM	9/24/2020	Plot has disturbance with walking trails and a nearby road.	NO	Late	5-25%	<i>Populus tremuloides</i>	5-25%	<i>Populus tremuloides</i>	25-50%	<i>Bromus inermis</i> , <i>Solidago canadensis</i>	0%	NA	25-50%	Stream has some disturbance with boulders from road stabilization. Areas downstream are in good condition.
7	JM	9/24/2020	Some disturbance from road gravel.	NO	Late	25-50%	<i>Pseudotsuga menziesii</i>	25-50%	<i>Symphoricarpos oreophilus</i> , <i>Artemisia tridentata</i>	5-25%	<i>Solidago canadensis</i> , <i>Asclepias syriaca</i>	0%	NA	50-75%	NA
8	JM	9/24/2020	Some roadside construction disturbance to site.	NO	Late	5-25%	<i>Pseudotsuga menziesii</i> , <i>Populus tremuloides</i>	50-75%	<i>Cercocarpus ledifolius</i> Nutt., <i>Symphoricarpos oreophilus</i>	5-25%	<i>Bromus inermis</i>	0%	NA	50-75%	NA
9	JM	9/24/2020	Some disturbance within plot from road stabilization.	NO	Late	25-50%	<i>Pseudotsuga menziesii</i>	25-50%	<i>Symphoricarpos oreophilus</i> , <i>Prunus virginiana</i>	Trace-5%	<i>Bromus inermis</i>	0%	NA	50-75%	NA
10	JM	9/24/2020	Gravel disturbance from road.	NO	Late	25-50%	<i>Acer grandidentatum</i> , <i>Populus tremuloides</i> , <i>Pseudotsuga menziesii</i>	25-50%	<i>Symphoricarpos oreophilus</i> , <i>Rosa woodsii</i>	5-25%	<i>Solidago canadensis</i> , <i>Thimopyrum ponticum</i> , <i>Bromus inermis</i>	0%	NA	50-75%	NA
11	JM	9/24/2020	No disturbance within plot.	NO	Late	25-50%	<i>Populus tremuloides</i> , <i>Pseudotsuga menziesii</i>	0%	NA	50-75%	<i>Bromus inermis</i>	0%	NA	75-95%	NA
13	JM	9/24/2020	Gravel disturbance from roadside.	NO	Mid	25-50%	<i>Populus tremuloides</i>	25-50%	<i>Symphoricarpos oreophilus</i>	5-25%	<i>Pseudoroegneria spicata</i> , <i>Bromus inermis</i>	0%	NA	50-75%	NA

15	JMMP	9/24/2020	Disturbance within plot due to trails.	NO	Late	5-25%	<i>Populus tremuloides</i> , <i>Pseudotsuga menziesii</i>	50-75%	<i>Symphoricarpos oreophilus</i>	5-25%		NA	50-75%	NA	Stream appears to be in good condition.
18	MP	9/24/2020	No evidence of disturbance in plot.	NO	Late	50-75%	<i>Pseudotsuga menziesii</i> , <i>Populus tremuloides</i>	50-75%	<i>Symphoricarpos oreophilus</i> , <i>Paxistima myrsinites</i>	Trace-5%		NA	5-25%	NA	
19	MP	9/24/2020	No evidence of disturbance observed.	NO	Late	25-50%	<i>Pseudotsuga menziesii</i> , <i>Populus tremuloides</i>	75-95%	<i>Salix wolfii</i> , <i>Populus tremuloides</i>	0%		NA	25-50%	NA	
22	MP	9/24/2020	Steep roadside slope with some reclaimed grassland.	NO	Late	25-50%	<i>Acer negundo</i> , <i>Acer grandidentatum</i> , <i>Pseudotsuga menziesii</i>	25-50%	<i>Prunus virginiana</i> , <i>Acer grandidentatum</i>	25-50%		<i>Bramus inermis</i> , <i>Thinyopyrum ponticum</i>	25-50%	NA	
22	MP	9/24/2020	Reclaimed road slope with wheatgrass. Just below is oak-maple community.	NO	Mid	0%	NA	0%	NA	75-95%		<i>Thinyopyrum ponticum</i> , <i>Ambrosia artemisiifolia</i>	5-25%	<i>Ambrosia artemisiifolia</i>	NA
23	MP	9/24/2020	Plot on roadside slope.	NO	Mid	5-25%	<i>Quercus gambellii</i> , <i>Acer grandidentatum</i>	5-25%	<i>Prunus virginiana</i> , <i>Acer grandidentatum</i>	25-50%		<i>Ribes aureum</i> , <i>Thinyopyrum ponticum</i> , <i>Bramus tectorum</i>	5-25%	<i>Bramus tectorum</i>	NA
23	MP	9/24/2020	Steep road slope with reclaimed grasses.	NO	Mid	0%	NA	5-25%	<i>Ericameria nauseosa</i>	25-50%		<i>Thinyopyrum ponticum</i> , <i>Symphytichium</i> sp.	25-50%	NA	NA
24	MP	9/24/2020	Plot on a road cut with some erosion.	NO	Mid	0%	NA	5-25%	<i>Quercus gambellii</i> , <i>Acer grandidentatum</i>	25-50%		<i>Symphytichium</i> sp., <i>Achillea millefolium</i>	50-75%	NA	NA
25	MP	9/24/2020	Some evidence of rock slope stabilization.	NO	Late	75-95%	<i>Acer grandidentatum</i>	25-50%	<i>Prunus virginiana</i>	Trace-5%		<i>Thinyopyrum ponticum</i>	25-50%	<i>Bramus tectorum</i>	NA
26	JM	9/24/2020	Site has some gravel disturbance from road.	NO	Late	50-75%	<i>Pseudotsuga menziesii</i> , <i>Acer grandidentatum</i>	25-50%	<i>Prunus virginiana</i> , <i>Symphoricarpos oreophilus</i> , <i>Ericameria nauseosa</i>	5-25%		<i>Grindelia squarrosa</i>	50-75%	NA	NA
27	JM	9/24/2020	Site not disturbed.	NO	Late	50-75%	<i>Pseudotsuga menziesii</i> , <i>Acer grandidentatum</i>	5-25%	<i>Acer grandidentatum</i> , <i>Prunus virginiana</i>	Trace-5%		<i>Thinyopyrum ponticum</i>	25-50%	NA	NA

28	JMAC	9/25/2020	Disturbance within plot with mountain biking trails.	NO	Late	50-75%	Quercus gambellii, Acer grandidentatum, Pseudotsuga menziesii	25-50%	Paxistima myrsinites, Acer grandidentatum, Mahonia aquifolium	0%	NA	0%	NA	50-75%	NA
29	JMAC	9/25/2020	Large intermittent stream within plot.	NO	Late	25-50%	Pseudotsuga menziesii, Quercus gambellii, Acer grandidentatum	5-25%	Mahonia aquifolium, Paxistima myrsinites	0%	NA	0%	NA	50-75%	NA
30	JMAC	9/25/2020	Stream causes some disturbance within plot.	NO	Late	50-75%	Pseudotsuga menziesii, Quercus gambellii	25-50%	Acer grandidentatum, Pseudotsuga menziesii	0%	NA	0%	NA	50-75%	NA
31	JMAC	9/25/2020	Hill slope off the side of S.R. 210.	NO	Late	25-50%	Acer grandidentatum	25-50%	Acer grandidentatum, Mahonia aquifolium	50-75%	Bromus inermis	0%	NA	75-95%	NA
32	JMAC	9/25/2020	Boxelder and larger trees downslope.	NO	Late	50-75%	Acer grandidentatum, Pseudotsuga menziesii	25-50%	Acer grandidentatum, Mahonia aquifolium, Lonicera involucrata	25-50%	Bromus inermis	0%	NA	95-100%	NA
33	JMAC	9/25/2020	Point taken from side of road. Steep hill slope.	NO	Late	25-50%	Quercus gambellii, Acer negundo	25-50%	Acer negundo, Quercus gambellii	5-25%	Bromus inermis	0%	NA	25-50%	NA
34	JMAC	9/25/2020	Steep hill slope.	NO	Late	25-50%	Acer grandidentatum, Quercus gambellii	5-25%	Acer grandidentatum, Quercus gambellii, Prunus virginiana	5-25%	Grindella squarrosa	NA	NA	25-50%	NA
35	JMAC	9/25/2020	Just off hill slope of road.	NO	Late	25-50%	Acer grandidentatum	5-25%	Mahonia aquifolium	5-25%	Bromus inermis	0%	NA	50-75%	NA
36	JM	9/29/2020	Site does not appear to be disturbed.	NO	Late	50-75%	Acer negundo, Acer grandidentatum	5-25%	Ericameria nauseosa, Prunus virginiana	5-25%	Bromus inermis, Thinopyrum ponticum	0%	NA	50-75%	NA
37	JMAC	9/25/2020	Steep hill slope.	NO	Late	50-75%	Quercus gambellii, Acer grandidentatum	50-75%	Quercus gambellii, Acer grandidentatum	5-25%	Grindella squarrosa, Bromus inermis	0%	NA	50-75%	NA
39	JM	9/25/2020	Site is not disturbed.	NO	Late	50-75%	Acer grandidentatum, Acer negundo	50-75%	Mahonia aquifolium	0%	NA	0%	NA	50-75%	NA

43	JM	9/25/2020	No disturbance within area.	NO	Late	25-50%	<i>Acer grandidentatum</i> , <i>Pseudotsuga menziesii</i>	5-25%	<i>Prunus virginiana</i> , <i>Paxistima myrsinites</i>	0%	NA	0%	NA	25-50%	NA	Some erosion on north bank and pipe at top of bank.	NA
44	MP	9/25/2020	Informal trails in plot.	NO	Late	50-75%	<i>Acer grandidentatum</i> , <i>Pseudotsuga menziesii</i>	25-50%	<i>Prunus virginiana</i> , <i>Acer grandidentatum</i>	25-50%	<i>Rubus parviflorus</i> , <i>Bromus inermis</i>	0%	NA	25-50%	NA		
45	JM	9/25/2020	Some gravel from road shoulder.	NO	Late	25-50%	<i>Quercus gambellii</i> , <i>Acer grandidentatum</i>	5-25%	<i>Quercus gambellii</i>	50-75%	<i>Bromus inermis</i>	0%	NA	50-75%	NA		
46	JM	9/25/2020	Site has disturbance from recreational activity.	NO	Late	50-75%	<i>Acer grandidentatum</i> , <i>Quercus gambellii</i>	25-50%	<i>Mahonia aquifolium</i> , <i>Prunus virginiana</i>	0%	NA	0%	NA	50-75%	NA		
47	JM	9/25/2020	Disturbance from road gravel.	NO	Late	50-75%	<i>Acer grandidentatum</i> , <i>Acer negundo</i>	5-25%	<i>Ericameria nauseosa</i>	5-25%	<i>Grindelia squarrosa</i> , <i>Asclepias syriaca</i>	0%	NA	25-50%	NA		
48	JM	9/25/2020	Some trails throughout plot.	NO	Late	50-75%	<i>Acer grandidentatum</i> , <i>Pseudotsuga menziesii</i>	25-50%	<i>Mahonia aquifolium</i> , <i>Prunus virginiana</i>	0%	NA	0%	NA	25-50%	NA		
49	JMAC	9/25/2020	Some road disturbance at site.	NO	Late	50-75%	<i>Acer grandidentatum</i> , <i>Quercus gambellii</i>	25-50%	<i>Ericameria nauseosa</i> , <i>Lonicera involucrata</i>	0%	NA	0%	NA	50-75%	NA		
50	JM	9/25/2020	No disturbance within site.	NO	Late	25-50%	<i>Acer grandidentatum</i>	50-75%	<i>Acer grandidentatum</i> , <i>Prunus virginiana</i> , <i>Mahonia aquifolium</i>	Trace-5%	<i>Thiopyrum ponticum</i>	0%	NA	50-75%	NA		
51	JM	9/25/2020	Popular trail runs through site.	NO	Late	25-50%	<i>Acer grandidentatum</i>	5-25%	<i>Ericameria nauseosa</i>	5-25%	<i>Thiopyrum ponticum</i>	0%	NA	25-50%	NA		
52	JMAC	9/25/2020	Construction ongoing at site.	NO	Late	50-75%	<i>Quercus gambellii</i> , <i>Acer grandidentatum</i>	25-50%	<i>Prunus virginiana</i> , <i>Acer grandidentatum</i>	0%	NA	0%	NA	50-75%	NA		
53	JMMP	9/24/2020	The disturbance observed in the plot.	NO	Late	25-50%	<i>Quercus gambellii</i>	5-25%	<i>Prunus virginiana</i>	0%	NA	0%	NA	25-50%	NA		
54	JMMP	9/24/2020	No disturbance observed in plot.	NO	Late	5-25%	<i>Quercus gambellii</i> , <i>Acer grandidentatum</i>	25-50%	<i>Ericameria nauseosa</i> , <i>Artemisia tridentata</i> , <i>Prunus virginiana</i>	5-25%	<i>Bromus inermis</i>	0%	NA	25-50%	NA		

ATTACHMENT C

RHCA Survey Plot Representative Photographs

RHCA Field Point 1



RHCA Field Point 2



RHCA Field Point 3



RHCA Field Point 4



RHCA Field Point 5



RHCA Field Point 6



RHCA Field Point 7



RHCA Field Point 8



RHCA Field Point 9



RHCA Field Point 10



RHCA Field Point 11



RHCA Field Point 12



RHCA Field Point 13



RHCA Field Point 14



RHCA Field Point 15



RHCA Field Point 16



RHCA Field Point 17



RHCA Field Point 18



RHCA Field Point 19



RHCA Field Point 20



RHCA Field Point 21



RHCA Field Point 22



RHCA Field Point 23



RHCA Field Point 24



RHCA Field Point 25



RHCA Field Point 26



RHCA Field Point 27



RHCA Field Point 28



RHCA Field Point 29



RHCA Field Point 30



RHCA Field Point 31



RHCA Field Point 32



RHCA Field Point 33



RHCA Field Point 34



RHCA Field Point 35



RHCA Field Point 36



RHCA Field Point 37



RHCA Field Point 38



RHCA Field Point 39



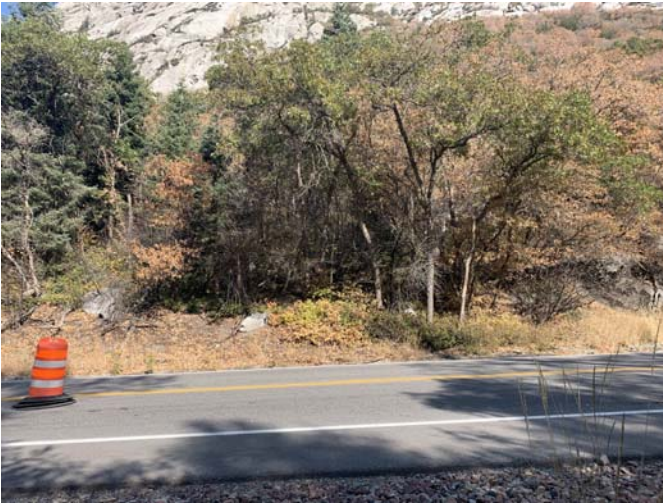
RHCA Field Point 40



RHCA Field Point 41



RHCA Field Point 42



RHCA Field Point 43



RHCA Field Point 44



RHCA Field Point 45



RHCA Field Point 46



RHCA Field Point 47



RHCA Field Point 48



RHCA Field Point 49



RHCA Field Point 50



RHCA Field Point 51



RHCA Field Point 52



RHCA Field Point 53



RHCA Field Point 54



Chapter 14: Floodplains

14.1 Introduction

This chapter discusses the floodplains in the floodplain impact analysis area and the effects of the proposed alternatives on these floodplains. For a discussion of aquatic resources associated with floodplains, see Chapter 13, Ecosystem Resources.

Floodplain Impact Analysis Area. The floodplain impact analysis area includes floodplains that are adjacent to and near State Route (S.R.) 210 from the intersection at Fort Union Boulevard (S.R. 190) in Cottonwood Heights to its terminus in the town of Alta (see Figure 14.3-1 through Figure 14.3-4, Floodplains in the Floodplain Impact Analysis Area, beginning on page 14-7). The floodplain impact analysis area also includes the Bypass Road between Snowbird and Alta and the proposed mobility hubs at the gravel pit and 9400 South and Highland Drive.

What is the floodplain impact analysis area?

The floodplain impact analysis area includes floodplains that are adjacent to and near S.R. 210 from the intersection at Fort Union Boulevard to its terminus in the town of Alta. It also includes the Bypass Road and the proposed mobility hubs at the gravel pit and 9400 South and Highland Drive.

14.2 Regulatory Setting

Two terms that are used in floodplain regulatory guidance are *100-year flood* and *floodplain*.

Floods are usually described in terms of their statistical frequency. A 100-year floodplain is the area that would be flooded by a water body during 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 in a given location during one year, there is still a 1% chance of a similar flood in the same location the following year.

Since floodplains can be mapped, the boundary of the 100-year flood is commonly used in floodplain mitigation programs to identify areas where risk of flooding is significant.

What are a 100-year floodplain and 100-year flood?

A 100-year floodplain is the area that would be flooded by a water body during 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.

14.2.1 Federal Emergency Management

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

special flood hazard areas, are described in 44 Code of Federal Regulations (CFR) Parts 60 and 65, respectively.

In the 1970s and 1980s, FEMA performed location hydrologic and hydraulic studies to identify and map the most significant special flood hazard areas within developed or developing areas of the communities participating in the National Flood Insurance Program. A result of the FEMA studies is the development of Flood Insurance Rate Maps that show the floodplain for each river, lake, or other surface water resource that was studied.

A *special flood hazard area* is the area that would be inundated by a 100-year flood, also referred to by FEMA as the *base flood*. National Flood Insurance Program regulations are based on these special flood hazard areas; 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. There are several types of zones in the floodplain impact analysis area, but the following special flood hazard area zones are pertinent to this project:

- **Zone A:** Areas subject to inundation by a base flood. These areas are identified by approximate studies, and no base flood elevations are established (FEMA 2018a).
- **Zone AE:** Areas subject to inundation by a base flood as determined by detailed methods. Base flood elevations are established (FEMA 2018b).

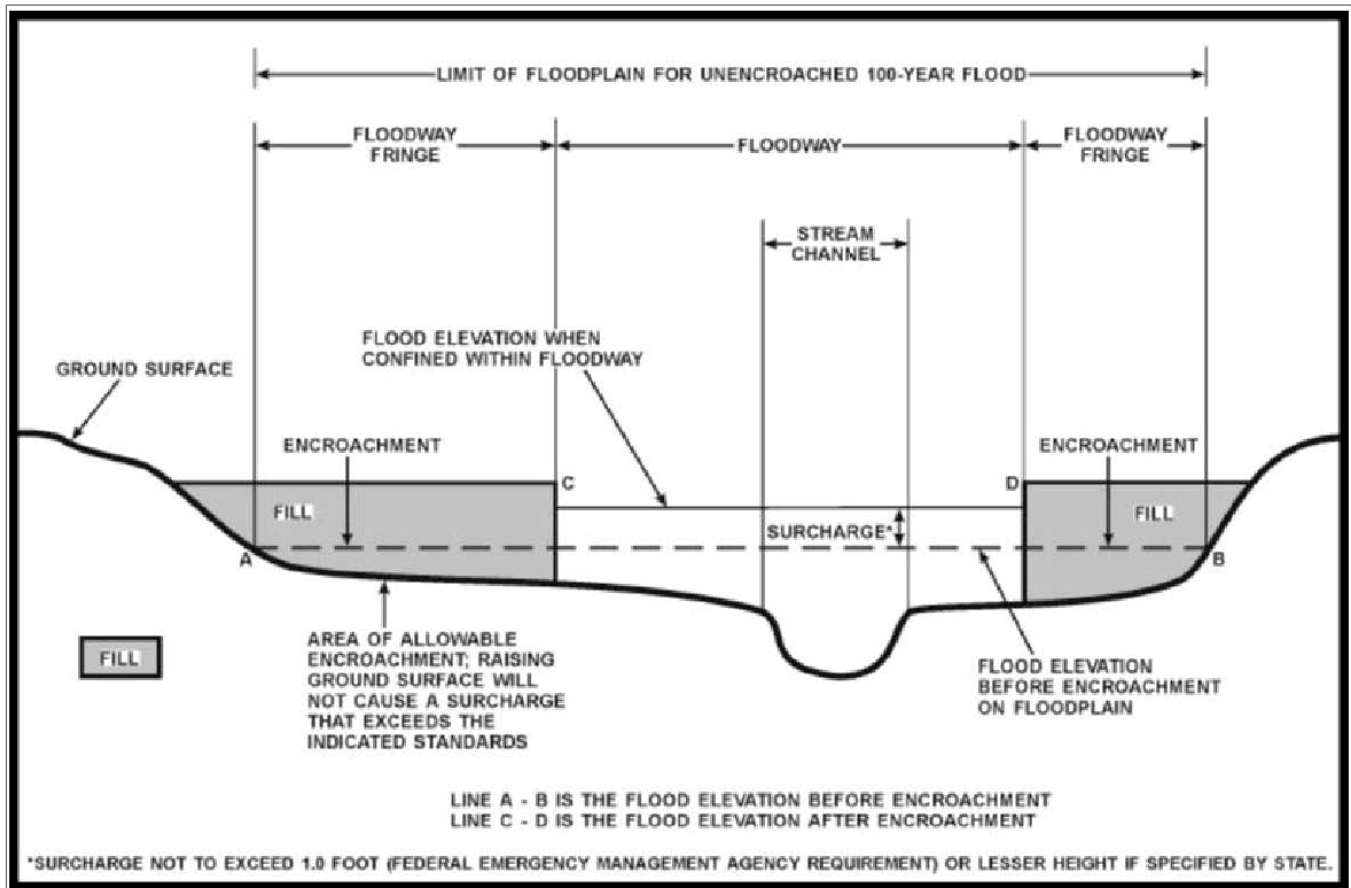
The 100-year floodplain for streams is the area in and around the stream that would be inundated by a 100-year flood. In AE zones, this floodplain might consist of both the floodway and the floodway fringe, as shown in Figure 14.2-1. The *floodway* is the defined stream channel and the adjacent areas 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. The *floodway fringe* is the area between the floodway and the boundary of the floodplain.

What is a stream?

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

Similarly, the 100-year floodplain for lakes and reservoirs is the area in and around the lake or reservoir that would be inundated by a 100-year flood.

Figure 14.2-1. FEMA Floodplain Schematic



Source: FEMA 2018c

14.2.2 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 the Federal Highway Administration (FHWA) adopted based on Executive Order 11988; these regulations govern the development of projects that could affect floodplains (23 CFR Part 650, Subpart A).

These regulations require that a location hydraulic report be prepared to demonstrate how the requirements of 44 CFR Parts 60 and 65 have been met by the project. These regulations state that the project proponent (in this case, the Utah Department of Transportation [UDOT]) will not approve a project that involves a “significant encroachment” on a floodplain unless the project proponent finds that the proposed significant encroachment is the “only practicable alternative” (23 CFR Section 650.113). This regulation also clearly states that the project must conform to 44 CFR Parts 60 and 65 as well as the floodplain management ordinance of the affected community.

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. 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 development (in conjunction with past and future encroachments).

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 (natural and beneficial floodplain values include flood conveyance, storage, and control; groundwater recharge; water quality function; and wildlife habitat and diversity)

As UDOT designs the Selected Alternative, it would include the supporting floodplain and hydraulic analyses to address FHWA regulations. UDOT’s design process includes preparing technical memoranda that, together with roadway and drainage plans and profiles, demonstrate compliance with various regulations, permitting requirements, and design criteria. Using the floodplain impact analysis in Section 14.4, Environmental Consequences and Mitigation Measures, as a basis, 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. Additionally, UDOT would evaluate the roadway embankments and other features to determine their effect on flood conveyance and risks.

According to guidance issued by FEMA, the 100-year floodplain should be used for developing Flood Insurance Rate Maps. Accordingly, the 100-year flood was used by UDOT in this floodplain impact analysis and would be used by UDOT throughout its design process.

As it designs the Selected Alternative, UDOT would perform a detailed hydraulic analysis of each drainage facility crossed to confirm that the bridges and culverts identified during the preliminary design would adequately convey flood waters. Overall impacts to the floodplains and floodplain values would be measured against the impacts and requirements documented in this Environmental Impact Statement (EIS).

For this project and based on the floodplain impact analysis that was performed, the action alternatives would not cause a significant impact to any floodplain; therefore, a finding of a practicable alternative as required by 23 CFR Part 650, Subpart A, is not required.

14.3 Affected Environment

The creeks that cross the floodplain impact analysis area originate in the Wasatch Mountains in Salt Lake County and flow to the west and north through the communities in Salt Lake County.

For the purpose of identifying streams and floodplains, the impact analysis area is described from north to south. Information about the impact analysis area was gathered from a variety of sources including FEMA’s Community Status Book, flood insurance studies, National Flood Hazard Layer (NFHL) data, U.S. Geological Survey topographic maps, and the Utah Geographic Information Systems (GIS) Portal.

14.3.1 Communities Participating in FEMA’s National Flood Insurance Program

The floodplain impact analysis area includes parts of communities in Salt Lake County as well as unincorporated areas of Salt Lake County. All of the communities in the impact analysis area participate in FEMA’s National Flood Insurance Program, 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 14.3-1.

Table 14.3-1. Identification Numbers for Communities Participating in the National Flood Insurance Program

Community	FEMA Community Identification Number
Salt Lake County ^a	490102
Cottonwood Heights City	490028
Town of Alta	490251

Source: FEMA 2018d

^a Effective floodplain data (NFHL data) are organized by county.

14.3.2 Floodplains in the Floodplain Impact Analysis Area

Streams and floodplains in the floodplain impact analysis area are described below and include named waterways and isolated areas for which regulatory floodplains are defined. Current effective floodplain maps for the analysis area are based on the latest study performed for Salt Lake County in 2012, the latest Letters of Map Revision (LOMR) in 2011 and 2013, and the latest Letters of Map Amendment (LOMA) from 2010 to 2018 (FEMA 2019). (A LOMR and a LOMA are FEMA’s modifications to an effective floodplains map.) Stream names are based on the FEMA data and are consistent with the names found on the U.S. Geological Survey topographic quadrangle (USGS 1998).

What is a regulatory floodplain?

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

In the following descriptions, references to Salt Lake County refer to unincorporated parts of the county. Streams and floodplains in the impact analysis area are shown in Figure 14.3-1 through Figure 14.3-4.

Big Cottonwood Creek. Big Cottonwood Creek flows from east to west starting in the upper portion of Big Cottonwood Canyon near Brighton and flows to the west and north through Salt Lake County and the cities of Cottonwood Heights, Midvale, and Murray, where the creek then flows into the Jordan River. In the floodplain impact analysis area, the creek is located north of S.R. 210 and is generally confined within the channel and immediate overbank areas. East of the intersection of S.R. 210 and S.R. 190 in Big Cottonwood Canyon, the creek's regulatory floodplain is designated as Zone A and does not have defined base flood elevations. Continuing downstream from the S.R. 210/S.R. 190 intersection, the creek's regulatory floodplain is designated as Zone AE, with a regulated floodway, through the local communities to the Jordan River. Base flood elevations for Big Cottonwood Creek are provided for Zone AE in the NFHL data. Big Cottonwood Creek in the impact analysis area is shown in Figure 14.3-1.

Little Cottonwood Creek. Little Cottonwood Creek flows from east to west starting in the upper portion of Little Cottonwood Canyon near Alta and flows to the west through Salt Lake County and the cities of Sandy, Midvale, and Murray, where the creek then flows into the Jordan River. In the floodplain impact analysis area, the creek is located south of S.R. 210 and is generally confined within the channel and immediate overbank areas. From the town of Alta downstream to the S.R. 210/S.R. 209 intersection, the creek's regulatory floodplain is designated as Zone A and does not have defined base flood elevations. Continuing downstream from the S.R. 210/S.R. 209 intersection, the creek's regulatory floodplain is designated as Zone AE, with a regulated floodway, through the local communities to the Jordan River. Base flood elevations for Little Cottonwood Creek are provided for Zone AE in the NFHL data. Little Cottonwood Creek in the impact analysis area is shown in Figure 14.3-2 through Figure 14.3-4.

Floodplain Areas adjacent to S.R. 210 near 3500 East. Regulatory floodplains designated as Zone A are located on both the east and west sides of S.R. 210 just north of the 3500 East intersection. The floodplain area on the east side of S.R. 210 is described on FEMA documents as "Oaks at Wasatch Basin," and the floodplain area on the west side of S.R. 210 north of the park-and-ride lot is described as "3500 East Street Basin." These floodplain areas are shown in Figure 14.3-2.

Floodplain Area Crossing S.R. 210 near 9000 South. A regulatory floodplain designated as Zone A crosses S.R. 210 near 9000 South. This floodplain area is associated with Deaf Smith Canyon Creek/Little Willow Creek and is shown in Figure 14.3-2. (This floodplain area might need to be remapped by FEMA, since it does not appear to be correct as shown on the FEMA floodplain map.)

Figure 14.3-1. Floodplains in the Floodplain Impact Analysis Area (1 of 4)



Figure 1 of 4

Figure 14.3-2. Floodplains in the Floodplain Impact Analysis Area (2 of 4)



Figure 14.3-3. Floodplains in the Floodplain Impact Analysis Area (3 of 4)

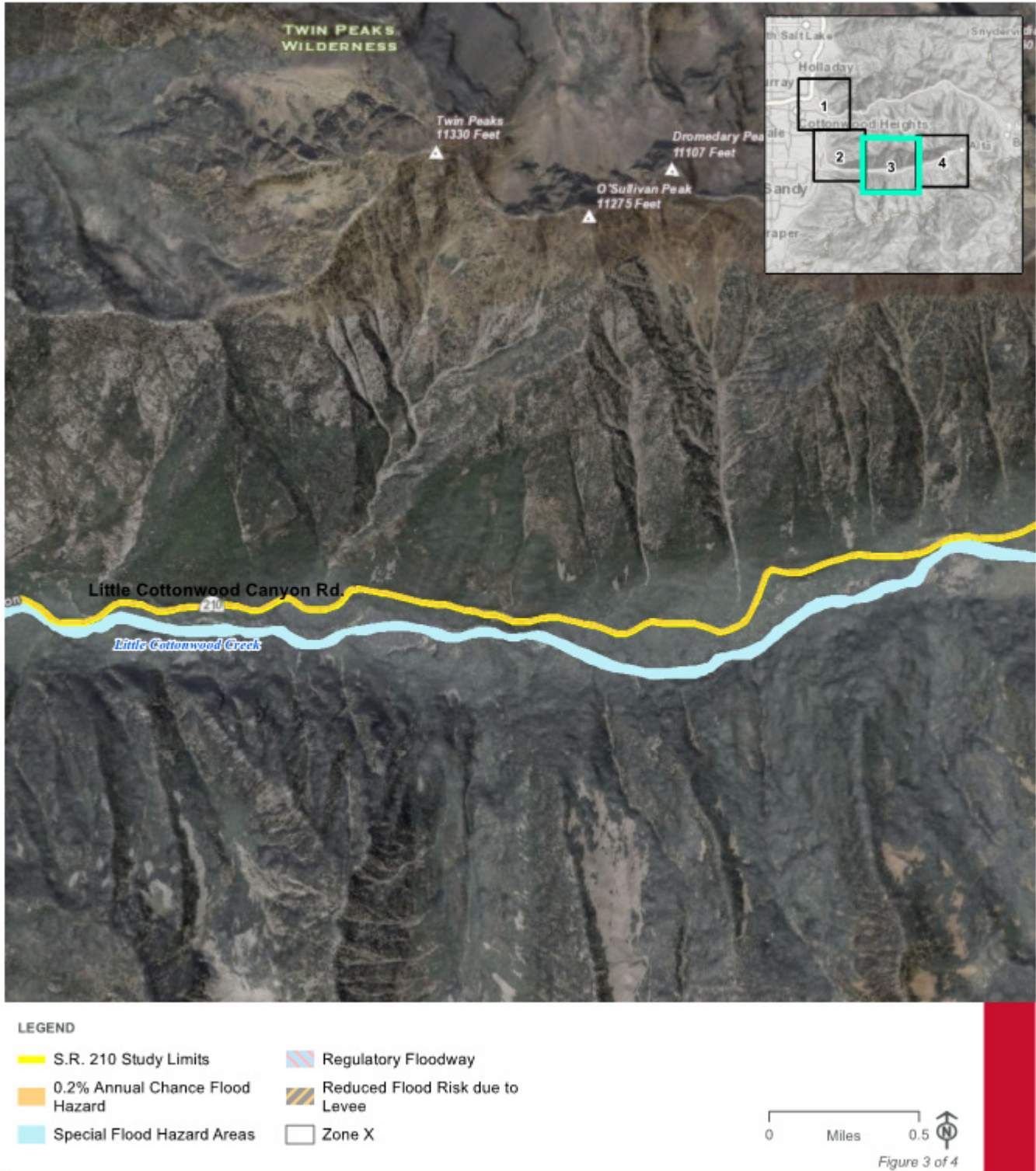


Figure 14.3-4. Floodplains in the Floodplain Impact Analysis Area (4 of 4)



14.4 Environmental Consequences and Mitigation Measures

This section discusses the floodplain impacts from each of the project alternatives based on the preliminary impact boundary for each alternative. The impact boundary includes the roadway surface, embankment limits, and temporary impacts from construction.

14.4.1 Methodology

UDOT determined the floodplain impacts from the action alternatives by comparing FEMA NFHL data to the proposed preliminary impact boundary of each alternative to identify crossings of regulatory floodplains in the floodplain impact analysis area. The regulatory floodplain analysis is based on current FEMA floodplain maps. When reviewing the floodplain impacts described in Sections 14.4.2 through 14.4.7, readers should take the following factors into consideration.

- A regulatory floodplain can be defined for all reaches, partial reaches, or no reaches of a stream. The analysis performed for and documented in Sections 14.4.2 through 14.4.7 is an analysis of the impacts to the regulatory floodplains, not an analysis of the impacts to all streams (either perennial or intermittent and those without defined regulatory floodplains).
- A stream located in the impact analysis area might not intersect with an alternative.
- New bridges and culverts would be designed for a 50-year or 100-year stormwater event to meet the more stringent of UDOT or FEMA requirements, and this design criterion would not affect floodplains. Culverts and bridges located where no regulatory floodplain has been defined would be designed to accommodate a 50-year or greater-magnitude storm event (one with a 2% chance of occurring in a given year). To satisfy FEMA requirements, in locations where a regulatory floodplain is present, culverts and bridges would be designed to accommodate the 100-year flood (one with a 1% chance of occurring in a given year). The hydraulic design described in this EIS is based on a preliminary roadway design at 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. All floodplain designs would meet FEMA's and FHWA's regulatory requirements for roadway design in a floodplain.

UDOT determined the floodplain impacts of the action alternatives using a GIS approach. The FEMA NFHL data were compared to the impact footprints of each alternative to identify the locations of regulatory floodplain crossings and to quantify the floodplain impact area (the area where the impact boundary and a floodplain intersect). Floodplain crossings along the project corridor can be transverse or longitudinal.

The effective NFHL data were obtained for Salt Lake County (FEMA 2017). Floodplain impact areas are reported by flooding source, crossing type, and FEMA-designated special flood hazard area zones.

What are transverse and longitudinal crossings?

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

14.4.2 No-Action Alternative

With the No-Action Alternative, the S.R. 210 Project would not be implemented, and no floodplains would be affected by the action alternatives. However, floodplain impacts could occur as a result of other infrastructure and development projects in the floodplain impact analysis area—projects that have not been addressed or analyzed in this EIS. These projects could occur with the No-Action and/or the action alternatives. Regulatory floodplains would continue to be managed by local floodplain administrators based on local ordinances and National Flood Insurance Program requirements.

14.4.3 Enhanced Bus Service Alternative

This section describes the floodplain impacts from the Enhanced Bus Service Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

14.4.3.1 S.R. 210 – Wasatch Boulevard

Table 14.4-1 summarizes the impacts to regulatory floodplains from the Imbalanced-lane and Five-lane Alternatives, which would both widen the Wasatch Boulevard segment of S.R. 210. Impacts are identified by FEMA zone and impact type (transverse or longitudinal) as well as quantified by the number of acres impacted. Regulatory floodplains in the floodplain impact analysis area are shown above in Figure 14.3-1 through Figure 14.3-4, Floodplains in the Floodplain Impact Analysis Area.

Table 14.4-1. Regulatory Floodplain Impacts from the Imbalanced-lane and Five-lane Alternatives

Stream	FEMA Zone(s) ^a	Acreage of Floodplain Impacts by Type		
		Type of Impact	Imbalanced-lane Alternative	Five-lane Alternative
Big Cottonwood Creek	A / AE / AE Floodway	No impacts		
Little Cottonwood Creek	A / AE / AE Floodway	No impacts; floodplain is outside this segment		
Adjacent to S.R. 210 near 3500 East	A	Longitudinal	0.32	0.32
Crossing S.R. 210 near 9000 South	A	Longitudinal	0.19	0.19
		Transverse	0.66	0.66

^a FEMA zones:

A = No base flood elevations determined.

AE = Base flood elevations determined. (The area within a Zone AE floodplain that is not within a floodway is referred to as the floodway fringe. See Figure 14.2-1, FEMA Floodplain Schematic, above.)

AE Floodway = Base flood elevations and floodway determined.

^b Determined based on the project impact footprint.

As shown above in Table 14.4-1, the Imbalanced-lane and Five-lane Alternatives would have transverse and longitudinal crossings of regulatory floodplains in Salt Lake County. Sections 14.4.3.1.1 and 14.4.3.1.2 below discuss the impacts from each of these alternatives.

14.4.3.1.1 Imbalanced-lane Alternative

The Imbalanced-lane Alternative would impact a total of about 1.17 acres of Zone A special flood hazard area adjacent to S.R. 210 near 3500 East and at the S.R. 210 crossing of Deaf Smith Canyon Creek near 9000 South. These impacts are classified as both transverse and longitudinal.

14.4.3.1.2 Five-lane Alternative

The Five-lane Alternative would add one additional travel lane, which would require about 12 feet more pavement than the Imbalanced-lane Alternative. However, the floodplain impacts from the Five-lane Alternative would be the same as from the Imbalanced-lane Alternative.

14.4.3.2 S.R. 210 – North Little Cottonwood Road to Alta

The Enhanced Bus Service Alternative does not include S.R. 210 roadway improvements or expanded embankments between North Little Cottonwood Road and the town of Alta. Therefore, no floodplain impacts have been identified from the Enhanced Bus Service Alternative in Little Cottonwood Canyon.

14.4.3.3 Mobility Hubs Alternative

The Enhanced Bus Service Alternative includes two mobility hubs: a mobility hub at the gravel pit and a mobility hub at the park-and-ride lot at 9400 South and Highland Drive.

The proposed mobility hub footprints at the gravel pit and at 9400 South and Highland Drive do not encroach on any regulatory floodplains; therefore, no floodplain impacts have been identified.

What is a mobility hub?

A mobility hub is a location where users can transfer from their personal vehicle to a bus.

What is the gravel pit?

The gravel pit is an existing aggregate (gravel) mine located on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard.

14.4.3.4 Avalanche Mitigation Alternatives

The Enhanced Bus Service Alternative includes two alternatives for avalanche mitigation: the Snow Sheds with Berms Alternative and the Show Sheds with Realigned Road Alternative.

Table 14.4-2 summarizes the impacts to regulatory floodplains from the avalanche mitigation alternatives with the Enhanced Bus Service Alternative. Impacts are identified by FEMA zone and impact type (transverse or longitudinal), as well as quantified by the number of acres impacted. Regulatory floodplains in the floodplain impact analysis area are shown above in Figure 14.3-1 through Figure 14.3-4, Floodplains in the Floodplain Impact Analysis Area.

Table 14.4-2. Regulatory Floodplain Impacts from the Avalanche Mitigation Alternatives with the Enhanced Bus Service Alternative

Stream	FEMA Zone(s) ^a	Acreage and Type of Floodplain Impacts ^b		
		Type of Impact	Snow Sheds with Berms Alternative	Snow Sheds with Realigned Road Alternative
Big Cottonwood Creek	A / AE / AE Floodway	No impacts; floodplain is outside this component		
Little Cottonwood Creek	A	Longitudinal	0.01	0.14
Little Cottonwood Creek	AE / AE Floodway	No impacts; floodplain is outside this component		
Adjacent to S.R. 210 near 3500 East	A	No impacts; floodplain is outside this component		
Crossing S.R. 210 near 9000 South	A	No impacts; floodplain is outside this component		

^a FEMA zones:

A = No base flood elevations determined.

AE = Base flood elevations determined. (The area within a Zone AE floodplain that is not within a floodway is referred to as the floodway fringe. See Figure 14.2-1, FEMA Floodplain Schematic, above.)

AE Floodway = Base flood elevations and floodway determined.

^b Determined based on the project impact footprint.

As shown above in Table 14.4-2, the avalanche mitigation alternatives with the Enhanced Bus Service Alternative would have longitudinal crossings of regulatory floodplains in Salt Lake County. Sections 14.4.3.4.1 and 14.4.3.4.2 below discuss the impacts from each of the avalanche mitigation alternatives with the Enhanced Bus Service Alternative.

14.4.3.4.1 Snow Sheds with Berms Alternative

The Snow Sheds with Berms Alternative would result in 0.01 acre of longitudinal Zone A floodplain impacts on Little Cottonwood Creek. These impacts are classified as longitudinal crossings because the flow in Little Cottonwood Creek is parallel to S.R. 210 near the proposed snow shed location. The snow sheds with berms would be above Little Cottonwood Creek. Because data about a base flood elevation are not available, it is unclear whether the footprint of this alternative would be in the floodway fringe or outside and above it.

14.4.3.4.2 Snow Sheds with Realigned Road Alternative

The Snow Sheds with Realigned Road Alternative would result in 0.14 acre of longitudinal Zone A floodplain impacts to Little Cottonwood Creek. Similar to the Snow Sheds with Berms Alternative, these impacts are classified as longitudinal crossings because the flow in Little Cottonwood Creek is parallel to S.R. 210 near the proposed snow shed location. Because data about a base flood elevation are not available, it is unclear whether the footprint of this alternative would be in the floodway fringe or outside and above it.

14.4.3.5 Trailhead Parking Alternatives

The Enhanced Bus Service Alternative includes three alternatives to address trailhead parking:

- Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative
- Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative
- No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

14.4.3.5.1 Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative

Table 14.4-3 summarizes the impacts to regulatory floodplains from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative with the Enhanced Bus Service Alternative. Impacts are identified by FEMA zone and impact type (transverse or longitudinal) as well as quantified by the number of acres impacted. Regulatory floodplains in the floodplain impact analysis area are shown above in Figure 14.3-1 through Figure 14.3-4, Floodplains in the Floodplain Impact Analysis Area.

Table 14.4-3. Regulatory Floodplain Impacts from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative with the Enhanced Bus Service Alternative

Stream	FEMA Zone(s) ^a	Acreage and Type of Floodplain Impacts ^b				
		Type of Impact	Bridge Trailhead	Gate Buttress Trailhead	Lisa Falls Trailhead	White Pine Trailhead
Big Cottonwood Creek	A / AE / AE Floodway	No impacts; floodplain is not in this segment				
Little Cottonwood Creek	A	Longitudinal	No impacts	0.01	No impacts	No impacts
Little Cottonwood Creek	AE / AE Floodway	No impacts; floodplain is not in this segment				
Adjacent to S.R. 210 near 3500 East	A	No impacts; floodplain is not in this segment				
Crossing S.R. 210 near 9000 South	A	No impacts; floodplain is not in this segment				

^a FEMA zones:

A = No base flood elevations determined.

AE = Base flood elevations determined. (The area within a Zone AE floodplain that is not within a floodway is referred to as the floodway fringe. See Figure 14.2-1, FEMA Floodplain Schematic, above.)

AE Floodway = Base flood elevations and floodway determined.

^b Determined based on the project footprint.

As shown above in Table 14.4-3, the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative would result in 0.01 acre of longitudinal Zone A floodplain impacts to Little Cottonwood Creek at the Gate Buttress Trailhead. The impact would occur from a drainage pipe and the energy-dissipation measure (riprap) placed at the pipe's outfall. Because no base flood elevations are provided and no detailed hydraulic modeling has been performed on Little Cottonwood Creek, it is unclear whether the drainage pipe would be above or below the floodplain elevation. Since the impact area is small,

UDOT does not anticipate that this alternative would change floodwater surface elevations. The proposed improvements at the other three trailheads would not cause impacts to the regulatory floodplain. The impacts are classified as longitudinal crossings because Little Cottonwood Creek flows parallel to S.R. 210 near the Gate Buttriss Trailhead.

14.4.3.5.2 Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The floodplain impacts from this alternative would be the same as those from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative.

14.4.3.5.3 No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

No additional pavement or roadway embankment is proposed with this alternative. For this reason, there would be no identified encroachments on, or impacts to, regulatory floodplains.

14.4.3.6 No Winter Parking Alternative

Eliminating winter parking on S.R. 210 with the No Winter Parking Alternative does not include any additional proposed pavement or roadway embankment. For this reason, there would be no identified encroachments on, or impacts to, regulatory floodplains.

14.4.3.7 Summary of Regulatory Floodplain Impacts

The floodplain impacts from the Enhanced Bus Service Alternative (between about 1.18 and 1.32 total acres) would occur as a result of longitudinal and transverse crossings of regulatory floodplains. The majority of these impacts (about 1.17 acres) are necessary to widen Wasatch Boulevard from Fort Union Boulevard to North Little Cottonwood Road and meet UDOT's safety standards. Therefore, completely avoiding floodplain encroachments from this alternative is not feasible. The impacted regulatory floodplains are classified as Zone A, meaning that no base flood elevations have been established. Without measures to reduce or mitigate floodplain impacts, this alternative could reduce the natural and beneficial floodplain values including flood conveyance, storage, and control; groundwater recharge; water quality function; and wildlife habitat and diversity.

Following the appropriate design standards and criteria would reduce floodplain impacts to adjoining properties, adjacent stream segments, and flooding risks to the highway infrastructure and the traveling public. Roadway elevations would continue to be above the adjacent floodplain elevations, where those elevations are defined, so that flooding would not interfere with the functional use of a transportation facility needed for emergency vehicles or evacuation. Culverts and bridges in regulatory floodplains would be designed to accommodate a 100-year flood in accordance with FEMA and local floodplain ordinance criteria. Culverts and bridges in other areas would be designed to accommodate a 50-year flood per UDOT's requirements for the facility. These design standards, together with the proper placement of structures and walls, would reduce the risk that the project improvements would exacerbate flooding conditions. Hydraulic structures and walls would also preserve floodplain connectivity and would reduce impacts to natural and beneficial floodplain conveyance values.

Floodplains, water quality, and ecosystems are interrelated; refer to the following chapters for additional discussion: Chapter 12, Water Resources, and Chapter 13, Ecosystem Resources. With the mitigation measures presented in Section 14.4.8, Mitigation Measures, the Enhanced Bus Service Alternative would not result in a significant adverse impact to natural and beneficial floodplain values.

In summary, the Enhanced Bus Service Alternative would result in neither a significant potential for interfering with a transportation facility needed for evacuation or emergency vehicles nor a significant risk of upstream flooding. Furthermore, the impacts to natural and beneficial floodplain values would not be significant because of proposed hydraulic structures and walls. For additional discussion, refer to Section 14.4.8, Mitigation Measures.

14.4.4 Enhanced Bus Service in Peak-period Shoulder Lane Alternative

This section describes the floodplain impacts from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 from North Little Cottonwood Road to the town of Alta, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

14.4.4.1 S.R. 210 – Wasatch Boulevard

The floodplain impacts from the Imbalanced-lane and Five-lane Alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as those with the Enhanced Bus Service Alternative.

14.4.4.2 S.R. 210 – North Little Cottonwood Road to Alta

Table 14.4-4 summarizes the impacts to regulatory floodplains from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative from North Little Cottonwood Road to the town of Alta. Impacts are designated by FEMA zone and impact type (transverse or longitudinal) as well as quantified by the number of acres impacted. Regulatory floodplains in the floodplain impact analysis area are shown above in Figure 14.3-1 through Figure 14.3-4, Floodplains in the Floodplain Impact Analysis Area.

As shown in Table 14.4-4, the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would have longitudinal crossings of regulatory floodplains in Salt Lake County. These impacts account for about 0.88 acre of Zone A floodplains on Little Cottonwood Creek. They would result from widening S.R. 210 from North Little Cottonwood Road to the town of Alta as a result of implementing shoulder lanes for the enhanced bus service.

S.R. 210 from North Little Cottonwood Road to the town of Alta crosses numerous tributary streams that do not have a regulatory floodplain. The current capacity of the existing S.R. 210 crossing culverts for these smaller tributary streams has not been evaluated. As described in Section 14.4.3.7, Summary of Regulatory Floodplain Impacts, UDOT would design these culverts to pass 50-year flow rates, which would improve the capacity of some of the culverts. Also see Chapter 12, Water Resources, for more information about the water quality effects of deficient culverts and Chapter 13, Ecosystem Resources, for additional discussion regarding the riparian values of these smaller tributaries.

Table 14.4-4. Regulatory Floodplain Impacts from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

Stream	FEMA Zone(s) ^a	Acreage and Type of Floodplain Impacts ^b	
		Type of Impact	Enhanced Bus Service in Peak-period Shoulder Lane Alternative
Big Cottonwood Creek	A / AE / AE Floodway	No impacts	
Little Cottonwood Creek	A	Longitudinal	0.88
Little Cottonwood Creek	AE / AE Floodway	No impacts; floodplain is not in this segment	
Adjacent to S.R. 210 near 3500 East	A	No impacts; floodplain is not in this segment	
Crossing S.R. 210 near 9000 South	A	No impacts; floodplain is not in this segment	

^a FEMA zones:

A = No base flood elevations determined.

AE = Base flood elevations determined. (The area within a Zone AE floodplain that is not within a floodway is referred to as the floodway fringe. See Figure 14.2-1, FEMA Floodplain Schematic, above.)

AE Floodway = Base flood elevations and floodway determined.

^b Determined based on the project footprint.

14.4.4.3 Mobility Hubs Alternative

The floodplain impacts from the mobility hubs with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

14.4.4.4 Avalanche Mitigation Alternatives

The floodplain impacts from the avalanche mitigation alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

14.4.4.5 Trailhead Parking Alternatives

The floodplain impacts from the trailhead parking alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

14.4.4.6 No Winter Parking Alternative

The floodplain impacts from the No Winter Parking Alternative with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

14.4.4.7 Summary of Regulatory Floodplain Impacts

The floodplain impacts from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative (between about 2.06 and 2.20 total acres) would occur as a result of longitudinal and transverse crossings of regulated floodplain. The majority of these impacts are necessary to widen Wasatch Boulevard (about 1.17 acres) and to widen S.R. 210 between North Little Cottonwood Road and the town of Alta (about 0.88 acres). Therefore, completely avoiding longitudinal floodplain encroachments from this alternative is not feasible. All of the impacted regulatory floodplains are classified as Zone A, meaning that no base flood elevations have been established. Without measures to reduce or mitigate floodplain impacts, this

alternative could reduce the natural and beneficial floodplain values including flood conveyance, storage, and control; groundwater recharge; water quality function; and wildlife habitat and diversity.

Following the appropriate design standards and criteria would avoid floodplain impacts to adjoining properties, adjacent stream segments, and flooding risks to the highway infrastructure and the traveling public. Roadway elevations would continue to be above the adjacent floodplain elevations, where those elevations are defined, so that flooding would not interfere with the use of a transportation facility needed for emergency vehicles or evacuation. Culverts and bridges in regulatory floodplains would be designed to accommodate 100-year flood flows in accordance with FEMA and local floodplain ordinance criteria. Culverts and bridges in other areas would be designed to accommodate a 50-year flood per UDOT's requirements for the facility. These design standards, together with the proper placement of structures and walls, would reduce the risk that the project improvements would exacerbate flooding conditions. Hydraulic structures and walls would also preserve floodplain connectivity and would reduce impacts to natural and beneficial floodplain conveyance values.

Floodplain values, water quality, and ecosystems are interrelated; refer to the following chapters for additional discussion: Chapter 12, Water Resources, and Chapter 13, Ecosystem Resources. With the mitigation measures presented in Section 14.4.8, Mitigation Measures, the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would not result in a significant adverse impact to natural and beneficial floodplain values.

In summary, the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would result in neither a significant potential for interfering with a transportation facility needed for evacuation or emergency vehicles nor a significant risk of upstream flooding. Furthermore, the impacts to natural and beneficial floodplain values would not be significant because of proposed hydraulic structures and walls. For additional discussion, refer to Section 14.4.8, Mitigation Measures.

14.4.5 Gondola Alternative A (Starting at Canyon Entrance)

This section describes the floodplain impacts from Gondola Alternative A, which includes a gondola alignment from the entrance to Little Cottonwood Canyon to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

14.4.5.1 S.R. 210 – Wasatch Boulevard

The floodplain impacts from the Imbalanced-lane and Five-lane Alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

What are base, angle, and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's gondola trip. Passengers board and disembark the gondola cabins at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

The gondola alternatives also include *angle stations*, which are needed to adjust the horizontal direction of the cabin; passengers remain in the cabin as it passes through an angle station.

A *tower* supports the gondola cable.

14.4.5.2 S.R. 210 – North Little Cottonwood Road to Alta

The floodplain impacts from Gondola Alternative A from North Little Cottonwood Road to the town of Alta would be the same as with the Enhanced Bus Service Alternative.

Table 14.4-5 summarizes the impacts to regulatory floodplains from the gondola towers and stations (base, angle, and destination stations) with Gondola Alternative A. Impacts are identified by FEMA zone and impact type (transverse or longitudinal) as well as quantified by the number of acres impacted. Regulatory floodplains in the floodplain impact analysis area are shown above in Figure 14.3-1 through Figure 14.3-4, Floodplains in the Floodplain Impact Analysis Area.

Table 14.4-5. Regulatory Floodplain Impacts from the Gondola Towers and Stations with Gondola Alternative A

Stream	FEMA Zone(s) ^a	Acreage and Type of Floodplain Impacts	
		Type of Impact	Gondola Alternative A
Impacts from Gondola Towers and Stations			
Big Cottonwood Creek	A / AE / AE Floodway	No impacts; floodplain is outside gondola alignment	
Little Cottonwood Creek	A	Longitudinal	0.32
Little Cottonwood Creek	AE / AE Floodway	No impacts	
Adjacent to S.R. 210 near 3500 East	A	No impacts; floodplain outside gondola alignment	
Crossing S.R. 210 near 9000 South	A	No impacts	

^a FEMA zones:

A = No base flood elevations determined.

AE = Base flood elevations determined. (The area within a Zone AE floodplain that is not within a floodway is referred to as the floodway fringe. See Figure 14.2-1, FEMA Floodplain Schematic, above.)

AE Floodway = Base flood elevations and floodway determined.

^b Determined based on the project footprint.

As shown above in Table 14.4-5, the gondola towers and stations with Gondola Alternative A would have longitudinal crossings of regulatory floodplains in Salt Lake County impacting about 0.3 acre of the Little Cottonwood Creek Zone A floodplain.

14.4.5.3 Mobility Hubs Alternative

The floodplain impacts from the mobility hubs with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

14.4.5.4 Avalanche Mitigation Alternatives

The floodplain impacts from the avalanche mitigation alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

14.4.5.5 Trailhead Parking Alternatives

The floodplain impacts from the trailhead parking alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

14.4.5.6 No Winter Parking Alternative

The floodplain impacts from the No Winter Parking Alternative with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

14.4.5.7 Summary of Regulatory Floodplain Impacts

The total floodplain impacts from Gondola Alternative A (between about 1.50 and 1.64 total acres) would occur as a result of longitudinal and transverse crossings. The majority of these impacts (about 1.17 acres) are necessary to widen Wasatch Boulevard. An additional about 0.32 acre of longitudinal floodplain impacts are necessary for placing the gondola towers and stations (base, angle, and destination stations). Therefore, completely avoiding floodplain encroachments from this alternative is not feasible. The impacted regulatory floodplains are classified as Zone A, meaning that no base flood elevations have been established. Without measures to reduce or mitigate floodplain impacts, this alternative could reduce the natural and beneficial floodplain values including flood conveyance, storage, and control; groundwater recharge; water quality function; and wildlife habitat and diversity.

Following the appropriate design standards and criteria would reduce floodplain impacts to adjoining properties, adjacent stream segments, and flooding risks to the highway infrastructure and the traveling public. Roadway elevations would continue to be above the adjacent floodplain elevations, where those elevations are defined, so that flooding would not interfere with the functional use of a transportation facility needed for emergency vehicles or evacuation. Culverts and bridges in regulatory floodplains would be designed to accommodate a 100-year flood in accordance with FEMA and local floodplain ordinance criteria. Culverts and bridges in other areas would be designed to accommodate a 50-year flood per UDOT's requirements for the facility. Some of the gondola towers are currently planned to be located in the floodplain. If they cannot be relocated outside the floodplain during final design, the footings would be located outside the floodway, and they would be designed to withstand flood flows if they are located in the floodway fringe. These design standards, together with the proper placement of structures and walls, would reduce the risk that the project improvements would exacerbate flooding conditions. Hydraulic structures and walls would also preserve floodplain connectivity and would reduce impacts to natural and beneficial floodplain conveyance values.

Floodplains, water quality, and ecosystems are interrelated; refer to the following chapters for additional discussion: Chapter 12, Water Resources, and Chapter 13, Ecosystem Resources. With the mitigation measures presented in Section 14.4.8, Mitigation Measures, Gondola Alternative A would not result in a significant adverse impact to natural and beneficial floodplain values.

In summary, Gondola Alternative A would result in neither a significant potential for interfering with a transportation facility needed for evacuation or emergency vehicles nor a significant risk of upstream flooding. Furthermore, the impacts to natural and beneficial floodplain values would not be significant because of proposed hydraulic structures and walls. For additional discussion, refer to Section 14.4.8, Mitigation Measures.

14.4.6 Gondola Alternative B (Starting at La Caille)

This section describes the floodplain impacts of Gondola Alternative B, which includes a gondola alignment from La Caille to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

14.4.6.1 S.R. 210 – Wasatch Boulevard

The floodplain impacts from the Imbalanced-lane and Five-lane Alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

14.4.6.2 S.R. 210 – North Little Cottonwood Road to Alta

Table 14.4-6 summarizes the impacts to regulatory floodplains from the gondola towers and stations (base, angle, and destination stations) and additional travel lanes for Gondola Alternative B. Impacts are identified by FEMA zone and impact type (transverse or longitudinal) as well as quantified by the number of acres impacted. Regulatory floodplains in the floodplain impact analysis area are shown above in Figure 14.3-1 through Figure 14.3-4, Floodplains in the Floodplain Impact Analysis Area.

Table 14.4-6. Regulatory Floodplain Impacts from the Gondola Towers and Stations and Additional Travel Lanes with Gondola Alternative B

Stream	FEMA Zone(s) ^a	Acreage and Type of Floodplain Impacts	
		Type of Impact	Gondola Alternative B
Impacts from Gondola Towers and Stations			
Big Cottonwood Creek	A / AE / AE Floodway	No impacts; floodplain is outside gondola alignment	
Little Cottonwood Creek	A	Longitudinal	0.32
Impacts from Additional Travel Lanes at Gondola Base Station at La Caille			
Adjacent to S.R. 210 near 3500 East	A	No impacts; floodplain is outside gondola alignment	
Crossing S.R. 210 near 9000 South	A	Longitudinal	0.55
Little Cottonwood Creek	AE	Longitudinal	0.02
Little Cottonwood Creek	AE Floodway	Longitudinal	0.05

^a FEMA zones:

A = No base flood elevations determined.

AE = Base flood elevations determined. (The area within a Zone AE floodplain that is not within a floodway is referred to as the floodway fringe. See Figure 14.2-1, FEMA Floodplain Schematic, above.)

AE Floodway = Base flood elevations and floodway determined.

^b Determined based on the project impact footprint.

As shown above in Table 14.4-6, Gondola Alternative B would have longitudinal crossings of regulatory floodplains in Salt Lake County impacting about 0.87 acre of Zone A floodplains from the gondola towers and stations and additional travel lanes. In addition, there would be impacts to about 0.02 acre of Zone AE

floodplains on Little Cottonwood Creek and about 0.05 acre of floodway near S.R. 210 as a part of accommodating the additional travel lanes at the gondola base station.

14.4.6.3 Mobility Hubs Alternative

With Gondola Alternative B, the mobility hubs at the gravel pit and 9400 South and Highland Drive would require about 600 and 400 parking spaces, respectively. This is less than the numbers proposed with the enhanced bus service alternatives and Gondola Alternative A of 1,500 spaces at the gravel pit and 1,000 spaces at 9400 South and Highland Drive. The fewer number of parking spaces at these two locations would not reduce the construction footprint of the parking structures but would reduce the height from three to four stories to two to three stories at the gravel pit and from three to four stories to two stories at 9400 South and Highland Drive. Because the construction footprint would be the same, the floodplain impacts from the mobility hubs with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

The analysis of the 1,500-space parking structure at the Gondola Alternative B base station is included in Section 14.4.6.2, S.R. 210 – North Little Cottonwood Road to Alta.

14.4.6.4 Avalanche Mitigation Alternatives

The floodplain impacts from the avalanche mitigation alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

14.4.6.5 Trailhead Parking Alternatives

The floodplain impacts from the trailhead parking alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

14.4.6.6 No Winter Parking Alternative

The floodplain impacts from the No Winter Parking Alternative with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

14.4.6.7 Summary of Regulatory Floodplain Impacts

The floodplain impacts from Gondola Alternative B (between about 2.12 and 2.26 total acres) would occur as a result of longitudinal and transverse crossings. The majority of these impacts (about 1.17 acres) are necessary to widen Wasatch Boulevard. An additional approximately 0.94 acre of longitudinal floodplain impacts are necessary for the additional travel lanes needed to access the gondola base station and for placing the gondola towers and stations (base, angle, and destination stations). Therefore, completely avoiding floodplain encroachments from this alternative is not feasible. The impacted regulatory floodplains are classified as Zone A, with the exception of 0.07 acre of floodplain impacts that are classified as Zone AE, including 0.05 acre of floodway. Base flood elevations have been established for the Zone AE floodplains only. Final design and hydraulic analysis will determine whether the encroachments into the Zone AE floodplains would change water surface elevations. Without measures to reduce or mitigate floodplain impacts, this alternative could reduce the natural and beneficial floodplain values including flood

conveyance, storage, and control; groundwater recharge; water quality function; and wildlife habitat and diversity.

Following the appropriate design standards and criteria would reduce floodplain impacts to adjoining properties and flooding risks to the highway infrastructure and the traveling public. Roadway elevations would continue to be above the adjacent floodplain elevations, where those elevations are defined, so that flooding would not interfere with the functional use of a transportation facility needed for emergency vehicles or evacuation. Culverts and bridges in regulatory floodplains would be designed to accommodate a 100-year flood in accordance with FEMA and local floodplain ordinance criteria. Culverts and bridges in other areas would be designed to accommodate a 50-year flood per UDOT's requirements for the facility. Some of the gondola towers are currently planned to be located in the floodplain. If they cannot be relocated outside the floodplain during final design, the footings would be located outside the floodway, and they would be designed to withstand flood flows if they are located in the floodway fringe. These design standards, together with the proper placement of structures and walls, would reduce the risk that the project improvements would exacerbate flooding conditions. Hydraulic structures and walls would also preserve floodplain connectivity and would reduce impacts to natural and beneficial floodplain conveyance values.

Floodplains, water quality, and ecosystems are interrelated; refer to the following chapters for additional discussion: Chapter 12, Water Resources, and Chapter 13, Ecosystem Resources. With the mitigation measures presented in Section 14.4.8, Mitigation Measures, Gondola Alternative B would not result in a significant adverse impact to natural and beneficial floodplain values.

In summary, Gondola Alternative B would result in neither a significant potential for interfering with a transportation facility needed for evacuation or emergency vehicles nor a significant risk of upstream flooding. Furthermore, the impacts to natural and beneficial floodplain values would not be significant because of proposed hydraulic structures and walls. For additional discussion, refer to Section 14.4.8, Mitigation Measures.

14.4.7 Cog Rail Alternative (Starting at La Caille)

This section describes the impacts to regulatory floodplains from the Cog Rail Alternative, which includes a cog rail alignment from La Caille to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 on North Little Cottonwood Road, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

14.4.7.1 S.R. 210 – Wasatch Boulevard

The floodplain impacts from the Imbalanced-lane and the Five-lane Alternatives with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative.

What are cog rail base and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's cog rail trip. Passengers board and disembark the cog rail vehicles at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

14.4.7.2 S.R. 210 – North Little Cottonwood Road to Alta

Table 14.4-7 summarizes the impacts to regulatory floodplains from the cog rail tracks and stations for the Cog Rail Alternative. Impacts are designated by FEMA zone and impact type (transverse or longitudinal) as well as quantified by the number of acres impacted. Regulatory floodplains in the floodplain impact analysis area are shown above in Figure 14.3-1 through Figure 14.3-4, Floodplains in the Floodplain Impact Analysis Area.

Table 14.4-7. Regulatory Floodplain Impacts from the Cog Rail Alternative

Stream	FEMA Zone(s) ^a	Acreage and Type of Floodplain Impacts ^b	
		Type of Impact	Cog Rail Alternative
Impacts from Cog Rail Tracks and Stations at Snowbird and Alta			
Big Cottonwood Creek	A / AE / AE Floodway	No impacts; floodplain is outside cog rail alignment	
Little Cottonwood Creek	A	Longitudinal	0.07
Little Cottonwood Creek	AE / AE Floodway	No impacts; floodplain is outside cog rail alignment	
Adjacent to S.R. 210 near 3500 East	A	No impacts; floodplain is outside cog rail alignment	
Crossing S.R. 210 near 9000 South	A	No impacts; floodplain is outside cog rail alignment	
Impacts from Additional Travel Lanes and Cog Rail Station at La Caille			
Big Cottonwood Creek	A / AE / AE Floodway	No impacts; floodplain is outside cog rail alignment	
Little Cottonwood Creek	A	Longitudinal	0.21
Little Cottonwood Creek	AE	Longitudinal	0.02
Little Cottonwood Creek	AE Floodway	Longitudinal	0.05
Adjacent to S.R. 210 near 3500 East	A	No impacts; floodplain is outside cog rail alignment	
Crossing S.R. 210 near 9000 South	A	No impacts; floodplain is outside cog rail alignment	

^a FEMA zones:

A = No base flood elevations determined.

AE = Base flood elevations determined. (The area within a Zone AE floodplain that is not within a floodway is referred to as the floodway fringe. See Figure 14.2-1, FEMA Floodplain Schematic, above.)

AE Floodway = Base flood elevations and floodway determined.

^b Determined based on the project footprint.

As shown above in Table 14.4-7, the Cog Rail Alternative would have longitudinal crossings of regulatory floodplains in Salt Lake County. These impacts account for about 0.28 acre of Zone A floodplains on Little Cottonwood Creek. In addition, there would be impacts to about 0.02 acre of Zone AE (floodway fringe) and 0.05 acre of Zone AE Floodway floodplains on Little Cottonwood Creek near S.R. 210 as a part of accommodating the additional travel lanes at the cog rail base station.

14.4.7.3 Mobility Hubs Alternative

The floodplain impacts from the mobility hubs with the Cog Rail Alternative would be the same as with Gondola Alternative B.

14.4.7.4 Avalanche Mitigation Alternatives

The Cog Rail Alternative includes two alternatives for avalanche mitigation in the mid-canyon segment: the Snow Sheds with Berms Alternative and the Snow Sheds with Realigned Road Alternative. These snow sheds would cover both the proposed cog rail tracks and the existing roadway. In the upper portions of the canyon, cog rail snow sheds would be needed for some of the higher-risk avalanche paths (East Hellgate, Hilton, Superior, and Little Superior). These snow sheds would cover the cog rail tracks. These upper-canyon snow sheds are all outside the floodplain of Little Cottonwood Creek.

Table 14.4-8 summarizes the impacts to regulatory floodplains from the avalanche mitigation alternatives with the Cog Rail Alternative. Impacts are identified by FEMA zone and impact type (transverse or longitudinal) as well as quantified by the number of acres impacted. For both avalanche mitigation alternatives, there would be an additional snow shed in the upper canyon to protect the cog rail tracks; however, this snow shed would be outside the regulatory floodplain, and no impacts are identified. Regulatory floodplains in the floodplain impact analysis area are shown above in Figure 14.3-1 through Figure 14.3-4, Floodplains in the Floodplain Impact Analysis Area.

Table 14.4-8. Regulatory Floodplain Impacts from the Avalanche Mitigation Alternatives with the Cog Rail Alternative

Stream	FEMA Zone(s) ^a	Acreage and Type of Floodplain Impacts ^b		
		Type of Impact	Snow Sheds with Berms Alternative	Snow Sheds with Realigned Road Alternative
Big Cottonwood Creek	A / AE / AE Floodway	No impacts; floodplain is not in this segment		
Little Cottonwood Creek	A	Longitudinal	No impacts	0.05
Little Cottonwood Creek	AE / AE Floodway	No impacts; floodplain is not in this segment		
Adjacent to S.R. 210 near 3500 East	A	No impacts; floodplain is not in this segment		
Crossing S.R. 210 near 9000 South	A	No impacts; floodplain is not in this segment		

^a FEMA zones:

A = No base flood elevations determined.

AE = Base flood elevations determined. (The area within a Zone AE floodplain that is not within a floodway is referred to as the floodway fringe. See Figure 14.2-1, FEMA Floodplain Schematic, above.)

AE Floodway = Base flood elevations and floodway determined.

^b Determined based on the project impact footprint.

14.4.7.4.1 Snow Sheds with Berms Alternative

There are no floodplain impacts identified from the Snow Sheds with Berms Alternative, which includes both the mid-canyon snow sheds and the upper-canyon, rail-only snow shed.

14.4.7.4.2 Snow Sheds with Realigned Road Alternative

The Snow Sheds with Realigned Road Alternative would result in 0.05 acre of longitudinal Zone A floodplain impacts to Little Cottonwood Creek. All these impacts would be from the mid-canyon snow sheds; there would no floodplain impacts as a result of the upper-canyon, rail-only snow shed. These impacts are

classified as longitudinal because the flow in Little Cottonwood Canyon is parallel to S.R. 210 near the proposed snow shed locations. Because the impacts would occur in a Zone A floodplain, no base flood elevations have been determined, and it is unclear whether these impacts would occur below the 100-year water surface elevation.

14.4.7.5 Trailhead Parking Alternatives

14.4.7.5.1 Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative

There are no floodplain impacts identified at the Bridge and White Pine Trailheads from this trailhead parking alternative. Improvements at the Grit Mill, Gate Buttress, and Lisa Falls Trailheads have been included in Section 14.4.7.2, S.R. 210 – North Little Cottonwood Road to Alta, since improvements at these trailheads are required to implement the required cog rail tracks and stations as part of the Cog Rail Alternative.

14.4.7.5.2 Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The floodplain impacts from this trailhead parking alternative would be the same as those from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative.

14.4.7.5.3 No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The floodplain impacts from this trailhead parking alternative would be the same as with the Enhanced Bus Service Alternative.

14.4.7.6 No Winter Parking Alternative

The floodplain impacts from the No Winter Parking Alternative with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative.

14.4.7.7 Summary of Regulatory Floodplain Impacts

The floodplain impacts from the Cog Rail Alternative (between about 1.52 and 1.57 total acres) would occur as a result of longitudinal and transverse crossings. The majority of these impacts (about 1.17 acres) are necessary to widen Wasatch Boulevard. An additional approximately 0.35 acre of longitudinal floodplain impacts are necessary for the additional travel lanes needed to access the cog rail base station and for the cog rail alignment and stations at Snowbird and Alta. An additional 0.05 acre of longitudinal floodplain impacts can be avoided by choosing the Snow Sheds with Berms Alternative instead of the Snow Sheds with Realigned Road Alternative for avalanche mitigation. Therefore, completely avoiding floodplain encroachments from the Cog Rail Alternative is not feasible.

The impacted regulatory floodplains are classified as Zone A, with the exception of 0.07 acre of floodplain impacts that are classified as Zone AE, including 0.05 acre of Zone AE Floodway. Base flood elevations have been established for the Zone AE floodplains only. Final design and hydraulic analysis will determine whether the encroachments into the Zone AE floodplains would change water surface elevations. Without measures to reduce or mitigate floodplain impacts, this alternative could reduce the natural and beneficial floodplain values including flood conveyance, storage, and control; groundwater recharge; water quality function; and wildlife habitat and diversity.

Following the appropriate design standards and criteria would reduce floodplain impacts to adjoining properties and flooding risks to the highway infrastructure and the traveling public. Roadway elevations would continue to be above the adjacent floodplain elevations, where those elevations are defined, so that flooding would not interfere with the functional use of a transportation facility needed for emergency vehicles or evacuation. Culverts and bridges in regulatory floodplains would be designed to accommodate a 100-year flood in accordance with FEMA and local floodplain ordinance criteria. Culverts and bridges in other areas would be designed to accommodate a 50-year flood per UDOT's requirements for the facility. These design standards, together with the proper placement of structures and walls, would reduce the risk that the project improvements would exacerbate flooding conditions. Hydraulic structures and walls would also preserve floodplain connectivity and would reduce impacts to natural and beneficial floodplain conveyance values.

Floodplains, water quality, and ecosystems are interrelated; refer to the following chapters for additional discussion: Chapter 12, Water Resources, and Chapter 13, Ecosystem Resources. With the mitigation measures presented in Section 14.4.8, Mitigation Measures, the Cog Rail Alternative would not result in a significant adverse impact to natural and beneficial floodplain values.

In summary, the Cog Rail Alternative would result in neither a significant potential for interfering with a transportation facility needed for evacuation or emergency vehicles nor a significant risk of upstream flooding. Furthermore, the impacts to natural and beneficial floodplain values would not be significant because of proposed hydraulic structures and walls. For additional discussion, refer to Section 14.4.8, Mitigation Measures.

14.4.8 Mitigation Measures

UDOT and/or its construction contractor will take measures to reduce floodplain impacts and to ensure that the project complies with all applicable regulations. These mitigation measures will include the following:

- The action alternatives would require a number of stream and floodplain crossings in the same locations where they presently exist. Where new or rehabilitated bridges and culverts are included in the design of an alternative, the design will follow FEMA requirements and the requirements of UDOT's *Drainage Manual of Instruction*, where applicable. Where no regulatory floodplain is defined, culverts and bridges will be designed to accommodate a 50-year (2%-annual-chance) or greater-magnitude flood. Where regulatory floodplains are defined, hydraulic structures will be designed to accommodate a 100-year (1%-annual-chance) flood. Energy-dissipation measures will be included in the alternative's design as applicable.
- Stream alteration permits will be obtained for stream crossings as required by the Utah Division of Water Rights. Note that the stream alteration permitting process is a separate process from the floodplain permitting process. The stream alteration permitting process is required to satisfy state regulations and under certain circumstances may 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 will be obtained for all locations where the proposed roadway embankment or structural elements would encroach on a regulatory floodplain, and structures will be designed to meet the more stringent of FEMA requirements and local floodplain ordinances. 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 will 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 following case applies:
 - For areas of Zone A floodplain impacts, the approach will be to analyze existing and proposed conditions and design project features such that compliance is achieved (that is, such that a CLOMR is not required) as much as possible. In these areas, FEMA performed floodplain mapping based on approximate methods. The absence of a detailed study or floodway delineation places the burden on the project proponent (in this case, UDOT) to perform hydrologic and hydraulic analyses consistent with FEMA standards. These analyses will confirm or refine the FEMA floodplain mapping and could increase or decrease the estimate of affected areas.
- UDOT will obtain flood-control permits from Salt Lake County for actions affecting County-controlled waterways, which include Little Cottonwood Creek and Big Cottonwood Creek. UDOT will obtain flood-control permits from Cottonwood Heights City for Unnamed Creek near 3500 East and Unnamed Creek near 9000 South.
- Roadway elevations will be a minimum of 2 feet above adjacent floodplain elevations, where those elevations are defined, so that flooding will not interfere with a transportation facility needed for emergency vehicles or evacuation.
- Walls will be designed and constructed to minimize longitudinal floodplain impacts.

14.5 References

[FEMA] Federal Emergency Management Agency

- 2017 National Flood Hazard Layer for Salt Lake County (All Jurisdictions). Obtained via FEMA Map Service Center. <https://msc.fema.gov/portal>. Updated October 2, 2017.
- 2018a Zone A Definition/Description. <https://www.fema.gov/zone>. Accessed May 2, 2018.
- 2018b Zone AE and A1-30 Definition/Description. <https://www.fema.gov/zone-ae-and-a1-30>. Accessed May 2, 2018.
- 2018c Flood Insurance Study. https://www.fema.gov/media-library-data/20130726-1554-20490-6003/dfm_dfft.pdf. Accessed November 14, 2018.
- 2018d Community Status Book. <https://www.fema.gov/cis/UT.pdf>. Accessed April 16, 2018. [FEMA's Community Status Book is updated daily.]
- 2019 Flood Insurance Study for Salt Lake County, Letters of Map Revision, and Letters of Map Amendment. Obtained via search on the FEMA Flood Map Service Center for Effective Products in Salt Lake County (All Jurisdictions). <https://msc.fema.gov/portal>.

[USGS] U.S. Geological Survey

- 1998 Draper, Utah, 7.5-minute topographic quadrangle, scale 1:24,000.

Chapter 15: Cultural Resources

15.1 Introduction

This chapter describes the cultural resources (historic architectural resources and archaeological resources) in the cultural resources impact analysis area and the impacts of the project alternatives on these resources.

The National Park Service establishes the criteria for eligibility as a historic property. According to the National Park Service, to be considered “historic,” a resource must generally be at least 50 years of age. To account for the amount of time that could elapse between the identification of resources and the implementation of any project decision, the Utah Department of Transportation (UDOT) identified and evaluated cultural resources that are at least 40 years old.

For this analysis, *cultural resources* include historic architectural and archaeological resources. *Architectural resources* may include structures, objects, historic buildings, or districts composed of these resources. *Archaeological resources* are sites, features, structures, or districts that are composed primarily of non-architectural elements.

Cultural Resources Impact Analysis Area. The impact analysis area, or analysis area, for cultural resources is the area where the action alternatives could affect existing or potential historic architectural or archaeological resources. The analysis area includes 772 acres under either U.S. Department of Agriculture (USDA) Forest Service management or private ownership.

The impact analysis area, which includes the area of potential effects for cultural resources, begins north of the intersection of Big Cottonwood Canyon Road and State Route (S.R.) 210 (milepost 0.0) and extends southeast to the end of S.R. 210 in the town of Alta (milepost 12.5), including the Alta Bypass Road (milepost 12.5 to milepost 13.6) (see Figure 1.1-1, Transportation Needs Assessment Study Area, in Chapter 1, Purpose and Need). The impact analysis area also includes the area around the gravel pit adjacent to Wasatch Boulevard north of Fort Union Boulevard and the existing Utah Transit Authority (UTA) park-and-ride lot at 9400 South and Highland Drive.

The impact analysis and area of potential effects included a cultural resource survey area of 100 feet from the pavement on either side of S.R. 210 and proposed project components for physical impacts, although in places this was widened or shifted to accommodate canyon topography and early alternatives development. For architectural resources, all legal parcels, as defined by the Salt Lake County Assessor, within the 100-foot buffer were evaluated for historic architectural resources, and all such resources on a given legal parcel were evaluated even if the parcel was partly outside the 100-foot buffer.

What is the cultural resources impact analysis area?

The cultural resources impact analysis area is the area where the action alternatives could affect existing or potential historic architectural or archaeological resources.

A separate analysis area for visual impacts was defined to include the environment encompassed within the extents of Little Cottonwood Canyon bound by bold, distinctive landforms to the north and south that create a focused and enclosed visual setting. The viewshed analysis area excludes the visual environment of the urban area surrounding S.R. 210 northwest of the entrance to Little Cottonwood Canyon due to the existing density of development.

What is a viewshed?

A viewshed is all of the views that can be seen from a given location.

15.2 Regulatory Setting

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of their actions on historic properties. UDOT has assumed the Federal Highway Administration's NHPA compliance responsibilities for certain federal-aid highway projects under a 2017 Memorandum of Understanding pursuant to 23 United States Code Section 327, which applies to the S.R. 210 Project. UDOT's Section 106 responsibilities are further defined in the *Third Amended Programmatic Agreement among the Federal Highway Administration, the Utah State Historic Preservation Officer, the Advisory Council on Historic Preservation, the United States Army Corps of Engineers, Sacramento District, and the Utah Department of Transportation Regarding Section 106 Implementation for Federal-Aid Transportation Projects in the State of Utah* (UDOT 2017).

The USDA Forest Service and the U.S. Army Corps of Engineers might also have NHPA compliance responsibilities in connection with the S.R. 210 Project. As the lead agency for the S.R. 210 Project Environmental Impact Statement (EIS), UDOT intends that the NHPA compliance described in this EIS can be relied on by the USDA Forest Service, the U.S. Army Corps of Engineers, and any other federal agency that funds or issues approvals for the project.

Section 106 is implemented under the regulations in 36 Code of Federal Regulations Part 800, Subpart B. The NHPA provides a framework for determining the relative importance of cultural resources and assessing how federal actions could affect them. The NHPA Section 106 process is commonly used to support analysis of environmental impacts to cultural resources under NEPA. The Section 106 process is documented in a project's corresponding NEPA document, which for the S.R. 210 Project is this EIS.

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. Only significant cultural resources (as defined in 36 Code of Federal Regulations Section 60.4) are subject to potential adverse impacts from a federal action. *Significant* cultural resources are defined as those included in or eligible for inclusion in the National Register of Historic Places (NRHP). Resources included in or eligible for inclusion in the NRHP are referred to as *historic properties*.

A resource that is eligible for inclusion in the NRHP must be significant in American history, architecture, archaeology, engineering, or culture and must retain integrity sufficient to convey its significance (NPS 1997). The term *eligible for inclusion in the NRHP* includes both properties formally determined as

such and all other properties that meet the NRHP criteria. The significance of resources is evaluated using four criteria; therefore, a resource may be eligible for inclusion in the NRHP if it

- is associated with events that have made a significant contribution to the broad patterns of our history (Criterion A); or
- is associated with the lives of persons significant in our past (Criterion B); or
- embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction (Criterion C); or
- yields, or may be likely to yield, information important in prehistory or history (Criterion D).

Resources considered significant under one or more of these criteria must also be evaluated for integrity in the component aspects of location, design, setting, materials, workmanship, feeling, and association. To be eligible for inclusion in the NRHP, a resource must possess integrity of those elements necessary to convey its significance regarding the criterion or criteria under which it would be determined eligible.

Pursuant to the NHPA regulations, UDOT is responsible for defining the area of potential effects (APE), determining whether any historic properties are located in the APE, and assessing whether the proposed undertaking would adversely affect those historic properties. An *adverse effect* is defined as any action that might directly or indirectly change the characteristics of the historic property that make it eligible for inclusion in the NRHP. If an adverse effect is identified, the federal agency (or, in this case, UDOT) must continue consultation to develop measures to avoid, minimize, or mitigate the adverse impacts of the undertaking.

15.3 Affected Environment

The west end of the analysis area is in Cottonwood Heights and Sandy, Utah. The analysis area then passes through Little Cottonwood Canyon and terminates at its east end at the town and ski resort of Alta, Utah. Development, both commercial and residential, is concentrated at the east and west ends of the analysis area, near the ski resorts of Snowbird and Alta, and in Cottonwood Heights, Sandy, and Salt Lake County. Large, undeveloped sections are present in the canyon, although evidence of a quarry and other historical industrial development remain near the canyon entrance.

15.3.1 Cultural Setting

Specific trends and events have shaped the cultural setting within and surrounding the analysis area. These trends and events provide a context for evaluating the significance of any identified architectural and archaeological resources in the analysis area. The resources date predominantly to the Historic period, although humans have occupied the Salt Lake Valley since the end of the last glacial maximum of the Pleistocene Epoch. This long prehistoric archaeological record is divided into four main periods based on changes in technology as well as settlement and subsistence patterns:

- Paleoarchaic (prior to 9000–6000 Before the Common Era [BCE])
- Archaic (6000–150 BCE)
- Fremont or Formative (150 BCE – 1300 Common Era [CE])
- Late Prehistoric (1300–1870 CE)

The arrival of Euro-American explorers and settlers in the region marks the beginning of the Historic period, which can be divided into four major periods in northern Utah that have been associated with significant events and activities (Lechert and others 2020):

- Exploration and Early History (1776–1847)
- Settlement and Early Industry (1847–1896)
- Tourism and the World Wars (1897–1945)
- Present Day (1945–present)

Cultural resources identified for this analysis are archaeological sites, buildings, and structures dating mostly to the last three major periods within the Historic period. These resources are related primarily to early milling and power generation; mining; tourism, especially related to the development of the ski industry; and residential development. One prehistoric site potentially from the Fremont period was identified.

15.3.2 Identification of Historic Properties

UDOT conducted cultural resources surveys in 2018, 2019, and 2020 to inform the Section 106 process and to identify historic architectural and archaeological resources in the analysis area. To account for the amount of time that could elapse between the identification of resources and the implementation of any project decision, architectural and archaeological resources that were at least 40 years old (that is, constructed or created during or before 1978 for surveys conducted in 2018) were documented and evaluated. The findings of the surveys are documented in the *Selective Reconnaissance-Level Architectural Survey for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah* (Hovanes and Lechert 2020) and the *Class III Archaeological Inventory for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah* (Lechert and others 2020).

15.3.2.1 Consultation

UDOT consulted with the Utah State Historic Preservation Officer (SHPO) as part of the effort to define the APE, identify historic properties, and determine the expected effects of the project alternatives. Other consulting parties, including the USDA Forest Service and Native American tribes, were given an opportunity to comment on the APE and the archaeological and architectural resources present in that area. In addition, certified local governments (CLGs), historical societies and organizations, and mayors or town councils where no CLG or historical society exists were consulted about archaeological and architectural resources. For additional details regarding the consultation with these agencies, tribes, and organizations, see Chapter 27, Public and Agency Consultation and Coordination.

15.3.2.2 Architectural Resources

Eighty-three architectural resources that are recommended as eligible for inclusion in the NRHP and 1 architectural resource that was previously included in the NRHP were identified in the analysis area (see Appendix 15A, Architectural Resources). During the survey, 5 additional properties with potentially eligible historic buildings could not be evaluated because they were not visible from the public right of way. These 5 properties are considered eligible for the purpose of this evaluation. The locations of these 89 historic buildings are shown in Figure 26.3-1 through Figure 26.3-11, Section 4(f) Resources, in Chapter 26, Section 4(f) and Section 6(f) Evaluation.

Of these, 9 are recommended eligible/significant (ES) and 74 are recommended eligible/contributing (EC) under the Utah Division of State History's (UDSH) rating system. In general, these resources were constructed between the 1930s and 1978 with the exception of two resources that were constructed in the 1880s. The overwhelming majority (82%) were constructed in the 1970s and represent the creation of the Snowbird ski resort at the top of Little Cottonwood Canyon and the expansion of Cottonwood Heights as a residential community serving the Salt Lake Valley and the ski areas in both Big and Little Cottonwood Canyons.

15.3.2.3 Archaeological Sites

Ten NRHP-eligible archaeological sites were either documented or field-verified in the analysis area. Nine of the sites date to the Historic period and are eligible for their association with the specific trends and events that contribute to the history of mining, power generation, and tourism in Little Cottonwood Canyon. One prehistoric site was identified.

15.4 Environmental Consequences and Mitigation Measures

The impact analysis for cultural resources addresses whether an action alternative has the potential to affect historic properties. The analysis incorporates UDOT's finding of effect pursuant to Section 106 of the NHPA. Under the NHPA, an **adverse effect** is any action that might change the characteristics that make the historic property eligible for inclusion in the NRHP. A **no adverse effect** finding indicates that historic properties would be impacted, but the impacts would not change the characteristics that make the historic property eligible for inclusion in the NRHP. A **no historic properties affected** finding indicates that no historic properties would be impacted. The criteria for eligibility and the aspects of integrity are listed in Section 15.2, Regulatory Setting.

What is an adverse effect under the NHPA?

Under the NHPA, an *adverse effect* is any action that might change the characteristics that make the historic property eligible for inclusion in the NRHP.

All action alternatives presented in this EIS could cause potential impacts to cultural resources from ground-disturbing activities during construction. Additional impacts include changes to the setting or viewshed of cultural resources through the construction of new facilities.

15.4.1 Methodology

This section describes the methods used to assess the impacts to cultural resources from the No-Action and action alternatives and the associated effects under Section 106.

UDOT assessed the architectural and archaeological resources described in Section 15.3, Affected Environment, that are eligible for inclusion in the NRHP to determine whether the action alternatives would impact any portion of the resource and whether that impact would constitute an effect under Section 106.

- A **direct effect on historic properties** was defined as use or physical alteration. A direct effect on eligible architectural resources includes physical alteration of any portion of the primary historic building, contributing historic outbuilding(s), or historically associated land as a result of one of the action alternatives. A direct effect on eligible archaeological resources includes activities that would diminish those qualities of the site that contribute to its historic significance such as, but not limited to, physical alteration of the site resulting from one of the action alternatives or as a reasonably foreseeable result of it.
- An **associated effect, one that is removed in space and time, on an NRHP-eligible architectural or archaeological resource** was defined as a visual, audible, or atmospheric impact.

After the analysis showed whether each historic property would be affected, UDOT assessed the nature and extent of those effects on the characteristics of the resource that make it eligible for inclusion in the NRHP under a particular criterion. If an alternative would alter the important characteristics so that some portion of the resource's eligibility would be affected, an adverse effect was considered likely. If the alternative would not significantly alter those important characteristics, the alternative was considered to have no adverse effect on the resource.

The following sections summarize the effects on known historic architectural resources and archaeological resources from each alternative. Both permanent and temporary effects are considered, and permanent right-of-way (ROW) acquisition and temporary construction easements (TCE) are described. Appendix 15B, Determinations of Eligibility and Findings of Effect, includes the determinations of eligibility (DOE) and findings of effect (FOE) for the S.R. 210 Project. The Utah SHPO concurred with the eligibility and effects determinations made by UDOT in the Determination of Eligibility and Finding of Effect (DOE/FOE) on May 14, 2021. A copy of the concurrence letter is included in Appendix 15B.

15.4.2 No-Action Alternative

This section describes the impacts to cultural resources from the No-Action Alternative in the Wasatch Boulevard segment of S.R. 210, in the segment of S.R. 210 from North Little Cottonwood Road to the town of Alta, at the gravel pit, and at the park-and-ride lot at 9400 South and Highland Drive.

With the No-Action Alternative, the S.R. 210 Project would not be implemented. UDOT would continue to make minor maintenance improvements such as rehabilitating pavement, maintaining guard rails and drainage, and making minor operational improvements to parking and access. Overall, with the No-Action Alternative, the basic layout and operation of S.R. 210 would not change. The No-Action Alternative would result in **no historic properties affected**.

15.4.3 Enhanced Bus Service Alternative

This section describes the impacts to cultural resources from the Enhanced Bus Service Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

What is a mobility hub?

A mobility hub is a location where users can transfer from their personal vehicle to a bus.

Based on the nature of the impacts from the Enhanced Bus Service Alternative, UDOT determined that there would be an **adverse effect** on a historic property (archaeological site 42SL419) in the analysis area under Section 106.

15.4.3.1 S.R. 210 – Wasatch Boulevard

This section describes the cultural resource impacts from the Imbalanced-lane Alternative and the Five-lane Alternative, which would both widen the Wasatch Boulevard segment of S.R. 210.

15.4.3.1.1 Imbalanced-lane Alternative

The Imbalanced-lane Alternative would impact nine historic architectural resources and also one archaeological resource, which is S.R. 210 itself (Table 15.4-1 and Table 15.4-2). Figures showing impacts to historic architectural resources are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect). The improvements made to S.R. 210 with the Imbalanced-lane Alternative would be a continuation of the historic trend of suburban development that has existed since the middle 20th century and presumably spurred residential development along Wasatch Boulevard in Cottonwood Heights.

15.4.3.1.2 Five-lane Alternative

The impacts from the Five-lane Alternative to cultural resources would be similar to those from the Imbalanced-lane Alternative. The impacts to seven of the nine historic properties would be identical; however, the area of land acquisition would be slightly larger for two properties (#19 and #22) as shown in Table 15.4-1. Unless stated in the table, the impacts from both alternatives would be the same.

Table 15.4-1. Impacts to NRHP-eligible Architectural Resources from the Wasatch Boulevard Imbalanced-lane and Five-lane Alternatives with the Enhanced Bus Service Alternative

ID	Address	Property Description	UDSH Rating/ NRHP Criteria	Description of Impact	Finding of Effect
3	7527 S. Brighton Point Drive	One-story contemporary-style single-family dwelling	EC/Criterion A	Impacts would include ~0.17 acre of permanent land acquisition for Wasatch Boulevard ROW and ~0.09 acre of TCE. The impact would be to the rear of the legal parcel. The building would not be physically affected.	No adverse effect
4	7537 S. Brighton Point Drive	One-story ranch-style single-family dwelling	EC/Criterion A	Impacts would include ~0.12 acre of land acquisition for Wasatch Boulevard ROW and ~0.04 acre of TCE. The impact would be to the rear of the legal parcel. The building would not be physically affected.	No adverse effect
5	7561 S. Brighton Point Drive	One-story ranch-style single-family dwelling	EC/Criterion A	Impacts would include ~0.08 acre of land acquisition for Wasatch Boulevard ROW and ~0.01 acre of TCE. The impact would be to the rear of the legal parcel. The building would not be physically affected.	No adverse effect
19	8296 S. Wasatch Boulevard	One-story early ranch-style single-family dwelling	EC/Criterion A	Impacts would include ~0.04 acre of land acquisition with the Imbalanced-lane Alternative or ~0.06 acre of land acquisition with the Five-lane Alternative and ~0.02 acre of TCE with both alternatives. The impact would be to the front of the legal parcel. The building would not be physically affected.	No adverse effect
20	3461 E. Kings Hill Drive	One-and-a-half-story split-level-style single-family dwelling	EC/Criterion A	Impacts would include ~0.02 acre of TCE. The impact would be to the front and side of the legal parcel. The building would not be physically affected.	No adverse effect
21	3475 E. Kings Hill Drive	One-and-a-half-story split-level-style single-family dwelling	EC/Criterion A	Impacts would include less than 0.01 acre of TCE. The impact would be to the front of the legal parcel. The building would not be physically affected.	No adverse effect
22	8342 S. Wasatch Boulevard	One-story ranch-style single-family dwelling	EC/Criterion A	Impacts would include ~0.03 acre of land acquisition with the Imbalanced-lane Alternative or ~0.05 acre of land acquisition with the Five-lane Alternative for Wasatch Boulevard ROW and ~0.05 acre of TCE with the Imbalanced-lane Alternative or 0.04 acre of TCE with the Five-lane Alternative. The impact would be to the front and side of the legal parcel. The building would not be physically affected.	No adverse effect
NV2 ^a	8640 S. Russell Park	Potential historic-age building	EC/Criterion A	Impacts would include ~0.06 acre of TCE with both alternatives. The impact would be to the front and side of the legal parcel. The building would not be physically affected.	No adverse effect

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Table 15.4-1. Impacts to NRHP-eligible Architectural Resources from the Wasatch Boulevard Imbalanced-lane and Five-lane Alternatives with the Enhanced Bus Service Alternative

ID	Address	Property Description	UDSH Rating/ NRHP Criteria	Description of Impact	Finding of Effect
36	8800 S. Alpen Way	One-story ranch-style single-family dwelling	EC/Criterion A	Impacts would include ~0.01 acre of land acquisition for Wasatch Boulevard ROW. The impact would be to the rear of the legal parcel. The building would not be affected.	No adverse effect

Source: Hovanes and Lechert 2020

~ = approximately

^a Salt Lake County Assessor data indicated this legal parcel as potentially having historic-age buildings; however, the resource was not visible enough from the public ROW to evaluate it for NRHP eligibility. The resource is being considered as eligible/contributing (EC) in the analysis of impacts.

Table 15.4-2. Impacts to NRHP-eligible Archaeological Resources from the Wasatch Boulevard Imbalanced-lane and Five-lane Alternatives with the Enhanced Bus Service Alternative

Site Number	Site Name/ Description	NRHP Criteria	Description of Impact	Finding of Effect
42SL830	Salt Lake to Alta Road/S.R. 210	Criterion A	Impacts would consist of ~31.24 acres of disturbance within the existing paved surface and adjacent roadbed to widen Wasatch Boulevard for the Imbalanced-lane Alternative and ~31.29 acres for the Five-lane Alternative. This would be a continuation of the historic pattern to improve and modernize the transportation facility. The alternatives would not diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect

Source: Lechert and others 2020

~ = approximately

15.4.3.2 S.R. 210 – North Little Cottonwood Road to Alta

With the Enhanced Bus Service Alternative, there would be no change to the existing S.R. 210 roadway from North Little Cottonwood Road to the town of Alta; therefore, there would be no impacts to architectural or archaeological resources.

15.4.3.3 Mobility Hubs Alternative

The Enhanced Bus Service Alternative includes two mobility hubs: a mobility hub at the gravel pit and a mobility hub at the park-and-ride lot at 9400 South and Highland Drive.

Mobility hubs would be built at a gravel pit on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard and at 9400 South and Highland Drive at an existing park-and-ride lot.

What is the gravel pit?

The gravel pit is an existing aggregate (gravel) mine located on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard.

15.4.3.3.1 Gravel Pit

This mobility hub would impact one historic architectural resource (Table 15.4-3). The gravel pit mobility hub would not diminish the integrity of features directly related to the criteria under which the architectural resource is included in the NRHP. No archaeological resources would be impacted by this mobility hub.

Table 15.4-3. Impacts to NRHP-eligible Architectural Resources from the Gravel Pit Mobility Hub with the Enhanced Bus Service Alternative

ID	Address	Property Descriptions	UDSH Rating/ NRHP Criteria	Description of Impact	Finding of Effect
1	6851 S. Big Cottonwood Canyon Road	Three-and-a-half-story vernacular Granite Paper Mill	ES/Criteria A and C; included in the NRHP	Impacts would include ~4.01 acres of land acquisition for the interchange ROW. The building would not be physically affected.	No adverse effect

Source: Hovanes and Lechert 2020
~ = approximately

15.4.3.3.2 9400 South and Highland Drive

This mobility hub would not impact historic architectural or archaeological resources.

15.4.3.4 Avalanche Mitigation Alternatives

The Enhanced Bus Service Alternative includes two alternatives for avalanche mitigation: the Snow Sheds with Berms Alternative and the Show Sheds with Realigned Road Alternative.

15.4.3.4.1 Snow Sheds with Berms Alternative

No historic architectural resources were identified in the analysis area; the alternative would not impact historic architectural resources. Two archaeological resources, sites 42SL830 and 42SL419, would be impacted by the alternative (Table 15.4-4).

Table 15.4-4. Impacts to NRHP-eligible Archaeological Resources from the Snow Sheds with Berms Alternative with the Enhanced Bus Service Alternative

Site Number	Site Name/Description	NRHP Criteria	Description of Impact	Finding of Effect
42SL830	Salt Lake to Alta Road/S.R. 210	Criterion A	Impacts would include ~7.30 acres of disturbance for the snow sheds and berms. The alternative would not diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect
42SL419	D&RGW Railroad/Wasatch & Jordan Valley Railroad/Salt Lake & Alta	Criterion A	Impacts would include ~0.19 acre of disturbance for the snow sheds and berms. Segments of intact retaining wall (known colloquially as the "China Wall") would be removed.	Adverse effect

Source: Lechert and others 2020

~ = approximately; D&RGW = Denver and Rio Grande Western

15.4.3.4.2 Snow Sheds with Realigned Road Alternative

No historic architectural resources were identified in the analysis area; the alternative would not impact historic architectural resources. Two archaeological resources, sites 42SL830 and 42SL419, would be impacted by the alternative (Table 15.4-5).

Table 15.4-5. Impacts to NRHP-eligible Archaeological Resources from the Snow Sheds with Realigned Road Alternative with the Enhanced Bus Service Alternative

Site Number	Site Name/Description	NRHP Criteria	Description of Impact	Finding of Effect
42SL830	Salt Lake to Alta Road/S.R. 210	Criterion A	Impacts would include ~9.58 acres of disturbance. The alternative would not diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect
42SL419	D&RGW Railroad/Wasatch & Jordan Valley Railroad/Salt Lake & Alta	Criterion A	Impacts would include ~0.19 acre of disturbance for the snow sheds and realigned road. Segments of intact retaining wall (known colloquially as the "China Wall") would be removed.	Adverse effect

Source: Lechert and others 2020

~ = approximately; D&RGW = Denver and Rio Grande Western

15.4.3.5 Trailhead Parking Alternatives

The Enhanced Bus Service Alternative includes three alternatives to address trailhead parking:

- Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative
- Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative
- No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

No historic architectural resources were identified in the trailhead parking analysis area. The trailhead parking alternatives would not impact historic architectural resources.

15.4.3.5.1 Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative

One historic archaeological resource would be impacted by this trailhead parking alternative with the Enhanced Bus Service Alternative (Table 15.4-6).

Table 15.4-6. Impacts to NRHP-eligible Archaeological Resources from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative with the Enhanced Bus Service Alternative

Site Number	Site Name/Description	NRHP Criteria	Description of Impact	Finding of Effect
42SL830	Salt Lake to Alta Road/ S.R. 210	Criterion A	Impacts would include disturbance for constructing trailhead parking improvements at the Bridge Trailhead (~0.20 acre), Gate Buttress Trailhead (~0.35 acre), Lisa Falls Trailhead (~1.17 acres), and White Pine Trailhead (~0.09 acre). The alternatives would not diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect

Source: Lechert and others 2020
~ = approximately

15.4.3.5.2 Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The impacts from this trailhead parking alternative to cultural resources would be the same as from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative with the Enhanced Bus Service Alternative.

15.4.3.5.3 No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

This trailhead parking alternative would not impact historic architectural or archaeological resources.

15.4.3.6 No Winter Parking Alternative

The No Winter Parking Alternative would not impact historic architectural or archaeological resources.

15.4.4 Enhanced Bus Service in Peak-period Shoulder Lane Alternative

This section describes the impacts to cultural resources from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 from North Little Cottonwood Road to the town of Alta, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

Based on the nature of the impacts from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, UDOT determined that there would be an **adverse effect** on a historic property (archaeological site 42SL419) in the analysis area under Section 106.

15.4.4.1 S.R. 210 – Wasatch Boulevard

The impacts to cultural resources along Wasatch Boulevard from the Imbalanced-lane Alternative and the Five-lane Alternative with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

15.4.4.2 S.R. 210 – North Little Cottonwood Road to Alta

The Enhanced Bus Service in Peak-period Shoulder Lane Alternative would impact 11 historic architectural resources and 4 archaeological sites from North Little Cottonwood Road to the town of Alta (Table 15.4-7 and Table 15.4-8). Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect). The alternative would not diminish the integrity of features directly related to the criterion under which the historic architectural resources or archaeological sites are eligible.

Table 15.4-7. Impacts to NRHP-eligible Architectural Resources from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative from North Little Cottonwood Road to the Town of Alta

ID	Address	Property Descriptions	UDSH Rating/ NRHP Criteria	Description of Impact	Finding of Effect
61	3742 E. North Little Cottonwood Road	One-and-a-half-story Victorian Eclectic-style single-family dwelling	ES/Criteria A and C	Impacts would include ~0.19 acre of TCE. The impact would be to the portion of the legal parcel that is on the opposite side of North Little Cottonwood Road. The building would not be physically affected.	No adverse effect
63	4700 E. Little Cottonwood Canyon	Temple Granite Quarry Historical Marker	EC/Criterion A	Impacts would include ~0.71 acre of TCE for constructing roadway slope and drainage features. The historical marker would not be physically affected.	No adverse effect
64	4526 E. Little Cottonwood Canyon	One-story 20th-century other-style hydroelectric energy facility (Whitmore Power Plant)	ES/Criteria A and C	Impacts would include ~0.01 acre of TCE for constructing roadway slope features. The building would not be physically affected.	No adverse effect

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Table 15.4-7. Impacts to NRHP-eligible Architectural Resources from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative from North Little Cottonwood Road to the Town of Alta

ID	Address	Property Descriptions	UDSH Rating/ NRHP Criteria	Description of Impact	Finding of Effect
66	5002 E. Little Cottonwood Canyon	One-and-a-half-story Tudor-style single-family dwelling	EC/Criterion A	Impacts would include ~0.02 acre of TCE for constructing roadway slope and drainage features. The impact would be to the front of the legal parcel and driveway. The building would not be physically affected.	No adverse effect
NV5 ^a	6279 E. Little Cottonwood Canyon	Potential historic-age building	EC/Criterion A	Impacts would include ~0.06 acre of permanent land acquisition for the alignment ROW and ~0.82 acre of TCE. The impact would be to the front of the legal parcel. The building would not be physically affected.	No adverse effect
67	9111 E. Little Cottonwood Canyon	Two-story Organic-style single-family dwelling	ES/Criteria A and C	Impacts would include ~0.12 acre of permanent land acquisition for shoulder-lane ROW and ~0.13 acre of TCE for constructing roadway slope and drainage features. The impact would be to the front of the property and driveway. The building would not be physically affected.	No adverse effect
68	9121 E. Snowbird Center Drive	Eleven-story Brutalist-style hotel/condominium (Iron Blossam Lodge)	ES/Criteria A and C	Impacts would include ~0.06 acre of permanent land acquisition for shoulder-lane ROW and ~0.10 acre of TCE for constructing roadway slope and drainage features. The building would not be physically affected.	No adverse effect
69	9180 E. Lodge Drive	Two-story Brutalist-style condominium	ES/Criteria A and C	Impacts would include ~0.05 acre of permanent land acquisition for shoulder-lane ROW and ~0.03 acre of TCE for constructing roadway slope features. The building would not be physically affected.	No adverse effect
70	9202 E. Lodge Drive	Seven-story Brutalist-style hotel/condominium (The Inn at Snowbird)	ES/Criteria A and C	Impacts would include less than 0.01 acre of permanent land acquisition for shoulder-lane ROW and less than 0.01 acre of TCE for constructing roadway slope features. The building would not be physically affected.	No adverse effect
71	9260 E. Lodge Drive	Seven-story Brutalist-style hotel/condominium (The Lodge at Snowbird)	ES/Criteria A and C	Impacts would include ~0.10 acre of permanent land acquisition for shoulder lane ROW and ~0.35 acre of TCE for constructing roadway slope features. The building would not be physically affected.	No adverse effect

(continued on next page)

Table 15.4-7. Impacts to NRHP-eligible Architectural Resources from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative from North Little Cottonwood Road to the Town of Alta

ID	Address	Property Descriptions	UDSH Rating/ NRHP Criteria	Description of Impact	Finding of Effect
72	9385 S. Snowbird Center Drive	Three-story Brutalist-style commercial and recreation/culture building (Snowbird Center)	ES/Criteria A and C	Impacts would include ~0.05 acre of permanent land acquisition for shoulder-lane ROW and ~0.78 acre of TCE for constructing roadway slope and drainage features. The building would not be physically affected.	No adverse effect

Source: Hovanes and Lechert 2020

~ = approximately

^a Salt Lake County Assessor data indicated this legal parcel as potentially having historic-age buildings; however, the resource was not visible enough from the public ROW to evaluate it for NRHP eligibility. The resource is being considered as eligible/contributing (EC) in the analysis of impacts.

Table 15.4-8. Impacts to NRHP-eligible Archaeological Sites from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative from North Little Cottonwood Road to the Town of Alta

Site Number	Site Name/ Description	NRHP Criteria	Description of Impact	Finding of Effect
42SL830	Salt Lake to Alta Road/S.R. 210	Criterion A	Impacts would include ~50.52 acres of disturbance to the existing paved surface and adjacent roadbed to construct shoulder lanes, roadway slope, and drainage features. This would be a continuation of the historic pattern to improve and modernize the transportation facility. This alternative would not diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect
42SL109	Little Cottonwood Grit Mill and Granite Quarry	Criteria A and D	Impacts would include ~3.19 acres of disturbance within the site boundary. However, the portions of the site that would be disturbed have been extensively impacted by residential development south of the highway and continual, heavy recreational public use. This alternative would not diminish integrity directly related to the criteria under which the resource is eligible.	No adverse effect
42SL549	Whitmore Temple Granite Power Plant	Criterion A	Impacts would include less than 0.01 acre of disturbance within the site boundary. This alternative would not impact features that contribute to the site's eligibility or diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect
42SL916	Little Cottonwood Quarry Trail	Criterion A	Impacts would include ~0.02 acre of disturbance within the site boundary. This alternative would not impact features that contribute to the site's eligibility or diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect

Source: Lechert and others 2020

~ = approximately

15.4.4.3 Mobility Hubs Alternative

The impacts to cultural resources from the mobility hubs with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

15.4.4.4 Avalanche Mitigation Alternatives

The impacts to cultural resources from the avalanche mitigation alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

15.4.4.5 Trailhead Parking Alternatives

The impacts to cultural resources from the trailhead parking alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

15.4.4.6 No Winter Parking Alternative

The No Winter Parking Alternative would not impact historic architectural or archaeological resources.

15.4.5 Gondola Alternative A (Starting at Canyon Entrance)

This section describes the impacts to cultural resources from Gondola Alternative A, which includes a gondola alignment from the entrance to Little Cottonwood Canyon to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

Based on the nature of the impacts from Gondola Alternative A, UDOT determined that there would be an **adverse effect** on historic properties (archaeological sites 42SL52 and 42SL419) in the analysis area under Section 106. Section 4(f) does not apply to archaeological site 42SL52 since the site does not warrant preservation in place.

15.4.5.1 S.R. 210 – Wasatch Boulevard

The impacts to cultural resources from the Imbalanced-lane and Five-lane Alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

15.4.5.2 S.R. 210 – North Little Cottonwood Road to Alta

Gondola Alternative A would impact 7 architectural resources and 5 archaeological sites from North Little Cottonwood Road to the town of Alta (Table 15.4-9 and Table 15.4-10). Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

Impacts from the gondola towers and terminal stations would include permanent land acquisition, temporary construction easements, and changes to the visual character of setting. The alternative would not diminish the integrity of features directly related to the criteria under which the architectural or archaeological resources are eligible.

What are gondola base, angle, and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's gondola trip. Passengers board and disembark the gondola cabins at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

The gondola alternatives also include *angle stations*, which are needed to adjust the horizontal direction of the cabin; passengers remain in the cabin as it passes through an angle station.

A *tower* supports the gondola cable.

Table 15.4-9. Impacts to NRHP-eligible Architectural Resources from Gondola Alternative A from North Little Cottonwood Road to the Town of Alta

ID	Address	Property Descriptions	UDSH Rating/ NRHP Criteria	Description of Impact	Finding of Effect
NV5 ^a	6279 E. Little Cottonwood Canyon	Potential historic-age building	EC/Criterion A	Impacts would include ~0.15 acre of permanent land acquisition for the gondola tower and an easement of ~2.01 acres under the gondola cables. The impact would be to the front of the legal parcel. The building would not be physically affected.	No adverse effect
68	9121 E. Snowbird Center Drive	Eleven-story Brutalist-style timeshare/condominium (Iron Blossam Lodge)	ES/Criteria A and C	Impacts would include two gondola towers, overhead cables, and gondola cabins visible in the viewshed. The building would not be physically altered.	No adverse effect
70	9202 E. Lodge Drive	Seven-story Brutalist-style hotel/condominium (The Inn at Snowbird)	ES/Criteria A and C	Impacts would include an easement of ~0.01 acre under the gondola cables. The building would not be physically altered.	No adverse effect
71	9260 E. Lodge Drive	Seven-story Brutalist-style hotel/condominium (The Lodge at Snowbird)	ES/Criteria A and C	Impacts would include an easement of ~0.40 acre under the gondola cables. The building would not be physically altered.	No adverse effect
72	9385 S. Snowbird Center Drive	Three-story Brutalist-style commercial and recreation/culture building (Snowbird Center)	ES/Criteria A and C	Impacts would include ~0.15 acre of permanent land acquisition for the gondola towers and an easement of ~1.31 acres under the gondola cables. The building would not be physically altered.	No adverse effect
73	9320 S. Cliff Lodge Drive	Eight-story Brutalist-style hotel/condominium (Cliff Lodge)	ES/Criteria A and C	Impacts would include two gondola towers, overhead cables, and gondola cabins visible in the viewshed. The building would not be physically altered.	No adverse effect
82	10230 E. Little Cottonwood Canyon	Three-story, mixed-style (cross-gabled ski chalet and International-style) hotel (Alta Lodge)	EC/Criterion A	Impacts would include ~0.06 acre of permanent land acquisition for the gondola towers and an easement of ~0.35 acre under the gondola cables. The building would not be physically altered.	No adverse effect

Source: Hovaness and Lechert 2020

~ = approximately

^a Salt Lake County Assessor data indicated this legal parcel as potentially having historic-age buildings; however, the resource was not visible enough from the public ROW to evaluate it for NRHP eligibility. The resource is being considered as eligible/contributing (EC) in the analysis of impacts.

Table 15.4-10. Impacts to NRHP-eligible Archaeological Sites from Gondola Alternative A from North Little Cottonwood Road to the Town of Alta

Site Number	Site Name/ Description	NRHP Criteria	Description of Impact	Finding of Effect
42SL52	Town of Alta Site	Criteria A and D	A tower and the Alta destination station would be constructed within the site. Impacts would include ~0.63 acre of disturbance within the site boundary. The tower would impact ~0.10 acre of Feature F-3, a large depression filled with historic debris.	Adverse effect
42SL90	Prehistoric rock shelter/rock art	Criterion D	Impacts would include two gondola towers, overhead cables, and moving cabins visible in the viewshed of the rock shelter. The contrast of the gondola towers, overhead cables, and cabins would be visually buffered and screened by the surrounding vegetation in the immediate foreground. Physical impacts would not occur within the site boundary.	No adverse effect
42LS102	Historic hydroelectric power plant	Criteria A and D	Impacts would include one gondola tower, overhead cables, and moving cabins visible in the middle ground of the viewshed. Physical impacts would not occur within the site boundary.	No adverse effect
42SL109	Little Cottonwood Grit Mill and Granite Quarry	Criteria A and D	A gondola tower and the gondola base station would be constructed within the site. Impacts would include ~2.57 acres of disturbance within the site boundary. The site has already been disturbed with an existing parking lot for Little Cottonwood Canyon and small pull-off parking for hiking trails that run through the sites. The alternative would avoid features that qualify the site for inclusion in the NRHP and would not diminish integrity directly related to the criteria under which the resource is eligible.	No adverse effect
42SL830	Salt Lake to Alta Road/S.R. 210	Criterion A	Impacts would include ~1.10 acres of disturbance to the existing paved surface and adjacent roadbed to construct the gondola base station. The site, as a road, retains its historic integrity in the aspect of location, but no other aspects of integrity are present because of its complete and ongoing modernization. The alternative would not diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect

Sources: Cypers and Daniels 2020; Lechert and others 2020
~ = approximately

15.4.5.3 Mobility Hubs Alternative

The impacts to cultural resources from the mobility hubs with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

15.4.5.4 Avalanche Mitigation Alternatives

The impacts to cultural resources from the avalanche mitigation alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

15.4.5.5 Trailhead Parking Alternatives

The impacts to cultural resources from the trailhead parking alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

15.4.5.6 No Winter Parking Alternative

The No Winter Parking Alternative would not impact historic architectural or archaeological resources.

15.4.6 Gondola Alternative B (Starting at La Caille)

This section describes the impacts to cultural resources from Gondola Alternative B, which includes a gondola alignment from La Caille to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

Based on the nature of the impacts from Gondola Alternative B, UDOT determined that there would be an **adverse effect** on historic properties (archaeological sites 42SL52 and 42SL419) in the analysis area under Section 106. Section 4(f) does not apply to archaeological site 42SL52 since the site does not warrant preservation in place.

15.4.6.1 S.R. 210 – Wasatch Boulevard

The impacts to cultural resources from the Imbalanced-lane and Five-lane Alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

15.4.6.2 S.R. 210 – North Little Cottonwood Road to Alta

The alignment for Gondola Alternative B would be the same as for Gondola Alternative A except for the addition of 0.75 mile of gondola service, an angle station at the Little Cottonwood Canyon park-and-ride lot, and three additional gondola towers. Also, with Gondola Alternative B, the gondola base station would be located at La Caille instead of at the Little Cottonwood Canyon park-and-ride lot.

From North Little Cottonwood Road to the town of Alta, Gondola Alternative B would impact an additional three historic architectural resources in addition to the impacts to historic architectural resources from Gondola Alternative A (Table 15.4-11). Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

Table 15.4-11. Impacts to NRHP-eligible Architectural Resources from Gondola Alternative B from North Little Cottonwood Road to the Town of Alta

ID	Address	Property Descriptions	UDSH Rating/ NRHP Criteria	Description of Impact	Finding of Effect
84	9338 S. North Little Cottonwood Road	One-and-a-half-story side-passage type Victorian Eclectic-style single-family dwelling	ES/Criteria A and C	Impacts would include ~0.04 acre of permanent land acquisition for the gondola base station. The impact would primarily be in the western portion of the legal parcel across North Little Cottonwood Road. The building would not be physically affected.	No adverse effect
61	3742 E. North Little Cottonwood Road	One-and-a-half-story Victorian Eclectic-style single-family dwelling	ES/Criteria A and C	Impacts would include ~0.43 acre of permanent land acquisition for the gondola base station. The impact would primarily be in the west portion of the of the legal parcel across North Little Cottonwood Road. The building would not be physically affected.	No adverse effect
NV3 ^a	4261 Little Cottonwood Road	Potential historic-age building	EC/Criterion A	Impacts would include an easement of ~0.16 acre under the gondola cables. The impact would be to the front of the legal parcel. The building would not be physically affected.	No adverse effect

Source: Hovanes and Lechert 2020

~ = approximately

^a Salt Lake County Assessor data indicated this legal parcel as potentially having historic-age buildings; however, the resource was not visible enough from the public ROW to evaluate it for NRHP eligibility. The resource is being considered as eligible/contributing (EC) in the analysis of impacts.

From North Little Cottonwood Road to the town of Alta, Gondola Alternative B would have an additional impact to one archaeological site, 42SL830, in addition to the impacts to the archaeological sites from Gondola Alternative A (Table 15.4-12). Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

Table 15.4-12. Impacts to NRHP-eligible Archaeological Resources from Gondola Alternative B from North Little Cottonwood Road to the Town of Alta

Site Number	Site Name/ Description	NRHP Criteria	Description of Impact	Finding of Effect
42SL830	Salt Lake to Alta Road/ S.R. 210	Criterion A	Impacts would include ~6.21 acres of disturbance of the existing paved surface and adjacent roadbed to construct the gondola base station. The alternative would not diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect

Source: Lechert and others 2020

~ = approximately

15.4.6.3 Mobility Hubs Alternative

With Gondola Alternative B, the mobility hubs at the gravel pit and at 9400 South and Highland Drive would require about 600 and 400 parking spaces, respectively. This is less than proposed numbers with the enhanced bus service alternatives and Gondola Alternative A, which would be 1,500 parking spaces at the gravel pit and 1,000 at 9400 South and Highland Drive. The fewer number of parking spaces at these two locations would not reduce the construction footprint of the parking structures but would reduce the height of the structures—from three to four stories to two to three stories at the gravel pit and from three to four stories to two stories at 9400 South and Highland Drive. Because the construction footprint would be the same, the impacts to cultural resources from the mobility hubs with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

15.4.6.4 Avalanche Mitigation Alternatives

The impacts to cultural resources from the avalanche mitigation alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

15.4.6.5 Trailhead Parking Alternatives

The impacts to cultural resources from the trailhead parking alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

15.4.6.6 No Winter Parking Alternative

The No Winter Parking Alternative would not impact historic architectural or archaeological resources.

15.4.7 Cog Rail Alternative (Starting at La Caille)

This section describes the impacts to cultural resources from the Cog Rail Alternative, which includes a cog rail alignment from La Caille to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 on North Little Cottonwood Road, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

Based on the nature of the impacts from the Cog Rail Alternative, UDOT determined that there would be an **adverse effect** on historic properties (archaeological sites 42SL109 and 42SL419) in the analysis area under Section 106. Section 4(f) does not apply to archaeological site 42SL109 since the site does not warrant preservation in place.

What are cog rail base and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's cog rail trip. Passengers board and disembark the cog rail vehicles at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

15.4.7.1 S.R. 210 – Wasatch Boulevard

The impacts to cultural resources from the Imbalanced-lane and Five-lane Alternatives with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative.

15.4.7.2 SR. 210 – North Little Cottonwood Road to Alta

The Cog Rail Alternative would impact eight historic architectural resources and three archaeological sites from North Little Cottonwood Road to the town of Alta (Table 15.4-13 and Table 15.4-14). Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

The alternative would not diminish the integrity of features directly related to the criterion under which the historic architectural resources or archaeological sites are eligible.

Table 15.4-13. Impacts to NRHP-eligible Architectural Resources from the Cog Rail Alignment and Base Station from North Little Cottonwood Road to the Town of Alta

ID	Address	Property Descriptions	UDSH Rating/ NRHP Criteria	Description of Impact	Finding of Effect
84	9338 S. North Little Cottonwood Road	One-and-a-half-story side-passage-type Victorian Eclectic-style single-family dwelling	ES/Criteria A and C	Impacts would include ~0.04 acre of permanent land acquisition for the cog rail base station. The impact would be to the rear of the legal parcel. The building would not be physically affected.	No adverse effect
61	3742 E. North Little Cottonwood Road	One-and-a-half-story Victorian Eclectic-style single-family dwelling	ES/Criteria A and C	Impacts would include ~0.43 acre of permanent land acquisition for the cog rail base station. The impact would primarily be in the west portion of the legal parcel across North Little Cottonwood Road. The building would not be physically affected.	No adverse effect
NV3 ^a	4261 Little Cottonwood Road	Potential historic-age building	EC/Criterion A	Impacts would include ~0.03 acre of permanent land acquisition for the rail alignment ROW. The impact would be to the front of the legal parcel. The building would not be physically affected.	No adverse effect
63	4700 E. Little Cottonwood Road	Temple Granite Quarry Historical Marker	EC/Criterion A	Impacts would include ~0.14 acre of TCE within the legal parcel. The marker would not be physically affected.	No adverse effect
NV5 ^a	6279 E. Little Cottonwood Canyon	Potential historic-age building	EC/Criterion A	Impacts would include ~2.22 acres of permanent land acquisition for the rail alignment ROW and ~1.23 acres of TCE. The impact would be to the front of the legal parcel. The building would not be physically affected.	No adverse effect
67	9111 E. Little Cottonwood Road	Two-story Organic-style single dwelling	ES/Criteria A and C	Impacts would include ~0.08 acre of permanent land acquisition for the rail alignment ROW. The impact would be to the front of the legal parcel. The building would not be physically affected.	No adverse effect
68	9121 E. Snowbird Center Drive	Eleven-story Brutalist-style timeshare/ condominium (Iron Blossam Lodge)	ES/Criteria A and C	Impacts would include ~0.36 acre of permanent land acquisition for the rail alignment ROW. The building would not be physically affected.	No adverse effect

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Table 15.4-13. Impacts to NRHP-eligible Architectural Resources from the Cog Rail Alignment and Base Station from North Little Cottonwood Road to the Town of Alta

ID	Address	Property Descriptions	UDSH Rating/ NRHP Criteria	Description of Impact	Finding of Effect
72	9385 S. Snowbird Center Drive	Three-story Brutalist-style commercial and recreation/culture building (Snowbird Center)	ES/Criteria A and C	Impacts would include ~1.61 acres of permanent land acquisition for the rail alignment ROW and ~0.02 acre of TCE. The impact would be to the portion of the legal parcel that is north of S.R. 210 opposite Snowbird Center. The building would not be physically affected.	No adverse effect

Source: Hovaness and Lechert 2020

~ = approximately

^a Salt Lake County Assessor data indicated these legal parcels as potentially having historic-age buildings; however, the resources were not visible enough from the public ROW to evaluate them for NRHP eligibility. The resources are being considered as eligible/contributing (EC) in the analysis of impacts.

Table 15.4-14. Impacts to NRHP-eligible Archaeological Resources from the Cog Rail Alignment and Base Station from North Little Cottonwood Road to the Town of Alta

Site Number	Site Name/ Description	NRHP Criteria	Description of Impact	Finding of Effect
42SL830	Salt Lake to Alta Road/S.R. 210	Criterion A	Impacts would include ~42.90 acres of disturbance to the existing paved surface and adjacent roadbed to construct the cog rail line, base and destination stations, operations and maintenance facility, upper-canyon snow shed, drainage features, and reconstructed trailheads on the north side of S.R. 210. This would be a continuation of the historic pattern to improve and modernize the transportation facility. The alternative would not diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect
42SL109	Little Cottonwood Grit Mill and Granite Quarry	Criteria A and D	Impacts would include ~10.62 acres of disturbance to construct the cog rail operations and maintenance facility. Portions of the character-defining features of the quarried canyon face and quarried stone boulders are scattered across the 31-acre site.	Adverse effect
42SL916	Little Cottonwood Quarry Trail	Criterion A	Impacts would include ~0.01 acre of disturbance within the site boundary. This alternative would not impact features that contribute to the site's eligibility or diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect

Source: Lechert and others 2020

~ = approximately

15.4.7.3 Mobility Hubs Alternative

The impacts to cultural resources from the mobility hubs with the Cog Rail Alternative would be the same as with Gondola Alternative B.

15.4.7.4 Avalanche Mitigation Alternatives

The impacts to cultural resources from the avalanche mitigation alternatives with the Cog Rail Alternative would include similar snow shed designs at the mid-canyon locations as the Enhanced Bus Service Alternative except that the snow sheds would be slightly wider to accommodate both the cog rail tracks and vehicles. However, with the Cog Rail Alternative, an additional snow shed would be constructed in the upper canyon between the west-end and east-end connections of the Alta Bypass Road to S.R. 210 to minimize avalanche risk to the cog rail system.

Constructing this snow shed would require right-of-way acquisition and a temporary construction easement from one historic property (#72, the Snowbird Center). The upper-canyon snow shed is integral to the Cog Rail Alternative; the alternative would not be constructed without it. For this reason, impacts from this snow shed were not calculated separately. Impacts related to this snow shed are included with the cog rail impacts described in Table 15.4-13 above, Impacts to NRHP-eligible Architectural Resources from the Cog Rail Alignment and Base Station from North Little Cottonwood Road to the Town of Alta, and Table 15.4-14 above, Impacts to NRHP-eligible Archaeological Resources from the Cog Rail Alignment and Base Station from North Little Cottonwood Road to the Town of Alta.

15.4.7.4.1 Snow Sheds with Berms Alternative

With the Cog Rail Alternative, the Snow Sheds with Berms Alternative would include similar snow shed designs at the mid-canyon locations as the Enhanced Bus Service Alternative except that the snow sheds would be slightly wider to accommodate both the cog rail tracks and vehicles. Two archaeological resources, sites 42SL830 and 42SL419, would be impacted by the alternative (Table 15.4-15). Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

Table 15.4-15. Impacts to NRHP-eligible Archaeological Resources from the Snow Sheds with Berms Alternative with the Cog Rail Alternative

Site Number	Site Name/Description	NRHP Criteria	Description of Impact	Finding of Effect
42SL830	Salt Lake to Alta Road/S.R. 210	Criterion A	Impacts would include ~7.78 acres of disturbance for the Snow Sheds with Berms Alternative. The alternative would not diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect
42SL419	D&RGW Railroad/Wasatch & Jordan Valley Railroad/Salt Lake & Alta	Criterion A	Impacts would include ~0.19 acre of disturbance for the Snow Sheds with Berms Alternative. Segments of intact retaining wall (known colloquially as the "China Wall") would be removed.	Adverse effect

Source: Lechert and others 2020

~ = approximately; D&RGW = Denver and Rio Grande Western

15.4.7.4.2 Snow Sheds with Realigned Road Alternative

With the Cog Rail Alternative, the Snow Sheds with Realigned Road Alternative would include similar snow shed designs at the mid-canyon locations as the Enhanced Bus Service Alternative except that the snow sheds would be slightly wider to accommodate both the cog rail tracks and vehicles. Two archaeological resources, sites 42SL830 and 42SL419, would be impacted by the alternative (Table 15.4-16). Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

Table 15.4-16. Impacts to NRHP-eligible Archaeological Resources from the Snow Sheds with Realigned Road Alternative with the Cog Rail Alternative

Site Number	Site Name/ Description	NRHP Criteria	Description of Impact	Finding of Effect
42SL830	Salt Lake to Alta Road/S.R. 210	Criterion A	Impacts would include ~8.88 acres of disturbance for the Snow Sheds with Realigned Road Alternative. The alternative would not diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect
42SL419	D&RGW Railroad/ Wasatch & Jordan Valley Railroad/ Salt Lake & Alta	Criterion A	Impacts would include ~0.19 acre of disturbance for the Snow Sheds with Realigned Road Alternative. Segments of intact retaining wall (known colloquially as the "China Wall") would be removed.	Adverse effect

Source: Lechert and others 2020

~ = approximately; D&RGW = Denver and Rio Grande Western

15.4.7.5 Trailhead Parking Alternatives

With the Cog Rail Alternative, the Gate Buttress, Grit Mill, and Lisa Falls Trailheads would be reconstructed as part of the cog rail design. These impacts are discussed in Section 15.4.7.2, SR. 210 – North Little Cottonwood Road to Alta. Only the White Pine and Bridge Trailheads would be reconstructed as part of the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative and the Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative.

15.4.7.5.1 Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative

This trailhead parking alternative includes improvements to the Bridge and White Pine Trailheads only. One historic archaeological resource would be impacted by this trailhead parking alternative (Table 15.4-17).

Table 15.4-17. Impacts to NRHP-eligible Archaeological Resources from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative with the Cog Rail Alternative

Site Number	Site Name/Description	NRHP Criteria	Description of Impact	Finding of Effect
42SL830	Salt Lake to Alta Road/ S.R. 210	Criterion A	Impacts would include disturbance for constructing trailhead parking improvements at Bridge Trailhead (~0.20 acre) and White Pine Trailhead (~0.09 acre). The alternative would not diminish integrity directly related to the criterion under which the resource is eligible.	No adverse effect

Source: Lechert and others 2020
~ = approximately

15.4.7.5.2 Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The impacts to cultural resources from this trailhead parking alternative with the Cog Rail Alternative would be the same as from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative with the Cog Rail Alternative.

15.4.7.5.3 No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

This trailhead parking alternative would not impact historic architectural or archaeological resources.

15.4.7.6 No Winter Parking Alternative

The No Winter Parking Alternative would not impact historic architectural or archaeological resources.

15.4.8 Mitigation Measures

15.4.8.1 Avalanche Mitigation Alternatives

If either the Snow Sheds with Berms Alternative or the Snow Sheds with Realigned Road Alternative is selected, mitigation measures will include the following:

- Archaeological data recovery for site 42SL419 will be conducted in consultation with the USDA Forest Service and the Utah SHPO.

15.4.8.2 Gondola Alternative A or B

If Gondola Alternative A or B is selected, mitigation measures will include the following:

- Single-pole gondola towers will be used to reduce visual impacts to the Iron Blossam Lodge, the Inn at Snowbird, The Lodge at Snowbird, the Snowbird Center, and the Alta Lodge.
- Construction monitoring will be conducted for sites 42SL52 and 42SL109.
- Archaeological data recovery for site 42SL52 will be conducted in consultation with the USDA Forest Service and the Utah SHPO.

15.4.8.3 Cog Rail Alternative

If the Cog Rail Alternative is selected, mitigation measures will include the following:

- Archaeological data recovery for sites 42SL109 and 42SL419 will be conducted in consultation with the USDA Forest Service and the Utah SHPO.

15.5 References

Cypers, L., and M. Daniels

- 2020 Visual Analysis of Historic, Architectural and Archaeological Resources for the Little Cottonwood Canyon Environmental Impact Statement. Prepared by SWCA Environmental Consultants, Salt Lake City, Utah. Prepared for UDOT Region Two and HDR, Inc. Copies available from the Utah Division of State History, Salt Lake City.

Hovanes, K., and S. Lechert

- 2020 Selective Reconnaissance-Level Architectural Survey for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah. Prepared by SWCA Environmental Consultants, Salt Lake City, Utah. Prepared for UDOT Region Two and HDR, Inc. Copies available from the Utah Division of State History, Salt Lake City.

Lechert, S., L. Krussow, K.A. Mohlenhoff, K. Hovanes, and M. Skidmore

- 2020 Class III Archaeological Inventory for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah. Prepared for UDOT and HDR, Inc. Submitted to UDOT Region Two Salt Lake City.

[NPS] National Park Service

- 1997 National Register Bulletin: How to Apply the National Register Criteria for Evaluation. U.S. Department of the Interior, Washington, DC.

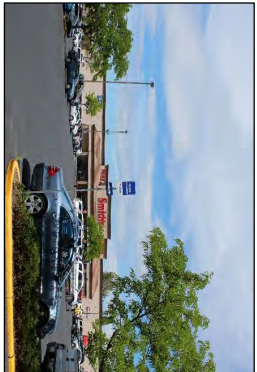
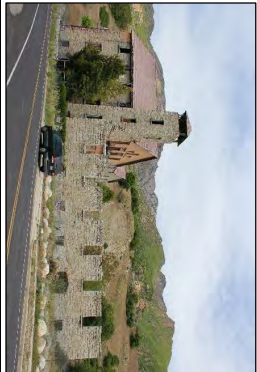
[UDOT] Utah Department of Transportation

- 2017 Third Amended Programmatic Agreement among the Federal Highway Administration, the Utah State Historic Preservation Officer, the Advisory Council on Historic Preservation, the United States Army Corps of Engineers, Sacramento District, and the Utah Department of Transportation Regarding Section 106 Implementation for Federal-Aid Transportation Project in the State of Utah. Available at: https://drive.google.com/file/d/1uO3B7H8kgEhb1dn8TAaW-3VDwHyo4_ix/view. Accessed November 30, 2020.

APPENDIX 15A

Architectural Resources


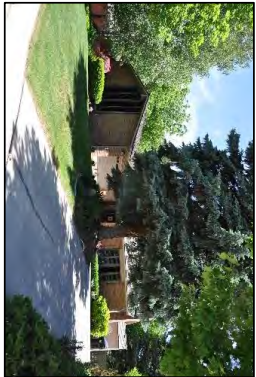
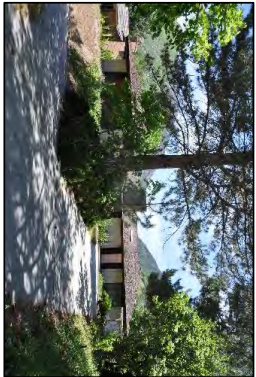
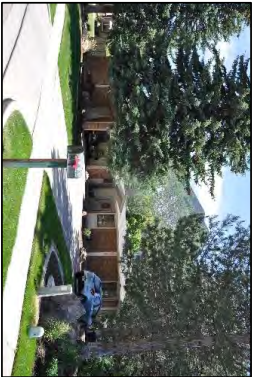
Table 4. Historical Architectural Resource Descriptions and Eligibility Recommendations for Properties in the Study Area

ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC1	28033510360000	2039 East 9400 South	Sandy	1978	One-story building in use as a grocery store. Foundation is poured concrete, with concrete-block walls. Roof is flat. Its material was not visible. Notable alterations include the portico covering the entrances (which may be original but has been altered through the application of stone veneer to the posts), the replacement of windows and doors, and the construction of modern outbuildings on the property. Two preexisting outbuildings were observed; all outbuildings on the property date to outside the historic period.	NC	
1	22234780100000	6951 South Big Cottonwood Canyon Road	Cottonwood Heights	1880	The NRHP-listed Granite Paper Mill (also known as the Deseret News Paper Mill) dates to 1880. It is a 3.5-story building with foundation and walls made of coursed granite ashlar (original) and stucco (a later addition). It has a front-gable roof covered with composite shingles. The building also features a four-story masonry tower at the southwest corner of the building and a two-story partially infill masonry rear section on the south side that now lacks a roof. Notable alterations include the stucco wall covering on the upper portion of the north and south sides of the building, the roof (which was changed after 1927), and the removal of the roof and upper portion of the walls of the rear two-story section ca. 1970. No outbuildings were observed.	ES NRHP Criteria A and C NRHP listed (1971)	

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC2	2224300014001	6999 Gun Club Road	Cottonwood Heights	1954	Property's primary use is as a gun club with six buildings. Five of the buildings date to outside the historic period. One building of historic age was observed on the property. Building is a one-story, south-facing vernacular outbuilding dating to 1954 standing on a poured concrete foundation with walls made of concrete blocks. Shed roof is covered with composite roll roofing. Has a shooting gallery extending from the main building. Property has five noncontributing buildings, which serve as the main buildings on the property. The construction of multiple buildings outside of the historic period has resulted in extensive alterations to the design of the property and traffic patterns between buildings and throughout the parcel.	NC	
NC3	22251780110000	3700 East Fort Union Boulevard	Cottonwood Heights	1948	One-story commercial (general) establishment, clad with stone veneer and metal siding. Originally served as a bar/taqueria known as the Canyon Inn. Notable alterations include the application of new siding and an addition on the northwest corner of the building. No outbuildings were observed.	NC	
NC4	22251780040000	3720 East Fort Union Boulevard	Cottonwood Heights	1975	One-story service station (a 7-Eleven convenience store), clad with brick and concrete block. Notable alterations include changes to the front facade. One central building structure, the service bay, was observed. Landmark site for many recreational users in Big and Little Cottonwood Canyons.	NC	

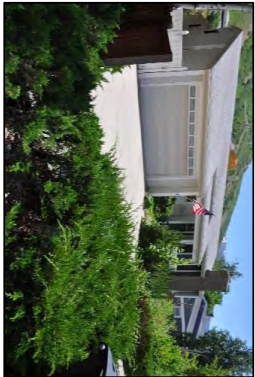
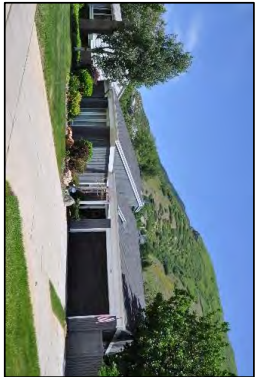

Selective Reconnaissance-Level Architectural Survey for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah

ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
2	22251770020000	7326 South Prospect Drive	Cottonwood Heights	1978	One-story ranch-style single-family dwelling, with walls of brick. Notable alterations consist of the replacement of windows and garage door. No outbuildings were observed.	EC NRHP Criterion A	
3	22253020390000	7157 South Brighton Point Drive	Cottonwood Heights	1974	One-story contemporary-style single-family dwelling, with walls of brick. Notable alterations include the replacement of windows. No contributing outbuildings were observed.	EC NRHP Criterion A	
4	22253020340000	7337 South Brighton Point Drive	Cottonwood Heights	1975	One-story ranch-style single-family dwelling, with walls of poured concrete and brick. No notable alterations were observed. One non-contributing outbuilding was observed.	EC NRHP Criterion A	
5	22253020360000	7361 South Brighton Point Drive	Cottonwood Heights	1976	One-story ranch-style single-family dwelling, with walls of brick and stucco. Notable alterations include the application of stucco and the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	



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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
6	22253530000000; 22253530000000	7693-7661 South Avaldale Drive	Cottonwood Heights	1974	One-and-a-half story shed-style duplex, with walls of vertical wood siding and poured concrete. No notable alterations were observed. No outbuildings were observed.	EC NRHP Criterion A	 
7	22253530000000; 22253530000000	7693-7671 South Avaldale Drive	Cottonwood Heights	1974	One-and-a-half story shed-style duplex, clad with vertical wood siding. Notable alterations include the application of stucco. No outbuildings were observed.	EC NRHP Criterion A	 


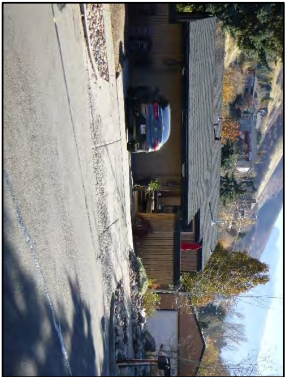

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC5	22253560190000	7885 South Avondale Drive	Cottonwood Heights	1972	Two-story split-level style single-family dwelling, clad with vinyl siding. Notable alterations include the replacement of windows and the application of vinyl siding. No outbuildings were observed.	NC	
8	22253560200000	7899 South Avondale Drive	Cottonwood Heights	1971	One-story contemporary-style single-family dwelling clad with vertical wood siding. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	
9	22253560210000	7709 South Avondale Drive	Cottonwood Heights	1972	One-story ranch-style single-family dwelling, clad with vertical wood siding. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	



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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRRP Eligibility*	Photographs
10	22253570020000; 22253570030000	7719-7721 South Avaldale Drive	Cottonwood Heights	1975	One-and-a-half-story contemporary-style duplex, with walls of brick. Notable alterations include the replacement of doors and windows. No outbuildings were observed.	EC NRRP Criterion A	
NC6	22253560230000	7731-7733 South Avaldale Drive	Cottonwood Heights	1975	Two-story late-twentieth-century other-style duplex, with walls of brick and stucco. Notable alterations include the addition of second stories over the garages. No outbuildings were observed.	NC	

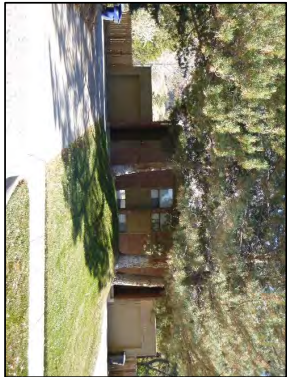

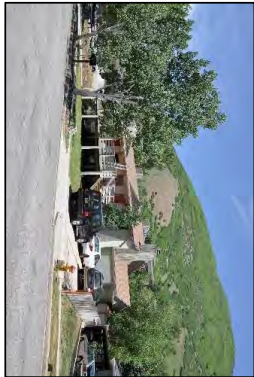
Selective Reconnaissance-Level Architectural Survey for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah

ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
11	22253980240000	7743-7745 South Avondale Drive	Cottonwood Heights	1975	One-and-a-half story contemporary-style duplex, with walls of brick. Notable alterations include the replacement of the front doors. No outbuildings were observed.	EC NRHP Criterion A	
12	22253980250000	3650 East Avondale Drive	Cottonwood Heights	1977	One-story contemporary-style single-family dwelling, clad with vertical wood siding. Notable alterations include the replacement of doors. One non-contributing outbuilding was observed.	EC NRHP Criterion A	
NC7	22253980350000	3615 East Bengal Boulevard	Cottonwood Heights	1977	Two-story contemporary-style duplex, clad with brick and stucco. Notable alterations include the replacement of garage doors, the addition of stucco, and the installation of vinyl railings. No outbuildings were observed.	NC	

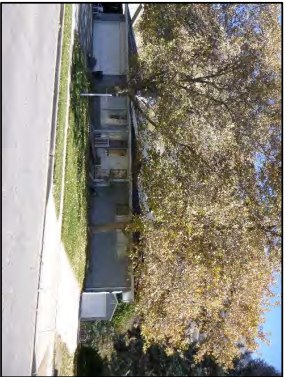


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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC8	22253590360000	3625-3629 East Bengal Boulevard	Cottonwood Heights	1973	Three-story contemporary-style duplex condominium, clad with Shevlin-type siding, stone veneer, stucco, and vinyl siding. Notable alterations include alterations of the cladding materials and the replacement of windows and doors. No outbuildings were observed.	NC	
	22253590370000						
13	22253590380000	3637 East Bengal Boulevard	Cottonwood Heights	1973	One-and-a-half-story contemporary-style single-family dwelling, clad with brick and wood boards. No significant alterations were observed. No outbuildings were observed.	EC NRHP Criterion A	
NC9	22253590390000	3647 East Bengal Boulevard	Cottonwood Heights	1975	One-and-a-half-story split-level-style single-family dwelling, clad with vinyl siding. Notable alterations include the application of vinyl siding. No outbuildings were observed.	NC	
14	22361030080000	3638-3648 East Bengal Boulevard	Cottonwood Heights	1977	Two-story late twentieth-century three-style duplex, clad with brick. Notable alterations include the replacement of some sliding glass doors. No outbuildings were observed.	EC NRHP Criterion A	





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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
15	22361030090000	7825-7827 South Honeycomb Road	Cottonwood Heights	1977	Two-story split-level-style duplex, clad with brick and diagonal wood siding. No notable alterations were observed. No outbuildings were observed.	EC NRHP Criterion A	
NC10	22361030110000	7835-7837 South Honeycomb Road	Cottonwood Heights	1977	Two-story late twentieth-century three-style duplex, clad with slump block and stucco. Notable alterations include the application of stucco siding. No outbuildings were observed.	NC	
16	22361030120000	7845 South Honeycomb Road	Cottonwood Heights	1976	One-and-a-half-story contemporary-style duplex, clad with brick and vertical wood siding. No notable alterations were observed, although garages may originally have been carports. No outbuildings were observed.	EC NRHP Criterion A	

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
17	22961030190000	7865 South Honeycomb Road	Cottonwood Heights	1977	One-story ranch-style single-family dwelling, clad with stucco. Notable alterations include the application of stucco to the exterior walls. No outbuildings were observed.	EC NRHP Criterion A	
18	22961030140000	7865 South Honeycomb Road	Cottonwood Heights	1972	One-story ranch-style single-family dwelling, clad with brick. Notable alterations include the replacement of the garage doors. No outbuildings were observed.	EC NRHP Criterion A	
NC11	22952790300000	8166 South Wasatch Boulevard	Cottonwood Heights	1965	One-and-a-half-story ranch-style single-family dwelling with walls of yellow brick. Notable alterations include the replacement of windows and the addition of an attached garage. No outbuildings were observed.	NC	

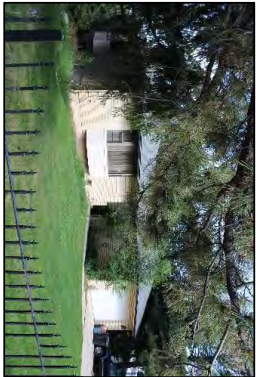


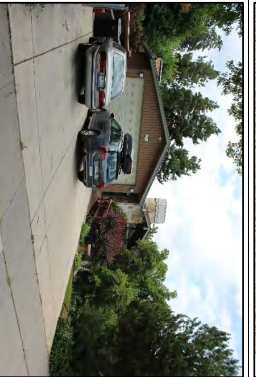
Selective Reconnaissance-Level Architectural Survey for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah

ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC12	22354300230000	8282 South Wasatch Boulevard	Cottonwood Heights	1944	One-and-a-half-story detached garage, with walls of concrete block and aluminum siding. Notable alterations include the replacement of the garage doors and the application of aluminum siding in the gable and ridged metal roofing. No outbuildings (or a primary building) were observed.	NC	
19	22354300040000	8286 South Wasatch Boulevard	Cottonwood Heights	1953	One-story early ranch-style single-family dwelling, clad with wood shingles and vertical board siding. No notable alterations were observed. Two contributing outbuildings (a freestanding garage and one shed) and two non-contributing structures (a carport and a basketball court) were observed.	EC NRHP Criterion A	
NC12	22354300720000	8304 South Wasatch Boulevard	Cottonwood Heights	1953	One-story early ranch-style single-family dwelling, clad with vinyl siding. Notable alterations include the replacement of windows, new siding, and a significant addition to the rear of the building. One contributing outbuilding, a garage, was observed.	NC	
20	22354310030000	3461 East Kings Hill Drive	Cottonwood Heights	1974	One-and-a-half-story split-level-style single-family dwelling, clad with brick and vertical wood siding. Notable alterations include the replacement of windows. One non-contributing outbuilding was observed.	EC NRHP Criterion A	

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
21	22354310040000	3475 East Kings Hill Drive	Cottonwood Heights	1971	One-and-a-half-story split-level-style single-family dwelling, clad with stone veneer and T-1-11 siding. Notable alterations include the replacement of windows, door, and garage door. No outbuildings were observed.	EC NRHP Criterion A	
NC14	22354310050000	3485 East Kings Hill Drive	Cottonwood Heights	1965	One-story ranch-style single-family dwelling, clad with vinyl siding and brick. Notable alterations include a front addition extending the length of the building, the addition of a garage, the replacement of windows, and the application of new siding. No outbuildings were observed.	NC	
NC15	22354310060000	3485 East Kings Hill Drive	Cottonwood Heights	1965	One-and-a-half-story ranch-style single-family dwelling, clad with brick. Notable alterations include the addition of a second story and the replacement of windows and doors. No outbuildings were observed.	NC	
NC16	22363010020000	3505 East Kings Hill Drive	Cottonwood Heights	1972	Two-story contemporary-style single-family dwelling, clad with brick and wood board siding. Notable alterations include the installation of bay windows, the Mansard roof, and the replacement of windows and doors. No outbuildings were observed.	NC	


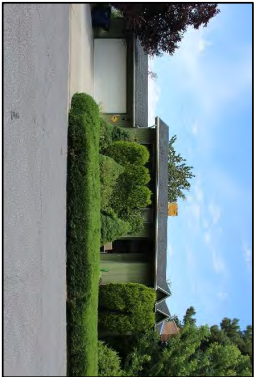

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
22	22954300270000	8342 South Wasatch Boulevard	Cottonwood Heights	1970	One-story ranch-style single-family dwelling, with walls of brick. Notable alterations include the replacement of windows and the garage door. No outbuildings were observed.	EC NRHP Criterion A	
NC17	22954330010000	3454 East Kings Hill Drive	Cottonwood Heights	1972	One-and-a-half-story split-level-style single-family dwelling, clad with vinyl siding and stone veneer. Notable alterations include the replacement of windows, the garage door, and the front door, and the application of aluminum siding and stone veneer. No outbuildings were observed.	NC	
NC18	22954330020000	3480 East Kings Hill Drive	Cottonwood Heights	1972	One-and-a-half-story split-level-style single-family dwelling, clad with brick and wood particle board. Notable alterations include the replacement of windows and the garage door. No outbuildings were observed.	NC	
23	22954320010000	3484 East Kings Hill Drive	Cottonwood Heights	1972	One-story contemporary-style single-family dwelling, clad with vinyl and T-1-1 siding. Notable alterations include the application of vinyl siding and the replacement of the garage door.	EC NRHP Criterion A	


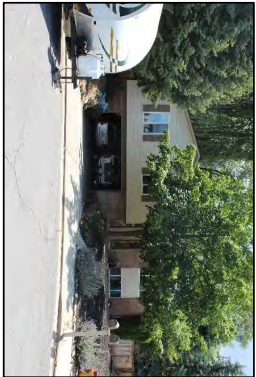

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC19	2235432020000	3482 East Kings Hill Drive	Cottonwood Heights	1972	One-story contemporary-type single-family dwelling, clad with vinyl siding. Notable alterations include the replacement of windows and the garage door, and the application of vinyl siding. No outbuildings were observed.	NC	
NC20	22363510010000	3510 East Kings Hill Drive	Cottonwood Heights	1971	One-story contemporary-type single-family dwelling, clad with stucco siding. Notable alterations include the replacement of windows and the garage door, and the application of stucco siding. No outbuildings were observed.	NC	
NC21	22354330140000	8376 South Dynasty Way	Cottonwood Heights	1949	One-story Minimal Traditional-style, single-family dwelling, clad with aluminum siding and stucco. Notable alterations include the replacement of windows, the addition of oak windows, alterations to the roofline, and the application of new siding. One non-contributing shed was observed.	NC	
24	22363540020000	8530 South Kings Cove Drive	Cottonwood Heights	1968	One-story contemporary-style single-family dwelling, clad with rock-faced brick and vinyl siding. Notable alterations include the replacement of windows and doors and the application of vinyl siding under the gable of the garage. No outbuildings were observed.	EC NRHP Criterion A	

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
25	22363540030000	8542 South Kings Cove Drive	Cottonwood Heights	1971	One-and-a-half-story split-level-style single-family dwelling. clad with T1-11 siding and stone veneer. Notable alterations include the replacement of windows and door. No outbuildings were observed.	EC NRHP Criterion A	
NC22	22363540040000	8552 South Kings Cove Drive	Cottonwood Heights	1971	One-and-a-half-story split-level-style single-family dwelling. clad with T1-11 siding. Notable alterations include the replacement of windows and door. No outbuildings were observed.	NC	
26	22354780063000	8556-8568 South Wasatch Boulevard	Cottonwood Heights	1977	Two-story, American vernacular-style duplex with a complex roof form. clad with brick and vertical wood siding. No notable alterations were observed. No outbuildings were observed.	EC NRHP Criterion A	
27	22354780070000	8572-8574 South Wasatch Boulevard	Cottonwood Heights	1977	Two-story, American vernacular-style duplex with a complex roof form. clad with brick, stucco, and faux half-timbering. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	


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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC23	22363540360000	8566 South Krags Cove Drive	Cottonwood Heights	1973	One-and-a-half-story split-level-style single-family dwelling, clad with stone veneer and stucco. Notable alterations include the replacement of windows and door, the application of new siding, and changes to landscaping. No outbuildings were observed.	NC	
NC24	22363540070000	8565 South Krags Cove Drive	Cottonwood Heights	1977	One-and-a-half-story split-level-style single-family dwelling, clad with brick and metal siding. Notable alterations include the replacement of windows and door and the application of new siding. No outbuildings were observed.	NC	
28	28011010010000	8680 South Aspen Circle	Cottonwood Heights	1974	One-and-a-half-story split-level-style single-family dwelling, clad with brick and vertical wood siding. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	
NC25	28022280010000	8635 South Russell Park Road	Cottonwood Heights	1977	One-story contemporary-style single-family dwelling, clad with vinyl siding and stone veneer. Notable alterations include the replacement of all windows and doors, the addition of modern siding, and a large addition to the rear. One non-contributing outbuilding was observed.	NC	


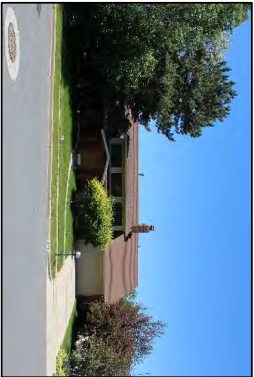
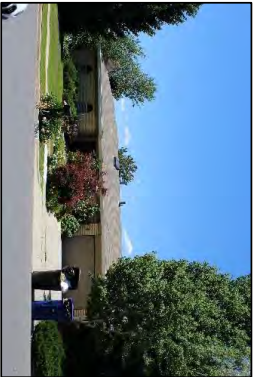
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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
29	2801101020000	8862 South Alpin Circle	Cottonwood Heights	1974	One-and-a-half-story split-level-style single-family dwelling, clad with vertical wood siding. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	
30	2801101030000	8864 South Alpin Circle	Cottonwood Heights	1975	One-story contemporary-style single-family dwelling, clad with stone veneer and vertical wood siding. No notable alterations were observed. No outbuildings were observed.	EC NRHP Criterion A	
31	2802228000000	8659 South Grand Oak Drive	Cottonwood Heights	1973	One-and-a-half-story contemporary-style single-family dwelling, clad with stone veneer and vertical wood siding. Notable alterations include the replacement of windows and doors. No outbuildings were observed.	EC NRHP Criterion A	

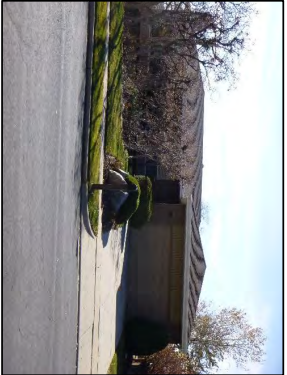

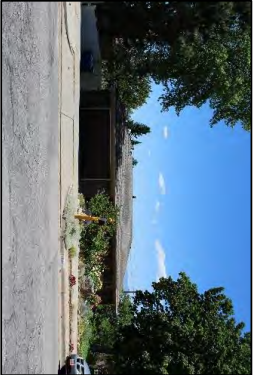
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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
32	28011040010000	8672 South Alpen Circle	Cottonwood Heights	1976	One-and-a-half story split-level-style single-family dwelling, clad with brick, vertical wood siding, and stone veneer. No notable alterations were observed. No outbuildings were observed.	EC NRHP Criterion A	
NC28	28022280040000	8673 South Grand Oak Drive	Cottonwood Heights	1972	One-story ranch-style single-family dwelling, clad with stone veneer and stucco. Notable alterations include the addition of modern stone veneer and stucco; the alteration of window sizes; the replacement of windows. No outbuildings were observed.	NC	




Selective Reconnaissance-Level Architectural Survey for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah

ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC27	2801104020000	8882 South Alpen Circle	Cottonwood Heights	1976	One-and-a-half-story split-level-style single-family dwelling, clad with stone veneer and stucco. Notable alterations include the application of exterior cladding and the replacement of windows. One non-contributing outbuilding was observed.	NC	
NC28	2801104060000	8730 South Alpen Way	Cottonwood Heights	1968	One-and-a-half-story ranch-style single-family dwelling, clad with brick and aluminum siding. Notable alterations include the replacement of windows and doors, and the addition of a second story and possibly the garage. No outbuildings were observed.	NC	
33	2801104007000	8742 South Alpen Way	Cottonwood Heights	1970	One-story ranch-style single-family dwelling, clad with brick. Notable alterations include the replacement of windows and doors. No outbuildings were observed.	EC NRHP Criterion A	

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
34	28011040080000	8754 South Alpen Way	Cottonwood Heights	1970	One-story ranch-style single-family dwelling, clad with brick and vertical wood siding. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	
35	28011040090000	3575 East Golden Hills Avenue	Cottonwood Heights	1968	One-story ranch-style single-family dwelling, clad with vertical wood siding. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	
36	28011580020000	8820 South Alpen Way	Cottonwood Heights	1976	One-story ranch-style single-family dwelling, clad with brick and plywood panels. Notable alterations include the replacement of windows and doors. No outbuildings were observed.	EC NRHP Criterion A	

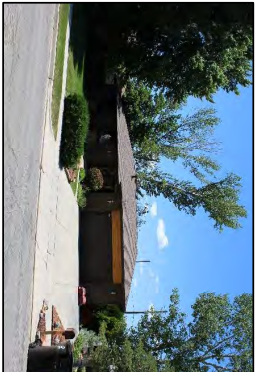
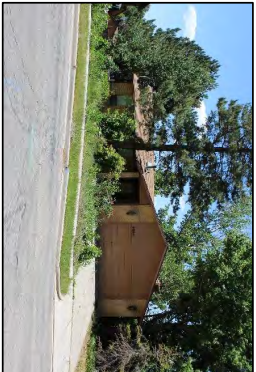
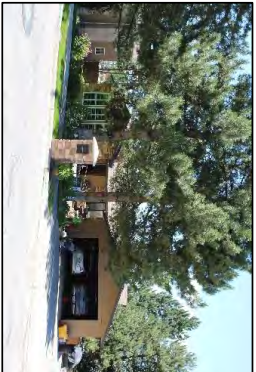
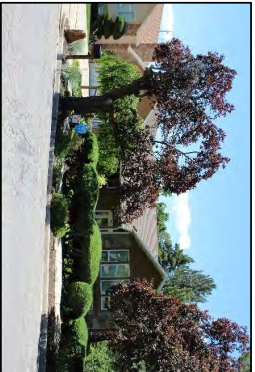
Selective Reconnaissance-Level Architectural Survey for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah

ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
37	28011580030000	8816 South Alpen Way	Cottonwood Heights	1975	One-story ranch-style single-family dwelling, clad with brick. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	  
NC29	28011580040000	8828 South Alpen Way	Cottonwood Heights	1972	One-story ranch-style single-family dwelling, clad with brick, vertical wood siding, and stucco. Notable alterations include the replacement of windows and the addition of a front-gable cross-wing. No outbuildings were observed.	NC	




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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
38	28011580050000	8840 South Alpin Way	Cottonwood Heights	1975	One-story contemporary-style single-family dwelling, clad with brick and vertical wood siding. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	
39	28011580060000	8852 South Alpin Way	Cottonwood Heights	1972	One-story ranch-style single-family dwelling, clad with stacked brick. Notable alterations include the replacement of doors and windows. No outbuildings were observed.	EC NRHP Criterion A	
40	28011580070000	8864 South Alpin Way	Cottonwood Heights	1971	One-story, ranch-style single-family dwelling, clad with brick. Notable alterations include the replacement of windows and doors. No outbuildings were observed.	EC NRHP Criterion A	
							

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
41	28011580090000	8884 South Alpen Way	Cottonwood Heights	1976	One-story ranch-style single-family dwelling. clad with brick, stone veneer, and shiplap siding. Notable alterations include the application of modern siding. No outbuildings were observed.	EC NRHP Criterion A	
42	28011580100000	8884 South Alpen Way	Cottonwood Heights	1976	One-story contemporary-style single-family dwelling clad with brick and diagonal wood siding. No notable alterations were observed. No outbuildings were observed.	EC NRHP Criterion A	
NC30	28011580110000	8905 South Alpen Way	Cottonwood Heights	1976	One-story contemporary-style single-family dwelling clad with stone veneer and stucco. Notable alterations include the replacement of the siding and windows. No outbuildings were observed.	NC	
NC31	28011580120000	8918 South Alpen Way	Cottonwood Heights	1977	One-and-a-half-story split-level-style single-family dwelling. clad with stone veneer and stucco. Notable alterations include changes to the roofline, the replacement of windows and doors, and the application of exterior wall cladding. No outbuildings were observed.	NC	





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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC32	28011580130000	8328 South Alpin Way	Cottonwood Heights	1977	One-and-a-half-story split-level-style single-family dwelling. clad with stucco and brick. Notable alterations include the replacement of windows and doors and the application of new exterior stucco; the front-gable porch may also be a modern addition. One non-contributing outbuilding was observed.	NC	
43	28011580140000	8940 South Alpin Way	Cottonwood Heights	1976	Two-story American vernacular-style single-family dwelling, clad with vertical wood siding and stone veneer. No notable alterations were observed. No outbuilding were observed.	EC NRHP Criterion A	
44	28011580150000	8950 South Alpin Way	Cottonwood Heights	1976	One-and-a-half-story contemporary-style single-family dwelling, clad with stone veneer and vertical wood siding. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	





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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
45	28011580160000	8982 South Alpen Way	Cottonwood Heights	1976	One-and-a-half-story contemporary-style single-family dwelling clad with stone veneer and vertical wood siding. Notable alterations include the replacement of some windows and doors. No outbuildings were observed.	EC NRHP Criterion A	
NC33	28011580170000	8974 South Alpen Way	Cottonwood Heights	1976	One-and-a-half-story split-level-style single-family dwelling, clad with brick and stucco. Notable alterations include the replacement of windows and the application of stucco; the roofline may also have been altered. No outbuildings were observed.	NC	
NC34	28013010060000	3573 East Green Hills Drive	Cottonwood Heights	1972	One-and-a-half-story split-level-style single-family dwelling, clad with brick and plywood. Notable alterations include the replacement of windows and garage door. No outbuildings were observed.	NC	
46	28013050010000; 28013050020000	9008-9016 South 3605 East	Cottonwood Heights	1976	Two-story late twentieth-century three-story duplex condominium, clad with wood boards and brick. Part of a condominium complex known as Canyon Place. Alterations consist of minor changes such as the replacement of windows and garage doors. No outbuildings were observed.	EC NRHP Criterion A	

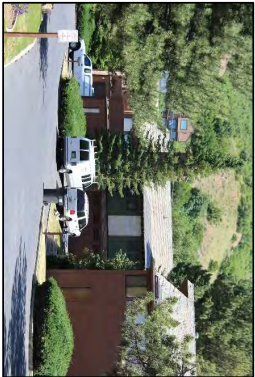
Selective Reconnaissance-Level Architectural Survey for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah

ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
47	2801305030000; 2801305040000	9016-9024 South 3605 East	Cottonwood Heights	1976	Two-story (late twentieth-century) other-style duplex condominium, clad with wood boards and brick. Part of a condominium complex known as Canyon Place. Alterations consist of minor changes such as the replacement of windows and garage doors. No outbuildings were observed.	EC NRHP Criterion A	
49	2801305017000; 2801305018000	9005-9009 South 3605 East	Cottonwood Heights	1976	Two-story (late twentieth-century) other-style duplex condominium, clad with wood boards and brick. Part of a condominium complex known as Canyon Place. No outbuildings were observed.	EC NRHP Criterion A	
49	2801305019000; 2801305020000	9015-9019 South 3605 East	Cottonwood Heights	1976	Two-story (late twentieth-century) other-style duplex condominium, clad with wood boards and brick. Part of a condominium complex known as Canyon Place. Alterations consist of minor changes such as the replacement of windows and doors. No outbuildings were observed.	EC NRHP Criterion A	
50	2801305021000; 2801305022000	9025-9029 South 3605 East	Cottonwood Heights	1976	Two-story (late twentieth-century) other-style duplex condominium, clad with wood boards and brick. Part of a condominium complex known as Canyon Place. Alterations consist of minor changes such as the replacement of windows and garage doors. No outbuildings were observed.	EC NRHP Criterion A	

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
51	28013050230000; 28013050240000	9035-9039 South 3605 East	Cottonwood Heights	1976	Two-story (late twentieth-century) other-style duplex condominium, clad with wood boards and brick. Part of a condominium complex known as Canyon Place. Alterations consist of minor changes such as the replacement of windows and garage doors. No outbuildings were observed.	EC NRHP Criterion A	
52	28013050250000; 28013050260000	9041-9043 South 3605 East	Cottonwood Heights	1976	Two-story (late twentieth-century) other-style duplex condominium, clad with wood boards and brick. Part of a condominium complex known as Canyon Place. Alterations consist of minor changes such as the replacement of windows and garage doors. No outbuildings were observed.	EC NRHP Criterion A	
53	28013050280000; 28013050100000	3590-3596 East 9050 South	Cottonwood Heights	1976	Two-story (late twentieth-century) other-style duplex condominium, clad with wood boards and brick. Part of a condominium complex known as Canyon Place. Alterations consist of minor changes such as the replacement of windows and garage doors. No outbuildings were observed.	EC NRHP Criterion A	
54	28013050110000; 28013050120000	3598-3602 East 9050 South	Cottonwood Heights	1976	Two-story (late twentieth-century) other-style duplex condominium, clad with wood boards and brick. Part of a condominium complex known as Canyon Place. The stone veneer and board and batten siding are alterations. No outbuildings were observed.	EC NRHP Criterion A	





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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
55	28013050130000	3604-3606 East 9050 South	Cottonwood Heights	1976	Two-story (late twentieth-century) three-story duplex condominium, clad with wood boards and brick. Part of a condominium complex known as Canyon Place. Alterations consist of minor changes such as the replacement of windows and garage doors. No outbuildings were observed.	EC NRHP Criterion A	
	28013050140000						
NC35	28013040030000	9043 South Despain Way	Cottonwood Heights	1971	One-story ranch-style single-family dwelling, clad with brick and T-11 siding. Notable alterations include the replacement of windows and door and the application of T-11 siding. No outbuildings were observed.	NC	
	28013040040000						
56	28013040040000	9057 South Despain Way	Cottonwood Heights	1974	One-and-a-half-story split-level-style single-family dwelling, clad with brick, aluminum siding, T-11 siding, and stone veneer. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	
	28013040050000						
57	28013040050000	9067 South Despain Way	Cottonwood Heights	1974	One-story contemporary-type single-family dwelling, clad with brick and board-and-batten siding. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	
	28013040060000						



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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
58	28013040060000	9075 South Despain Way	Cottonwood Heights	1974	One-and-a-half-story split-level-style single-family dwelling. clad with brick and T1-11 siding. No alterations were observed. No outbuildings were observed.	EC NRHP Criterion A	
59	28013060050000	9046 South Kings Hill Place	Cottonwood Heights	1977	One-story ranch-style single-family dwelling. clad with brick, vertical board siding, and stone veneer. No notable alterations were observed. No outbuildings were observed.	EC NRHP Criterion A	
NC36	28013060060000	9060 South Kings Hill Place	Cottonwood Heights	1977	One-story contemporary-style single-family dwelling. clad with brick, stone veneer, and stucco. Notable alterations include the application of stone veneer to the exterior and the replacement of windows. No outbuildings were observed.	NC	

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
60	28913080080000	9086 South Kings Hill Place	Cottonwood Heights	1978	One-story contemporary-style single-family dwelling, clad with brick. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP- Criterion A	
64	289121010070000	9338 South North Little Cottonwood Road	Cottonwood Heights	1908	One-and-a-half-story side-passage type single family dwelling exhibiting characteristics of the Victorian Eclectic-style. The dwelling is rectangular in plan with a complex hip with cross gable roof. The exterior walls are cream colored brick. The principal elevation features a partial-width entry porch supported on classical columns. Notable alterations include replacement of windows and replaced or reconstructed porch on the west elevation. No outbuildings were observed.	ES NRHP- Criteria A and C	
61	289121760150000	3742 East North Little Cottonwood Road	Cottonwood Heights	1898	One-and-a-half-story Victorian Eclectic-style single-family dwelling, clad with brick. Notable alterations include the replacement of windows and a rear addition. One non-contributing outbuilding was observed.	ES NRHP- Criteria A and C	
NC37	289121270020000	3744 E North Little Cottonwood Road	Cottonwood Heights	1975	One-and-a-half-story ranch-style single-family dwelling, clad with stone veneer, wood shingles, and wood weatherboard. Notable alterations include the addition of a second story, the application of new siding, and the replacement of windows. No outbuildings were observed.	NC	

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
62	29073000010000	4306 Little Cottonwood Road	Sandy	1947	One-story early ranch-style single family dwelling, clad with wood clapboard siding. Notable alterations include the replacement of the front door and the replacement of deck railings. One contributing outbuilding was observed.	EC NRHP Criterion A	
63	29073000060000	4700 East Little Cottonwood Road	Sandy	1934	Historic marker—Temple Granite Quarry Historical Marker—at a park. Marker is granite with a bronze plaque.	EC NRHP Criterion A	



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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
64	2907300080000; 29073000110000	4526 East Little Cottonwood Road	Sandy	1930	One-story twentieth-century other-style hydroelectric energy facility (Whitmore Power Plant); consists of formed concrete. Notable alterations include missing windows and doors. Five contributing structures (a peristock, a pipeline, two dams, and a turnout) were observed.	EC NRHP Criteria A and C	 
NC38	29074270070000	4883 East Wasatch Resort Road	Sandy	1945	One-story shed-style single-family dwelling clad with corrugated metal. Notable alterations include the replacement of the siding and the extension of the roof to the east. Three non-contributing outbuildings were observed.	NC	

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC39	29074270010000	4821 East Granite Cliffs Road	Sandy	1926	One-story, house-type single-family dwelling, clad with vertical and horizontal wood siding. Notable alterations include the replacement of the siding and windows, a probable rear addition, and possible changes to the roofline. Two contributing resources (a garage and a studio) were observed.	NC	




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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRRP Eligibility*	Photographs
65	29074270180000	4945 East Granite Cliffs Road	Sandy	1975	One-and-a-half-story single-family dwelling clad with wood shingles. Noble alterations include the possible replacement of windows. No outbuildings were observed.	EC NRRP- Criterion A	
NC40	29074270170000	4987 Granite Cliffs Road	Sandy	1925	One-story Colonial Revival-style single-family dwelling clad with wood shingles. Visibility was poor, but a lane addition was visible above and behind the original house. No notable alterations were observed. One contributing outbuilding, a garage, was observed.	NC	


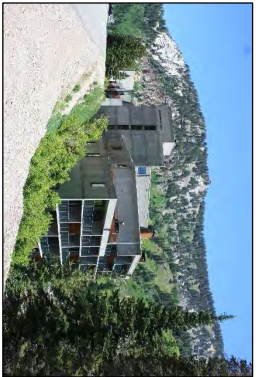
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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
66	29074270030000	5002 East Little Cottonwood Road	Sandy	1936	One-and-a-half-story Tudor-style single-family dwelling, clad with wood shingles and stone veneer. Notable alterations include the replacement of doors and windows, and the addition of a garage. One non-contributing log-sided outbuilding was observed.	EC NRHP Criterion A	  


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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC41	290742702000001	5070 East Granite Cliffs Road	Sandy	1930	Two-story single-family dwelling with no style, but it features elements of Period Revival and ranch styles, clad in clapboard siding and stone veneer. No notable alterations were observed. One contributing outbuilding (a garage) was observed.	NC	
NC42	29113000010000	Tanners Flat Campground 77490 Little Cottonwood Canyon Road	Sandy	Ca. 1980	One-story Park Service Modern-style tollbooth, clad with vertical wood siding, and other campground features like roads, trails, tent pads, picnic tables, fire rings, outhouses, and an amphitheater. Notable alterations include modern campsite amenities (tent pads, picnic tables, outhouses, and amphitheater) and paving of roads.	NC	 

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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
67	2901478020000	9111 East Little Cottonwood Canyon Road	Sandy	1970	Two-story Organic-style single dwelling built of formed concrete and horizontal wood siding. No alterations were observed. No outbuildings were observed.	ES NRHP Criteria A and C	
68	2901478001000	9121 East Spauldard Center Drive	Sandy	1976	Five-story Brutalist-style timeshare/condominium, the Iron Blossom Lodge, built of formed concrete. No notable alterations were observed. No outbuildings were observed.	ES NRHP Criteria A and C	

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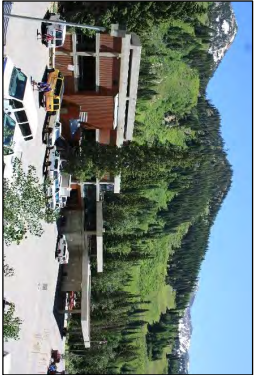
ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
69	2901477005000	9180 East Lodge Drive	Sandy	1967	Two-story Brutalist-style condominium with walls of formed concrete and vertical wood siding. Visibility was poor, so it is unclear if there have been any alterations. No outbuildings were observed.	EC NRHP Criteria A and C	

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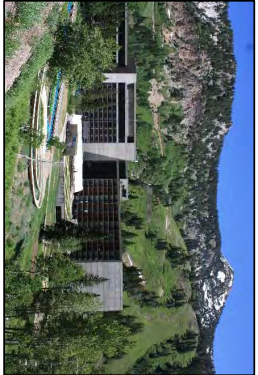


ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
70	290147900100004	9222 East Lodge Drive	Sandy	1971	Seven-story Brutalist-style hotel/condominium. The Inn at Snowbird, with walls of formed concrete and vertical wood siding. No alterations were observed. No outbuildings were observed.	EC NRHP- Criteria A and C	







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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
71	3006320800001	9280 East Lodge Drive	Sandy	1970	Seven-story Brutalist-style hotel/condominium. The Lodge at Snowbird; walls are made of poured concrete and sections of vertical board siding. No notable alterations were observed. No outbuildings were observed.	ES NRHP Criteria A and C	
72	300637601220001	9385 South Snowbird Center Drive	Sandy	Ca. 1977	Three-story Brutalist-style Commercial (Gen.) and Recreation/Culture building, Snowbird Center, with walls of formed concrete and vertical wood siding. No alterations were observed. One contributing outbuilding was observed.	ES NRHP Criteria A and C	


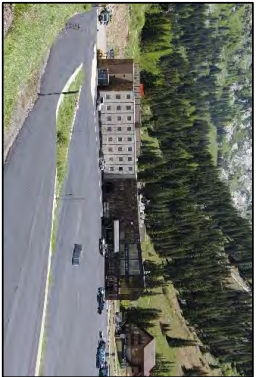

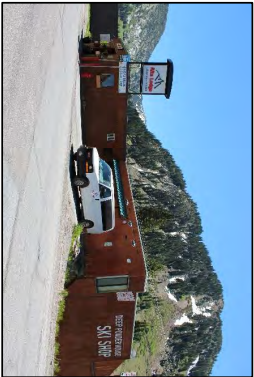
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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
73	300645289200001	9320 South Cliff Lodge Drive	Alta	1974	Eight-story Brutalist-style hotel/condominium. The Cliff Lodge. Walls are made of poured concrete. Only the west wing dates to 1974. Notable alterations consist of large additions to the east and window replacement. No outbuildings were observed.	ES NRHP Criteria A and C	
74	300637892100001	9426 East Bypass Road	Alta	Ca. 1975	Three-story Brutalist-style apartment/condominium. Walls are made of poured concrete and sections of wood board. No notable alterations were observed. No outbuildings were observed.	EC NRHP Criteria A and C	
75	300625200100001	9650 East Little Cottonwood Road	Alta	1970	Three-and-a-half-story shed-style condominium unit, Hellgate Condominiums; walls are made of vertical board siding and partially clad with standing seam metal. Notable alterations include the addition of a new wing with precast concrete panels and steel framing. One contributing outbuilding (a garage) was observed.	EC NRHP Criteria A	




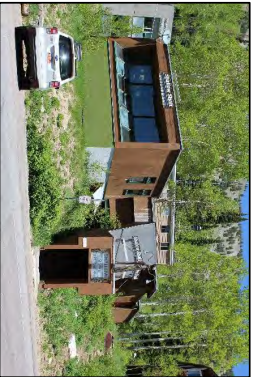
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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
76	3006253001000004	9670 East Little Cottonwood Road	Alta	1970	Three-and-a-half-story shed-style condominium unit. Heli-gate Condominiums; walls are clad with wood shingles and vertical board siding. No notable alterations were observed other than several covered walkways. One contributing outbuilding, a garage, was observed.	EC NRHP Criterion A	
77	30051540070000	9920 East Peruvian Acres Road	Alta	1978	One-and-a-half-story, side-gabled, vernacular-style single-family dwelling with rustic stylistic elements, with walls made of stacked logs. No notable alterations were observed. No outbuildings were observed.	EC NRHP Criterion A	
78	30051540040000	9391 East Peruvian Acres Road	Alta	1978	Two-and-a-half-story, vernacular (chalet-style) single-family dwelling, with a cross-gabled roof and rustic stylistic elements, clad with wood board siding and stucco. No notable alterations were observed other than the replacement of doors and windows. No outbuildings were observed.	EC NRHP Criterion A	
79	30051540130000	10000 East Little Cottonwood Road	Alta	1945	Three-story symmetrical mansard-style hotel, the Alta Peruvian Lodge; walls are clad with Shevlin-type siding. Notable alterations include the replacement of windows and a one-story addition on the facade. One contributing outbuilding (a garage) was observed.	ES NRHP Criteria A and C	



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ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
80	30051010010000S	710161 East Little Cottonwood Road	Alta	1965	One-story contemporary-style single-family dwelling, clad with Shewlin-type siding with a basement level of concrete block. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	
81	30051780020000	10160 East Little Cottonwood Road	Alta	1960	The Goddiner's Daughter is a three-story, Late 20th Century, Other style, hotel, medical center, and elementary school. The exterior walls are clad with formed concrete and sections of stone veneer and pebbled concrete panels. Notable alterations include glass-walled additions on the south side. No contributing outbuildings were observed.	EC NRHP Criterion A	
NC43	30051780030000	10220 East Little Cottonwood Road	Alta	1968	Three-story vernacular ski shop/commercial building with Bradist-style elements; walls are clad with vertical wood slating. The wood slating and glazed, shed-roofed ingate appear to be additions. No outbuildings were observed.	NC	 

Selective Reconnaissance-Level Architectural Survey for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah

ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
82	30051780040000	10230 East Little Cottonwood Road	Alta	1939	Three-story, mixed-style (cross-gabled ski chalet and International style) hotel and restaurant, the Alta Lodge; walls are clad with metal panels, vertical wood siding, and wood shingles; International style lodges that contribute to the significance of the building were designed by renowned local architect John Slogden. These were completed in 1959, 1965, and 1985. Two non-contributing outbuildings (shed-roofed structures and walkways) were observed.	ES NRHP Criteria A and C	 
83	30051280020000	10231 East Little Cottonwood Road	Alta	1968	Two separate buildings: it is unclear which is the primary building. The first building is the one-story Shallow Shaft restaurant with modern stylistic elements. Notable alterations include the replacement of doors and windows. The second building is a two-story, shed-style single-family dwelling, with vertical board siding. Notable alterations include the replacement of windows. No outbuildings were observed.	EC NRHP Criterion A	 

Selective Reconnaissance-Level Architectural Survey for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah

ID No.	Current Parcel Number	Street Address	City	Year Built	Property Description	UDSH Rating and NRHP Eligibility*	Photographs
NC44	30052510050000	10380 East Little Cottonwood Road	Alta	1973	Five-story Brutalist-style hotel, the Rusler Lodge, walls are poured concrete with applied stucco, vertical wood siding, and shingle wood siding. Notable alterations include the construction of an entirely new primary portion of the building leaving only limited portions of the 1970s-era building to the west. One contributing outbuilding, likely a power building, was observed.	NC	
NC45	300520100120001 \$	710489 East Little Cottonwood Road	Alta	Ca. 1918	One-story building enclosing an old mine shaft, the Bay City Tunnel, walls are made of random-coursed granite and poured concrete. Notable alterations include the construction of the building to enclose the mine tunnel. One contributing outbuilding, likely an explosives storage bunker, was observed.	NC	

EC = eligible/contributing; ES = eligible/significant; NC = ineligible/non-contributing.

* Photograph obtained from the Salt Lake County Assessor's website.

† Parcel number is estimated from the Salt Lake County Assessor's website. It was unclear what parcel number is associated with the structure because the Assessor's data noted there were no structures on this or adjacent parcels or were large condominium buildings with numerous units. For large the condominium buildings with numerous units parcel numbers, the common space owners association parcel number is used.

\$ The parcel area is also referenced as 425US890 in the archaeological inventory (sheet 2025a) as a previously documented site within 0.5 mile of the study area. The site is outside the study area and was not revisited for the inventory; however, the parcel on which the resource is located falls within the study area and thus is recorded in the architecture survey.

APPENDIX 15B

Determinations of Eligibility and Findings of Effect



State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

TERIANNE S. NEWELL, P.E.
Deputy Director of Planning and Investment

LISA J. WILSON, P.E.
Deputy Director of Engineering and Operations

May 7, 2021

Mr. Chris Hansen
Historic Preservation Specialist
Utah Division of State History
300 Rio Grande
Salt Lake City, UT 84101-1182

RE: UDOT Project No. S-R299(281)0; Little Cottonwood Canyon EIS, Salt Lake County, Utah (PIN 16092)
Determination of Eligibility and Finding of Adverse Effect.

Dear Mr. Hansen:

The Utah Department of Transportation (UDOT) in conjunction with the United States Forest Service, Uinta-Wasatch-Cache National Forest (USFS), is preparing to undertake the subject federal-aid project. In accordance with Parts 3.1.1 and 3.2 of the *Memorandum of Understanding Between the Federal Highway Administration and the Utah Department of Transportation Concerning State of Utah's Participation in the Surface Transportation Project Delivery Program Pursuant to 23 USC §327* (executed January 17, 2017), the UDOT assumes responsibility, assigned by the Federal Highway Administration (FHWA), for ensuring compliance with Section 106 of the NHPA and with Section 4(f) of the DOT Act of 1966, as amended. Also in accordance with the *Third Amended Programmatic Agreement among the FHWA, the Utah State Historic Preservation Officer, the Advisory Council on Historic Preservation, the USACE Sacramento District, and the UDOT Regarding Section 106 Implementation for Federal-Aid Transportation Projects in the State of Utah* (executed August 23, 2017), Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 300101 et seq.), and U.C.A.9-8-404, the UDOT has taken into account the effects of this undertaking on historic properties, and is affording the Utah State Historic Preservation Officer (SHPO) an opportunity to comment on the undertaking. Additionally, this submission is in compliance with Section 4(f) of the Department of Transportation Act of 1966, 23 U.S.C. § 138 (as amended) and 49 U.S.C. § 303 (as amended).

PROJECT DESCRIPTION

The Utah Department of Transportation (UDOT) began an Environmental Impact Statement (EIS) in the spring of 2018 for Little Cottonwood Canyon and Wasatch Boulevard in partnership with Utah Transit Authority and the USDA Forest Service. The purpose of the EIS is to provide an integrated transportation system that improves the reliability, mobility, and safety for all users on SR-210 from Fort Union Boulevard through the town of Alta. UDOT has developed five action alternatives to meet the purpose and need for this project: Enhanced Bus Service Alternative (EBS), Enhanced Bus Service in Peak-period Shoulder Lanes Alternative (PPSL), Gondola Alternative A (GA), Gondola Alternative B (GB) and Cog Rail (COG). Additional information on the alternatives can be found at www.littlecottonwoodeis.udot.utah.gov/draft-alternatives.

Each action alternative includes the following items: widening of Wasatch Blvd, two mobility hubs, avalanche mitigation, changes to trailhead parking and no winter roadside parking (See attached Fact Sheet). There are two options for widening along Wasatch Blvd. which are discussed separately. The Imbalanced Lane Alternative (WIL)

would widen Wasatch Blvd. where necessary to between 3 to 5 lanes to achieve an improved level of service but with an inconsistent roadway corridor. The Five Lane Alternative (W5L) would add one additional travel lane in each direction and roundabout intersections at three cross-streets. Each action alternative requires passengers to park at a mobility hub and then board a bus that will transport them to the destination resorts or a gondola or rail terminal. The mobility hubs are located at 6200 S Wasatch Blvd. and 9400 S Highland Dr. and both include construction of a parking structure. In the EBS, PPSL, and GA Alternatives the 6200S Wasatch Blvd. mobility hub would provide 1,500 parking spaces in a structure 3-4 stories tall. The 9400 S Highland Dr. mobility hub would provide 1,000 parking spaces in a structure that is 3 stories tall. In the GB and COG Alternatives parking at the mobility hubs would be reduced due to additional spaces at the terminal and therefore the 6200 S Wasatch Blvd. mobility hub would provide 600 parking spaces in a structure 2-3 stories tall and the 9400 S Highland Dr. mobility hub would provide 400 parking spaces in a structure 2 stories tall.

Additional information on the alternatives can be found at www.littlecottonwoodeis.udot.utah.gov/draft-alternatives.

Enhanced Bus Service Alternative (EBS)

The Enhanced Bus Service Alternative includes frequent bus service from two mobility hubs (the gravel pit and 9400 South/Highland Drive), improvements to Wasatch Boulevard, avalanche mitigation, improvements to trailheads, and no winter parking.

Enhanced Bus Service in Peak-period Shoulder Lanes Alternative (PPSL)

The Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative. The only difference between the alternatives is that this alternative includes widening SR-210 from North Little Cottonwood Road to the Alta Bypass Road to add peak-period shoulder lanes.

Gondola Alternative A Alternative (GA)

Gondola Alternative A would include a gondola alignment from the intersection of SR-209/SR-210 to both the Snowbird and Alta ski resorts. The gondola facility will include a terminal station at the existing park-and-ride lot on the north side of SR-210 at the entrance of Little Cottonwood Canyon, an angle station west of the Tanners Flat Campground (no additional ground disturbance), 20 towers varying in height from 130 to 230 feet in height, and base stations at the Snowbird and Alta ski areas. The alternative would include frequent bus service from two mobility hubs to the gondola base station, improvements to Wasatch Boulevard, snow sheds, improvements to trailheads, and no winter parking.

Gondola Alternative B Alternative (GB)

Gondola Alternative B would be similar to Gondola Alternative A, but the terminal station would be located at a proposed development south of North Little Cottonwood Road near the La Caille restaurant, about 0.75 mile northwest of the intersection of S.R. 209 and S.R. 210. An additional segment of the gondola alignment would run for about 0.75 mile from the base station to the Little Cottonwood Canyon park-and-ride lot. Additional items in this alternative include a 1,500-stall parking structure at the terminal station, travel lanes from Wasatch Blvd. to the termination station, and a new trail segment to connect to the trails on Wasatch Blvd. and Fort Union Blvd.

Cog Rail Alternative (COG)

The Cog Rail Alternative would start at a terminal station located at a proposed development south of North Little Cottonwood Road near the La Caille restaurant, about 0.75 mile northwest of the intersection of S.R. 209 and S.R. 210, and would travel on the north side of S.R. 210 to both the Snowbird and Alta ski resorts. The rail alignment would include reconfiguration of the parking lots at the Little Cottonwood Canyon park and ride lot, Grit Mill trailhead, Gate Buttress trailhead, and Lisa Falls trailhead; and construction of an additional snow shed between the Snowbird and Alta ski areas. The alternative would include frequent bus service from two mobility hubs to the cog rail base station, improvements to Wasatch Boulevard, snow sheds, improvements to trailheads, and no winter parking.

AREA OF POTENTIAL EFFECT AND SURVEYS

The area of potential affects (APE) includes the proposed footprint of all active alternatives as well as all adjoining parcels. The APE is approximately 11 miles long and will extend 0.25mi to either side of the existing SR-210

centerline for a total of 791 ac. A study area (or physical impacts APE) was defined within the APE to delineate the area that was subject to archaeological inventory and extends 100 feet either side of the SR-210 centerline. This project also includes an APE for associated (visual) effects which includes the visual environment within Little Cottonwood Canyon and those areas within the viewshed of the Project.

This area has potential for cultural resources to be present due to its proximity to several mountain drainages, historic mining areas and development to the ski industry in Little Cottonwood Canyon. However, the APE has also experienced extensive ground disturbance from previous road construction and mine remediation activities.

An intensive-level archaeological inventory and a selective reconnaissance-level survey for historic architecture were performed for an area 100 feet either side of the project centerline, as well as adjacent project areas. The APE has been surveyed by SWCA, under State Antiquities Project Number U18ST218, and the complete results are reported in *Class III Archaeological Inventory for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah* (see enclosed report). An intensive level pedestrian survey was conducted using 15 meter transects to identify archaeological resources as terrain allowed. A selective reconnaissance level survey was conducted to record architectural properties and those results are reported in *Selective Reconnaissance-Level Architectural Survey for the Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah* (see enclosed report). Five parcels could not be effectively surveyed due to vegetation and/or terrain and these are assumed to be historic properties.

The surveys have resulted in the identification of 22 archaeological sites and 129 architectural properties. Of these, 9 archaeological sites and 84 architectural properties are eligible to the National Register of Historic Places (NRHP). Five previously documented archaeological sites were not re-located. No known traditional cultural properties are located in the APE. The Determinations of Eligibility and Findings of Effects (for both Section 106 and Section 4(f)) are provided in the following sections for each action alternative with impacts to archaeological sites listed in Table 1 and impacts to architectural resources listed in Table 2. Please see attached notification letter regarding Section 4(f) *de minimis* impacts.

An analysis was also conducted for all cultural resources within the visual effects APE and those results are reported in *Cultural Resources Visual Analysis for the Little Cottonwood Canyon Environmental Impact Statement* (see enclosed report). The analysis determined that five resources required evaluation, 2 archaeological sites and 3 historic buildings. Three of the resources (42SL102, Cliff Lodge, and Iron Blossam Lodge) have a strong contrast rating, one (Alta Lodge) has a moderate contrast rating, and one (42SL90) has a weak contrast rating. The GA and GB Alternatives are the only alternatives to pose a visual impact to cultural resources, and it was found that while they would alter the setting of these cultural resources, they would not diminish any character-defining features or aspects of integrity that qualify these resources for inclusion in the NRHP and will result in no adverse effects to these historic properties.

ENHANCED BUS SERVICE ALTERNATIVE

Archaeological Resources

The EBS Alternative will impact two archaeological sites: Site 42SL830 and 42SL419.

Site 42SL830 is the historic Salt Lake to Alta Road (SR-210) which is overlain with the modern pavement. This site is affected by the EBS along modern Wasatch Blvd and SR-210 to varying degrees based on the details of those alternatives. Since no historic road fabric or associated features or artifacts were observed, this alternative will result in a finding of a finding of No Adverse Effect.

Site 42SL419 is the Denver & Rio Grande Western Railroad, Alta Branch, which has been largely destroyed within the APE. In this alternative, both of the snow shed alternatives would impact approximately 0.19 ac. of an intact retaining wall (known colloquially as the “China Wall”). As this impact would remove the only remaining intact feature of this site, the proposed project will result in a finding of Adverse Effect.

Section 4(f) applies to Site 42SL419 as it is eligible for the NRHP only under Criterion A. Site 42SL830 is partly eligible for data potential and does not warrant preservation in place, therefore is exempt from Section 4(f) under 23CFR 774.13(b).

Architectural Resources

The EBS Alternative will impact a total of 10 historic properties. All impacts would be to a portion of the parcel and not impact the primary building. The acquisitions, temporary construction easement (TCE) and associated construction affect a relatively small portion of each property and will not substantially impact or alter any contributing elements of the properties or any of the character-defining features for which each were determined eligible for the NRHP. Thus, the proposed project will result in a finding of No Adverse Effect. Property acquisition at seven of these buildings will result in a Section 4(f) *de minimis* impact, three others would constitute Temporary Occupancy.

ENHANCED BUS SERVICE WITH IN PEAK-PERIOD SHOULDER LANES ALTERNATIVE

Archaeological Resources

The PPSL Alternative will impact five archaeological sites: Sites 42SL109, 42SL830, 42SL549, 42SL419 and 42SL916.

Site SL109 is the Little Cottonwood Grit Mill and Granite Quarry which lies on either side of SR-210. Impacts by the PPSL would include about 3.19ac. of disturbance along the road margins, a small portion of the site, and avoid all documented features. As a result of construction monitoring for a roadside project in 2020, several additional boulders with drill scars and imbedded tools were identified. If selected, construction monitoring will be conducted at this site. This alternative will not substantially impact or alter any contributing elements of the site or any of the character-defining features for which it was determined eligible for the NRHP. Thus, the proposed project will result in a finding of No Adverse Effect.

Site 42SL830 is the historic Salt Lake to Alta Road (SR-210) which is overlain with the modern pavement. This site is affected by the EBS along modern Wasatch Blvd and SR-210 to varying degrees based on the details of those alternatives. Since no historic road fabric or associated features or artifacts were observed, this alternative will result in a finding of a finding of No Adverse Effect.

Site 42SL549 is the historic Whitmore Temple Granite Power Plant and this alternative would only impact the northern portion of this site (<0.01ac.). At this location the alternative would encroach on the location of F-08, a wooden pipeline, but would not directly impact it. As this alternative would only impact a small portion of the site and will not substantially impact or alter any contributing elements of the site or any of the character-defining features for which it was determined eligible for the NRHP. Thus, the proposed project will result in a finding of No Adverse Effect.

Site 42SL419 is the Denver & Rio Grande Western Railroad, Alta Branch, which has been largely destroyed within the APE. In this alternative, both of the snow shed alternatives would impact approximately 0.19 ac. of an intact retaining wall (known colloquially as the “China Wall”). As this impact would remove the only remaining intact feature of this site, the proposed project will result in a finding of Adverse Effect.

Site 42SL916 is the historic wagon road to Alta, which has been partly converted to the Little Cottonwood Creek Trail. This alternative would impact approximately 0.02ac. within the site boundary for a temporary construction easement to construct drainage culverts. These culverts will be buried beneath the trail and all trail features restored. As this alternative would only impact a small portion of the site and will not substantially impact or alter any contributing elements of the site or any of the character-defining features for which it was determined eligible for the NRHP. Thus, the proposed project will result in a finding of No Adverse Effect.

Section 4(f) applies to Site 42SL419 as it is eligible for the NRHP only under Criterion A. The remaining sites are partly eligible for data potential and does not warrant preservation in place, therefore is exempt from Section 4(f) under 23CFR 774.13(b).

Architectural Resources

The PPSL Alternative will impact a total of 22 historic properties. The acquisitions, TCEs and associated construction affect a relatively small portion of each property and will not substantially impact or alter any contributing elements of the properties or any of the character-defining features for which each were determined

eligible for the NRHP. Thus, the proposed project will result in a finding of No Adverse Effect. Property acquisition at 15 of these buildings will result in a Section 4(f) *de minimis* impact, seven others would constitute Temporary Occupancy.

GONDOLA A ALTERNATIVE

Archaeological Resources

The GA Alternative will impact 6 archaeological sites: Sites 42SL52, 42SL90, 42SL102, 42SL109, 42SL830, and 42SL419.

Site 42SL52 is the 79.8ac. historic Alta townsite, the boundary of which includes historic debris and structures as well as modern development. A gondola tower and the Alta destination station would be constructed within the site. The tower is currently impacting approximately 0.10ac. of Feature F-3, a large depression filled with historic debris. It is unclear if F-3 represents the remains of a demolished structure, adit, or refuse pit. The station will impact 0.52ac. but is not impacting any known site features in that area. This site has a high potential for buried deposits and therefore construction monitoring will be conducted for any project elements within the site boundary. Therefore, the proposed project would result in a finding of Adverse Effect.

Site 42SL90 is a prehistoric rock shelter and rock art panel. This site will not experience any physical impacts and all potential visual impacts would be screened by dense vegetation. Therefore the proposed project would result in a finding of No Historic Properties Affected.

Site 42SL102 is a historic hydroelectric plant. This site will not experience any physical impacts and all potential visual impacts would be screened by dense vegetation. Therefore the proposed project would result in a finding of No Historic Properties Affected.

Site SL109 is the Little Cottonwood Grit Mill and Granite Quarry which lies on either side of SR-210. Impacts by the GA would include a gondola tower and the base station which would be located in the existing parking lot. Approximately 2.42ac. would be necessary for the base station, the majority of which is within the current parking lot and is designed to avoid features that contribute to the NRHP eligibility of the site. The tower would impact 0.15ac. of the site and there are no known features in this area. As a result of construction monitoring for a roadside project in 2020, several additional boulders with drill scars and imbedded tools were identified. If selected, construction monitoring will be conducted at recommended for this site. As no known significant features would be impacted, the proposed project would result in a finding of No Adverse Effect.

Site 42SL830 is the historic Salt Lake to Alta Road (SR-210) which is overlain with the modern pavement. Since no historic road fabric or associated features or artifacts were observed, this alternative will result in a finding of a finding of No Adverse Effect.

Site 42SL419 is the Denver & Rio Grande Western Railroad, Alta Branch, which has been largely destroyed within the APE. In this alternative, both of the snow shed alternatives would impact approximately 0.19 ac. of an intact retaining wall (known colloquially as the "China Wall"). As this impact would remove the only remaining intact feature of this site, the proposed project will result in a finding of Adverse Effect.

Section 4(f) applies to Site 42SL419 as it is eligible for the NRHP only under Criterion A. The remaining sites are partly eligible for data potential and does not warrant preservation in place, therefore is exempt from Section 4(f) under 23CFR 774.13(b).

Architectural Resources

The GA Alternative will impact a total of 17 historic properties, including five at the Snowbird Ski and Summer Report. Property acquisition would be necessary to accommodate the gondola towers, TCEs and changes to the visual character of the property setting. In addition to the impact of gondola towers, impacts to historic architecture also include easements underneath the gondola cables. The acquisitions, TCEs and associated construction affect a relatively small portion of each property and will not substantially impact or alter any contributing elements of the properties or any of the character-defining features for which each were determined eligible for the NRHP. For Snowbird, SWCA and the UDOT Cultural Resources staff identified character-defining features within four

predominant themes: planning, ecological, modernism, and verticality. None of the GA Alternative impacts will adversely affect the Snowbird properties within the context of these themes. (A memorandum addressing the Snowbird properties is attached). Thus, the proposed project will result in a finding of No Adverse Effect. Property acquisition at 12 of these buildings will result in a Section 4(f) *de minimis* impact, three others would constitute Temporary Occupancy.

GONDOLA B ALTERNATIVE

Archaeological Resources

The GB Alternative will have an impact to the same 6 archaeological sites as GA: Sites 42SL52, 42SL90, 42SL102, 42SL109, 42SL830 and 42SL419.

Site 42SL52 is the 79.8ac. historic Alta townsite, the boundary of which includes historic debris and structures as well as modern development. A gondola tower and the Alta destination station would be constructed within the site. The tower is currently impacting approximately 0.10ac. of Feature F-3, a large depression filled with historic debris. It is unclear if F-3 represents the remains of a demolished structure, adit, or refuse pit. The station will impact 0.52ac. but is not impacting any known site features in that area. This site has a high potential for buried deposits and therefore construction monitoring will be conducted for any project elements within the site boundary. Therefore, the proposed project would result in a finding of Adverse Effect.

Site 42SL90 is a prehistoric rock shelter and rock art panel. This site will not experience any physical impacts and all potential visual impacts would be screened by dense vegetation. Therefore the proposed project would result in a finding of No Historic Properties Affected.

Site 42SL102 is a historic hydroelectric plant. This site will not experience any physical impacts and all potential visual impacts would be screened by dense vegetation. Therefore the proposed project would result in a finding of No Historic Properties Affected.

Site SL109 is the Little Cottonwood Grit Mill and Granite Quarry which lies on either side of SR-210. Impacts by the GB would include a gondola tower and the base station which would be located in the existing parking lot. Approximately 2.42ac. would be necessary for the base station, the majority of which is within the current parking lot and is designed to avoid features that contribute to the NRHP eligibility of the site. The tower would impact 0.15ac. of the site and there are no known features in this area. As a result of construction monitoring for a roadside project in 2020, several additional boulders with drill scars and imbedded tools were identified. If selected, construction monitoring will likely be recommended for this site. As no known significant features would be impacted, the proposed project would result in a finding of No Adverse Effect.

Site 42SL830 is the historic Salt Lake to Alta Road (SR-210) which is overlain with the modern pavement. This site is affected by the GB along modern Wasatch Blvd and SR-210 to varying degrees based on the details of those alternatives. Since no historic road fabric or associated features or artifacts were observed, this alternative will result in a finding of a finding of No Adverse Effect.

Site 42SL419 is the Denver & Rio Grande Western Railroad, Alta Branch, which has been largely destroyed within the APE. In this alternative, both of the snow shed alternatives would impact approximately 0.19 ac. of an intact retaining wall (known colloquially as the "China Wall"). As this impact would remove the only remaining intact feature of this site, the proposed project will result in a finding of Adverse Effect.

Section 4(f) applies to Site 42SL419 as it is eligible for the NRHP only under Criterion A. The remaining sites are partly eligible for data potential and does not warrant preservation in place, therefore is exempt from Section 4(f) under 23CFR 774.13(b).

Architectural Resources

The GB Alternative will impact a total of 20 historic properties, including 5 at the Snowbird Ski and Summer Resort. Property acquisition would be necessary to accommodate the gondola towers and base station, TCEs and changes to the visual character of the property setting. In addition to the impact of gondola towers, impacts to

historic architecture also include easements underneath the gondola cables. The acquisitions, TCEs and associated construction affect a relatively small portion of each property and will not substantially impact or alter any contributing elements of the properties or any of the character-defining features for which each were determined eligible for the NRHP. For Snowbird, SWCA and the UDOT Cultural Resources staff identified character-defining features within four predominant themes: planning, ecological, modernism, and verticality. None of the GB Alternative impacts will adversely affect the Snowbird properties within the context of these themes. (A memorandum addressing the Snowbird properties is attached). Thus, the proposed project will result in a finding of No Adverse Effect. Property acquisition at 15 of these buildings will result in a Section 4(f) *de minimis* impact, three others would constitute Temporary Occupancy.

COG RAIL ALTERNATIVE

Archaeological Resources

The COG Alternative will impact 4 archaeological sites: Sites 42SL109, 42SL830, 42SL419 and 42SL916.

Site SL109 is the Little Cottonwood Grit Mill and Granite Quarry which lies on either side of SR-210. Impacts by the COG Alternative would include the rail tracks, maintenance facility, and reconstruction of the current parking lot and trailhead, comprising 10.62ac (approximately 1/3 of the site area). Portions of the quarried canyon face and quarried stone boulders are scattered across the 31-acre site. As a result of construction monitoring for a roadside project in 2020, several additional boulders with drill scars and imbedded tools were identified. If selected, construction monitoring will be conducted at this site. Given the scale and distribution of impacts throughout the site boundary which would impact defining characteristics of the site, the proposed project would result in a finding of Adverse Effect.

Site 42SL830 is the historic Salt Lake to Alta Road (SR-210) which is overlain with the modern pavement. This site is affected by the COG along modern Wasatch Blvd and SR-210 to varying degrees based on the details of those alternatives. Since no historic road fabric or associated features or artifacts were observed, this alternative will result in a finding of a finding of No Adverse Effect.

Site 42SL419 is the Denver & Rio Grande Western Railroad, Alta Branch, which has been largely destroyed within the APE. In this alternative, both of the snow shed alternatives would impact approximately 0.19 ac. of an intact retaining wall (known colloquially as the “China Wall”). As this impact would remove the only remaining intact feature of this site, the proposed project will result in a finding of Adverse Effect.

Site 42SL916 is the historic wagon road to Alta, which has been partly converted to the Little Cottonwood Creek Trail. This alternative would impact approximately 0.02ac. within the site boundary for a temporary construction easement to construct drainage culverts. These culverts will be buried beneath the trail and all trail features restored. As this alternative would only impact a small portion of the site and will not substantially impact or alter any contributing elements of the site or any of the character-defining features for which it was determined eligible for the NRHP. Thus, the proposed project will result in a finding of No Adverse Effect.

Section 4(f) applies to Site 42SL419 as it is eligible for the NRHP only under Criterion A. The remaining sites are partly eligible for data potential and does not warrant preservation in place, therefore is exempt from Section 4(f) under 23CFR 774.13(b).

Architectural Resources

The COG Alternative will impact a total of 18 historic properties. The acquisitions, TCEs and associated construction affect a relatively small portion of each property and will not substantially impact or alter any contributing elements of the properties or any of the character-defining features for which each were determined eligible for the NRHP. Thus, the proposed project will result in a finding of No Adverse Effect. Property acquisition at 14 of these buildings will result in a Section 4(f) *de minimis* impact, four others would constitute Temporary Occupancy.

SECTION 4(f) EVALUATION

Under Section 4(f), use of a property includes permanent incorporation of land into a transportation facility, temporary uses, and constructive uses (i.e., severe proximity impacts). Uses that result in minor impacts without adverse effects are considered to have a *de minimis* impact. Uses that result in Greater than *de minimis* impacts result in adverse effects to the activities, features, or attributes qualifying a property for protection under Section 4(f). Additionally, some temporary occupancies of land are so minimal as to not constitute a use within the meaning of Section 4(f) when the scope of the work is minor and the magnitude of the changes to the Section 4(f) property are minimal. The land would also need to be fully restored to a condition at least as good as that which existed prior to the project.

The project will result in a use of Section 4(f) resources resulting in a *de minimis* impact of up to 15 buildings and temporary occupancy finding for up to 7 buildings as outlined in Table 3. An individual Section 4(f) evaluation is being prepared and will be included with the environmental document prepared for this project. The evaluation discusses the impact by the action alternative and measures taken to minimize harm to the Section 4(f) properties. This information is summarized below. A copy of the Section 4(f) evaluation will be provided upon request.

Section 4(f) applies to archeological sites that are on or eligible for the NRHP and that warrant preservation in place. Section 4(f) does not apply if FHWA determines, after consultation with SHPO and the ACHP (if participating) that the archeological resource is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place. None of the eight eligible archaeological sites within the study area retain appropriate integrity and significance to be considered Section 4(f) properties.

Table 3. Summary of Section 4(f) Impact by Build Alternative

	EBS	PPSL	GA	GB	COG
Greater than <i>de minimis</i> Impact	1	1	2	2	2
<i>De minimis</i> Impact	7	15	12	15	14
Temporary Occupancy (no Section 4(f) Use)	3	7	3	3	4
Total No. of Section 4(f) Impacts	8	16	14	17	16

CONSULTATION EFFORTS

Native American consultation was initiated through letters sent to the Uintah and Ouray Ute Tribes, Shoshone-Bannock Tribes, Eastern Shoshone Tribe of the Wind River Reservation, Northwestern Band of Shoshone Nation, Skull Valley Band of Goshute Indians, Confederated Tribes of the Goshute Reservation, and the Cedar and Shivwits Bands of the Paiute (sent March 7, 2018). No responses were received from this correspondence, but the Utah Division of Indian Affairs is a Participating Agency under NEPA for the EIS.

The following organizations were also invited to be consulting parties under Section 106: Friends of Alta, Alta Historical Society, Alta Community Enrichment, Cottonwood Heights Historic Committee, Cottonwood Heights CLG, Wasatch Mountain Club, Cottonwood Canyons, Foundation, Save Our Canyons, Preservation Utah, the Utah Professional Archaeological Council, and the Church of Jesus Christ of Latter-day Saints (sent March 7, 2018). The Cottonwood Heights Historic Committee, Cottonwood Heights CLG, and Church of Jesus Christ of Latter-day Saints agreed to be consulting parties.

Public open house meetings have been held at the NEPA Scoping (June 2019) and Alternatives Screening stages and the public was notified of potential impacts to cultural resources. To date, few comments about cultural resources have been submitted and express general concern about archaeological resources, and the ‘China Wall’ portion of

42SL419. Public comments will be solicited at other stages of the EIS with updated information on impacts to cultural resources as they are known and will be addressed throughout the project.

SUMMARY

All action alternatives equally impact Site 42SL419 resulting in a finding of Adverse Effect and a Section 4(f) use with Greater than *de minimis* impacts. In addition, the GA and GB alternatives result in an Adverse Effect to Site 42SL52 and the COG alternative results in an Adverse Effect to Site 42SL109. Table 4 summarizes these impacts on archaeological resources.

Table 4. Summary of Effect of Alternatives on Archaeological Resources

	EBS	PPSL	GA	GB	COG
Adverse Effect	1	1	2	2	2
No Adverse Effect	1	4	2	2	2
No Historic Properties Affected	0	0	2	2	0

All action alternatives require the partial acquisition of properties eligible for the NRHP resulting in a finding of No Adverse Effect and a Section 4(f) use with *de minimis* impacts. Table 5 summarizes these impacts on architectural resources.

Table 5. Summary of Effect of Alternatives on Architectural Resources

	EBS	PPSL	GA	GB	COG
Adverse Effect	0	0	0	0	0
No Adverse Effect	10	22	17	20	18
No Historic Properties Affected	Varies	Varies	Varies	Varies	Varies

Therefore, the project will result in a finding of Adverse Effect for up to 2 archaeological sites, No Adverse Effect and Section 4(f) *de minimis* impact for up to 4 archaeological sites and 22 architectural properties, and a finding of No Historic Properties Affected for all remaining architectural properties and archaeological sites. Therefore, the potential Finding of Effect for the proposed UDOT Project No. S-R299(281)0; Little Cottonwood Canyon EIS, Salt Lake County, Utah, is **Adverse Effect**. UDOT will submit a final Finding of Effect and continue consultation for the project once a Preferred Alternative is selected.

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by UDOT pursuant to 23 *USC* §327 and a Memorandum of Understanding dated January 17, 2017, and executed by FHWA and UDOT.

Please review this document and, providing you agree with the findings contained herein, provide written concurrence. Should you have any questions or need additional information, please feel free to contact Liz Robinson at 801-910-2035 or lizrobinson@utah.gov, or Elizabeth Giraud at 801-965-4917 or egiraud@utah.gov.

Sincerely,

Liz Robinson

Liz Robinson
Cultural Resources Program Manager
UDOT Central Environmental

Elizabeth Giraud

Elizabeth Giraud, AICP
Architectural Historian
UDOT Central Environmental

Enclosures

cc: Joshua VanJura, Project Manager
Brandon Weston, Environmental Director

Little Cottonwood Canyon EIS DOE/FOE:

Archaeology Impact Table & Figures

Table 1. Determinations of Eligibility and Findings of Effect for Archaeological Sites

Site Number	Site Type	Site Name	NRHP Evaluation	Alternative(s) Having Impact	Nature of Impact	Section 106 Effect	Section 4(f) Use/Impact	Warrants Preservation in Place	Figure Reference	
42SL830	Road	Salt Lake to Alta Road/SR 210	Eligible	All Alternatives	31.24 acres of potential impact (WIL)	No adverse effect	N/A	No	Figure 36	
					31.29 acres of potential impact (W5L)					N/A
					9.58 acres of potential impact (SSRR)					N/A
					7.30 acres of potential impact (SSB)					N/A
					1.81 acres of potential impact (TH)					N/A
					50.52 acres of potential impact					N/A
					1.10 acres of potential impact					N/A
					7.31 acres of potential impact					N/A
					42.90 acres of potential impact					N/A
					0.29 acres of potential impact (TH)					N/A
				COG						
				GB						
				GA						
				PSSL						

42SL109	Granite quarry	Little Cottonwood Grit Mill Property	Eligible	PSSL	3.19 acres of potential impact	No adverse effect	N/A	No	Figure 40
				GA, GB	2.57 acres of potential impact	No adverse effect	N/A		Figure 41
				COG	10.62 acres of potential impact	Adverse effect	N/A		Figure 44
42SL549	Power plant	Whitmore Temple Granite Power Plant	Eligible	PSSL	less than 0.01 acres of potential impact	No adverse effect	N/A	No	Figure 40
42SL52	Town site	Town Site of Alta	Eligible	GA, GB	0.63 acres of potential impact	No adverse effect	N/A	No	Figure 41
42SL90	Rock shelter/ rock art	Prehistoric rock shelter and rock art	Eligible	GA, GB	Visual	No adverse effect	N/A	No	Figure 41
42SL102	Power plant	Tanner Hill Site hydroelectric plant	Unevaluated	GA, GB	Visual	No adverse effect	N/A	N/A	Figure 41
42SL405	Power plant	Cottonwood Granite Company Power Plant #3	Not eligible	N/A	N/A	No historic properties affected	N/A	N/A	N/A
42SL419	Railroad	D&RGW Railroad/Wasatch & Jordan Valley Railroad/Salt Lake & Alta	Eligible	All alternatives	0.19 acres of potential impact (SSRR, SSB)	Adverse Effect	Yes	No	Figure 46
42SL473	Tramway	Michigan-Utah Mine Aerial Tramway	Not eligible	N/A	N/A	No historic properties affected	N/A	N/A	N/A
42SL507	Power plant	Whitmore Wasatch Power Plant	Not eligible	N/A	N/A	No historic properties affected	N/A	N/A	N/A
42SL538	Dam	Utah Granite and Marble Co./Whitmore Power Plant	Not eligible	N/A	N/A	No historic properties affected	N/A	N/A	N/A

42SL551	Road	Road to Little Cottonwood	Not eligible	N/A	N/A	No historic properties affected	N/A	N/A	N/A
42SL740	Road	Alta Prince of Wales Road	Eligible	N/A	Property avoided	No historic properties affected	N/A	No	N/A
42SL916	Road	Wagon Road to Alta	Eligible	PSSL	0.02 acres potential effect	No Adverse Effect	No	No	Figure 47
				COG	0.01acres potential effect	No Adverse Effect	No	No	Figure 47
42SL860	Mine	Emma Mine	Eligible	N/A	Property avoided	No historic properties affected	N/A	No	N/A
42SL915	Gravel Pit	Walker and Draper Gravel Pits	Not eligible	N/A	N/A	No historic properties affected	N/A	N/A	N/A
42SL393	Ditch	Butler Ditch	Not eligible	N/A	N/A	No historic properties affected	N/A	N/A	N/A

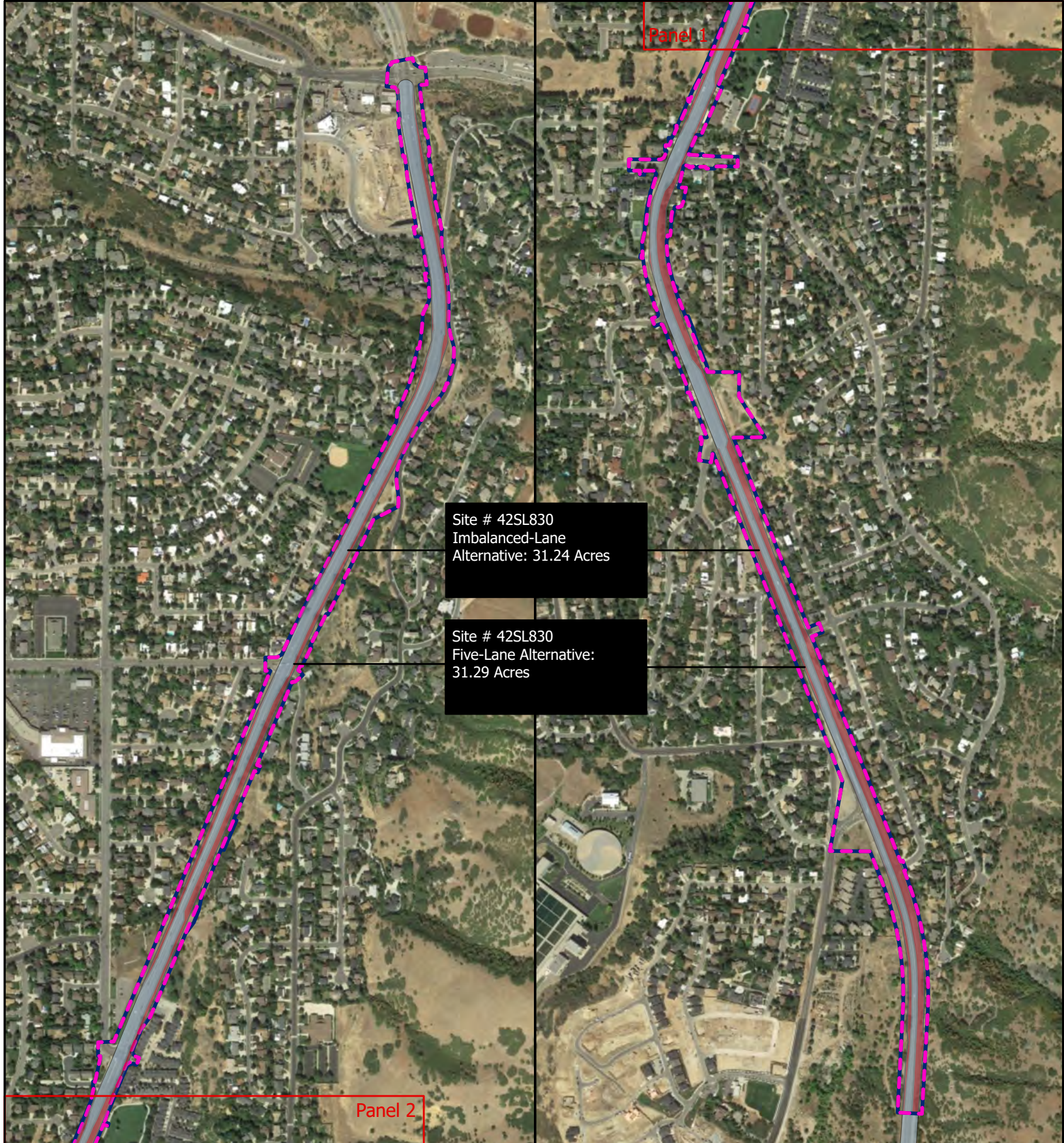
Alternative Abbreviations

Action Alternatives (main alternatives being evaluated in detail)

PPSL	Enhanced Bus Service in Peak-period Shoulder Lane Alternative
GA	Gondola Alternative A
GB	Gondola Alternative B
COG	Cog Rail Alternative

Sub-alternatives (alternative options that fall under action alternatives)

WIL	Wasatch Boulevard Imbalanced-lane Alternative (could apply to all action alternatives)
W5L	Wasatch Boulevard Five-lane Alternative (could apply to all action alternatives)
SSRR	Snow Sheds with Realigned Roads Alternative
SSB	Snow Sheds with Berms Alternative
TH	Trailhead Improvements



Site # 42SL830
Imbalanced-Lane
Alternative: 31.24 Acres

Site # 42SL830
Five-Lane Alternative:
31.29 Acres

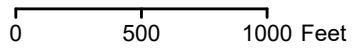
Panel 2

Panel 1



- - - Imbalanced-Lane Alternative Total Impacts
- - - Five-Lane Alternative Total Impacts
- Impacted Area
- Archaeological Site Boundary (42SL830)

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



*Impacts on this figure apply to all action alternatives.

Snow Sheds With Realigned Road Alternative



Site # 42SL830
Snow Sheds With Realigned
Road Alternative: 9.58 Acres

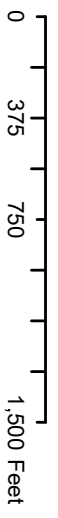
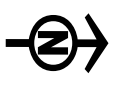
Snow Sheds With Berms Alternative



Site # 42SL830
Snow Sheds With Berms
Alternative: 7.30 Acres

- Snow Sheds with Berms Alternative Impact Area
- Snow Sheds with Realigned Road Alternative Impact Area
- Impacted Area
- Archaeological Site Boundary (42SL830)

*Impacts on this figure apply to all action alternatives except cog-rail.



LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(28-1); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT

White Pine Trailhead

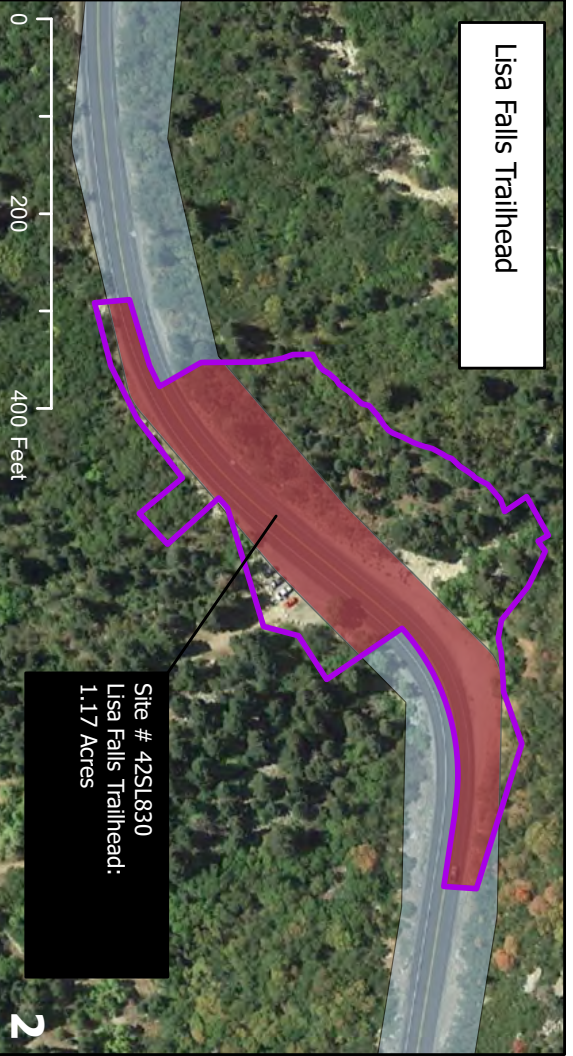
Site # 42SL830
White Pine Lot:
0.09 Acres



1

Lisa Falls Trailhead

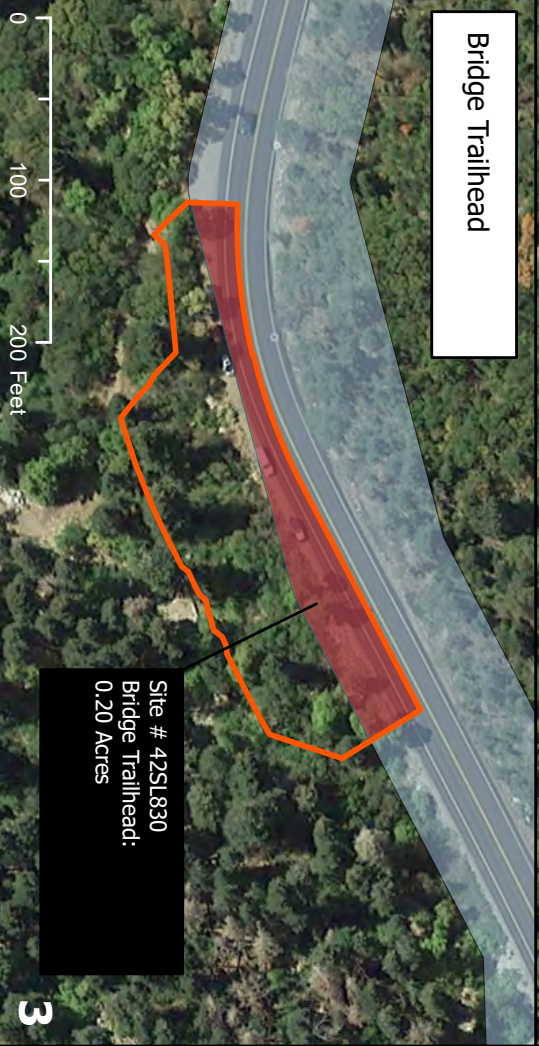
Site # 42SL830
Lisa Falls Trailhead:
1.17 Acres



2

Bridge Trailhead

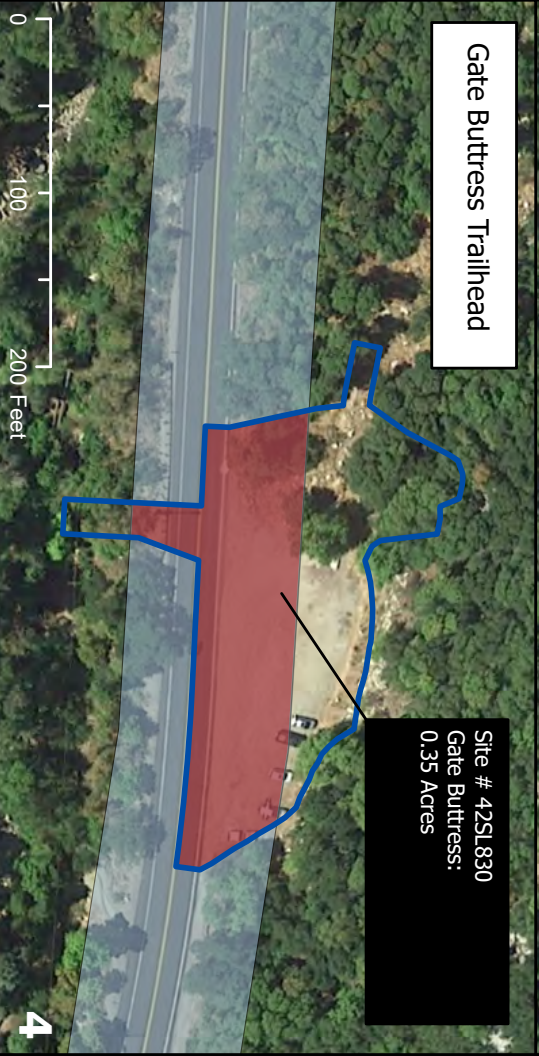
Site # 42SL830
Bridge Trailhead:
0.20 Acres



3

Gate Buttrass Trailhead

Site # 42SL830
Gate Buttrass:
0.35 Acres



4

- Trailhead Improvements
- Parking - Bridge Trailhead
- Parking - Gate Buttrass
- Parking - Lisa Falls PPSL Option A
- Parking - White Pine Option A

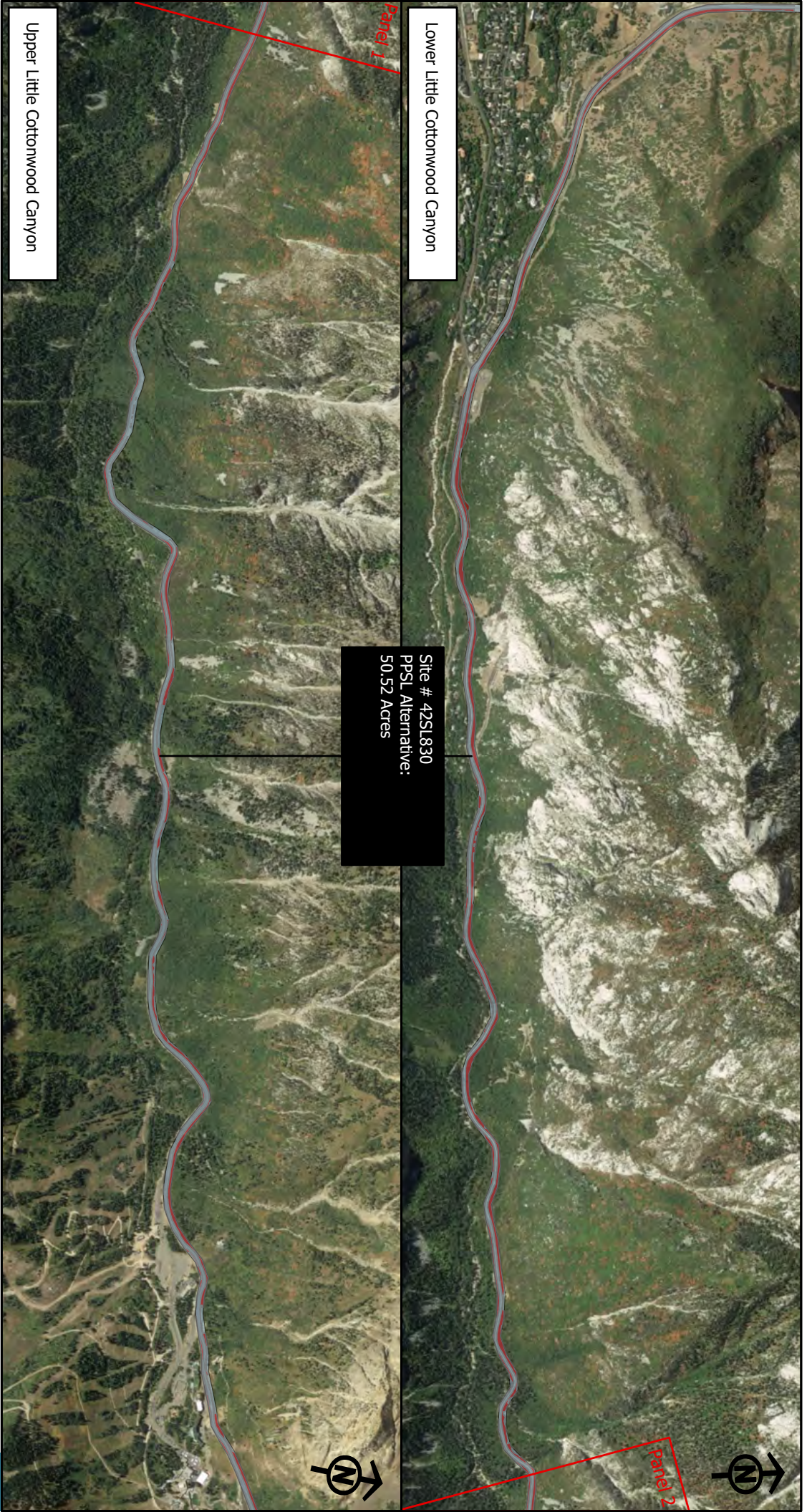
- Impacted Area
- Archaeological Site Boundary (42SL830)

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(28-1): PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



*Impacts for White Pine Trailhead and Bridge Trailhead apply to all action alternatives.



*Impacts for Lisa Falls Trailhead and Gate Buttrass Trailhead apply to all action alternatives except the Cog Rail Alternative.



Upper Little Cottonwood Canyon

Lower Little Cottonwood Canyon

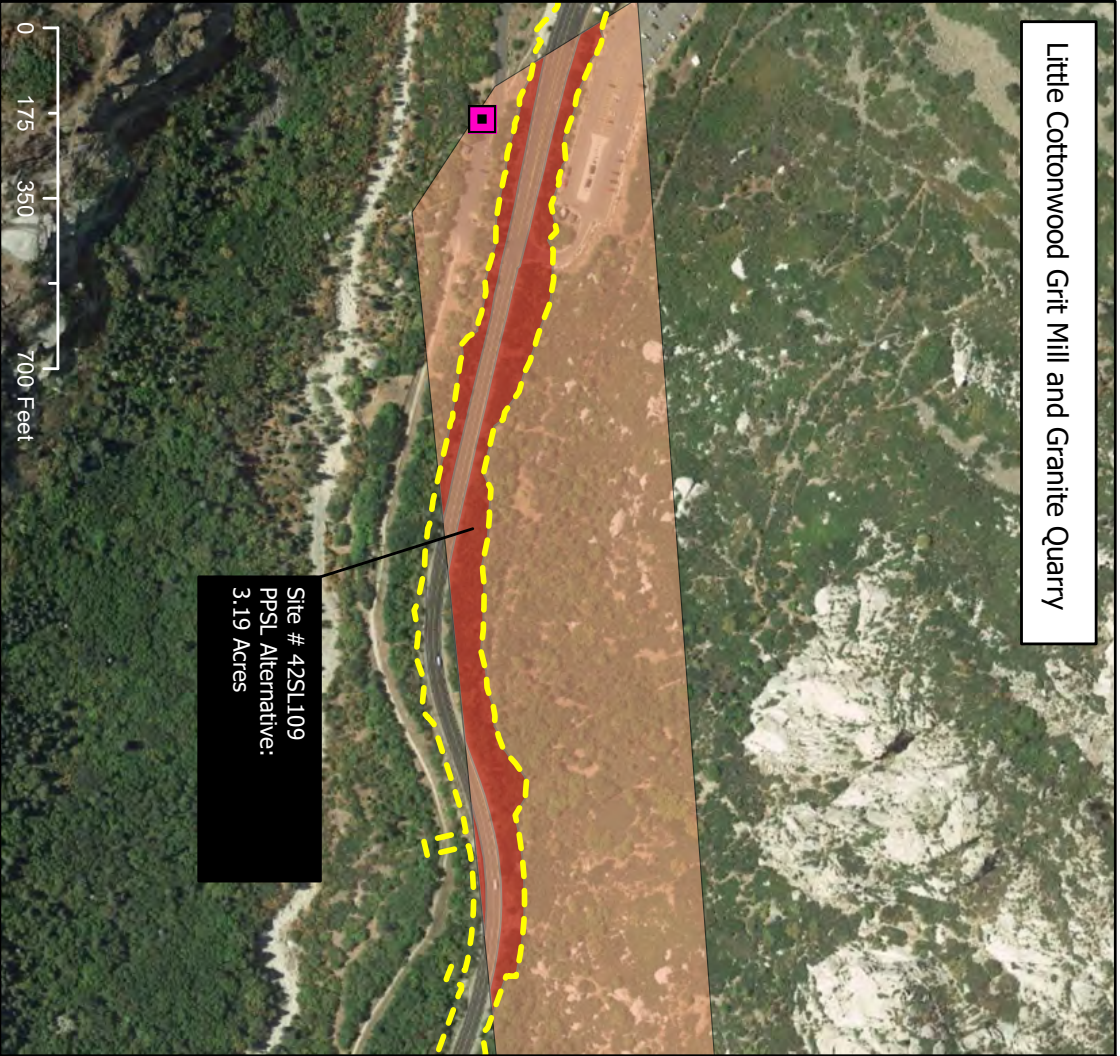
Site # 42SL830
PPSL Alternative:
50.52 Acres

-  Impacted Area PPSL Alternative
-  Archaeological Site Boundary (42SL830)

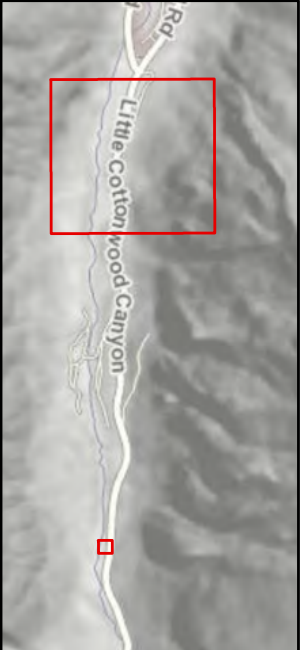
LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(28-1): PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



Little Cottonwood Grit Mill and Granite Quarry



Whitmore Temple Granite Power Plant

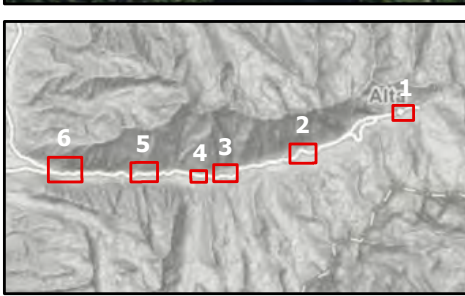
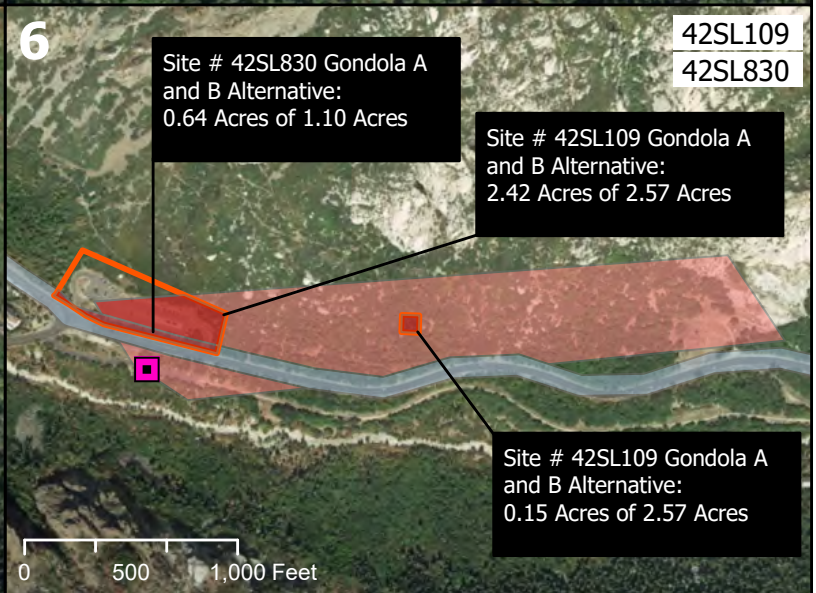
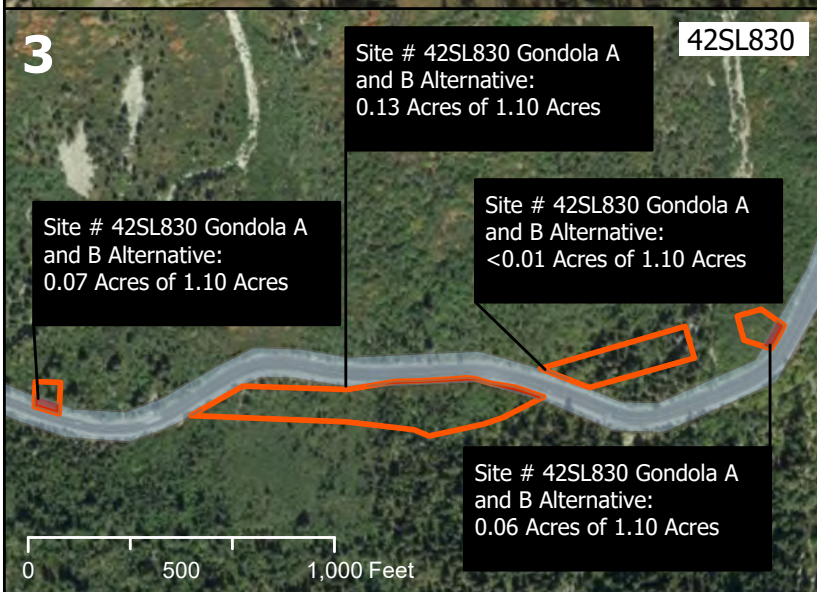
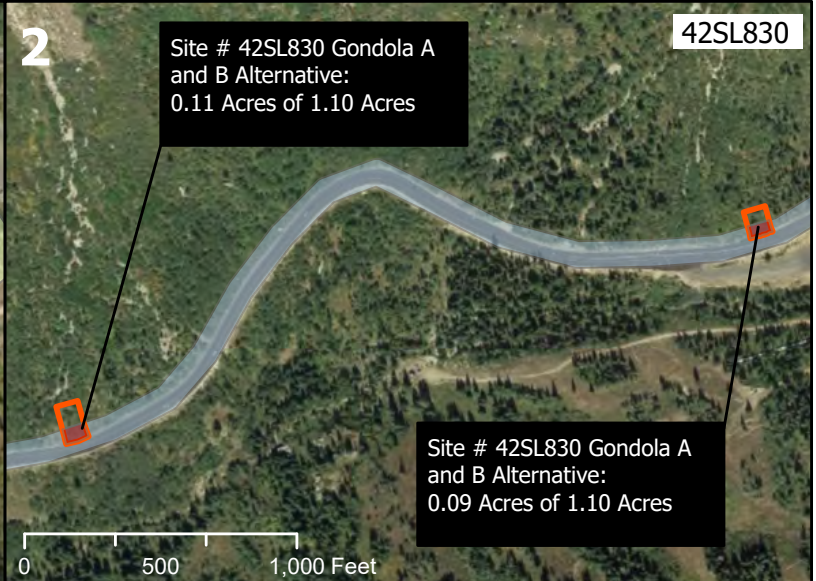
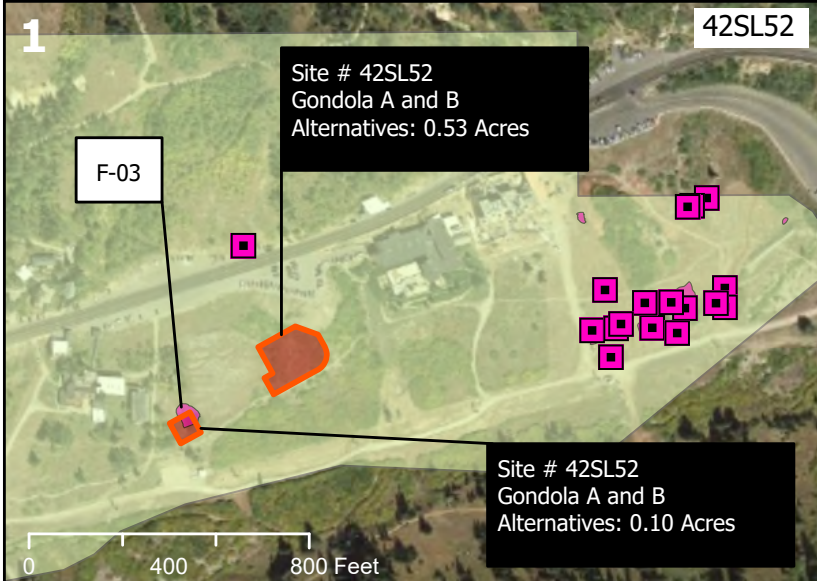


- PPSL Alternative Impacts
- Impacted Area
- Archaeological Site Boundaries
- 42SL109
- 42SL549

- Archaeological Features
- Archaeological Points
- Archaeological Lines

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(28-1); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





- Gondola A and B Towers and Stations
- Impacted Area
- Archaeological Site Boundaries
- 42SL102
- 42SL109
- 42SL52
- 42SL830
- 42SL90
- Archaeological Features
- Archaeological Points
- Archaeological Lines
- Archaeological Area

**LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT**

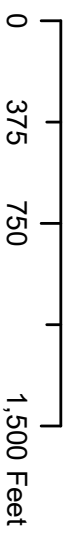


*Impacts on this figure apply to both gondola A and B alternatives.



- Impacted Area
- Gondola B (La Caille Area Only)
- Archaeological Site Boundary (42SL830)

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





Lower Little Cottonwood Canyon

Upper Little Cottonwood Canyon

Site # 425L 830
Cog Rail Alternative:
33.55 Acres

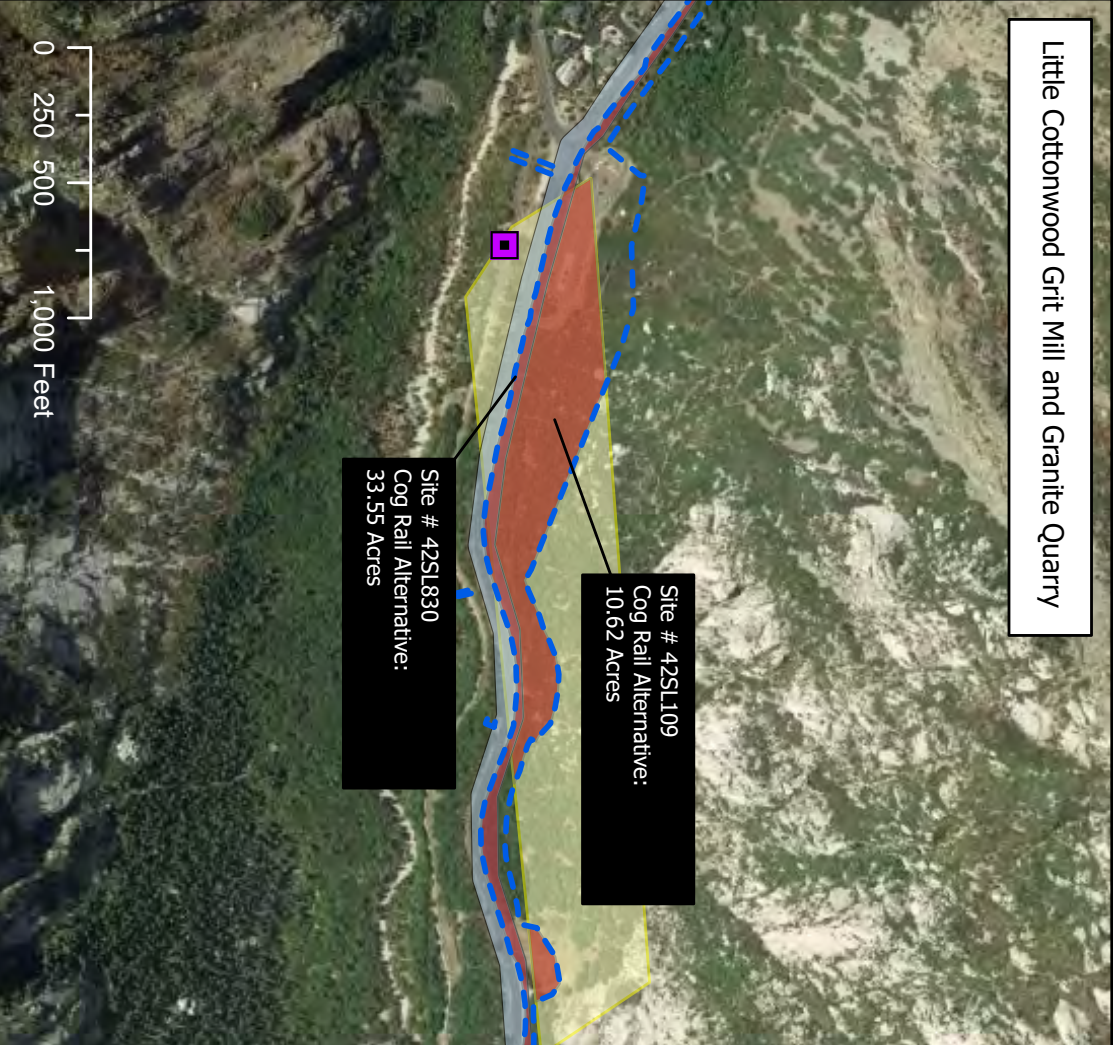


-  Impacted Area Cog Rail Alignment Alternative
-  Archaeological Site Boundary (425L830)

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(284); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



Little Cottonwood Grit Mill and Granite Quarry



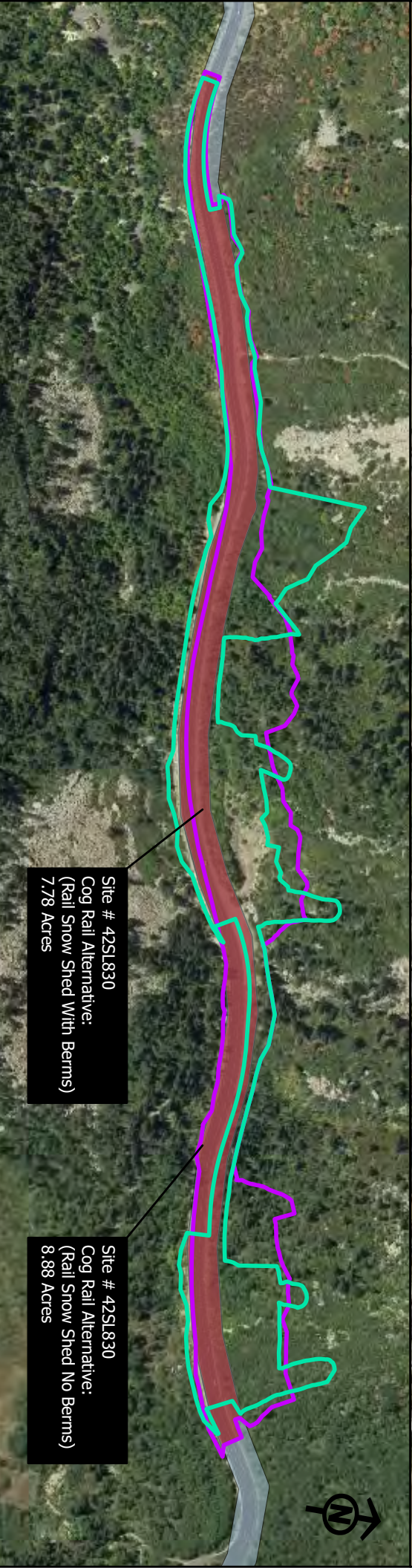
Rail Base Station



- Archaeological Feature - Point
- ▭ Rail Base Station
- ▭ Rail Alignment Total Impacts Area
- ▭ Impacted Area Cog Rail Alternative
- ▭ Archaeological Site Boundary (425109)
- ▭ Archaeological Site Boundary (425109)

LITTLE COTTONWOOD CANYON EIS
 PROJECT S-R299(281); PIN 16092
 DETERMINATION OF ELIGIBILITY AND
 FINDING OF EFFECT





- Rail Snow Shed Upper Canyon
- Rail Snow Shed With Berms
- Rail Snow Shed No Berms
- Impacted Area Cog Rail Alternative
- Archaeological Site Boundary (42SL830)

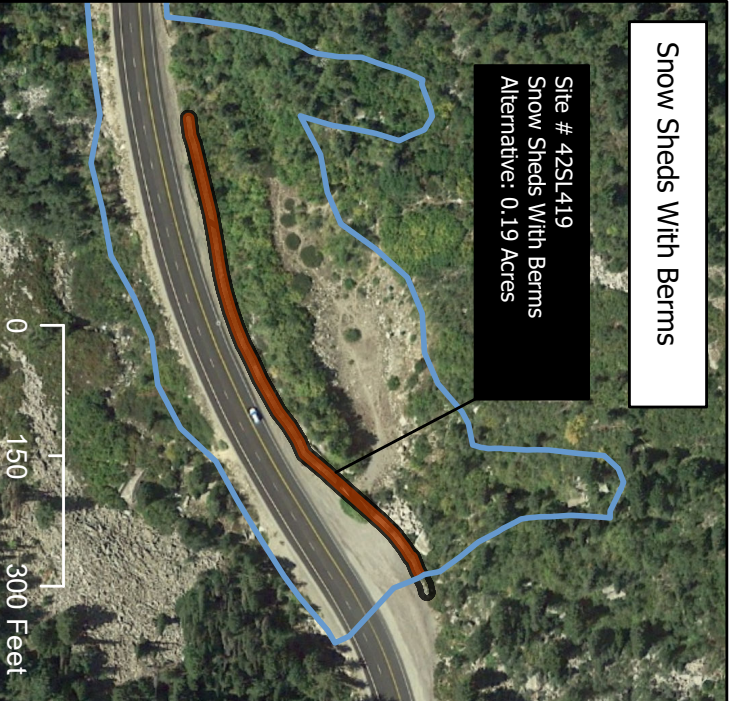


LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



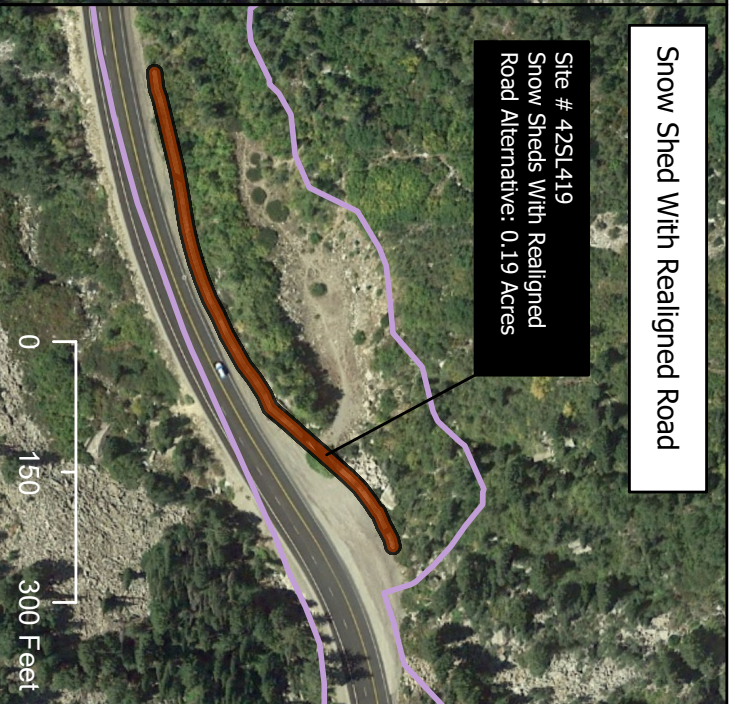
Snow Sheds With Berms

Site # 42SL419
Snow Sheds With Berms
Alternative: 0.19 Acres



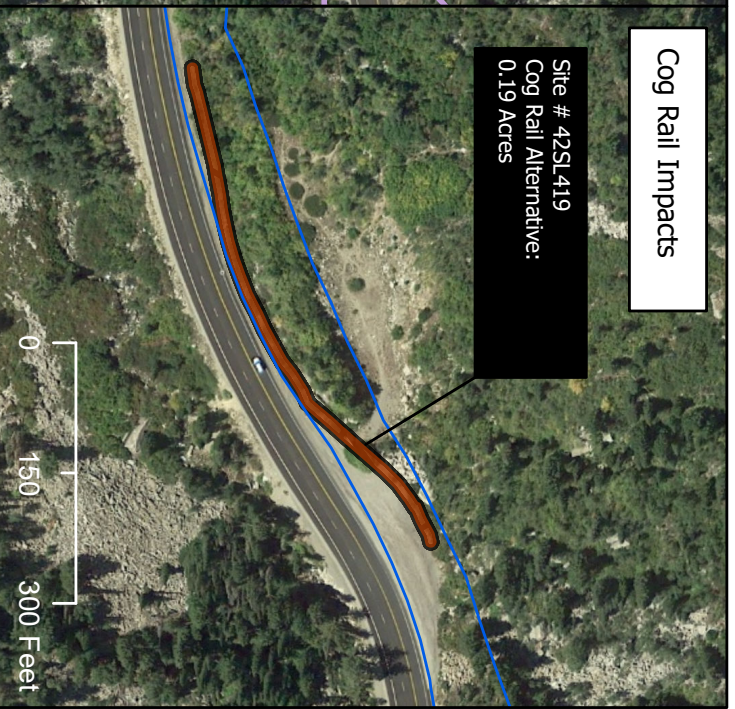
Snow Shed With Realigned Road

Site # 42SL419
Snow Sheds With Realigned
Road Alternative: 0.19 Acres

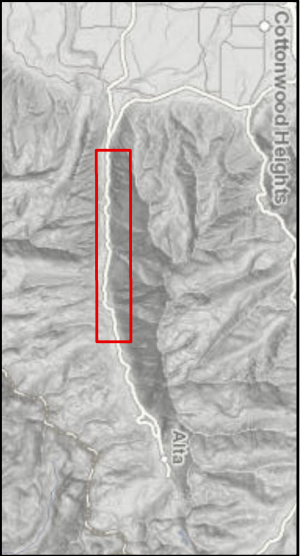







Cog Rail Impacts

Site # 42SL419
Cog Rail Alternative:
0.19 Acres



Overview



-  Snowsheds - Revised Curves
-  Rail Total Impacts without Pavement
-  Snowsheds - With Berms
-  Impacted Area (Snow Sheds With Berms, Snow Sheds with Realigned Road, and Cog Rail Alternatives)
-  Archaeological Site Boundary (42SL419)

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(28-1): PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



Quarry Trail Cog Rail Alternative Impact

Site # 42SL916
Cog Rail Alternative:
0.01 Acres

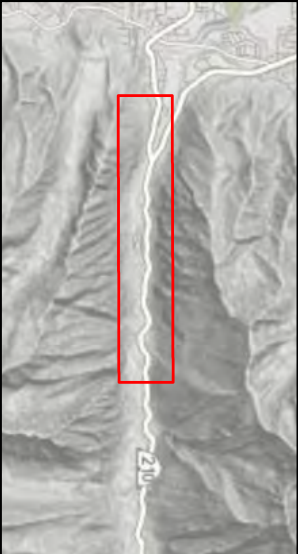
0 150 300 Feet





Quarry Trail PPSL Alternative Impact

Site # 42SL916
PPSL Alternative:
0.02 Acres

0 100 200 Feet

Overview



-  PPSL Impacts Total
-  Rail Total Impacts without Pavement
-  Impacted Area (Cog Rail and PPSL Alternative)
-  Archaeological Site Boundary (42SL416)

0 1,250 2,500 Feet

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(28-1); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



Little Cottonwood Canyon EIS DOE/FOE:
Architecture Impact Table and Figures

Determinations of Eligibility and Findings of Effect

Address / ID	SHPO Rating /NRHP Eligibility	Year Built	Type / Style	Alternative(s) Having Impact	Nature of Impact	Section 106 Effect	Section 4(f) Use/Impact	Figure Reference
2039 East 9400 South (NC1)	NC/ Not eligible	1978	Vernacular grocery store.	N/A	N/A	No historic properties affected	N/A	N/A
6851 South Big Cottonwood Canyon Road (1)	ES/ Eligible	1880	NRHP-listed Granite Paper Mill.	All Alternatives	Partial acquisition: 4.01 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 1
6999 Gun Club Road (NC2)	NC/ Not eligible	1954	Gun club with one one-story historic-age vernacular building and five non-contributing buildings	N/A	N/A	No historic properties affected	N/A	N/A
3700 East Fort Union Boulevard (NC3)	NC/ Not eligible	1948	Commercial (general) establishment	N/A	N/A	No historic properties affected	N/A	N/A
3720 East Fort Union Blvd (NC4)	NC/ Not eligible	1975	Service station	N/A	N/A	No historic properties affected	N/A	N/A
7326 South Prospector Drive (2)	EC/ Eligible	1978	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
7527 South Brighton Point Drive (3)	EC/ Eligible	1974	Contemporary-style single-family dwelling	All Alternatives	Partial acquisition: 0.17 acres; temporary construction easement: 0.09 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 2

7537 South Brighton Point Drive (4)	EC/ Eligible	1975	Ranch-style single-family dwelling	All Alternatives	Partial acquisition: 0.12 acres; temporary construction easement: 0.04 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 2
7561 South Brighton Point Drive (5)	EC/ Eligible	1976	Ranch-style single-family dwelling	All Alternatives	Partial acquisition: 0.08 acres; temporary construction easement: 0.01 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 3
7659 South Avondale Drive (6)	EC/ Eligible	1974	Shed-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
7669 South Avondale Drive (7)	EC/ Eligible	1974	Shed-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
7685 South Avondale Drive (NC5)	NC/ Not eligible	1972	Split-level-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
7699 South Avondale Drive (8)	EC/ Eligible	1971	Contemporary-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
7709 South Avondale Drive (9)	EC/ Eligible	1972	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
7719 South Avondale Drive (10)	EC/ Eligible	1975	Contemporary-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
7731-7733 South Avondale Drive (NC6)	NC/ Not eligible	1975	Late-twentieth-century other-style duplex	N/A	N/A	No historic properties affected	N/A	N/A
7743-7745 South Avondale Drive (11)	EC/ Eligible	1975	Contemporary-style duplex	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
3650 East Avondale Drive (12)	EC/ Eligible	1977	Contemporary-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A

3615 East Bengal Boulevard (NC7)	NC/ Not eligible	1977	Contemporary-style duplex	N/A	N/A	No historic properties affected	N/A	N/A
3625 East Bengal Boulevard (NC8)	NC/ Not eligible	1973	Contemporary-style duplex condominium	N/A	N/A	No historic properties affected	N/A	N/A
3637 East Bengal Boulevard (130)	EC/ Eligible	1973	Contemporary-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
3647 East Bengal Boulevard (NC9)	NC/ Not eligible	1975	Split-level-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
3638-3648 East Bengal Boulevard (14)	EC/ Eligible	1977	late twentieth-century other-style duplex	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
7825-7827 South Honeycomb Road (15)	EC/ Eligible	1977	Split-level-style duplex	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
7835-7837 South Honeycomb Road (NC10)	NC/ Not eligible	1977	Late twentieth-century other-style duplex	N/A	N/A	No historic properties affected	N/A	N/A
7845 South Honeycomb Road (16)	EC/ Eligible	1976	Contemporary-style duplex	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
7855 South Honeycomb Road (17)	EC/ Eligible	1977	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
7865 South Honeycomb Road (18)	EC/ Eligible	1972	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8166 South Wasatch Boulevard (NC11)	NC/ Not eligible	1965	Ranch-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
8282 South Wasatch Boulevard (NC12)	NC/ Not eligible	1944	Detached garage	N/A	N/A	No historic properties affected	N/A	N/A
8296 South Wasatch Blvd (19)	EC/ Eligible	1953	Early ranch-style single-family dwelling	All Alternatives	Partial acquisition: 0.04 acres; temporary construction easement: 0.02 acres (W/L)	No adverse effect	Yes/ <i>de minimis</i>	Figure 4

					Partial acquisition: 0.06 acres; temporary construction easement: 0.02 acres (W5L)	No adverse effect	Yes/ <i>de minimis</i>	Figure 4
8304 South Wasatch Boulevard (NC13)	NC/ Not eligible	1953	Early ranch-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
3461 East Kings Hill Drive (20)	EC/ Eligible	1974	Split-level-style single-family dwelling	All Alternatives	Temporary construction easement: 0.02 acres	No adverse effect	No/ Temporary occupancy	Figure 5
3475 East Kings Hill Drive (21)	EC/ Eligible	1971	Split-level-style single-family dwelling	All Alternatives	Temporary construction easement: less than 0.01 acres	No adverse effect	No/ Temporary occupancy	Figure 5
3485 East Kings Hill Drive (NC14)	NC/ Not eligible	1965	Ranch-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
3495 East Kings Hill Drive (NC15)	NC/ Not eligible	1965	Ranch-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
3509 East Kings Hill Drive (NC16)	NC/ Not eligible	1972	Contemporary-style single family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
8342 South Wasatch Blvd (22)	EC/ Eligible	1970	Ranch-style single-family dwelling	All Alternatives	Partial acquisition: 0.03 acres; temporary construction easement: 0.05 acres (W/L)	No adverse effect	Yes/ <i>de minimis</i>	Figure 6
					Partial acquisition: 0.05 acres; temporary construction easement: 0.04 acres (W5L)	No adverse effect	Yes/ <i>de minimis</i>	Figure 6
Ffdfa3454 East Kings Hill Drive (NC17)	NC/ Not eligible	1972	Split-level-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A

3460 East Kings Hill Drive (NC18)	NC/ Not eligible	1972	Split-level-style single-family dwelling	N/A	N/A	N/A	No historic properties affected	N/A	N/A
3484 East Kings Hill Drive (23)	EC/ Eligible	1972	Contemporary-type single-family dwelling	N/A	Property avoided	No historic properties affected	No historic properties affected	No/ N/A	N/A
3492 East Kings Hill Drive (NC19)	NC/ Not eligible	1972	Contemporary-style single family dwelling	N/A	N/A	No historic properties affected	No historic properties affected	N/A	N/A
3510 East Kings Hill Drive (NC20)	NC/ Not eligible	1971	Contemporary-style single family dwelling	N/A	N/A	No historic properties affected	No historic properties affected	N/A	N/A
8376 South Dynasty Way (NC21)	NC/ Not eligible	1949	Minimal Traditional-style, single-family dwelling	N/A	N/A	No Historic Properties Affected	No Historic Properties Affected	N/A	N/A
8530 South Kings Cove Drive (25)	EC/ Eligible	1968	Contemporary-type single-family dwelling	N/A	Property avoided	No historic properties affected	No historic properties affected	No/ N/A	N/A
8542 South Kings Cove Drive (25)	EC/ Eligible	1971	Split-level-style single-family dwelling	N/A	Property avoided	No historic properties affected	No historic properties affected	No/ N/A	N/A
8552 South Kings Cove Drive (NC22)	NC/ Not eligible	1971	Split-level-style single-family dwelling	N/A	N/A	No historic properties affected	No historic properties affected	N/A	N/A
8566-8568 South Wasatch Blvd (26)	EC/ Eligible	1977	American vernacular-style duplex	N/A	Property avoided	No historic properties affected	No historic properties affected	No/ N/A	N/A
8574 South Wasatch Blvd (27)	EC/ Eligible	1977	American vernacular-style duplex	N/A	Property avoided	No historic properties affected	No historic properties affected	No/ N/A	N/A
8566 South Kings Cove Dr (NC23)	NC/ Not eligible	1973	Split-level-style single-family dwelling	N/A	N/A	No historic properties affected	No historic properties affected	N/A	N/A
8565 South Kings Cove Drive (NC24)	NC/ Not eligible	1977	Split-level-style single-family dwelling	N/A	N/A	No historic properties affected	No historic properties affected	N/A	N/A
8590-8592 South Wasatch Boulevard (NV1)	EC/ Eligible	1977	Potential historic age duplex	N/A	Property avoided	No historic properties affected	No historic properties affected	No/ N/A	N/A
8640 South Russell Park (NV2)	EC/ Eligible	1972	Potential historic age single-family dwelling	All Alternatives	Temporary construction easement: 0.06 acres	No adverse effect	No adverse effect	No/ Temporary occupancy	Figure 7

8660 South Alpen Circle (28)	EC/ Eligible	1974	Split-level-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8635 South Russell Park Road (NC25)	NC/ Not eligible	1977	Contemporary-style single family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
8662 South Alpen Circle (29)	EC/ Eligible	1974	Split-level-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8664 South Alpen Circle (30)	EC/ Eligible	1975	Contemporary-style single family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8659 South Grand Oak Drive (31)	EC/ Eligible	1973	Contemporary-style single family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8672 South Alpen Circle (32)	EC/ Eligible	1976	Split-level-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8673 South Grand Oak Drive (NC26)	NC/ Not eligible	1965	Ranch-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
8682 South Alpen Circle (NC27)	NC/ Not eligible	1976	Split-level-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
8730 South Alpen Way (NC28)	NC/ Not eligible	1968	Ranch-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
8742 South Alpen Way (33)	EC/ Eligible	1970	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8754 South Alpen Way (34)	EC/ Eligible	1970	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
3575 East Golden Hills Ave (35)	EC/ Eligible	1968	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8800 South Alpen Way (36)	EC/ Eligible	1976	Ranch-style single-family dwelling	All Alternatives	Partial acquisition: 0.01 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 8
8816 South Alpen Way (37)	EC/ Eligible	1975	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A

8828 South Alpen Way (NC29)	NC/ Not eligible	1972	Ranch-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
8840 South Alpen Way (38)	EC/ Eligible	1975	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8852 South Alpen Way (39)	EC/ Eligible	1972	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8864 South Alpen Way (40)	EC/ Eligible	1971	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8884 South Alpen Way (41)	EC/ Eligible	1976	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8894 South Alpen Way (42)	EC/ Eligible	1976	Contemporary-style single family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8906 South Alpen Way (NC30)	NC/ Not eligible	1976	Contemporary-style single family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
8918 South Alpen Way (NC31)	NC/ Not eligible	1977	Split-level-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
8928 South Alpen Way (NC32)	NC/ Not eligible	1977	Split-level-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
8940 South Alpen Way (43)	EC/ Eligible	1976	American vernacular-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8950 South Alpen Way (44)	EC/ Eligible	1976	Contemporary-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8962 South Alpen Way (45)	EC/ Eligible	1976	Contemporary-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
8974 South Alpen Way (NC33)	NC/ Not eligible	1976	Split-level-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
3573 East Green Hills Drive (NC34)	NC/ Not eligible	1972	Split-level-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A

9008 South 3605 East (46)	EC/ Eligible	1976	Late twentieth-century other-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9018 South 3605 East (47)	EC/ Eligible	1976	Late twentieth-century other-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9005 South 3605 East (48)	EC/ Eligible	1976	Late twentieth-century other-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9015 South 3605 East (49)	EC/ Eligible	1976	Late twentieth-century other-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9025 South 3605 East (50)	EC/ Eligible	1976	Late twentieth-century other-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9035 South 3605 East (51)	EC/ Eligible	1976	Late twentieth-century other-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9041 South 3605 East (52)	EC/ Eligible	1976	Late twentieth-century other-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
3590 East 9050 South (53)	EC/ Eligible	1976	Late twentieth-century other-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
3598 East 9050 South (54)	EC/ Eligible	1976	Late twentieth-century other-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
3604 East 9050 South (55)	EC/ Eligible	1976	Late twentieth-century other-style duplex condominium	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9043 South Despain Way (NC35)	NC/ Not eligible	1971	Ranch-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
9057 South Despain Way (56)	EC/ Eligible	1974	Split-level-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9067 South Despain Way (57)	EC/ Eligible	1974	Contemporary-type single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9075 South Despain Way (58)	EC/ Eligible	1974	Split-level-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A

9046 South Kings Hill Place (59)	EC/ Eligible	1977	Ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9060 South Kings Hill Place (NC36)	NC/ Not eligible	1977	Contemporary-style single family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
9086 South Kings Hill Place (60)	EC/ Eligible	1978	Contemporary-style single family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9338 South North Little Cottonwood Road (84)	ES/ Eligible	1908	Victorian Eclectic-style side-passage type single-family dwelling	GB COG	Partial acquisition: 0.04 acres Partial acquisition: 0.04 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 26
3742 East North Little Cottonwood Road (61)	ES/ Eligible	1898	Victorian Eclectic-style single-family dwelling	PPSL GB COG	Temporary construction easement: 0.19 acres Partial acquisition: 0.4336 acres Partial acquisition: 0.4336 acres	No adverse effect No adverse Effect	No/ Temporary occupancy Yes/ <i>de minimis</i>	Figure 9 Figure 27 Figure 30
3744 East North Little Cottonwood Road (NC37)	NC/ Not eligible	1975	Ranch-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
4261 Little Cottonwood Road (NV3)	EC/ Eligible	1973	Potential historic age single-family dwelling	GB COG	Partial acquisition: 0.05 acres Perpetual easement: 0.153 acres Partial acquisition: 0.03 acres	No adverse effect No adverse effect	Yes/ <i>de minimis</i> Yes/ <i>de minimis</i>	Figure 28 Figure 31
4306 Little Cottonwood Road (62)	EC/ Eligible	1947	Early ranch-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A

4700 East Little Cottonwood Canyon (63)	EC/ Eligible	1934	Temple Granite Quarry Historical Marker	PPSL	Temporary construction easement: 0.71 acres	No adverse effect	No/ Temporary occupancy	Figure 10
4526 East Little Cottonwood Canyon (64)	EC/ Eligible	1930	Twentieth-century other-style hydroelectric energy facility (Whitmore Power Plant)	COG	Temporary construction easement: 0.14 acres	No adverse effect	No/ Temporary occupancy	Figure 32
				PPSL	Temporary construction easement: 0.01 acres	No adverse effect	No/ Temporary occupancy	Figure 11
4883 East Wasatch Resort Road (NC38)	NC/ Not eligible	1945	Shed-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
4921 East Granite Cliffs Road (NC39)	NC/ Not eligible	1926	I-house-type single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
4964 East Little Cottonwood Road (NV4)	EC/ Eligible	—	—	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
4945 East Granite Cliffs Road (65)	EC/ Eligible	1975	Shed-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
4967 East Granite Cliffs Road (NC40)	NC/ Not eligible	1925	Colonial Revival-style single-family dwelling	N/A	N/A	No historic properties affected	N/A	N/A
5002 East Little Cottonwood Canyon (66)	EC/ Eligible	1936	Tudor-style single-family dwelling	PPSL	Temporary construction easement: 0.02 acres	No adverse effect	No/ Temporary occupancy	Figure 12
5070 East Granite Cliffs Road (NC41)	NC/ Not eligible	1930	Single-family dwelling with no style, but it features elements of Period Revival and ranch styles	N/A	N/A	No historic properties affected	N/A	N/A
6279 East Little Cottonwood Road (NV5)	EC/ Eligible	1968	Potential historic age commercial building	PPSL	Partial acquisition: 0.06 acres; temporary construction easement: 0.82 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 13
				GA, GB	Partial acquisition: 0.15 acres; perpetual easement: 2.01 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 21

77490 E Little Cottonwood Rd (NC42)	NC/ Not eligible	1950	Park Service Modern-style toll both	COG	Partial acquisition: 2.22 acres; temporary construction easement: 1.23 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 33
9111 East Little Cottonwood (67)	ES/ Eligible	1970	Organic-style single dwelling	PPSL	Partial acquisition: less than 0.01 acres; temporary construction easement: 0.01 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 14
				COG	Partial acquisition: 0.08 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 34
9121 East Snowbird Center Drive (68)	ES/ Eligible	1975	Brutalist-style timeshare/condominium (Iron Blossam Lodge)	PPSL	Partial acquisition: 0.12 acres; temporary construction easement: 0.13 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 15
				GA, GB	Visual	No adverse effect	No/ N/A	N/A
				COG	Partial acquisition: 0.36 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 35
9180 East Lodge Drive (69)	EC/ Eligible	1967	Brutalist-style condominium	PPSL	Partial acquisition: 0.05 acres; temporary construction easement: 0.03 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 16
9202 East Lodge Drive (70)	EC/ Eligible	1971	Brutalist-style hotel/condominium (The Inn at Snowbird)	PPSL,	Partial acquisition: less than 0.01 acres; temporary construction easement: less than 0.01 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 17
				GA, GB	Perpetual easement: 0.01 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 22

9260 East Lodge Drive (71)	ES/ Eligible	1970	Brutalist-style hotel/condominium (The Lodge at Snowbird)	PPSL,	Partial acquisition: 0.1 acres; temporary construction easement: 0.35 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 18
				GA, GB	Perpetual Easement: 0.40 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 23
9385 South Snowbird Center Drive (72)	ES/ Eligible	1977	Brutalist-style Commercial and Recreation/Culture building (Snowbird Center)	PPSL	Partial acquisition: 0.05 acres; temporary construction easement: 0.78 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 19
				GA, GB	Partial acquisition: 0.15 acres; perpetual easement: 1.31 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 24
				COG	Partial acquisition: 1.61 acres; temporary construction easement: 0.02 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 36
9320 South Cliff Lodge Drive (73)	ES/ Eligible	1974	Brutalist-style hotel/condominium (Cliff Lodge)	GA, GB	Visual	No adverse effect	No/ N/A	N/A
9425 East Bypass Road (74)	EC/ Eligible	1975	Brutalist-style apartment/condominium	PPSL	Partial acquisition: less than 0.01 acres; temporary construction easement: 0.01 acres	No adverse effect	Yes/ <i>de minimis</i>	Figure 20
9650 East Little Cottonwood (75)	EC/ Eligible	1970	Shed-style condominium unit (Hellgate Condominiums)	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9670 East Little Cottonwood (76)	EC/ Eligible	1970	Shed-style condominium unit (Hellgate Condominiums)	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
9920 East Peruvian Acre Road (77)	EC/ Eligible	1978	Side-gabled, vernacular-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A

9931 East Peruvian Acre Road (78)	EC/ Eligible	1978	Vernacular (chalet-style) single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
10000 East Little Cottonwood (79)	ES/ Eligible	1945	Mansard-style hotel (Alta Peruvian Lodge)	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
?10161 East Little Cottonwood (80)	EC/ Eligible	1965	Contemporary-style single family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
10160 East Little Cottonwood (81)	EC/ Eligible	1960	Late-twentieth century other-style hotel (Goldminer's Daughter)	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
10220 East Little Cottonwood (NC43)	NC/ Not eligible	1968	Vernacular ski shop/commercial building (Deep Powderhouse)	N/A	N/A	No historic properties affected	N/A	N/A
10230 East Little Cottonwood (82)	ES/ Eligible	1939	Swiss chalet and International style hotel (Alta Lodge)	GA, GB	Partial acquisition: 0.06 acres; perpetual easement: 0.35 acres; visual	No adverse effect	Yes/ <i>de minimis</i>	Figure 25
10231 East Little Cottonwood (83)	EC/ Eligible	1968	Restaurant with modern stylistic elements (Shallow Shaft), and two-story shed-style single-family dwelling	N/A	Property avoided	No historic properties affected	No/ N/A	N/A
10380 East Little Cottonwood (NC44)	NC/ Not eligible	1973	Brutalist-style hotel (Rustler Lodge)	N/A	N/A	No historic properties affected	N/A	N/A
?10499 East Little Cottonwood (NC45)	NC/ Not eligible	1918	Mine adit (Bay City Tunnel)	N/A	N/A	No historic properties affected	N/A	N/A

Alternative Abbreviations

Action Alternatives (main alternatives being evaluated in detail)

EBS	Enhanced Bus Service
PPSL	Peak-period Shoulder Lane Alternative
GA	Gondola Alternative A
GB	Gondola Alternative B
COG	Cog Rail Alternative

Sub-alternatives (alternative options that fall under action alternatives)

WIL	Wasatch Boulevard Imbalanced-lane Alternative (could apply to all action alternatives)
W5L	Wasatch Boulevard Five-lane Alternative (could apply to all action alternatives)

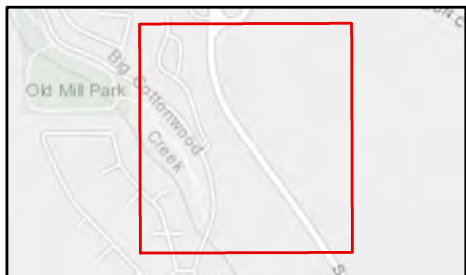


**Mobility Hub Gravel
Pit Alternative:
4.01 Acres**

6851 S BIG
COTTONWOODCYN
ID # 1

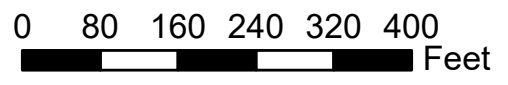
110.0 ft

67.8 ft

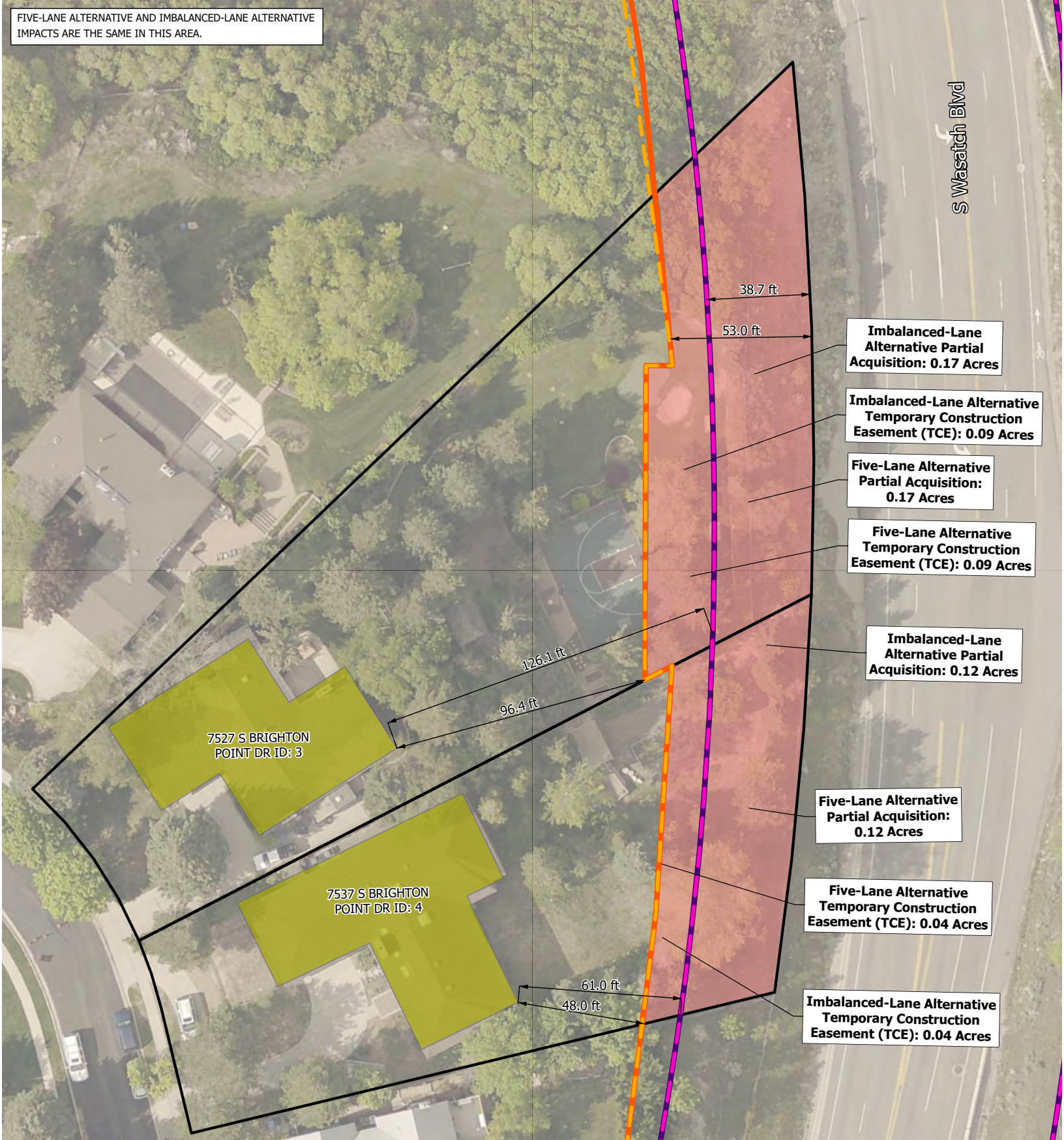


- NRHP-Eligible Historic Building
- Impacted Area
- Historic Parcels
- Gravel Pit Interchange

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



FIVE-LANE ALTERNATIVE AND IMBALANCED-LANE ALTERNATIVE IMPACTS ARE THE SAME IN THIS AREA.



S Wasatch Blvd

Imbalanced-Lane Alternative Partial Acquisition: 0.17 Acres

Imbalanced-Lane Alternative Temporary Construction Easement (TCE): 0.09 Acres

Five-Lane Alternative Partial Acquisition: 0.17 Acres

Five-Lane Alternative Temporary Construction Easement (TCE): 0.09 Acres

Imbalanced-Lane Alternative Partial Acquisition: 0.12 Acres

Five-Lane Alternative Partial Acquisition: 0.12 Acres

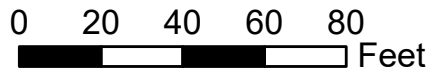
Five-Lane Alternative Temporary Construction Easement (TCE): 0.04 Acres

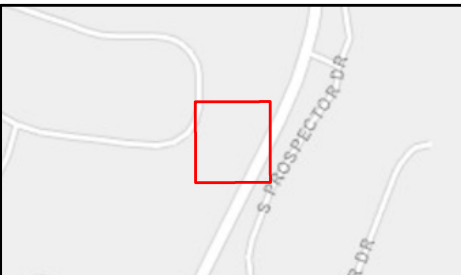
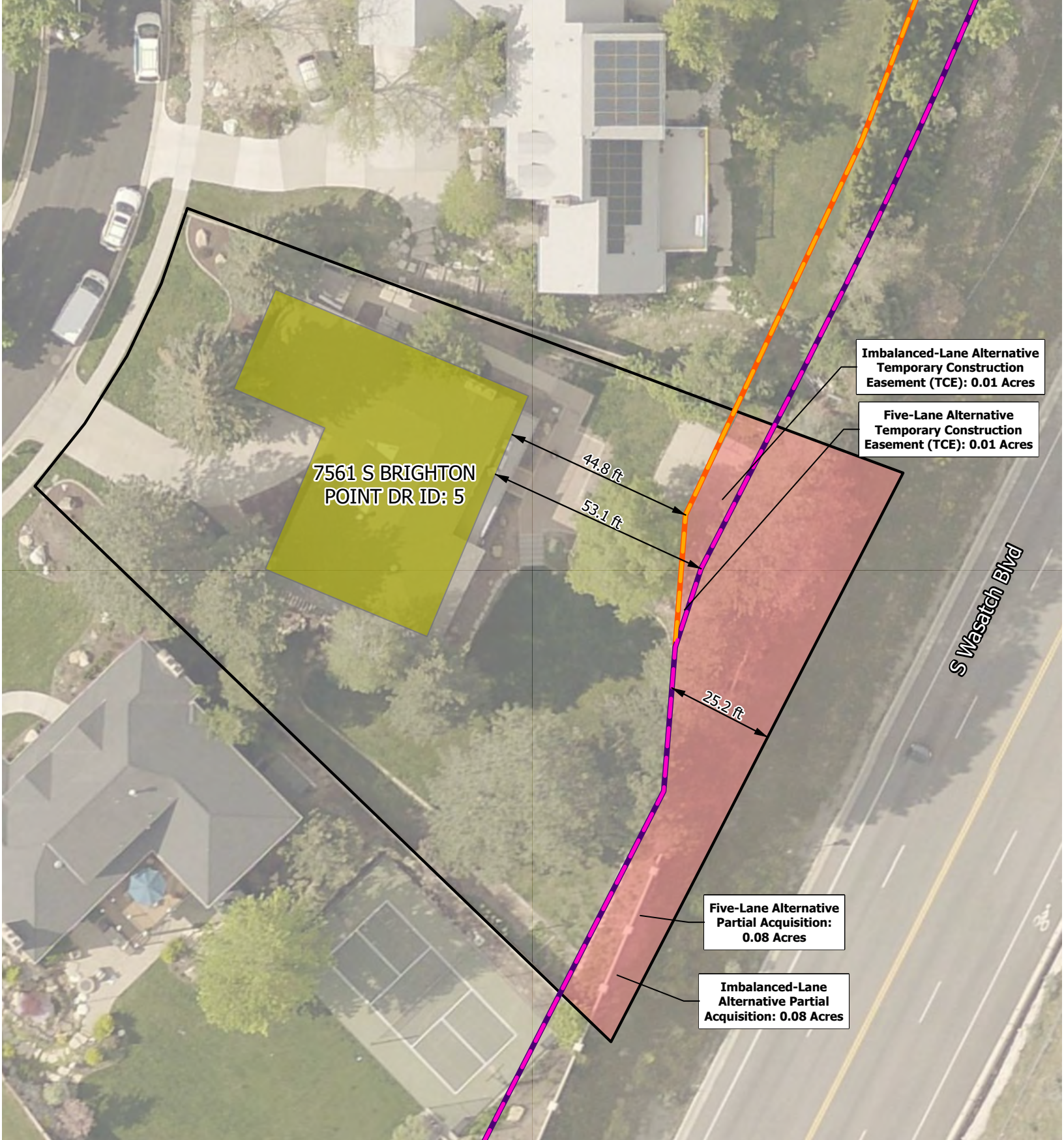
Imbalanced-Lane Alternative Temporary Construction Easement (TCE): 0.04 Acres



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Five-Lane Alternative TCE
- Five-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative TCE

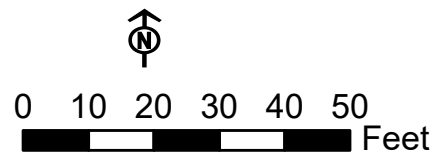
LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT

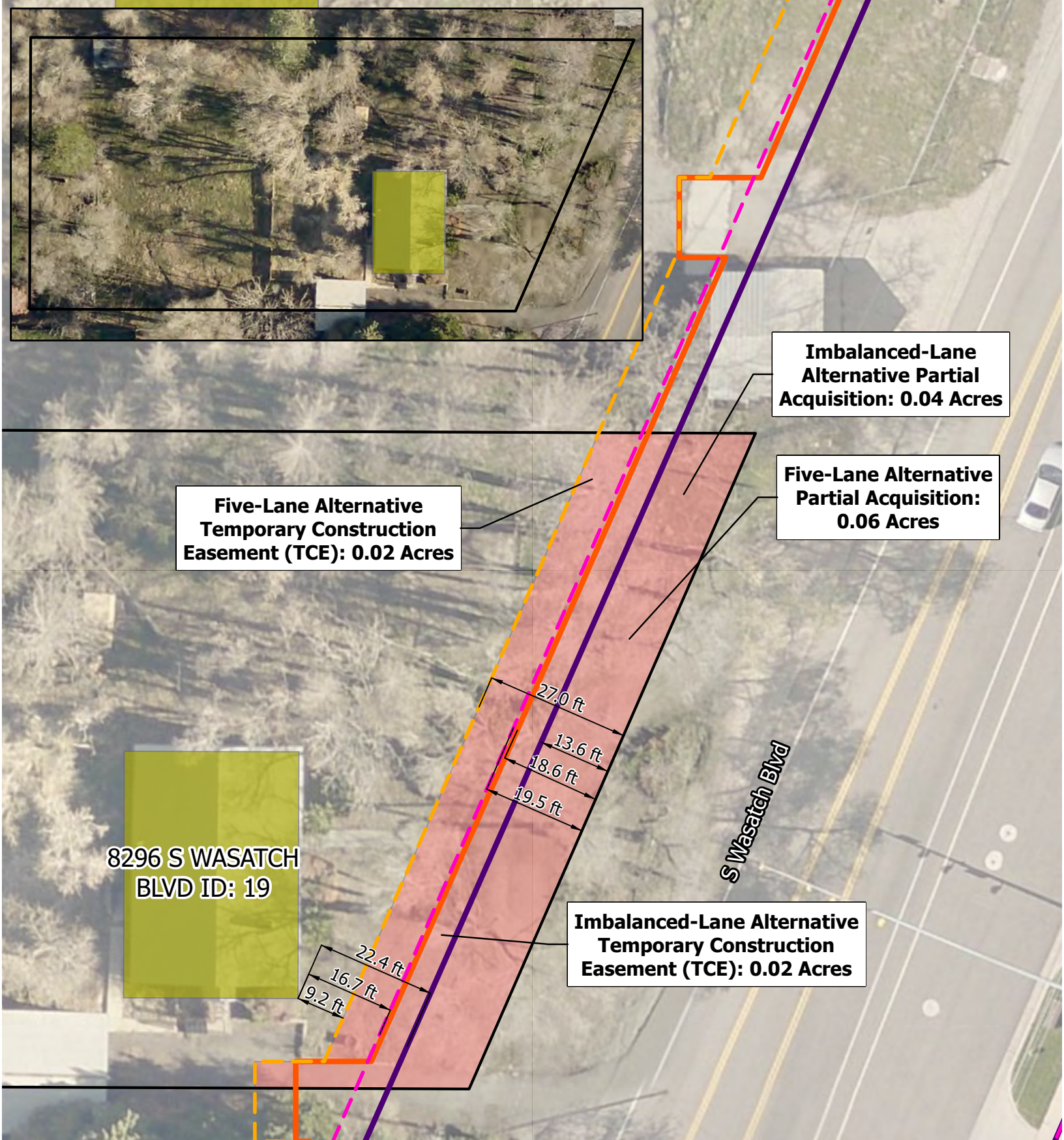




- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Five-Lane Alternative TCE
- Five-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative TCE

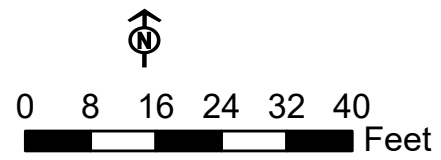
LITTLE COTTONWOOD CANYON EIS
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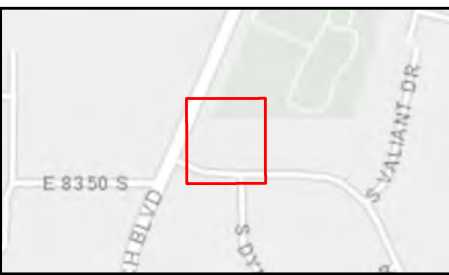
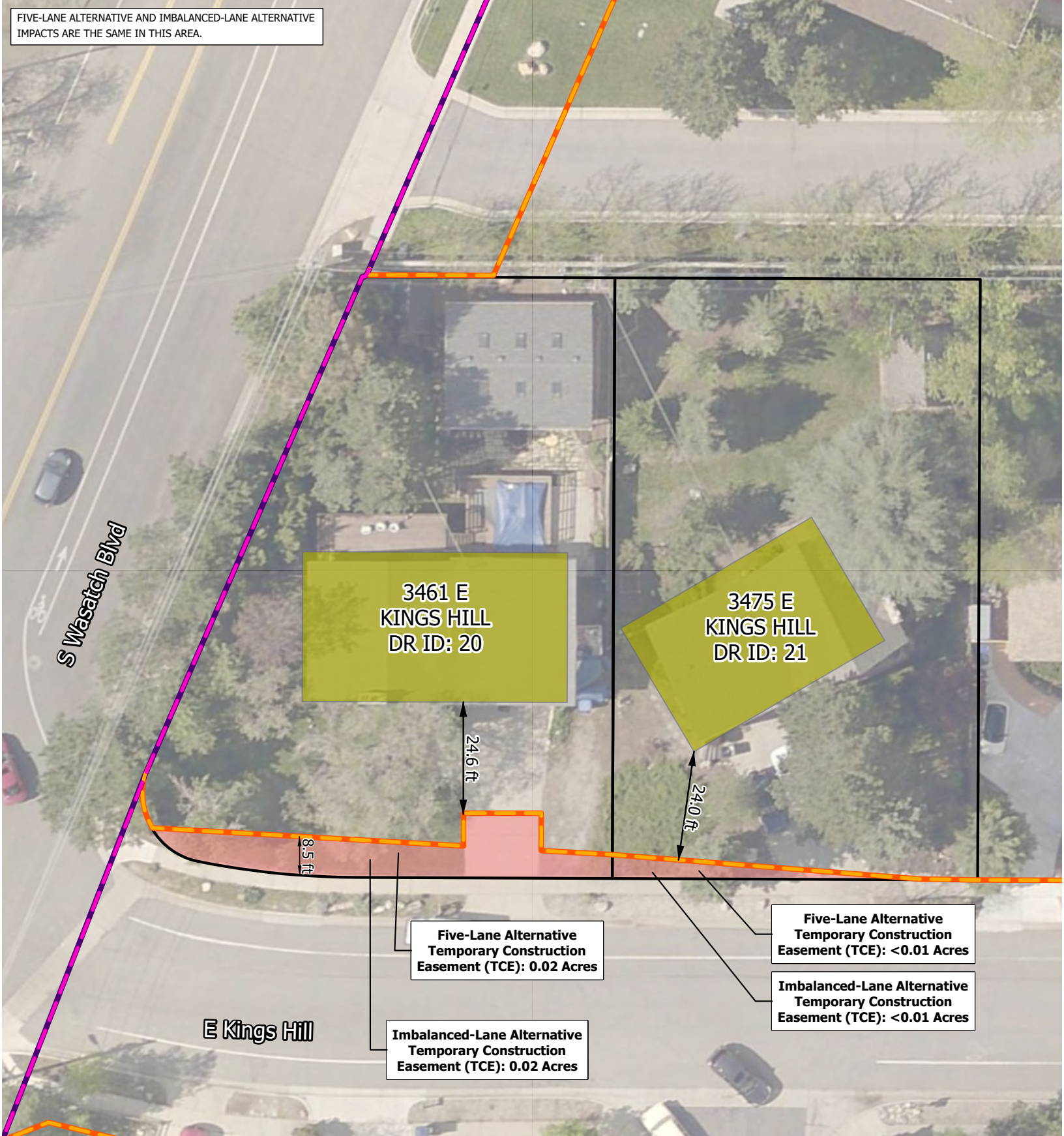


- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Five-Lane Alternative TCE
- Five-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative TCE

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT

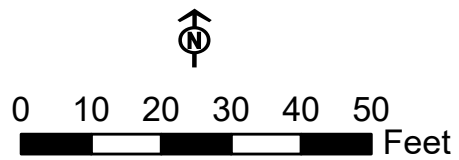


FIVE-LANE ALTERNATIVE AND IMBALANCED-LANE ALTERNATIVE IMPACTS ARE THE SAME IN THIS AREA.



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Five-Lane Alternative TCE
- Five-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative TCE

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





**Five-Lane Alternative
Temporary Construction
Easement (TCE): 0.04 Acres**

**Imbalanced-Lane Alternative
Temporary Construction
Easement (TCE): 0.05 Acres**

**Imbalanced-Lane
Alternative Partial
Acquisition: 0.03 Acres**

**Five-Lane
Alternative Partial
Acquisition: 0.05 Acres**

8342
S WASATCH
BLVD ID: 22

S Wasatch Blvd

16.9 ft
12.4 ft

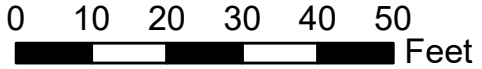
25.3 ft
20.4 ft

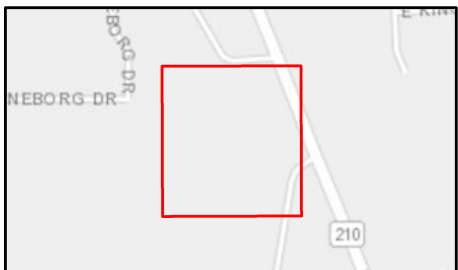
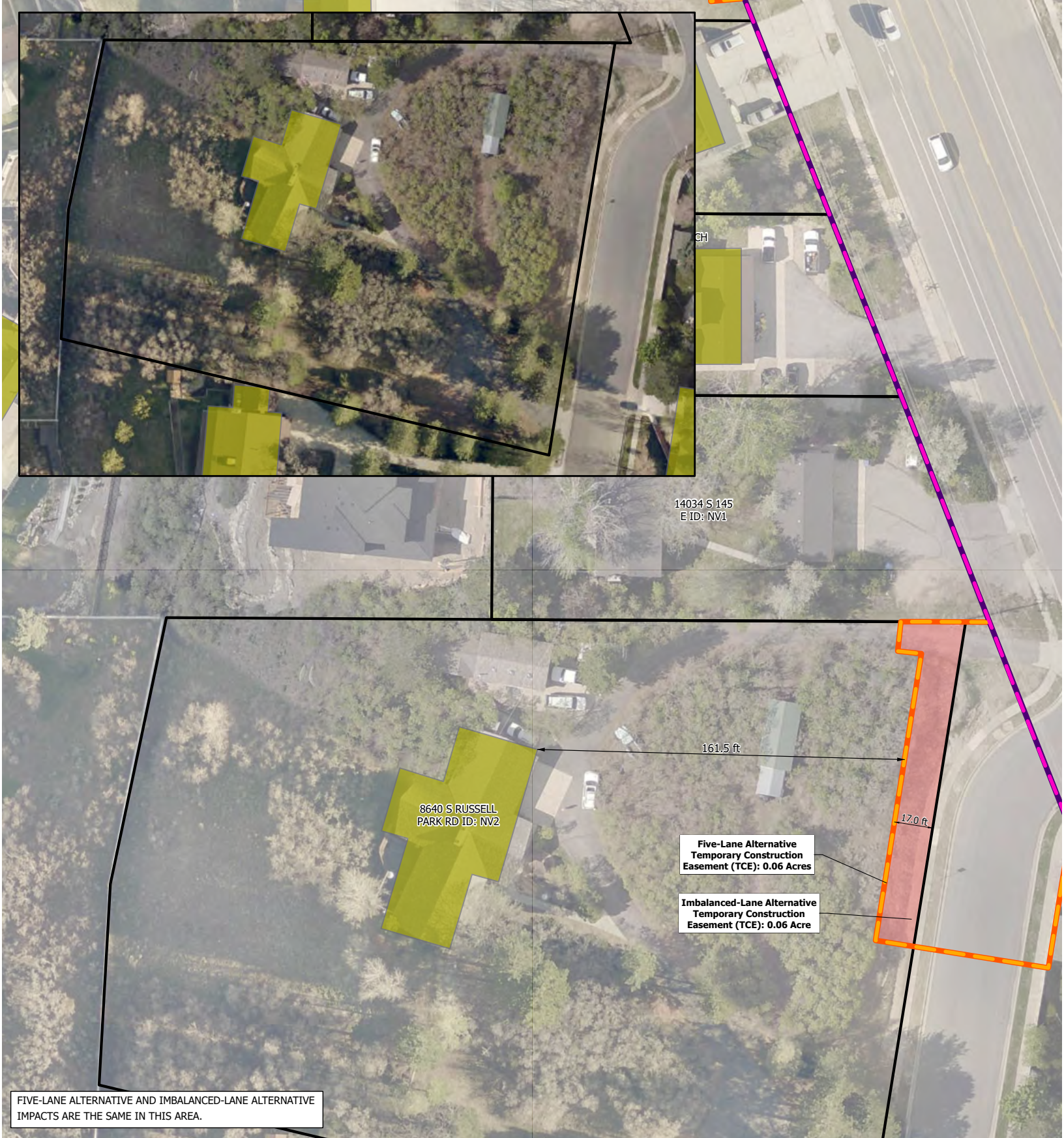
15.4 ft
20.4 ft



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Five-Lane Alternative TCE
- Five-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative TCE

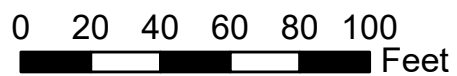
LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Five-Lane Alternative TCE
- Five-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative TCE

**LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT**



FIVE-LANE ALTERNATIVE AND IMBALANCED-LANE ALTERNATIVE IMPACTS ARE THE SAME IN THIS AREA.

Five-Lane Alternative Partial Acquisition: 0.01 Acres

Imbalanced-Lane Alternative Partial Acquisition: 0.01 Acres

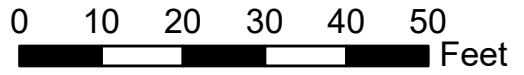


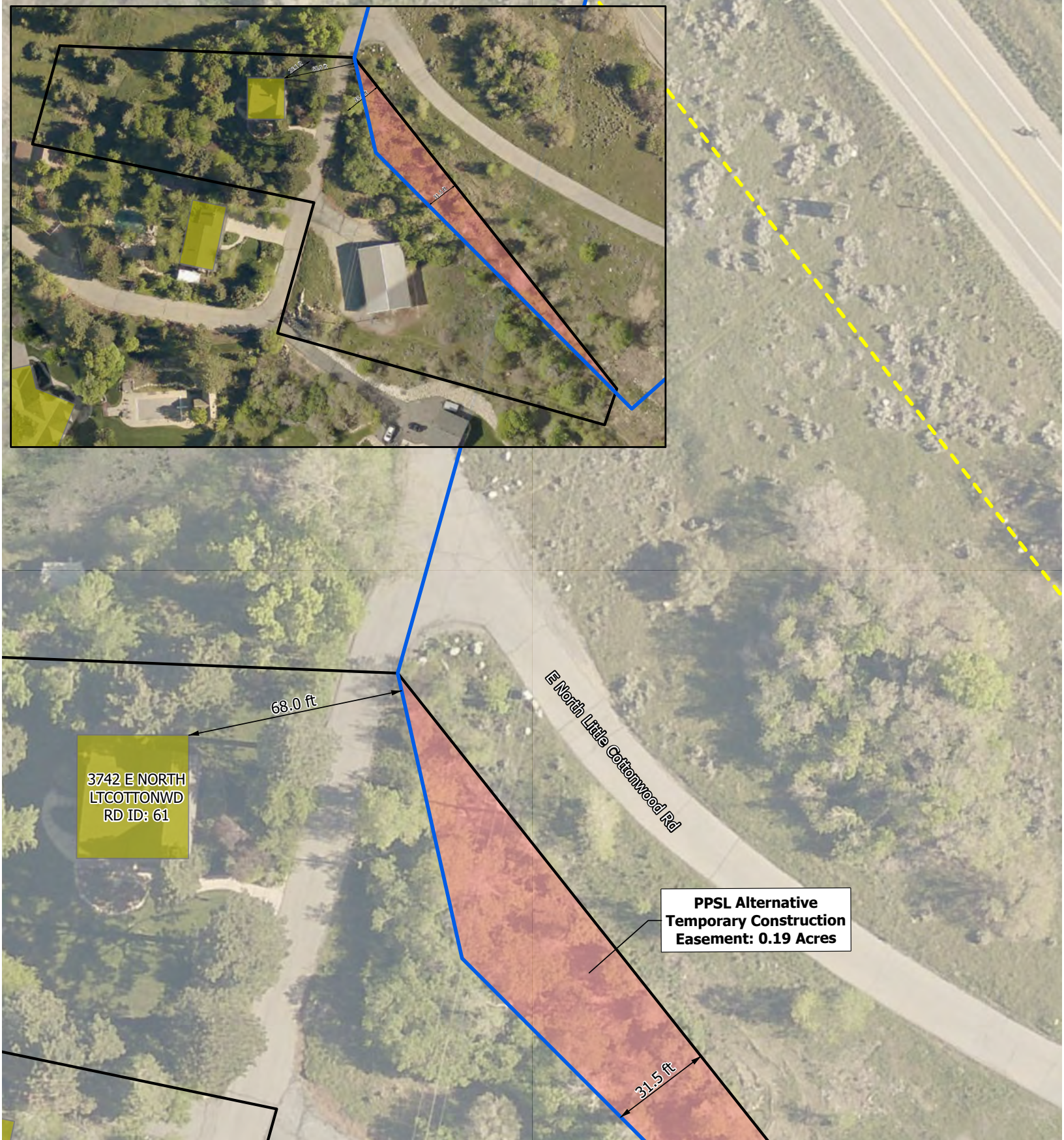
**8800 S ALPEN
WY ID: 36**



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Five-Lane Alternative TCE
- Five-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative Partial Acquisition
- Imbalanced-Lane Alternative TCE

**LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT**





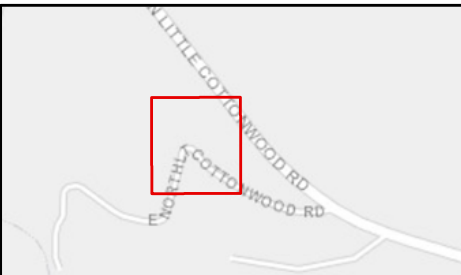
**PPSL Alternative
Temporary Construction
Easement: 0.19 Acres**

**3742 E NORTH
LTCOTTONWD
RD ID: 61**

68.0 ft

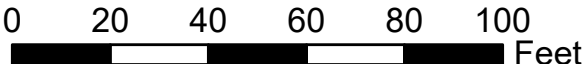
31.5 ft

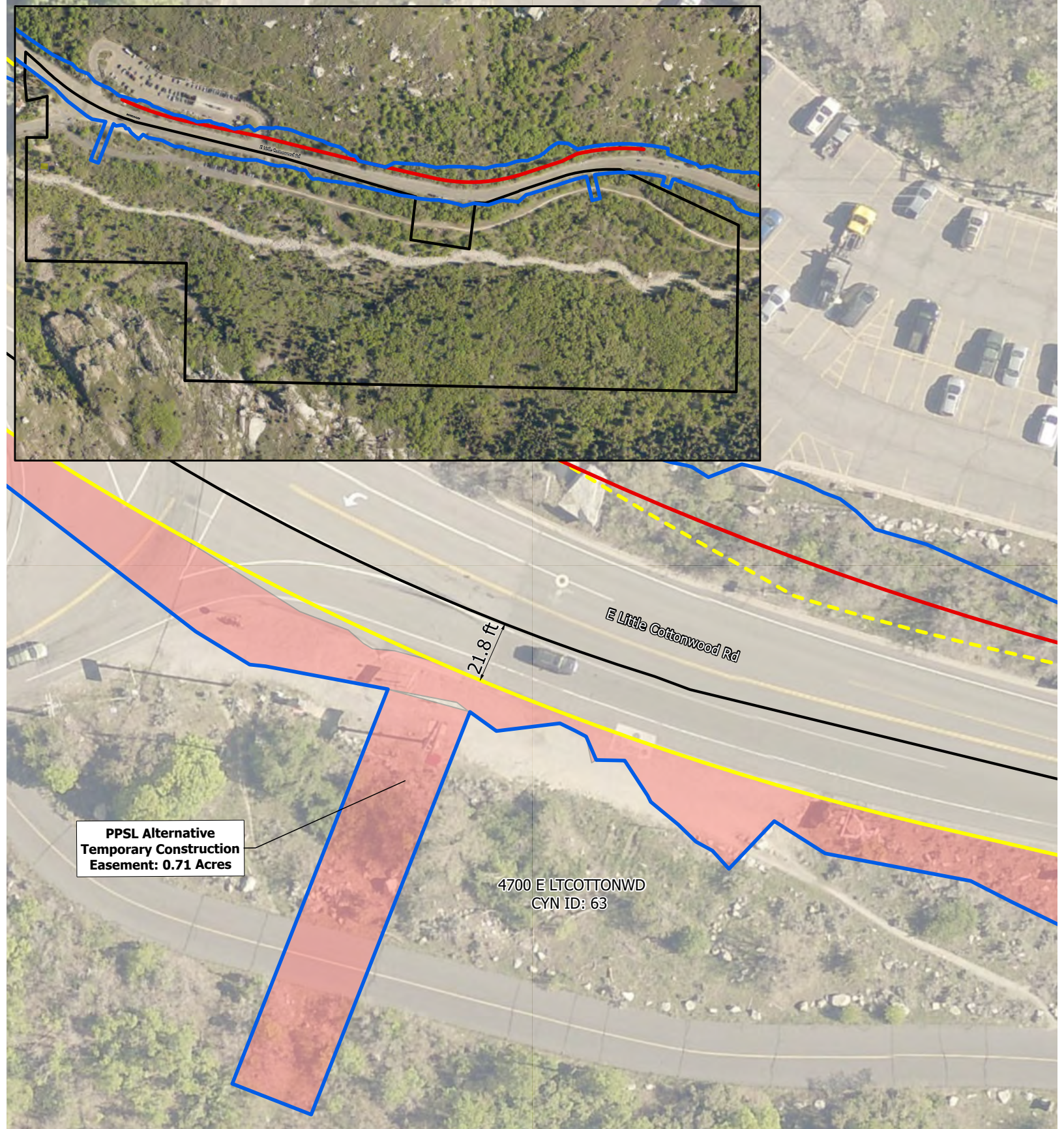
E North Little Cottonwood Rd



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





**PPSL Alternative
Temporary Construction
Easement: 0.71 Acres**

4700 E LTCOTTONWD
CYN ID: 63

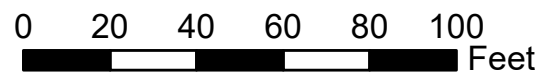
21.8 ft

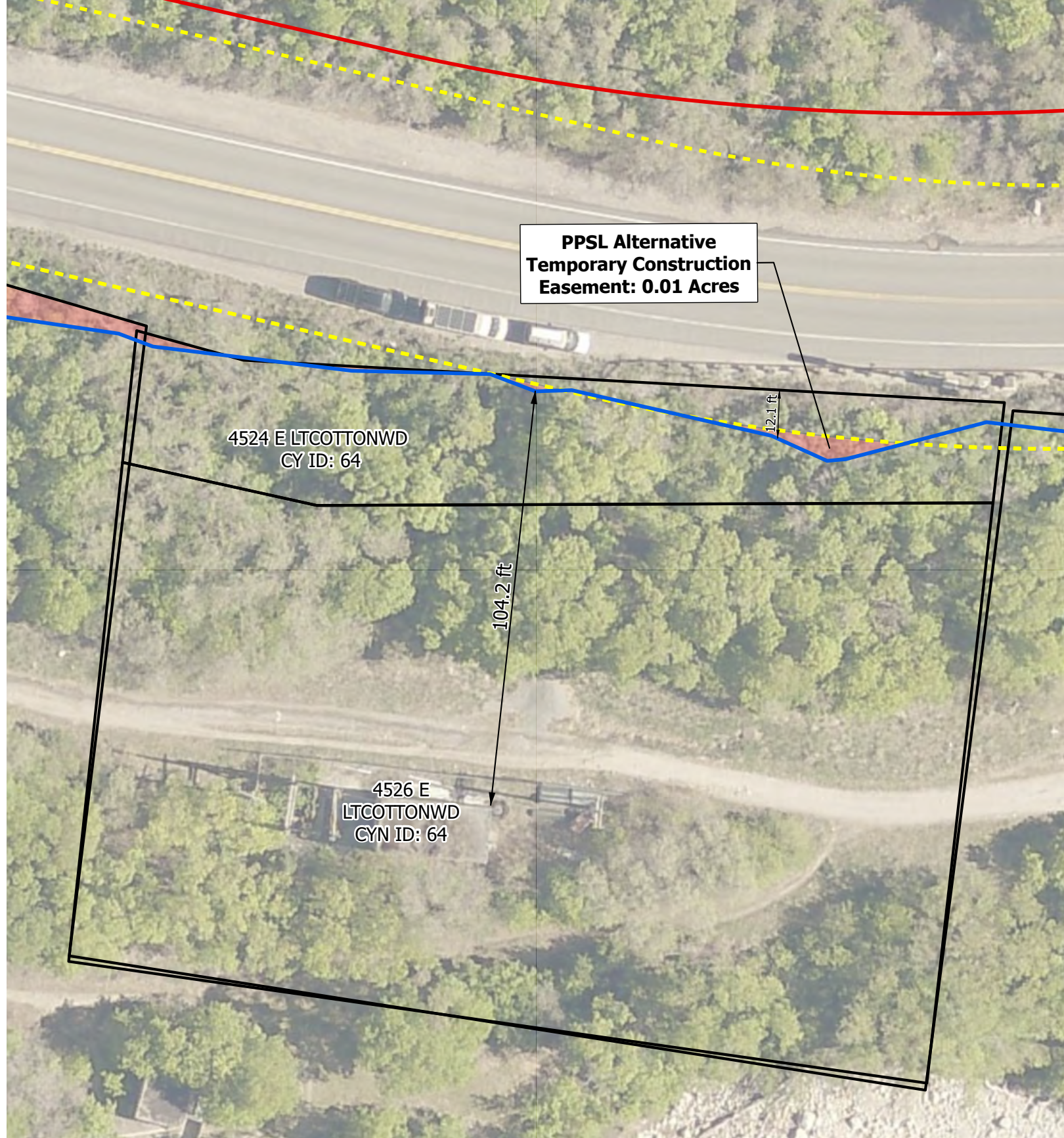
E Little Cottonwood Rd



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





**PPSL Alternative
Temporary Construction
Easement: 0.01 Acres**

4524 E LTCOTTONWD
CY ID: 64

4526 E
LTCOTTONWD
CYN ID: 64

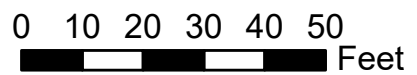
104.2 ft

12.1 ft



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





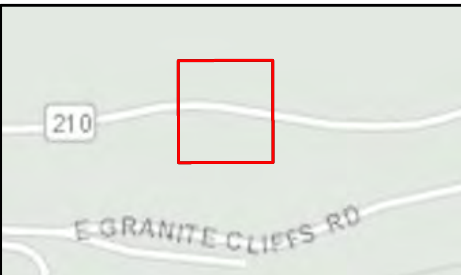
E Little Cottonwood Rd

**PPSL Alternative
Temporary Construction
Easement: 0.02 Acres**

5002 E
LTCOTTONWD
CYN ID: 66

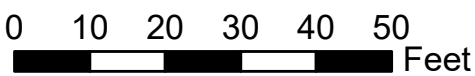
3.4 ft

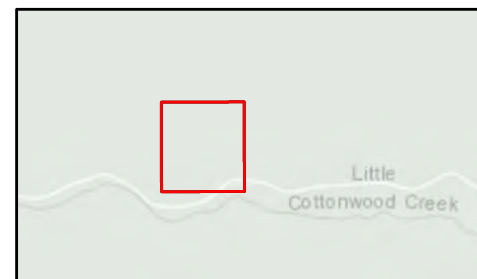
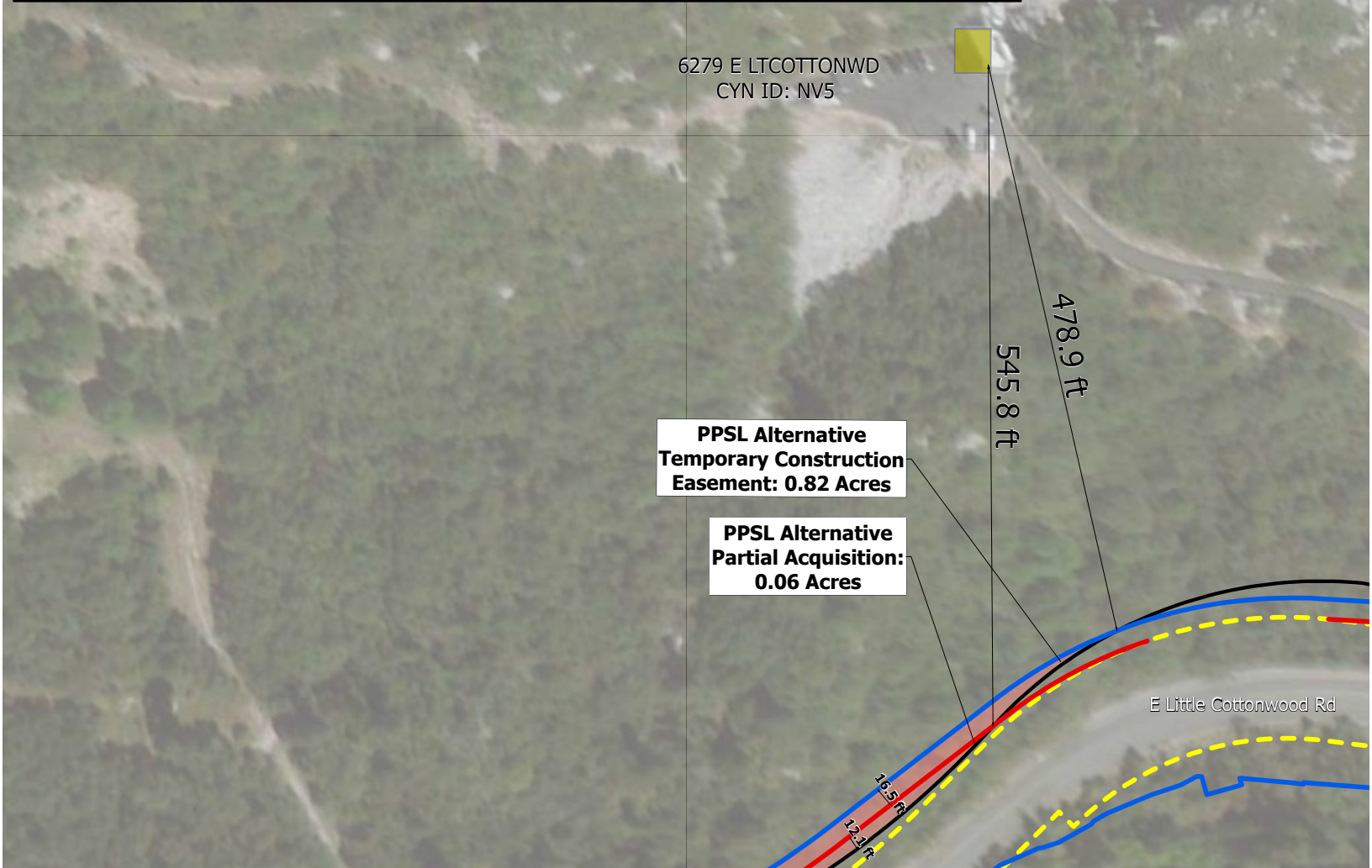
6.9 ft



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

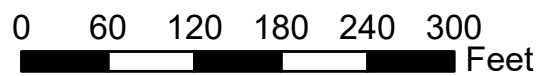
LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT

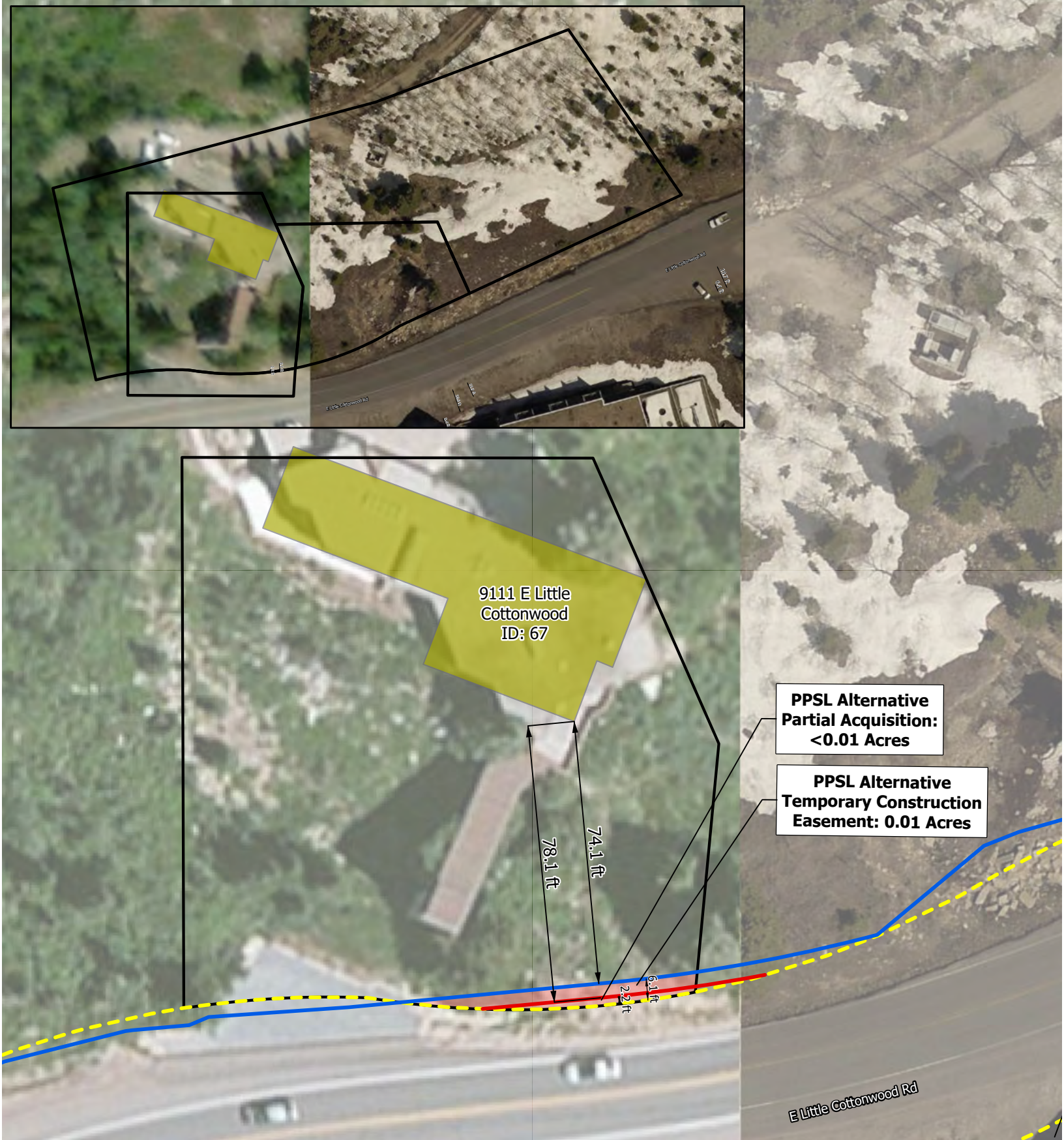




- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

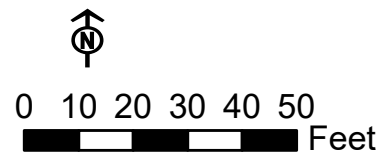
LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT

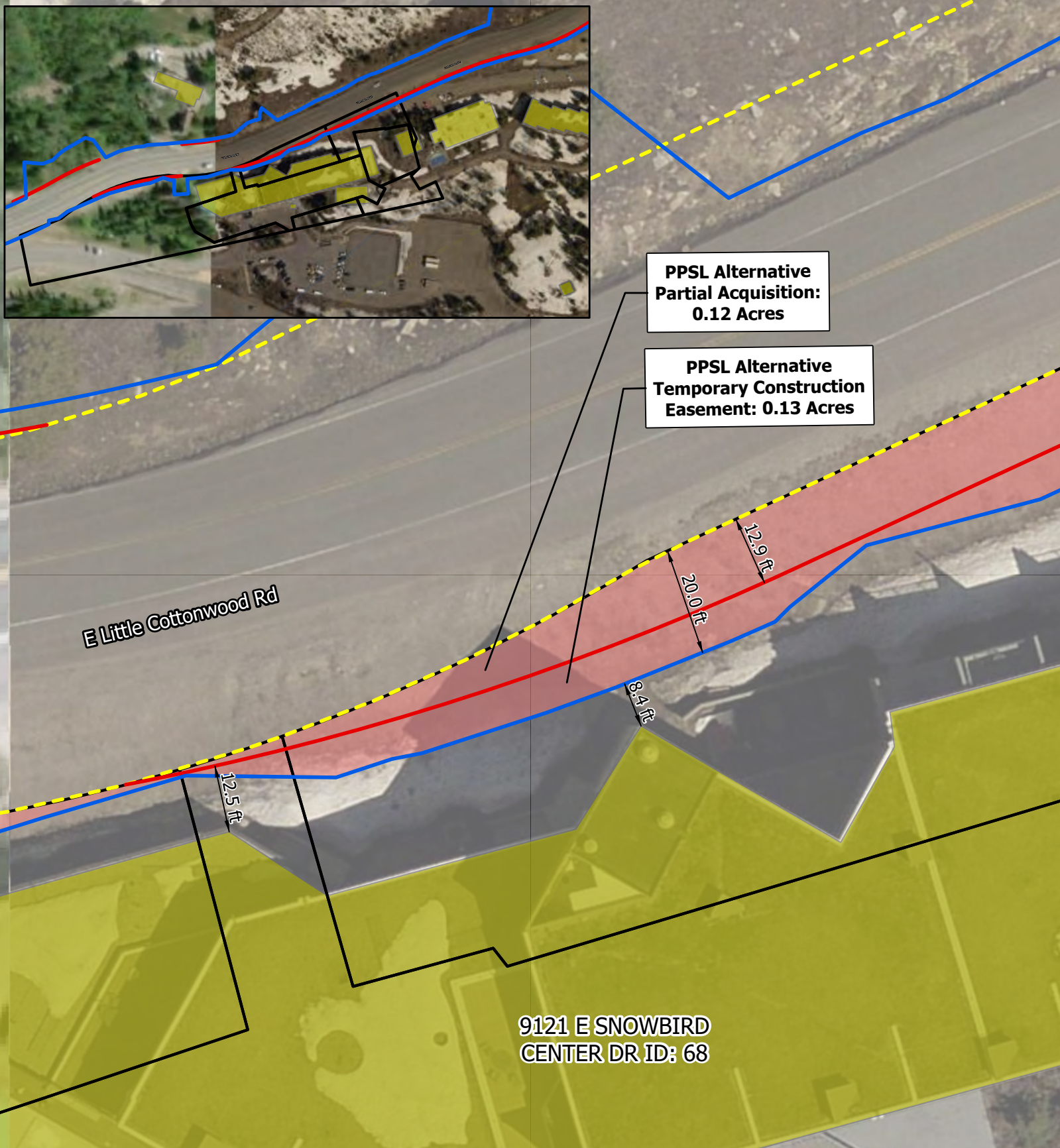




- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



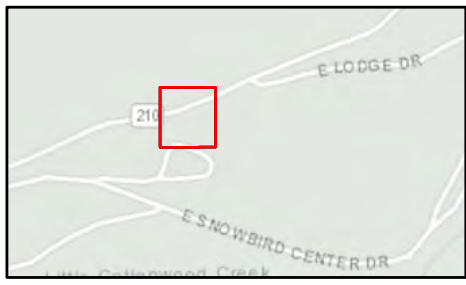


**PPSL Alternative
Partial Acquisition:
0.12 Acres**

**PPSL Alternative
Temporary Construction
Easement: 0.13 Acres**

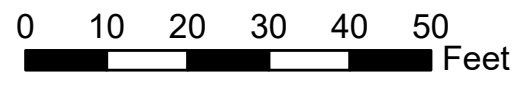
E Little Cottonwood Rd

**9121 E SNOWBIRD
CENTER DR ID: 68**



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

**LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT**





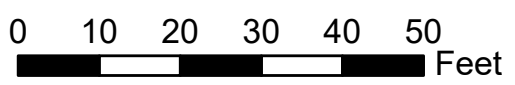
PPSL Alternative Partial Acquisition: 0.05 Acres

PPSL Alternative Temporary Construction Easement: 0.03 Acres



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT

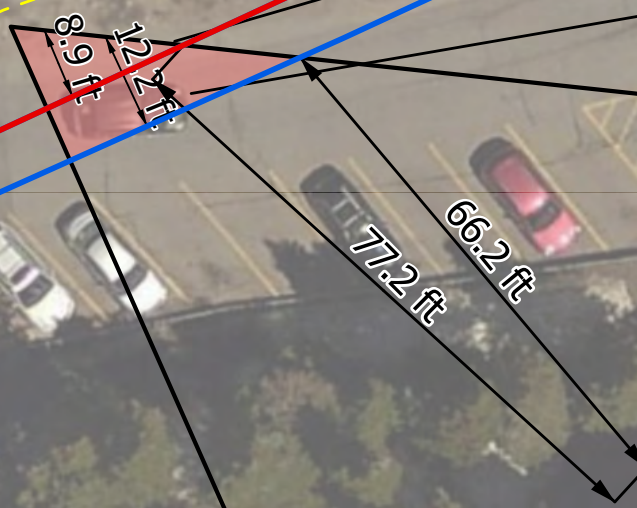




E Little Cottonwood Rd

PPSL Alternative Partial Acquisition: <0.01 Acres

PPSL Alternative Temporary Construction Easement: <0.01 Acres



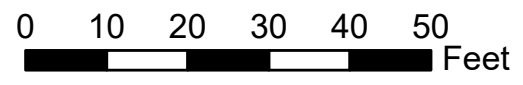
9202 E LODGE DR # 101 ID: 70

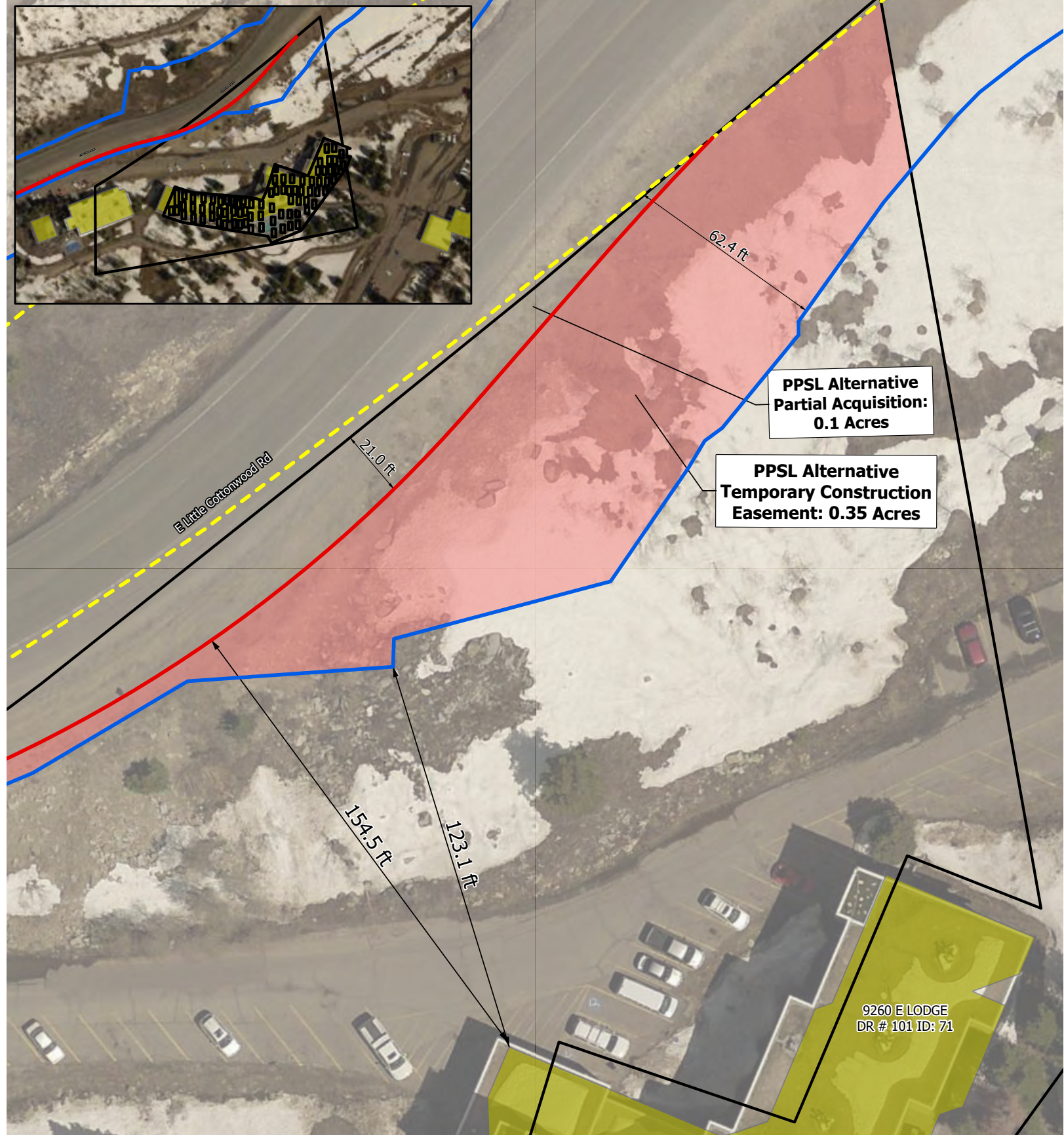
9180 E LODGE DR ID: 69



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





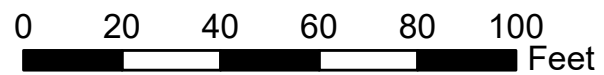
**PPSL Alternative
Partial Acquisition:
0.1 Acres**

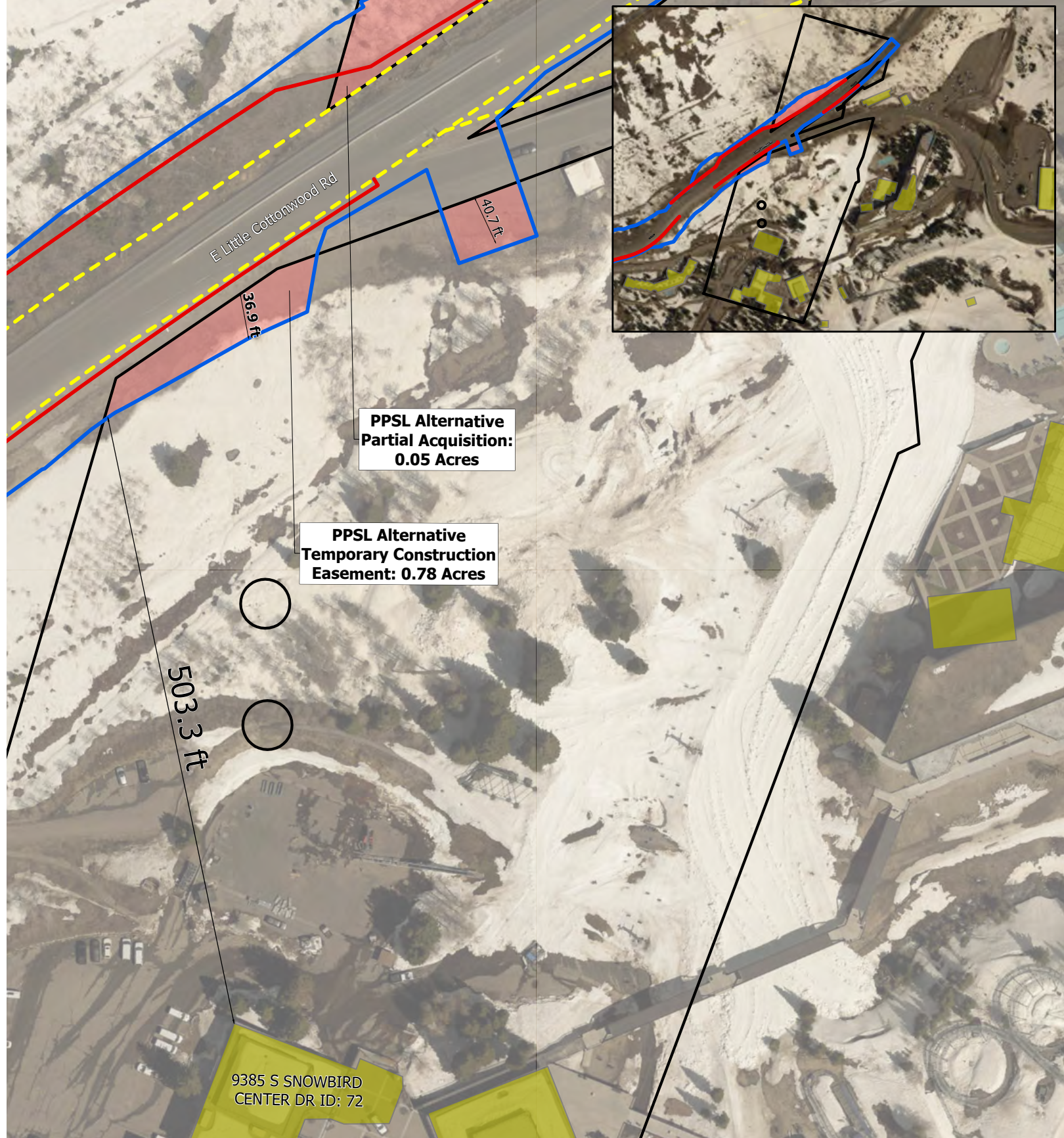
**PPSL Alternative
Temporary Construction
Easement: 0.35 Acres**



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





**PPSL Alternative
Partial Acquisition:
0.05 Acres**

**PPSL Alternative
Temporary Construction
Easement: 0.78 Acres**

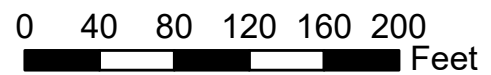
503.3 ft

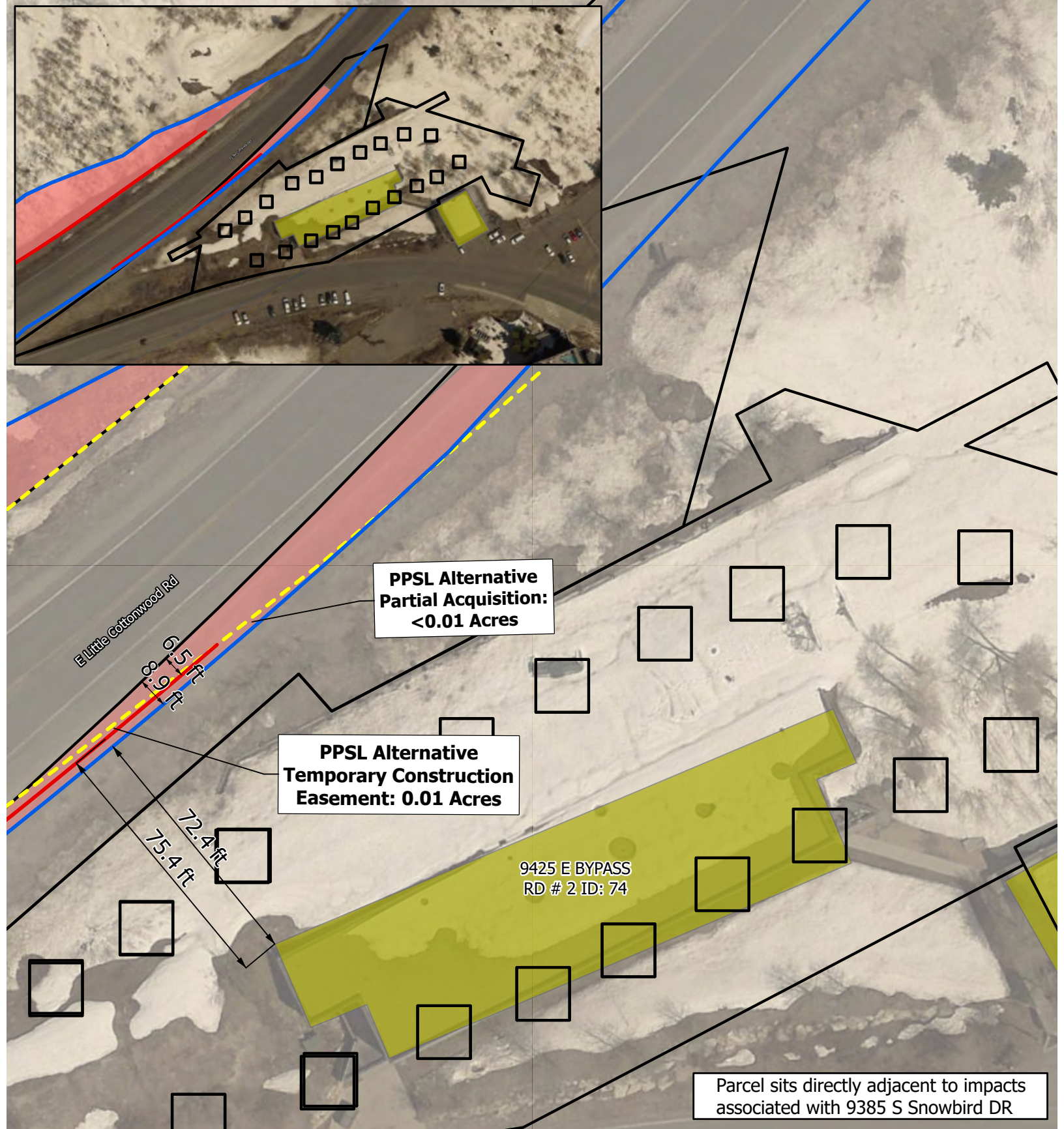
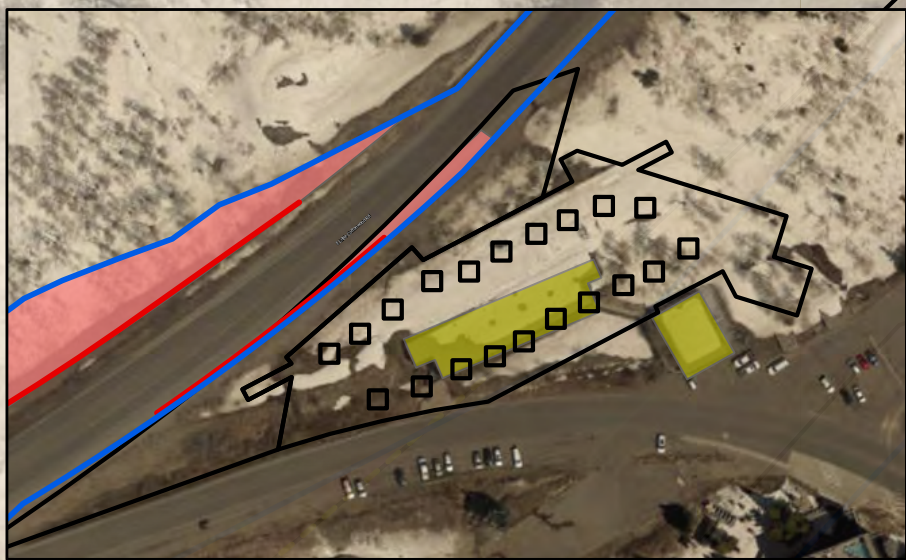
9385 S SNOWBIRD
CENTER DR ID: 72



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



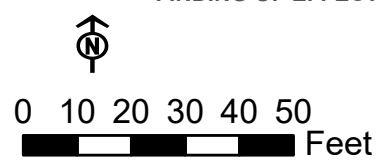


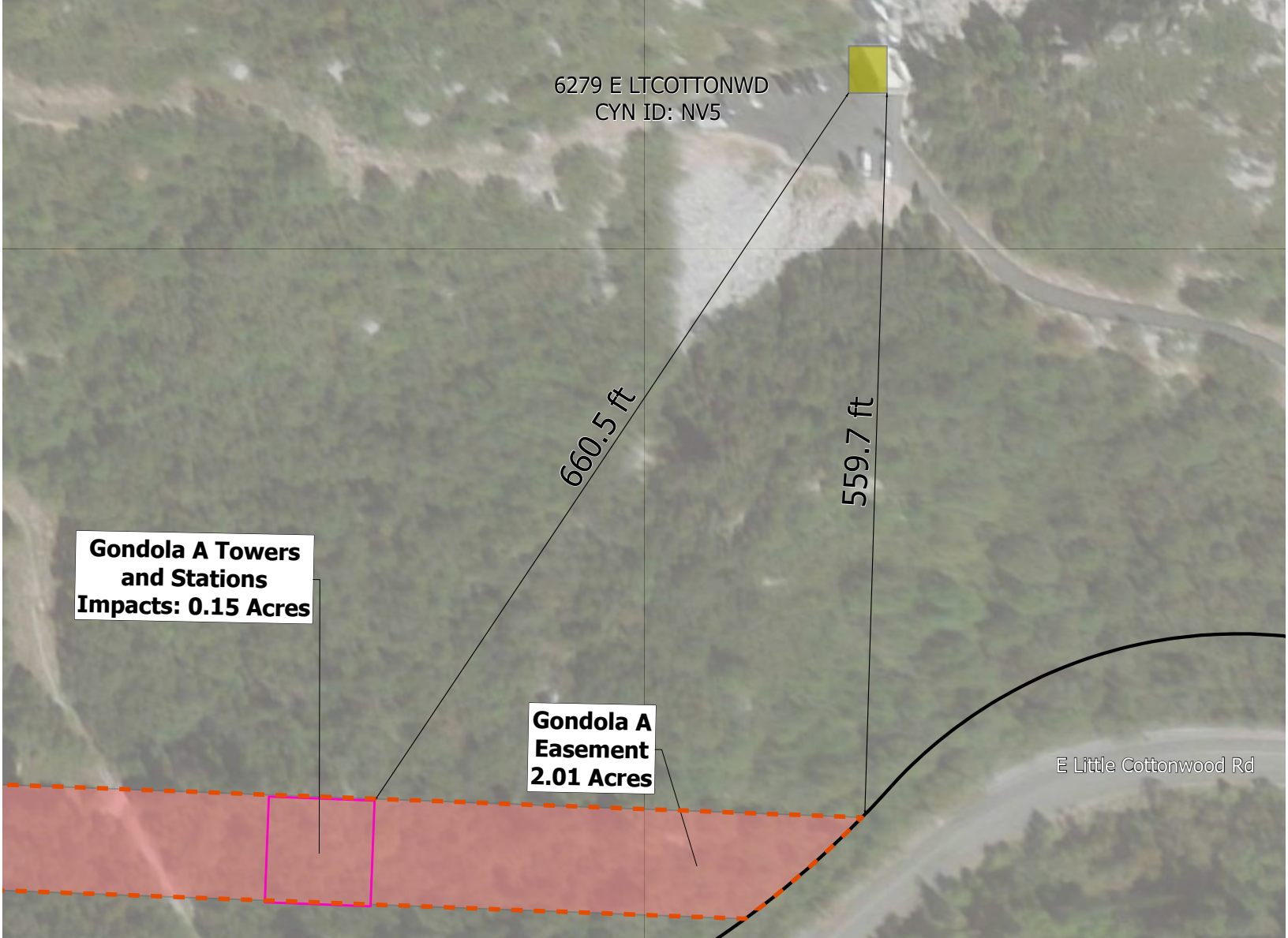
Parcel sits directly adjacent to impacts associated with 9385 S Snowbird DR



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- PPSL New ROW
- PPSL Easement
- PPSL Existing ROW

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





**Gondola A Towers and Stations
Impacts: 0.15 Acres**

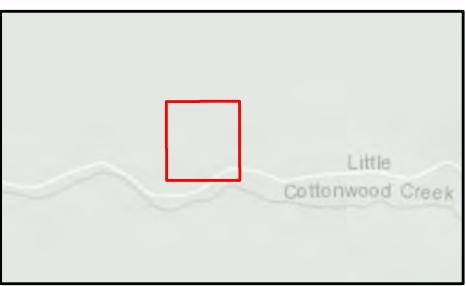
**Gondola A Easement
2.01 Acres**

6279 E LTCOTTONWD
CYN ID: NV5

E Little Cottonwood Rd

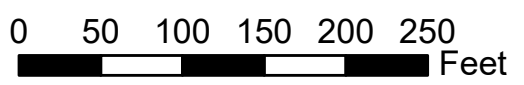
660.5 ft

559.7 ft



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Gondola A Towers and Stations
- Easement Boundary

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



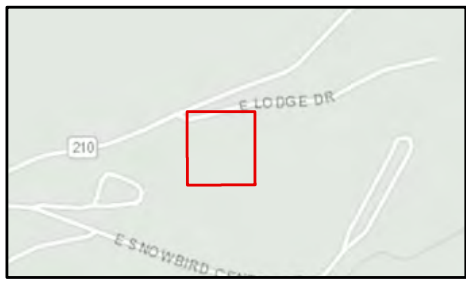


9180 E LODGE
DR ID: 69

9202 E LODGE
DR # 101
ID: 70

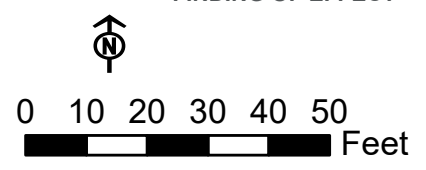
94.8 ft

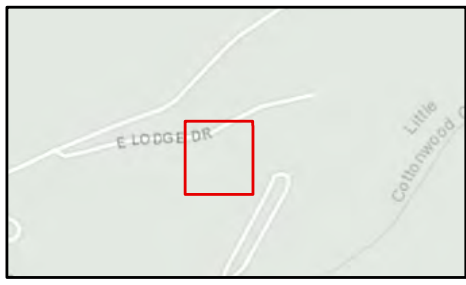
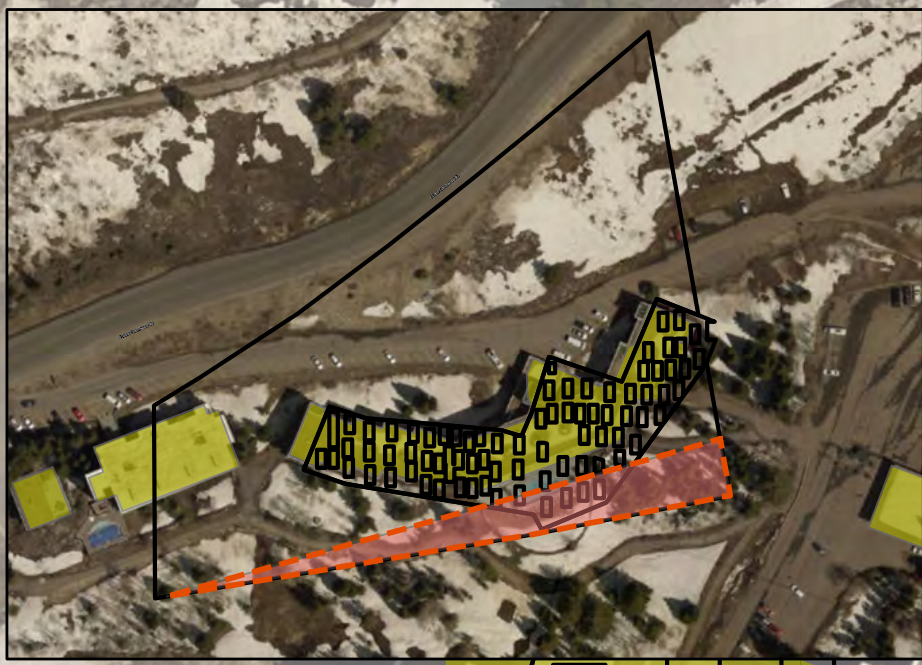
**Gondola A Easement
Impacts: .01 Acres**



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Gondola A Towers and Stations
- Easement Boundary

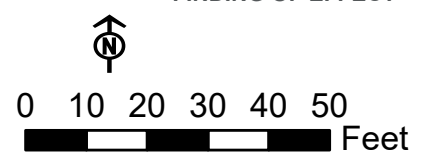
LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Gondola A Towers and Stations
- Easement Boundary

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





**Gondola A Towers and Stations
Impacts: 0.15 Acres**

**Gondola A Easement
Impacts: 1.31 Acres**

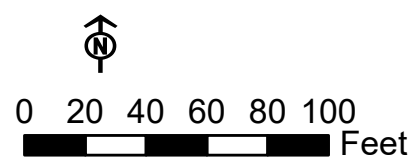
9385 S SNOWBIRD
CENTER DR ID: 72

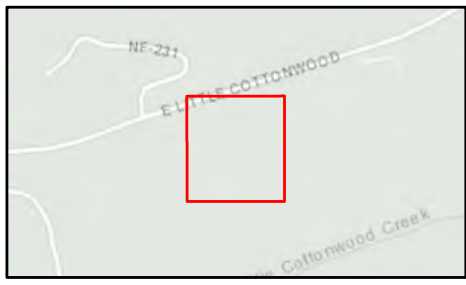
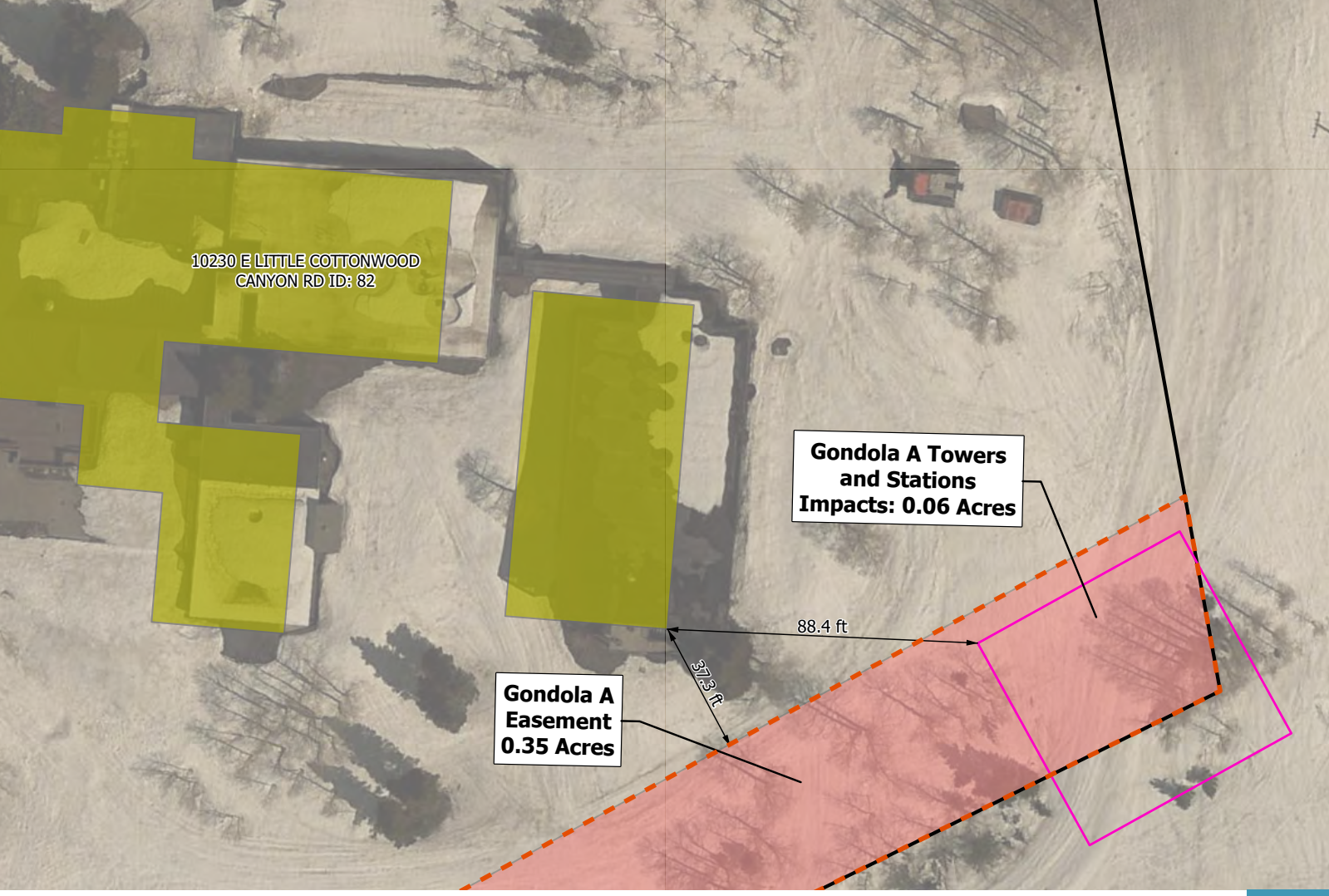
24.9 ft



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Gondola A Towers and Stations
- Easement Boundary

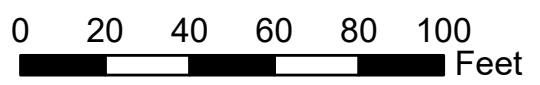
LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Easement Boundary
- Gondola A Towers and Stations

LITTLE COTTONWOOD CANYON EIS
 PROJECT S-R299(281); PIN 16092
 DETERMINATION OF ELIGIBILITY AND
 FINDING OF EFFECT



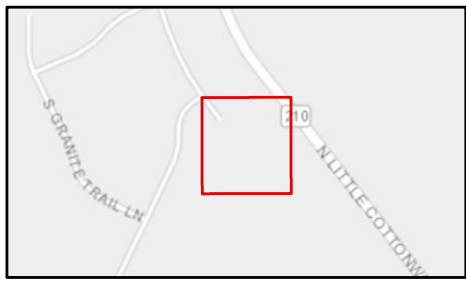
E Little Cottonwood Rd








9338 S NORTH
LITTLE COTTONWOOD
RD ID: 84

39.2 ft

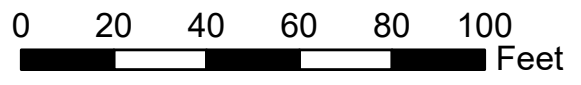
37.5 ft

Gondola B Alternatives
Partial Acquisition:
0.04 Acres



-  NRHP-Eligible Historic Building
-  Historic Parcels
-  Impacted Area
-  Gondola A Towers and Stations
-  Gondola A Easement
-  Gondola B (La Caille Area Only)
-  Gondola B Easement

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





3742 E NORTH
LTCOTTONWD
RD ID: 61

Gondola B Alternatives
Partial Acquisition:
0.43 Acres

Garage

12.9 ft

28.1 ft

68.0 ft

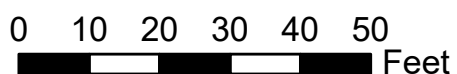
35.9 ft

E North Little Cottonwood Rd



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Gondola A Towers and Stations
- Gondola A Easement
- Gondola B (La Caille Area Only)
- Gondola B Easement

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





Gondola B Alternative Easement: 0.16 Acres

4261 LTCOTTONWD
RD ID: NV3

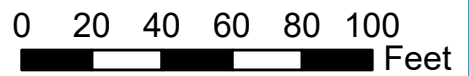
15.1 ft

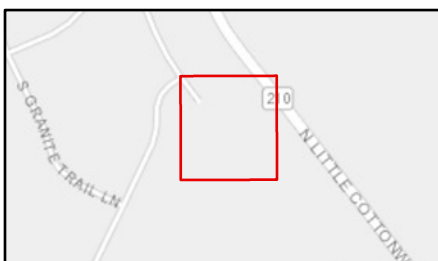
Garage

41.2 ft

- NRHP-Eligible Historic Building
- Impacted Area
- Historic Parcels
- Gondola B Easement

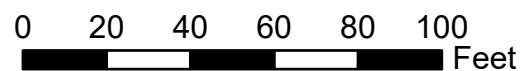
LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





- NRHP-Eligible Historic Building
- Historic Parcels
- Rail Base Station
- Impacted Area

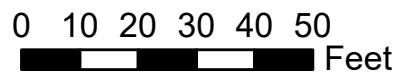
LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





- NRHP-Eligible Historic Building
- Historic Parcels
- Rail Base Station
- Impacted Area

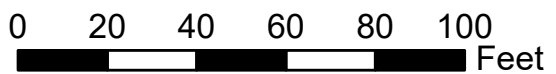
LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT

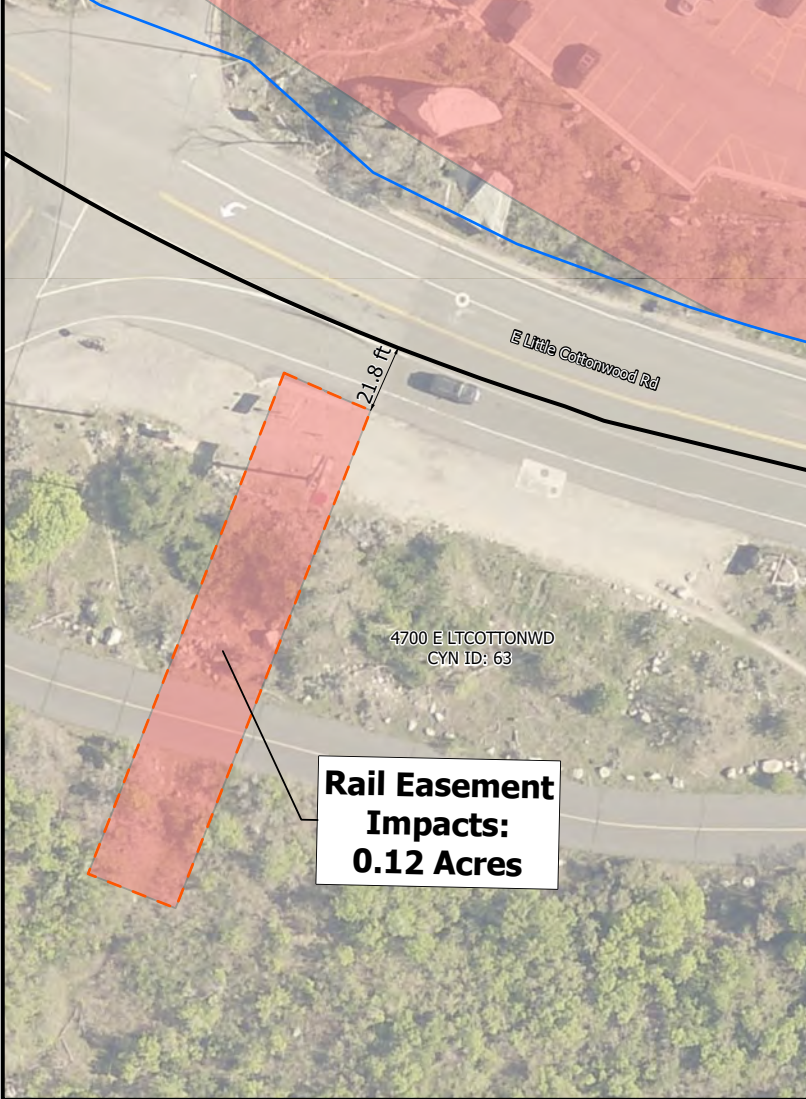
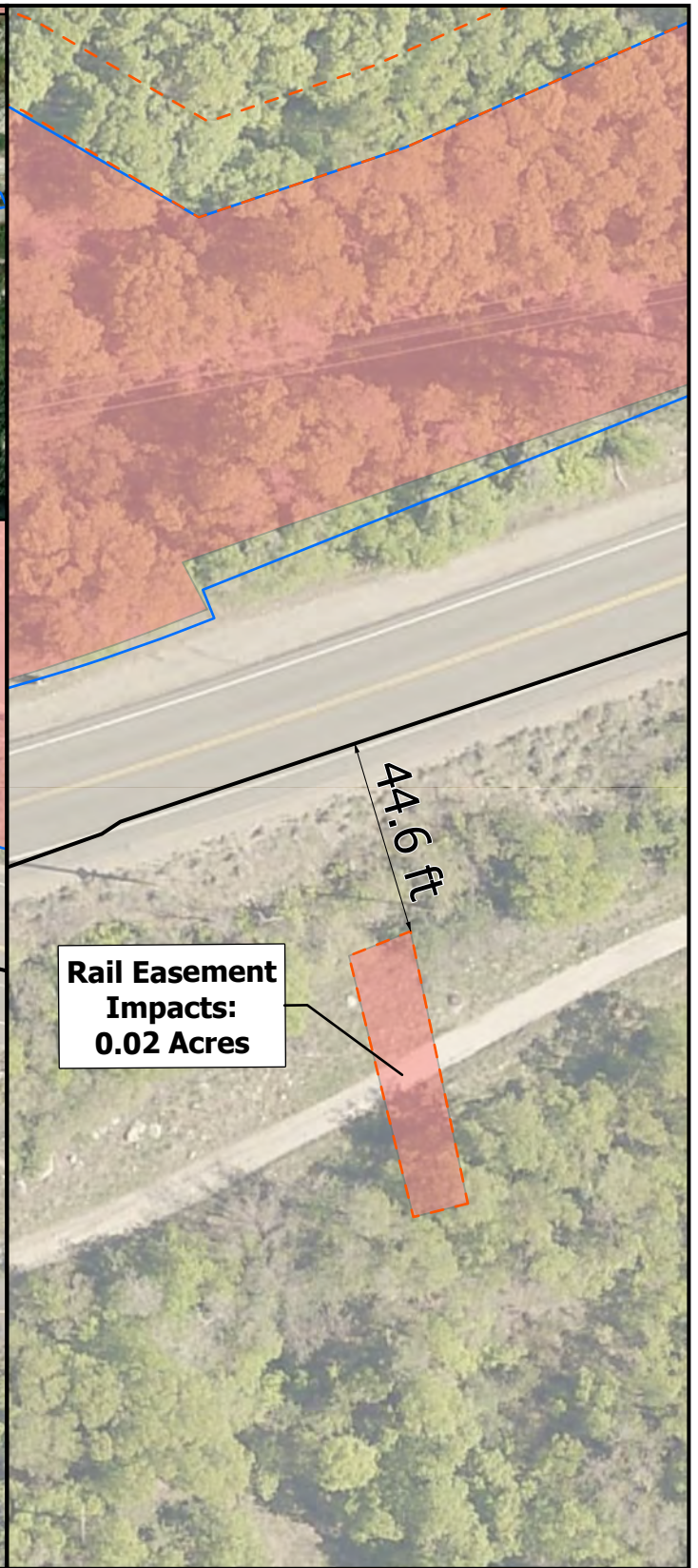
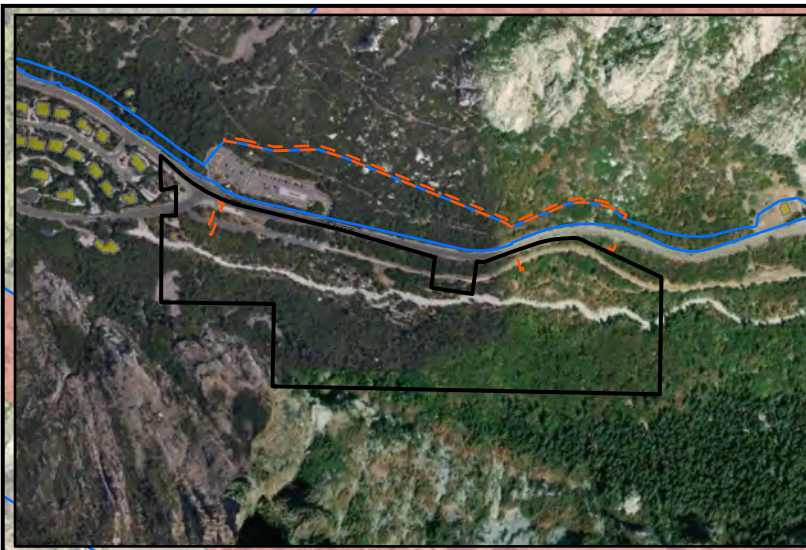








- NRHP-Eligible Historic Building
- Historic Parcels
- Rail New ROW
- Impacted Area

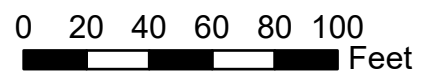
LITTLE COTTONWOOD CANYON EIS
 PROJECT S-R299(281); PIN 16092
 DETERMINATION OF ELIGIBILITY AND
 FINDING OF EFFECT

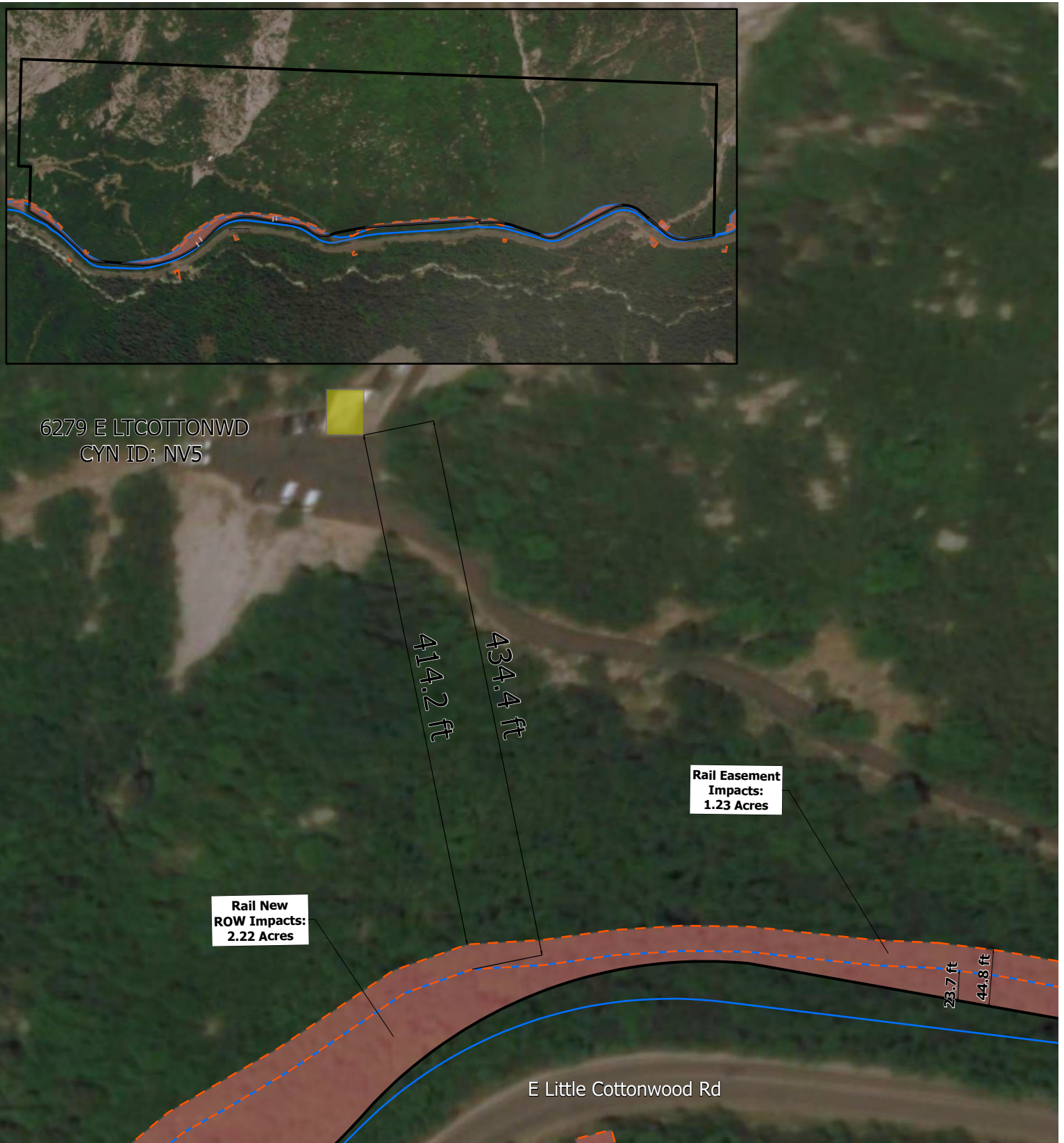




-  Historic Parcels
-  Impacted Area
-  Rail Easement
-  Rail New ROW

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





6279 E LTCOTTONWD
CYN ID: NV5

**Rail New
ROW Impacts:
2.22 Acres**

**Rail Easement
Impacts:
1.23 Acres**

414.2 ft

434.4 ft

23.7 ft

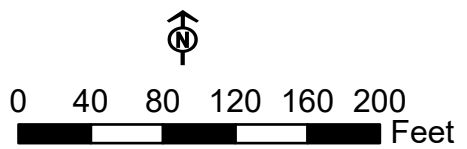
44.8 ft

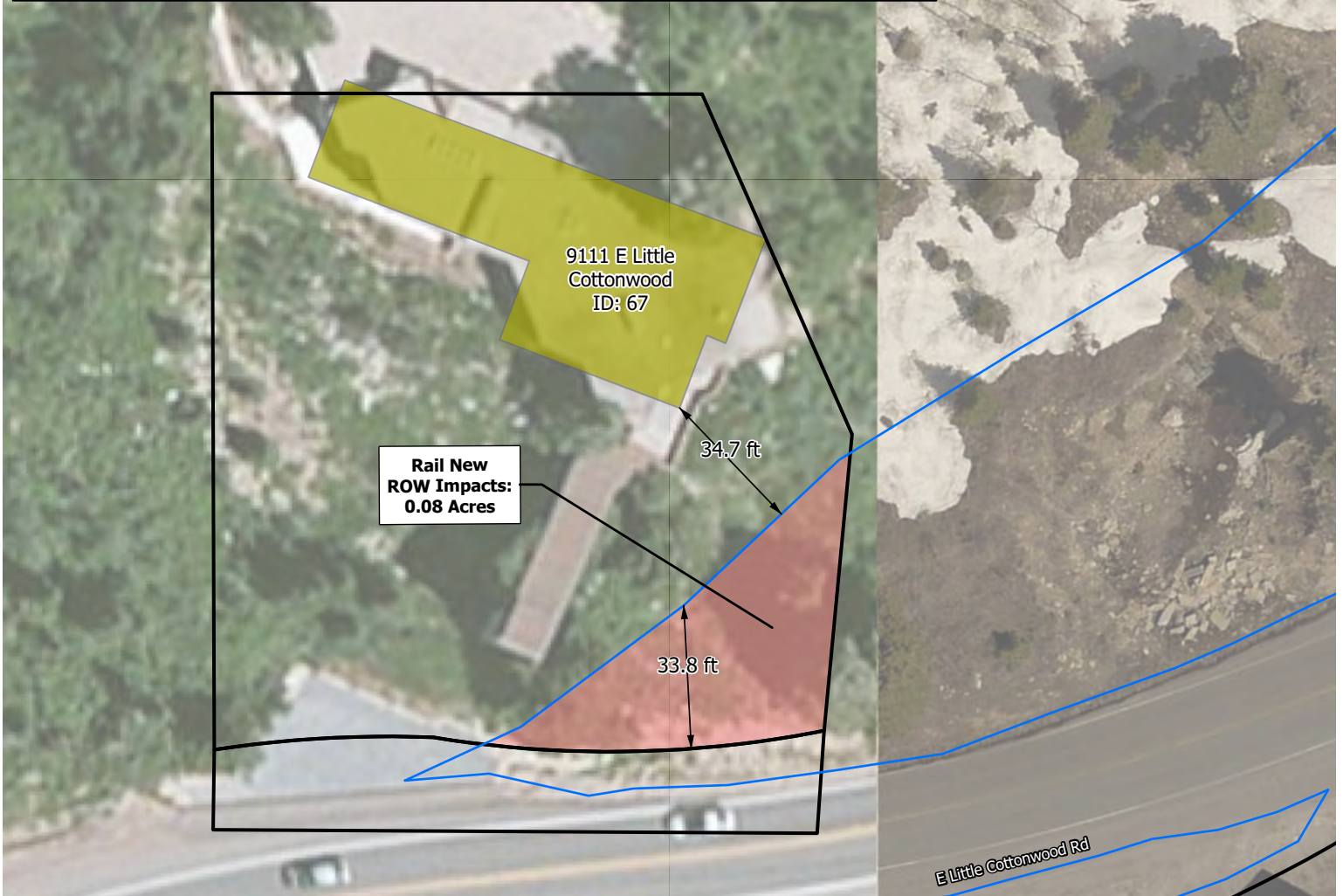
E Little Cottonwood Rd



- NRHP-Eligible Historic Building
- Historic Parcels
- Rail Easement
- Rail New ROW
- Impacted Area

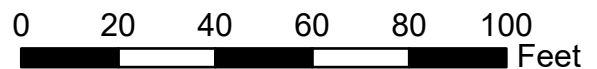
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PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT

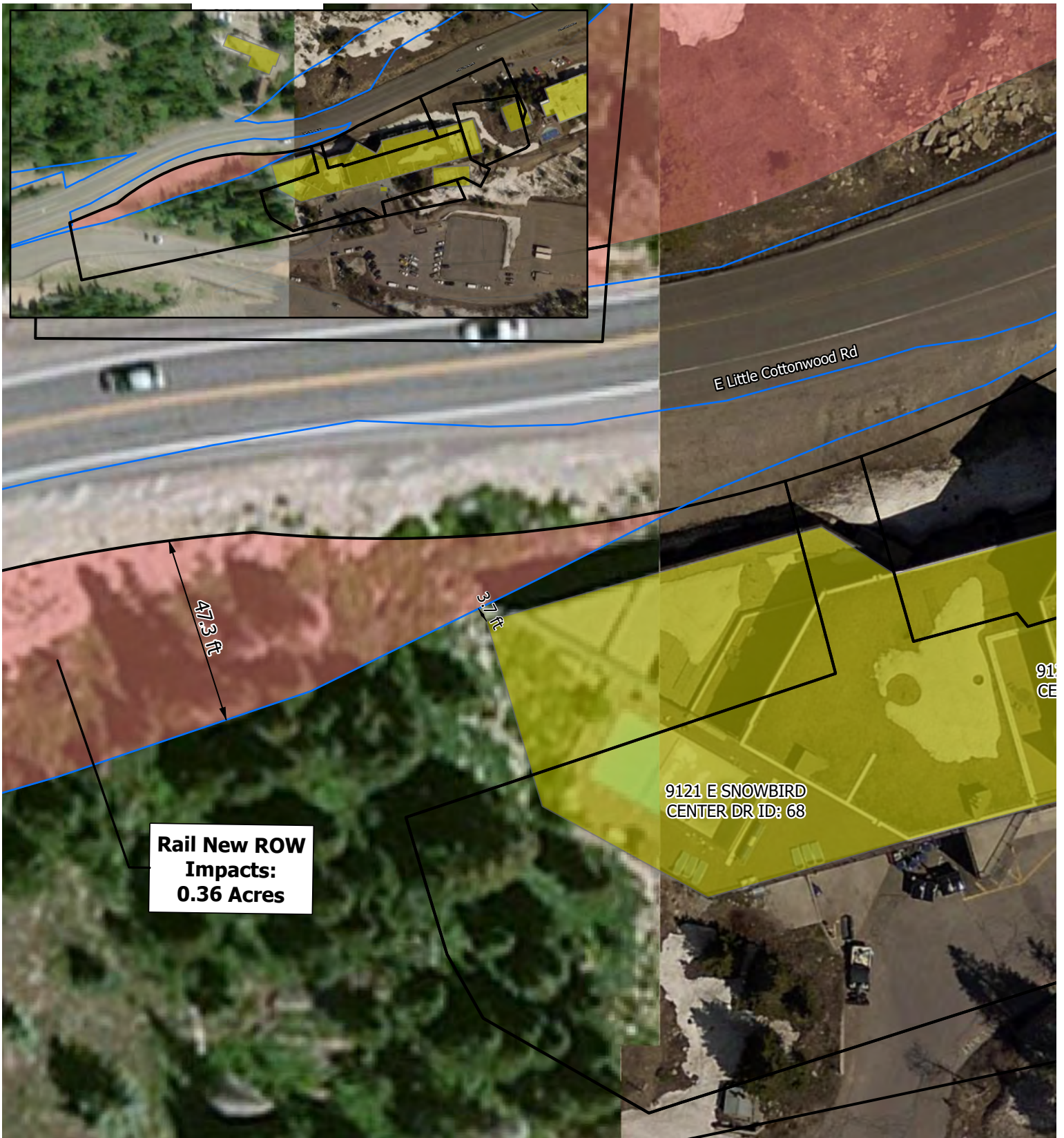




- NRHP-Eligible Historic Building
- Historic Parcels
- Rail New ROW
- Impacted Area

LITTLE COTTONWOOD CANYON EIS
 PROJECT S-R299(281); PIN 16092
 DETERMINATION OF ELIGIBILITY AND
 FINDING OF EFFECT





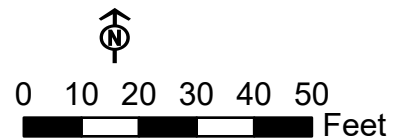
**Rail New ROW
Impacts:
0.36 Acres**

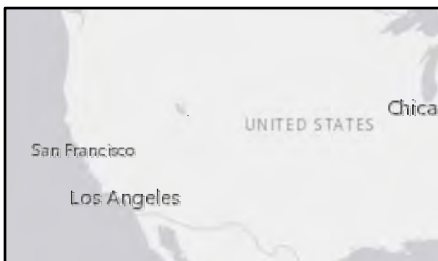
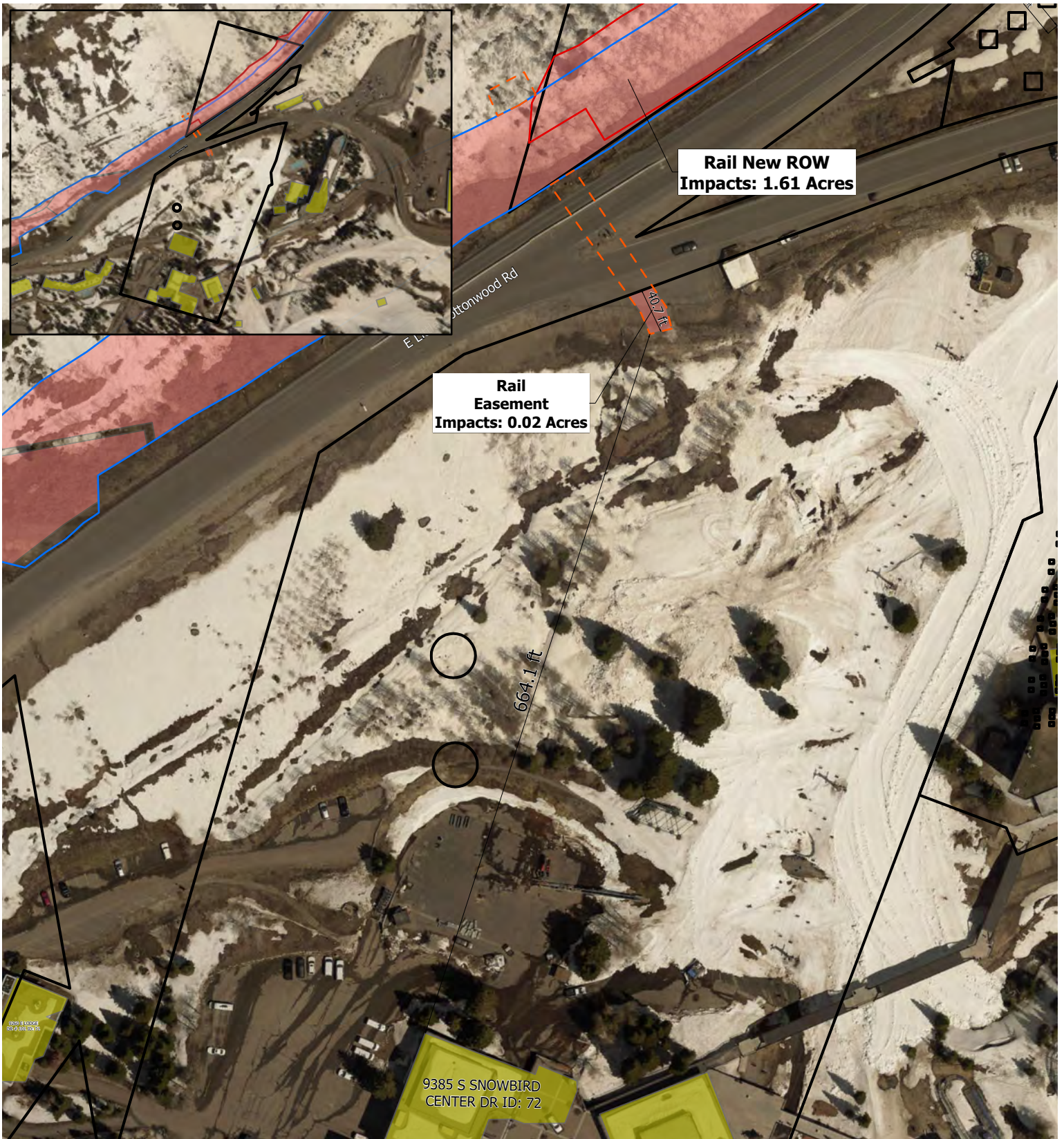
9121 E SNOWBIRD
CENTER DR ID: 68



- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Rail New ROW

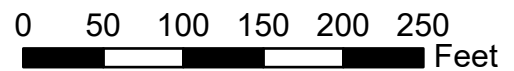
LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT





- NRHP-Eligible Historic Building
- Historic Parcels
- Impacted Area
- Rail Easement
- Rail New ROW
- Rail Snow Shed Upper Canyon

LITTLE COTTONWOOD CANYON EIS
PROJECT S-R299(281); PIN 16092
DETERMINATION OF ELIGIBILITY AND
FINDING OF EFFECT



Little Cottonwood Canyon EIS DOE/FOE:
Snowbird Historic Property Memo

TECHNICAL MEMORANDUM

To: Elizabeth Giraud, AICP
Utah Department of Transportation
4501 South 2700 West
Box 148450
Salt Lake City, Utah 84114-8450

From: Megan Daniels, Architectural Historian

Date: November 6, 2020

Re: **Significance of Snowbird Ski Resort: Little Cottonwood Canyon SR-210 Environmental Impact Statement / SWCA Project No. 45832**

RESEARCH SUMMARY

Due to the sensitive nature of the historic architectural resources and their potential to be impacted by the Gondola Alternatives, additional research was conducted on the Snowbird Ski Resort (Snowbird). This memorandum summarizes SWCA Environmental Consultants' findings on the construction sequence and design intent of Snowbird and is intended to 1) establish the themes relevant to the resort's significance and 2) evaluate the potential effects to its historic integrity posed by the Gondola Alternatives of the Little Cottonwood Canyon SR-210 project.

Significance

Margaret Supplee Smith, architectural historian and author of *American Ski Resort: Architecture, Style and Experience*, notes, "Ski resorts rarely are considered architecturally significant, but Snowbird was so unusual—for its era—so ecologically sound that it attracted extensive media attention and widespread acclaim" (Smith 2013:119). She describes the architecture as using "unabashedly brute concrete" designed by architects that, "were young, committed modernists, passionate environmentalists, and expert skiers" (Threndyle 2014). The resort is described as "following in the French pattern . . . planning all the structure and integrating them all into a single compact, connected entity" (Smith 2013:125). Described by Smith as "[h]igh-rise and high-density, Snowbird opened in December 1971, after years of environmental and architectural planning" (Smith 2013:119). The research revealed the following overarching themes: planning, ecological compatibility, modernism, and verticality.

Planning

Avid skier and manager of Alta Lodge, Ted Johnson conceptualized Snowbird in the early 1960s (Smith 2013). Johnson was adamantly opposed to a traditional "alpine lodge" theme with individual chalets sprawled throughout the canyon defacing acres of land with numerous small buildings requiring access roads and utility lines. He considered them impractical and realized their vulnerability in the path of Little Cottonwood Canyon's avalanche zones (McFall 2016). Instead, Johnson envisioned a dense, compact resort that would fit into the limited available land without disrupting the landscape. With the help of Jack

Smith, architect and ski cohort of Johnson's, and avalanche expert Ed LaChapelle, Johnson laid out a preliminary design with buildings, lifts, and runs to accommodate the conditions of Little Cottonwood Canyon within the narrow strip mining claims he had quietly purchased one by one beginning in 1963 (Smith 2013). Smith developed a relationship with renowned modernist landscape architect and avid skier, Dan Kiley, while teaching at the University of Utah. At Kiley's suggestion, Smith formed the Snowbird Design Group (SDG) with Robert Bliss, Martin Brixen, and James Christopher. Kiley served as SDG's site planning consultant during the initial stages of design (Cultural Landscape Foundation 2013). By 1967, the SDG developed the initial master plan for a year-round resort that would then be branded for marketing the resort to potential investors (Huffaker 2012; Smith 2013). Initially, "Smith envisioned a megastructure, one big hotel turned on its side to make a bridge that would span the canyon walls. . . . Skiers would leave their cars seven miles down the canyon, take a tram up to the resort, and then another tram up the mountain to ski" (Smith Associates 2020; Smith 2013:121). However, Johnson ultimately vetoed the concept for more realistic ideas that could be pitched to potential investors (Smith 2013). In 1969, Dick Bass, a Texas oil and gas mogul, avid skier, and Vail investor agreed to finance Snowbird (Smith 2013).

With funding secured, Smith and M. Ray Kinston—both architects with Brixen & Christopher—left the firm to form the partnership, Enteleki Architects (Enteleki), that would work solely on further developing the master plan for Snowbird. They were joined by Franklin T. Ferguson and John Irving Perkins. In 1971, the U.S. Forest Service (USFS) approved Enteleki's Snowbird Master Plan, of which "the heart was the megastructure [tram terminal]" (Smith 2013:123). Johnson recalled in 2001, "The awesome massiveness of the tramway and its terminal buildings-to-be set the stage for the bold architectural statements of all of Snowbird" (Snowbird 2020). The plan included an integrated series of multi-level buildings that provide commerce and lodging. The vertical lodges were arranged in a linear fashion following the contours of the natural landscape and were connected to the village plaza by gently sloping pedestrian trails (Allen 1974). The architects heeded Kiley's suggestion to place the tram terminal and the village plaza north of the creek and connect it to the mountain by a skier's bridge to take advantage of a gentle ski run out in the natural terrain (Cultural Landscape Foundation 2013; Smith 2013). The architects involved from the conception of the master plan subsequently collaborated on the buildings at Snowbird, "which the architects planned as vertical villages" (Smith 2013:123). These signature buildings were constructed between 1971 and 1974 (Figure 1 and Table 1).

Snowbird Ski Resort

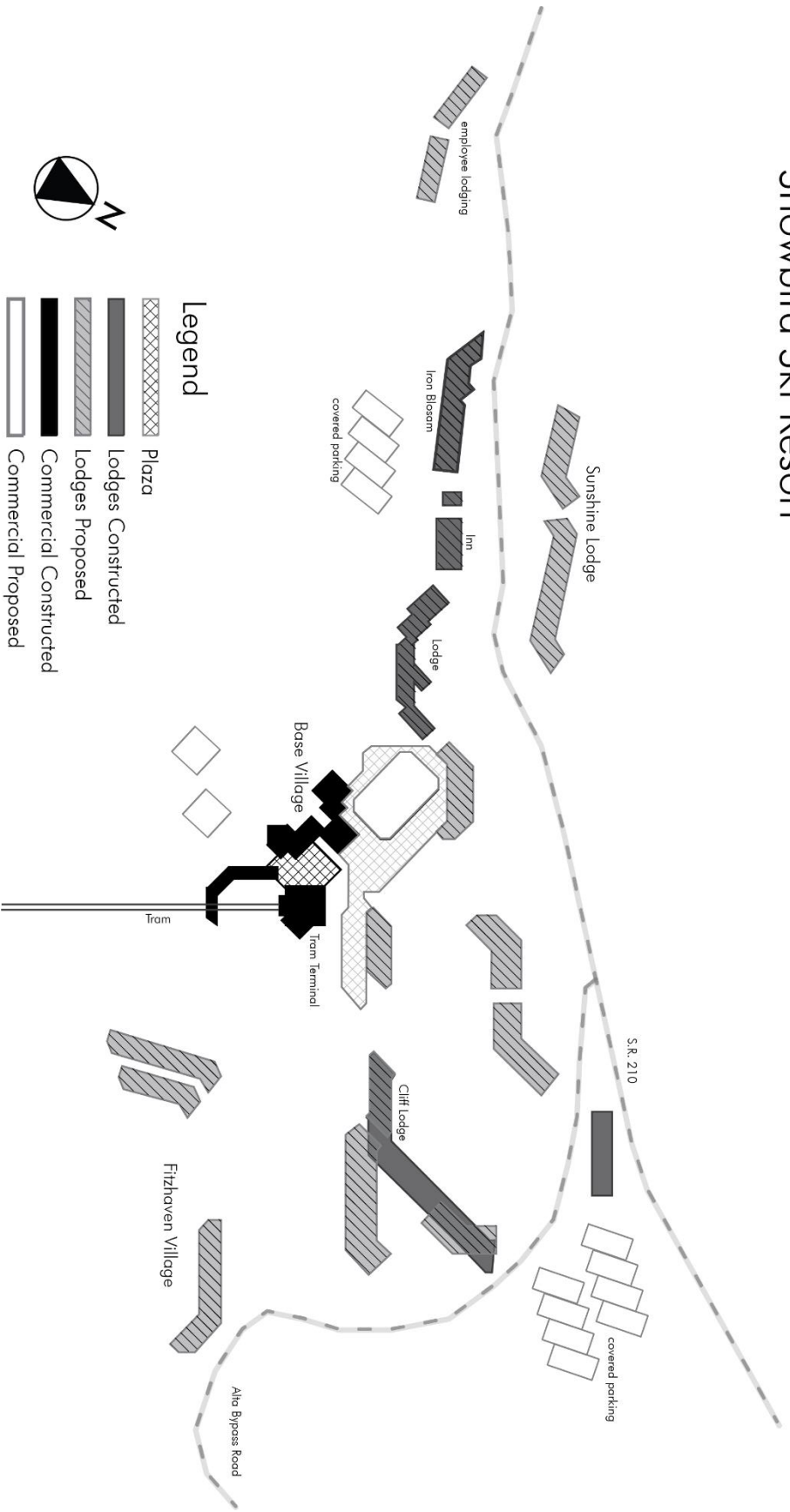


Figure 1. Diagram of buildings proposed in the 1971 Snowbird Master Plan and buildings constructed.

Table 1. Snowbird Ski Resort Construction Summary

Year	Description	Architect / Firm	Reference
1967	Unfinished site design for Snowbird	Robert Bliss / Bliss & Campbell	UCFA 2016b
1967	Snowbird Model building	Snowbird Design Group	Smith 2013; Oliver 2012
1971	Snowbird Master Plan	Enteleki Architects	Smith 2013 Smith Associates 2020
1971	Snowbird Tram Terminal	Jim Christopher / Brixen & Christopher	UCFA 2016a
1971	Snowbird Village Plaza and Bridge	Jim Christopher / Brixen & Christopher	UCFA 2016a
1971	Inn at Snowbird	Jim Christopher / Brixen & Christopher	UCFA 2016a
1971	Lodge at Snowbird	Jim Christopher / Brixen & Christopher	Smith 2013
1973, 1985	Cliff Lodge	M. Ray Kinston / Enteleki Architects	Smith 2013
1974	Iron Blossam	John Irving Perkins / Enteleki Architects	Smith 2013
1974	Mid-Gad Valley Restaurant and Gad Valley Warming Hut	Franklin Ferguson / Enteleki Architects	Huffaker 2012; Smith 2013

Ecological Compatibility

Johnson envisioned a resort composed of a unified grouping of avalanche-proof, reinforced concrete structures, narrow and long, multilevel and fireproof, yet large enough to be a resort (Smith 2013). Johnson’s vision for an ecologically compatible resort was influenced by his travels to the French Alps where he witnessed the negative impacts of sprawling resorts and multitudinous chalets on the natural landscape (Huffaker 2012). The master plan focused on a megastructure concept concentrating development on fewer acres and keeping as much land as possible in its virgin state (McFall 2016). The architects further sought to preserve as many trees as possible and minimize water run off (Allen 1974). Jim Christopher, architect and partner of Brixen & Christopher, described Snowbird as a “high-density project” that the design team was forced into by the limited fee simple land amidst the USFS land (Oliver 2012). Thus, Snowbird was designed on a narrow footprint to withstand the perils of the avalanche-prone canyon, earthquake dangers, heavy snows, and strong winds while consciously minimizing impacts to the natural environment and the Little Cottonwood Canyon watershed (Allen 2014; Smith 2013).

Modernism

Snowbird is rare among American ski resorts for its emulation of the modern, brutalist high-rise buildings akin to those designed by Marcel Breuer in the French Alps (Smith 2013). A modernist and environmentalist, Smith was influential in the modernist concept of Snowbird and the connection between Johnson and Brixen & Christopher. Christopher acknowledged that “modern was a given for us” and that the design team “bought into the concept of a concrete frame with cedar and glass infill panels and an accent of granite. That’s it. That’s Snowbird” (Oliver 2012). In addition to modernism, context was an important factor for Christopher. When observing Little Cottonwood Canyon, he noted that the predominant feature was rock, not forests or woods (McFall 2016). Based on this context and interpretation, Christopher’s Snowbird megastructure design featured the lavish use of concrete, representing his intent to blend the buildings into the surroundings canyon walls and mountain peaks.

Over forty years after Snowbird opened, Margaret Supplee Smith hailed Snowbird as “a perfect time capsule of mid-century modernism” as it continues to emulate the bold modernist ideals of its designers (Threndyle 2014).

Verticality

In 1974 *Architectural Record* described Snowbird as “in scale with the mountains,” mimicking the surrounding peaks with vertically oriented buildings that preserved the vulnerable landscape with minimal footprints (Smith 2013: 120). Tantamount to ecological compatibility and modernism, Snowbird was conceptualized with narrow, multilevel buildings that would limit disruption of the terrain while creating the capacity for a resort. The vertical megastructure concept for Snowbird precluded piecemeal, replication of small cabins or chalets sprawling across the canyon and destroying the natural landscape with access roads and utilities. Instead, vertical lodges were designed and constructed in scale with the surrounding mountains to provide necessary residential accommodations (Allen 1974).

Evaluation

UDOT and SHPO are evaluating the impacts of the proposed Gondola Alternatives on Snowbird. Particular concern was raised about the visual intrusion of the gondola towers into the viewshed from the lodges to the ski slopes. The literature revealed only two references to the buildings being designed to take advantage of the mountain views. In *Architectural Record*, the Lodge condominium units are described as being, “arranged along single-loaded corridors so that they all have the advantage of facing the sun and the ski runs,” and the Cliff Lodge is described as, “skewed from rectangle to parallelogram in order to attain longer views up and down the canyon” (Allen 1974: 124-125). However, in the same article, greater emphasis is placed on the design principles of Snowbird as high-density through vertically oriented buildings and ecologically compatibility. It is also worth noting that the Snowbird Master Plan proposed three lodges with 150 to 200 rooms each to be constructed south of the Cliff Lodge within the Fitzhaven Village. Presumably, the unbuilt phase of development would have been constructed with similar modernist, vertical design principles and would have been in the Cliff Lodge viewshed toward the mountains, further reinforcing the fact that uninterrupted natural views were not a primary concern of the designers.

Instead, the research firmly and consistently reiterates that the predominant focus of Johnson and the architects of Snowbird was emulating modernist and environmentalist ideals. For this reason, the character-defining features of Snowbird are the planning, ecological compatibility, modernism, and verticality of megastructures with narrow footprints. These interrelated features qualify the Snowbird campus and buildings for listing in the National Register of Historic Places as they embody Snowbird’s significance as a high-density, brutalist, high-rise resort designed to preserve and withstand the ecological conditions of the site in Little Cottonwood Canyon.

Although the proposed Gondola Alternatives would place towers within the viewshed of the lodges, the towers would not change the original spatial layout of the masterplan, modernist design, ecological compatibility, or verticality. Further, the focal point of the Snowbird Master Plan was the tram terminal and the aerial tram, which consists of 70 to 140 foot lattice towers carrying passenger cabins from the village to the mountain. The Gondola Alternatives are compatible with the original bold statement of the megastructure terminal and one of the longest and largest aerial tramways in the world (Snowbird 2020). The gondola towers would also be consistent with Snowbird’s modernist megastructure concept, in regard to the transparent structural appearance of modernist architecture—particularly brutalist—and in regard to the limited footprint within the landscape. The proposed Gondola Alternatives are compatible with the intent of the approved master plan to maintain as much natural landscape as possible and eliminate the need for future surface parking lots. And finally, the proposed Gondola Alternatives appear consistent

with Jack Smith's original vision of an aerial tram transporting patrons from a parking lot at the base of the canyon to Snowbird Ski Resort.

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2016b Robert Lewis Bliss. Utah Center for Architecture. Available at: <http://www.utahcfa.org/architect/robert-lewis-bliss>. Accessed October 15, 2020.



Spencer J. Cox
Governor

Deidre M. Henderson
Lieutenant Governor

Jill Remington Love
Executive Director
Department of
Heritage & Arts



Christopher Merritt
State Historic Preservation Officer

Kevin Fayles
Interim Director

May 14, 2021

Liz Robinson
Cultural Resources Program Manager
Utah Dept of Transportation (UDOT)
4501 Constitution Blvd
Salt Lake City, UT 84119

RE: PIN 16092_Little Cottonwood Canyon EIS_ S-R299(281)0

For future correspondence, please reference Case No. 21-0815

Dear Ms. Robinson,

The Utah State Historic Preservation Office received your submission and request for our comment on the above-referenced undertaking on April 14, 2021. Based on the information provided to our office, we concur with your determinations of eligibility for the project area, and we concur with a finding of Adverse Effect for the undertaking. We'll look forward to further consulting with you and developing a Memorandum of Agreement to address effects to historic properties.

This information is provided to assist with Section 106 responsibilities as per §36CFR800. If you have questions, please contact me at (801) 245-7239 or by email at clhansen@utah.gov.

Sincerely,

Christopher Hansen
Preservation Planner/Utah SHPO

Chapter 16: Hazardous Materials and Waste Sites

16.1 Introduction

This chapter describes sites near the project alternatives that could contain hazardous materials and hazardous waste sites and analyzes the expected effects of the project alternatives on these sites. This chapter also analyzes the health and safety effects of constructing the action alternatives on construction workers or on people who live near the known sites that could contain hazardous materials.

Hazardous Materials Impact Analysis Area. The hazardous materials impact analysis area includes the area within 0.5 mile on each side of State Route (S.R.) 210 from Fort Union Boulevard through the town of Alta including the Alta Bypass Road (see Figure 16.3-1, Hazardous Material Facilities in the Hazardous Materials Impact Analysis Area, on page 16-3). The impact analysis area also includes the areas proposed for the gravel pit and 9400 South and Highland Drive mobility hubs.

What is the hazardous materials impact analysis area?

The hazardous materials impact analysis area includes the area within 0.5 mile on each side of S.R. 210 from Fort Union Boulevard through the town of Alta including the Alta Bypass Road. The impact analysis area also includes the areas proposed for the gravel pit and 9400 South and Highland Drive mobility hubs.

16.2 Regulatory Setting

Hazardous materials are regulated by the Resource Conservation and Recovery Act; by the Comprehensive Environmental Response, Compensation, and Liability Act; and by Utah Administrative Code Title 19, *Environmental Quality Code*. The following concerns are raised when a transportation project could affect 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 16.3.2, Facilities with Hazardous Materials in the Impact Analysis Area, provides a preliminary identification of known parcels that contain hazardous materials. During the final design of the Selected Alternative and before any property is acquired, the Utah Department of Transportation (UDOT) would assess sites of concern to determine whether contamination is present and to establish the exact nature and limits of the potential hazard.

16.3 Affected Environment

16.3.1 Resource Identification Methods

To determine the presence of sites that could contain hazardous materials in the hazardous materials impact analysis area, UDOT reviewed the following private and public databases:

- Utah Division of Environmental Response and Remediation’s (DERR) Interactive Map (DERR 2020a)
- DERR’s Underground Storage Tank and Leaking Underground Storage Tank lists (DERR 2020b)
- U.S. Environmental Protection Agency’s (EPA) EnviroMapper database (EPA 2020)
- U.S. Geological Survey’s Mineral Resources Data System (USGS 2021)
- Utah Division of Oil, Gas and Mining’s Abandoned Mine Reclamation Program (Utah Division of Oil, Gas and Mining 2021)
- Utah Division of Solid and Hazardous Waste’s list of solid waste facilities (Utah Division of Solid and Hazardous Waste 2020)

Using these databases, UDOT identified the following types of sites in the hazardous materials impact analysis area:

- Underground storage tanks (USTs)
- Tier 2 facilities (facilities that store amounts of hazardous chemicals above EPA listed quantities)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites, commonly known as Superfund sites
- Voluntary Cleanup Program sites (designated where federal or state assistance has been provided to support the cleanup of CERCLA or other contaminated sites)
- Solid Waste facilities (facilities that treat or dispose of nonhazardous solid waste)
- Historic mine sites

16.3.2 Facilities with Hazardous Materials in the Impact Analysis Area

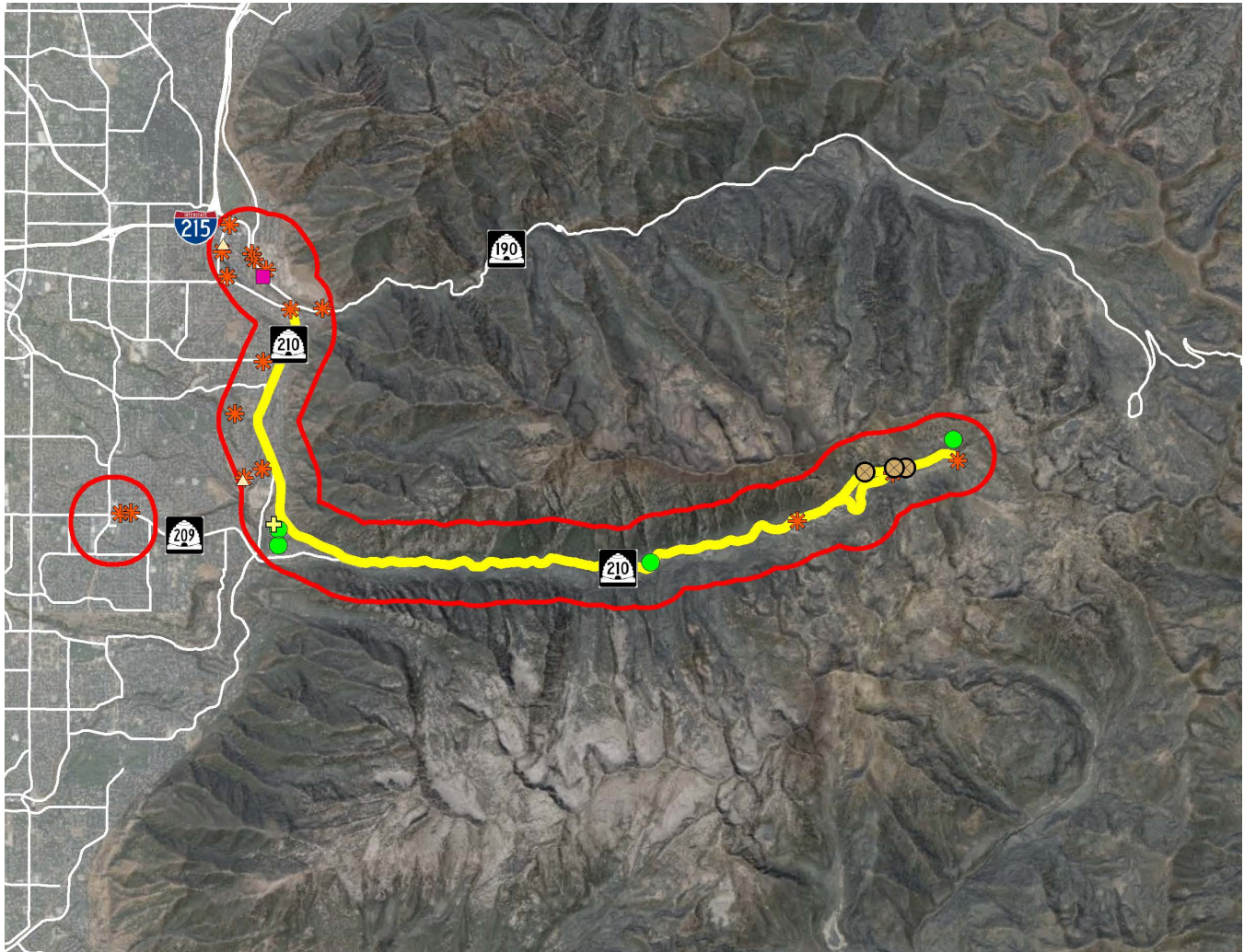
Table 16.3-1 lists and Figure 16.3-1 shows the 27 sites in the hazardous materials impact analysis area that are known to contain or have previously contained hazardous materials. These sites are described in detail beginning on page 16-5.

A few locations have multiple sites (for example, the gravel pit has three records of previous USTs) or are sites of greater concern, such as the Flagstaff Smelter and the Jones and Pardee Smelter. These sites are shown in Figure 16.3-2.

Table 16.3-1. Hazardous Materials Sites in the Hazardous Materials Impact Analysis Area

Facility Type	Number of Facilities
Underground storage tanks (USTs)	18
Tier 2 facilities	3
Superfund (CERCLA) sites	4
Voluntary Cleanup Program sites	1
Solid Waste facilities	1
Historic mine sites	3

Figure 16.3-1. Hazardous Material Facilities in the Hazardous Materials Impact Analysis Area

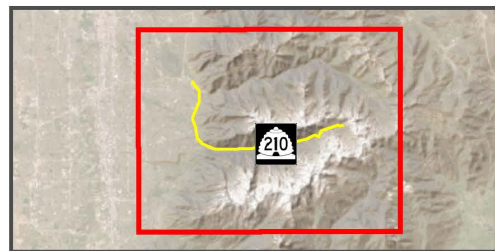


Hazardous Materials Impact Analysis Area

S.R. 210 Study Limits

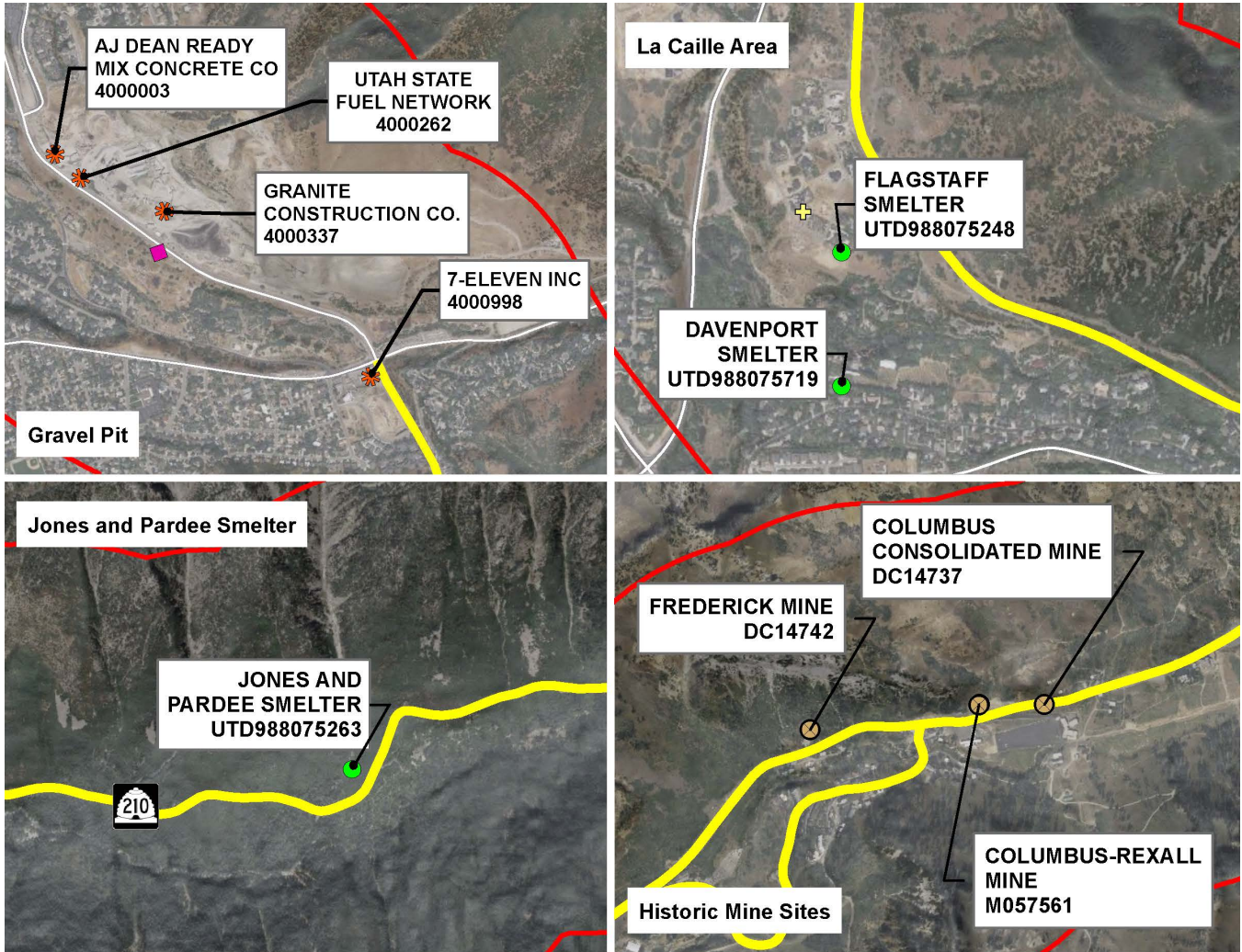
Hazardous Material Facilities

- Voluntary Cleanup Sites
- UST
- Tier 2 Facilities
- Solid Waste
- CERCLA
- Historic Mines



0 1 2 Miles

Figure 16.3-2. Hazardous Material Facilities of Greater Concern in the Hazardous Materials Impact Analysis Area

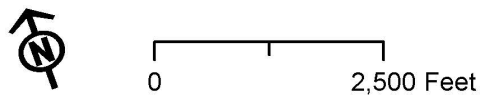
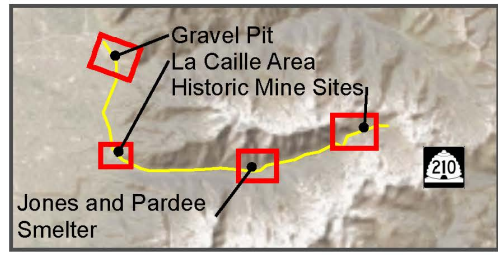


Hazardous Materials Impact Analysis Area

S.R. 210 Study Limits

Hazardous Material Facilities

- + Voluntary Cleanup Sites
- * UST
- △ Tier 2 Facilities
- Solid Waste
- CERCLA
- ⊙ Historic Mines



16.3.2.1 Underground Storage Tanks (USTs)

7-Eleven Gas Station at 3720 East 7000 South (DERR ID 4000998). The 7-Eleven gas station at 3720 East 7000 South is an active UST site with two gasoline tanks and one diesel tank. The tanks currently in use were installed in 2012 (DERR 2020a).

7-Eleven Gas Station at 2175 East 9400 South (DERR ID 4000999). The 7-Eleven gas station at 2175 East 9400 South is an active UST site with three gasoline tanks. The tanks currently in use were installed in 1989 (DERR 2020a).

Big Cottonwood Water Treatment Plant (DERR ID 4000838). One tank was previously located at this facility on the north side of S.R. 209 at the Big Cottonwood Water Treatment Plant and has been permanently removed.

Evangelical Free Church (DERR ID 4001679). One tank was previously located at this facility on the southeast corner of S.R. 190 and 3000 East and has been permanently removed.

Gravel Pit Area (DERR IDs 4000003, 4000262, 4000337). The gravel pit on the east side of S.R. 190/Wasatch Boulevard and north of Big Cottonwood Canyon has three records that include 13 diesel or gasoline USTs. All of these tanks were closed in the late 1980s or 1990s and are listed as permanently out of use. There are no records of current, active USTs at this location.

What is the gravel pit?

The gravel pit is an existing aggregate (gravel) mine located on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard.

Little Cottonwood Water Treatment Plant (DERR ID 4000833). Two tanks are located at this facility on Danish Road and are currently in use.

Maintenance Facility near Alta Peruvian Lodge (DERR ID 4000019). One gasoline tank is located at this facility and is currently in use. Also, a chemical storage area (Tier 2) is located at this site.

Memorial Estates Mountain View (DERR ID 4001808). One tank was previously located at this facility north of Fort Union Boulevard and has been permanently removed.

Smith's Gas Station at 3470 East 7800 South (DERR ID 4002318). Two underground gasoline tanks and one underground diesel tank are located at this facility. All three tanks are currently in use.

Smith's Gas Station at 2095 East 9400 South (DERR ID 4000757). Two underground gasoline tanks and one underground diesel tank are located at this facility. All three USTs are currently in use.

Snowbird Vehicle Maintenance Facility (DERR ID 4000951). One gasoline tank and one diesel tank are located at this facility on Gad Valley Drive and are currently in use.

U.S. West Utility at 3480 E. Danish Road (DERR ID 4000590). A diesel UST was located at 3480 E. Danish Road. This underground tank was closed in 1994 and is permanently out of use.

U.S. West Utility near Alta Peruvian Lodge (DERR ID 4001799). A diesel tank was located on the north side of S.R. 210 across from the Alta Peruvian Lodge. This underground tank was closed in 1998 and is permanently out of use.

UDOT Station #2433 (DERR ID 4001397). Two tanks had previously been located at this facility, and both have been permanently removed.

Vehicle Maintenance Building at Alta (DERR ID 4000020). One gasoline UST and two diesel USTs are located at this facility. All three tanks are currently in use.

W.W. Steed and Sons (DERR ID 4001236). Three tanks had previously been located at this facility, and all three have been permanently removed.

16.3.2.2 Tier 2 Facilities

Alta Peruvian Lodge (DERR ID 8628). The permitted Tier 2 facility is located at the Alta Peruvian Lodge.

Utah Fleet, UDOT Cottonwood Station #223 (DERR ID 6939). The permitted Tier 2 facility is located at the UDOT Cottonwood Station at 6601 South 3000 East.

Verizon Wireless Facility (DERR ID 7258). The permitted Tier 2 facility is located at the Little Cottonwood Water Treatment Plant on Danish Road.

16.3.2.3 Superfund (CERCLA) Sites and Voluntary Cleanup Program Sites

Davenport Smelter (DERR ID UTD988075719). The historic Davenport Smelter site is about 6 acres and is now a residential area within 0.5 mile south of S.R. 210 at about 9565 S. Wasatch Boulevard. The old smelter site processed lead and copper ores from Little Cottonwood Canyon. It was in operation from 1872 to 1875. The historic Davenport Smelter is a Superfund (CERCLA) site and is listed on the National Priorities List (NPL). The NPL is intended to guide EPA and DERR in determining which sites warrant further investigation.

Flagstaff Smelter (DERR ID UTD988075248; Voluntary Cleanup Program site C032). The historic Flagstaff Smelter is a Superfund (CERCLA) site and is located within 0.5 mile south of S.R. 210 at about 9500 South. This is also shown as a Voluntary Cleanup Program site in Figure 16.3-2 above, Hazardous Material Facilities of Greater Concern in the Hazardous Materials Impact Analysis Area. According to DERR, this site was a lead smelter that operated from 1870 to 1873. EPA placed the site on the Superfund program's NPL in April 2003. Throughout this site, cleanup activities were performed which included excavation and treatment of soils, off-site disposal, and site restoration. The site reached the Superfund milestone "construction complete" in August 2012. With the completion of all response actions, the site was deleted from the NPL on July 27, 2018 (DERR 2020a). The site was also part of a Voluntary Cleanup Program from 2002 to 2004.

Jones and Pardee Smelter (DERR ID UTD988075263). The historic Jones and Pardee Smelter is a Superfund (CERCLA) site and is located north of S.R. 210 about 6 miles east of the intersection of S.R. 210 and S.R. 209. This Superfund site is across the road from Tanners Flat Campground. According to DERR, this site was a lead smelter that operated from 1871 to 1873. Also, this site is within the Tanners avalanche path.

North Star Smelter (DERR ID UTD988075289). The historic North Star Smelter is a Superfund (CERCLA) site and is located north of Alta across S.R. 210 in Grizzly Gulch. The smelter was likely operated starting in 1866 and was in operation for about 1 year. The waste at this site contains slag, which has high concentrations of heavy metals. The site is about 13 acres.

16.3.2.4 Solid Waste Facilities

Walker Development Recycling (DERR ID SW246). This facility was located at 6845 S. Big Cottonwood Canyon Road. No reports have been filed since 2009. This facility appears to be inactive.

16.3.2.5 Historic Mine Sites

Frederick Tunnel/Frederick Mine (USGS MRDS ID DC14742). The site of the historic Frederick Tunnel/Frederick Mine is located on the north side of S.R. 210 north of Hellgate Road near milepost 11.31. This site was a past producer of silver and lead. Only point data are available. No polygons or official mapping of the site is available from the data source.

Columbus-Rexall Mine (USGS MRDS ID M057561). The site of the historic Columbus-Rexall Mine is located on the north side of S.R. 210 across from the access to the Alta Wildcat Base area/Goldminer's Daughter near milepost 11.70. This site was a past producer of copper, gold, silver, lead, and zinc. Only point data are available. No polygons or official mapping of the site is available from the data source.

Columbus Consolidated Mine/Wasatch Drain Tunnel (USGS MRDS ID DC14737). The site of the historic Columbus Consolidated Mine/Wasatch Drain Tunnel is located on the current alignment of S.R. 210 east of the access road to the Alta Wildcat Base area/Goldminer's Daughter near milepost 11.84. This site was a past producer of lead, copper, and silver. Only point data are available. No polygons or official mapping of the site is available from the data source. This site is not within an area proposed for improvements with any of the action alternatives and is not discussed further in this chapter.

16.3.3 Avalanche Artillery Shells

The most critical avalanche paths with respect to uncontrolled, observed road events and residual avalanche risk are the Tanners, White Pine Chutes, White Pine, and Little Pine avalanche paths. UDOT's active avalanche-control program in these paths consists primarily of using artillery to cause a controlled avalanche release. From 2004 to 2017, an average of 163 artillery shells per ski season were fired into these avalanche paths (Dynamic Avalanche Consulting 2019). In the spring, UDOT surveys the avalanche paths for artillery shells. Artillery fragments from exploded artillery are not removed.

16.4 Environmental Consequences and Mitigation Measures

16.4.1 Methodology

UDOT's first step in evaluating impacts to or disturbances of hazardous material sites of concern was to categorize the types of sites identified in the hazardous materials impact analysis area by the relative likelihood of finding contamination. The second step was to conduct a "windshield" (drive-through) survey to validate the locations of hazardous material sites. Sites were categorized as having a high, moderate, or low probability of environmental degradation.

High Probability of Environmental Degradation. The following sites have a high probability of existing soil or groundwater degradation:

- Active Superfund (CERCLA) sites
- Historic mine sites from the U.S. Geological Survey's Mineral Resources Data System

Moderate Probability of Environmental Degradation. The following sites have a moderate probability of environmental degradation:

- Active UST sites
- Tier 2 sites

Low Probability of Environmental Degradation. The following sites have a low probability of environmental degradation:

- Removed and closed USTs
- Closed and/or inactive Superfund (CERCLA) sites

16.4.2 No-Action Alternative

This section describes the impacts to and from hazardous materials and hazardous waste sites with the No-Action Alternative in the Wasatch Boulevard segment of S.R. 210, in the segment of S.R. 210 from North Little Cottonwood Road to the town of Alta, at the gravel pit, and at the park-and-ride lot at 9400 South and Highland Drive.

With the No-Action Alternative, the improvements associated with the S.R. 210 Project would not be made. Therefore, no impacts to or disturbances of hazardous material sites would occur from the roadway improvements made as part of the project. Existing sites would continue to be managed in accordance with state and federal regulations. With the No-Action Alternative, UDOT is evaluating opportunities to phase out the use of artillery shells to conduct avalanche mitigation.

16.4.3 Enhanced Bus Service Alternative

This section describes the impacts to and from hazardous materials and hazardous waste sites with the Enhanced Bus Service Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

16.4.3.1 S.R. 210 – Wasatch Boulevard

This section describes the impacts to and from hazardous materials and hazardous waste sites with the Imbalanced-lane Alternative and the Five-lane Alternative, which would both widen the Wasatch Boulevard segment of S.R. 210.

16.4.3.1.1 Imbalanced-lane Alternative

With the Imbalanced-lane Alternative, there would be no impacts to sites with hazardous materials. One site with a moderate probability of environmental degradation, the active UST site at the 7-Eleven gas station at 3720 East 7000 South, would be adjacent to the Imbalanced-lane Alternative. However, no impacts to the active UST site are anticipated with the Imbalanced-lane Alternative.

16.4.3.1.2 Five-lane Alternative

The impacts to sites with hazardous materials from the Five-lane Alternative would be the same as those from the Imbalanced-lane Alternative.

16.4.3.2 S.R. 210 – North Little Cottonwood Road to Alta

With the Enhanced Bus Service Alternative, there would be no change to S.R. 210 from North Little Cottonwood Road through Alta. Therefore, with this alternative, there would be no impacts to sites with hazardous materials on S.R. 210 between North Little Cottonwood Road and Alta.

16.4.3.3 Mobility Hubs Alternative

The Enhanced Bus Service Alternative includes two mobility hubs: a mobility hub at the gravel pit and a mobility hub at the park-and-ride lot at 9400 South and Highland Drive.

The gravel pit site has three records with DERR that include 13 diesel or gasoline USTs. All of these tanks were closed in the late 1980s or 1990s and are listed as permanently out of use. There are no records of current, active USTs at this location. There are no known active hazardous material sites at the gravel pit. However, because the gravel pit site has had continued mining and processing activities, prior to construction UDOT would conduct an environmental site investigation to determine the extent of potential contamination, if any. If contamination is found, an avoidance or a remediation plan would be developed. If remediation of a former UST is required, it is possible that remediation could delay the project at the location of the UST and increase this alternative's construction cost.

What is a mobility hub?

A mobility hub is a location where users can transfer from their personal vehicle to a bus.

16.4.3.4 Avalanche Mitigation Alternatives

The Enhanced Bus Service Alternative includes two alternatives for avalanche mitigation: the Snow Sheds with Berms Alternative and the Snow Sheds with Realigned Road Alternative.

16.4.3.4.1 Snow Sheds with Berms Alternative

There would be no impacts to sites with hazardous materials from the Snow Sheds with Berms Alternative.

UDOT also considered the use of artillery shells when evaluating avalanche mitigation. From 2004 to 2017, an average of 163 artillery shells per ski season were fired into the avalanche paths crossed by S.R. 210 in Little Cottonwood Canyon. With the Snow Shed with Berms Alternative, UDOT anticipates that artillery use could be reduced by 80% to about 31 artillery shells per season (Dynamic Avalanche Consulting 2019). During the spring, UDOT surveys the avalanche paths for artillery shells.

16.4.3.4.2 Snow Sheds with Realigned Road Alternative

The impacts to sites with hazardous materials and the use of artillery shells from the Snow Sheds with Realigned Road Alternative would be the same as from the Snow Sheds with Berms Alternative.

16.4.3.5 Trailhead Parking Alternatives

The Enhanced Bus Service Alternative includes three alternatives to address trailhead parking:

- Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative
- Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative
- No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

16.4.3.5.1 Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ mile of Trailheads Alternative

There would be no impacts to sites with hazardous materials from this alternative.

16.4.3.5.2 Trailhead Improvements and No Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

There would be no impacts to sites with hazardous materials from this alternative.

16.4.3.5.3 No Trailhead Improvements and No Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

There would be no impacts to sites with hazardous materials from this alternative.

16.4.3.6 No Winter Parking Alternative

There would be no impacts to sites with hazardous materials from the No Winter Parking Alternative.

16.4.4 Enhanced Bus Service in Peak-period Shoulder Lane Alternative

This section describes the impacts to and from hazardous materials and hazardous waste sites with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 from North Little Cottonwood Road to the town of Alta, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

16.4.4.1 S.R. 210 – Wasatch Boulevard

The impacts to sites with hazardous materials from the Imbalanced-lane and Five-lane Alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

16.4.4.2 S.R. 210 – North Little Cottonwood Road to Alta

The Enhanced Bus Service in Peak-period Shoulder Lane Alternative would widen S.R. 210. Substantial mining activity has occurred in Little Cottonwood Canyon; therefore, construction activities on or adjacent to S.R. 210 would impact soils that could contain higher levels of contaminants.

The area of widening near Tanner's Flat (about mileposts 7.9 to 8.2) would be adjacent to a site with a high probability of contamination: the Jones and Pardee Smelter Superfund (CERCLA) site that is located on the north side of S.R. 210 in this area. Prior to construction, UDOT would conduct an environmental site investigation to determine the extent of the potential contamination, if any. If contamination is found, an avoidance or a remediation plan would be developed. If remediation of the Pardee Smelter site is required, it is possible that remediation could delay the project at the location of the remediation and increase this alternative's construction cost.

16.4.4.3 Mobility Hubs Alternative

The impacts to sites with hazardous materials from the mobility hubs with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

16.4.4.4 Avalanche Mitigation Alternatives

The impacts to sites with hazardous materials and the use of artillery shells from the avalanche mitigation alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

16.4.4.5 Trailhead Parking Alternatives

The impacts to sites with hazardous materials from the trailhead parking alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

16.4.4.6 No Winter Parking Alternative

The impacts to sites with hazardous materials from the No Winter Parking Alternative with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

16.4.5 Gondola Alternative A (Starting at Canyon Entrance)

This section describes the impacts to and from hazardous materials and hazardous waste sites with Gondola Alternative A, which includes a gondola alignment from the entrance to Little Cottonwood Canyon to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

16.4.5.1 S.R. 210 – Wasatch Boulevard

The impacts from the Imbalanced-lane and Five-lane Alternatives to sites with hazardous materials with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

16.4.5.2 S.R. 210 – North Little Cottonwood Road to Alta

Substantial mining activity has occurred in Little Cottonwood Canyon; therefore, construction activities on or adjacent to S.R. 210 would impact soils that could contain higher levels of contaminants.

Gondola tower 9 and the angle station near Tanner’s Flat would both be adjacent to a site with a high probability of contamination: the Jones and Pardee Smelter Superfund (CERCLA) site that is located on the north side of S.R. 210 in this area. Prior to construction, UDOT would conduct an environmental site investigation to determine the extent of the potential contamination, if any. If contamination is found, an avoidance or a remediation plan would be developed. If remediation of the Pardee Smelter site is required, it is possible that remediation could delay the project at the location of the remediation and increase this alternative’s construction cost.

No other sites with hazardous materials would be impacted by Gondola Alternative A on S.R. 210 between North Little Cottonwood Road and Alta.

16.4.5.3 Mobility Hubs Alternative

The impacts to sites with hazardous materials from the mobility hubs with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

16.4.5.4 Avalanche Mitigation Alternatives

The impacts to sites with hazardous materials and the use of artillery shells from the avalanche mitigation alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

16.4.5.5 Trailhead Parking Alternatives

The impacts to sites with hazardous materials from the trailhead parking alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

What are gondola base, angle, and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger’s gondola trip. Passengers board and disembark the gondola cabins at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

The gondola alternatives also include *angle stations*, which are needed to adjust the horizontal direction of the cabin; passengers remain in the cabin as it passes through an angle station.

A *tower* supports the gondola cable.

16.4.5.6 No Winter Parking Alternative

The impacts to sites with hazardous materials from the No Winter Parking Alternative with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

16.4.6 Gondola Alternative B (Starting at La Caille)

This section describes the impacts to and from hazardous materials and hazardous waste sites with Gondola Alternative B, which includes a gondola alignment from La Caille to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

The hazardous material and waste impacts from Gondola Alternative B, including the impacts from the improvements to Wasatch Boulevard, mobility hubs, avalanche mitigation, trailhead parking improvements, and no winter parking, would be the same as with Gondola Alternative A.

16.4.6.1 S.R. 210 – Wasatch Boulevard

The impacts to sites with hazardous materials from the Imbalanced-lane and Five-lane Alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

16.4.6.2 S.R. 210 – North Little Cottonwood Road to Alta

In addition to the Gondola Alternative A impacts, the Gondola Alternative B base station near 9500 South would be adjacent to a site with a high probability of contamination: the Flagstaff Smelter Superfund (CERCLA) and Voluntary Cleanup Program site that is located on the south side of S.R. 210 in this area. Prior to construction, UDOT would conduct an environmental site investigation to determine the extent of the potential contamination, if any. If contamination is found, an avoidance or a remediation plan would be developed. If remediation of the Flagstaff Smelter site is required, it is possible that remediation could delay the project at the location of the remediation and increase this alternative's construction cost.

16.4.6.3 Mobility Hubs Alternative

With Gondola Alternative B, the mobility hubs at the gravel pit and at 9400 South and Highland Drive would require about 600 and 400 parking spaces, respectively. This is less than that proposed with the enhanced bus service alternatives and Gondola Alternative A of 1,500 parking spaces at the gravel pit and 1,000 at 9400 South and Highland Drive. The fewer number of parking spaces at these two locations would not reduce the construction footprint of the parking structures but would reduce the height from three to four stories to two to three stories at the gravel pit and from three to four stories to two stories at 9400 South and Highland Drive. Because the construction footprint would be the same, the impacts from the mobility hubs with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

The analysis of the 1,500-space parking structure at the Gondola Alternative B base station is included in Section 16.4.6.2, S.R. 210 – North Little Cottonwood Road to Alta.

16.4.6.4 Avalanche Mitigation Alternatives

The impacts to sites with hazardous materials and the use of artillery shells from the avalanche mitigation alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

16.4.6.5 Trailhead Parking Alternatives

The impacts to sites with hazardous materials from the trailhead parking alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

16.4.6.6 No Winter Parking Alternative

The impacts to sites with hazardous materials from the No Winter Parking Alternative with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

16.4.7 Cog Rail Alternative (Starting at La Caille)

This section describes the impacts to and from hazardous materials and hazardous waste sites with the Cog Rail Alternative, which includes a cog rail alignment from La Caille to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 on North Little Cottonwood Road, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

What are cog rail base and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's cog rail trip. Passengers board and disembark the cog rail vehicles at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

16.4.7.1 S.R. 210 – Wasatch Boulevard

The impacts to sites with hazardous materials from the Imbalanced-lane and Five-lane Alternatives with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative.

16.4.7.2 S.R. 210 – North Little Cottonwood Road to Alta

The impacts from the Cog Rail Alternative would be similar to the impacts from Gondola Alternative A. Substantial mining activity has occurred in Little Cottonwood Canyon, so construction activities on or adjacent to S.R. 210 would impact soils that could contain higher levels of contaminants.

The Cog Rail Alternative would cross an area near Tanner's Flat that is adjacent to a site with a high probability of contamination: the Jones and Pardee Smelter Superfund (CERCLA) site on the north side of S.R. 210 in this area. Prior to construction, UDOT would conduct an environmental site investigation to determine the extent of the potential contamination, if any. If contamination is found, an avoidance or a remediation plan would be developed. If remediation of the Pardee Smelter site is required, remediation could delay the project schedule at the location of the remediation and increase this alternative's construction cost.

The cog rail base station at La Caille would also have similar impacts as the Gondola Alternative B base station near 9500 South. Both base stations would be in the same location and would be adjacent to a site with a high probability of contamination: the Flagstaff Smelter Superfund (CERCLA) and Voluntary Cleanup Program site on the south side of S.R. 210 in this area. Prior to construction, UDOT would conduct an environmental site investigation to determine the extent of the potential contamination, if any. If contamination is found, an avoidance or a remediation plan would be developed. If remediation of the Flagstaff Smelter site is required, remediation could delay the project schedule at the location of the remediation and increase this alternative's construction cost.

Based on data from the U.S. Geological Survey's Mineral Resources Data System, the eastern end of the Cog Rail Alternative alignment in Alta would be located near two historic mine sites. The site of the historic Frederick Tunnel/Frederick Mine is located on the north side of S.R. 210 north of Hellgate Road. This site was a past producer of silver and lead. The site of the historic Columbus-Rexall Mine is located on the north side of S.R. 210 across from the access to the Alta Wildcat Base area/Goldminer's Daughter. This site was a past producer of copper, gold, silver, lead, and zinc. It is unknown what, if any, remediation activities occurred at these mine sites, so they are both considered sites with a high probability of contamination. Prior to construction, UDOT would conduct an environmental site investigation to determine the extent of the potential contamination, if any. If contamination is found, an avoidance or a remediation plan would be developed. If remediation of the Frederick Tunnel/Frederick Mine or Columbus-Rexall Mine sites is required, remediation could delay the project schedule at the location of the remediation and increase this alternative's construction cost.

No other sites with hazardous materials would be impacted by the Cog Rail Alternative on S.R. 210 between North Little Cottonwood Road and the town of Alta.

16.4.7.3 Mobility Hubs Alternative

The impacts to sites with hazardous materials from the mobility hubs with the Cog Rail Alternative would be the same as with Gondola Alternative B. The analysis of the 1,500-space parking structure at the cog rail base station at La Caille is included in Section 16.4.7.2, S.R. 210 – North Little Cottonwood Road to Alta.

16.4.7.4 Avalanche Mitigation Alternatives

The impacts from the mid-canyon avalanche mitigation alternatives to sites with hazardous materials and the use of artillery shells would be the same as with the Enhanced Bus Service Alternative. There are no hazardous materials or waste sites at or adjacent to the upper-canyon snow sheds; therefore, no impacts would occur from constructing or operating the upper-canyon snow sheds.

16.4.7.5 Trailhead Parking Alternatives

The impacts to sites with hazardous materials from the trailhead parking alternatives with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative.

16.4.7.6 No Winter Parking Alternative

The impacts to sites with hazardous materials from the No Winter Parking Alternative with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative.

16.4.8 Mitigation Measures

Site investigations conducted by UDOT during the final design of the Selected Alternative will determine potential hazards, if any, and the appropriate protective measures. In the case of an identified chemical hazard, UDOT will negotiate the site remedy with the property owner before property is acquired and through possible coordination with DERR. If a smelter site or historic mine site in Little Cottonwood Canyon is impacted, UDOT will also coordinate with the U.S. Department of Agriculture Forest Service and the Salt Lake City Department of Public Utilities to address each Department's watershed concerns.

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

During construction, coordination will take place among UDOT or DERR, the construction contractor, and the appropriate property owners. This coordination will 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 will be used to reduce the potential for public or worker exposure to hazardous materials as determined necessary by UDOT.

16.5 References

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Chapter 17: Visual Resources

17.1 Introduction

The visual resources of a community or area include the physical features that make up the visible landscape and vistas—land, water, vegetation, topography, and human-made features such as buildings, roads, utilities, and structures—combined with the viewer response to the area. This chapter focuses on the evaluation of visual resources and the characterization of the visual impacts of the project alternatives.

Visual Resources Impact Analysis Area. The visual resources impact analysis area consists of the area within a 0.5-mile buffer on either side of State Route (S.R.) 210 as well as the gravel pit and 9400 South and Highland Drive mobility hub locations (Figure 17.1-1). However, views from outside this buffer were included, where appropriate, based on unique viewing locations not captured within the focused analysis area.

What is the visual resources impact analysis area?

The visual impact analysis area consists of the area within a 0.5-mile buffer on either side of S.R. 210 as well as the gravel pit and 9400 South and Highland Drive mobility hub locations. Views from outside this buffer were also included where appropriate.

The viewshed is influenced by distinctive and dominant topography, varying vegetation types, urban development, and ski resort infrastructure. The impact analysis area covers Little Cottonwood Canyon and the Wasatch Range from the entrance of Little Cottonwood Canyon to the Alta resort and urbanized residential areas surrounding Wasatch Boulevard from Fort Union Boulevard to North Little Cottonwood Road.

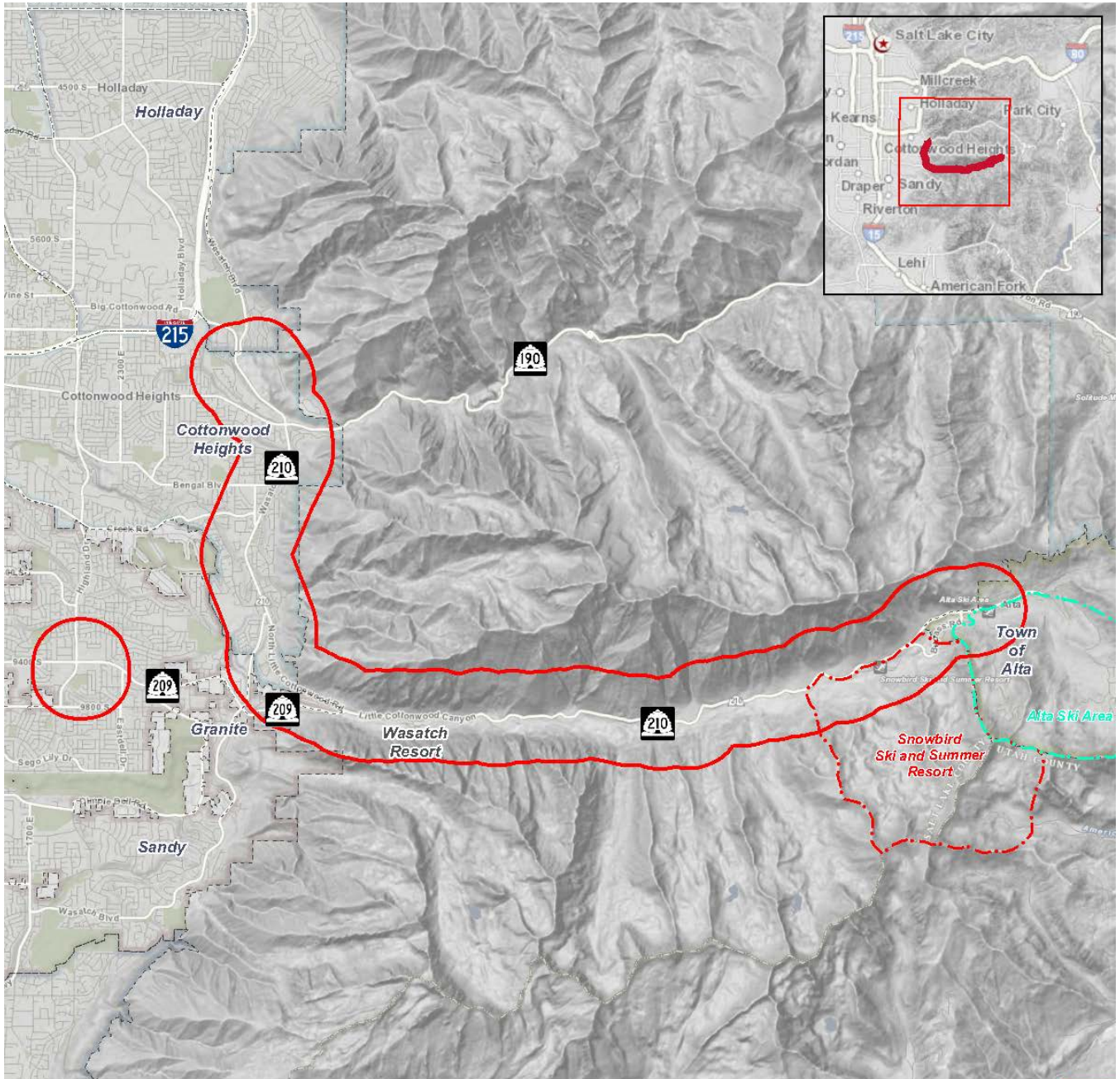
17.2 Regulatory Setting

This section summarizes applicable regulations, policies, and procedures that pertain to visual resources as well as the construction and operation of the action alternatives. In addition to guidance from the Federal Highway Administration (FHWA), this Environmental Impact Statement (EIS) applies the visual assessment guidance and principles of the U.S. Department of Agriculture (USDA) Forest Service because some project components would be in the Uinta-Wasatch-Cache National Forest and a USDA Forest Service special-use authorization or easement might be required. Formal guidelines for managing visual resources on private, state, and municipal land in the visual resources impact analysis area are not established.

17.2.1 Federal Highway Administration

FHWA Technical Advisory T 6640.8A requires that an EIS analyze a project's impacts to visual resources (FHWA 1987). FHWA has developed visual assessment guidance, *Guidelines for the Visual Impact Assessment for Highway Projects* (FHWA 2015), which were adapted and applied as appropriate for the analysis in this EIS, as described more fully in this chapter.

Figure 17.1-1. Visual Resources Impact Analysis Area



LEGEND

 Visual Resources Impact Analysis Area



17.2.2 USDA Forest Service

Regulations pertaining to special-use authorizations (easements and special-use permits) on USDA Forest Service lands primarily address the administrative and procedural aspects of the permitting process, although guidance on terms and conditions for such authorizations includes stating that damage to scenic and aesthetic values should be minimized (36 Code of Federal Regulations [CFR] Section 251.56). The USDA Forest Service's consideration of visual resource issues associated with special-use authorizations is generally based on the visual resource provisions of standard USDA Forest Service policies and procedures for land use planning and National Environmental Policy Act (NEPA) compliance.

The USDA Forest Service has developed a formal system to inventory visual resources on the lands under its jurisdiction, evaluate visual changes in the landscape, and manage visual resources under its jurisdiction. Visual resource management approaches for the USDA Forest Service are discussed in Section 17.4.1, Methodology.

17.2.3 Revised Forest Plan for the Wasatch-Cache National Forest

The impact analysis area includes lands managed by the USDA Forest Service under the guidance of the *Revised Forest Plan: Wasatch-Cache National Forest (Forest Plan)* (USDA Forest Service 2003). The Uinta-Wasatch-Cache National Forest (UWCNF) uses the Scenery Management System (SMS) as presented in *Landscape Aesthetics: A Handbook for Scenery Management* (USDA Forest Service 1995) to provide direction for arranging, planning, and designing landscape attributes relative to the appearance of places and expanses in outdoor settings. The SMS is integrated with ecosystem management and addresses landscape character, constituent preferences, scenic integrity, and landscape visibility as key aesthetic considerations. The UWCNF uses SMS as a guideline intended to assist managers and help the public understand the scenic resource management framework for project-level decisions and larger area analyses. The *Forest Plan* details the desired future condition of scenery in Little Cottonwood Canyon as an area that “will continue to be a valuable and pleasurable natural backdrop for the urban area” and states that the views “will be carefully managed to sustain scenic resources” (USDA Forest Service 2003, page 4-163).

17.3 Affected Environment

This section describes the existing visual character of the visual resources impact analysis area for assessing visual resources. This section provides information about the character of the regional landscape and the land use patterns that have modified the natural landscape.

17.3.1 Geographic Setting

The visual resources impact analysis area is located within northern Utah's Great Salt Lake Basin along the eastern edge of the Basin and Range topographic region, which is characterized by a series of linear fault-block mountain ranges that trend from north to south. Directly to the east, the Wasatch Range extends from north to south and consists of uplifted, fault-block mountains that form the western edge of the Rocky Mountains and the dramatic, abrupt, wall-like Wasatch Front that rises over 6,000 feet above the eastern edge of the Salt Lake Valley floor. The Wasatch Range is the most distinct element in the region and dominates the eastern horizon. Other obvious topographic features are the benches of Lake Bonneville, a great inland freshwater lake that covered about 20,000 square miles 10 to 30 million years ago.

The most dominant natural features in the Salt Lake Valley viewed are the Wasatch Range east of S.R. 210, the entrance of Little Cottonwood Canyon, Little Cottonwood Canyon along S.R. 210, and the Salt Lake Valley and the Oquirrh Mountains to the west. Roads, as well as single-family homes and neighborhoods, are the dominant human-made features in the viewshed along Wasatch Boulevard.

What is a viewshed?

A viewshed is all of the views that can be seen from a given location.

Little Cottonwood Canyon runs west to east and was carved by a massive glacier over thousands of years, beginning 30,000 years ago. The boulder-strewn ridge south of the canyon mouth is the left-lateral moraine; the right-lateral moraine is pushed up against the hillside on the north. As one moves up the canyon, additional glacial evidence can be seen, including hanging valleys on the south side of the canyon and moraine remnants. Repeated large earthquakes that occurred tens of thousands of years ago created the long, steep slope cutting across the canyon mouth. The Salt Lake Valley and the Oquirrh Mountains, another mountain range that trends from north to south, are to the west.

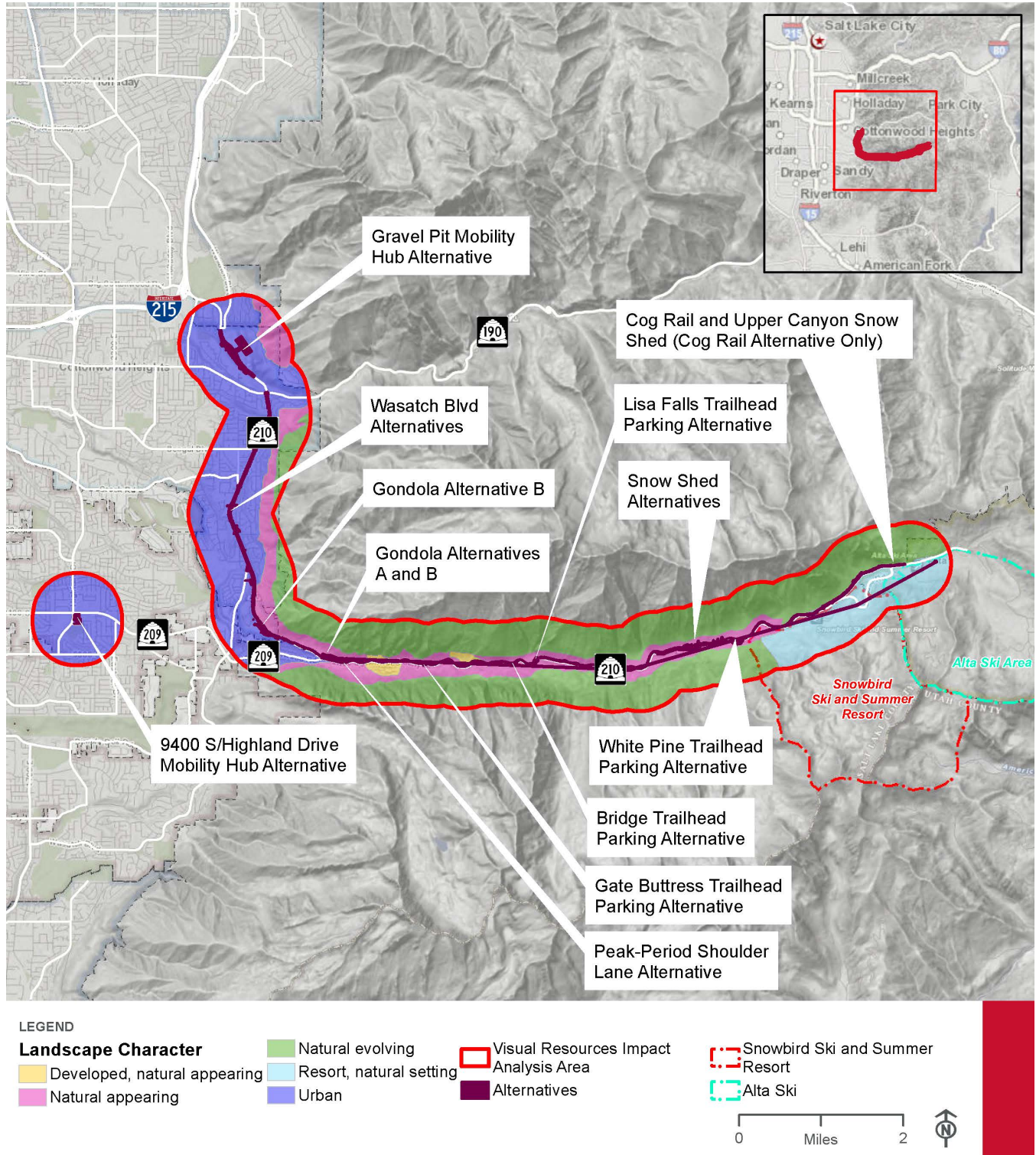
17.3.2 Landscape Character

The visual resources impact analysis area's landscape character consists of the physical, biological, and cultural attributes that make the landscape identifiable or unique or give it a memorable sense of place (USDA Forest Service 1995). To develop and delineate landscape character units (LCUs), this analysis implemented an approach consistent with the USDA Forest Service SMS direction, using the attributes of landform, rock form, water form, vegetation, and cultural features, and drew on the landscape character themes identified in the *Forest Plan* (USDA Forest Service 2003). A similar concept, landscape units, is described in FHWA's *Guidelines for the Visual Impact Assessment for Highway Projects* (FHWA 2015); landscape units are defined by viewsheds and landscape type. These LCUs were refined within the impact analysis area to better represent the current landscape character that could be affected by the project alternatives (Figure 17.3-1). The Urban LCU was developed to provide consistency in describing LCUs; the urban characterization was not identified within the impact analysis area as part of the current UWCNF SMS inventory. Impacts to landscape character were determined using scenic integrity inventory data, project contrast ratings, reviews of aerial images, and field verification.

17.3.2.1 Urban

The Urban LCU includes both residential and urban developments and is located along the Wasatch Front. It runs from north to south along Wasatch Boulevard and North Little Cottonwood Road to the entrance of Little Cottonwood Canyon where recreation and parking also occur. Developments in this unit intermix with the foothills of the Wasatch Front and have a view of those foothills as well as of Salt Lake City. This transition area is more natural-appearing than the residential areas farther from the canyon entrance and exhibits rural-like qualities, including large-acre properties, dense vegetation, and minimal industrial and commercial development. The existing landscape character has been influenced heavily by human activities, even in those rural-like areas. Remaining natural elements include the native shrubs and grasses that cover the foothills to the east of Wasatch Boulevard. Transmission line infrastructure consisting primarily of wooden single poles is present throughout this unit. Residential areas are continuous along the west side of Wasatch Boulevard and inconsistent along the east side, with varied vegetation heights and coverage.

Figure 17.3-1. Landscape Character Units in the Visual Resources Impact Analysis Area



17.3.2.2 Developed Natural Appearing

The Developed Natural Appearing LCU exists in small pockets along S.R. 210. The existing landscape character in this unit is characteristic of National Forest scenic byways with developed recreation facilities, concentrated use areas, and undeveloped recreation impacts within the immediate foreground of the viewshed (less than 0.25 mile). In these areas, the roadway, recreation amenities, and development are anticipated features in the landscape. For users, these amenities are part of the valued natural-appearing landscape. In some cases, users of these amenities are attracted to the natural-appearing landscape but desire moderate-to-easy access to the natural landscape through the use of these amenities. Campgrounds, group sites, picnic areas, and signs are present but harmonize with the surrounding landscape. Parking lots, trailheads, and residential development are present in this LCU, including in the town of Alta.

17.3.2.3 Natural Appearing

The Natural Appearing LCU runs along S.R. 210 and the Wasatch Front and is directly east of Wasatch Boulevard. The existing landscape character of this LCU has been influenced by both direct and indirect human activities but appears natural to most viewers. Natural elements such as native trees, shrubs, grasses, rounded foothills, and rocky canyon walls dominate the views. Although there is evidence of human influence from historic use, recreation, and management activity, these are part of the valued built environment in the landscape. Parking lots, trailheads, and restrooms are present but are constructed in a way that borrows from the form, line, color, and texture of the surrounding landscape. Road cuts are present throughout this unit but are shaped, contoured, and constructed so that the landscape is interrupted by only the track of road.

17.3.2.4 Natural Evolving

The Natural Evolving LCU extends north and south along S.R. 210 in Little Cottonwood Canyon. The evolving nature of this LCU originates primarily from natural disturbances and succession of plants, with subtle changes due to indirect human activities. The existing landscape character in this unit generally continues to change gradually over time through natural processes. This unit includes bold, trapezoidal cliff faces with sloped spines, scree fields, and upright broken rock faces that range from gray to pale yellow. Dominant vegetation includes evergreens and aspens at higher elevations giving way to shrubs and indistinct grasses in the foreground. This unit does not include any large structural developments and consists primarily of the Lone Peak and Twin Peaks Wilderness Areas.

17.3.2.5 Resort Natural Setting

The Resort Natural Setting LCU is in the eastern portion of the visual resources impact analysis area and includes the Alta and Snowbird resorts. In these areas, recreation amenities are the main attraction for people and are the reason they come to an area. Facilities are designed and constructed to harmonize with the natural setting. Although the form of the base-area facilities dominates the immediate foreground views, the domination of the view declines as a resort area transitions into the mountain and becomes subordinate in the foreground and middleground views. Likewise, recreation opportunities provided in base areas rely more heavily on constructed facilities, whereas those higher on the mountain become increasingly oriented toward the natural setting. Parking lots follow contours of the land and are visually broken to reduce their dominance. Ski trails are subordinate to adjacent landscapes by repeating openings found in the surrounding landscape.

Trams and ski lifts blend with vegetation or lines and colors found in the resort scene. In addition, the scattered pockets of vegetation that pattern this landscape provide screening for land use patterns and partially limit the visibility of modifications. The unit has unique landforms with open areas that are atypical of landscapes in the impact analysis area. Land use patterns dominated by recreation-related activities are compatible with the landscape setting and are generally screened by or consistent with the topography.

17.3.2.6 Viewer Sensitivity

The term *sensitive viewers* has been used to refer to what the USDA Forest Service SMS terms “constituents” (USDA Forest Service 1995). Sensitive viewers typically include the viewing public who visit recreation sites in a National Forest or have views of USDA Forest Service land outside a forest’s designated boundary. Travel routes, recreation areas, and residences are the principal viewer types that have been identified in the visual resources impact analysis area.

Viewer sensitivity, termed “concern levels” in the USDA Forest Service SMS, pertains to viewers’ degree of concern for changes to the landscape setting or a particular viewshed. The *Forest Plan* does not define viewer sensitivity levels. In this analysis, viewer sensitivity ratings are based on USDA Forest Service SMS guidance and consideration of the volume of use, viewing duration, concern for aesthetics, scenic or historic status, and type of use (travelers, tourists and recreation users, or residents). In general, viewers who have a high concern for aesthetics are associated with areas of national importance that have a high sensitivity to changes in the landscape. Those viewers who have a moderate concern for aesthetics are generally associated with areas of local importance. Scenic or historic status could increase the amount of use and duration of use for viewers, thereby increasing their concern for changes to the landscape. There might also be a higher concern for aesthetics in special management areas or designations.

Sensitive viewer groups are categorized as the following:

- **Travelers:** Travelers who use roads from which the landscape is viewed
- **Tourists and recreation users:** Local and seasonal residents engaged in recreation activities, and tourists and recreation users visiting from outside the local area
- **Residents:** People who live and work in the impact analysis area and generally view the landscape from their properties and homes, and often from places of employment while engaged in daily activities

Travel routes associated with travelers include scenic routes, interstate routes, U.S. highways, state highway routes, and recreation routes. These routes include various levels of concern for aesthetics and viewing durations. Travelers along the Little Cottonwood Canyon State Scenic Byway (that is, S.R. 210), which extends along the entire length of the canyon, are considered to have a high sensitivity rating and concern for aesthetic and scenic values. Further information related to the Little Cottonwood Canyon State Scenic Byway can be found in the *Cottonwood Canyons Scenic Byways Corridor Management Plan* (UDOT 2008).

What are sensitive viewers?

Sensitive viewers typically include the viewing public who visit recreation sites in a National Forest or have views of USDA Forest Service land outside a forest’s designated boundary.

What is viewer sensitivity?

Viewer sensitivity pertains to viewers’ degree of concern for changes to the landscape setting or a particular viewshed.

Tourist and recreation user areas encompass a variety of viewer types including users of trails, picnic areas, trailheads, overlooks, and a variety of backcountry, solitude-oriented recreation activities. Those users of the recreation areas evaluated through a USDA Forest Service inventory process have different levels of concern for aesthetics and viewing durations. Communities with a view of project construction and the operation of project elements would have a high level of sensitivity with high-use duration and concern for aesthetics.

During the preliminary scoping and alternatives development periods for the S.R. 210 Project, viewers stated that they were concerned about the prominence and dominance of large-scale project infrastructure (such as the gondola towers) in Little Cottonwood Canyon as well as large-scale project infrastructure (such as gondola towers) near neighboring communities. Commenters stated that those project elements would not match the natural character of Little Cottonwood Canyon and would detract from recreational users' experience. Residents who live near the proposed improvements along Wasatch Boulevard also said that project road improvements and pedestrian overpass would detract from the community feeling and association along Wasatch Boulevard.

What is scoping?

Scoping is an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.

17.3.3 Key Observation Points

Key observation points (KOPs) represent viewing locations from which the sensitive viewer types would typically view the project elements from either stationary locations (for example, residential areas or recreation sites) or linear locations (for example, highways and major roads). The Utah Department of Transportation (UDOT) identified 25 KOPs (Table 17.3-1 and Figure 17.3-2) according to locations in the visual resources impact analysis area that would have views of the project elements and that represent the most critical viewpoints.

What are key observation points (KOPs)?

Key observation points represent viewing locations from which the sensitive viewer types would typically view the project elements from either stationary or linear locations.

As part of the analysis, based on FHWA's *Guidelines for the Visual Impact Assessment for Highway Projects* (FHWA 2015), UDOT considered views of the project elements from the perspective of adjacent areas (residents) as well as views from the perspective of travelers using the highway (travelers). KOPs were selected in coordination with UWCNF staff to represent sensitive viewers who have the highest sensitivity, particularly in residential areas, from important travel routes or from recreation areas. In the context of this analysis, UDOT identified several KOPs to represent typical viewing conditions associated with sensitive viewers. Representative photographs of existing conditions at each KOP are provided in Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives.

Views from the Twin Peaks and Lone Peak Wilderness Areas were not specifically assessed in this analysis in accordance with Section 303 of the Utah Wilderness Act of 1984 (Public Law 98-428). This section clarifies that the creation of these wilderness areas was not intended to create buffers to preclude non-wilderness activities beyond their boundaries. The KOP selection process did include a review of KOP locations along trails traversing these wilderness areas, including from the Red Pine Trail, to assess the impacts of the project alternatives on views from USDA Forest Service-managed trails.

Table 17.3-1. Key Observation Points and Rationales for Their Locations

KOP No.	KOP Name	Viewer Group(s)	Rationale for Location
1	Gravel Pit Mobility Hub	Travelers	This KOP represents typical views from Wasatch Boulevard in the area of the gravel pit mobility hub.
2	Fort Union Boulevard	Residents, travelers	This KOP represents typical views from residential areas adjacent to Wasatch Boulevard, as well as views from travelers on the road.
3	Daneborg Drive	Residents, travelers	This KOP represents typical views from residential areas adjacent to Wasatch Boulevard, as well as views from travelers on the road.
4	Quarry Trailhead	Residents, tourists and recreational	This KOP represents typical views from a popular trailhead at the entrance to Little Cottonwood Canyon.
5	Wasatch Resort	Residents, tourists and recreational	This KOP represents typical views from a residential area in Little Cottonwood Canyon and an adjacent popular trail.
6	Gate Buttress Trailhead	Tourists and recreational	This KOP represents typical views from a popular trailhead.
7	Bridge Trailhead	Tourists and recreational	This KOP represents typical views from a popular trailhead.
8	Lisa Falls Trailhead	Tourists and recreational	This KOP represents typical views from a popular trailhead.
9	Tanner's Flat Group Site C	Tourists and recreational	This KOP represents typical views from a popular campsite.
10 ^a	First Snow Shed	Tourists and recreational	This KOP represents typical views from a popular campsite looking toward S.R. 210.
11	Southwest Toward Tanner's Flat (S.R. 210)	Tourists and recreational, travelers	This KOP represents typical views from travelers on S.R. 210.
12	Second Snow Shed (S.R. 210)	Tourists and recreational, travelers	This KOP represents typical views from travelers on S.R. 210.
13	Third Snow Shed (S.R. 210)	Tourists and recreational, travelers	This KOP represents typical views from travelers on S.R. 210.
14 ^a	Red Pine Trail Low	Tourists and recreational	This KOP represents typical views near the base of a popular trail.
15	Red Pine Trail Mid	Tourists and recreational	This KOP represents typical views from a viewpoint near the top of a popular trail looking down on S.R. 210 and toward the entrance to the canyon.
16	White Pine Trailhead	Tourists and recreational	This KOP represents typical views from a popular trailhead.
17	White Pine Lake Trail	Tourists and recreational	This KOP represents typical views from a viewpoint near the top of a popular trail looking down on S.R. 210.
18	Snowbird Entry 1	Tourists and recreational	This KOP represents typical views from travelers on S.R. 210 and recreation users or tourists at the Snowbird resort.
19	Catherine's Pass	Tourists and recreational	This KOP represents typical views from recreation users at the Alta resort.
20	La Caille Base Station	Residents, tourists and recreational	This KOP represents typical views from North Little Cottonwood Road and adjacent residential areas in the area of the mobility hub at La Caille.

(continued on next page)

Table 17.3-1. Key Observation Points and Rationales for Their Locations

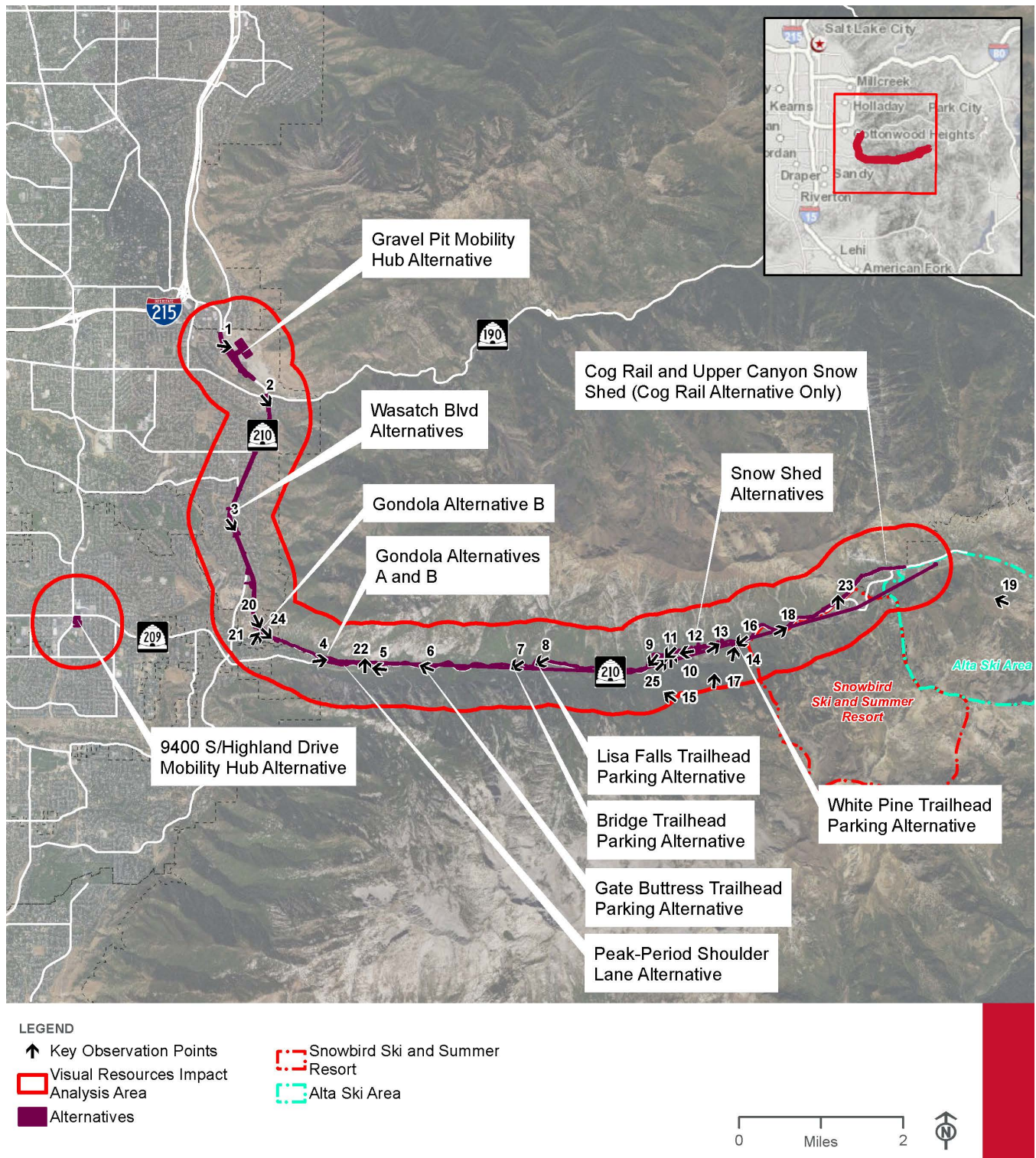
KOP No.	KOP Name	Viewer Group(s)	Rationale for Location
21	La Caille Residential Area	Residents	This KOP represents typical views from residential areas south of North Little Cottonwood Road.
22 ^b	Grit Mill Trailhead	Tourists and recreational	This KOP represents typical views from travelers on S.R. 210 and recreation users or tourists at a popular trailhead.
23 ^b	Upper Canyon Snow Sheds	Tourists and recreational	This KOP represents typical views from travelers on S.R. 210 and recreation users or tourists at the Snowbird resort.
24 ^b	Cog Rail Overpass	Tourists and recreational	This KOP represents typical views from North Little Cottonwood Road.
25 ^c	Tanners Flat Campground	Tourists and recreational	This KOP represents typical views from a popular campsite.

^a This KOP was not carried forward into detailed analysis because views from this location would be completely obstructed by vegetation.

^b This KOP is associated with the Cog Rail Alternative only.

^c This KOP is associated with the enhanced bus service alternatives only.

Figure 17.3-2. Key Observation Point Locations in the Visual Resources Impact Analysis Area



17.3.4 Determining Conformance with Scenic Integrity Objectives and Forest Plan

UDOT determined the project alternatives' conformance with the USDA Forest Service's Scenic Integrity Objectives (SIOs), which are goals for maintaining the scenic integrity of the forest landscape as described in the *Revised Forest Plan: Wasatch-Cache National Forest*. UDOT evaluated the SIOs identified in the *Forest Plan* with the project alternatives' contrast, impacts to landscape character, and impacts to sensitive viewers.

What are Scenic Integrity Objectives?

Scenic Integrity Objectives are goals set in the *Forest Plan* for maintaining the scenic integrity of the forest landscape.

Scenic integrity is a measure of the intactness associated with the visual elements that define a particular LCU and can range from very high to unacceptably low. LCUs with minimal visual disruption are considered to have high scenic integrity. LCUs occupied by discordant landscape features modify the landscape character of a particular unit and have diminished scenic integrity. Other landscape features can be compatible with the landscape character (for example, trails, campgrounds, and picnic areas) and can contribute to or enhance scenic integrity.

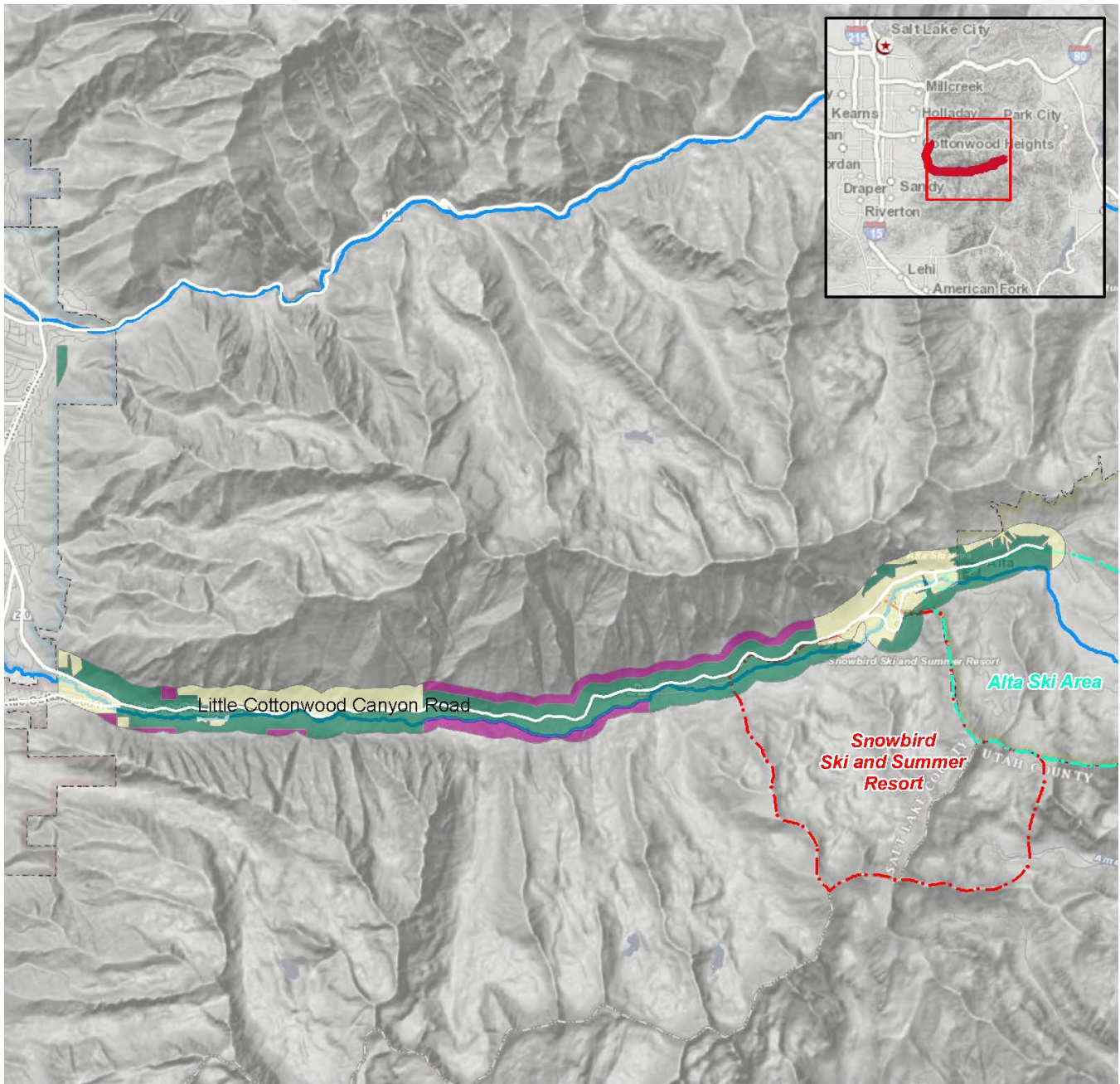
Scenic integrity and the corresponding management objectives are expressed by the USDA Forest Service as very high, high, moderate, low, very low, and unacceptably low. Table 17.3-2 and Figure 17.3-3 present the range of SIO levels and their associated definitions against which the project alternatives were evaluated.

Table 17.3-2. USDA Forest Service Scenic Integrity Objectives

SIO Level	Description
Very High	The valued landscape character is intact with only subtle, if any, deviations. Generally provides for ecological change only.
High	Landscapes where the valued landscape character appears intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely, and at such scale, that they are not evident.
Moderate	Refers to landscapes where the described landscape character appears slightly intact. Noticeable deviations must remain visually subordinate to the landscape character being viewed.
Low	Activities must remain visually subordinate to the attributes of the described landscape character. Activities may repeat form, line, color, or texture common to the landscape character, but changes in quality of size, number, intensity, direction, pattern, and so on, must remain visually subordinate to the described landscape character.
Very Low	Activities of vegetation and landform alterations may dominate the described landscape character but should appear as valued occurrences when viewed at background distances.
Unacceptably Low	Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern, or scale from the landscape character. Landscapes at this level of integrity need rehabilitation. This level should be used only to inventory existing integrity; it must not be used as a management objective.

Sources: USDA Forest Service 1995, 2003

Figure 17.3-3. Scenic Integrity Objectives in the Visual Resources Impact Analysis Area



LEGEND

- | | |
|------------------------------------|--------------------------------|
| Scenic Integrity Objectives | Snowbird Ski and Summer Resort |
| Private Land | Alta Ski Area |
| High Scenic Integrity | |
| Very High Scenic Integrity | |

0 Miles 1



17.4 Environmental Consequences and Mitigation Measures

This section discusses the methodology that UDOT developed to assess impacts to landscape character and sensitive viewers, as well as the project alternatives' compliance with *Forest Plan* SIOs. The results of this assessment, the expected impacts, and compliance with SIOs are described for each alternative and are organized by the alternatives' elements (for example, roadway improvements, snow sheds, and gondola infrastructure).

17.4.1 Methodology

This analysis evaluates visual resources that would be affected by the project alternatives using guidance and methods derived from *Guidelines for the Visual Impact Assessment for Highway Projects* (FHWA 2015), *Landscape Aesthetics: A Handbook for Scenery Management* (USDA Forest Service 1995), and Bureau of Land Management (BLM) Handbook H-8431-1, *Visual Resource Contrast Rating* (BLM 1986). In accordance with these guidelines and methods, the existing visual character and scenic quality of the affected environment, as well as the viewer response to those resources, provide the framework for assessing the changes in visual character that would be caused by the project alternatives. The results of this analysis provide the foundation for the visual mitigation measures discussed in Section 17.4.8, Mitigation Measures.

The methodology that UDOT used to evaluate and analyze visual resources was derived from and is consistent with the USDA Forest Service SMS as described in *Landscape Aesthetics: A Handbook for Scenery Management* (USDA Forest Service 1995). Evaluation data and information were obtained from aerial photographs, the *Forest Plan*, a digital elevation model, and field reconnaissance. The evaluation and subsequent analysis were conducted on all lands, including public and private, regardless of jurisdiction.

The following sections focus on identifying and characterizing visual impacts from the construction, operation, and maintenance of the project alternatives. Impacts to landscape character, impacts to sensitive viewers, and compliance with SIOs have been evaluated to identify and characterize impacts. UDOT's impact assessment methodology is consistent with the USDA Forest Service's SMS procedures and concepts as well as other recent visual studies associated with linear projects conducted in comparable settings. Visual impacts resulting from the project alternatives were identified in part by measuring the level of visual change to the landscape (in which the alternatives would be located) in context with landscape character, sensitive viewers, and the definitions associated with the designated SIOs. The impact assessment was conducted through field investigation and consultation with UWCNF staff.

Some of the project alternatives would not be in conformance with the *Forest Plan* SIO guidelines. FHWA may appropriate the land needed for the project alternatives from the USDA Forest Service for transfer to UDOT (typically in the form of a highway easement deed) under the authority of 23 USC Section 317, or UDOT would obtain an easement or other special-use authorization from the USDA Forest Service to allow construction, operation, and maintenance of the Selected Alternative. If FHWA appropriates the USDA Forest Service lands, the *Forest Plan* and its SIO standards and guidelines would no longer apply to those lands. If UDOT obtains an easement or other special-use authorization from the USDA Forest Service, the *Forest Plan* and its SIO standards and guidelines would still apply, and the USDA Forest Service might need to amend the *Forest Plan* to address the nonconformance to the SIO standards and guidelines (see Chapter 28, U.S. Department of Agriculture Forest Service Land Use Plan Amendments).

17.4.1.1 Project Contrast

Project contrast is a measure of the overall visual change to existing features of the landscape (including landscape character, landform/slope, and vegetation) resulting from the construction and operation of a given project. UDOT assessed project contrast by comparing the visual elements of the landscape in terms of form, line, color, and texture to the visual elements associated with the construction and operation of the project alternatives in relation to viewers in the landscape by applying the methodology in BLM Handbook H-8431-1, *Visual Resource Contrast Rating* (BLM 1986).

What is project contrast?

Project contrast is a measure of the overall visual change to existing features of the landscape (including landscape character, landform/slope, and vegetation) resulting from the construction and operation of a given project.

The BLM contrast rating process is a widely used analysis tool regardless of jurisdiction and provides a consistent approach to evaluating project elements within the landscape and how those elements could be perceived by viewers. The ability to discern change in the landscape depends primarily on distance. For this analysis, the immediate foreground area is defined as the area up to 0.25 mile from the action alternatives, and the foreground area is defined as the area 0.25 to 0.5 mile from the action alternatives. The middle ground is beyond 0.5 mile.

A landform (slope) analysis was conducted using a 30-meter digital elevation model to determine topographical categories in the visual resources impact analysis area that influence project contrast related to the gondola alternatives. Other project elements were analyzed using design footprints and the area identified to be disturbed to construct and maintain those elements (for example, road widening and parking lot improvements).

Vegetation types and densities were confirmed through field investigation and incorporated into project contrast analysis as appropriate. In addition, proximity to similar facilities and incongruent landscape features were also identified. The elements of landform/slope, vegetation, and existing conditions were photographed and were detailed on Contrast Form Rating Sheets. Photosimulations were developed for KOPs where there would be a large contrast between the existing conditions and the conditions with a project alternative. Photosimulations were also developed for KOPs where a project alternative would conflict with a use (such as camping) (see Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives, and Appendix 17B, Key Observation Points for the Cog Rail Alternative).

Project contrast was used as the baseline for assessing impacts to landscape character and sensitive viewers and determining conformance with designated SIOs. Table 17.4-1 provides descriptions for each impact level, associated with the project contrast rating, on views and landscape character. As described in Section 17.3.2, Landscape Character, each LCU has an existing landscape character with an expectation of what types of development would continue to meet that existing character (for example, a parking structure would be expected in an urban LCU but would be visually dominant in a natural appearing LCU). Because of this additional consideration, impacts to landscape character and viewers (KOPs) might not directly correspond, especially along the urban/natural boundary between the Salt Lake Valley and the Wasatch Range.

Table 17.4-1. Criteria for Assessing Level of Impacts to Visual Resources

Level of Impacts	Contrast Perceived by Viewers (KOPs)	Magnitude of Change to Landscape Character
None/negligible	<ul style="list-style-type: none"> Project elements would repeat elements and/or patterns common in the landscape. Project elements would not be visually evident. 	<ul style="list-style-type: none"> Landscape would appear to be intact, and project elements would not attract attention. Project elements would repeat the form, line, color, texture, or scale common in the landscape and would not be visually evident (no contrast). Would meet a very high SIO: Landscape character is intact with only minor, if any, deviations.
Low	<ul style="list-style-type: none"> Project elements would introduce elements and/or patterns common in the landscape that would be visually subordinate. Project elements would create weak contrast compared with other features in the landscape. 	<ul style="list-style-type: none"> Landscape would be noticeably altered, and project elements would begin to attract attention. Project elements would introduce the form, line, color, texture, or scale common in the landscape and would be visually subordinate (weak contrast). Would meet a high SIO: Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely, and at such scale, that they are not evident.
Moderate	<ul style="list-style-type: none"> Project elements would introduce elements and/or patterns not common in the landscape. Project elements would be visually prominent in the landscape and would create moderate contrast compared with other features in the landscape. 	<ul style="list-style-type: none"> Landscape would appear to be substantially altered, and project elements would begin to dominate the visual setting. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape (moderate contrast). Would meet a moderate SIO: Noticeable deviations must remain visually subordinate to the landscape character being viewed.
High	<ul style="list-style-type: none"> Project elements would introduce elements and/or patterns that would be visually dominant and create strong contrast compared with other features in the landscape. 	<ul style="list-style-type: none"> Landscape would appear to be severely altered, and project elements would dominate the visual setting. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually dominant in the landscape (strong contrast). Would meet a low SIO: Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, edge effect, and pattern of natural openings; vegetation type changes; or architectural styles outside the landscape being viewed. Would meet a very low SIO: Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect, and the landscape being viewed.

17.4.2 No-Action Alternative

This section describes the visual impacts of the No-Action Alternative in the Wasatch Boulevard segment of S.R. 210, in the segment of S.R. 210 from North Little Cottonwood Road to the town of Alta, at the gravel pit, and at the park-and-ride lot at 9400 South and Highland Drive.

17.4.2.1 S.R. 210 – Wasatch Boulevard

With the No-Action Alternative, the S.R. 210 Project would not be implemented, so the visual resources impact analysis area would not be affected by the project. Because no major roadway improvements would be made as part of the S.R. 210 Project, there would be no topographic changes or disturbances associated with the project, and the views in the impact analysis area would be similar to the existing conditions.

17.4.2.2 S.R. 210 – North Little Cottonwood Road to Alta

With the No-Action Alternative, the S.R. 210 Project would not be implemented, and the visual resources impact analysis area would remain in its current condition. Because no major roadway improvements would be made or gondola or cog rail elements constructed as part of the S.R. 210 Project, there would be no topographic changes or disturbances associated with the project, and the views in the impact analysis area would be similar to the existing conditions. This similarity includes no impacts to the visitor experience or the management of the Little Cottonwood Canyon State Scenic Byway.

17.4.2.3 Mobility Hubs

17.4.2.3.1 Gravel Pit

With the No-Action Alternative, the mobility hub at the gravel pit location would not be constructed. However, Cottonwood Heights City is planning to develop the gravel pit with a mix of residential and commercial uses. This development would change the visual character of this location from an industrial aggregate mine to more typical urban uses.

17.4.2.3.2 9400 South and Highland Drive

With the No-Action Alternative, there would be no change to the existing park-and-ride lot at 9400 South and Highland Drive. The visual character would continue to be urban.

What is a mobility hub?

A mobility hub is a location where users can transfer from their personal vehicle to a bus.

What is the gravel pit?

The gravel pit is an existing aggregate (gravel) mine located on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard.

17.4.3 Enhanced Bus Service Alternative

This section describes the visual impacts of the Enhanced Bus Service Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

The impact levels associated with the Enhanced Bus Service Alternative are based on project contrast and magnitude of change resulting from the introduction of project elements in the characteristic landscape, or as viewed from KOP locations, by applying the criteria identified above in Table 17.4-1, Criteria for Assessing Level of Impacts to Visual Resources.

17.4.3.1 S.R. 210 – Wasatch Boulevard

This section describes the visual impacts of the Imbalanced-lane Alternative and the Five-lane Alternative, which would both widen the Wasatch Boulevard segment of S.R. 210. More-detailed design information including proposed areas of cut and fill is included in Appendix 2B, Wasatch Boulevard Imbalanced-lane Alternative Plans, and Appendix 2C, Wasatch Boulevard Five-lane Alternative Plans, for Chapter 2, Alternatives.

17.4.3.1.1 Imbalanced-lane Alternative

The impacts from the Imbalanced-lane Alternative would be similar to those from the Five-lane Alternative but would, in general, be less intense because fewer acres would be modified in the Urban LCU and viewed as modified (visual contrast) from KOP locations.

17.4.3.1.2 Five-lane Alternative

Table 17.4-2 describes the magnitude of change in landscape character associated with the improvements to Wasatch Boulevard with the Five-lane Alternative.

Table 17.4-2. Impacts to Landscape Character Units from the Five-lane Alternative

LCU	Level of Impact	Impact Description
Urban	Negligible	Landscape would appear intact, and project elements would not attract attention within the urban setting. Project elements would repeat form, line, color, texture, or scale common in the landscape and would not be visually evident (no contrast). About 38 acres of project elements (roadway improvements) would be within this LCU.

Three KOPs representing travelers and residents were identified to describe impacts to views resulting from the roadway improvements with the Five-lane Alternative. Table 17.4-3 lists, by KOP, the criteria used to determine impact levels, including viewer sensitivity, distance from the roadway improvements, viewer position, and visibility. The table identifies the resulting impact level as low, with a short narrative describing the types of impacts the alternative would have on these views. For more detail regarding each KOP, refer to the Contrast Form Rating Sheets in Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives.

Table 17.4-3. Impacts to Viewers (KOPs) from Wasatch Boulevard Improvements with the Five-lane Alternative and the Enhanced Bus Service Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Element (approximate)	Viewer Position	Level of Impact	Impact Description
1	Gravel Pit Mobility Hub	Travelers	Moderate	Adjacent	Neutral	Low	Widening Wasatch Boulevard would be visually subordinate and similar to other infrastructure in the area. Views toward Wasatch Boulevard would be unobstructed.
2	Fort Union Boulevard	Residents, travelers	High	Adjacent	Neutral	Low	Project elements, such as a widened Wasatch Boulevard, a pedestrian bridge, and a shared-use path, would be visually subordinate and similar to other infrastructure in the area. Views toward Wasatch Boulevard would be intermittently screened by vegetation, topography, and existing development.
3	Daneborg Drive	Residents, travelers	High	Adjacent	Neutral	Low	Project elements, such a widened Wasatch Boulevard, a pedestrian bridge, and a shared-use path, would be visually subordinate and similar to other infrastructure in the area. Views toward Wasatch Boulevard would be intermittently screened by vegetation, topography, and existing development.

17.4.3.2 S.R. 210 – North Little Cottonwood Road to Alta

With the Enhanced Bus Service Alternative, no roadway improvements would be made along S.R. 210 between North Little Cottonwood Road and the town of Alta (Little Cottonwood Canyon State Scenic Byway). There would be no topographic changes or disturbances associated with this alternative, and the views in the visual resources impact analysis area would be similar to the existing conditions. Impacts to the visitor experience or the management of the scenic byway would be mostly associated with the avalanche mitigation described in Section 17.4.3.4, Avalanche Mitigation Alternatives.

For tolling, a gantry (single pole over the westbound travel lane) immediately adjacent to the travel lane just west of Snowbird Entry 1 might be required depending on the final tolling technology selected. The tolling gantry would likely be placed immediately adjacent to the roadway next to the existing S.R. 210 emergency roadway closure gates just west of Snowbird Entry 1. Because the tolling gantry would be placed next to the existing road closure gates and near the developed Snowbird resort, the overall landscape character would not be severely altered. The tolling gantry would span a single travel lane, similar to the closure gates, and would not dominate the visual setting in the immediate foreground and foreground areas. The overall level of impact would be moderate.

17.4.3.3 Mobility Hubs Alternative

The Enhanced Bus Service Alternative includes two mobility hubs: a mobility hub at the gravel pit and a mobility hub at the park-and-ride lot at 9400 South and Highland Drive.

17.4.3.3.1 Gravel Pit

Table 17.4-4 describes the magnitude of change in landscape character associated with the gravel pit mobility hub.

Table 17.4-4. Impacts to Landscape Character Units from the Gravel Pit Mobility Hub with the Enhanced Bus Service Alternative

LCU	Level of Impact	Impact Description
Urban	Negligible	Landscape would appear intact, and project elements would not attract attention within the urban setting. Project elements would repeat form, line, color, texture, or scale common in the landscape and would not be visually evident (no contrast). About 39 acres of project elements (mobility hub) would be within this LCU.

One KOP representing travelers along Wasatch Boulevard was identified to describe impacts to views resulting from the mobility hub parking structure. Table 17.4-5 lists the criteria used to determine the impact level from this KOP, including viewer sensitivity, distance from the mobility hub, viewer position, and visibility. The table identifies the resulting impact level as moderate, with a short narrative describing the type of impacts the mobility hub parking structure would have from this location. For more detail regarding this KOP, refer to the Contrast Form Rating Sheets in Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives.

Table 17.4-5. Impacts to Viewers (KOPs) from the Gravel Pit Mobility Hub with the Enhanced Bus Service Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Element (approximate)	Viewer Position	Level of Impact	Impact Description
1	Gravel Pit Mobility Hub	Travelers	Moderate	900 feet	Neutral	Moderate	Project elements, such as the parking structure, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape.

17.4.3.3.2 9400 South and Highland Drive

The impacts to landscape character from the 9400 South and Highland Drive mobility hub would be similar to those from the gravel pit mobility hub. The 9400 South and Highland Drive mobility hub would be located entirely within the urban environment of the Sandy metropolitan area and would be consistent with the character of the Urban LCU. There are no KOPs at this location because it is in an urban, commercial location with few adjacent sensitive receptors.

17.4.3.4 Avalanche Mitigation Alternatives

The Enhanced Bus Service Alternative includes two alternatives for avalanche mitigation: the Snow Sheds with Berms Alternative and the Snow Sheds with Realigned Road Alternative.

17.4.3.4.1 Snow Sheds with Berms Alternative

Table 17.4-6 describes the magnitude of change in landscape character from the Snow Sheds with Berms Alternative.

Table 17.4-6. Impacts to Landscape Character Units from the Snow Sheds with Berms Alternative with the Enhanced Bus Service Alternative

LCU	Level of Impact	Impact Description
Natural Appearing	High	The landscape would appear severely altered, and the snow shed infrastructure with berms would dominate the visual setting in the immediate foreground and foreground areas of the LCU. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually dominant in the landscape (strong contrast). About 13 acres of project elements within this LCU are associated with the Snow Sheds with Berms Alternative.

UDOT identified six KOPs representing tourists and recreational users along S.R. 210 and within the area of the snow sheds to describe impacts to views from this alternative. Table 17.4-7 lists, by KOP, the criteria used to determine impact levels at these KOPs, including viewer sensitivity, distance from the snow sheds and berms, viewer position, and visibility for this alternative. Additionally, the table identifies the resulting impact levels (from none to high), with a short narrative describing the type of impacts the alternative would have from these locations. For more detail regarding each KOP, refer to the Contrast Form Rating Sheets in Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives.

Impacts to the Little Cottonwood Canyon State Scenic Byway visitor experience would include views of three snow sheds (at KOPs 11, 12, and 13) in the upper portion of Little Cottonwood Canyon between Tanner's Flat and the Snowbird resort. These elements would be visually dominant compared to the existing landscape as visitors drive this approximately 1.5-mile section of the overall 7-mile-long scenic byway.

As stated in the *Cottonwood Canyons Corridor Management Plan*, the vision for the scenic byway is to "offer outstanding scenery, access to year-round developed and undeveloped recreation, and visitor education and information, creating an enjoyable and satisfying experience for visitors to the byways and their destinations" (UDOT 2008). Specifically, the plan identifies a strategy to protect scenic vistas under the goal of protecting the canyon's watershed and natural resources. The snow sheds would be focused in one area where avalanches limit year-round access along the scenic byway due to occasional road closures. For

this reason, these elements would diminish but not limit the management of the scenic byway by the USDA Forest Service to protect scenic vistas and intrinsic scenic qualities.

Table 17.4-7. Impacts to Viewers (KOPs) from the Snow Sheds with Berms Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Element (approximate)	Viewer Position	Level of Impact	Impact Description
10	First Snow Shed	Tourists and recreational	High	215 feet	Inferior	None	Project elements associated with the Snow Sheds with Berms Alternative would not be visually evident.
11	Southwest Toward Tanner's Flat (S.R. 210)	Tourists and recreational, travelers	High	Adjacent	Neutral to inferior	High	Project elements, such as alterations to slope and a snow shed, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape.
12	Second Snow Shed (S.R. 210)	Tourists and recreational	High	Adjacent	Neutral to inferior	High	Project elements, such as alterations to slope and a snow shed, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape.
13	Third Snow Shed (S.R. 210)	Tourists and recreational	High	225 feet	Neutral to inferior	High	Project elements, such as alterations to slope and a snow shed, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape.
17	White Pine Lake Trail	Tourists and recreational	Moderate	260 feet	Superior	Moderate	Project elements, such as snow sheds and berms, would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape.
25	Tanners Flat Camp-ground	Tourists and recreational	Moderate	350 feet	Inferior	Moderate	Project elements, such as retaining walls, would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape.

17.4.3.4.2 Snow Sheds with Realigned Road Alternative

Table 17.4-8 describes the magnitude of change in landscape character from the Snow Sheds with Realigned Road Alternative.

Table 17.4-8. Impacts to Landscape Character Units from the Snow Sheds with Realigned Road Alternative with the Enhanced Bus Service Alternative

LCU	Level of Impact	Impact Description
Natural Appearing	High	The landscape would appear severely altered, and the snow shed infrastructure with the realigned road would dominate the visual setting in the immediate foreground and foreground areas of the LCU. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually dominant in the landscape (strong contrast). About 19 acres of project elements within this LCU would be associated with the Snow Sheds with Realigned Road Alternative.

UDOT identified six KOPs representing tourists and recreational users along S.R. 210 and within the area of the snow sheds to describe impacts to views resulting from this alternative. Table 17.4-9 lists, by KOP, the criteria used to determine impact levels at these KOPs, including viewer sensitivity, distance from the snow sheds and realigned road, viewer position, and visibility for this alternative. Additionally, the table identifies the resulting impact levels (from none to high), with a short narrative describing the type of impacts the alternative would have from these locations. For more detail regarding each KOP, refer to the Contrast Form Rating Sheets in Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives.

The impacts to the visitor experience and management of the scenic byway would be similar to those from the Snow Sheds with Berms Alternative.

Table 17.4-9. Impacts to Viewers (KOPs) from the Snow Sheds with Realigned Road Alternative with the Enhanced Bus Service Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Element (approximate)	Viewer Position	Level of Impact	Impact Description
10	First Snow Shed	Tourists and recreational	High	215 feet	Inferior	None	Project elements associated with this alternative would not be visually evident.
11	Southwest Toward Tanner's Flat (S.R. 210)	Tourists and recreational, travelers	High	Adjacent	Neutral to inferior	High	Project elements, such as alterations to slope and a snow shed, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape.
12	Second Snow Shed (S.R. 210)	Tourists and recreational	High	Adjacent	Neutral to inferior	High	Project elements, such as alterations to slope and a snow shed, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape.
13	Third Snow Shed (S.R. 210)	Tourists and recreational	High	Adjacent	Neutral to inferior	High	Project elements, such as alterations to slope and a snow shed, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape.
17	White Pine Lake Trail	Tourists and recreational	Moderate	Adjacent	Superior	Moderate	Project elements, such as snow sheds, would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape.
25	Tanners Flat Camp-ground	Tourists and recreational	Moderate	350 feet	Inferior	Moderate	Project elements, such as retaining walls, would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape.

17.4.3.5 Trailhead Parking Alternatives

The Enhanced Bus Service Alternative includes three alternatives to address trailhead parking:

- Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative
- Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative
- No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

17.4.3.5.1 Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative

Table 17.4-10 describes the magnitude of change in landscape character from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative.

Table 17.4-10. Impacts to Landscape Character Units from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative with the Enhanced Bus Service Alternative

LCU	Level of Impact	Impact Description
Natural Appearing	Low	Landscape would appear noticeably altered, and project elements would begin to attract attention within the immediate foreground area. Project elements would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate (weak contrast) and similar to existing trailhead parking infrastructure found within the LCU. About 7 acres of trailhead improvements would be located within this LCU.

UDOT identified four KOPs representing tourists and recreational users to describe impacts to views resulting from the trailhead improvements throughout Little Cottonwood Canyon. Table 17.4-11 lists, by KOP, the criteria used to determine impact levels, including viewer sensitivity, approximate distance from the improvements, viewer position, and visibility. The table identifies the resulting impact level as low, with a short narrative describing the types of impacts the improvements would have from these locations. For more detail regarding each KOP, refer to the Contrast Form Rating Sheets in Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives.

Table 17.4-11. Impacts to Viewers (KOPs) from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative with the Enhanced Bus Service Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Element (approximate)	Viewer Position	Level of Impact	Impact Description
6	Gate Buttress Trailhead	Tourists and recreational	Moderate	140 feet	Neutral to inferior	Low	Project elements, such as cut slopes, a restroom structure, and parking lot improvements, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.
7	Bridge Trailhead	Tourists and recreational	Moderate	Adjacent	Neutral to inferior	Low	Project elements, such as a retaining wall, a restroom structure, and parking lot improvements, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.
8	Lisa Falls Trailhead	Tourists and recreational	Moderate	290 feet	Neutral to inferior	Low	Project elements, such as signs, restrooms, and parking lot improvements, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.
16	White Pine Trailhead	Tourists and recreational	Moderate	70 feet	Neutral to inferior	Low	Project elements, such as parking lot improvements and an exit ramp, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.

17.4.3.5.2 Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The impacts of this alternative would be similar to those from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative except for additional No Parking signs along S.R. 210. The additional signs would be visually subordinate in the setting and would not attract attention from KOPs.

17.4.3.5.3 No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The impacts to landscape character and on views from KOPs from this alternative would be limited to additional No Parking signs along S.R. 210 that would be visually subordinate in the setting and would not attract attention from KOPs. No additional topographic changes or disturbances associated with this alternative would occur.

17.4.3.6 No Winter Parking Alternative

Impacts to landscape character, and on views from KOPs, would be minor with the No Winter Parking Alternative because no topographic changes or disturbances associated with the alternative would occur.

17.4.3.7 Conformance with USDA Forest Service Scenic Integrity Objectives – Enhanced Bus Service Alternative

The USDA Forest Service has developed measurable standards for managing the scenic resources of USDA Forest Service lands through the SMS. This analysis determined whether the Enhanced Bus Service Alternative and its associated elements would be in conformance with the established objectives in the *Forest Plan*. On the basis of the respective SIO levels, the stated management objectives were compared with the alternative regarding magnitude of change in visual character and inherent scenic integrity, viewer sensitivity, and visual contrast within the existing landscape.

Table 17.4-6 through Table 17.4-11 above identify impacts to landscape character and viewers in the visual resources impact analysis area associated with snow shed and trailhead improvement infrastructure. In the areas that have a high SIO in relation to the snow shed locations and trailhead improvements (Figure 17.4-1 through Figure 17.4-3 below) and where the impact determination is moderate to high (Table 17.4-12 on page 17-31), the high SIO would not be met and would not be in conformance with the following SIO guidelines identified in the *Forest Plan* for scenery management (USDA Forest Service 2003):

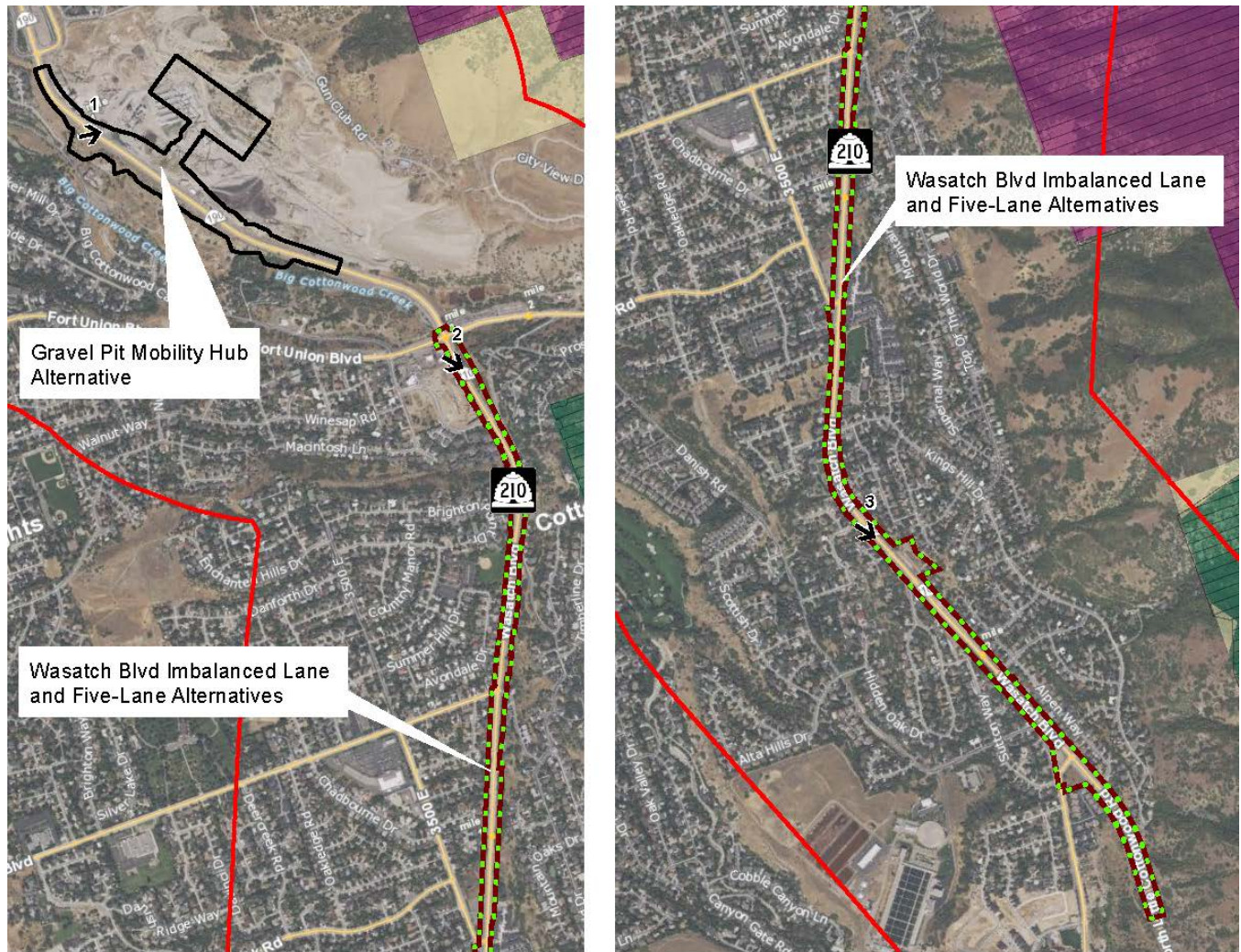
- **G59:** Manage forest landscapes according to landscape character themes, and SIOs as mapped (USDA Forest Service 2003, page 4-48).
- **G60:** Resource management activities should not be permitted to reduce scenic integrity below objectives stated for management prescription categories (USDA Forest Service 2003, page 4-48).

In areas where trailhead improvements would be made as part of the Enhanced Bus Service Alternative and where the impact determination is low, those elements would conform to the *Forest Plan* SIO designation of high.

UDOT anticipates that these areas of nonconformance with SIO guidelines would be in conformance with the following SIO standard identified in the *Forest Plan* for scenery management (USDA Forest Service 2003):

- **S22:** Management actions that would result in a scenic integrity level of Unacceptably Low are prohibited in all landscape character themes (USDA Forest Service 2003, page 4-48).

Figure 17.4-1. Scenic Integrity Objectives in the Visual Resources Impact Analysis Area for the Enhanced Bus Service Alternative (1 of 3)



↑ Key Observation Points **Scenic Integrity Objectives**

- Visual Resources Impact Analysis Area
- Uinta-Wasatch-Cache National Forest Boundary

- Private Land
- High Scenic Integrity
- Very High Scenic Integrity

Alternatives

- Gravel Pit Interchange
- Wasatch Blvd - Imbalanced Lane
- Wasatch Blvd - Five Lane



0 2,500 Feet

Figure 17.4-2. Scenic Integrity Objectives in the Visual Resources Impact Analysis Area for the Enhanced Bus Service Alternative (2 of 3)

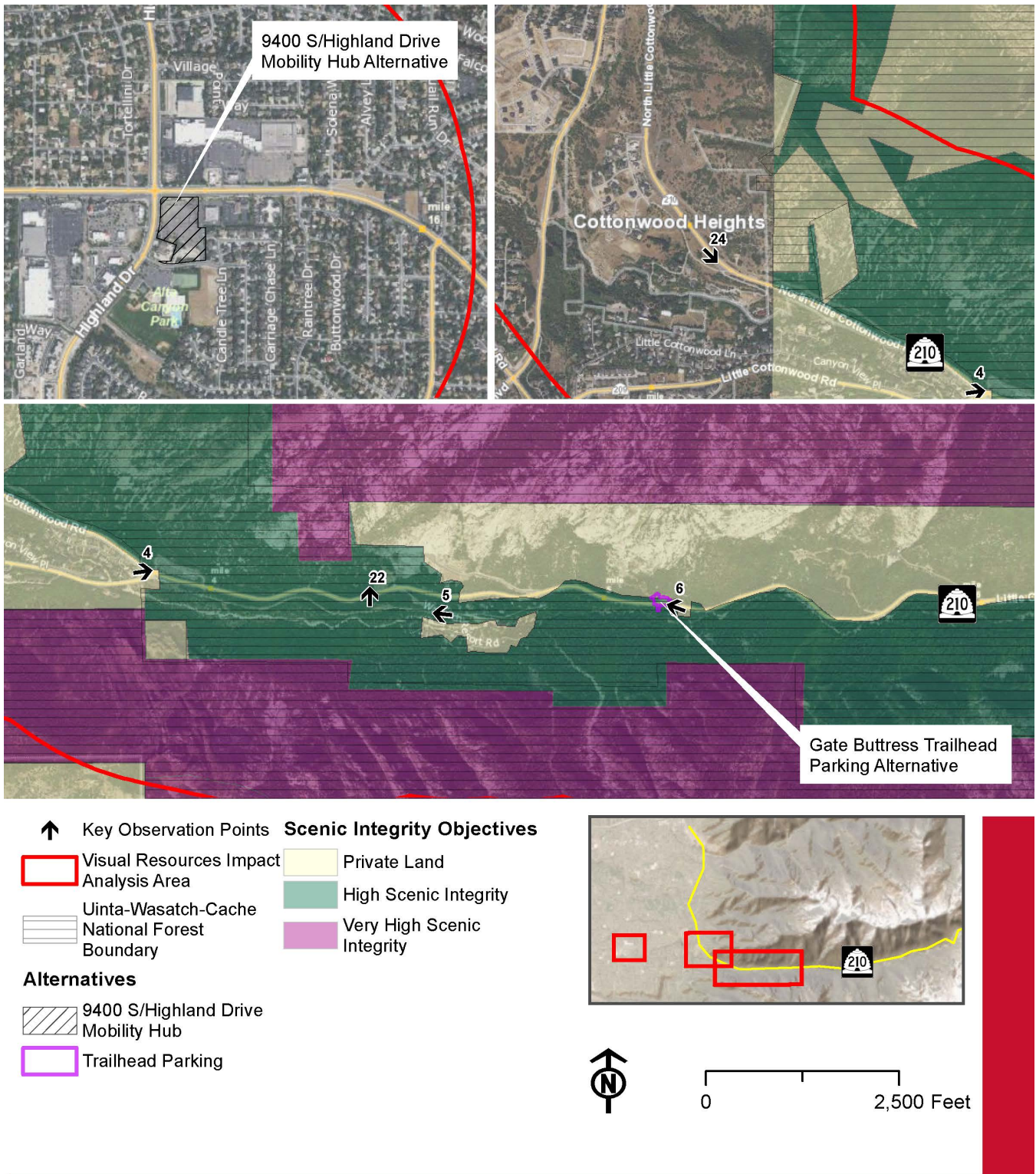


Figure 17.4-3. Scenic Integrity Objectives in the Visual Resources Impact Analysis Area for the Enhanced Bus Service Alternative (3 of 3)

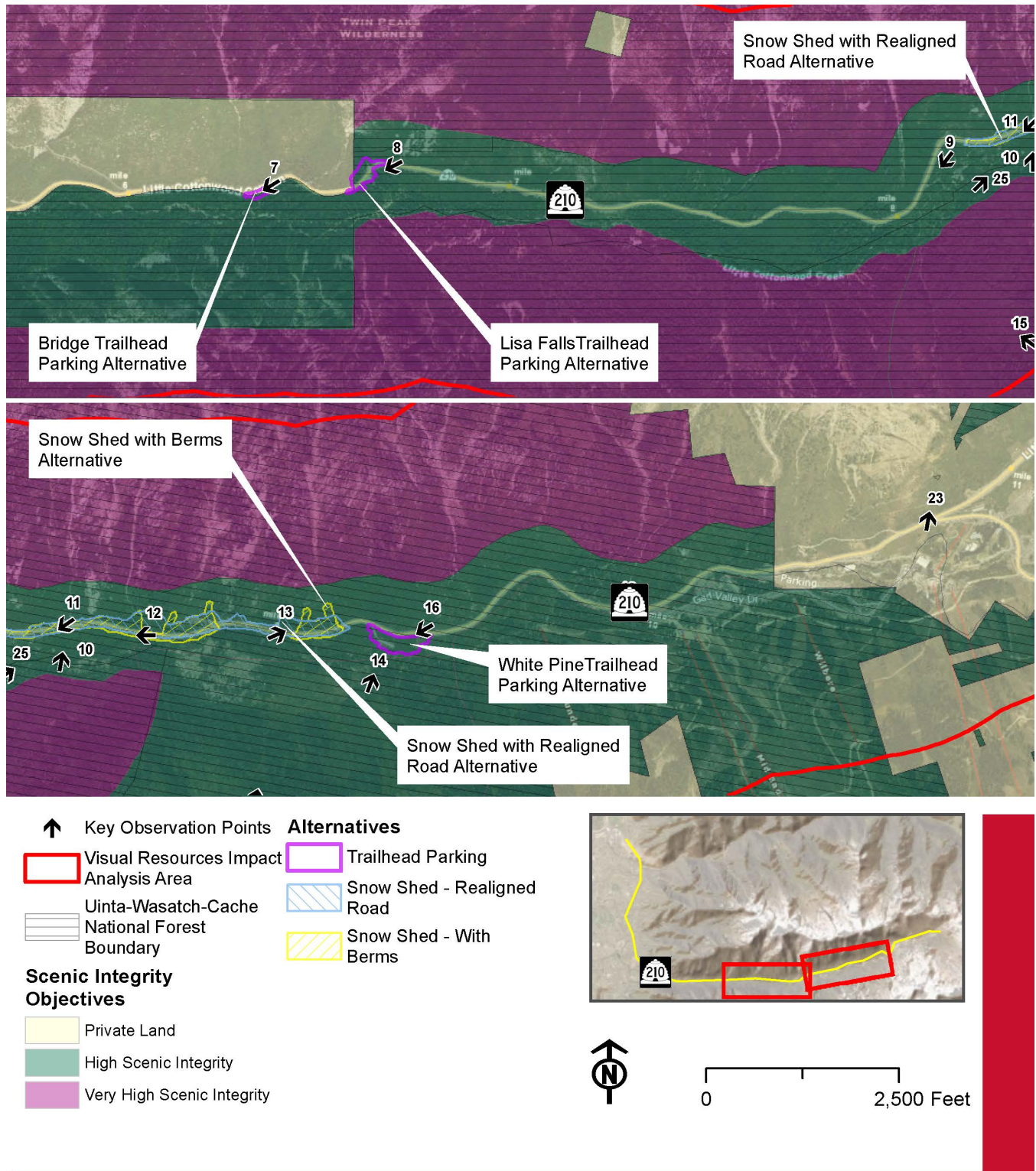


Table 17.4-12. Conformance with SIO Guidelines at KOP Locations Associated with the Enhanced Bus Service Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Position	Level of Impact	SIO Level	Conformance with SIO Guidelines?
6	Gate Butress Trailhead	Tourists and recreational	Neutral to inferior	Low	High	Yes
7	Bridge Trailhead	Tourists and recreational	Neutral to inferior	Low	High	Yes
8	Lisa Falls Trailhead	Tourists and recreational	Neutral to inferior	Low	High	Yes
10	First Snow Shed	Tourists and recreational	Inferior	None	High	Yes
11	Southwest Toward Tanner's Flat (S.R. 210)	Tourists and recreational, travelers	Neutral to inferior	High	High	No
12	Second Snow Shed (S.R. 210)	Tourists and recreational	Neutral to inferior	High	High	No
13	Third Snow Shed (S.R. 210)	Tourists and recreational	Neutral to inferior	High	High	No
16	White Pine Trailhead	Tourists and recreational	Neutral to inferior	Low	High	Yes
17	White Pine Lake Trail	Tourists and recreational	Superior	Moderate	High	No
25	Tanners Flat Campground	Moderate	Inferior	Moderate	High	No

17.4.4 Enhanced Bus Service in Peak-period Shoulder Lane Alternative

This section describes the visual impacts of the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 from North Little Cottonwood Road to the town of Alta, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative. More-detailed design information including proposed areas of cut and fill is included in Appendix 2D, Enhanced Bus Service in Peak-period Shoulder Lane Alternative Plans, for Chapter 2, Alternatives.

The impact levels of the elements associated with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative are based on project contrast and magnitude of change resulting from the introduction of this alternative's elements within the characteristic landscape, or as viewed from KOP locations, by applying the criteria identified in Table 17.4-1 above, Criteria for Assessing Level of Impacts to Visual Resources.

17.4.4.1 S.R. 210 – Wasatch Boulevard

The impacts from the improvements to Wasatch Boulevard with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

17.4.4.2 S.R. 210 – North Little Cottonwood Road to Alta

Table 17.4-13 describes the magnitude of change in landscape character associated with improvements to S.R. 210 (Little Cottonwood Canyon State Scenic Byway) with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative.

UDOT identified 17 KOPs representing travelers, tourists, and recreational users along S.R. 210 (Little Cottonwood Canyon State Scenic Byway) and within the impact analysis area of Little Cottonwood Canyon to describe impacts to views from those locations resulting from the introduction of roadway improvements along S.R. 210. Table 17.4-14 lists, by KOP, the criteria used to determine impact levels, including viewer sensitivity, approximate distance from the roadway improvements, viewer position, and visibility. The table identifies the resulting impact levels as none to moderate, with a short narrative describing the type of impacts the roadway improvements would have from these locations. For more detail regarding each KOP, refer to the Contrast Form Rating Sheets in Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives.

Impacts to the Little Cottonwood Canyon State Scenic Byway visitor experience would include views of road improvements. These improvements would be visually subordinate to the existing landscape as visitors drive the 7-mile-long scenic byway. In a few areas, such as the area adjacent to KOP 7 (Bridge Trailhead), proposed cut-and-fill slopes would be visually prominent in the landscape and would attract the attention of visitors driving the scenic byway. The visual simulation from this location depicts the larger earthwork proposed and is characteristic of other areas where additional cut-and-fill slopes would be required for the peak-period shoulder lane. Since the road improvements including associated earthwork would be visually subordinate along most of the scenic byway, except for views of areas where more-extensive earthwork would be required, the proposed improvements would not diminish or limit the management of the scenic byway by the USDA Forest Service to protect scenic vistas and intrinsic scenic qualities. The impacts from the potential tolling gantry would be the same as with the Enhanced Bus Service Alternative.

Table 17.4-13. Impacts to Landscape Character Units from S.R. 210 Improvements with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

LCU	Level of Impact	Impact Description
Urban	Negligible	Landscape would appear intact, and project elements would not attract attention within the urban setting. Project elements would repeat form, line, color, texture, or scale common in the landscape and would not be visually evident (no contrast). About 18 acres of project elements (roadway improvements) would be located within this LCU.
Developed Natural Appearing	Low	Landscape would appear noticeably altered in some areas where cut-and-fill slopes are not as prevalent, and landform modifications would attract attention within the immediate foreground area. Project elements would introduce form, line, color, texture, or scale common in the landscape, would be visually subordinate (weak contrast), and would be similar to existing roadway landform modifications found within the LCU. About 9 acres of roadway improvements would be located within this LCU.
Natural Appearing	Low	Landscape would appear noticeably altered in some areas where cut-and-fill slopes are not as prevalent, and landform modifications would attract attention within the immediate foreground area. Project elements would introduce form, line, color, texture, or scale common in the landscape, would be visually subordinate (weak contrast), and would be similar to existing roadway landform modifications found within the LCU. About 70 acres of roadway improvements would be located within this LCU.
Natural Evolving	Low	Landscape would appear noticeably altered in some areas where cut-and-fill slopes are not as prevalent, and landform modifications would attract attention within the immediate foreground area. Project elements would introduce form, line, color, texture, or scale common in the landscape, would be visually subordinate (weak contrast), and would be similar to existing roadway landform modifications found within the LCU. About 2 acres of roadway improvements would be located within this LCU.
Resort Natural Setting	Low	Landscape would appear noticeably altered in some areas where cut-and-fill slopes are not as prevalent, and landform modifications would attract attention within the immediate foreground area. Project elements would introduce form, line, color, texture, or scale common in the landscape, would be visually subordinate (weak contrast), and would be similar to existing roadway landform modifications found within the LCU. About 12 acres of roadway improvements would be located within this LCU.

Table 17.4-14. Impacts to Viewers (KOPs) from S.R. 210 Improvements with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Element (approximate)	Viewer Position	Level of Impact	Impact Description
4	Quarry Trailhead	Residents, tourists and recreational	Moderate	Adjacent	Neutral to inferior	Low	Project elements, such as cut-and-fill slopes, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.
5	Wasatch Resort	Residents, tourists and recreational	Moderate	235 feet	Neutral to inferior	None	Project elements associated with the roadway improvements would not be visually evident.
6	Gate Buttress Trailhead	Tourists and recreational	Moderate	Adjacent	Neutral to inferior	Low	Project elements, such as cut-and-fill slopes, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.
7	Bridge Trailhead	Tourists and recreational	Moderate	Adjacent	Neutral to inferior	Moderate	Project elements, such as cut-and-fill slopes up to 70 feet wide, would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape.
8	Lisa Falls Trailhead	Tourists and recreational	Moderate	Adjacent	Neutral to inferior	Low	Project elements, such as cut-and-fill slopes, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.
9	Tanner's Flat Group Site C	Tourists and recreational	Moderate	270 feet	Inferior	None	Project elements associated with the roadway improvements would not be visually evident.
10	First Snow Shed	Tourists and recreational	High	230 feet	Inferior	None	Project elements associated with the roadway improvements would not be visually evident.
11	Southwest Toward Tanner's Flat (S.R. 210)	Tourists and recreational, travelers	High	Adjacent	Neutral to superior	None	Project elements associated with the roadway improvements would not be visually evident.
12	Second Snow Shed (S.R. 210)	Tourists and recreational, travelers	High	Adjacent	Neutral to inferior	Low	Project elements, such as cut-and-fill slopes, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.

(continued on next page)

Table 17.4-14. Impacts to Viewers (KOPs) from S.R. 210 Improvements with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Element (approximate)	Viewer Position	Level of Impact	Impact Description
13	Third Snow Shed (S.R. 210)	Tourists and recreational, travelers	High	Adjacent	Neutral to inferior	Low	Project elements, such as cut-and-fill slopes, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.
14	Red Pine Trail Low	Tourists and recreational	Moderate	770 feet	Inferior	None	Project elements associated with the roadway improvements would not be visually evident.
15	Red Pine Trail Mid	Tourists and recreational	Moderate	0.50 mile	Superior	Low	Project elements, such as cut-and-fill slopes, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.
16	White Pine Trailhead	Tourists and recreational	Moderate	Adjacent	Neutral to inferior	Low	Project elements, such as cut-and-fill slopes, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.
17	White Pine Lake Trail	Tourists and recreational	Moderate	0.40 mile	Superior	None	Project elements associated with the roadway improvements would not be visually evident.
18	Snowbird Entry 1	Tourists and recreational	Moderate	Adjacent	Neutral	Moderate	Project elements, such as cut-and-fill slopes, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.
19	Catherine's Pass	Tourists and recreational	Moderate	1.95 miles	Superior	None	Project elements associated with the roadway improvements would not be visually evident.
25	Tanners Flat Campground	Tourists and recreational	Moderate	350 feet	Inferior	Moderate	Project elements, such as retaining walls, would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape.

17.4.4.3 Mobility Hubs Alternative

The impacts from the mobility hub parking structures with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

17.4.4.4 Avalanche Mitigation Alternatives

The impacts from the avalanche mitigation alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

17.4.4.5 Trailhead Parking Alternatives

The impacts from the trailhead parking alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

17.4.4.6 No Winter Parking Alternative

The impacts from the No Winter Parking Alternative with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

17.4.4.7 Conformance with USDA Forest Service Scenic Integrity Objectives – Enhanced Bus Service in Peak-period Shoulder Lane Alternative

The USDA Forest Service has developed measurable standards for managing the scenic resources of USDA Forest Service lands through the SMS. On the basis of the respective SIO levels, the stated management objectives were compared with the alternative regarding magnitude of change in visual character and inherent scenic integrity, viewer sensitivity, and visual contrast within the existing landscape.

In addition to the impacts to landscape character and viewers associated with the snow shed and trailhead improvement infrastructure described for the Enhanced Bus Service Alternative, Table 17.4-13 and Table 17.4-14 above identify impacts to landscape character and viewers in the visual resources impact analysis area associated with improvements to S.R. 210. In the areas that have a high SIO in relation to the improvements to S.R. 210, snow shed locations and trailhead improvements (Figure 17.4-4 through Figure 17.4-6 below) and where the impact determination is moderate to high (Table 17.4-15 below), the high SIO would not be met and would not be in conformance with the following SIO guidelines identified in the *Forest Plan* for scenery management (USDA Forest Service 2003):

- **G59:** Manage forest landscapes according to landscape character themes, and SIOs as mapped (USDA Forest Service 2003, page 4-48).
- **G60:** Resource management activities should not be permitted to reduce scenic integrity below objectives stated for management prescription categories (USDA Forest Service 2003, page 4-48).

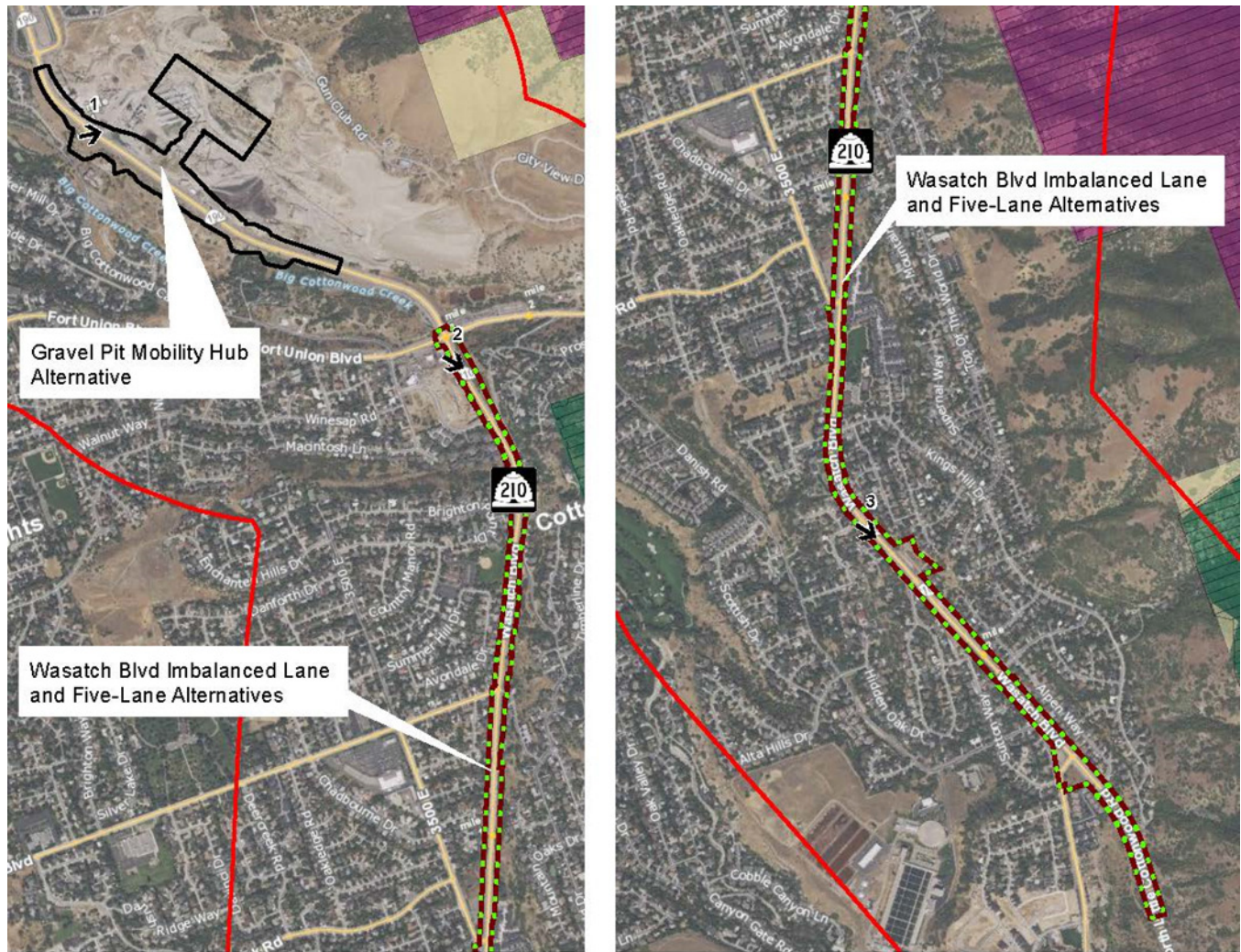
UDOT anticipates that some of these areas of nonconformance with SIO guidelines might not be in conformance with the following SIO standard identified in the *Forest Plan* for scenery management (USDA Forest Service 2003), which would require a plan amendment as described in Chapter 28, U.S. Department of Agriculture Forest Service Land Use Plan Amendments.

- **S22:** Management actions that would result in a scenic integrity level of Unacceptably Low are prohibited in all landscape character themes (USDA Forest Service 2003, page 4-48).

Table 17.4-15. Conformance with SIO Guidelines at KOP Locations Associated with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Position	Level of Impact	SIO Level	Conformance with SIO Guidelines?
4	Quarry Trailhead	Residents, tourists and recreational	Neutral to inferior	Low	High	Yes
5	Wasatch Resort	Residents, tourists and recreational	Neutral to inferior	None	High	Yes
6	Gate Buttress Trailhead	Tourists and recreational	Neutral to inferior	Low	High	Yes
7	Bridge Trailhead	Tourists and recreational	Neutral to inferior	Moderate	High	No
8	Lisa Falls Trailhead	Tourists and recreational	Neutral to inferior	Low	High	Yes
9	Tanner's Flat Group Site C	Tourists and recreational	Inferior	None	High	Yes
10	First Snow Shed	Tourists and recreational	Inferior	None	High	Yes
11	Southwest Toward Tanner's Flat (S.R. 210)	Tourists and recreational, travelers	Neutral to superior	High	High	No
12	Second Snow Shed (S.R. 210)	Tourists and recreational, travelers	Neutral to inferior	High	High	No
13	Third Snow Shed (S.R. 210)	Tourists and recreational, travelers	Neutral to inferior	High	High	No
14	Red Pine Trail Low	Tourists and recreational	Inferior	None	High	Yes
15	Red Pine Trail Mid	Tourists and recreational	Superior	Low	High	Yes
16	White Pine Trailhead	Tourists and recreational	Neutral to inferior	Low	High	Yes
17	White Pine Lake Trail	Tourists and recreational	Superior	Moderate	High	No
18	Snowbird Entry 1	Tourists and recreational	Neutral	Moderate	High	No
19	Catherine's Pass	Tourists and recreational	Superior	None	High	Yes
25	Tanners Flat Campground	Tourists and recreational	Inferior	Moderate	High	No

Figure 17.4-4. Scenic Integrity Objectives in the Visual Resources Impact Analysis Area for the Enhanced Bus Service in Peak-period Shoulder Lane Alternative (1 of 3)



↑ Key Observation Points **Scenic Integrity Objectives**

- Visual Resources Impact Analysis Area
- Uinta-Wasatch-Cache National Forest Boundary

- Private Land
- High Scenic Integrity
- Very High Scenic Integrity

Alternatives

- Gravel Pit Interchange
- Wasatch Blvd - Imbalanced Lane
- Wasatch Blvd - Five Lane



0 2,500 Feet

Figure 17.4-5. Scenic Integrity Objectives in the Visual Resources Impact Analysis Area for the Enhanced Bus Service in Peak-period Shoulder Lane Alternative (2 of 3)

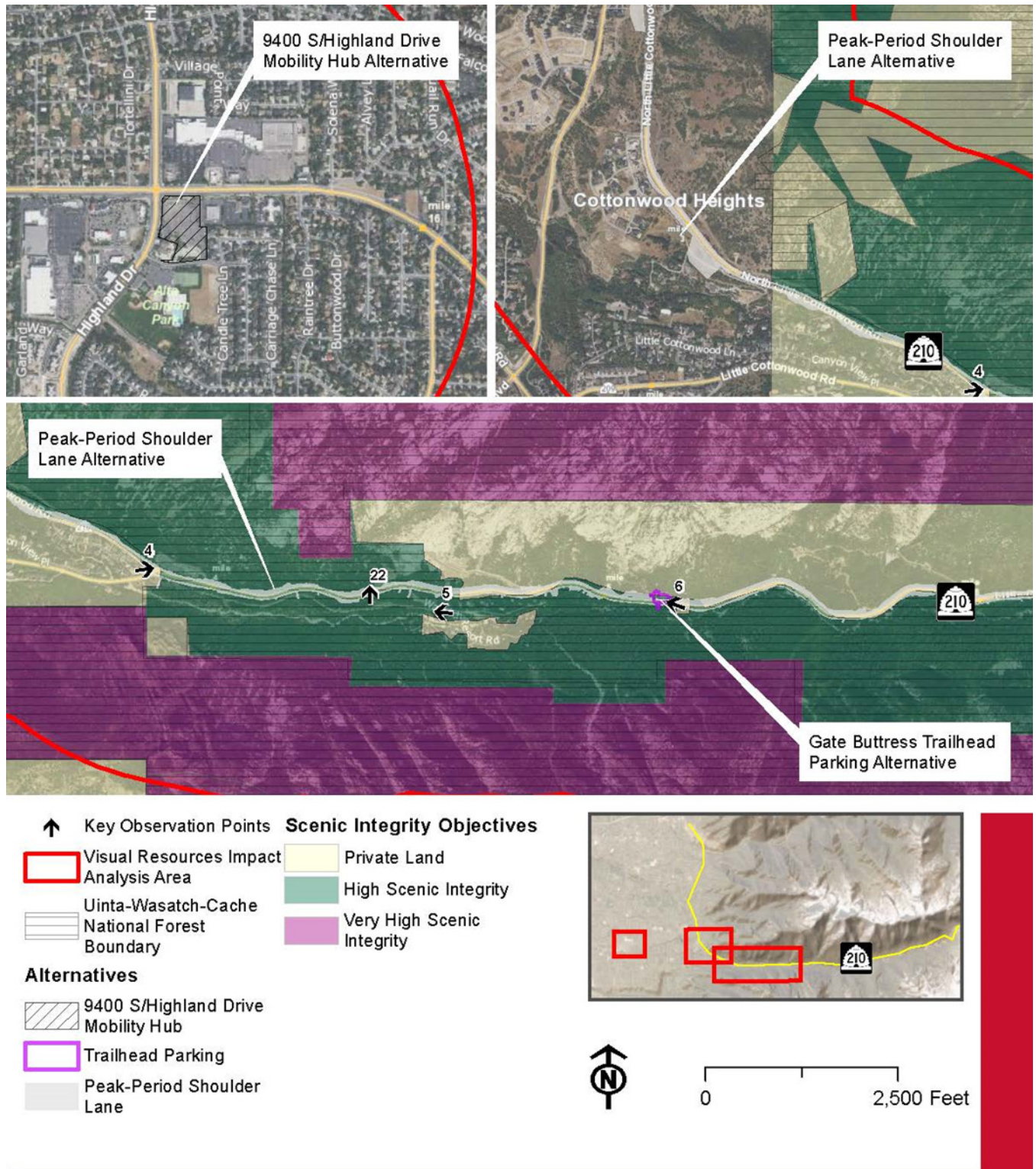
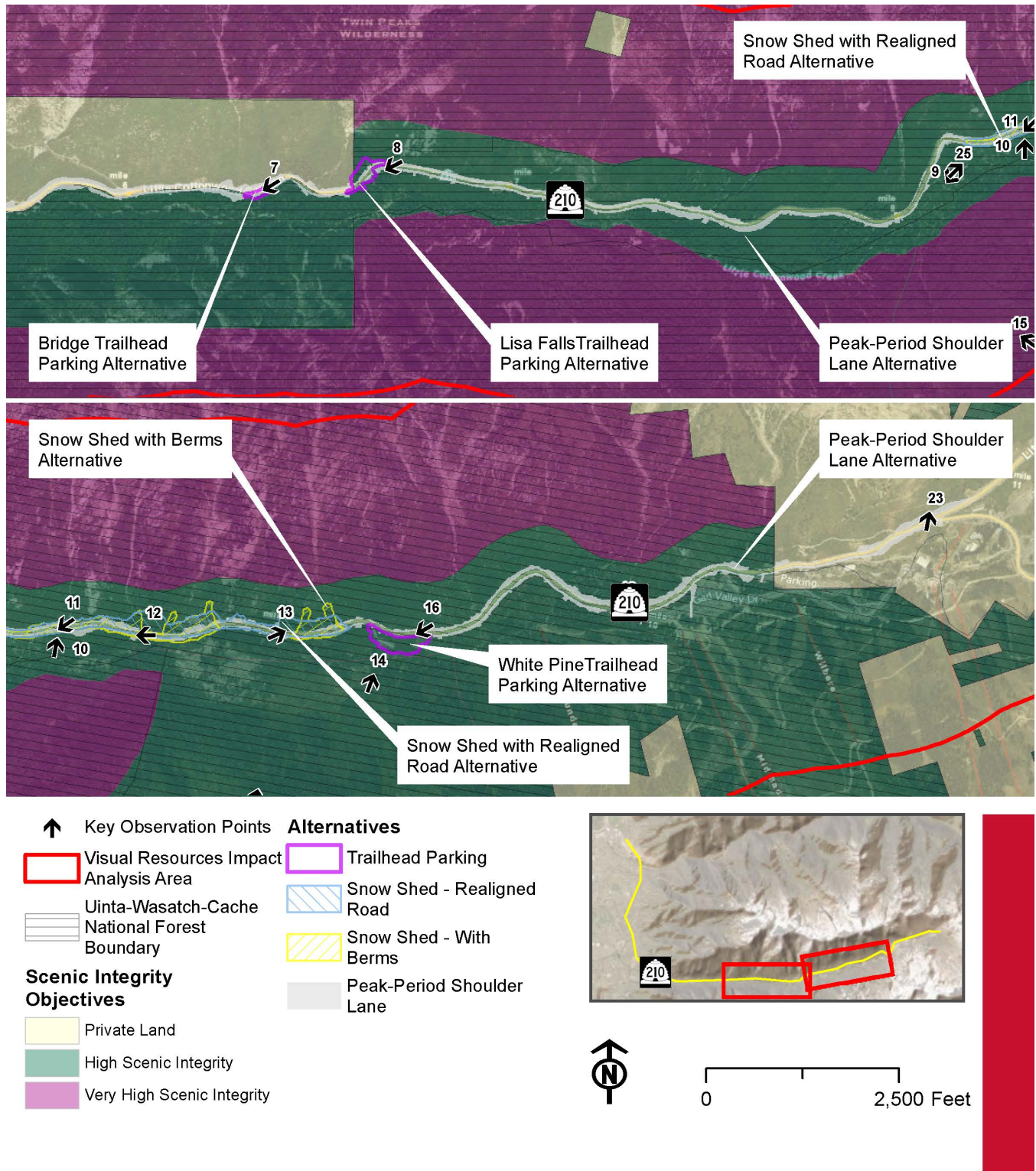


Figure 17.4-6. Scenic Integrity Objectives in the Visual Resources Impact Analysis Area for the Enhanced Bus Service in Peak-period Shoulder Lane Alternative (3 of 3)



17.4.5 Gondola Alternative A (Starting at Canyon Entrance)

This section describes the visual impacts of Gondola Alternative A, which includes a gondola alignment from the entrance to Little Cottonwood Canyon to the Snowbird and Alta resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative. More-detailed design information including proposed areas of cut and fill is included in Appendix 2E, Gondola Alternatives Plans, for Chapter 2, Alternatives.

17.4.5.1 S.R. 210 – Wasatch Boulevard

The impacts from the improvements to Wasatch Boulevard with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

17.4.5.2 S.R. 210 – North Little Cottonwood Road to Alta

The impact levels of the elements associated with Gondola Alternative A are based on the contrast and magnitude of change resulting from the introduction of this alternative's elements within the characteristic landscape, or as viewed from KOP locations, by applying the criteria identified in Table 17.4-1 above, Criteria for Assessing Level of Impacts to Visual Resources. An additional analysis component related to the influence of the degree of slope has been applied for the gondola infrastructure. Slopes greater than 15% are anticipated to require more grading and vegetation clearing to access and construct the gondola towers, thus resulting in greater contrast with existing landform and vegetative patterns.

Movement associated with the large, elevated gondola cabins would further dominate the visual setting and attract attention from KOP locations. This movement would be most apparent closest to the gondola alignment where the gondola cabins would demand attention as they move through the landscape. Additionally, depending on local lighting conditions, the gondola cabins would introduce moving shadows, thereby generating increased motion in the visual setting near the alignment. Views from more-distant KOPs would include several gondola cabins moving up and down the canyon at the same time in the KOPs' viewshed, especially KOPs with a panoramic view of Little Cottonwood Canyon, such as KOP 15.

Impacts to the Little Cottonwood Canyon State Scenic Byway visitor experience would include views of the gondola infrastructure (gondola base station, towers, and moving gondola cabins) along most of the 7-mile-long scenic byway. Due to tall vegetation adjacent to the scenic byway, views of the gondola infrastructure would be intermittently screened in some locations, but where the gondola infrastructure is visible it would be visually dominant and would demand the attention of visitors, especially where the gondola alignment crosses over the scenic byway. Since views along the scenic byway would be dominated by gondola infrastructure, the visitor experience would be degraded and would therefore limit the USDA Forest Service's

What are gondola base, angle, and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's gondola trip. Passengers board and disembark the gondola cabins at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

The gondola alternatives also include *angle stations*, which are needed to adjust the horizontal direction of the cabin; passengers remain in the cabin as it passes through an angle station.

A *tower* supports the gondola cable.

ability to manage the scenic byway to protect scenic vistas and intrinsic scenic qualities. Impacts from the potential tolling gantry would be the same as with the Enhanced Bus Service Alternative.

To avoid collisions between aircraft and the gondola towers and cables, the Federal Aviation Administration (FAA) requires structures greater than 200 feet above ground level to have obstruction lighting. Given the enclosed nature of Little Cottonwood Canyon, and for analysis purposes, obstruction lighting might be required for all gondola towers for safe operation of aircraft in the area. Red FAA warning lights, similar to warning lights on wind turbine generators, would simultaneously flash about 20 to 40 times per minute, introducing a string of flashing lights up Little Cottonwood Canyon. Night skies in much of the canyon are relatively dark, especially mid-canyon between the light dome of Salt Lake City and local nighttime lighting near the Snowbird and Alta resorts. Although Gondola Alternative A would follow FAA's obstruction marking and lighting requirements as defined by Advisory Circular No. 70/7460-1L (FAA 2016), UDOT would coordinate with FAA regarding the feasibility of implementing an aircraft detection lighting system (ADLS) to reduce the impacts of nighttime lighting.

An ADLS (or a similar system) would remain off until it detects nearby aircraft. It would then turn on and would turn off again after the aircraft leaves the area. Implementing an ADLS depends on several factors including flight paths, proximity of airports, commercial availability, technical feasibility, and agency review and approval. The synchronized flashing of the ADLS, if implemented, would cause strong, shorter-duration night sky impacts to the surrounding landscape. If an ADLS is approved during the FAA permit and process, the short-duration synchronized flashing of the ADLS would have substantially fewer visual impacts at night than the standard continuous, medium-intensity, red-strobe FAA warning system, so it would help to reduce the impacts of nighttime lighting. Because there is little air traffic in Little Cottonwood Canyon at night, and such air traffic is generally limited to emergency evacuations or heli-skiing flights, the ADLS would activate infrequently, further reducing the intensity of visual impacts compared to the standard FAA warning system.

The magnitude of change in landscape character associated with Gondola Alternative A would be none to high within the immediate foreground and foreground areas of the LCUs where the alternative's elements would be located. Table 17.4-16 further identifies impacts associated with each LCU.

Table 17.4-16. Impacts to Landscape Character Units from Gondola Infrastructure with Gondola Alternative A

LCU	Level of Impact	Slopes Where Project Elements Would Be Located (Percent)	Impact Description
Urban	Negligible	0% to 15%	Landscape would appear to be intact, and project elements would not attract attention within the urban setting. Project elements would repeat form, line, color, texture, or scale common in the landscape and would not be visually evident (no contrast). About 3 acres of project elements would be located within this LCU.
Developed Natural Appearing	High	15% to 30%	The landscape would appear to be severely altered, and the gondola infrastructure would dominate the visual setting. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually dominant in the landscape (strong contrast). Less than 1 acre of project elements would be located within this LCU.
Natural Appearing	High	15% to 30%	The landscape would appear to be severely altered, and the gondola infrastructure would dominate the visual setting. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually dominant in the landscape (strong contrast). About 7 acres of project elements would be located within this LCU.
Natural Evolving	Moderate	15% to 30%	Landscape would appear substantially alternated, and project elements would begin to dominate the visual setting at the edge of this LCU. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape (moderate contrast). Less than 1 acre of project elements would be located within this LCU.
Resort Natural Setting	Negligible	0% to > 30%	Landscape would appear to be intact, and project elements would not attract attention within the ski resort setting. Project elements would repeat form, line, color, texture, or scale common in the landscape and would not be visually evident (no contrast). About 2 acres of project elements would be located within this LCU.

UDOT identified 16 KOPs representing different sensitive viewer groups to describe impacts to views, including along S.R. 210 (Little Cottonwood Canyon State Scenic Byway), resulting from the gondola infrastructure. Table 17.4-17 lists, by KOP, the criteria used to determine impact levels, including viewer sensitivity, approximate distance from the gondola infrastructure, viewer position, and visibility. The table identifies the resulting impact levels as none to high, with a short narrative describing the types of impacts the infrastructure would have on these views. For more detail regarding each KOP, refer to the Contrast Form Rating Sheets in Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives.

Table 17.4-17. Impacts to Viewers (KOPs) from Gondola Infrastructure with Gondola Alternative A

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Element (approximate)	Viewer Position	Level of Impact	Impact Description
4	Quarry Trailhead	Residents, tourists and recreational	Moderate	300 feet	Neutral to inferior	High	Project elements, such as the gondola base station and towers, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the gondola infrastructure would be partially screened by vegetation and topography.
5	Wasatch Resort	Residents, tourists and recreational	Moderate	440 feet	Neutral to inferior	Low	Project elements, such as overhead gondola cables, would be visually subordinate and similar to other infrastructure in the area. Views toward the gondola infrastructure would be heavily screened by vegetation and topography.
6	Gate Buttress Trailhead	Tourists and recreational	Moderate	200 feet	Neutral to inferior	High	Project elements, such as the gondola towers, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the gondola infrastructure would be partially screened by vegetation and topography.
7	Bridge Trailhead	Tourists and recreational	Moderate	160 feet	Neutral to inferior	Moderate	Project elements, such as the gondola towers, would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape. Views toward the gondola infrastructure would be partially screened by vegetation and topography.
8	Lisa Falls Trailhead	Tourists and recreational	Moderate	480 feet	Neutral to inferior	None	Project elements associated with the gondola would not be visually evident. Views toward the gondola infrastructure would be partially screened by vegetation and topography.

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Table 17.4-17. Impacts to Viewers (KOPs) from Gondola Infrastructure with Gondola Alternative A

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Element (approximate)	Viewer Position	Level of Impact	Impact Description
9	Tanner's Flat Group Site C	Tourists and recreational	Moderate	125 feet	Inferior	Low	Project elements, such as overhead gondola cables, would be visually subordinate. Views toward the gondola infrastructure would be heavily screened by vegetation and topography.
10	First Snow Shed	Tourists and recreational	High	150 feet	Inferior	None	Project elements associated with the gondola would not be visually evident. Views toward the gondola infrastructure would be entirely screened by vegetation and topography.
11	Southwest Toward Tanner's Flat (S.R. 210)	Tourists and recreational, travelers	High	470 feet	Neutral to superior	Low	Project elements, such as overhead gondola cables and towers, would be visually subordinate and mostly obstructed by vegetation.
12	Second Snow Shed (S.R. 210)	Tourists and recreational, travelers	High	200 feet	Neutral to inferior	None	Project elements associated with the gondola would not be visually evident. Views toward the gondola infrastructure would be partially screened by vegetation and topography.
13	Third Snow Shed (S.R. 210)	Tourists and recreational, travelers	High	70 feet	Neutral to inferior	Low	Project elements, such as overhead gondola cables and towers, would be visually subordinate and obstructed by vegetation. Views toward the gondola infrastructure would be partially screened by vegetation and topography.
14	Red Pine Trail Low	Tourists and recreational	Moderate	700 feet	Inferior	None	Project elements associated with the gondola would not be visually evident. Views toward the gondola infrastructure would be entirely screened by vegetation and topography.

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Table 17.4-17. Impacts to Viewers (KOPs) from Gondola Infrastructure with Gondola Alternative A

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Element (approximate)	Viewer Position	Level of Impact	Impact Description
15	Red Pine Trail Mid	Tourists and recreational	Moderate	0.48 mile	Superior	High	Project elements, such as the gondola angle station ^a and towers, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the gondola infrastructure would be partially screened by vegetation and topography.
16	White Pine Trailhead	Tourists and recreational	Moderate	Adjacent	Neutral to inferior	High	Project elements, such as the gondola towers, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the gondola infrastructure would be partially screened by vegetation and topography.
17	White Pine Lake Trail	Tourists and recreational	Moderate	0.40 mile	Superior	Moderate	Project elements, such as the gondola tower and tower pad, would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape. Views toward the gondola infrastructure would be partially screened by vegetation and topography.
18	Snowbird Entry 1	Tourists and recreational	Moderate	70 feet	Neutral	High	Project elements, such as the gondola towers, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the gondola infrastructure would be partially screened by vegetation and topography.

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Table 17.4-17. Impacts to Viewers (KOPs) from Gondola Infrastructure with Gondola Alternative A

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Element (approximate)	Viewer Position	Level of Impact	Impact Description
19	Catherine's Pass	Tourists and recreational	Moderate	1 mile	Superior	None	Project elements associated with the gondola would not be visually evident. Views toward the gondola infrastructure would be heavily screened by vegetation and topography.

^a The gondola alternatives include angle stations, which are needed to adjust the horizontal direction of the cabin; passengers remain in the cabin as it passes through an angle station.

17.4.5.3 Mobility Hubs Alternative

The impacts from the mobility hub parking structures with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

17.4.5.4 Avalanche Mitigation Alternatives

The impacts from the avalanche mitigation alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

17.4.5.5 Trailhead Parking Alternatives

The impacts from the trailhead parking alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

17.4.5.6 No Winter Parking Alternative

The impacts from the No Winter Parking Alternative with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

17.4.5.7 Conformance with USDA Forest Service Scenic Integrity Objectives – Gondola Alternative A

The USDA Forest Service has developed measurable standards for managing the scenic resources of USDA Forest Service lands through the SMS. This analysis determined whether Gondola Alternative A and its associated elements would be in conformance with the established objectives in the *Forest Plan*. On the basis of the respective SIO levels, the stated management objectives were compared with the alternative regarding magnitude of change in visual character and inherent scenic integrity, viewer sensitivity, and visual contrast within the existing landscape.

Table 17.4-16 and Table 17.4-17 above identify impacts to landscape character and viewers in the visual resources impact analysis area associated with gondola infrastructure. In the areas that have a high SIO and where the impact determination is either moderate or high where the gondola infrastructure would be located and a new right of way would be established (Figure 17.4-7 and Figure 17.4-8 below), the high SIO would not be met (Table 17.4-18 on page 17-51) and would not be in conformance with the following SIO guidelines identified in the *Forest Plan* for scenery management (USDA Forest Service 2003):

- **G59:** Manage forest landscapes according to landscape character themes, and SIOs as mapped (USDA Forest Service 2003, page 4-48).
- **G60:** Resource management activities should not be permitted to reduce scenic integrity below objectives stated for management prescription categories (USDA Forest Service 2003, page 4-48).

UDOT anticipates that these areas of nonconformance with SIO guidelines would be in conformance with the following SIO standard identified in the *Forest Plan* for scenery management (USDA Forest Service 2003):

- **S22:** Management actions that would result in a scenic integrity level of Unacceptably Low are prohibited in all landscape character themes (USDA Forest Service 2003, page 4-48).

Figure 17.4-7. Scenic Integrity Objectives in the Visual Resources Impact Analysis Areas for the Gondola Alternatives (1 of 2)

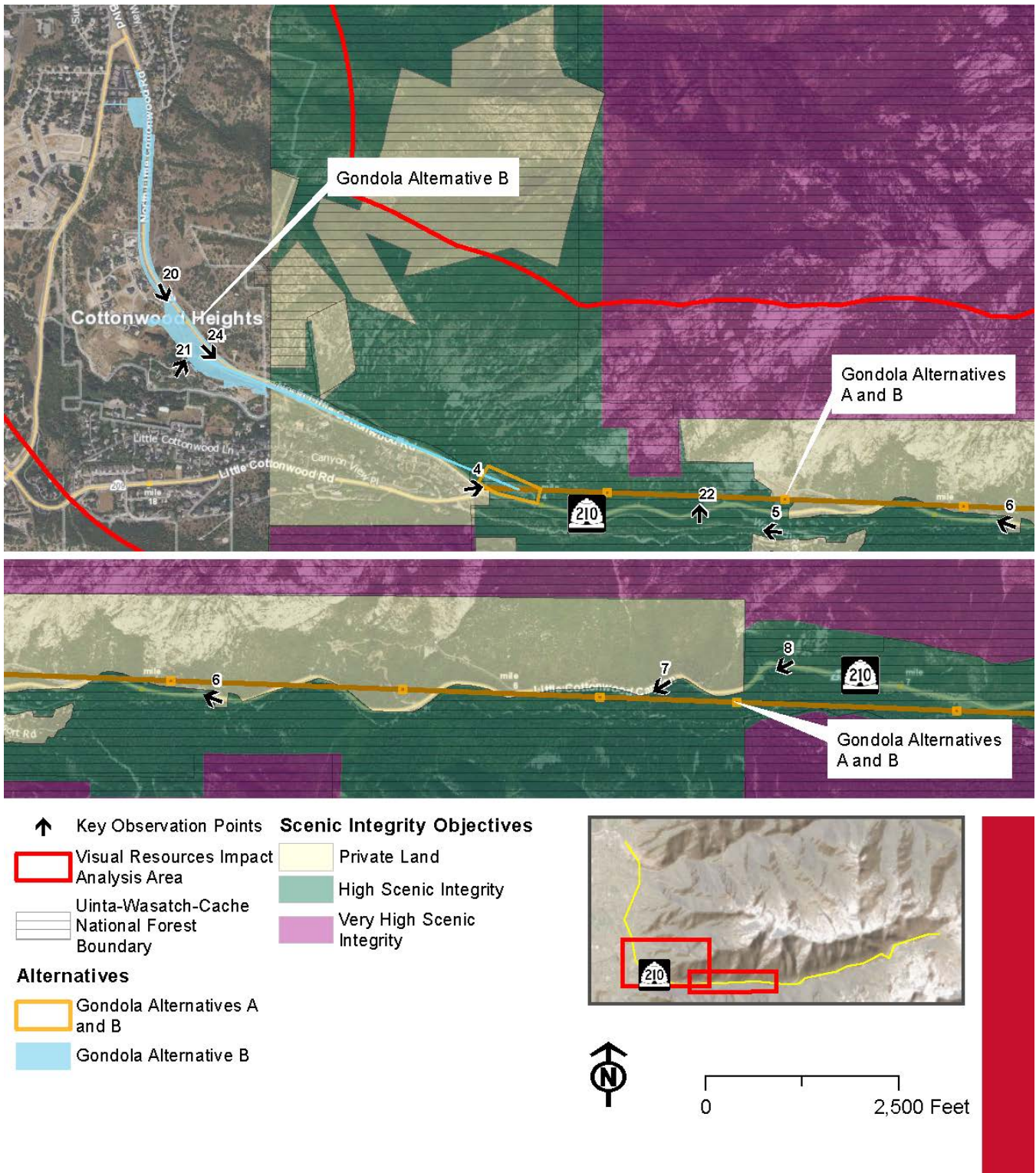
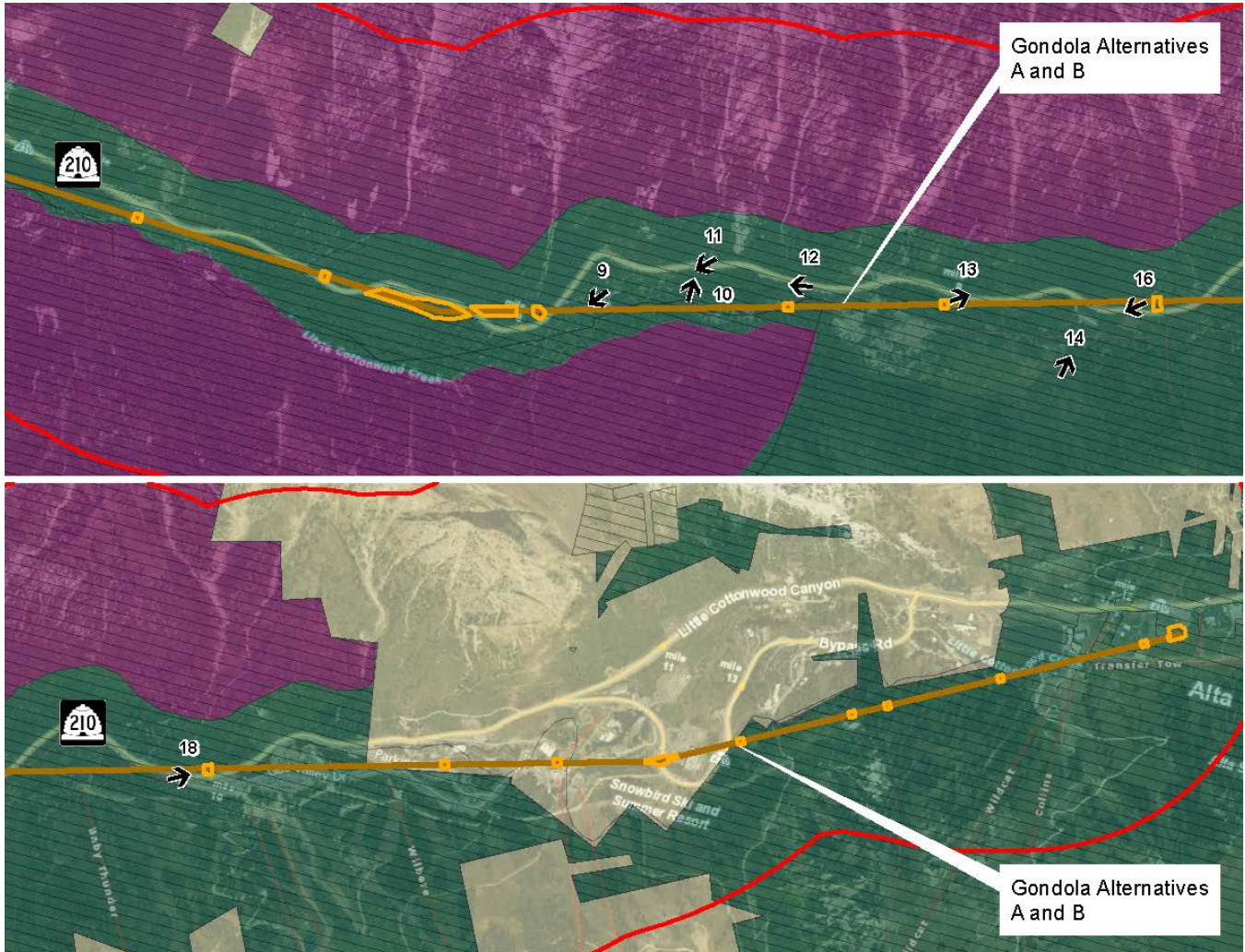


Figure 17.4-8. Scenic Integrity Objectives in the Visual Resources Impact Analysis Areas for the Gondola Alternatives (2 of 2)



- | | | |
|---|--|------------------------------------|
| ↑ | Key Observation Points | Scenic Integrity Objectives |
| | Visual Resources Impact Analysis Area | Private Land |
| | Uinta-Wasatch-Cache National Forest Boundary | High Scenic Integrity |
| | Alternative
Gondola Alternatives A and B | Very High Scenic Integrity |

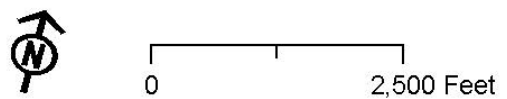


Table 17.4-18. Conformance with SIO Guidelines at KOP Locations Associated with Gondola Alternative A

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Position	Level of Impact	SIO Level	Conformance with SIO Guidelines?
4	Quarry Trailhead	Residents, tourists and recreational	Neutral to inferior	High	High	No
5	Wasatch Resort	Residents, tourists and recreational	Neutral to inferior	Low	High	Yes
6	Gate Buttress Trailhead	Tourists and recreational	Neutral to inferior	High	High	No
7	Bridge Trailhead	Tourists and recreational	Neutral to inferior	Moderate	High	No
8	Lisa Falls Trailhead	Tourists and recreational	Neutral to inferior	Low	High	Yes
9	Tanner's Flat Group Site C	Tourists and recreational	Inferior	Low	High	Yes
10	First Snow Shed	Tourists and recreational	Inferior	None	High	Yes
11	Southwest Toward Tanner's Flat (S.R. 210)	Tourists and recreational, travelers	Neutral to superior	High	High	No
12	Second Snow Shed (S.R. 210)	Tourists and recreational, travelers	Neutral to inferior	High	High	No
13	Third Snow Shed (S.R. 210)	Tourists and recreational, travelers	Neutral to inferior	High	High	No
14	Red Pine Trail Low	Tourists and recreational	Inferior	None	High	Yes
15	Red Pine Trail Mid	Tourists and recreational	Superior	High	High	No
16	White Pine Trailhead	Tourists and recreational	Neutral to inferior	High	High	No
17	White Pine Lake Trail	Tourists and recreational	Superior	Moderate	High	No
18	Snowbird Entry 1	Tourists and recreational	Neutral	High	High	No
19	Catherine's Pass	Tourists and recreational	Superior	None	High	Yes

17.4.6 Gondola Alternative B (Starting at La Caille)

This section describes the visual resource impacts of Gondola Alternative B, which includes a gondola alignment from La Caille to the Snowbird and Alta resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative. More-detailed design information including proposed areas of cut and fill is included in Appendix 2E, Gondola Alternatives Plans, for Chapter 2, Alternatives.

17.4.6.1 S.R. 210 – Wasatch Boulevard

The impacts from the improvements to Wasatch Boulevard with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

17.4.6.2 S.R. 210 – North Little Cottonwood Road to Alta

The impacts to visual resources from Gondola Alternative B would be the same as with Gondola Alternative A except for the additional 0.75 mile of gondola infrastructure from the entrance to Little Cottonwood Canyon to La Caille. The visual resource impacts of the additional 0.75 mile of infrastructure are discussed in this section.

The magnitude of change in landscape character associated with Gondola Alternative B would be none to moderate within the immediate foreground and within foreground areas of the LCUs where the alternative's elements would be located. Table 17.4-19 further identifies impacts associated with each LCU.

Table 17.4-19. Impacts to Landscape Character Units from Gondola Infrastructure for Gondola Alternative B

LCU	Level of Impact	Slopes Where Project Elements Would Be Located (Percent)	Impact Description
Urban	Negligible	0% to 15%	Landscape would appear to be intact, and project elements would not attract attention within the urban setting. Project elements would repeat form, line, color, texture, or scale common in the landscape and would not be visually evident (no contrast). About 25 acres of project elements (including the base station, parking structure, improvements to S.R. 210, and additional gondola towers) would be located within this LCU.
Natural Appearing	Moderate	15% to 30%	The landscape would appear to be substantially altered, and the gondola infrastructure would begin to dominate the visual setting at the forest/urban interface along S.R. 210. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape (moderate contrast). About 6 acres of project elements (including additional gondola towers and improvements to S.R. 210) would be located within this LCU.

UDOT identified two additional KOPs representing different sensitive viewer groups to describe impacts to views resulting from the addition of 0.75 mile of gondola infrastructure from the entrance to Little Cottonwood Canyon to La Caille. Table 17.4-20 lists, by KOP, the criteria used to determine impact levels, including viewer sensitivity, approximate distance from the gondola infrastructure, viewer position, and

visibility. The table identifies the resulting impact level as high, with a short narrative describing the types of impacts the alternative would have on these views. For more detail regarding each KOP, refer to the Contrast Form Rating Sheets in Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives.

Table 17.4-20. Impacts to Viewers (KOPs) from Gondola Infrastructure with Gondola Alternative B

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Elements (approximate)	Viewer Position	Level of Impact	Impact Description
20	La Caille Base Station	Residents, tourists and recreational	Moderate	600 feet	Neutral	High	Project elements, such as the gondola base station and towers, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the gondola infrastructure would be partially screened by vegetation and topography.
21	La Caille Residential Area	Residents	High	150 feet	Inferior	High	Project elements, such as the gondola base station and parking structure, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the gondola infrastructure would be partially screened by vegetation.

17.4.6.1 Mobility Hubs Alternative

With Gondola Alternative B, the mobility hubs at the gravel pit and 9400 South and Highland Drive would require about 600 and 400 parking spaces, respectively. This is less than the number proposed with the enhanced bus service alternatives and Gondola Alternative A of 1,500 parking spaces at the gravel pit and 1,000 at 9400 South and Highland Drive. The fewer number of parking spaces at these two locations would not reduce the construction footprint of the parking structures but would reduce the height from three to four stories to two to three stories at the gravel pit and from three to four stories to two stories at 9400 South and Highland Drive. Although the parking structures would be about one story less at each mobility hub, the overall impacts to visual resources would be the same as with the Enhanced Bus Service Alternative.

The analysis of the 1,500-space parking structure at the Gondola Alternative B base station is included in Section 17.4.6.2, S.R. 210 – North Little Cottonwood Road to Alta.

17.4.6.2 Avalanche Mitigation Alternatives

The impacts from the avalanche mitigation measures with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

17.4.6.3 Trailhead Parking Alternatives

The impacts from the trailhead parking alternatives with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

17.4.6.4 No Winter Parking Alternative

The impacts from the No Winter Parking Alternative with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative.

17.4.6.5 Conformance with USDA Forest Service Scenic Integrity Objectives – Gondola Alternative B

The USDA Forest Service has developed measurable standards for managing the scenic resources of USDA Forest Service lands through the SMS. This analysis determined whether Gondola Alternative B and its associated elements would be in conformance with the established objectives in the *Forest Plan*. On the basis of the respective SIO levels, the stated management objectives were compared with the alternative regarding magnitude of change in visual character and inherent scenic integrity, viewer sensitivity, and visual contrast within the existing landscape.

Table 17.4-19 and Table 17.4-20 above identify impacts to landscape character and viewers in the visual resources impact analysis area associated with gondola infrastructure. In the areas that have a high SIO and where the impact determination is either moderate or high where the gondola infrastructure would be located and a new right of way would be established (Figure 17.4-7 and Figure 17.4-8 above), the high SIO would not be met (Table 17.4-21 below) and would not be in conformance with the following SIO guidelines identified in the *Forest Plan* for scenery management (USDA Forest Service 2003):

- **G59:** Manage forest landscapes according to landscape character themes, and SIOs as mapped (USDA Forest Service 2003, page 4-48).
- **G60:** Resource management activities should not be permitted to reduce scenic integrity below objectives stated for management prescription categories (USDA Forest Service 2003, page 4-48).

UDOT anticipates that these areas of nonconformance with SIO guidelines would be in conformance with the following SIO standard identified in the *Forest Plan* for scenery management (USDA Forest Service 2003):

- **S22:** Management actions that would result in a scenic integrity level of Unacceptably Low are prohibited in all landscape character themes (USDA Forest Service 2003, page 4-48).

Table 17.4-21. Conformance with SIO Guidelines at KOP Locations Associated with Gondola Alternative B (La Caille Base Station to S.R. 209/S.R. 210 Intersection)

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Position	Level of Impact	SIO Level	Conformance with SIO Guidelines?
20	La Caille Base Station	Residents, tourists and recreational	Neutral	High	Private land	Not applicable
21	La Caille Residential Area	Residents	Inferior	High	Private land	Not applicable

17.4.7 Cog Rail Alternative (Starting at La Caille)

This section describes the impacts to visual resources from the Cog Rail Alternative, which includes a cog rail alignment from La Caille to the Snowbird and Alta resorts, improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 on North Little Cottonwood Road, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative. More-detailed design information including proposed areas of cut and fill is included in Appendix 2F, Cog Rail Alternative Plans, for Chapter 2, Alternatives.

The impact levels of the elements associated with the Cog Rail Alternative are based on project component contrast and magnitude of change resulting from the introduction of this alternative's elements within the characteristic landscape, or as viewed from KOP locations, by applying criteria identified in Table 17.4-1 above, Criteria for Assessing Level of Impacts to Visual Resources.

What are cog rail base and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's cog rail trip. Passengers board and disembark the cog rail vehicles at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

17.4.7.1 S.R. 210 – Wasatch Boulevard

The impacts from the improvements to Wasatch Boulevard with the Cog Rail Alternative would be the same as those with the Enhanced Bus Service Alternative.

17.4.7.2 S.R. 210 – North Little Cottonwood Road to Alta

Table 17.4-22 describes the magnitude of change in landscape character associated with the Cog Rail Alternative. The change to the landscape character would be low to high within the immediate foreground and foreground areas of the LCUs where the project elements occur. Table 17.4-22 further identifies impacts associated with each LCU. Impacts from the potential tolling gantry would be the same as with the Enhanced Bus Service Alternative.

Table 17.4-22. Impacts to Landscape Character Units from the Cog Rail Infrastructure for the Cog Rail Alternative

LCU	Level of Impact	Impact Description
Urban	Low	Landscape would appear noticeably altered, and cog rail infrastructure would attract attention within the immediate foreground area. Project elements would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate (weak contrast). About 28 acres of project elements are within this LCU.
Developed Natural Appearing	High	The landscape would appear severely altered, and the cog rail infrastructure would dominate the visual setting. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually dominant in the landscape (strong contrast). About 7 acres of project elements are within this LCU.
Natural Appearing	High	The landscape would appear severely altered, and the cog rail infrastructure would dominate the visual setting. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually dominant in the landscape (strong contrast). About 66 acres of project elements are within this LCU.
Natural Evolving	High	The landscape would appear severely altered, and the cog rail infrastructure would dominate the visual setting. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually dominant in the landscape (strong contrast). About 8 acres of project elements are within this LCU.
Resort Natural Setting	Moderate	Landscape would appear substantially altered, and project elements would attract attention in the ski resort setting. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape (moderate contrast). About 10 acres of project elements are within this LCU.

UDOT identified 21 KOPs representing travelers, tourists, and recreational users along S.R. 210 (Little Cottonwood Canyon State Scenic Byway) and within the impact analysis area of Little Cottonwood Canyon to describe impacts to views from those locations resulting from the Cog Rail Alternative. Table 17.4-23 lists, by KOP, the criteria used to determine impact levels, including viewer sensitivity, approximate distance from the roadway improvements, viewer position, and visibility. The table identifies the resulting impact levels as none to high, with a short narrative describing the type of impacts the roadway improvements would have from these locations. For more detail regarding each KOP, refer to the Contrast Form Rating Sheets in Appendix 17B, Key Observation Points for the Cog Rail Alternative.

Movement associated with the cog rail vehicles would further dominate the visual setting and attract attention at KOPs. The movement would be most apparent adjacent to the cog rail alignment where, because of the relative scale of the trains compared to vehicles traveling along S.R. 210, the cog rail system would demand attention as the trains move through the landscape. Viewers at distant KOPs might view multiple cog rail trains moving up and down the canyon at the same time in their viewshed; however, because of the slower speed of the trains compared to vehicles traveling along S.R. 210, there would be less additive effect because their movement would not attract as much attention. Unlike the gondola system proposed with the gondola alternatives, the cog rail system would not be elevated and therefore would not cast moving shadows down on adjacent areas.

Impacts to the Little Cottonwood Canyon State Scenic Byway visitor experience would include views of the cog rail infrastructure (cog rail alignment and moving trains) along the entire 7-mile-long scenic byway. Because of the proximity of the cog rail alignment to the scenic byway, with no vegetation to remain between

the two, the cog rail infrastructure would be visually dominant and demand attention of visitors for the entire length of the scenic byway. Additionally, at the base of the canyon, the new parking structure, new operations and maintenance yard and building, and reconfiguration of the park-and-ride lot would further dominate the setting and demand attention of visitors.

As motorists approach the canyon, their views would become constrained and focused between the new parking structure to the south and the elevated cog rail alignment to the north. These effects would be most noticeable at KOP 24 where the proposed rail bridge would cross over the scenic byway and would partially block views of the Wasatch Range as depicted in the visual simulation (Appendix 17B, Key Observation Points for the Cog Rail Alternative). For these reasons, the visitor experience would be degraded, and, because of the level of visual change proposed, the ability to manage the scenic byway to protect scenic vistas and intrinsic scenic qualities would be inhibited.

Table 17.4-23. Impacts to Viewers (KOPs) from Cog Rail Infrastructure for the Cog Rail Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Component (approximate)	Viewer Position	Level of Impact	Impact Description
4	Quarry Trailhead	Residents, tourists and recreational	Moderate	150 feet	Neutral to inferior	High	Project elements, such as the maintenance facility (lights and buildings), rail tracks, and parking lot adjustments, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the cog rail infrastructure would be minimally screened by vegetation and topography.
5	Wasatch Resort	Residents, tourists and recreational	Moderate	210 feet	Inferior	None	Project elements associated with the cog rail would not be visually evident. Views toward the cog rail infrastructure would be entirely screened by vegetation and topography.
6	Gate Buttress Trailhead	Tourists and recreational	Moderate	45 feet	Neutral	Moderate	Project elements, such as the parking area improvements and rail tracks, would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape. Views toward the cog rail infrastructure would not be screened by vegetation and topography.

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Table 17.4-23. Impacts to Viewers (KOPs) from Cog Rail Infrastructure for the Cog Rail Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Component (approximate)	Viewer Position	Level of Impact	Impact Description
7	Bridge Trailhead	Tourists and recreational	Moderate	80 feet	Neutral	High	Project elements, such as the rail tracks, rail bed, and landform alterations, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the cog rail infrastructure would not be screened by vegetation and topography.
8	Lisa Falls Trailhead	Tourists and recreational	Moderate	40 feet	Neutral	High	Project elements, such as the rail tracks, landform alterations, and parking area improvements, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the cog rail infrastructure would not be screened by vegetation and topography.
9	Tanner's Flat Group Site C	Tourists and recreational	Moderate	345 feet	Inferior	None	Project elements associated with the cog rail would not be visually evident. Views toward the cog rail infrastructure would be entirely screened by vegetation and topography.
10	First Snow Shed	Tourists and recreational	High	210 feet	Inferior	None	Project elements associated with the cog rail would not be visually evident. Views toward the cog rail infrastructure would be entirely screened by vegetation and topography.
11	Southwest Toward Tanner's Flat (S.R. 210)	Tourists and recreational, travelers	High	Adjacent	Neutral	None	Project elements associated with the cog rail would not be visually evident since views would be screened by the proposed snow shed.
12	Second Snow Shed (S.R. 210)	Tourists and recreational, travelers	High	Adjacent	Neutral	None	Project elements associated with the cog rail would not be visually evident since views would be screened by the proposed snow shed.

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Table 17.4-23. Impacts to Viewers (KOPs) from Cog Rail Infrastructure for the Cog Rail Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Component (approximate)	Viewer Position	Level of Impact	Impact Description
13	Third Snow Shed (S.R. 210)	Tourists and recreational, travelers	High	20 feet	Neutral	High	Project elements associated with the cog rail would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the cog rail infrastructure would not be screened by vegetation and topography.
14	Red Pine Trail Low	Tourists and recreational	Moderate	780 feet	Neutral to superior	None	Project elements associated with the cog rail would not be visually evident. Views toward the cog rail infrastructure would be entirely screened by vegetation and topography.
15	Red Pine Trail Mid	Tourists and recreational	Moderate	0.50 mile	Superior	Moderate	Project elements, such as the rail tracks, would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape. Views toward the cog rail infrastructure would be partially screened by vegetation and topography.
16	White Pine Trailhead	Tourists and recreational	Moderate	Adjacent	Neutral	High	Project elements, such as the rail tracks and concrete barrier, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the cog rail infrastructure would not be screened by vegetation and topography.
17	White Pine Lake Trail	Tourists and recreational	Moderate	0.40 mile	Superior	Moderate	Project elements, such as the rail tracks and rail bed would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape where visible.

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Table 17.4-23. Impacts to Viewers (KOPs) from Cog Rail Infrastructure for the Cog Rail Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Component (approximate)	Viewer Position	Level of Impact	Impact Description
18	Snowbird Entry 1	Tourists and recreational	Moderate	70 feet	Neutral	Moderate	Project elements, such as the rail tracks, rail bed, and concrete barrier, would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape. Views toward the cog rail infrastructure would not be screened by vegetation and topography.
19	Catherine's Pass	Tourists and recreational	Moderate	1.25 miles	Superior	None	Project elements associated with the cog rail would not be visually evident. Views toward the cog rail infrastructure would be heavily screened by vegetation and topography.
20	La Caille Base Station	Residents, tourists and recreational	Moderate	Adjacent	Neutral to superior	High	Project elements, such as the cog rail base station and parking structure, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the cog rail infrastructure would be partially screened by topography.
21	La Caille Residential Area	Residents	High	65 feet	Inferior	High	Project elements, such as the cog rail base station and parking structure, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the cog rail infrastructure would be partially screened by vegetation.

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Table 17.4-23. Impacts to Viewers (KOPs) from Cog Rail Infrastructure for the Cog Rail Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Component (approximate)	Viewer Position	Level of Impact	Impact Description
22	Grit Mill Trailhead	Tourists and recreational	Moderate	30 feet	Neutral	Moderate	Project elements, such as the rail tracks and parking area and trailhead improvements, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the cog rail infrastructure would not be screened by vegetation and topography.
23	Upper Canyon Snow Sheds	Tourists and recreational	Moderate	50 feet	Neutral	High	Project elements, such as rail tracks, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the cog rail infrastructure would not be screened by vegetation and topography.
24	Cog Rail Overpass	Tourists and recreational	Moderate	65 feet	Neutral to inferior	High	Project elements, such as the cog rail base station and overpass, would introduce elements and/or patterns that would be visually dominant and would create strong contrast compared with other features in the landscape. Views toward the cog rail infrastructure would not be screened by vegetation and topography.

17.4.7.3 Mobility Hubs Alternative

The impacts from the mobility hubs with the Cog Rail Alternative would be the same as with Gondola Alternative B.

17.4.7.4 Avalanche Mitigation

17.4.7.4.1 Snow Sheds with Berms Alternative

The impacts from the Snow Sheds with Berms Alternative for the mid-canyon snow sheds would be the same as those from the Enhanced Bus Service Alternative except that the inclusion of the cog rail alignment would require slightly wider snow shed structures. However, overall, the impacts would be the same high level of impact to the landscape character and to KOPs as from the Enhanced Bus Service Alternative.

Two additional upper-canyon snow sheds are also proposed with the Cog Rail Alternative (these snow sheds would not include berms and would cover only the cog rail alignment). The magnitude of change in landscape character associated with the additional upper-canyon snow sheds is described in Table 17.4-24. The impacts of the mid-canyon snow sheds would be the same as with the Enhanced Bus Service Alternative.

Table 17.4-24. Impacts to Landscape Character Units for the Snow Sheds with Berms Alternative

LCU	Level of Impact	Impact Description
Natural Appearing	High	The landscape would appear severely altered, and the snow sheds and berms would dominate the visual setting in the immediate foreground and foreground areas of the LCU. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually dominant in the landscape (strong contrast). About 5 acres of project elements are within this LCU.
Resort Natural Setting	Moderate	The landscape would appear substantially alternated, and project elements would dominate the visual setting at the edge of this LCU. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape (moderate contrast). About 4 acres of project elements are located within this LCU.

One additional KOP representing tourists and recreational users along S.R. 210 was identified to describe impacts to views resulting from the upper-canyon snow sheds. Table 17.4-25 identifies the criteria used to determine impact levels from this KOP, including viewer sensitivity, distance from the cog rail alternative, viewer position, and visibility. Additionally, Table 17.4-25 identifies the resulting impact level as high, with a short narrative describing the type of impacts the avalanche mitigation alternatives would have from this location. For more details regarding each KOP, refer to the Contrast Form Rating Sheets in Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives. The impacts from the mid-canyon snow sheds would be the same as with the Enhanced Bus Service Alternative.

Impacts to the Little Cottonwood State Scenic Byway visitor experience would include views of two new snow sheds in upper Little Cottonwood Canyon in addition to the three snow sheds proposed mid-canyon. These elements would be visually dominant compared to the existing landscape as visitors drive between Tanner's Flat and the Alta resort, which is an approximately 3-mile section of the overall 7-mile-long scenic byway. Because the snow sheds would be focused in two areas, where avalanches limit year-round access along the scenic byway from occasional road closures, the snow shed structures would diminish but not limit the management of the scenic byway to protect scenic vistas and intrinsic scenic qualities.

Table 17.4-25. Impacts to Viewers (KOPs) for the Upper-canyon Snow Sheds

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Component (approximate)	Viewer Position	Level of Impact	Impact Description
23	Upper Canyon Snow Sheds	Tourists and recreational	Moderate	120 feet	Neutral	High	Project elements, such as the snow sheds, would introduce elements and/or patterns that would be visually dominant and create strong contrast compared with other features in the landscape. Views toward the snow sheds would not be screened by vegetation and topography.

17.4.7.4.2 Snow Sheds with Realigned Road Alternative

The impacts from the Snow Sheds with Realigned Road Alternative would be the same as those from the Enhanced Bus Service Alternative except where the inclusion of the cog rail alignment for the mid-canyon snow sheds would require slightly wider snow shed structures. However, overall, the impacts would be the same high level of impact to the landscape character and to KOPs as for the Enhanced Bus Service Alternative.

The visual impacts from the upper-canyon snow sheds would be the same from the Snow Sheds with Berms Alternative with the Cog Rail Alternative.

17.4.7.5 Trailhead Parking Alternatives

With the Cog Rail Alternative, the Gate Buttriss, Grit Mill, and Lisa Falls Trailheads would be reconstructed as part of the cog rail design. The visual impacts for those trailheads are discussed in Section 17.4.7.2, S.R. 210 – North Little Cottonwood Road to Alta. Only the White Pine and Bridge Trailheads would be reconstructed as part of the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative and also as part of the Trailhead Improvements and No Roadside Parking from S.R. 209/S.R 210 Intersection to Snowbird Entry 1 Alternative.

17.4.7.5.1 *Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative*

The magnitude of the change in landscape character associated with the trailhead improvements is described in Table 17.4-26.

Table 17.4-26. Impacts to Landscape Character Units from Trailhead Parking Alternative

LCU	Level of Impact	Impact Description
Natural Appearing	Low	The landscape would appear noticeably altered, and project elements would attract attention within the immediate foreground area. Project elements would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate (weak contrast) and similar to existing trailhead parking infrastructure in the LCU. About 4 acres of trailhead improvements are in this LCU.

UDOT identified two KOPs representing tourists and recreational users to describe impacts to views resulting from the trailhead improvements throughout Little Cottonwood Canyon. Table 17.4-27 lists, by KOP, the criteria used to determine impact levels, including viewer sensitivity, approximate distance from improvements, viewer position, and visibility. Table 17.4-27 identifies the resulting impact level as low, with a short narrative describing the types of impacts the improvements would have from these locations. For more details regarding each KOP, refer to the Contrast Form Rating Sheets in Appendix 17A, Key Observation Points for the Enhanced Bus Service and Gondola Alternatives.

Table 17.4-27. Impacts to Viewers (KOPs) from Trailhead Parking Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Sensitivity	Distance from Closest Project Component (approximate)	Viewer Position	Level of Impact	Impact Description
7	Bridge Trailhead	Tourists and recreational	Moderate	Adjacent	Neutral	Low	Project elements, such as a retaining wall, restroom structure, and parking lot improvements, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.
16	White Pine Trailhead	Tourists and recreational	Moderate	80 feet	Neutral to superior	Low	Project elements, such as parking lot improvements and an exit ramp, would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate.

17.4.7.5.2 *Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative*

The impacts associated with this trailhead improvement alternative would be the same as those from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative except for the installation of additional No Parking signs along S.R. 210. The additional signs would be visually subordinate in the setting and would not attract attention from the KOPs.

17.4.7.5.3 No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The impacts of this trailhead parking alternative with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative.

17.4.7.6 No Winter Parking Alternative

The impacts of the No Winter Parking Alternative with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative.

17.4.7.7 Conformance with USDA Forest Service Scenic Integrity Objectives – Cog Rail Alternative

The USDA Forest Service has developed measurable standards for managing the scenic resources of USDA Forest Service lands through the SMS. This analysis determined whether the Cog Rail Alternative and associated project elements would conform with the established objectives in the *Forest Plan*. On the basis of the respective SIO levels, the stated management objectives were compared with the alternative regarding magnitude of change in visual character and inherent scenic integrity, viewer sensitivity, and visual contrast within the existing landscape.

Table 17.4-22 through Table 17.4-27 above identify impacts to landscape character and viewers in the visual resources impact analysis area associated with cog rail alignment and associated facilities, snow sheds, and trailhead improvements. In the areas that have a high SIO in relation to the cog rail infrastructure, snow sheds, and trailhead improvements (Figure 17.4-9 and Figure 17.4-10 below) and where the impact determination is moderate to high (Table 17.4-28 on page 17-68), the high SIO would not be met and would not be in conformance with the following SIO guidelines identified in the *Forest Plan* for scenery management (USDA Forest Service 2003):

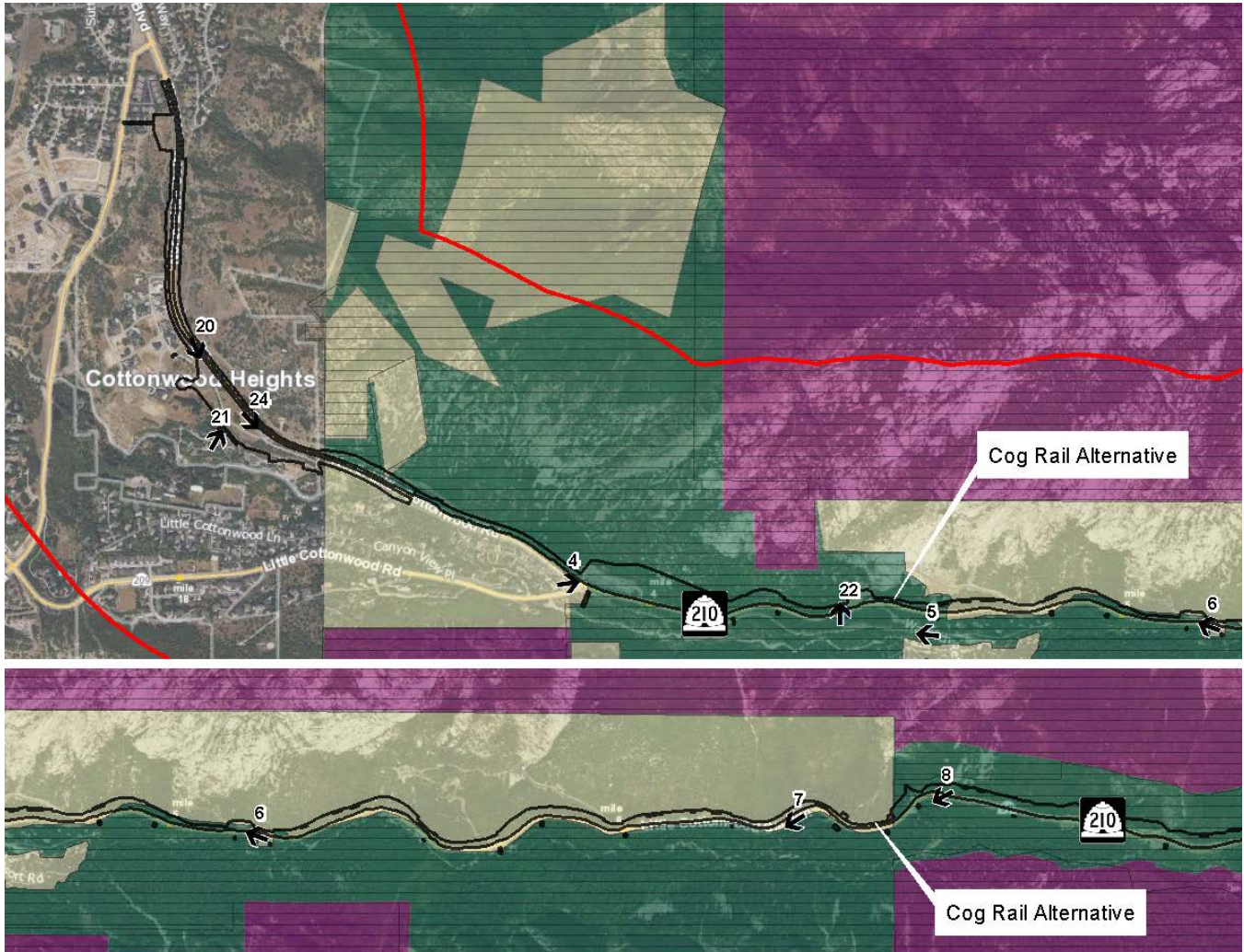
- **G59:** Manage forest landscapes according to landscape character themes, and SIOs as mapped (USDA Forest Service 2003, page 4-48).
- **G60:** Resource management activities should not be permitted to reduce scenic integrity below objectives stated for management prescription categories (USDA Forest Service 2003, page 4-48).

In areas where trailhead improvements would be made as part of the Cog Rail Alternative and the impact determination is low, those project elements would conform to the *Forest Plan* SIO designation of high.

UDOT anticipates that some of these areas of nonconformance with SIO guidelines would not be in conformance with the following SIO standard identified in the *Forest Plan* for scenery management (USDA Forest Service 2003), which would require a plan amendment as described in Chapter 28, U.S. Department of Agriculture Forest Service Land Use Plan Amendments.

- **S22:** Management actions that would result in a scenic integrity level of Unacceptably Low are prohibited in all landscape character themes (USDA Forest Service 2003, page 4-48).

Figure 17.4-9. Scenic Integrity Objectives in the Visual Resources Impact Analysis Area for the Cog Rail Alternative (1 of 2)



- ↑ Key Observation Points
- Visual Resources Impact Analysis Area
- Uinta-Wasatch-Cache National Forest Boundary
- Private Land
- High Scenic Integrity
- Very High Scenic Integrity
- Cog Rail Alternative Impact Boundary

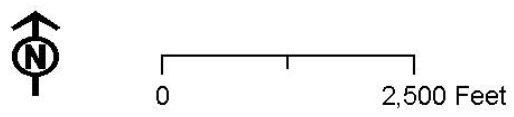
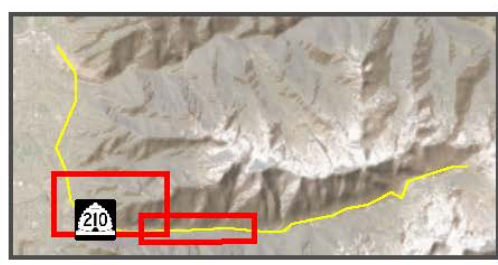


Figure 17.4-10. Scenic Integrity Objectives in the Visual Resources Impact Analysis Area for the Cog Rail Alternative (2 of 2)

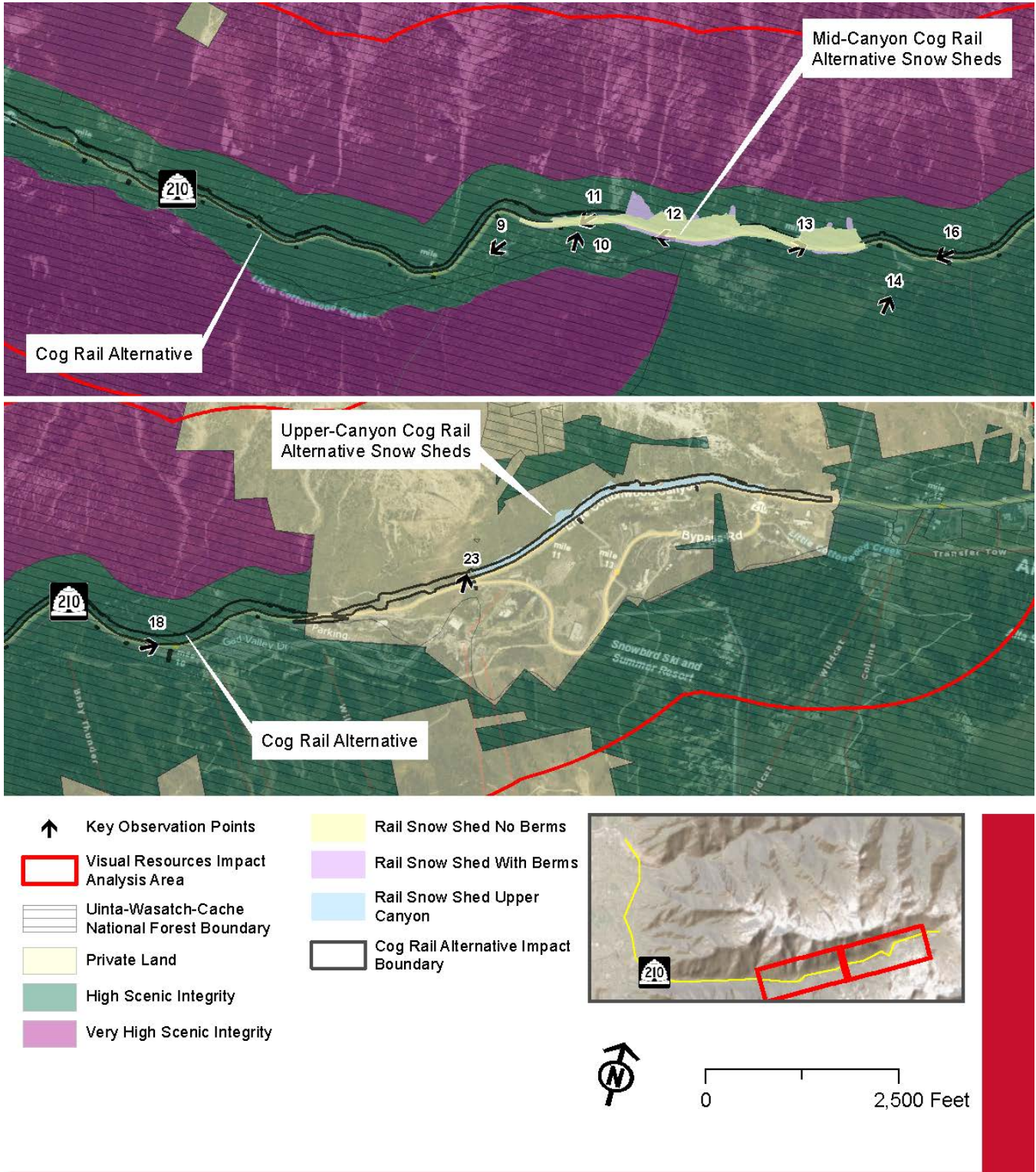


Table 17.4-28. Conformance with SIO Guidelines at KOP Locations Associated with the Cog Rail Alternative

KOP No.	KOP Name	Sensitive Viewer Groups	Viewer Position	Level of Impact	SIO Level	Conformance with SIO Guidelines?
4	Quarry Trailhead	Residents, tourists and recreational	Neutral to inferior	High	High	No
5	Wasatch Resort	Residents, tourists and recreational	Inferior	None	High	Yes
6	Gate Buttress Trailhead	Tourists and recreational	Neutral	Moderate	High	No
7	Bridge Trailhead	Tourists and recreational	Neutral	High	High	No
8	Lisa Falls Trailhead	Tourists and recreational	Neutral	High	High	No
9	Tanner's Flat Group Site C	Tourists and recreational	Inferior	None	High	Yes
10	First Snow Shed	Tourists and recreational	Inferior	None	High	Yes
11	Southwest Toward Tanner's Flat (S.R. 210)	Tourists and recreational, travelers	Neutral	High	High	No
12	Second Snow Shed (S.R. 210)	Tourists and recreational, travelers	Neutral	High	High	No
13	Third Snow Shed (S.R. 210)	Tourists and recreational, travelers	Neutral	High	High	No
14	Red Pine Trail Low	Tourists and recreational	Neutral to superior	None	High	Yes
15	Red Pine Trail Mid	Tourists and recreational	Superior	Moderate	High	No
16	White Pine Trailhead	Tourists and recreational	Neutral	High	High	No
17	White Pine Lake Trail	Tourists and recreational	Superior	Moderate	High	No
18	Snowbird Entry 1	Tourists and recreational	Neutral	Moderate	High	No
19	Catherine's Pass	Tourists and recreational	Superior	None	High	Yes
20	La Caille Base Station	Residents, tourists and recreational	Neutral to superior	High	Private land	Not applicable
21	La Caille Residential Area	Residents	Inferior	High	Private land	Not applicable
22	Grit Mill Trailhead	Tourists and recreational	Neutral	Moderate	High	No
23	Upper Canyon Snow Sheds	Tourists and recreational	Neutral	High	Private land	Not applicable
24	Cog Rail Overpass	Tourists and recreational	Neutral to inferior	High	High	No

17.4.8 Mitigation Measures

All aesthetic treatments will be coordinated with the USDA Forest Service landscape architect and implemented in accordance with UDOT Policy 08C-03, *Project Aesthetics and Landscaping Plan Development and Review* (UDOT 2014a); the *UDOT Aesthetics Guidelines* (UDOT 2014b); and the guidelines in the *Cottonwood Canyons Scenic Byways Corridor Management Plan* in coordination with the USDA Forest Service and local municipal agencies. 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; the color of bridges, structures, and retaining walls; and other architectural features, such as railings. UDOT typically evaluates aesthetic treatments during the final design phase of a project after an alternative is selected in the project's Record of Decision and funding has been allocated for the project.

UDOT will consider, on a case-by-case basis and in conjunction with the USDA Forest Service and municipal agencies as appropriate, the following mitigation measures for minimizing the adverse effects of the Selected Alternative on visual resources:

- When siting a facility, incorporate measures to minimize the profile of all facility-related structures, particularly for facilities proposed within the immediate foreground and foreground distance of sensitive viewing locations.
- Use custom-designed gondola structures, buildings, and avalanche-control structures in key areas when such designs would soften the visual impact and blend more effectively with the surroundings.
- Select materials and surface treatments for structures, cog rail, gondola, and roads that repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. Improvements should consider and be consistent with the visual guidelines in the *Cottonwood Canyons Scenic Byways Corridor Management Plan*. For example, if the elements of the Selected Alternative would be viewed against an earthen or other non-sky background, appropriately colored materials will be selected to help blend structures with the elements' backdrop.
- Identify appropriate colors and textures for facility materials by considering both summer and winter appearance, as well as seasons of peak visitor use.
- On structures, use materials, coatings, or paints that have little or no reflectivity.
- Use variable-length tower legs to reduce the cut and fill needed to form a level tower pad.
- Minimize vegetation clearing to the extent practicable, especially adjacent to S.R. 210 or the locations of other sensitive viewers.
- Where vegetation would be cleared, feather the edges to reduce the creation of geometric clearings incongruent with the existing landscape character.
- Use nonreflective gondola cable infrastructure to reduce glare and reflectiveness.
- Design facilities and structures using natural materials (for example, wood or stone) to blend with the "forest" aesthetic.

17.5 References

[BLM] Bureau of Land Management

1986 Visual Resource Contrast Rating. BLM Handbook H-8431-1.

[FAA] Federal Aviation Administration

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APPENDIX 17A

Key Observation Points for the Enhanced Bus Service and Gondola Alternatives

KOPs in this appendix are listed in ascending order.



KOP 1 – Existing Condition – Gravel Pit Mobility Hub



KOP 1 – Proposed Condition – Gravel Pit Mobility Hub (All Alternatives)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 1 - Gravel Pit Mobility Hub (All Alternatives)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Trapezoidal, mounded, exposed aggregate backdrop with rugged, undulating broken ridges	Domestic vegetation plantings; short and low indistinct grasses; rounded low shrubs at foot of mound; rounded oak shrubs; conical evergreens on ridge	Industrial cylindrical upright structures; rectangular buildings
LINE	Several horizontal lines from tiered mound/mountain ridgelines; rugged broken ridgelines	Distinct lines between dense vegetation and low grasses or exposed soil/aggregate	Varied angles and orientations; complex
COLOR	Golden tan exposed rock to pinkish tones; exposed light tan to gray aggregate	Gray green sage; yellowish to dark green shrubs; lime to golden straw-colored grasses	Green and brown building; grays, blues, beige, yellow throughout complex; earth tones
TEXTURE	Distinct, smooth, uniform, and patterned soil; rugged, broken landforms in background	Clustered and organized; low stippled, broken sage groupings; consistent carpeted grasses; dense clusters of domestic vegetation with varied heights	Irregular, complex, rigid, disorganized

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Abrupt change in gradation between flat clearing and foothills	No perceived change.	Defined, angular organized infrastructure with descending ramps to flat/grade lot; prominent 3- to-4-story geometric structure
LINE	Unknown	No perceived change.	Distinct, abrupt lines between paved road and parking lot and the mine; horizontal lines created by overpass; ascending and descending lines associated with ramp contours
COLOR	Gray to brown exposed soil at toe of foothills	No perceived change.	Dark gray to black asphalt; dark tones of mobility hub, infrastructure and surface treatments
TEXTURE	Irregular to flat; inconsistent transitions to abrupt distinctive parking structure	No perceived change.	Smooth continuous roadway; angular, organized infrastructure

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
			X						X		X			
			X						X		X			
ELEMENTS	Form		X					X		X			3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD	
	Line		X					X		X				
	Color		X					X		X				
	Texture		X					X		X				
Evaluator's Names											Date			
Laren Cyphers/ Chris Bockey											7/24/2020			

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information



KOP 2 – Existing Condition – Fort Union Boulevard

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 2 - Fort Union Boulevard (All Alternatives: Five-lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Sloping, angular side slopes; lower rounded foothills of residential properties that taper to roadway; Open setting compared to enclosed setting of subsequent KOPs; broader views because adjacent slopes are lower in elevation	Mix of evergreen, domestic deciduous, and oak brush	Geometric, angular forms of residents that are mostly obscured by vegetation; geometric prominent developments and infrastructure line roadway, including rigid Jersey barriers;
LINE	Undulating ridgelines descending to flat valley	Amorphic lines of groupings; some vertical evergreens; mostly rounded, dense brush and shrubs	Varied single-pole wood and transmission lines; continuous linear pattern of associated electric telephone lines
COLOR	Brown to dark brown exposed soils intermixed with gray aggregate and light gray to dark gray exposed rock	Dark deep to light yellow green of most vegetation; soft gray green of Russian olives	Light beige to dark brown structures
TEXTURE	Smooth ridges transition to lower elevations	Carpeted, continuous vegetation on foothills; varied vegetation height in residential area	Inconsistent, organized structures; smooth, continuous, flat road surface; continuous fine energy cables with repetitive transmission poles

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Cut and fill would generally follow existing form; some distinct abrupt changes in gradation between residential structures and developments and widened roadway	No perceived change.	Multi-use path, roadway improvements, bike lanes, pedestrian bridge would all create distinct, vertical and horizontal geometric, rectangular structures to span the roadway
LINE	Distinct horizontal line between flat roadway and cut slopes	No perceived change.	Horizontal and vertical distinct lines
COLOR	Dark brown exposed soils and gray aggregate and rocks	No perceived change.	Light gray to dark tones of infrastructure and surface treatments
TEXTURE	More abrupt changes in elevation and gradation	No perceived change.	Angular, organized infrastructure; smooth, flat, continuous roadway

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
ELEMENTS	Form			X				X	X					3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line			X				X		X				
												Evaluator's Names	Date	
												Laren Cyphers/ Chris Bockey	7/17/2020	

	Color			X					X		X		
	Texture			X					X		X		

SECTION D. (Continued)

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information



KOP 3 – Existing Condition – Daneborg Drive



KOP 3 – Proposed Condition – Daneborg Drive (All Alternatives: Five-lane Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 3 - Daneborg Drive (All Alternatives: Five-lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Sloping, angular side slopes; lower rounded foothills of residential properties that taper to roadway	Mix of evergreen, domestic deciduous, and oak brush	Geometric, angular forms of residential structures that line the roadway; mostly obscured by vegetation
LINE	Undulating ridgelines descending to flat valley	Amorphic lines of groupings; some vertical evergreens; mostly rounded, dense brush and shrubs	Varied single-pole wood and transmission lines; continuous, linear pattern of associated electric telephone lines
COLOR	Brown to dark brown exposed soils intermixed with gray aggregate	Dark deep to light yellow green of most vegetation; soft gray green of Russian olives	Light beige to dark brown structures
TEXTURE	Smooth ridges transition to lower elevations	Carpeted, continuous vegetation on foothills; varied vegetation height in residential area	Inconsistent, angular residential structures; smooth, continuous flat road surface; continuous fine energy cables with repetitive transmission poles

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Cut and fill would generally follow existing form; some distinct abrupt changes in gradation between residential structures to the east and widened roadway	Revegetation of low, indistinct grasses and shrubs mostly or entirely obscured by retaining wall	Multi-use path, roadway improvements, bike lanes, pedestrian bridge would all create distinct, vertical and horizontal geometric, rectangular structures to span the roadway
LINE	Distinct horizontal line between flat roadway and cut slopes	Line between vegetation type and height; soft, undulating lines	Horizontal and vertical distinct lines
COLOR	Dark brown exposed soils and gray aggregate	Seasonal variety assumed based on revegetation	Light gray to dark tones of infrastructure and surface treatments
TEXTURE	More abrupt changes in elevation and gradation	Shorter stature oak brush; gradual tapering; loss of vertical elements	Angular, organized infrastructure; smooth, flat continuous roadway

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
				X				X		X				
				X				X			X			
ELEMENTS	Form			X				X		X				3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line			X				X			X			
	Color			X				X			X			
	Texture			X				X			X			
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020	Date	

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)
To be developed based on further design information



KOP 4 – Existing Condition – Quarry Trailhead

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 4 - Quarry Trailhead (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rugged, broken canyon faces; rounded, irregular cliffs; distinct spines and angled, linear drainages transition to chunky, broken, exposed granite walls; tiered parking lot set above roadway	Consistent, dense shrub and deciduous forest; some indistinct shrubs and low grasses	Flat, horizontal roadway; some geometric, upright signage; horizontal transmission cables overhead attached to upright, vertical utility poles
LINE	Irregular and inconsistent rock bands; undulating, broken ridgeline; directional breakage along cliff face	Amorphic lines created by tree groupings; distinct lines between dense vegetation and exposed cliff	Curvilinear roadway; horizontal and vertical lines of energy infrastructure
COLOR	Whitish-gray cliffs with dark gray to black vertical striations	Yellowish-green to dark green shrubs	Dark gray asphalt; natural wood utility poles; gray cables and energy infrastructure
TEXTURE	Broken, soft, and rounded edged cliff face which transitions to some medium boulders roadside	Consistent, carpeted, and dense forest	Smooth, continuous roadway; fine cables; inconsistent energy infrastructure

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Some subtle cut areas tapering to slope	No perceived change.	No perceived change.
LINE	Subtle transitions between paved and natural surfaces	No perceived change.	No perceived change.
COLOR	Dark brown to gray exposed soil; light gray exposed boulders and gravel	No perceived change.	No perceived change.
TEXTURE	Gradational transition to slope	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
ELEMENTS		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD	
				X					X				X		
				X					X				X		
				X					X				X		
				X					X				X		
Evaluator's Names												Date			
Laren Cyphers/ Chris Bockey												7/17/2020			

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information



KOP 4 – Proposed Condition – Quarry Trailhead (Gondola Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 4 - Quarry Trailhead (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	Rugged, broken canyon faces; rounded irregular cliffs; Distinct spines and angled linear drainages transition to chunky broken exposed granite walls; tiered parking lot set above roadway	Consistent, dense shrub and deciduous forest; some indistinct shrubs and low grasses		Flat horizontal roadway; Some geometric upright signage; horizontal transmission cables overhead attached to upright vertical utility poles	
LINE	Irregular and inconsistent rock bands; undulating broken ridgeline; directional breakage along cliff face	Amorphic lines created by tree groupings; distinct lines between dense vegetation and exposed cliff		Curvilinear roadway; horizontal and vertical lines of energy infrastructure	
COLOR	Whitish gray cliffs with dark gray to black vertical striations	Yellowish greens to dark green shrubs		Dark gray asphalt; natural wood utility poles; gray cables and energy infrastructure	
TEXTURE	Broken soft and rounded edged cliff face which transitions to some medium boulders roadside	Consistent, carpeted, and dense forest		Smooth continuous roadway; fine cables; inconsistent energy infrastructure	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	No perceived change.	No perceived change.		Upright, vertical, geometric form with angular and vertical components; linear continuous cables; geometric square gondola car; Lack of backdrop makes towers and cables more distinct in the skyline	
LINE	No perceived change.	No perceived change.		Bold, vertical, rigid; intersecting perpendicular lines; continuous cables	
COLOR	No perceived change.	No perceived change.		Galvanized steel	
TEXTURE	No perceived change.	No perceived change.		Rigid, broken, inconsistent towers; continuous fine cables; repetitive gondola cars	

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X	X				
					X				X	X				
ELEMENTS	Form				X				X	X				
	Line				X				X	X				
	Color				X				X	X				
	Texture				X				X	X				
												3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD		
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020		
												Date		

Comments from item 2.

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 5 – Existing Condition – Wasatch Resort

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 5 - Wasatch Resort (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rugged, broken, rounded edged diff faces	Consistent, dense shrub and deciduous forest; low grasses in foreground	Clustered residential development; built forms for landscaping; low-voltage 69-kV transmission line in immediate and middle foreground; flat roadway for devilmint
LINE	Irregular and inconsistent rock bands; directional breakage in diff side; broken ridgeline on V-shaped horizon; intersecting cliffs create focal point	Amorphic lines created by tree groupings; distinct line between vegetation and rock	Tall vertical poles; horizontal, continuous thin electric lines
COLOR	Whitish-gray diffs with subtle tan to yellow streaks	Yellowish-green to mostly dark forest and shrub	Buckskin poles; light gray attached infrastructure; darker wood transmission line in distance
TEXTURE	Soft diff face with inconsistent breakage	Consistent, carpeted, dense forest	Irregular residential area; linear smooth, continuous distribution line

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Horizontal, contrasting, thin, linear, continuous, and consistent cables
LINE	No perceived change.	No perceived change.	Linear, continuous cables
COLOR	No perceived change.	No perceived change.	Grayish-silver cables; dark tones of gondola cabins
TEXTURE	No perceived change.	No perceived change.	Continuous fine cables; repetitive gondola cabins

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
				X				X				X	
			X				X				X	Date	
ELEMENTS	Form			X			X				X		
	Line			X			X				X		
	Color			X			X				X		

	Texture				X				X			X	
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SECTION D. (Continued)

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 6 – Existing Condition – Gate Buttress Trailhead

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 6 - Gate Buttress Trailhead (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rugged, broken canyon faces; rounded, irregular cliffs	Consistent, dense shrub and deciduous forest; some indistinct shrubs and low grasses	Only significant structure is the roadway
LINE	Irregular and inconsistent rock bands; undulating, broken ridgeline; directional breakage along cliff face	Amorphic lines created by tree groupings	
COLOR	Whitish-gray cliffs with dark gray to black vertical striations	Yellowish-green to dark green shrubs	
TEXTURE	Broken soft and rounded edged cliff face which transitions to some medium boulders roadside	Consistent, carpeted, and dense forest	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Some subtle cut areas tapering to slope	No perceived change.	Geometric restroom, flat, smooth parking lot
LINE	Subtle transitions between paved and natural surfaces	No perceived change.	More distinct edge between soil and paved surface; geometric lines of restroom, both horizontal and vertical
COLOR	Dark brown to gray exposed soil; light gray exposed boulders	No perceived change.	Tan restrooms; dark gray asphalt
TEXTURE	Gradational transition to slope	No perceived change.	Smooth, soft parking lot; organized restroom

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
ELEMENTS		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
				X					X			X		
				X					X			X		
				X					X			X		
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020	Date	

	Texture			X				X			X	
--	---------	--	--	---	--	--	--	---	--	--	---	--

SECTION D. (Continued)

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 6 - Gate Buttress Trailhead (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rugged, broken canyon faces; rounded irregular cliffs	Consistent, dense shrub and deciduous forest; some indistinct shrubs and low grasses	Only significant structure is the roadway
LINE	Irregular and inconsistent rock bands; undulating broken ridgeline; directional breakage along cliff face	Amorphic lines created by tree groupings	
COLOR	Whitish gray cliffs with dark gray to black vertical striations	Yellowish greens to dark green shrubs	
TEXTURE	Broken soft and rounded edged cliff face which transitions to some medium boulders roadside	Consistent, carpeted, and dense forest	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Upright, vertical geometric towers with angular and vertical components; linear continuous cables; geometric gondola cabin
LINE	No perceived change.	No perceived change.	Bold vertical rigid tower; intersecting perpendicular lines; continuous cables
COLOR	No perceived change.	No perceived change.	Galvanized steel of towers; dark tones of gondola cabins
TEXTURE	No perceived change.	No perceived change.	Rigid broken inconsistent tower; continuous fine cables; repetitive gondola cabins

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X	X				
					X				X	X				
ELEMENTS	Form				X				X	X				
	Line				X				X	X				
	Color				X				X	X				
	Texture				X				X	X				
												3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD		
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020		
												Date		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 7 – Existing Condition – Bridge Trailhead



KOP 7 – Proposed Condition – Bridge Trailhead (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 7 - Bridge Trailhead (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed, rugged, broken canyon faces; scree slopes	Distinct conical evergreens; shrubby, dense deciduous trees; moderate height shrubs and low grasses	Flat, smooth road
LINE	Broken, converging, irregular, inconsistent lines along canyon faces and ridges	Distinct transition between cut slope and hill; lines created by variation in vegetation	Sinuuous, curvilinear road
COLOR	Light tan to light gray soil; soft gray with reddish-toned cliff side	Vibrant yellowish-green to lime green to dark, muted green; isolated gray to dark brown of wood material	Muted dark gray of roadway surface
TEXTURE	Jagged, rigged, inconsistent, coarse cliffs; broken, cobbled sandy roadside	Consistent, dense vegetation; more stippled on rocky slopes; gradational pattern based on vegetation height	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed perspective; maximum cut areas approximately 70 feet wide, tapering to slope	Low, indistinct grasses and shrubs	Rectangular and geometric retaining wall; geometric, short restrooms
LINE	Pronounced lines between roadside area and cut slope	Line between vegetation type and height; soft, undulating lines	Defined hard line from wall; geometric restrooms
COLOR	Dark brown exposed soil; light gray gravel to cobble exposed rock	Seasonal variety assumed based on revegetation; Removal of dark evergreen trees	Assume tan bathroom; muted gray to dark tones of concrete for retaining wall
TEXTURE	Abrupt transition from flat to cut slope	Shorter stature oak brush; gradual tapering; loss of vertical elements	Abrupt, defined edged wall; ordered restroom

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
ELEMENTS	Form		X			X							X		3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line		X			X							X		
	Color			X		X							X		
	Texture		X			X							X		
												Evaluator's Names	Date		
												Laren Cyphers/ Chris Bockey	7/17/2020		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT VISUAL CONTRAST RATING WORKSHEET	District N/A <hr/> Resource Area N/A <hr/> Activity (program) N/A
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SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements 2. Key Observation Point: 7 - Bridge Trailhead (Gondola Alternative) 3. VRM Class	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
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SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	Enclosed, rugged, broken canyon faces; Scree slopes	Distinct conical evergreens; shrubby dense deciduous trees; moderate height shrubs and low grasses		Flat, smooth road	
LINE	Broken converging irregular inconsistent lines along canyon faces and ridges	Distinct transition between cut slope and hill; lines created by variation in vegetation		Sinuous; curvilinear road	
COLOR	Light tan to light gray soil; soft gray with reddish toned cliff side	Vibrant yellowish green to lime green to dark muted green; isolated gray to dark brown of wood material		Muted dark gray of roadway surface	
TEXTURE	Jagged, rigged, inconsistent, coarse cliffs; broken, cobbled sandy roadside	Consistent, dense vegetations; more stippled on rocky slopes; gradational pattern based on vegetation height		Smooth and consistent roadway	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	No perceived change.	No perceived change.		Upright, vertical geometric towers with angular and vertical components; linear continuous cables; geometric gondola cabins	
LINE	No perceived change.	No perceived change.		Bold vertical rigid tower; intersecting perpendicular lines; continuous cables	
COLOR	No perceived change.	No perceived change.		Galvanized steel; dark tones of gondola cabins	
TEXTURE	No perceived change.	No perceived change.		Rigid broken inconsistent tower; continuous fine cables; repetitive gondola cabins	

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

ELEMENTS	1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD Evaluator's Names _____ Date _____ Laren Cyphers/ Chris Bockey 7/17/2020
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X		X			
					X				X		X			
				X				X		X				

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 8 – Existing Condition – Lisa Falls Trailhead

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 8 - Lisa Falls Trailhead (Enhanced Bus Service Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed, rugged, broken canyon faces; scree slopes	Distinct, conical evergreens; shrubby, dense deciduous trees; moderate-height shrubs and low grasses	Flat, smooth road
LINE	Broken, converging, irregular, inconsistent lines along canyon faces and ridges	Distinct transition between cut slope and hill; lines created by variation in vegetation	Sinuous, curvilinear road
COLOR	Light tan to light gray soil; soft gray with reddish-toned cliff side	Vibrant yellowish-green to lime green to dark, muted green; isolated gray to dark brown of wood material	Muted dark gray of roadway surface
TEXTURE	Jagged, rigged, inconsistent, coarse cliffs; broken, cobbled sandy roadside	Consistent, dense vegetation; more stippled on rocky slopes; gradational pattern based on vegetation height	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Soft, subtle transition at parking lot; low, concave depression from drainages	No perceived change.	Geometric, short in structure restrooms; similar to other government vault toilets
LINE	Undulating and continuous line between cut slope and vegetation	No perceived change.	Geometric
COLOR	Light tan to darker brown exposed soils; gray exposed cobble and boulders	No perceived change.	Tan restrooms with dark roof consistent with USFS design
TEXTURE	Tapered smooth transition to parking lot	No perceived change.	Smooth, ordered, subtle

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A		
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)						
ELEMENTS	Form	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD	Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020	Date
	Line			X					X				X			
	Color			X					X				X			
	Texture			X					X				X			

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 9 – Existing Condition – Tanners Flat Group Site C



KOP 9 – Proposed Condition – Tanners Flat Group Site C (Gondola Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 9 - Tanners Flat Group Site C (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	Flat canyon bottom; canyon walls mostly obstructed by vegetation and inferior viewpoint; rugged mountain ridgeline seen to the northeast	Vertical, dense, scraggly deciduous trees and shrubs in foreground; conical evergreens at higher elevations	Organized, angular, rigid campground infrastructure; flat, horizontal roadway and parking lot
LINE	Sloping ridgeline tapering to canyon bottom	Distinct lines between deciduous trees and shrubs and developed campgrounds; vertical trees	Horizontal and vertical lines of infrastructure; curvilinear parking lot
COLOR	Dark brown exposed soils; gray to light gray exposed granite rocks in campground	Yellowish-green deciduous trees; dark green evergreens in background	Grays, blacks, and browns of infrastructure; dark gray asphalt
TEXTURE	Rugged, tapered canyon walls transition to a generally flat, uniform canyon bottom	Dense, inconsistent, grouped vegetation with varied heights	Organized, unnatural, rigid infrastructure; smooth roadway and parking lot

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Towers obstructed by vegetation; linear continuous cables run overhead southwest to northeast; geometric gondola cabins
LINE	No perceived change.	No perceived change.	Horizontal continuous cables
COLOR	No perceived change.	No perceived change.	Galvanized steel; dark tones of gondola cabins
TEXTURE	No perceived change.	No perceived change.	Continuous fine cables; repetitive gondola cabins

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X			X		
					X				X			X		
ELEMENTS	Form				X				X			X		3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line				X				X			X		
	Color				X				X			X		
	Texture				X				X			X		
Evaluator's Names												Date		
Laren Cyphers/ Chris Bockey 7/17/2020														

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 10 – Existing Condition – First Snow Shed

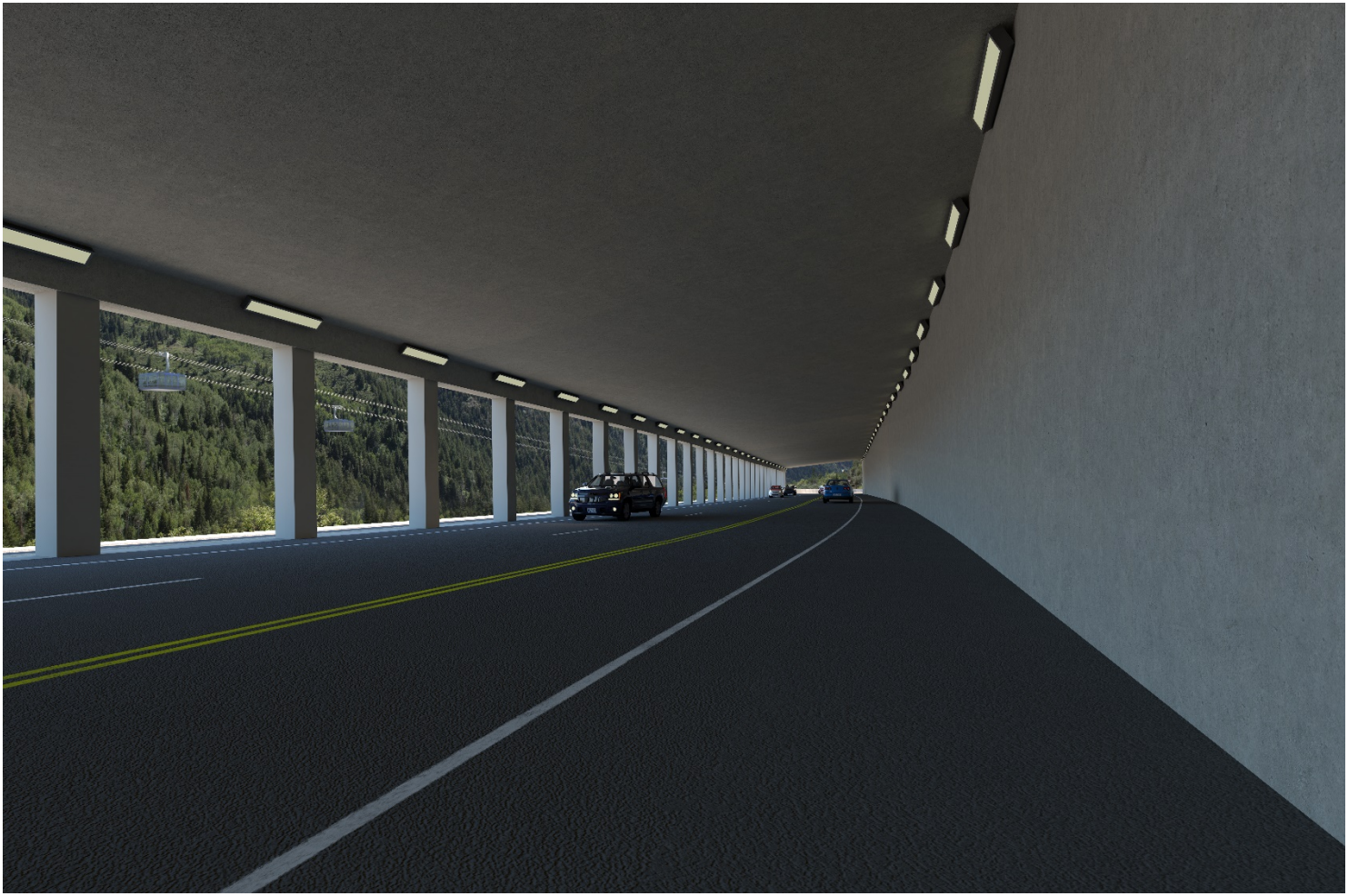
Note: Proposed Condition simulation not included for this KOP.

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)
None recommended



KOP 11 – Existing Condition – Southwest Toward Tanners Flat (S.R. 210)



KOP 11 – Proposed Condition – Southwest Toward Tanners Flat (S.R. 210) (Gondola Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 11 - Southwest Toward Tanners Flat (S.R. 210) (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed, rugged, broken canyon faces; scree slopes; abrupt transition to northeastern slope from flat roadway	Distinct, conical evergreens; shrubby, dense deciduous trees; moderate height shrubs and low grasses	Flat, smooth road
LINE	Broken, irregular, inconsistent lines along canyon faces and ridges	Distinct transition between bare roadway and gradually more vegetated hill; lines created by variation in vegetation	Sinuous, curvilinear road
COLOR	Light tan to light gray soil; soft gray granite diff side and loose rock near roadside	Vibrant yellowish-green to lime green to dark, muted green; isolated gray to dark brown of wood material	Muted dark gray of roadway surface
TEXTURE	Ridged, inconsistent, coarse diffs; broken, cobbled sandy roadside	Consistent, dense vegetation; gradational pattern based on vegetation height	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Towers mostly obstructed by snowshed, cabin visible with movement; linear continuous cables run overhead; geometric openings of snowshed and enclosure
LINE	No perceived change.	No perceived change.	Horizontal continuous cables, distinctive vertical and horizontal lines of snowshed
COLOR	No perceived change.	No perceived change.	Galvanized steel; dark tones of gondola cabins; light muted gray of concrete snowshed
TEXTURE	No perceived change.	No perceived change.	Continuous fine cables; repetitive gondola cabins; rigid, hard, and repetitive elements of snowshed

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
ELEMENTS	Form				X				X	X				3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line				X				X	X				
	Color				X				X	X				
	Texture				X				X	X				
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020	Date	

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 12 – Existing Condition – Second Snow Shed (S.R. 210)



KOP 12 – Proposed Condition – Second Snow Shed (S.R. 210) (Enhanced Bus Service Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 12 - Second Snow Shed (S.R. 210) (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed, rugged canyon faces and ridgelines; scree slopes	Distinct, conical evergreens; shrubby, dense deciduous trees; moderate height shrubs and low grasses	Flat, smooth road
LINE	Broken, irregular, inconsistent lines along canyon ridges	Distinct transition between bare roadway and tall conifers; lines created by variation in vegetation	Sinuuous, curvilinear road
COLOR	Light tan to light gray soil; soft gray granite diff side and loose rock near roadside	Vibrant yellowish-green to lime green to dark, muted green; isolated gray to dark brown of wood material	Muted dark gray of roadway surface
TEXTURE	Ridged, inconsistent, coarse diffs; broken, cobbled sandy roadside	Consistent, dense vegetation; gradational pattern based on vegetation height	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Horizontal, tapered transition into slope of snow chute	Low, indistinct grasses and shrubs	Geometric rectangle, rigid, defined, bold/dark opening
LINE	Subtle line created between snow shed and earth	Line between vegetation type and height; soft, undulating lines	Angular, sloping, continuous line of length of snow shed wall, perpendicular intersection lines of snow shed opening
COLOR	Dark brown to light gray exposed soil	Seasonal variety assumed based on revegetation; Removal of dark evergreen trees	Light gray muted concrete
TEXTURE	Smooth, consistent, and feathered to existing slope	Shorter stature oak brush; gradual tapering; loss of vertical elements	Soft face; rigid and abrupt edges of snow shed opening

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A			
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
ELEMENTS		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD			
		Form	X				X				X						
		Line	X				X				X						
		Color	X				X				X						
		Texture	X				X			X							
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020					
												Date					

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 13 – Existing Condition – Third Snow Shed (S.R. 210)



KOP 13 – Proposed Condition – Third Snow Shed (S.R. 210) (Enhanced Bus Service Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 13 - Third Snow Shed (S.R. 210) (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed, rugged canyon faces and ridgelines; scree slopes;	Distinct, conical evergreens; shrubby, dense deciduous trees; moderate height shrubs and low grasses	Flat, smooth road
LINE	Broken, irregular, inconsistent lines along canyon ridges	Distinct transition between bare roadway and vertical scraggly aspens and evergreens; lines created by variation in vegetation	Sinuuous, curvilinear road
COLOR	Light tan to light gray soil; soft gray granite diff side and loose rock near roadside	Vibrant yellowish-green to lime green to dark, muted green; isolated gray to dark brown of wood material	Muted dark gray of roadway surface
TEXTURE	Ridged, inconsistent, coarse cliffs; broken, cobbled sandy roadside	Consistent, dense vegetation; gradational pattern based on vegetation height	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Horizontal tapered transition into slope of snow chute	Low, indistinct grasses and shrubs	Geometric rectangle, rigid, defined, bold/dark opening
LINE	Subtle line created between snow shed and earth	Line between vegetation type and height; soft, undulating lines	Angular, sloping, continuous line length of snow shed wall, perpendicular intersection lines of snow shed opening
COLOR	Dark brown to light gray exposed soil	Yellow green vegetation; seasonal variety assumed based on revegetation	Light gray muted concrete
TEXTURE	Smooth, consistent and feathered to existing slope	Subtle change to low vegetation and decreased density	Soft face; rigid and abrupt edges of snow shed opening

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

ELEMENTS	1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
			X				X				X			
			X				X				X			
		X				X				X				
		Evaluator's Names												Date
		Laren Cyphers/ Chris Bockey 7/17/2020												

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 13 - Third Snow shed (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed, rugged canyon faces and ridgelines; Scree slopes;	Distinct conical evergreens; shrubby dense deciduous trees; moderate height shrubs and low grasses	Flat, smooth road
LINE	Broken irregular inconsistent lines along canyon ridges	Distinct transition between bare roadway and vertical scraggly aspens and evergreens; lines created by variation in vegetation	Sinuuous; curvilinear road
COLOR	Light tan to light gray soil; soft gray granite diff side and loose rock near roadside	Vibrant yellowish green to lime green to dark muted green; isolated gray to dark brown of wood material	Muted dark gray of roadway surface
TEXTURE	Ridged, inconsistent, coarse diffs; broken, cobbled sandy roadside	Consistent, dense vegetation; gradational pattern based on vegetation height	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Towers entirely obstructed by vegetation; curvilinear continuous cables run overhead visible from canopy to canopy; geometric gondola cabins
LINE	No perceived change.	No perceived change.	Curved continuous cables
COLOR	No perceived change.	No perceived change.	Galvanized Steel; dark tones of gondola cabins
TEXTURE	No perceived change.	No perceived change.	Continuous fine cables; repetitive gondola cabins

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD	
ELEMENTS	Form				X				X				X		Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020
	Line				X				X				X		
	Color				X				X				X		
	Texture				X				X				X		

SECTION D. (Continued)

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 15 – Existing Condition – Red Pine Trail Mid



KOP 15 – Proposed Condition – Red Pine Trail Mid (Gondola Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 15 - Red Pine Trail Mid (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Bold, trapezoidal, prominent canyon walls that create an enclosed, bowl setting; ridges/spines descending canyon walls	Vertical, conical evergreens transition to low grasses and shrubs	Flat, smooth road
LINE	Horizontal, undulating horizon; directional drainages and snow shoots ; U-shape created by canyon walls on either edge of the viewshed	Amorphic lines between vegetation type; distinct lines between dense vegetation and exposed rock	Sinuous, curvilinear road
COLOR	Light brown to tan soils; gray to grayish-white exposed rocks	Dark green evergreens; light green to lime green shrubs and grasses	Muted dark gray of roadway surface
TEXTURE	Variety of exposed rock outcrops intermixed with inconsistent ridges across canyon walls	Feathered, bristly, transitional areas of smaller vegetation to taller vegetation	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Cut slopes would be similar to existing condition.	No perceived change.	No perceived change.
LINE	Cut slopes would be similar to existing condition.	No perceived change.	No perceived change.
COLOR	Cut slopes would be similar to existing condition.	No perceived change.	No perceived change.
TEXTURE	Cut slopes would be similar to existing condition.	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
ELEMENTS	Form	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
				X					X				X	
	Line			X					X				X	Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020

	Color			X					X				X
	Texture			x					X				x

SECTION D. (Continued)

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 15 - Red Pine Mid-Trail (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	Bold, trapezoidal, prominent canyon walls that create an enclosed, bowl setting; ridges/spines descending canyon walls	Vertical conical evergreens transition to low grasses and shrubs	Flatt, smooth road
LINE	Horizontal, undulating horizon; directional drainages and snow shoots; "U" shape created by canyon walls on either edge of the viewshed	Amorphic lines between vegetation type; distinct lines between dense vegetation and exposed rock	Sinuous curvilinear road
COLOR	Light brown to tan soils; gray to grayish white exposed rocks;	Dark green evergreens; light green to lime green shrubs and grasses	Muted dark gray of roadway surface
TEXTURE	Variety of exposed rock outcrops intermixed with inconsistent ridges across canyon walls	Feathered, bristly, transitional areas of smaller vegetation to taller vegetation	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	Consistent geometric/square pattern of tower footing; rectangular clearing on approach and exit of the turn station	Repetitive distinctive continuous and soft angles of lattice structure; geometric, domed or blocky, bod distinct turn station
LINE	No perceived change.	Distinctive lines from vegetation clearings	Vertical triangular, distinctive towers give way to finer lines as the eye moves down canyon; continuous, fine, directional cables; distinct, horizontal and vertical lines of the abrupt, rigid, turn station
COLOR	No perceived change.	No change.	Galvanized steel; dark tones of gondola cabins
TEXTURE	No perceived change.	Distinct geometric patterns; consistent rhythmic, unnatural openings	Repetitive, continuous towers and cables; irregular, rigid turn station; consistent pattern of gondola cabins

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
ELEMENTS		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
		Form			X		X			X				
		Line			X			X		X				
		Color			X				X	X				
		Texture			X			X		X			Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020	
												Date		

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 16 – Existing Condition – White Pine Trailhead



KOP 16 – Proposed Condition – White Pine Trailhead (Gondola Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 16 - White Pine Trailhead (Enhanced Bus Service Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	Broken, horizontal ridgeline to north and smoother ridgeline to southeast; concave valley with high walls; angular, upright rock features; flatter valley bottom	Conical evergreens; feathered, scraggly aspens, low grasses, medium indistinct shrubs; amorphic shapes between vegetation transitions	Flat, horizontal road; geometric signage
LINE	Undulating, sometimes broken ridgeline of canyon walls mostly obstructed by inferior viewpoint and vegetation	Amorphic, indistinct, soft, and transitional; differences driven by color and height	Horizontal, continuous road
COLOR	Muted gray exposed rock; light tan to grayish soils	Lime green grasses and shrubs; dark yellow green conifers; yellowish-green aspens; gray brown dead wood material	Dark gray asphalt; yellow signage
TEXTURE	Rugged, rocky, rigid; some smooth transition to lower elevations with less exposed rock	Bristly, fairly consistent, gradational pattern, based on vegetation height	Smooth, continuous road

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	Higher mounded road that tapers toward lot; ramp that ascends to existing road surface; cut slopes and fill would look similar to existing conditions	No perceived change.	Non-roadway structures mimic existing parking structure and infrastructure; flat, broad, consistent parking lot mostly obstructed
LINE	Defined transition from horizontal sloping line of fill; subtle transition to grade	Distinct lines between vegetation and soil; distinct lines at parking lot to vegetation; subtle and undulating lines to match cut slope	Subtle line between asphalt and fill; distinct line between lot and vegetation with abrupt transition
COLOR	Dark browns to light gray exposed soil on mounds and cut and fill slopes	No perceived change.	Dark gray to black asphalt; contrast at freshly painted road markings
TEXTURE	Uniform, continuous, smooth along mounds	Subtle transitions to low vegetation; softer, finer textures on entry and exit to lot	Smooth, consistent roadway and parking surface

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
ELEMENTS		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD	
					X				X				X		
					X			X					X		
					X			X					X		
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020			
												Date			

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

District: N/A
Resource Area: N/A
Activity (program): N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 16 - White Pine Trailhead (Gondola Alternative)		
3. VRM Class: N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	Broken, horizontal ridgeline to north and smoother ridgeline to southeast; concave valley with high walls; angular upright rock features; flatter valley bottom	Conical evergreens; feathered scraggly aspens, low grasses, medium indistinct shrubs; amorphic shapes between vegetation transitions		Flat horizontal road; geometric signage	
LINE	Undulating sometimes broken ridgeline of canyon walls mostly obstructed by inferior viewpoint and vegetation	Amorphic indistinct soft and transitional; differences driven by color and height		horizontal, continuous road	
COLOR	Muted gray exposed rock; light tan to grayish soils	Lime green grasses and shrubs; dark yellow green conifers; yellowish green aspens; gray brown dead wood material		Dark gray asphalt; yellow signage	
TEXTURE	Rugged, rocky, rigid; some smooth transition to lower elevations with less exposed rock	Bristly, fairly consistent, gradational pattern, based on vegetation height		Smooth continuous road	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	No perceived change.	No perceived change.		Tower to the west is obstructed; Tower to the east: Upright, vertical, geometric form with angular and vertical components; linear continuous cables; geometric square gondola cabins	
LINE	No perceived change.	No perceived change.		Bold, vertical, rigid; intersecting perpendicular lines; continuous cables	
COLOR	No perceived change.	No perceived change.		Galvanized steel; dark tones of gondola cabins	
TEXTURE	No perceived change.	No perceived change.		Rigid, broken, inconsistent towers; continuous fine cables; repetitive gondola cabins	

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
		X							X	X				
		X							X	X				
ELEMENTS	Form				X				X	X				
	Line				X				X	X				
	Color				X				X	X				
	Texture				X				X	X				
												3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD		
												Evaluator's Names: Laren Cyphers/ Chris Bockey 7/17/2020		
												Date		

SECTION D. (Continued)

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 17 – Existing Condition – White Pine Lake Trail

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 17 - White Pine Lake Trail (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Bold, trapezoidal, prominent cliff faces with spined slopes; distinct scree slopes; upright broken exposed rock faces	Vertical, conical evergreens; tall, skinny aspens; predominately indistinct grasses and moderate-height shrubs in foreground	No structures visible.
LINE	Horizontal, undulating horizon; directional drainages along slope faces	Directional lines along drainages; distinct, irregular lines of vegetation groupings	
COLOR	Light brown to grayish soils; gray to pale yellow exposed rock and scree fields	Dark green evergreens; light green to yellowish-green of aspens, shrubs, and grasses	
TEXTURE	Variety of exposed rocky outcrops and broken rock faces; irregular, rugged, ridged spines across mountain	Transitional areas of tall, feathery evergreens to low indistinct shrubs and grasses in the background; dense, consistent vegetation in the foreground	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Geometric pattern of (presumably) square pad; pyramidal, tall, slender tower
LINE	No perceived change.	No perceived change.	A finer, softer tower structure due to busy background; distant, fine cables against busy background
COLOR	No perceived change.	No perceived change.	Galvanized steel
TEXTURE	No perceived change.	No perceived change.	Softened, rigid gondola elements

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X	X				
					X				X			X		
ELEMENTS	Form				X				X				X	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line				X				X				X	
	Color				X				X					
	Texture				X				X				X	
Evaluator's Names												Date		
Laren Cyphers/ Chris Bockey 7/17/2020														

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements 2. Key Observation Point 17 - White Pine Lake Trail (Enhanced Bus Service in Peak-period Shoulder Lane Alternative; Snowsheds without berms) 3. VRM Class N/A	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
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SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Bold, trapezoidal, prominent cliff faces with spined slopes; distinct scree slopes; upright, broken, exposed rock faces	Vertical, conical evergreens; tall skinny aspens; predominately indistinct grasses and moderate-height shrubs in foreground	No structures visible.
LINE	Horizontal, undulating horizon; directional drainages along slope faces	Directional lines along drainages; distinct, irregular lines of vegetation groupings	
COLOR	Light brown to grayish soils; gray to pale yellow exposed rock and scree fields	Dark green evergreens; light green to yellowish-green of aspens, shrubs, and grasses	
TEXTURE	Variety of exposed rocky outcrops and broken rock faces; irregular, rugged, ridged spines across mountain	Transitional areas of tall, feathery evergreens to low, indistinct shrubs and grasses in the background; dense, consistent vegetation in the foreground	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Horizontal tapered transition into slope of snow shoot	Low indistinct grasses and shrubs	N/A – Obstructed by vegetation and topography
LINE	Subtle line created between snow shed and earth	Line between vegetation type and height; soft undulating lines	N/A – Obstructed by vegetation and topography
COLOR	Dark brown to light gray exposed soil	Yellow green vegetation; seasonal variety assumed based on revegetation	N/A – Obstructed by vegetation and topography
TEXTURE	Smooth, consistent and feathered to existing slope	Subtle change to low vegetation and decreased density	N/A – Obstructed by vegetation and topography

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
ELEMENTS		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020
				X				X					X	
				X				X					X	
				X				X					X	
				X				X					X	
												Date		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 18 – Existing Condition – Snowbird Entry 1



KOP 18 – Proposed Condition – Snowbird Entry 1 (Gondola Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 18 - Snowbird Entry 1 (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Broken, rugged cliff faces; concave valley with high walls; angular, upright rock features	Conical evergreens; feathered aspens, low grasses, medium indistinct shrubs; amorphic shapes between vegetation transitions	Angular, geometric structures; linear, cylindrical tube; flat, horizontal road; geometric signage; tall, vertical, insistent lift towers
LINE	Converging angular lines that create a focal point; undulating, broken ridgeline of canyon walls; angular striations; directional incised drainages	Amorphic, indistinct soft and transitional; differences driven by color	Horizontal, rigid, definite; continuous, horizontal conveyor tube; flowing road
COLOR	Beige to muted gray exposed rock; light tan to rust soils; gold banding	Lime green grasses and shrubs; dark yellow green conifers; gray brown dead wood material	Light gray concrete; black windows; reflective shiny tube, blues of tube and resort sign; muted gray lift towers
TEXTURE	Rugged, rocky, rigid; some smooth transition to lower elevations with less exposed rock	Bristly, fairly consistent, gradational pattern, based on vegetation height	Smooth with defined edges; continuous, smooth tube; continuous, repetitive towers; smooth, continuous road

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Upright, vertical, geometric form with angular and vertical components; linear, continuous cables; geometric, square gondola cabins
LINE	No perceived change.	No perceived change.	Bold, vertical, rigid; intersecting perpendicular lines; continuous cables
COLOR	No perceived change.	No perceived change.	Galvanized steel; dark tones of gondola cabins
TEXTURE	No perceived change.	No perceived change.	Rigid, broken, inconsistent towers; continuous fine cables; repetitive gondola cabins

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X	X				
					X				X	X				
ELEMENTS	Form				X				X	X				
	Line				X				X	X				
	Color				X				X	X				
	Texture				X				X		X			
												3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD		
Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020											Date			

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT VISUAL CONTRAST RATING WORKSHEET	District N/A
	Resource Area N/A
	Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 18 - Snowbird Entrance 1 (Enhanced Bus Service in Peak-period Shoulder Lane)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	Broken rugged cliff faces; concave valley with high walls; angular upright rock features	Conical evergreens; feathered aspens, low grasses, medium indistinct shrubs; amorphic shapes between vegetation transitions		Angular geometric structures; linear cylindrical tube; flat horizontal road; geometric signage; tall vertical insistent lift towers	
LINE	Converging angular lines that create a focal point; undulating broken ridgeline of canyon walls; angular striations; directional incised drainages	Amorphic indistinct soft and transitional; differences driven by color		horizontal, rigid, definite; continuous horizontal conveyor tube; flowing road	
COLOR	Beige to muted gray exposed rock; light tan to rust soils; gold banding	Lime green grasses and shrubs; dark yellow green conifers; gray brown dead wood material		Light gray concrete; black windows; reflective shiny tube, blues of tube and resort sign; muted gray lift towers	
TEXTURE	Rugged, rocky, rigid, ; some smooth transition to lower elevations with less exposed rock	Bristly, fairly consistent, gradational pattern, based on vegetation height		Smooth with defined edges; continuous smooth tube; continuous repetitive towers; smooth continuous road	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	Cut areas tapering to slope	Low, indistinct grasses and shrubs		N/A	
LINE	Pronounced lines between roadside area and cut slope	Line between vegetation type and height; soft, undulating lines		N/A	
COLOR	Exposed dark brown to gray soils with exposed muted gray rocks (1-3 ft cobbles)	Seasonal variety assumed based on revegetation; Removal of dark evergreen trees		N/A	
TEXTURE	Abrupt transition from flat to cut slope	Shorter stature oak brush; gradual tapering; loss of vertical elements		N/A	

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
ELEMENTS	Form	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD Evaluator's Names: Laren Cyphers/ Chris Bockey 7/17/2020 Date:	
	Line		X			X									
	Color			X		X									
	Texture		X			X									
	Form					X									

SECTION D. (Continued)

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 19 – Existing Condition – Catherine’s Pass

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 19 - Catherine's Pass (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Bold, trapezoidal, angular, prominent mountains; enclosed bowl setting	Vertical, conical evergreens; tall, skinny, light aspens; low, indistinct grasses and shrubs	Bold, geometric forms of base lodges and facilities; geometric residential structures; bold horizontal and vertical distinct lines; distinct curved, smooth asphalt road
LINE	Horizontal, undulating horizon; directional drainages along slope faces; sinuous, flowing roads	Directional lines along drainages; broken, undulating, amorphic lines between vegetation patterns and vegetation types	Horizontal and vertical bold lines that converge
COLOR	Light brown to tan soils; gray to pale yellowish-white exposed rocks; exposed rust soil from mining activity	Yellowish-green to deeper green evergreens and aspens; lime green grasses; brown to dark dead or wood vegetation	Beige to dark brown matte structures; light gray-toned paved roadway
TEXTURE	Variety of exposed rock outcrops intermixed with smooth to fine transitions	Feathered, bristly trees; transitional areas of smaller (smooth) vegetation to taller (coarse) vegetation	Angular, rigid, clustered, organized structures

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	No perceived change.
LINE	No perceived change.	No perceived change.	No perceived change.
COLOR	No perceived change.	No perceived change.	No perceived change.
TEXTURE	No perceived change.	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
ELEMENTS		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (Explain on reverse side)
					X				X				X	
					X				X				X	
					X				X				X	
Evaluator's Names												Date		
Laren Cyphers/ Chris Bockey												7/17/2020		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)
None recommended



KOP 20 – Existing Condition – La Caille Base Station

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date October 12, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 20 - La Caille Base Station (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rugged, broken canyon faces; rounded, irregular cliffs; distinct spines and angled linear drainages; sloped foothills transition to flat road which transitions to steeper slope down to flat residential area and road set below roadway	Fairly consistent mix of evergreen, domestic deciduous, oak brush, and some indistinct shrubs and low grasses	Flat, horizontal roadway; geometric, angular forms of residential structures that line roadway; mostly obscured by vegetation; indistinct energy transmission line
LINE	Irregular and inconsistent rock bands; undulating, broken ridgeline; undulating foothills descending to flat valley	Amorphic lines of groupings; vertical evergreens in the background; mostly rounded, dense brush, shrubs, and grasses in foreground	Curvilinear roadway; horizontal and vertical lines of energy infrastructure
COLOR	Light brown to gray exposed soils intermixed with gray aggregate	Dark deep to light yellow green to yellow of most vegetation; tan dry grasses; some oak brush transitioning to red	Gray asphalt; natural wood utility poles and guard rails; gray and brown homes
TEXTURE	Broken soft and rounded edged diff face in the background; smooth foothills transition to lower elevations	Consistent, carpeted, and dense forest and brush	Smooth, continuous roadway; fine cables; inconsistent residential structures

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Cut and fill would cause some distinct abrupt changes in gradation between sloped foothills to flat parking lot to steep slope down to residential structures	No perceived change.	Defined, angular, organized infrastructure with descending ramps to flat/grade road, parking lot, and base station; prominent 3- to 4-story geometric structure; upright, vertical, geometric form of base station with angular and vertical components; linear, continuous cables; geometric, square gondola cabins
LINE	Distinct horizontal line between flat roadway and cut slopes	No perceived change.	Bold, vertical, rigid; intersecting perpendicular lines; continuous cables; ascending and descending lines associated with ramp contours
COLOR	Dark brown to gray exposed soils	No perceived change.	Galvanized steel of gondola towers and infrastructure; dark gray to black asphalt; gray concrete faces of road components; light gray of concrete parking structure, brown to rust earth tones of lift house
TEXTURE	More abrupt changes in elevation and gradation	No perceived change.	Rigid, broken, inconsistent towers; continuous fine cables; repetitive gondola cars; smooth, continuous roadway; angular, organized base station infrastructure

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

ELEMENTS	1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
				X					X	X	X			
				X					X	X	X			
		X					X	X	X					
		X					X	X	X					
3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD													Evaluator's Names Laren Cyphers/ Chris Bockey 10/12/2020	
Date														

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 21 – Existing Condition – La Caille Residential Area

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date October 12, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 21 - La Calle Residential Area (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Sloping, angular side slopes; lower rounded foothills of residential properties that taper to roadway	Inconsistent domestic and deciduous trees; low grasses	Clustered residential development; built forms for landscaping; 69-kV transmission line in middle foreground; flat roadway for access to residences
LINE	Undulating foothills descending to flat valley	Amorphic lines created by tree groupings; distinct line between tall and short vegetation	Tall, vertical transmission line poles; horizontal, continuous thin electric lines; smooth continuous roadway surface
COLOR	Brown to dark brown exposed soils intermixed with gray aggregate	Yellowish green to green trees; tan, gray, and brown dry grasses	Buckskin transmission line poles; light gray attached infrastructure; darker wood transmission line in distance; light gray asphalt
TEXTURE	Soft foothill slopes; smooth, undulating flat area	Consistent, carpeted grasses in spots; inconsistent tree groupings	Irregular residential area; linear, smooth roadway; continuous distribution line

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Cut and fill would cause distinct, abrupt changes in gradation between sloped foothills to flat parking lot to steep slope down to residential structures; foothills in background would be mostly obstructed	Vegetation clearing will result in less consistent tree groupings	Defined, angular, organized infrastructure of parking garage and lot, and base station; prominent 3- to 4-story geometric structure; upright, vertical, geometric form of base station with angular and vertical components; flat, large parking lot somewhat obstructed by vegetation
LINE	Distinct horizontal line between flat overhead parking area cut and fill slopes, and flat residential area	Distinct line between new roads and infrastructure and vegetation that remains	Bold, vertical, rigid; intersecting, perpendicular lines
COLOR	Dark brown to gray exposed soils	No perceived change.	Dark gray to black asphalt of roadway changes; light gray of concrete parking structure, brown to rust earth tones of lift house
TEXTURE	Abrupt changes in elevation and gradation	Inconsistent, distinct tree groupings giving way to flat cleared areas	Angular, organized base station infrastructure; smooth, flat parking lot

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
			X					X		X				
			X					X		X				
ELEMENTS	Form		X					X		X				3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line		X					X		X				
	Color		X					X		X				
	Texture		X					X		X				
												Evaluator's Names Laren Cyphers/ Chris Bockey 10/12/2020	Date	

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 25 – Existing Condition – Tanner's Flat Campground



KOP 25 – Proposed Condition – Tanner's Flat Campground (Enhanced Bus Service Alternative and Enhanced Bus Service in Peak-period Shoulder Lane)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date March 30, 2021

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 25 - Tanner's Flat Campground (Enhanced Bus Service Alternative and Enhanced Bus Service in Peak-period Shoulder Lane)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	Flat canyon bottom; canyon walls mostly obstructed by vegetation and inferior viewpoint; rugged mountain ridgeline in distance	Vertical, dense, scraggly deciduous trees and shrubs in foreground; conical evergreens at higher elevations	Organized, angular, rigid campground infrastructure; flat, horizontal roadway and guardrail above
LINE	Sloping ridgeline tapering to canyon bottom	Distinct lines between deciduous trees and shrubs and developed campgrounds; vertical trees	Horizontal and vertical lines of existing infrastructure
COLOR	Dark brown exposed soils; gray to light gray exposed granite rocks in campground; covered in snow	Dormant deciduous trees; dark green evergreens in background; seasonal variation	Grays, blacks, and wood browns of infrastructure
TEXTURE	Rugged, tapered canyon walls transition to a generally flat, uniform canyon bottom	Dense, inconsistent, grouped vegetation with varied heights	Organized, unnatural, rigid infrastructure

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	Any change obstructed by inferior viewpoint and proposed retaining wall. No perceived change.	Any change obstructed by inferior viewpoint and proposed retaining wall. No perceived change.	Geometric, distinct retaining wall, partially obstructed by vegetation
LINE	No perceived change.	No perceived change.	Geometric, horizontal lines of structure
COLOR	No perceived change.	No perceived change.	Light colored concrete structure
TEXTURE	No perceived change.	No perceived change.	Smooth, continuous, angled structure

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X	X	X			
					X				X	X	X			
ELEMENTS	Form				X				X	X	X			
	Line				X				X	X	X			
	Color				X				X	X	X			
	Texture				X				X	X	X			
												3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD		
												Evaluator's Names Laren Cyphers/ Kevin Rauhe 4/14/2021		
												Date		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

APPENDIX 17A

Key Observation Points for the Enhanced Bus Service and Gondola Alternatives

KOPs in this appendix are listed in ascending order.



KOP 1 – Existing Condition – Gravel Pit Mobility Hub



KOP 1 – Proposed Condition – Gravel Pit Mobility Hub (All Alternatives)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 1 - Gravel Pit Mobility Hub (All Alternatives)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Trapezoidal, mounded, exposed aggregate backdrop with rugged, undulating broken ridges	Domestic vegetation plantings; short and low indistinct grasses; rounded low shrubs at foot of mound; rounded oak shrubs; conical evergreens on ridge	Industrial cylindrical upright structures; rectangular buildings
LINE	Several horizontal lines from tiered mound/mountain ridgelines; rugged broken ridgelines	Distinct lines between dense vegetation and low grasses or exposed soil/aggregate	Varied angles and orientations; complex
COLOR	Golden tan exposed rock to pinkish tones; exposed light tan to gray aggregate	Gray green sage; yellowish to dark green shrubs; lime to golden straw-colored grasses	Green and brown building; grays, blues, beige, yellow throughout complex; earth tones
TEXTURE	Distinct, smooth, uniform, and patterned soil; rugged, broken landforms in background	Clustered and organized; low stippled, broken sage groupings; consistent carpeted grasses; dense clusters of domestic vegetation with varied heights	Irregular, complex, rigid, disorganized

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Abrupt change in gradation between flat clearing and foothills	No perceived change.	Defined, angular organized infrastructure with descending ramps to flat/grade lot; prominent 3- to-4-story geometric structure
LINE	Unknown	No perceived change.	Distinct, abrupt lines between paved road and parking lot and the mine; horizontal lines created by overpass; ascending and descending lines associated with ramp contours
COLOR	Gray to brown exposed soil at toe of foothills	No perceived change.	Dark gray to black asphalt; dark tones of mobility hub, infrastructure and surface treatments
TEXTURE	Irregular to flat; inconsistent transitions to abrupt distinctive parking structure	No perceived change.	Smooth continuous roadway; angular, organized infrastructure

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
			X						X	X	X			
			X						X	X	X			
ELEMENTS	Form		X					X	X			3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD		
	Line		X					X	X					
	Color		X					X	X					
	Texture		X					X	X					
Evaluator's Names											Date			
Laren Cyphers/ Chris Bockey 7/24/2020														

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information



KOP 2 – Existing Condition – Fort Union Boulevard

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 2 - Fort Union Boulevard (All Alternatives: Five-lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Sloping, angular side slopes; lower rounded foothills of residential properties that taper to roadway; Open setting compared to enclosed setting of subsequent KOPs; broader views because adjacent slopes are lower in elevation	Mix of evergreen, domestic deciduous, and oak brush	Geometric, angular forms of residents that are mostly obscured by vegetation; geometric prominent developments and infrastructure line roadway, including rigid Jersey barriers;
LINE	Undulating ridgelines descending to flat valley	Amorphic lines of groupings; some vertical evergreens; mostly rounded, dense brush and shrubs	Varied single-pole wood and transmission lines; continuous linear pattern of associated electric telephone lines
COLOR	Brown to dark brown exposed soils intermixed with gray aggregate and light gray to dark gray exposed rock	Dark deep to light yellow green of most vegetation; soft gray green of Russian olives	Light beige to dark brown structures
TEXTURE	Smooth ridges transition to lower elevations	Carpeted, continuous vegetation on foothills; varied vegetation height in residential area	Inconsistent, organized structures; smooth, continuous, flat road surface; continuous fine energy cables with repetitive transmission poles

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Cut and fill would generally follow existing form; some distinct abrupt changes in gradation between residential structures and developments and widened roadway	No perceived change.	Multi-use path, roadway improvements, bike lanes, pedestrian bridge would all create distinct, vertical and horizontal geometric, rectangular structures to span the roadway
LINE	Distinct horizontal line between flat roadway and cut slopes	No perceived change.	Horizontal and vertical distinct lines
COLOR	Dark brown exposed soils and gray aggregate and rocks	No perceived change.	Light gray to dark tones of infrastructure and surface treatments
TEXTURE	More abrupt changes in elevation and gradation	No perceived change.	Angular, organized infrastructure; smooth, flat, continuous roadway

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
ELEMENTS	Form			X					X	X				
	Line			X					X	X				Date

	Color			X					X		X		
	Texture			X					X		X		

SECTION D. (Continued)

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information



KOP 3 – Existing Condition – Daneborg Drive



KOP 3 – Proposed Condition – Daneborg Drive (All Alternatives: Five-lane Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 3 - Daneborg Drive (All Alternatives: Five-lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Sloping, angular side slopes; lower rounded foothills of residential properties that taper to roadway	Mix of evergreen, domestic deciduous, and oak brush	Geometric, angular forms of residential structures that line the roadway; mostly obscured by vegetation
LINE	Undulating ridgelines descending to flat valley	Amorphic lines of groupings; some vertical evergreens; mostly rounded, dense brush and shrubs	Varied single-pole wood and transmission lines; continuous, linear pattern of associated electric telephone lines
COLOR	Brown to dark brown exposed soils intermixed with gray aggregate	Dark deep to light yellow green of most vegetation; soft gray green of Russian olives	Light beige to dark brown structures
TEXTURE	Smooth ridges transition to lower elevations	Carpeted, continuous vegetation on foothills; varied vegetation height in residential area	Inconsistent, angular residential structures; smooth, continuous flat road surface; continuous fine energy cables with repetitive transmission poles

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Cut and fill would generally follow existing form; some distinct abrupt changes in gradation between residential structures to the east and widened roadway	Revegetation of low, indistinct grasses and shrubs mostly or entirely obscured by retaining wall	Multi-use path, roadway improvements, bike lanes, pedestrian bridge would all create distinct, vertical and horizontal geometric, rectangular structures to span the roadway
LINE	Distinct horizontal line between flat roadway and cut slopes	Line between vegetation type and height; soft, undulating lines	Horizontal and vertical distinct lines
COLOR	Dark brown exposed soils and gray aggregate	Seasonal variety assumed based on revegetation	Light gray to dark tones of infrastructure and surface treatments
TEXTURE	More abrupt changes in elevation and gradation	Shorter stature oak brush; gradual tapering; loss of vertical elements	Angular, organized infrastructure; smooth, flat continuous roadway

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
				X				X		X				
				X				X			X			
ELEMENTS	Form			X				X		X				3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line			X				X			X			
	Color			X				X			X			
	Texture			X				X			X			
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020	Date	

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)
To be developed based on further design information



KOP 4 – Existing Condition – Quarry Trailhead

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 4 - Quarry Trailhead (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rugged, broken canyon faces; rounded, irregular cliffs; distinct spines and angled, linear drainages transition to chunky, broken, exposed granite walls; tiered parking lot set above roadway	Consistent, dense shrub and deciduous forest; some indistinct shrubs and low grasses	Flat, horizontal roadway; some geometric, upright signage; horizontal transmission cables overhead attached to upright, vertical utility poles
LINE	Irregular and inconsistent rock bands; undulating, broken ridgeline; directional breakage along cliff face	Amorphic lines created by tree groupings; distinct lines between dense vegetation and exposed cliff	Curvilinear roadway; horizontal and vertical lines of energy infrastructure
COLOR	Whitish-gray cliffs with dark gray to black vertical striations	Yellowish-green to dark green shrubs	Dark gray asphalt; natural wood utility poles; gray cables and energy infrastructure
TEXTURE	Broken, soft, and rounded edged cliff face which transitions to some medium boulders roadside	Consistent, carpeted, and dense forest	Smooth, continuous roadway; fine cables; inconsistent energy infrastructure

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Some subtle cut areas tapering to slope	No perceived change.	No perceived change.
LINE	Subtle transitions between paved and natural surfaces	No perceived change.	No perceived change.
COLOR	Dark brown to gray exposed soil; light gray exposed boulders and gravel	No perceived change.	No perceived change.
TEXTURE	Gradational transition to slope	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
				X					X				X	
				X					X				X	
ELEMENTS	Form			X				X				X	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD	
	Line			X				X				X		
	Color			X				X				X		
	Texture			X				X				X		
Evaluator's Names												Date		
Laren Cyphers/ Chris Bockey												7/17/2020		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information



KOP 4 – Proposed Condition – Quarry Trailhead (Gondola Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 4 - Quarry Trailhead (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	Rugged, broken canyon faces; rounded irregular cliffs; Distinct spines and angled linear drainages transition to chunky broken exposed granite walls; tiered parking lot set above roadway	Consistent, dense shrub and deciduous forest; some indistinct shrubs and low grasses		Flat horizontal roadway; Some geometric upright signage; horizontal transmission cables overhead attached to upright vertical utility poles	
LINE	Irregular and inconsistent rock bands; undulating broken ridgeline; directional breakage along cliff face	Amorphic lines created by tree groupings; distinct lines between dense vegetation and exposed cliff		Curvilinear roadway; horizontal and vertical lines of energy infrastructure	
COLOR	Whitish gray cliffs with dark gray to black vertical striations	Yellowish greens to dark green shrubs		Dark gray asphalt; natural wood utility poles; gray cables and energy infrastructure	
TEXTURE	Broken soft and rounded edged cliff face which transitions to some medium boulders roadside	Consistent, carpeted, and dense forest		Smooth continuous roadway; fine cables; inconsistent energy infrastructure	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	No perceived change.	No perceived change.		Upright, vertical, geometric form with angular and vertical components; linear continuous cables; geometric square gondola car; Lack of backdrop makes towers and cables more distinct in the skyline	
LINE	No perceived change.	No perceived change.		Bold, vertical, rigid; intersecting perpendicular lines; continuous cables	
COLOR	No perceived change.	No perceived change.		Galvanized steel	
TEXTURE	No perceived change.	No perceived change.		Rigid, broken, inconsistent towers; continuous fine cables; repetitive gondola cars	

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
					X				X	X					
					X				X	X					
ELEMENTS	Form				X			X	X						
	Line				X			X	X						
	Color				X			X	X						
	Texture				X			X	X						
												3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD			
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020			
												Date			

Comments from item 2.

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 5 – Existing Condition – Wasatch Resort

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 5 - Wasatch Resort (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rugged, broken, rounded edged diff faces	Consistent, dense shrub and deciduous forest; low grasses in foreground	Clustered residential development; built forms for landscaping; low-voltage 69-kV transmission line in immediate and middle foreground; flat roadway for devilmint
LINE	Irregular and inconsistent rock bands; directional breakage in diff side; broken ridgeline on V-shaped horizon; intersecting cliffs create focal point	Amorphic lines created by tree groupings; distinct line between vegetation and rock	Tall vertical poles; horizontal, continuous thin electric lines
COLOR	Whitish-gray diffs with subtle tan to yellow streaks	Yellowish-green to mostly dark forest and shrub	Buckskin poles; light gray attached infrastructure; darker wood transmission line in distance
TEXTURE	Soft diff face with inconsistent breakage	Consistent, carpeted, dense forest	Irregular residential area; linear smooth, continuous distribution line

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Horizontal, contrasting, thin, linear, continuous, and consistent cables
LINE	No perceived change.	No perceived change.	Linear, continuous cables
COLOR	No perceived change.	No perceived change.	Grayish-silver cables; dark tones of gondola cabins
TEXTURE	No perceived change.	No perceived change.	Continuous fine cables; repetitive gondola cabins

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
				X				X				X	
			X				X				X	Date	
ELEMENTS	Form			X			X				X		
	Line			X			X				X		
	Color			X			X				X		

	Texture				X				X			X	
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SECTION D. (Continued)

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 6 – Existing Condition – Gate Buttruss Trailhead

Note: Proposed Condition simulation not included for this KOP.

	Texture			X				X			X	
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SECTION D. (Continued)

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 6 - Gate Buttress Trailhead (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rugged, broken canyon faces; rounded irregular cliffs	Consistent, dense shrub and deciduous forest; some indistinct shrubs and low grasses	Only significant structure is the roadway
LINE	Irregular and inconsistent rock bands; undulating broken ridgeline; directional breakage along cliff face	Amorphic lines created by tree groupings	
COLOR	Whitish gray cliffs with dark gray to black vertical striations	Yellowish greens to dark green shrubs	
TEXTURE	Broken soft and rounded edged cliff face which transitions to some medium boulders roadside	Consistent, carpeted, and dense forest	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Upright, vertical geometric towers with angular and vertical components; linear continuous cables; geometric gondola cabin
LINE	No perceived change.	No perceived change.	Bold vertical rigid tower; intersecting perpendicular lines; continuous cables
COLOR	No perceived change.	No perceived change.	Galvanized steel of towers; dark tones of gondola cabins
TEXTURE	No perceived change.	No perceived change.	Rigid broken inconsistent tower; continuous fine cables; repetitive gondola cabins

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X	X				
					X				X	X				
ELEMENTS	Form				X				X	X				
	Line				X				X	X				
	Color				X				X	X				
	Texture				X				X	X				
												3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD		
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020		
												Date		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 7 – Existing Condition – Bridge Trailhead



KOP 7 – Proposed Condition – Bridge Trailhead (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 7 - Bridge Trailhead (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed, rugged, broken canyon faces; scree slopes	Distinct conical evergreens; shrubby, dense deciduous trees; moderate height shrubs and low grasses	Flat, smooth road
LINE	Broken, converging, irregular, inconsistent lines along canyon faces and ridges	Distinct transition between cut slope and hill; lines created by variation in vegetation	Sinuuous, curvilinear road
COLOR	Light tan to light gray soil; soft gray with reddish-toned cliff side	Vibrant yellowish-green to lime green to dark, muted green; isolated gray to dark brown of wood material	Muted dark gray of roadway surface
TEXTURE	Jagged, rigged, inconsistent, coarse cliffs; broken, cobbled sandy roadside	Consistent, dense vegetation; more stippled on rocky slopes; gradational pattern based on vegetation height	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed perspective; maximum cut areas approximately 70 feet wide, tapering to slope	Low, indistinct grasses and shrubs	Rectangular and geometric retaining wall; geometric, short restrooms
LINE	Pronounced lines between roadside area and cut slope	Line between vegetation type and height; soft, undulating lines	Defined hard line from wall; geometric restrooms
COLOR	Dark brown exposed soil; light gray gravel to cobble exposed rock	Seasonal variety assumed based on revegetation; Removal of dark evergreen trees	Assume tan bathroom; muted gray to dark tones of concrete for retaining wall
TEXTURE	Abrupt transition from flat to cut slope	Shorter stature oak brush; gradual tapering; loss of vertical elements	Abrupt, defined edged wall; ordered restroom

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
ELEMENTS	Form		X			X							X		3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line		X			X							X		
	Color			X		X							X		
	Texture		X			X							X		
												Evaluator's Names	Date		
												Laren Cyphers/ Chris Bockey	7/17/2020		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT VISUAL CONTRAST RATING WORKSHEET	District N/A <hr/> Resource Area N/A <hr/> Activity (program) N/A
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SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements 2. Key Observation Point: 7 - Bridge Trailhead (Gondola Alternative) 3. VRM Class	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
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SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	Enclosed, rugged, broken canyon faces; Scree slopes	Distinct conical evergreens; shrubby dense deciduous trees; moderate height shrubs and low grasses		Flat, smooth road	
LINE	Broken converging irregular inconsistent lines along canyon faces and ridges	Distinct transition between cut slope and hill; lines created by variation in vegetation		Sinuous; curvilinear road	
COLOR	Light tan to light gray soil; soft gray with reddish toned cliff side	Vibrant yellowish green to lime green to dark muted green; isolated gray to dark brown of wood material		Muted dark gray of roadway surface	
TEXTURE	Jagged, rigged, inconsistent, coarse cliffs; broken, cobbled sandy roadside	Consistent, dense vegetations; more stippled on rocky slopes; gradational pattern based on vegetation height		Smooth and consistent roadway	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	No perceived change.	No perceived change.		Upright, vertical geometric towers with angular and vertical components; linear continuous cables; geometric gondola cabins	
LINE	No perceived change.	No perceived change.		Bold vertical rigid tower; intersecting perpendicular lines; continuous cables	
COLOR	No perceived change.	No perceived change.		Galvanized steel; dark tones of gondola cabins	
TEXTURE	No perceived change.	No perceived change.		Rigid broken inconsistent tower; continuous fine cables; repetitive gondola cabins	

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

ELEMENTS	1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD Evaluator's Names _____ Date _____ Laren Cyphers/ Chris Bockey 7/17/2020
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
	Form				X				X		X			
	Line				X				X		X			
Color				X				X		X				
Texture				X				X		X				

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 8 – Existing Condition – Lisa Falls Trailhead

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 8 - Lisa Falls Trailhead (Enhanced Bus Service Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed, rugged, broken canyon faces; scree slopes	Distinct, conical evergreens; shrubby, dense deciduous trees; moderate-height shrubs and low grasses	Flat, smooth road
LINE	Broken, converging, irregular, inconsistent lines along canyon faces and ridges	Distinct transition between cut slope and hill; lines created by variation in vegetation	Sinuous, curvilinear road
COLOR	Light tan to light gray soil; soft gray with reddish-toned cliff side	Vibrant yellowish-green to lime green to dark, muted green; isolated gray to dark brown of wood material	Muted dark gray of roadway surface
TEXTURE	Jagged, rigged, inconsistent, coarse cliffs; broken, cobbled sandy roadside	Consistent, dense vegetation; more stippled on rocky slopes; gradational pattern based on vegetation height	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Soft, subtle transition at parking lot; low, concave depression from drainages	No perceived change.	Geometric, short in structure restrooms; similar to other government vault toilets
LINE	Undulating and continuous line between cut slope and vegetation	No perceived change.	Geometric
COLOR	Light tan to darker brown exposed soils; gray exposed cobble and boulders	No perceived change.	Tan restrooms with dark roof consistent with USFS design
TEXTURE	Tapered smooth transition to parking lot	No perceived change.	Smooth, ordered, subtle

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
ELEMENTS	Form	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line			X					X				X	
	Color			X					X				X	
	Texture			X					X				X	
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020	Date	

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 9 – Existing Condition – Tanners Flat Group Site C



KOP 9 – Proposed Condition – Tanners Flat Group Site C (Gondola Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 9 - Tanners Flat Group Site C (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	Flat canyon bottom; canyon walls mostly obstructed by vegetation and inferior viewpoint; rugged mountain ridgeline seen to the northeast	Vertical, dense, scraggly deciduous trees and shrubs in foreground; conical evergreens at higher elevations	Organized, angular, rigid campground infrastructure; flat, horizontal roadway and parking lot
LINE	Sloping ridgeline tapering to canyon bottom	Distinct lines between deciduous trees and shrubs and developed campgrounds; vertical trees	Horizontal and vertical lines of infrastructure; curvilinear parking lot
COLOR	Dark brown exposed soils; gray to light gray exposed granite rocks in campground	Yellowish-green deciduous trees; dark green evergreens in background	Grays, blacks, and browns of infrastructure; dark gray asphalt
TEXTURE	Rugged, tapered canyon walls transition to a generally flat, uniform canyon bottom	Dense, inconsistent, grouped vegetation with varied heights	Organized, unnatural, rigid infrastructure; smooth roadway and parking lot

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Towers obstructed by vegetation; linear continuous cables run overhead southwest to northeast; geometric gondola cabins
LINE	No perceived change.	No perceived change.	Horizontal continuous cables
COLOR	No perceived change.	No perceived change.	Galvanized steel; dark tones of gondola cabins
TEXTURE	No perceived change.	No perceived change.	Continuous fine cables; repetitive gondola cabins

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X			X		
					X				X			X		
ELEMENTS	Form				X				X			X		3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line				X				X			X		
	Color				X				X			X		
	Texture				X				X			X		
Evaluator's Names												Date		
Laren Cyphers/ Chris Bockey 7/17/2020														

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 10 – Existing Condition – First Snow Shed

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
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VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 10 - First Snow Shed (All Alternatives)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Sloping, rolling with intermixed drainages	Vertical, upright deciduous trees; low, indistinct shrubs and ground cover	None visible
LINE	Broken and intersecting; complex	Directional lines along drainages; broken, undulating, amorphic lines between vegetation patterns and vegetation types	None visible
COLOR	Light brown to dark brown soils; gray to pale yellowish-white exposed rocks	Yellowish-green to deeper green evergreens and aspens; lime green grasses; brown to dark dead or wood vegetation	None visible
TEXTURE	Undulating with a variety of transition within drainages	Feathered, bristly trees; transitional areas of coarse smaller vegetation to taller vegetation	None visible

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	No perceived change.
LINE	No perceived change.	No perceived change.	No perceived change.
COLOR	No perceived change.	No perceived change.	No perceived change.
TEXTURE	No perceived change.	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

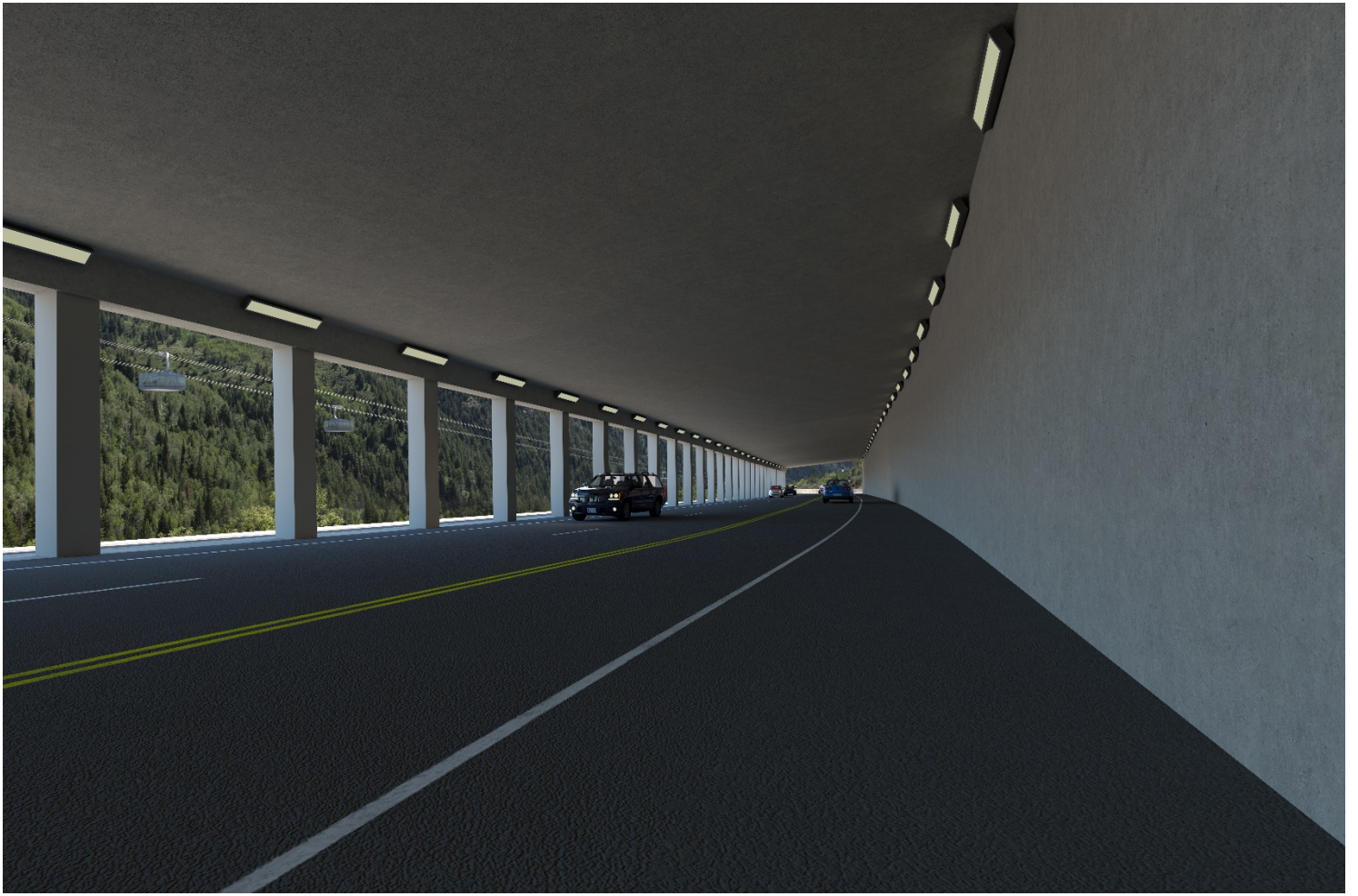
1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
ELEMENTS	Form				X				X				X	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (Explain on reverse side)
	Line				X				X				X	
	Color				X				X				X	
	Texture				X				X				X	
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020
														Date

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)
None recommended



KOP 11 – Existing Condition – Southwest Toward Tanners Flat (S.R. 210)



KOP 11 – Proposed Condition – Southwest Toward Tanners Flat (S.R. 210) (Gondola Alternative)

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 12 – Existing Condition – Second Snow Shed (S.R. 210)



KOP 12 – Proposed Condition – Second Snow Shed (S.R. 210) (Enhanced Bus Service Alternative)

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VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 12 - Second Snow Shed (S.R. 210) (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed, rugged canyon faces and ridgelines; scree slopes	Distinct, conical evergreens; shrubby, dense deciduous trees; moderate height shrubs and low grasses	Flat, smooth road
LINE	Broken, irregular, inconsistent lines along canyon ridges	Distinct transition between bare roadway and tall conifers; lines created by variation in vegetation	Sinuuous, curvilinear road
COLOR	Light tan to light gray soil; soft gray granite diff side and loose rock near roadside	Vibrant yellowish-green to lime green to dark, muted green; isolated gray to dark brown of wood material	Muted dark gray of roadway surface
TEXTURE	Ridged, inconsistent, coarse diffs; broken, cobbled sandy roadside	Consistent, dense vegetation; gradational pattern based on vegetation height	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Horizontal, tapered transition into slope of snow chute	Low, indistinct grasses and shrubs	Geometric rectangle, rigid, defined, bold/dark opening
LINE	Subtle line created between snow shed and earth	Line between vegetation type and height; soft, undulating lines	Angular, sloping, continuous line of length of snow shed wall, perpendicular intersection lines of snow shed opening
COLOR	Dark brown to light gray exposed soil	Seasonal variety assumed based on revegetation; Removal of dark evergreen trees	Light gray muted concrete
TEXTURE	Smooth, consistent, and feathered to existing slope	Shorter stature oak brush; gradual tapering; loss of vertical elements	Soft face; rigid and abrupt edges of snow shed opening

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
			X				X				X			
				X				X				X		
ELEMENTS	Form		X				X				X			3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line		X				X				X			
	Color		X				X				X			
	Texture		X				X				X			
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020	Date	

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 13 – Existing Condition – Third Snow Shed (S.R. 210)



KOP 13 – Proposed Condition – Third Snow Shed (S.R. 210) (Enhanced Bus Service Alternative)

UNITED STATES
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Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 13 - Third Snow Shed (S.R. 210) (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed, rugged canyon faces and ridgelines; scree slopes;	Distinct, conical evergreens; shrubby, dense deciduous trees; moderate height shrubs and low grasses	Flat, smooth road
LINE	Broken, irregular, inconsistent lines along canyon ridges	Distinct transition between bare roadway and vertical scraggly aspens and evergreens; lines created by variation in vegetation	Sinuuous, curvilinear road
COLOR	Light tan to light gray soil; soft gray granite diff side and loose rock near roadside	Vibrant yellowish-green to lime green to dark, muted green; isolated gray to dark brown of wood material	Muted dark gray of roadway surface
TEXTURE	Ridged, inconsistent, coarse cliffs; broken, cobbled sandy roadside	Consistent, dense vegetation; gradational pattern based on vegetation height	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Horizontal tapered transition into slope of snow chute	Low, indistinct grasses and shrubs	Geometric rectangle, rigid, defined, bold/dark opening
LINE	Subtle line created between snow shed and earth	Line between vegetation type and height; soft, undulating lines	Angular, sloping, continuous line length of snow shed wall, perpendicular intersection lines of snow shed opening
COLOR	Dark brown to light gray exposed soil	Yellow green vegetation; seasonal variety assumed based on revegetation	Light gray muted concrete
TEXTURE	Smooth, consistent and feathered to existing slope	Subtle change to low vegetation and decreased density	Soft face; rigid and abrupt edges of snow shed opening

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

ELEMENTS	1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
			X				X				X			
			X				X				X			
		X				X				X				
		Evaluator's Names												Date
		Laren Cyphers/ Chris Bockey 7/17/2020												

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 13 - Third Snow shed (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed, rugged canyon faces and ridgelines; Scree slopes;	Distinct conical evergreens; shrubby dense deciduous trees; moderate height shrubs and low grasses	Flat, smooth road
LINE	Broken irregular inconsistent lines along canyon ridges	Distinct transition between bare roadway and vertical scraggly aspens and evergreens; lines created by variation in vegetation	Sinuuous; curvilinear road
COLOR	Light tan to light gray soil; soft gray granite diff side and loose rock near roadside	Vibrant yellowish green to lime green to dark muted green; isolated gray to dark brown of wood material	Muted dark gray of roadway surface
TEXTURE	Ridged, inconsistent, coarse diffs; broken, cobbled sandy roadside	Consistent, dense vegetation; gradational pattern based on vegetation height	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Towers entirely obstructed by vegetation; curvilinear continuous cables run overhead visible from canopy to canopy; geometric gondola cabins
LINE	No perceived change.	No perceived change.	Curved continuous cables
COLOR	No perceived change.	No perceived change.	Galvanized Steel; dark tones of gondola cabins
TEXTURE	No perceived change.	No perceived change.	Continuous fine cables; repetitive gondola cabins

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD	
ELEMENTS	Form				X				X				X		Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020
	Line				X				X				X		
	Color				X				X				X		
	Texture				X				X				X		

SECTION D. (Continued)

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 15 – Existing Condition – Red Pine Trail Mid



KOP 15 – Proposed Condition – Red Pine Trail Mid (Gondola Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 15 - Red Pine Trail Mid (Enhanced Bus Service in Peak-period Shoulder Lane Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Bold, trapezoidal, prominent canyon walls that create an enclosed, bowl setting; ridges/spines descending canyon walls	Vertical, conical evergreens transition to low grasses and shrubs	Flat, smooth road
LINE	Horizontal, undulating horizon; directional drainages and snow shoots ; U-shape created by canyon walls on either edge of the viewshed	Amorphic lines between vegetation type; distinct lines between dense vegetation and exposed rock	Sinuous, curvilinear road
COLOR	Light brown to tan soils; gray to grayish-white exposed rocks	Dark green evergreens; light green to lime green shrubs and grasses	Muted dark gray of roadway surface
TEXTURE	Variety of exposed rock outcrops intermixed with inconsistent ridges across canyon walls	Feathered, bristly, transitional areas of smaller vegetation to taller vegetation	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Cut slopes would be similar to existing condition.	No perceived change.	No perceived change.
LINE	Cut slopes would be similar to existing condition.	No perceived change.	No perceived change.
COLOR	Cut slopes would be similar to existing condition.	No perceived change.	No perceived change.
TEXTURE	Cut slopes would be similar to existing condition.	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
ELEMENTS	Form	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
				X					X				X	
	Line			X					X				X	Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020

	Color			X					X				X
	Texture			x					X				x

SECTION D. (Continued)

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 15 - Red Pine Mid-Trail (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	Bold, trapezoidal, prominent canyon walls that create an enclosed, bowl setting; ridges/spines descending canyon walls	Vertical conical evergreens transition to low grasses and shrubs	Flatt, smooth road
LINE	Horizontal, undulating horizon; directional drainages and snow shoots; "U" shape created by canyon walls on either edge of the viewshed	Amorphic lines between vegetation type; distinct lines between dense vegetation and exposed rock	Sinuous curvilinear road
COLOR	Light brown to tan soils; gray to grayish white exposed rocks;	Dark green evergreens; light green to lime green shrubs and grasses	Muted dark gray of roadway surface
TEXTURE	Variety of exposed rock outcrops intermixed with inconsistent ridges across canyon walls	Feathered, bristly, transitional areas of smaller vegetation to taller vegetation	Smooth and consistent roadway

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	Consistent geometric/square pattern of tower footing; rectangular clearing on approach and exit of the turn station	Repetitive distinctive continuous and soft angles of lattice structure; geometric, domed or blocky, bod distinct turn station
LINE	No perceived change.	Distinctive lines from vegetation clearings	Vertical triangular, distinctive towers give way to finer lines as the eye moves down canyon; continuous, fine, directional cables; distinct, horizontal and vertical lines of the abrupt, rigid, turn station
COLOR	No perceived change.	No change.	Galvanized steel; dark tones of gondola cabins
TEXTURE	No perceived change.	Distinct geometric patterns; consistent rhythmic, unnatural openings	Repetitive, continuous towers and cables; irregular, rigid turn station; consistent pattern of gondola cabins

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
ELEMENTS	Form	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line				X		X			X				
	Color				X				X	X				
	Texture				X		X			X				
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020		
												Date		

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 16 – Existing Condition – White Pine Trailhead



KOP 16 – Proposed Condition – White Pine Trailhead (Gondola Alternative)

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

District: N/A
Resource Area: N/A
Activity (program): N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 16 - White Pine Trailhead (Gondola Alternative)		
3. VRM Class: N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Broken, horizontal ridgeline to north and smoother ridgeline to southeast; concave valley with high walls; angular upright rock features; flatter valley bottom	Conical evergreens; feathered scraggly aspens, low grasses, medium indistinct shrubs; amorphic shapes between vegetation transitions	Flat horizontal road; geometric signage
LINE	Undulating sometimes broken ridgeline of canyon walls mostly obstructed by inferior viewpoint and vegetation	Amorphic indistinct soft and transitional; differences driven by color and height	horizontal, continuous road
COLOR	Muted gray exposed rock; light tan to grayish soils	Lime green grasses and shrubs; dark yellow green conifers; yellowish green aspens; gray brown dead wood material	Dark gray asphalt; yellow signage
TEXTURE	Rugged, rocky, rigid; some smooth transition to lower elevations with less exposed rock	Bristly, fairly consistent, gradational pattern, based on vegetation height	Smooth continuous road

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Tower to the west is obstructed; Tower to the east: Upright, vertical, geometric form with angular and vertical components; linear continuous cables; geometric square gondola cabins
LINE	No perceived change.	No perceived change.	Bold, vertical, rigid; intersecting perpendicular lines; continuous cables
COLOR	No perceived change.	No perceived change.	Galvanized steel; dark tones of gondola cabins
TEXTURE	No perceived change.	No perceived change.	Rigid, broken, inconsistent towers; continuous fine cables; repetitive gondola cabins

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X	X				
					X				X	X				
ELEMENTS	Form				X				X	X				
	Line				X				X	X				
	Color				X				X	X				
	Texture				X				X	X				
												3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD		
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020		
												Date		

SECTION D. (Continued)

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 17 – Existing Condition – White Pine Lake Trail

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 17 - White Pine Lake Trail (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Bold, trapezoidal, prominent cliff faces with spined slopes; distinct scree slopes; upright broken exposed rock faces	Vertical, conical evergreens; tall, skinny aspens; predominately indistinct grasses and moderate-height shrubs in foreground	No structures visible.
LINE	Horizontal, undulating horizon; directional drainages along slope faces	Directional lines along drainages; distinct, irregular lines of vegetation groupings	
COLOR	Light brown to grayish soils; gray to pale yellow exposed rock and scree fields	Dark green evergreens; light green to yellowish-green of aspens, shrubs, and grasses	
TEXTURE	Variety of exposed rocky outcrops and broken rock faces; irregular, rugged, ridged spines across mountain	Transitional areas of tall, feathery evergreens to low indistinct shrubs and grasses in the background; dense, consistent vegetation in the foreground	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Geometric pattern of (presumably) square pad; pyramidal, tall, slender tower
LINE	No perceived change.	No perceived change.	A finer, softer tower structure due to busy background; distant, fine cables against busy background
COLOR	No perceived change.	No perceived change.	Galvanized steel
TEXTURE	No perceived change.	No perceived change.	Softened, rigid gondola elements

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X	X				
					X				X			X		
ELEMENTS	Form				X				X				X	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line				X				X				X	
	Color				X				X					
	Texture				X				X				X	
Evaluator's Names												Date		
Laren Cyphers/ Chris Bockey 7/17/2020														

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements 2. Key Observation Point 17 - White Pine Lake Trail (Enhanced Bus Service in Peak-period Shoulder Lane Alternative; Snowsheds without berms) 3. VRM Class N/A	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
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SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Bold, trapezoidal, prominent cliff faces with spined slopes; distinct scree slopes; upright, broken, exposed rock faces	Vertical, conical evergreens; tall skinny aspens; predominately indistinct grasses and moderate-height shrubs in foreground	No structures visible.
LINE	Horizontal, undulating horizon; directional drainages along slope faces	Directional lines along drainages; distinct, irregular lines of vegetation groupings	
COLOR	Light brown to grayish soils; gray to pale yellow exposed rock and scree fields	Dark green evergreens; light green to yellowish-green of aspens, shrubs, and grasses	
TEXTURE	Variety of exposed rocky outcrops and broken rock faces; irregular, rugged, ridged spines across mountain	Transitional areas of tall, feathery evergreens to low, indistinct shrubs and grasses in the background; dense, consistent vegetation in the foreground	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Horizontal tapered transition into slope of snow shoot	Low indistinct grasses and shrubs	N/A – Obstructed by vegetation and topography
LINE	Subtle line created between snow shed and earth	Line between vegetation type and height; soft undulating lines	N/A – Obstructed by vegetation and topography
COLOR	Dark brown to light gray exposed soil	Yellow green vegetation; seasonal variety assumed based on revegetation	N/A – Obstructed by vegetation and topography
TEXTURE	Smooth, consistent and feathered to existing slope	Subtle change to low vegetation and decreased density	N/A – Obstructed by vegetation and topography

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
ELEMENTS	Form	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020	
	Line			X				X					X		
	Color			X				X							X
	Texture			X				X							X
													Date		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 18 – Existing Condition – Snowbird Entry 1



KOP 18 – Proposed Condition – Snowbird Entry 1 (Gondola Alternative)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 18 - Snowbird Entry 1 (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Broken, rugged cliff faces; concave valley with high walls; angular, upright rock features	Conical evergreens; feathered aspens, low grasses, medium indistinct shrubs; amorphic shapes between vegetation transitions	Angular, geometric structures; linear, cylindrical tube; flat, horizontal road; geometric signage; tall, vertical, insistent lift towers
LINE	Converging angular lines that create a focal point; undulating, broken ridgeline of canyon walls; angular striations; directional incised drainages	Amorphic, indistinct soft and transitional; differences driven by color	Horizontal, rigid, definite; continuous, horizontal conveyor tube; flowing road
COLOR	Beige to muted gray exposed rock; light tan to rust soils; gold banding	Lime green grasses and shrubs; dark yellow green conifers; gray brown dead wood material	Light gray concrete; black windows; reflective shiny tube, blues of tube and resort sign; muted gray lift towers
TEXTURE	Rugged, rocky, rigid; some smooth transition to lower elevations with less exposed rock	Bristly, fairly consistent, gradational pattern, based on vegetation height	Smooth with defined edges; continuous, smooth tube; continuous, repetitive towers; smooth, continuous road

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Upright, vertical, geometric form with angular and vertical components; linear, continuous cables; geometric, square gondola cabins
LINE	No perceived change.	No perceived change.	Bold, vertical, rigid; intersecting perpendicular lines; continuous cables
COLOR	No perceived change.	No perceived change.	Galvanized steel; dark tones of gondola cabins
TEXTURE	No perceived change.	No perceived change.	Rigid, broken, inconsistent towers; continuous fine cables; repetitive gondola cabins

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X	X				
					X				X	X				
ELEMENTS	Form				X				X	X				
	Line				X				X	X				
	Color				X				X	X				
	Texture				X				X		X			
												3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD		
												Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020		
												Date		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT VISUAL CONTRAST RATING WORKSHEET	District N/A Resource Area N/A Activity (program) N/A
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SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements 2. Key Observation Point: 18 -Snowbird Entrance 1 (Enhanced Bus Service in Peak-period Shoulder Lane) 3. VRM Class N/A	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
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SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	Broken rugged diff faces; concave valley with high walls; angular upright rock features	Conical evergreens; feathered aspens, low grasses, medium indistinct shrubs; amorphic shapes between vegetation transitions		Angular geometric structures; linear cylindrical tube; flat horizontal road; geometric signage; tall vertical insistent lift towers	
LINE	Converging angular lines that create a focal point; undulating broken ridgeline of canyon walls; angular striations; directional incised drainages	Amorphic indistinct soft and transitional; differences driven by color		horizontal, rigid, definite; continuous horizontal conveyor tube; flowing road	
COLOR	Beige to muted gray exposed rock; light tan to rust soils; gold banding	Lime green grasses and shrubs; dark yellow green conifers; gray brown dead wood material		Light gray concrete; black windows; reflective shiny tube , blues of tube and resort sign; muted gray lift towers	
TEX-TURE	Rugged, rocky, rigid, ; some smooth transition to lower elevations with less exposed rock	Bristly, fairly consistent, gradational pattern, based on vegetation height		Smooth with defined edges; continuous smooth tube; continuous repetitive towers; smooth continuous road	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION		3. STRUCTURES	
FORM	Cut areas tapering to slope	Low, indistinct grasses and shrubs		N/A	
LINE	Pronounced lines between roadside area and cut slope	Line between vegetation type and height; soft, undulating lines		N/A	
COLOR	Exposed dark brown to gray soils with exposed muted gray rocks (1-3 ft cobbles)	Seasonal variety assumed based on revegetation; Removal of dark evergreen trees		N/A	
TEX-TURE	Abrupt transition from flat to cut slope	Shorter stature oak brush; gradual tapering; loss of vertical elements		N/A	

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A 3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD		
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)						
ELEMENTS	Form	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	X	Evaluator's Names Laren Cyphers/ Chris Bockey 7/17/2020	Date
	Line		X			X								X		
	Color			X		X								X		
	Texture		X			X								X		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 19 – Existing Condition – Catherine's Pass

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date June 17, 2020

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 19 - Catherine's Pass (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Bold, trapezoidal, angular, prominent mountains; enclosed bowl setting	Vertical, conical evergreens; tall, skinny, light aspens; low, indistinct grasses and shrubs	Bold, geometric forms of base lodges and facilities; geometric residential structures; bold horizontal and vertical distinct lines; distinct curved, smooth asphalt road
LINE	Horizontal, undulating horizon; directional drainages along slope faces; sinuous, flowing roads	Directional lines along drainages; broken, undulating, amorphic lines between vegetation patterns and vegetation types	Horizontal and vertical bold lines that converge
COLOR	Light brown to tan soils; gray to pale yellowish-white exposed rocks; exposed rust soil from mining activity	Yellowish-green to deeper green evergreens and aspens; lime green grasses; brown to dark dead or wood vegetation	Beige to dark brown matte structures; light gray-toned paved roadway
TEXTURE	Variety of exposed rock outcrops intermixed with smooth to fine transitions	Feathered, bristly trees; transitional areas of smaller (smooth) vegetation to taller (coarse) vegetation	Angular, rigid, clustered, organized structures

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	No perceived change.
LINE	No perceived change.	No perceived change.	No perceived change.
COLOR	No perceived change.	No perceived change.	No perceived change.
TEXTURE	No perceived change.	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
ELEMENTS		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (Explain on reverse side) Evaluator's Names: Laren Cyphers/ Chris Bockey Date: 7/17/2020
					X				X				X	
					X				X				X	
					X				X				X	

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)
None recommended



KOP 20 – Existing Condition – La Caille Base Station

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date October 12, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 20 - La Caille Base Station (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rugged, broken canyon faces; rounded, irregular cliffs; distinct spines and angled linear drainages; sloped foothills transition to flat road which transitions to steeper slope down to flat residential area and road set below roadway	Fairly consistent mix of evergreen, domestic deciduous, oak brush, and some indistinct shrubs and low grasses	Flat, horizontal roadway; geometric, angular forms of residential structures that line roadway; mostly obscured by vegetation; indistinct energy transmission line
LINE	Irregular and inconsistent rock bands; undulating, broken ridgeline; undulating foothills descending to flat valley	Amorphic lines of groupings; vertical evergreens in the background; mostly rounded, dense brush, shrubs, and grasses in foreground	Curvilinear roadway; horizontal and vertical lines of energy infrastructure
COLOR	Light brown to gray exposed soils intermixed with gray aggregate	Dark deep to light yellow green to yellow of most vegetation; tan dry grasses; some oak brush transitioning to red	Gray asphalt; natural wood utility poles and guard rails; gray and brown homes
TEXTURE	Broken soft and rounded edged diff face in the background; smooth foothills transition to lower elevations	Consistent, carpeted, and dense forest and brush	Smooth, continuous roadway; fine cables; inconsistent residential structures

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Cut and fill would cause some distinct abrupt changes in gradation between sloped foothills to flat parking lot to steep slope down to residential structures	No perceived change.	Defined, angular, organized infrastructure with descending ramps to flat/grade road, parking lot, and base station; prominent 3- to 4-story geometric structure; upright, vertical, geometric form of base station with angular and vertical components; linear, continuous cables; geometric, square gondola cabins
LINE	Distinct horizontal line between flat roadway and cut slopes	No perceived change.	Bold, vertical, rigid; intersecting perpendicular lines; continuous cables; ascending and descending lines associated with ramp contours
COLOR	Dark brown to gray exposed soils	No perceived change.	Galvanized steel of gondola towers and infrastructure; dark gray to black asphalt; gray concrete faces of road components; light gray of concrete parking structure, brown to rust earth tones of lift house
TEXTURE	More abrupt changes in elevation and gradation	No perceived change.	Rigid, broken, inconsistent towers; continuous fine cables; repetitive gondola cars; smooth, continuous roadway; angular, organized base station infrastructure

SECTION D. CONTRAST RATING SHORT TERM LONG TERM

ELEMENTS	1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
				X					X	X				
				X					X	X				
		X					X	X						
		X					X	X						
3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD													Evaluator's Names Laren Cyphers/ Chris Bockey 10/12/2020	
Date														

Comments from item 2.

N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 21 – Existing Condition – La Caille Residential Area

Note: Proposed Condition simulation not included for this KOP.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date October 12, 2020

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 21 - La Calle Residential Area (Gondola Alternative)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Sloping, angular side slopes; lower rounded foothills of residential properties that taper to roadway	Inconsistent domestic and deciduous trees; low grasses	Clustered residential development; built forms for landscaping; 69-kV transmission line in middle foreground; flat roadway for access to residences
LINE	Undulating foothills descending to flat valley	Amorphic lines created by tree groupings; distinct line between tall and short vegetation	Tall, vertical transmission line poles; horizontal, continuous thin electric lines; smooth continuous roadway surface
COLOR	Brown to dark brown exposed soils intermixed with gray aggregate	Yellowish green to green trees; tan, gray, and brown dry grasses	Buckskin transmission line poles; light gray attached infrastructure; darker wood transmission line in distance; light gray asphalt
TEXTURE	Soft foothill slopes; smooth, undulating flat area	Consistent, carpeted grasses in spots; inconsistent tree groupings	Irregular residential area; linear, smooth roadway; continuous distribution line

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Cut and fill would cause distinct, abrupt changes in gradation between sloped foothills to flat parking lot to steep slope down to residential structures; foothills in background would be mostly obstructed	Vegetation clearing will result in less consistent tree groupings	Defined, angular, organized infrastructure of parking garage and lot, and base station; prominent 3- to 4-story geometric structure; upright, vertical, geometric form of base station with angular and vertical components; flat, large parking lot somewhat obstructed by vegetation
LINE	Distinct horizontal line between flat overhead parking area cut and fill slopes, and flat residential area	Distinct line between new roads and infrastructure and vegetation that remains	Bold, vertical, rigid; intersecting, perpendicular lines
COLOR	Dark brown to gray exposed soils	No perceived change.	Dark gray to black asphalt of roadway changes; light gray of concrete parking structure, brown to rust earth tones of lift house
TEXTURE	Abrupt changes in elevation and gradation	Inconsistent, distinct tree groupings giving way to flat cleared areas	Angular, organized base station infrastructure; smooth, flat parking lot

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
			X					X		X				
			X					X		X				
ELEMENTS	Form		X					X		X				3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD
	Line		X					X		X				
	Color		X					X		X				
	Texture		X					X		X				
Evaluator's Names												Date		
Laren Cyphers/ Chris Bockey												10/12/2020		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.



KOP 25 – Existing Condition – Tanner's Flat Campground



KOP 25 – Proposed Condition – Tanner's Flat Campground (Enhanced Bus Service Alternative and Enhanced Bus Service in Peak-period Shoulder Lane)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date March 30, 2021

District N/A

Resource Area N/A

Activity (program) N/A

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name: Little Cottonwood Canyon Wasatch Blvd to Alta Transportation Improvements	4. Location See figure in EIS section	5. Location Sketch See figure in EIS section
2. Key Observation Point: 25 - Tanner's Flat Campground (Enhanced Bus Service Alternative and Enhanced Bus Service in Peak-period Shoulder Lane)		
3. VRM Class N/A		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	Flat canyon bottom; canyon walls mostly obstructed by vegetation and inferior viewpoint; rugged mountain ridgeline in distance	Vertical, dense, scraggly deciduous trees and shrubs in foreground; conical evergreens at higher elevations	Organized, angular, rigid campground infrastructure; flat, horizontal roadway and guardrail above
LINE	Sloping ridgeline tapering to canyon bottom	Distinct lines between deciduous trees and shrubs and developed campgrounds; vertical trees	Horizontal and vertical lines of existing infrastructure
COLOR	Dark brown exposed soils; gray to light gray exposed granite rocks in campground; covered in snow	Dormant deciduous trees; dark green evergreens in background; seasonal variation	Grays, blacks, and wood browns of infrastructure
TEXTURE	Rugged, tapered canyon walls transition to a generally flat, uniform canyon bottom	Dense, inconsistent, grouped vegetation with varied heights	Organized, unnatural, rigid infrastructure

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LAND/WATER		2. VEGETATION	3. STRUCTURES
FORM	Any change obstructed by inferior viewpoint and proposed retaining wall. No perceived change.	Any change obstructed by inferior viewpoint and proposed retaining wall. No perceived change.	Geometric, distinct retaining wall, partially obstructed by vegetation
LINE	No perceived change.	No perceived change.	Geometric, horizontal lines of structure
COLOR	No perceived change.	No perceived change.	Light colored concrete structure
TEXTURE	No perceived change.	No perceived change.	Smooth, continuous, angled structure

SECTION D. CONTRAST RATING SHORT TERM X LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) N/A
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
					X				X	X	X			
					X				X	X	X			
ELEMENTS	Form				X				X	X	X			
	Line				X				X	X	X			
	Color				X				X	X	X			
	Texture				X				X	X	X			
												3. Additional mitigating measures recommended? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side) TBD		
												Evaluator's Names Laren Cyphers/ Kevin Rauhe 4/14/2021		
												Date		

Comments from item 2.
N/A

Additional Mitigating Measures (See item 3)

To be developed based on further design information.

Chapter 18: Energy

18.1 Introduction

This chapter describes how energy demands would be affected in the short and long terms with the project alternatives. The energy use associated with the project alternatives is evaluated primarily in the form of fuel consumption. For this analysis, data on average vehicle fuel efficiencies are taken from the Bureau of Transportation Statistics (2019).

Vehicle 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 urban travel. Fuel efficiency under steady-flow, “cruising” driving conditions peaks at 45 to 60 miles per hour 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).

The energy analysis in this chapter is based on current fuel consumption rates to provide an equal comparison between alternatives based on known fuel consumption rates and technologies. It would be speculative to develop consumption rates for 2050 since vehicle technology, percentage of electric cars, use of electric/hybrid buses, or use of hybrid trains cannot be predicted. Data from the U.S. Energy Information Administration shows that the average light-duty vehicle-miles per gallon (mpg) could increase from 25 mpg today to about 35 mpg in 2050 (EIA 2021). The same data are not available for buses, cog rail, or future gondola system electric motors. The Utah Department of Transportation expects that all of the various modes would see improvements in future energy use.

18.2 Regulatory Setting

The National Environmental Policy Act (NEPA) regulations (40 Code of Federal Regulations Section 1502.16) require an examination of the energy requirements of a proposed project and the potential of the project for conserving energy. The Federal Highway Administration’s guidelines for preparing environmental documents state that, for most projects, Environmental Impact Statements should discuss in general terms the construction and operational energy requirements and conservation potential of the alternatives, including the No-Action Alternative. A detailed energy analysis including computing energy requirements is generally not needed.

How is energy use evaluated?

In this chapter, the energy use associated with the project alternatives is evaluated primarily in the form of fuel consumption.

18.3 Affected Environment

In 2018, Wasatch Boulevard from Fort Union Boulevard to North Little Cottonwood Road had an average annual daily traffic volume of 16,000 to 18,000 vehicles. Assuming an average vehicle fuel efficiency of about 25 mpg, about 1,400 to 1,600 gallons of fuel were used daily over the 2.2-mile segment of Wasatch Boulevard (Fehr & Peers 2018).

In 2018, State Route (S.R.) 210 in Little Cottonwood Canyon had an average daily traffic volume of about 6,922 vehicles. Assuming an average vehicle fuel efficiency of about 25 mpg, about 2,800 gallons of fuel were used daily over the 10-mile-long road from North Little Cottonwood Road to Alta.

To equally compare alternatives, the analysis of enhanced bus service assumes a one-way, 12-mile trip, which would be similar to the travel from the gravel pit mobility hub or the 9400 South and Highland Drive mobility hub. The current ski bus service in Little Cottonwood Canyon provides 42 trips per day to the Alta ski resort over 12 hours of operation, for a total of about 1,008 round-trip miles of travel per day. Assuming an average bus fuel efficiency of 3.2 mpg, about 315 gallons of diesel fuel are consumed daily. The total personal vehicle fuel consumption plus bus fuel consumption on S.R. 210 in Little Cottonwood Canyon equals about 3,115 gallons of fuel consumed per day during the winter when the ski bus service is in operation.

What is a mobility hub?

A mobility hub is a location where users can transfer from their personal vehicle to a bus.

What is the gravel pit?

The gravel pit is an existing aggregate (gravel) mine located on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard.

18.4 Environmental Consequences and Mitigation Measures

18.4.1 Methodology

The analysis for the action alternatives converted energy use to gallons of fuel so that the alternatives' energy consumption could be compared. All of the action alternatives require the use of buses that go through the S.R. 209/S.R. 210 intersection; therefore, to compare the alternatives, the analysis for bus fuel consumption considered only the additional travel of the buses using S.R. 210 in Little Cottonwood Canyon.

18.4.2 No-Action Alternative

18.4.2.1 Construction-related Energy Impacts

With the No-Action Alternative, the changes associated with the S.R. 210 Project would not be implemented. The only construction-related energy impacts would be caused by roadway maintenance and any roadway work that occurs as part of ongoing commercial and residential development in the vicinity of S.R. 210.

18.4.2.2 Direct Energy Impacts

With the No-Action Alternative, increased traffic and congestion resulting from the projected growth in the region (see Chapter 1, Purpose and Need) would increase overall energy requirements in 2050 compared to the existing conditions.

Wasatch Boulevard from Fort Union Boulevard to North Little Cottonwood Road is projected to have an average annual daily traffic volume of 17,000 to 25,000 vehicles in 2050 (Fehr & Peers 2018). The increase in traffic compared to existing conditions would be caused by the increase in population between today and 2050. Assuming an average vehicle fuel efficiency of about 25 mpg, about 1,500 to 2,200 gallons of fuel would be used daily over the 2.2-mile segment of Wasatch Boulevard. This would be an increase of about 7% to 37% compared to the existing conditions in 2020.

In 2050, S.R. 210 in Little Cottonwood Canyon is projected to have an average annual daily traffic volume of about 9,900 vehicles. Assuming an average vehicle fuel efficiency of about 25 mpg, about 3,960 gallons of fuel would be used daily over the 10-mile-long road (North Little Cottonwood Road to Alta), or an increase of 41% compared to 2020 conditions.

For the No-Action Alternative, the ski bus service in Little Cottonwood Canyon in 2050 is assumed to be the same as the current ski bus service—42 trips per day for a total of about 1,008 miles of travel per day. Assuming an average bus fuel efficiency of 3.2 mpg, about 315 gallons of diesel fuel would be consumed daily. The total personal vehicle fuel consumption plus bus fuel consumption on S.R. 210 in Little Cottonwood Canyon would equal about 4,275 gallons of fuel consumed per day during the winter when the ski bus service is in operation.

18.4.3 Enhanced Bus Service Alternative

18.4.3.1 Construction-related Energy Impacts

Implementing the Enhanced Bus Service Alternative (which includes widening Wasatch Boulevard) would involve operating heavy machinery with a resulting increase in energy use, since fuel would be consumed as part of the construction activities. In addition, traffic congestion would increase during construction, so more fuel would be used. The construction-related energy consumption would be temporary.

18.4.3.2 Direct Energy Impacts

With the Enhanced Bus Service Alternative, Wasatch Boulevard from Fort Union Boulevard to North Little Cottonwood Road is projected to have an average annual daily traffic volume of 18,000 to 26,000 vehicles in 2050. The 1,000-vehicle-per-day increase in average annual daily traffic volumes over the No-Action Alternative would be the result of improvements made to Wasatch Boulevard with the action alternatives. Assuming an average vehicle fuel efficiency of 25 mpg, about 1,600 to 2,300 gallons of fuel would be used daily over the 2.2-mile segment of Wasatch Boulevard. This would be an increase of about 5% to 7% compared to the No-Action Alternative in 2050.

With the Enhanced Bus Service Alternative, implementing a toll would reduce personal vehicle use in Little Cottonwood Canyon by about 30%. With a reduction of 30% in average annual daily traffic in 2050, daily traffic volumes would be about 6,930 vehicles, or similar to the existing conditions in 2020. Assuming an average vehicle fuel efficiency of 25 mpg, about 2,800 gallons of fuel would be used daily over the 10-mile-long road. This would be a decrease of about 29% compared to the No-Action Alternative in 2050. The overall reduction in energy consumption from personal vehicle use on S.R. 210 in Little Cottonwood Canyon would be beneficial.

The enhanced bus service in Little Cottonwood Canyon would consist of 24 buses per hour to the Alta ski resort for 6 hours of operation and 12 buses per hour for 6 hours of operation, for a total of about

5,184 miles of travel per day based on a 24-mile round trip for each bus (12-mile, one-way trip from either mobility hub). Assuming an average bus fuel efficiency of 3.2 mpg, about 1,620 gallons of diesel fuel would be consumed daily. The total personal vehicle fuel consumption plus bus fuel consumption on S.R. 210 in Little Cottonwood Canyon would equal about 4,420 gallons consumed per day during the winter when the ski bus service is in operation, which would be slightly more than the fuel consumption with the No-Action Alternative (4,275 gallons per day). The fuel consumption comparison does not take into account future improvements in either personal vehicle or bus fuel efficiency.

18.4.4 Enhanced Bus Service in Peak-period Shoulder Lane Alternative

18.4.4.1 Construction-related Energy Impacts

Implementing the Enhanced Bus Service in Peak-period Shoulder Lane Alternative (which includes widening Wasatch Boulevard) would involve operating heavy machinery with a resulting increase in energy use, since fuel would be consumed as part of the construction activities. In addition, traffic congestion would increase during construction, so more fuel would be used. Constructing the peak-period shoulder lanes in Little Cottonwood Canyon would consume additional energy compared to the Enhanced Bus Service Alternative. The construction-related energy consumption would be temporary.

18.4.4.2 Direct Energy Impacts

The vehicle energy use with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

18.4.5 Gondola Alternative A (Starting at Canyon Entrance)

18.4.5.1 Construction-related Energy Impacts

Implementing Gondola Alternative A would involve operating heavy machinery with a resulting increase in energy use, since fuel would be consumed as part of the construction activities. In addition, traffic congestion would increase during construction, so more fuel would be used. Constructing the gondola system would consume less energy compared to the energy used to implement the Enhanced Bus Service Alternative but less than that for the Enhanced Bus Service in Peak-period Shoulder Lane Alternative. The construction-related energy consumption would be temporary.

18.4.5.2 Direct Energy Impacts

The vehicle energy use with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative except that the ski buses would not travel on S.R. 210 in Little Cottonwood Canyon, which would result in less bus fuel consumption. However, Gondola Alternative A would require bus service from both the gravel pit and 9400 South and Highland Drive mobility hubs (about a 9-mile round trip from each mobility hub). Assuming 216 daily bus trips at an average bus fuel efficiency of 3.2 mpg, about 608 gallons of diesel fuel would be consumed daily by buses traveling to the Gondola Alternative A base station from the mobility hubs.

Gondola Alternative A's gondola system would use about 35,280 kilowatt-hours of electricity per day. Using a conversion factor of 33.70 kilowatt-hours per gallon of gasoline, this equates to about 996 gallons of

gasoline per day (U.S. Department of Energy 2014). The total fuel consumption for Gondola Alternative A including personal vehicle use in the canyon (2,800 gallons per day) would be about 4,404 gallons of gasoline per day.

18.4.6 Gondola Alternative B (Starting at La Caille)

18.4.6.1 Construction-related Energy Impacts

The energy consumption from implementing Gondola Alternative B would be the same as from implementing Gondola Alternative A except that an additional two gondola towers and an angle station would be required for Gondola Alternative B.

18.4.6.2 Direct Energy Impacts

The vehicle energy use with Gondola Alternative B would be the same as with the Enhanced Bus Service Alternative except that the ski buses would not travel on S.R. 210 in Little Cottonwood Canyon, which would result in less bus fuel consumption. However, Gondola Alternative B would require bus service from both the gravel pit and 9400 South and Highland Drive mobility hubs (about an 8-mile round trip from the gravel pit mobility hub and a 10-mile trip from the 9400 South and Highland Drive mobility hub). Assuming 144 trips per day total (72 from each hub) at an average bus fuel efficiency of 3.2 mpg, about 405 gallons of diesel fuel would be consumed daily by buses traveling to the Gondola Alternative B base station at La Caille from the mobility hubs.

With the 0.75-mile greater distance from the Gondola Alternative B base station to the entrance to Little Cottonwood Canyon and the need for one additional angle station compared to Gondola Alternative A, Gondola Alternative B would use about 40,680 kilowatt-hours of electricity per day. Using a conversion factor of 33.70 kilowatt-hours per gallon of gasoline, this equates to about 1,206 gallons of gasoline per day (U.S. Department of Energy 2014). The total fuel consumption for Gondola Alternative B including personal vehicle use in the canyon (2,800 gallons per day) would be about 4,412 gallons of gasoline per day.

What are gondola base, angle, and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's gondola trip. Passengers board and disembark the gondola cabins at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

The gondola alternatives also include *angle stations*, which are needed to adjust the horizontal direction of the cabin; passengers remain in the cabin as it passes through an angle station.

A *tower* supports the gondola cable.

18.4.7 Cog Rail Alternative (Starting at La Caille)

18.4.7.1 Construction-related Energy Impacts

Implementing the Cog Rail Alternative would involve operating heavy machinery with a resulting increase in energy use, since fuel would be consumed as part of the construction activities. In addition, traffic congestion would increase during construction, so more fuel would be used. Constructing the Cog Rail Alternative would use more energy than would constructing the other action alternatives. The construction-related energy consumption would be temporary.

18.4.7.2 Direct Energy Impacts

The vehicle energy use with the Cog Rail Alternative would be the same with as the Enhanced Bus Service Alternative except that the ski buses would not travel on S.R. 210 in Little Cottonwood Canyon, which would result in less bus fuel consumption. However, the cog rail system would use diesel-electric locomotives that require diesel fuel. About 37 cog rail trips would be made per day with a round-trip distance of about 17 miles, or 629 total miles per day. Assuming a diesel-electric locomotive fuel efficiency of 0.5 mpg, about 1,258 gallons of diesel fuel would be consumed daily (DiDomenico and Dick 2014). The bus fuel consumption for the Cog Rail Alternative would be the same as for Gondola Alternative B, for a total fuel consumption of 4,463 gallons of diesel fuel per day (including personal vehicle use in the canyon of 2,800 gallons per day).

18.4.8 Summary of Energy Consumption

The list below summarizes the total energy consumption in gallons of fuel for each primary action alternative. The total energy consumption does not include vehicle use on Wasatch Boulevard since it would be the same for each alternative—an increase of between 100 to 300 gallons of fuel over the No-Action Alternative depending on the alternative. Note that the fuel use by the gondola alternatives is a conversion from total electricity use. The gondola alternatives would not use gasoline or diesel fuel to operate.

- No-Action Alternative - 4,275 gallons of fuel per day
- Enhanced Bus Service Alternative – 4,420 gallons of fuel per day
- Enhanced Bus Service in Peak-period Shoulder Lane Alternative – 4,420 gallons of fuel per day
- Gondola Alternative A (Starting at Canyon Entrance) – 4,404 gallons of fuel per day
- Gondola Alternative B (Starting at La Caille) – 4,412 gallons of fuel per day
- Cog Rail Alternative (Starting at La Caille) – 4,463 gallons of fuel per day

18.4.9 Mitigation Measures

No mitigation measures for energy impacts are proposed.

18.5 References

Bureau of Transportation Statistics

- 2019 Average Fuel Efficiency of U.S. Light-duty Vehicles. April 23. <https://www.bts.gov/content/average-fuel-efficiency-us-light-duty-vehicles>, Accessed October 6, 2020.

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- 2021 Annual Energy Outlook 2021.

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- 2018 Summary of Forecasting for S.R. 210 (Urban). July.

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Chapter 19: Construction Impacts

19.1 Introduction

This chapter describes the construction impacts of the action alternatives. Construction of any of the action alternatives would cause temporary construction-related impacts from ground disturbance and the operation of construction equipment. Construction could also cause impacts to the public, air quality, water quality, wetlands, streams, wildlife, noise levels, visual resources, cultural resources, hazardous materials, utility service, traffic flow, businesses, noxious and invasive species, and construction staging and material borrow areas. See Chapter 13, Ecosystem Resources, for specific construction-related impacts to wildlife habitat, wildlife, sensitive species, and wetlands.

The nature and timing of these impacts would be related to the alternative selected for the State Route (S.R.) 210 Project and the construction methods that would be used to build that alternative. Most construction-related impacts to the public would be associated with travel delays and recreation access during construction.

Little Cottonwood Canyon is within the Salt Lake City Department of Public Utilities watershed and within National Forest System lands used for recreation and wildlife habitat preservation. The canyon also includes designated wilderness. Because of the sensitive water quality requirements and ecological and recreation value of the canyon, the Utah Department of Transportation (UDOT) would coordinate before the start of construction with the Salt Lake City Department of Public Utilities and the U.S. Department of Agriculture (USDA) Forest Service with respect to construction planning and mitigation.

What resources could be affected by construction of the action alternatives?

Construction could cause impacts to the public, air quality, water quality, wetlands, streams, wildlife, noise levels, visual resources, cultural resources, hazardous materials, utility service, traffic flow, businesses, noxious and invasive species, construction staging and material borrow areas, and ecosystem resources.

19.2 Environmental Consequences and Mitigation Measures

19.2.1 No-Action Alternative

With the No-Action Alternative, the improvements associated with the S.R. 210 Project would not be made, so there would be no construction-related impacts from the Selected Alternative.

19.2.2 Action Alternatives

Overall, construction-related impacts would be temporary. The following discussion of construction-related impacts applies to all of the action alternatives unless otherwise stated. Table 19.2-1 summarizes the typical construction activities by alternative.

Table 19.2-1. Construction Activity by Action Alternative

Construction Activity	Enhanced Bus Service Alternative	Enhanced Bus Service in Peak-period Shoulder Lane Alternative	Gondola Alternative A	Gondola Alternative B	Cog Rail Alternative
Vegetation removal	✓	✓	✓	✓	✓
Excavation and grading	✓	✓	✓	✓	✓
Paving	✓	✓	✓	✓	✓
Blasting ^a	✓	✓	✓	✓	✓
Helicopter use			✓	✓	
Pile driving					✓

^a Blasting could be required for snow sheds, road widening, and the cog rail tracks. The snow sheds would be part of any action alternative. Blasting debris would likely be used as fill for other parts of the alternative that would need imported material or would remain on site if transporting material would cause further environmental damage.

19.2.2.1 Construction Phasing

In general, the alternatives analysis in a National Environmental Policy Act (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 S.R. 210 Project, the year 2050 (FHWA 2010). The impacts of the project are defined as the total impacts of the action alternatives in the design year assuming full construction of all elements that are included in those alternatives. 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. The USDA Forest Service might also issue a ROD depending the alternative selected. Once the ROD(s) has (have) been issued, and if UDOT selects an action alternative, UDOT might implement the Selected Alternative through a series of separate contracts for individual sections or components of the alternative. Unless otherwise specified in the ROD(s), UDOT has the flexibility to determine the appropriate construction phasing.

What is a design year?

NEPA studies often focus 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 S.R. 210 Project, the year 2050.

If only partial funding were allocated for construction, UDOT would construct portions or components of the Selected Alternative based on the amount of the funding while considering safety and operational benefits. Any implemented portion or component of the Selected Alternative would need to have independent utility and logical termini. The Wasatch Boulevard portion of the S.R. 210 Project is included in the Wasatch Front Regional Council's 2019–2050 *Wasatch Front Regional Transportation Plan* (RTP) for construction in Phase 1 (2019–2030). The construction of the third lane on S.R. 210 between the entrance of Little Cottonwood Canyon and the town of Alta is identified in the RTP as needed in Phase 1 (2019–2030) and as funded in Phase 3 (2040–2050). Neither the gondola alternatives nor the Cog Rail Alternative are included in the RTP; however, these are alternatives to constructing a third

lane on S.R. 210 in Little Cottonwood Canyon. The RTP phasing would be the same as the third lane: sometime between 2019 and 2030. Potential construction phasing by alternative could include the following:

- **Enhanced Bus Service Alternative.** UDOT could start with initial smaller mobility hubs and fewer buses and build the bus service as ridership demand increases with population growth. Snow sheds, Wasatch Boulevard improvements, and trailhead improvements would be implemented based on construction funding.
- **Enhanced Bus Service in Peak-period Shoulder Lane Alternative.** UDOT could start with initial smaller mobility hubs and fewer buses and build the bus service as ridership demand increases with population growth. Construction of the peak-period shoulder lanes could be delayed until the bus service is slowed by congestion on S.R. 210. Snow sheds, Wasatch Boulevard improvements, and trailhead improvements would be implemented based on construction funding.
- **Gondola Alternative A.** Initial construction would require the complete gondola system. UDOT could start with initial smaller mobility hubs and fewer buses and build the bus service as ridership demand increases with population growth. Snow sheds, Wasatch Boulevard improvements, and trailhead improvements would be implemented based on construction funding
- **Gondola Alternative B.** Initial construction would require the complete gondola system and 1,500-space parking garage at the gondola base station at La Caille. UDOT could start with initial smaller mobility hubs and fewer buses and build the bus service as ridership demand increases with population growth. Snow sheds, Wasatch Boulevard improvements, and trailhead improvements would be implemented based on construction funding.
- **Cog Rail Alternative.** Initial construction would require the complete cog rail system and 1,500-space parking garage at the cog rail base station at La Caille. UDOT could start with initial smaller mobility hubs and fewer buses and build the bus service as ridership demand increases with population growth. Snow sheds, Wasatch Boulevard improvements, and trailhead improvements would be implemented based on construction funding.

What is a mobility hub?

A mobility hub is a location where users can transfer from their personal vehicle to a bus.

A consequence of constructing the Selected Alternative in phases is the prolonged period of construction impacts. The main impact of prolonged construction is the traffic congestion experienced by the traveling public and potential disruption of recreation access in Little Cottonwood Canyon. Constructing the project in phases would likely prolong constructed-related congestion over a longer period and potentially result in the loss of sales by businesses in the construction area over a longer period. The economic impact for the S.R. 210 Project would be greatest for the businesses at the intersection of Wasatch Boulevard and Fort Union Boulevard; however, construction phasing is unlikely to affect these businesses in the long term.

The S.R. 210 Project has a design year of 2050 so that the project can provide benefits for at least 20 years before other improvements might be required. If construction of the Selected Alternative spans a long period, the benefit of the project would be reduced, and the full benefits would be realized over a shorter period.

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

19.2.2.2 Easements

UDOT might need to obtain permanent or temporary easements for some properties that are not included in the right-of-way analysis in this Environmental Impact Statement (EIS) in order to construct the action alternatives. 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.

In situations requiring easements, UDOT would use these properties and would provide compensation to the landowner for the use. For some construction and utility easements, the property would be fully returned to the owner when the use of the property is no longer required, typically when construction is complete or the utility is buried. These properties might be temporarily affected, but no long-term impacts are expected. If easements on National Forest System lands are needed for construction, UDOT would coordinate with the Federal Highway Administration and the USDA Forest Service to acquire those easements and any necessary permits.

For some utilities such as water lines, sewer lines, and power poles, permanent easements might be required. The locations of these easements would be determined during the final design phase of the project in coordination with the utility companies. For this reason, the exact locations of the easements were not known when this EIS was published. For permanent easements, the appropriate additional environmental documentation would be prepared for any potential impacts if the easements are beyond the project impacts included in this EIS.

19.2.2.3 Public Impacts due to Construction

A thorough public information program would be implemented to inform the public and businesses about construction activities and to minimize construction-related 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. In addition, night and weekend work could be scheduled to shorten the duration of construction impacts. UDOT would develop a website and release public information through social media about potential delays and restrictions for recreation users in Little Cottonwood Canyon.

19.2.2.4 Air Quality Impacts from Construction

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

- Excavation related to cut-and-cover
- Mobile emissions from construction workers' vehicles as they travel to and from the project site
- Mobile emissions from delivering and hauling construction supplies and debris to and from the project site
- Stationary emissions from on-site construction equipment
- Mobile emissions from vehicles whose speeds are slowed because of increased congestion caused by construction
- Blasting (related dust)

Because construction would be local and short-term, any 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 (PM₁₀).

19.2.2.5 Water Quality Impacts from Construction

Excavation, grading, blasting, and other construction activities could increase sediment and pollution (oil, gasoline, lubricants, cement, pollutants from temporary restrooms, and so on) levels in stormwater runoff, and these pollutants could enter nearby waterways used for public drinking water. The potential for sediment and pollution levels to increase would exist until the project construction is completed and permanent soil-stabilization measures are fully functional.

Any impact to waterways in the Little Cottonwood Canyon watershed could degrade the ability of the Little Cottonwood Water Treatment Plant to process drinking water (see Chapter 12, Water Resources). The primary alternatives and sub-alternatives that could increase sedimentation and pollution in Little Cottonwood Canyon are the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, the gondola alternatives, the Cog Rail Alternative, the avalanche mitigation alternatives, and the trailhead parking alternatives that improve parking at the trailheads. Based on acres of disturbance, the Cog Rail Alternative would have the greatest potential for construction-related water quality impacts followed by the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, the avalanche mitigation alternatives, the gondola alternatives, and trailhead parking alternatives that improve parking.

To reduce the potential for construction adjacent to or near Little Cottonwood Creek to impact water quality, UDOT would coordinate as appropriate with the Salt Lake City Department of Public Utilities and the USDA Forest Service with respect to best management practices (BMPs) and other measures to minimize runoff and sediment.

A Utah Pollutant Discharge Elimination System (UPDES) stormwater permit for construction activities and a stormwater pollution prevention plan would be required for construction activities (for more information, see Chapter 24, Permits, Reviews, Clearances, and Approvals). BMPs specified in the stormwater pollution prevention plan would be used during construction to reduce impacts to surface water. For construction on National Forest System lands, UDOT would obtain approval from the USDA Forest Service regarding BMPs and would develop a stormwater pollution prevention plan prior to construction.

19.2.2.6 Construction Impacts to Wetlands, Streams, and Wildlife

During construction, some erosion might occur outside the specific construction zone, and this erosion might increase sediment levels in adjacent streams. BMPs such as silt fences and other erosion-control features would be used in areas adjacent to streams and in areas where construction activities could affect wetlands outside the project area. If any construction activities would affect wetlands through increased sediments or fill, the construction contractor would identify the amount of wetlands that would be affected. The contractor would also obtain the necessary authorization from the U.S. Army Corps of Engineers (USACE) and all other environmental clearances before affecting these areas.

Construction activities could disrupt the feeding, nesting, and reproductive activities of wildlife in or near the right of way because of higher noise levels, construction equipment activity, and lights. Although it would be short-term and intermittent, blasting (with the Enhanced Bus Service in Peak-period Shoulder Lane

Alternative, the Cog Rail Alternative, and potentially with the avalanche mitigation alternatives) and helicopter use (with the gondola alternatives) could startle wildlife, causing them to avoid the area. 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. For more information, see Chapter 13, Ecosystem Resources.

19.2.2.7 Noise Impacts from Construction

Construction causes a substantial amount of temporary noise. Noise during construction could be a nuisance to nearby residents, businesses, or, in Little Cottonwood Canyon, recreationists. Noise that would occur sporadically in different locations throughout the construction period 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.

Because of safety hazards, most construction sites would have a buffer, and the nearest sensitive receptor would typically be 50 feet from operating equipment. Typical noise levels from construction equipment range from 69 A-weighted decibels (dBA) to 106 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 (Table 19.2-2). To some people, noise at 65 dBA is intrusive and 80 dBA is disruptive. At 80 dBA, people must shout to be heard. As an example, typical vacuum cleaners have a noise level of 85 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 90 dBA at 50 feet, it would decrease to about 83 dBA at 100 feet and 76 dBA at 200 feet.

For the proposed cog rail bridge over North Little Cottonwood Road, there is the potential for pile driving of the columns that support the structure. Earthborne vibration levels from impact pile driving range from 1.1 millimeters per second (mm/sec) to 38.5 mm/sec (0.04 inch per second [in/sec] to 1.5 in/sec), depending on the force of the pile driver, the distance from the pile driver to the receptor, and the type of soil between the pile driver and the receptor. Vibrations from impact pile-driving activities generally do not exceed the threshold for damage to historic buildings of 5 mm/sec (0.2 in/sec) farther than 200 feet from the pile driver, even with poor soil conditions. Pile-driving activities more than 75 feet from newer, non-historic buildings would not exceed the risk criterion for these buildings (HDR 2004). There are no historic structures within 200 feet and no other structures within 75 feet of the proposed pile-driving locations.

In Little Cottonwood Canyon, blasting might be required to remove rock for road, cog rail, and snow shed construction. Specific locations and the need for blasting would be determined based on final on-the-ground assessments. Blasting is an intermittent and infrequent construction activity and can result in noise levels up to 94 dBA at 50 feet. Because blasting would occur in remote locations removed from residential receptors, the blasting noise would likely attenuate to a level below daytime noise standards in the nearest residential areas. Because of the intermittent and infrequent occurrence of blasting activities, the remote locations of blasting activities, the timing that avoids the more sensitive times of the day, and the avoidance of blasting near sensitive receptors, blasting would not cause a substantial temporary increase in noise levels at sensitive receptors.

Table 19.2-2. Typical Construction Noise Level

Construction Equipment or Operation	Noise Level at 50 Feet (dBA) ^a	Common Noise Level for Comparison ^b
	105–110	Rock band at 16 feet
	100–105	Jet flyover at 985 feet
Pile driving	101	
Blasting	94	
Concrete saw	90	
	90–95	Gas lawn mower at 3 feet
Excavator	85	
Crane	85	
Dozer	85	
Concrete mixer truck	85	
Grader	85	
Paver	85	
Generator	82	
	80–85	Food blender or garbage disposal at 3 feet
Backhoe	80	
Air compressor	80	
Front end loader	80	
	73–78	Shouting at 3 feet
	60–65	Normal speech at 3 feet

^a Source: FHWA 2006

^b Source: FHWA 2018

Helicopters would be used to transport materials and personnel to gondola construction sites that are inaccessible by road. Helicopters can emit noise levels of 87.9 dBA at 50 feet overhead. Use of helicopters would be infrequent, occurring intermittently during the period during which gondola towers are constructed. Helicopters would be used during the day, avoiding sensitive evening and nighttime hours. The helicopter flight path would likely be over the center of Little Cottonwood Canyon, and the helicopter noise would disturb residents of the Wasatch Resort and visitors recreating in the canyon.

For information regarding wildlife impacts from construction noise, see Chapter 13, Ecosystem Resources.

19.2.2.8 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 forest or open land and with recreation and residential areas that viewers of the area are accustomed to seeing. In addition, construction equipment and materials would clutter views in the construction area. Visual quality from sensitive viewer locations such as homes and recreation areas would be temporarily reduced during construction. Until construction is completed and the right of way is revegetated, the construction area would visually stand out.

19.2.2.9 Cultural Resource Construction Impacts

During construction of all of the action alternatives, previously unknown archaeological, paleontological, or historical resources might be discovered beyond those identified during the cultural resource surveys (see Chapter 15, Cultural Resources).

19.2.2.10 Hazardous Materials Construction Impacts

As with any ground-disturbing activities, previously unknown sites such as underground storage tanks, leaking underground storage tanks, and other hazardous materials sites could be encountered. Exposure to these sites could pose a health risk. Because the general public would not be allowed onto construction sites, there would be no health risks to the public from ground contamination.

19.2.2.11 Utility Service Impacts from Construction

Although utility service would be maintained throughout most construction activities, utility service could be temporarily disrupted during construction. The affected utilities could include electric, natural gas, water, sewer, telephone, cable, and storm drainage. UDOT would consult with all utility providers affected by construction to complete utility agreements before construction, and the construction contractor would coordinate with all utility providers to minimize utility service interruptions.

19.2.2.12 Traffic Impacts from Construction

The primary construction impacts that could affect vehicle traffic during construction of any of the action alternatives are the following:

- Traffic detours and some temporary road closures could change frequently 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 vehicle travel times, fuel use, and air pollutant emissions. Delays in Little Cottonwood Canyon could deter people from recreating until construction is completed.
- Access to commercial properties could be temporarily disrupted, which could cause longer commute times and a potential loss of revenue for some businesses.

19.2.2.13 Business Impacts from Construction

The only businesses along Wasatch Boulevard are located at the intersection with Fort Union Boulevard near the gravel pit. The businesses most likely to be affected are convenience businesses—those that cater to impulse shopping or “in-route” shopping. Gas stations belong to this first group and are considered high-impact businesses (the businesses that would experience the most impacts from construction). Destination businesses that have extensive competition, such as grocery stores, hardware stores, and sit-down restaurants, are the group that would experience the second-most impacts and are therefore considered moderate-impact businesses.

What are convenience and destination businesses?

Convenience businesses are those that customers visit on impulse or when passing by. Destination businesses are businesses that customers plan to visit in advance of their trip.

Low-impact businesses include specialty and unique stores or services such as ski rental businesses, outfitters, guides, special events, and ski resorts because these businesses are likely to be only slightly affected by construction. Low-impact businesses could also include businesses using National Forest System lands under a permit, such as commercial filming and photography. The fourth group of businesses, which includes offices, industrial parks, schools, and churches, is expected to be negligibly affected. Construction activities would most likely not affect this group's day-to-day operations since consumer traffic generally does not sustain their business activities.

What is the gravel pit?

The gravel pit is an existing aggregate (gravel) mine located on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard.

19.2.2.14 Invasive Species Impacts from Construction

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

19.2.2.15 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. To the extent practicable, construction staging areas would be located in previously disturbed areas.

19.2.2.16 Mitigation Measures for Construction Impacts

The following mitigation measures will be implemented during construction.

19.2.2.16.1 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 will be implemented for the specific design for each phase. Future mitigation for subsequent phases will take into account the final design of the Selected Alternative for that phase and any changes in regulations or potential improvements to BMPs at the time of implementation.

19.2.2.16.2 Mitigation Measures for Public Impacts from Construction

A thorough public information program will be implemented to inform the public about construction activities and to reduce impacts. Information will include work hours and alternate routes. Construction signs will be used to notify drivers about work activities and changes in traffic patterns.

If nighttime construction is required, impacts from lighting will be reduced by aiming construction lights directly at the work area and/or shielding the lights. Utility agreements will be completed to coordinate utility relocations. UDOT will also reach out to owners of property adjacent to construction areas including homeowners who have special-use permits to access their homes on National Forest System lands.

19.2.2.16.3 Mitigation Measures for Air Quality Impacts from Construction

The contractor will follow the appropriate BMPs included in UDOT's plans and specifications for roadway and bridge construction. This includes items such as fugitive-dust control and street sweeping (UDOT Standard Specification 01355, *Environmental Compliance*).

19.2.2.16.4 Mitigation Measures for Water Quality Impacts from Construction

To reduce the temporary impacts to water quality, a UPDES stormwater permit would be required. As part of the requirements of the permit, the contractor will develop and implement a stormwater pollution prevention plan. The plan will identify measures to reduce impacts to receiving waters from construction activities including site grading, materials handling and storage, fueling, and equipment maintenance. As part of the stormwater pollution prevention plan, the contractor will develop a water quality protection BMP implementation and effectiveness and monitoring plan. The development of this plan will be coordinated with the USDA Forest Service and the Salt Lake City Department of Public Utilities.

For disturbance adjacent to or near Little Cottonwood Creek, UDOT will coordinate as appropriate with the Salt Lake City Department of Public Utilities and the USDA Forest Service with respect to BMPs and other measures to minimize runoff and sediment. For construction on National Forest System lands, UDOT will obtain approval from the USDA Forest Service regarding BMPs and will develop a stormwater pollution prevention plan prior to construction.

19.2.2.16.5 Mitigation Measures for Impacts to Wetlands, Streams, and Wildlife from Construction

For proposed mitigation measures for impacts to wetlands, streams, and wildlife, see Chapter 13, Ecosystem Resources.

19.2.2.16.6 Mitigation Measures for Noise Impacts from Construction

The contractor will comply with all state and local regulations relating to construction noise. The contractor will be required to obtain a UDOT temporary noise permit and to notify the local government authority in advance of any percussive noise activity and for any nighttime work.

19.2.2.16.7 Mitigation Measures for Visual Impacts from Construction

UDOT will prepare and implement an appropriate seeding vegetation and/or landscaping plan to restore or enhance aesthetics after the project is completed. The plan will be implemented by the contractor. For construction on National Forest System lands, UDOT will coordinate with the USDA Forest Service regarding an acceptable seed mix and other components of the landscaping plan.

19.2.2.16.8 Mitigation Measures for Construction-related Impacts to Cultural Resources

In accordance with UDOT Standard Specification 01355, *Environmental Compliance*, if cultural resources are discovered during construction, activities in the area of the discovery will immediately stop. The construction contractor will notify UDOT of the nature and exact location of the finding and will 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 State Historic Preservation Office

(SHPO) and tribes. 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. For discoveries on National Forest System lands, UDOT will coordinate with the USDA Forest Service regarding the course of action taken for any discoveries. A programmatic agreement might be developed between UDOT, the USDA Forest Service, and the Utah SHPO regarding potential discoveries.

19.2.2.16.9 Mitigation Measures for Construction-related Discoveries of Hazardous Materials

If contamination is discovered during construction, mitigation measures will be coordinated according to UDOT Standard Specification 01355, *Environmental Compliance*, which directs the construction contractor to stop work and notify UDOT of the possible contamination. Any hazardous materials will be disposed of according to applicable state and federal guidelines.

19.2.2.16.10 Mitigation Measures for Utility Service Impacts from Construction

UDOT will consult with all utility providers affected by construction to complete utility agreements before construction, and the construction contractor will coordinate with all utility providers to minimize interruptions to utility service. Before beginning work, the contractor is required to contact Blue Stakes to identify the locations of all utilities. The contractor will use care when excavating to avoid unplanned utility disruptions. If utilities are unintentionally disrupted, UDOT will work with the contractor and the utility companies to restore service as quickly as possible. UDOT will coordinate with the USDA Forest Service for the relocation of any utilities on National Forest System lands including those within UDOT's right of way on National Forest System lands.

19.2.2.16.11 Mitigation Measures for Traffic Impacts from Construction

The contractor will 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, residences, and recreation areas must be maintained and existing roads kept open to traffic.

Even with the implementation of the maintenance-of-traffic plan, traffic congestion would increase over the short term 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. UDOT will coordinate with the USDA Forest Service regarding an appropriate outreach program for notifying the public of potential construction delays and temporary closures of resources (trailheads, campgrounds, or other recreation areas).

19.2.2.16.12 Mitigation Measures for Economic Impacts from Construction

To the extent practicable, access to businesses will be maintained during the construction and post-construction phases of this project. For each phase of the project, UDOT will 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 will be placed in construction areas to direct drivers to businesses. Other potential mitigation measures for construction impacts could include the following:

- Frequently notify all businesses in the construction area regarding the progress of the construction and upcoming construction events.
- Provide business access signs that identify business access points within the construction limits.
- Hold 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.
- For construction in Little Cottonwood Canyon, avoid activities during peak recreation times such as holidays and weekends.
- To the extent practicable, UDOT will reach out to special-event organizers, permitted commercial activities, outfitters, and guides about construction activities. UDOT will coordinate with the USDA Forest Service with regard to an appropriate outreach program.

19.2.2.16.13 Mitigation Measures for Invasive Species Impacts from Construction

To mitigate the possible introduction of invasive weeds due to construction activities, the invasive weed BMPs in UDOT's current *Standard Specifications for Road and Bridge Construction* will be implemented, monitored, and included in the plans and specifications for the project. In addition, UDOT will follow USDA Forest Service guidelines for inspecting equipment and vehicles for invasive plant and noxious weed species and will coordinate with the USDA Forest Service regarding any additional required Forest Service noxious and invasive species BMPs to be implemented on National Forest System lands.

- The contractor will follow the noxious weed mitigation and control measures identified in UDOT's Supplemental Specification 02924S, *Invasive Weed Control*.
- The contractor will reduce the potential for weed infestations by strictly following BMPs.
- On National Forest System lands, with the USDA Forest Service's coordination and approval, the contractor will obtain and import certified weed-free soil from a vendor or other certified source, and UDOT will retain the certification documentation in the project files.
- On National Forest System Lands, areas disturbed by construction work will be monitored by UDOT for new invading weeds for a minimum of 3 years, and, when weeds are located, they will be treated or removed immediately.
- The contractor will avoid selecting and placing staging areas in locations that have existing invasive and noxious weed infestations.
- The contractor will avoid selecting borrow areas that have existing invasive and noxious weed infestations.
- The contractor will reseed the construction area with native plants, and UDOT will monitor seedlings to determine when vegetation becomes re-established. This measure will mitigate direct-disturbance impacts and reduce the potential for weed invasions.
- On National Forest System lands, UDOT will use only Forest Service–approved seed mixes.
- Daily or multiple times a day if needed, the contractor will wash vehicles and equipment at a portable wash station set up at the exit of the staging area before the equipment goes into any work locations that are currently weed-free.

19.2.2.16.14 Mitigation Measures for Construction Staging and Material Borrow Areas

Earth-disturbing activities would be generally confined to the limits of cut and fill, although staging areas and some construction activity might be located outside the limits of cut and fill included in the EIS impacts. Any ground disturbances on National Forest Service lands, including those at staging areas, will comply with the USDA Forest Service requirements listed in this chapter.

19.3 References

[FHWA] Federal Highway Administration

- 2006 Construction Noise Handbook Final Report. August.
- 2010 Interim Guidance on the Application of Travel and Land Use Forecasting in NEPA. March.
- 2018 Techniques for Reviewing Noise Analyses and Associated Noise Reports Final Report. June 1.

HDR, Inc.

- 2004 Vibration Impacts on Historic Structures Final Technical Report, Legacy Parkway Environmental Re-evaluation. April.

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Chapter 20: Indirect Effects

20.1 Introduction

This chapter evaluates the potential indirect effects of the action alternatives identified in Chapter 2, Alternatives. Typically, for transportation 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 or changes in access. For the action alternatives, potential indirect effects also include improved access to recreation areas and ski resorts as a result of the proposed transportation improvements in Little Cottonwood Canyon. Indirect effects related to constructing the action alternatives are evaluated in each resource chapter.

What is the indirect effects impact analysis area?

The indirect effects impact analysis area consists of Cottonwood Heights, the Granite Community, Sandy, the town of Alta, portions of Salt Lake County adjacent to S.R. 210, and private and National Forest System lands in Little Cottonwood Canyon.

Indirect Effects Impact Analysis Area. The indirect effects impact analysis area consists of Cottonwood Heights, the Granite Community, Sandy, the town of Alta, portions of Salt Lake County adjacent to State Route (S.R.) 210, and private and National Forest System (NFS) lands in Little Cottonwood Canyon (for the locations of these areas, see Figure 1.1-1, Transportation Needs Assessment Study Area, in Chapter 1, Purpose and Need). The analysis also includes potential indirect effects from tolling in Big Cottonwood Canyon. The impact analysis area was selected to include locations where project-related activities could cause changes in land use, use of recreation resources, and tolling.

20.2 Regulatory Setting

The Council on Environmental Quality's (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) require that an Environmental Impact Statement (EIS) analyze the effects of a proposed action. Indirect effects are defined by the CEQ regulations (40 Code of Federal Regulations Section 1508.8) 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 the induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Federal agencies such as CEQ and the Federal Highway Administration have stated that there is no prescribed specific technique or method that must be used to analyze the indirect effects of transportation projects (FHWA 1992). A national survey of completed EISs found that a wide range of methods were used to evaluate indirect effects (USDOT 2005). For details regarding the methods used in this EIS, see Section 20.4.1, Methodology.

20.3 Affected Environment

20.3.1 S.R. 210 – Wasatch Boulevard

S.R. 210 from Fort Union Boulevard to S.R. 209 passes through an area of urban-related land uses consistent with a mature city. Cottonwood Heights and the Granite Community are mostly developed, so their population growth is expected to be low (about 5% between 2018 and 2050; CSBS 2019). Over the past couple years, a few vacant parcels have developed into residential subdivisions, and any private property along Wasatch Boulevard south of Bengal Boulevard that is still vacant is zoned for residential development.

Regionally, south of 9400 South along Wasatch Boulevard, land is mostly developed with residential uses in Sandy and Draper. Most of the undeveloped land is in two areas: (1) south of Wasatch Boulevard along North Little Cottonwood Road to S.R. 209 and (2) on Wasatch Boulevard between North Little Cottonwood Road and 9400 South. In these two areas, the undeveloped land either is being developed with residential developments, or the property owners are interested in developing the vacant property even with the current congestion on Wasatch Boulevard. (For more information, see Section 1.4.3, Current and Future Transportation System Needs, in Chapter 1, Purpose and Need.)

Understanding current commuter traffic patterns helps predict where potential changes to land use could occur. Commuters' travel origins and destinations show where people live and where they travel to work. During the morning and evening commutes, about 53% of the traffic on Wasatch Boulevard in Cottonwood Heights is coming from or going to areas south of 9400 South, including Sandy and Draper. These travelers are commuting to Interstate 215, mostly to employment in Salt Lake City (Cottonwood Heights City 2018). This commuting pattern shows that land uses south of Cottonwood Heights have a large influence on the travel demand on S.R. 210 through this city.

20.3.2 S.R. 210 – North Little Cottonwood Road to Alta

Little Cottonwood Canyon is in the Uinta-Wasatch-Cache National Forest, which is on the eastern edge of the Salt Lake City metropolitan area located in Salt Lake County. Salt Lake County has a population of about 1.12 million people. The canyon is home to two internationally recognized ski resorts, Alta and Snowbird, and includes parts of two National Wilderness Areas: Twin Peaks Wilderness to the north and Lone Peak Wilderness to the south. S.R. 210 is a designated state scenic byway because of the cliff walls and high mountains that make up the canyon.

Winter recreation activities include but are not limited to skiing at the resorts, backcountry skiing, snowshoeing, and ice climbing. During the 2017–2018 winter season, the Alta and Snowbird resorts had about 853,000 skiers. During the summer, the resorts offer abundant recreation opportunities, and land administered by the U.S. Department of Agriculture (USDA) Forest Service is used extensively for hiking, cycling, rock climbing, fishing, camping, and picnicking.

The canyon is also defined as a watershed area by the Salt Lake Valley Board of Health as authorized by Section 26A-1-121(1) of the Utah Code Annotated. The purpose of the watershed designation is to protect and promote health and promote conditions that contribute to preserving and protecting drinking water quality. The watershed provides water for cities in eastern Salt Lake County. The quality of the watershed

and the quantity of the water provided are critical to the local water supply. Because of the importance of the watershed to the water supply, dogs are not allowed in Little Cottonwood Canyon.

The substantial recreational opportunities in Little Cottonwood Canyon and its proximity to a large metropolitan area generate about 1.2 million vehicle trips into the canyon per year, which carry about 2.1 million visitors (Lamborn and Burr 2016). Visitation into the canyon is equally distributed between winter and summer uses, with winter use more focused on peak ski weekends and holidays (Mountain Accord 2015). Given that the populations of Salt Lake and Utah Counties are expected to grow by 36% and 108%, respectively, through 2050, the number of travelers into Little Cottonwood Canyon also is expected to increase through 2050 (see Section 1.4.1.2, Projected Growth in Population, Employment, and Households, in Chapter 1, Purpose and Need).

The popularity of outdoor recreation continues to grow with the population, and this trend shows no signs of slowing. One report found that the number of recreation visits to the Wasatch Mountains will likely double over the next 30 to 40 years. Such a doubling would put a major potential strain on the quality of the recreation experience as well as on habitat, the watershed in Little Cottonwood Canyon, and the existing transportation network (Envision Utah 2010).

During the summer, canyon users have difficulty finding parking near trailheads. The amount of trailhead parking is limited and can quickly reach capacity, causing many people to park on the side of the road and walk along the roadway to trailheads, which creates a safety issue. One of the most congested parking areas is the White Pine Trailhead (Mountain Accord 2014), which is located at a curve with limited sight distances and narrow shoulders, both of which increase safety-related issues for motorists, cyclists, and pedestrians. Parking along the road has created a rut at the edge of the pavement and a network of “spider web” trails that promote erosion and weed infestation. Roadside parking also creates a safety hazard for cyclists and pedestrians traveling along the shoulder of the road because it narrows the area in which they can travel and requires them to use part of the travel lane.

There are no official usage data regarding the number of cyclists using S.R. 210 in Little Cottonwood Canyon. The only available information is from a social media application (Strava) that is used by cyclists to track their rides. Strava does not account for all users and therefore underrepresents the number of cyclists. The data from Strava show that, in 2018, about 13,600 cyclist trips entered Little Cottonwood Canyon on S.R. 210 or on the Little Cottonwood Canyon Trail. About 3,500 cyclist trips terminated at Snowbird Entry 1, and about 1,800 trips terminated at Alta.

20.4 Indirect Effects and Mitigation Measures

The Utah Department of Transportation (UDOT) analyzed the indirect effects of mobility changes on S.R. 210 from Fort Union Boulevard to the town of Alta. This analysis includes traffic capacity improvements on Wasatch Boulevard; improved winter recreation access to the ski resorts as a result of increased bus, gondola, and cog rail capacity; and improved summer recreation access to the ski resorts as a result of implementing a gondola or cog rail system that would operate in winter as well as summer. The action alternatives would provide bus, gondola, and/or cog rail service to the ski resorts only; there would be no stops at trailheads in lower Little Cottonwood Canyon, so the alternatives would not induce use at the trailheads.

None of the project alternatives include summer bus use in Little Cottonwood Canyon, so there would be no induced recreational visitation during the summer for the enhanced bus service alternatives. For the indirect effects analysis, the assumption is that the improved trailhead parking proposed with the project alternatives would not expand the number of parking spaces at the trailheads or along S.R. 210 from the intersection with S.R. 209 to Snowbird Entry 1 based on the inventoried number of existing parking spaces along this road segment (Avenue Consultants 2012). For the analysis in this chapter, the trailhead parking with all of the action alternatives would decrease the number of parking spaces by between 17 and 429 spaces. Therefore, there would be no induced recreational demand caused by the trailhead improvement alternatives. However, the amount of available parking would be reduced, thereby limiting overall recreation access.

Since there would be no summer bus service and because the trailhead parking alternatives would reduce overall parking at the trailheads, UDOT did not analyze the indirect effects of increased recreation use in the summer from the enhanced bus service alternatives. The gondola and cog rail alternatives would operate during the summer to the ski resorts, so the indirect analysis does analyze induced recreational use at the resorts and surrounding areas.

20.4.1 Methodology

For the S.R. 210 Project, *indirect effects* are defined as effects that could result from the action alternatives beyond direct impacts to property and resources within the project right of way and the construction footprint. In this analysis, indirect effects are primarily (1) the effects of land development that could occur due to the improved accessibility and mobility in the area influenced by the action alternatives, (2) changes to recreation use in Little Cottonwood Canyon, and (3) changes in traffic patterns due to tolling or a ban on single-occupant vehicles. Indirect effects on natural resources would typically be caused when undeveloped or partially developed land with such natural resources is converted to residential, industrial, commercial, or governmental land uses, or when a change in recreation activities induced by an alternative such as hiking harms a natural resource.

Within the indirect effects impact analysis area, the action alternatives are not expected to induce population growth in a specific geographic area. Instead, the alternatives are expected to change mobility on Wasatch Boulevard and to change how recreation users access the ski resorts with all alternatives during the winter and with the gondola and cog rail alternatives during the summer (there would be no stops at the trailheads). The transportation improvements would not change vehicle access during the summer or increase the amount of parking in Little Cottonwood Canyon at trailheads. UDOT does not expect the project alternatives to have appreciable indirect effects on the social resources of community facilities, public facilities and

services, or noise. The project alternatives would also have no indirect effects on hazardous waste sites or floodplains.

The economic impact analysis in Chapter 6, Economics, includes the potential direct and indirect effects of the project alternatives on the local and regional economies. In addition, the air quality analysis in this EIS considers regionwide conformity of transportation projects to the state implementation plan, so an analysis of potential indirect effects on air quality is included in Chapter 10, Air Quality.

The remainder of Section 20.4.1 discusses the methodology used for the indirect effects analysis. Sections 20.4.2 through 20.4.5 discuss the potential indirect effects of the project alternatives on land use, recreation, ecosystem resources (water quality, vegetation, soil, and wildlife), environmental justice populations, and tolling.

What is transportation conformity?

Transportation conformity refers to whether a proposed project would conform to the state implementation plan for meeting air quality standards. For more information, see Section 10.2.2, Transportation Conformity Requirements, in Chapter 10, Air Quality.

20.4.1.1 Land Use Changes

Evaluating the indirect effects of transportation projects can be a complex task. An indirect effects analysis involves evaluating how a given project could influence land use patterns over the project's planning horizon (for this EIS, the planning horizon is 2050). Land use patterns are the product of interdependent decisions by numerous parties including local elected officials, local and regional planning staff, developers, citizens, regional planning authorities, transportation agencies, and many other public and private entities. Land use patterns are strongly affected by economic and demographic forces that are beyond the control of governmental authorities and by an area's access to utilities such as power, water, and sewer.

UDOT based the analysis of the indirect effects on land use on a review of existing and proposed future development; existing and future improvements to the existing transportation network; improvements to travel time, access, and parking as a result of the action alternatives; and future city and county land use plans. These data were used to determine whether the action alternatives would influence changes to land use and the type and timing of development.

20.4.1.2 Visitor Use in Little Cottonwood Canyon

UDOT based the analysis of indirect effects on recreation use on the potential for buses, gondola service, or cog rail service to increase visitation to the ski resorts and the potential for transportation improvements to increase overall visitation in the canyon. There are no plans to operate the enhanced bus service alternatives in the summer, but UDOT would consider operating the gondola and cog rail alternatives in the summer with stops only at the ski resorts. Therefore, the indirect analysis in this chapter assumes that there would be no increase in summer visitation from the enhanced bus service alternatives and a potential for some increase in visitation at the ski resorts from the gondola and cog rail alternatives.

All of the trailhead parking alternatives decrease the availability of parking in the canyon and therefore would not increase summer use of designated trailheads or other access points into forest land outside the ski resorts. If in the future a plan is developed to implement summer transit to trailheads, the USDA Forest Service would prepare or be involved in the necessary study for implementation.

20.4.1.2.1 Winter Visitation

For winter use, the indirect effects analysis assumes an increased number of visitors based on increasing transit service (bus, gondola, or cog rail) and assuming that the buses, gondola service, or cog rail service operate to meet the 30th-highest hourly traffic volume demand, which is expected to occur on about 49 days (holiday periods and weekends). A toll or a ban on single-occupant vehicles would be implemented to reduce vehicle use by 30% on S.R. 210 in Little Cottonwood Canyon.

As shown in Table 20.4-1, with improved transit, there could be an additional 2,283 skiers divided between the Snowbird and Alta ski resorts on a busy ski day, or about 1,141 skiers per resort. Over the course of 49 busy ski days, that could be an additional 111,328 skiers per season. During the 2017–2018 winter season, the Alta and Snowbird resorts had about 853,000 skiers; therefore, the additional transit capacity could increase the number of skiers by about 13% over current conditions.

What is the 30th-highest hourly traffic demand?

The 30th-highest hourly traffic demand refers to the hour over an entire year with the projected 30th-highest traffic volume on S.R. 210 in Little Cottonwood Canyon. For more information, see Section 7.2.1.2, S.R. 210 – North Little Cottonwood Road to Alta, in Chapter 7, Traffic and Transportation.

Table 20.4-1. Change in Daily Skier Capacity with the Action Alternatives

Mode	Skier Capacity with Existing Infrastructure	Skier Capacity with Buses, Gondola, or Cog Rail
Parking capacity	7,595 ^a	7,595 ^a
Roadside parking	1,953 ^b	1,454 ^c
Transit	1,512 ^d	4,536 ^e
Reduction for ski resort employees ^f	1,062	1,304
Total skiers	9,998	12,281

^a Assumes resort parking of 3,500 parking spaces at average vehicle occupancy of 2.17.

^b Assumes roadside parking of 900 parking spaces at average vehicle occupancy of 2.17.

^c Assume elimination of winter roadside parking of 230 spaces as part of alternative. Vehicle occupancy of 2.17.

^d Assumes maximum capacity of current Utah Transit Authority (UTA) bus service of 36 trips from 7 AM to 1 PM with occupancy of 42 people per bus.

^e Assumes maximum capacity of Enhanced Bus Service Alternative with 108 trips from 7 AM to 1 PM with occupancy of 42 people per bus.

^f Assumes 9.6% of users are resort employees. The employees are reduced from the total skiers per day.

20.4.1.2.2 Summer Visitation

The analysis of summer visitation considers whether the proposed summer operation of a gondola or cog rail system in Little Cottonwood Canyon would merely provide an additional transportation amenity or whether it would attract additional visitors beyond those who would normally drive to the ski resorts for recreation. Summer visitation at the ski resorts is an extremely competitive market, with multiple resorts vying to maintain or improve their share of a market. Resorts often look to broaden their range of recreation offerings, which individually might not specifically increase visitation but collectively might improve the overall attractiveness of a resort. An example of this would be adding an alpine slide in the resort base area.

It is not possible to predict with any certainty the number of additional summer gondola and cog rail riders to the ski resorts beyond those who were already planning to make the trip by private vehicle. Some users might have planned a trip to the ski resorts by vehicle but might decide to take the gondola or cog rail instead to enjoy the scenic ride. The analysis in this chapter attempts to determine how many additional users would make the trip to the resorts only because of the gondola or cog rail. The proposed gondola and cog rail systems would have restrictions such as operating hours and a prohibition on bicycles. With such a prohibition on bicycles on the gondola or cog rail system, use of the trails below the Snowbird resort by cyclists would not increase as a result of the gondola or cog rail alternatives between the resorts and the entrance of Little Cottonwood Canyon. Many summer and fall events have their own appeal, and some of the people who would participate in the events might take the gondola or cog rail instead of using their personal vehicle. This would not increase the number of users in Little Cottonwood Canyon but rather would shift their transportation mode. During the summer, the price of a ticket to ride the gondola or cog rail would not be subsidized, which might discourage use since taking a personal vehicle would be faster and less costly.

Because summer use of the gondola and cog rail is difficult to predict, UDOT used the best available information regarding how new infrastructure can induce use (HDR 2020a). In 2018, a visitation and use assessment was conducted for a new gondola connecting the base areas at the Squaw Valley/Alpine Meadows ski resort in California. The assessment determined that the gondola would likely increase winter visitation by about 1.4% during the first year (SE Group and RRC Associates 2018). The rate of increased visitation was predicted to eventually go to zero in year 5 as the interest factor of the new gondola wore off. For the analysis of the gondola and cog rail alternatives in this chapter, the analysis assumes that the *number* of additional summer visitors—as a result of an assumed initial 1.4% bump in the first year—would stay constant through 2050. The Squaw Valley/Alpine Meadows analysis was used to predict summer visitation estimates for the gondola alternatives because of the similarities of a new gondola or cog rail system in a ski resort setting.

If a gondola or cog rail system is built in Little Cottonwood Canyon, tourists might take the gondola or cog rail to at least Snowbird for reasons of curiosity. The gondola or cog rail system might garner national and international media coverage, which could result in an initial increase in summer visitation in Little Cottonwood Canyon for tourists already traveling to Utah.

A traffic analysis conducted by UDOT based on historical data over a 10-year period found a 1.2% annual growth factor for traffic in Little Cottonwood Canyon. UDOT used the 2018 average eastbound traffic on S.R. 210 for Saturday and Sundays (4,660 vehicles) in the summer months of June through September and applied the 1.2% growth factor to determine the projected traffic in 2050. Based on the 2018 weekend summer traffic, UDOT determined that, in 2050, there would be an estimated 6,760 vehicle trips into Little Cottonwood Canyon. UDOT assumed a similar summer occupancy rate per vehicle of 2.1 persons as during

a winter weekend. This would result in about 14,196 visitors in Little Cottonwood Canyon on weekends in 2050. Using the 1.4% visitation increase attributed to the gondola or cog rail, about **198 additional visitors per day** would visit the ski resorts who would not have otherwise made the trip. This number is likely high because the traffic volumes include travel to all areas in Little Cottonwood Canyon, not just the ski resorts that would be served by the gondola or cog rail; however, the exact number of additional users overall could be higher or lower than the 198 predicted in this analysis.

The increased number of visitors to the ski resorts in the summer would be below the number of visitors in the winter, so the ski resorts have the infrastructure to support the use and would likely open the necessary facilities to accommodate the use. The additional 198 people per day might stay around the immediate resort area or hike on the trails surrounding the resorts.

20.4.1.3 Latent (or Induced) Demand

Latent demand (sometimes called induced demand) is the concept that increasing a road’s capacity, and thereby reducing congestion and travel time, encourages more people to drive on the road. However, the purpose of all of the action alternatives is to improve mobility on S.R. 210 and achieve this goal by reducing personal vehicle use in Little Cottonwood Canyon during the winter by implementing a toll or a ban on single-occupancy vehicles. The goal of the project is to reduce the use of personal vehicles in the canyon by 30%, thus counteracting the latent demand caused by less congested roads.

What is latent (or induced) demand?

Latent demand is the concept that increasing a road’s capacity, and thereby reducing congestion and travel time, encourages more people to drive on the road.

If S.R. 210 becomes more congested, the toll or vehicle occupancy restriction would be changed to continue to reduce the use of personal vehicles. In addition, none of the action alternatives increase winter parking, thus eliminating the potential for more vehicles accessing the ski resorts. The increase in visitation at the ski resorts would result from the increases in transit capacity provided by the bus, gondola, and cog rail alternatives. With the extra capacity provided by buses, gondola, and cog rail, it is possible that more people would have the opportunity to visit the resorts.

During the summer, traffic on S.R. 210 in Little Cottonwood Canyon operates under mostly free-flow conditions because travel is spread throughout the day. Since there is usually little congestion, latent demand is unlikely to occur. In addition, the action alternatives would not increase the roadway capacity of S.R. 210 during the summer. Therefore, with the action alternatives, S.R. 210 would essentially operate the same as under existing conditions during the summer, and induced travel or use is not expected.

20.4.1.4 Tolling or Vehicle Occupancy Restrictions

With any of the action alternatives, UDOT would implement a toll or a ban on single-occupant vehicles during the winter. The purpose of the toll or ban would be to incentivize transit use and reduce the use of personal vehicles during winter by 30% to the ski resorts. S.R. 210 in Little Cottonwood Canyon is the only road that services the ski resorts and it ends at the top of the canyon, so tolling would not increase traffic on other routes into Little Cottonwood Canyon since there are no bypass routes by which drivers could avoid vehicle restriction policies. Taking the enhanced bus service, gondola, or cog rail to the ski resorts would be the only option to avoid paying the toll.

A potential indirect effect of a toll or a ban on single-occupant vehicles on S.R. 210 could be that skiers would visit other ski resorts that are not accessed via roads with restrictions. The main traffic impact would be to S.R. 190 in Big Cottonwood Canyon, which is about 3 miles north of Little Cottonwood Canyon and provides access to two ski resorts (Solitude and Brighton). If skiers use S.R. 190 to avoid a toll or a ban on single-occupant vehicles on S.R. 210, this could increase congestion levels on S.R. 190, causing delays to reach the ski resorts and traffic backups on Fort Union Boulevard and Wasatch Boulevard near the entrance to Big Cottonwood Canyon.

To mitigate the potential for indirect effects in the form of increased congestion on S.R. 190, UDOT would likely implement a toll or a ban on single-occupant vehicles on this road as well, so both S.R. 190 and S.R. 210 would have similar congestion-management policies. If a toll were implemented for S.R. 190, bus service would need to be improved for those not willing to pay a toll or for single occupant vehicles. The indirect effects analysis considers the impact of a toll or a ban on single-occupant vehicles on S.R. 190.

20.4.1.5 Visitor Capacity Analysis

UDOT received numerous comments during the EIS scoping period that a visitor capacity analysis should be conducted to determine how many recreation users can be supported by the natural resources in Little Cottonwood Canyon before the environment and the recreation experience are degraded. The visitor capacity analysis could then inform the alternatives development process so that potential alternatives would be designed to limit the number of recreation users to the number determined by the visitor capacity analysis. Although some commenters felt that current levels of visitation are beyond the current capacity of the environment and the recreation experience in Little Cottonwood Canyon, other commenters supported transit and other alternatives that would improve the capacity of the transportation system.

Although the intent of the action alternatives in this EIS is not to increase visitation in the canyon but rather to improve overall transportation mobility by implementing transit and reducing personal vehicle use, it is likely that the growing recreation demand caused by an increase in population in Salt Lake Valley could increase visitation. During the EIS process, UDOT and the USDA Forest Service (a cooperating agency in preparing this EIS) considered the visitor carrying capacity of Little Cottonwood Canyon. The USDA Forest Service advised UDOT on the potential impacts to NFS lands and forest resources in accordance with the 2003 *Revised Forest Plan: Wasatch-Cache National Forest* (USDA Forest Service 2003).

The *Forest Plan* acknowledges that Mill Creek, Big Cottonwood, and Little Cottonwood Canyons provide a wide array of recreation opportunities designed to serve a large and growing urban population while maintaining stable watersheds, water quality, and the ecological integrity of the land, its physical resources, and its biological communities. The *Forest Plan* directs Forest decisions responding to increasing recreation demands to give first consideration to desired water quality and riparian conditions.

In specific regard to wilderness, the *Forest Plan* directs the USDA Forest Service to control and reduce the adverse impacts of human use through education and minimum regulation. The *Forest Plan* also indicates that the USDA Forest Service will not allow crowding and physical impacts from visitor use to reach levels where solitude is destroyed or evidence of humans dominates. Through its implementation of the *Forest Plan*, the USDA Forest Service closely monitors use levels on NFS lands to preserve forest resources and protect wilderness characteristics. The USDA Forest Service acknowledges that, in the future, management might be needed to limit resource impacts from user visitation. The *Forest Plan* states that such management options could include, but are not limited to, use capacity analysis, allowed use limits and quotas, permit systems, designated camp sites, wilderness management plans, and/or amendments to the *Forest Plan* (USDA Forest Service 2018).

For this EIS, a visitor capacity analysis was not performed. Through its implementation and monitoring of the management protocols and objectives in the *Forest Plan*, the USDA Forest Service determined that many areas on the Uinta-Wasatch-Cache National Forest can handle increased use, without substantial resource impacts, and while maintaining quality recreation experiences for visitors, with the construction and sustained operations and maintenance of infrastructure designed to accommodate current and future visitor demands. The construction and sustained operations and maintenance of infrastructure could greatly reduce visitor impacts to natural resources in some areas through controlled access, improved trails, proper toilet facilities, and safe parking. Throughout the EIS process, the USDA Forest Service collaboratively worked with UDOT and the other cooperating and participating agencies to develop mitigation measures, as necessary, for the alternatives evaluated in this EIS to protect NFS lands and forest resources (USDA Forest Service 2018).

The indirect effects analysis in this chapter is based on studies that evaluated the impacts of visitation in wilderness areas on water quality, wildlife, soils, vegetation, and trail users' expectations regarding the quality of their recreation experience.

20.4.2 Enhanced Bus Service Alternatives

The Enhanced Bus Service Alternative and the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would have the same indirect effects, as described below.

20.4.2.1 S.R. 210 – Wasatch Boulevard

UDOT does not expect that the additional roadway capacity that would be added on Wasatch Boulevard with the enhanced bus service alternatives would induce local or regional development. The proposed roadway widening is consistent with Cottonwood Heights City's land use and transportation plans for Wasatch Boulevard. City planning representatives also believe that residential growth along Wasatch Boulevard will continue with or without the S.R. 210 Project (that is, with an action alternative or with the No-Action Alternative) and that improvements to Wasatch Boulevard would not change the rate of development or the timing and types of developments (HDR 2019).

Additionally, for the following three main reasons, UDOT does not expect the improvements to Wasatch Boulevard proposed in this EIS to induce development.

- Wasatch Boulevard is part of a mature, regional transportation system that already provides a high degree of accessibility to the surrounding developed areas. Research has shown that the extent of indirect effects is influenced by the maturity of the regional transportation system, and greater effects are associated with new roads compared with existing roads that are expanded (Haughwout and Boarnet 2000; NCHRP 2002). No new roads are proposed with the S.R. 210 Project, and the existing access to the regional transportation network would not change except to improve safety and reduce congestion. Therefore, no new access to undeveloped areas would be provided.
- The improvements to Wasatch Boulevard are intended primarily to improve safety and reduce congestion on this 2.2-mile segment. UDOT does not expect the travel-time savings during peak travel periods to be great enough to substantially change regional land use patterns or to substantially shift development from one part of the region to another.

Traffic analyses have estimated that the travel-time savings in 2050 on the 2.2-mile segment of Wasatch Boulevard to be about 5 minutes on average per vehicle during the PM peak period (3 PM to 6 PM). Practitioners who study transportation-related indirect effects believe that at least 10 minutes of travel-time savings are needed before intraregional land use patterns are substantially affected (Avin and others 2007). In addition, adding new travel lanes would not shorten the distances among destinations, nor would it serve land that does not already have access to Wasatch Boulevard. The new travel lanes also would not affect travel times during nonpeak periods when traffic is currently typically free-flowing.

- Land use patterns and development have already established themselves along Wasatch Boulevard and in communities in southern Salt Lake County such as Draper. Because so much development has occurred, it is difficult to distinguish the role of Wasatch Boulevard from other factors that influence development, especially because the region already has a high level of transportation accessibility, and employment centers already are distributed throughout Salt Lake County. Therefore, it is not likely that improvements to Wasatch Boulevard would further change land uses.

Based on the above three factors, the proposed improvements to Wasatch Boulevard are not expected to induce development or population growth in Salt Lake County and thereby cause indirect effects.

20.4.2.2 S.R. 210 – North Little Cottonwood Road to Alta

20.4.2.2.1 Land Use

Ski Resorts

Similar to Wasatch Boulevard, S.R. 210 in Little Cottonwood Canyon is a mature transportation system. Neither of the enhanced bus service alternatives would increase roadway capacity for personal vehicles during the year. Personal vehicle access for current and future residents would be unchanged and so would not cause induced development changes in the town of Alta or on private land. The main change would be the increased transit capacity provided by the enhanced bus service.

As discussed in Section 20.4.1.2.1, Winter Visitation, the enhanced bus service could result in about 1,141 more skiers per resort on each of about 49 busy ski days per year. With the increase in skiers, the resorts might want to improve some infrastructure to handle the increased demand. See Section 20.4.2.2.2, Recreation, for more information regarding adding lift capacity at the resorts. Beyond lift improvements, the resorts might also want to add other facilities such as more restrooms and additional lodge capacity. These infrastructure improvements that would result from the increased visitation would not change the existing resort-based land uses and so would not result in an indirect effect on land use. Any changes to the ski resorts would require an update to each resort's master development plan.

Town of Alta

In 2019, the Town of Alta passed a resolution (2019-R-14) supporting a visitor management plan in anticipation of roadway capacity and mobility improvements on S.R. 210. Neither of the enhanced bus service alternatives would increase the capacity for personal vehicles on S.R. 210, and both alternatives would try to reduce personal vehicle use by 30% during the winter. Thus, there should be a beneficial impact to the transportation system in the town of Alta during the winter. Specifically, the enhanced bus service alternatives would reduce congestion and roadside parking by about 230 spaces near the resorts by eliminating winter roadside parking. The proposed bus service would stop at the ski resorts only and so would not induce visitation in the town of Alta. Overall, the proposed enhanced bus service improvements should reduce congestion in the town of Alta, thereby reducing the need for the Town to manage traffic, an activity that would affect the Town's operating budget.

20.4.2.2.2 Recreation

Winter Recreation

For winter use, the indirect effects analysis assumes an increased number of visitors based on increasing bus service and assuming that the buses operate to meet the 30th-highest hourly traffic volume, which is expected to occur on about 49 days (holiday periods and weekends). A toll or a ban on single-occupant vehicles would be implemented to reduce vehicle use by about 30% on S.R. 210 in Little Cottonwood Canyon. As shown above in Table 20.4-1, Change in Daily Skier Capacity with the Action Alternatives, with the enhanced bus service, there could be an additional 2,283 skiers divided between the Snowbird and Alta ski resorts on a busy ski day, or about 1,141 skiers per resort. This increase in use would occur on about 49 busy ski days per year (weekends and holiday periods).

The increase in users caused by the enhanced bus service alternatives could detract from the skier experience. Note that the analysis assumes that the enhanced bus service alternatives operate at 100% capacity from 7 AM to 1 PM. This is unlikely, so the total number of skiers would likely be less. In addition, some backcountry skiers might take the bus to the resorts, which could also increase backcountry use.

The ski resorts would be responsible for managing the increased visitation. The National Ski Area Permit Act of 1986, as amended by the Ski Area Recreational Opportunity Enhancement Act of 2011 (16 United States Code Section 497b), directs the U.S. Secretary of Agriculture to permit acreage sufficient and appropriate to accommodate a permittee's needs for ski operations and appropriate ancillary facilities, as determined by the Secretary, and does not explicitly direct the Secretary to set visitor capacity limits for the permitted acreage. Managing visitors' experience and safety is the responsibility of each individual ski area. This management is reflected in a ski area's master development plan, which is required by the standard Forest Service Ski Area Term Special Use Permit, and its operating plan, which outlines the ski area's responsibilities for protecting public health, safety, and the environment and for ensuring delivery of high-quality services. Additionally, the ski resort permits require the resorts to provide appropriate infrastructure to accommodate skiers.

Representatives with the ski resorts were uncertain how additional skiers would change ski resort operations. With the potential for about 1,141 additional skiers at each ski resort, the resorts might want to increase ski lift capacity to maintain the skier experience and reduce lift lines, or add other infrastructure at larger base facilities. Increasing lift capacity could include replacing existing ski lifts with higher-capacity ski lifts or new ski lifts. It is not possible at this time to identify specific improvements, the locations of the improvements, or the timing. Any improvements at the resorts have the potential to cause the following impacts:

- Temporary loss of soil productivity from construction compaction
- Soil erosion and sediment delivery to local streams
- Water quality impacts to the watershed
- Fill placed in wetlands
- Loss of vegetation and impacts to sensitive plant species
- Spread of invasive plants
- Loss of wildlife habitat
- Loss of cultural resources
- Change in the visual landscape character
- Improved access for skiers

If a resort were to propose to expand lift capacity or add other infrastructure to address an increased number of skiers, the USDA Forest Service would prepare an environmental document under NEPA. The environmental document would assess impacts and mitigation for the proposed improvements for consideration by the USDA Forest Service in its decision regarding whether to issue an approval. The resort would also need to obtain other environmental permits. The resorts would also need to work within the limits of existing culinary water allotments (provided by Salt Lake City) and sanitary sewer capacity. According to discussions with a representative with Salt Lake County Service Area #3, which manages drinking water and sewer use in Little Cottonwood Canyon, contracted water use is 34% of the total available amount, and sewer use is about 6%. Overall, the representative with Service Area #3 believes that there is enough water and sewer capacity to accommodate increased use (Hanson 2021).

Recreation users' perception of the additional skiers at each resort would vary. Most ski resort users expect some level of crowds and lift wait times. Not all recreationists perceive the environment in the same way; what is a quality ski experience to one person might be entirely undesirable to another. It is not possible to predict each user's recreation experience, but increased use of recreation areas and longer lift lines would likely lower the quality of the recreation experience for most users. The impacts to backcountry use, during which some users might expect some solitude while skiing, would be greater. Overall, the quality of the recreation experience depends on the expectations of each user, even with increased visitation.

Increased use at the resorts and in the backcountry could increase safety risks, specifically an increase in the potential for user conflicts on busy ski terrain. At the resorts, these conflicts are managed to reduce the risk of an accident. However, as the number of skiers increases, the risk of an accident could increase if the additional use is not managed appropriately. In the backcountry, skier conflicts are not managed. If backcountry use does increase, the risk of skiing accidents and skier-induced avalanches could also increase.

Summer Recreation

The enhanced bus service alternatives would not operate during the summer, so there would be no change to visitor summer use as a result of bus service that could cause indirect effects on recreation use. However, with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, cyclists would be allowed to use the shoulder lane during the summer and during the winter when the lane is not being used by buses.

UDOT evaluated the potential for the peak-period shoulder lanes to induce additional cyclist use in Little Cottonwood Canyon. No available data or studies are available with which to accurately predict how improved shoulders would induce cyclist use in conditions similar to Little Cottonwood Canyon. S.R. 210 is very steep; its average grade is 7.2%, and its maximum grade is 11%. This steep grade deters typical recreational or casual cyclists because of the steep climb and the fast speeds when going downhill (often equal to vehicle speeds of 40 miles per hour). The total elevation gain from the canyon entrance to the town of Alta is about 4,000 feet over 8 miles. The steep grade deterrent could be overcome by the use of electric bicycles, but cyclists would still need to contend with downhill speeds.

In addition, the peak-period shoulder lanes would not be separated from the travel lanes by a barrier. As occurs currently on S.R. 210, cyclists biking uphill would be traveling much more slowly than vehicles on a windy canyon road, which might make some users uncomfortable. Typically, cyclists feel more comfortable in a barrier-separated lane, which is more likely to increase cyclist use (Aldred and others 2017; IIHS 2019). Because the steep grades in the canyon would remain, and because the peak-period shoulder lanes would not be separated from the travel lanes by a barrier, UDOT does not expect the Enhanced Bus Service in Peak-period Shoulder Lane Alternative to substantially increase cyclist use of S.R. 210 in Little Cottonwood Canyon. The use of electric bicycles could increase; it is not possible to predict the increases in electric bicycle use.

20.4.2.2.3 Ecosystem Resources (Water Quality, Vegetation, Soil, and Wildlife)

Winter

As stated in Section 20.4.2.2.2, Recreation, UDOT expects that the number of winter skiers (resort and backcountry) would increase on busy ski days. The ski resorts are designed for winter use and have appropriate infrastructure to manage the use as required by their respective special-use permit. Refer to that section for more information regarding adding lift capacity and other infrastructure at the resorts and the potential environmental impacts from these improvements. The impacts could include increased erosion and sediments, reduced water quality, and loss of vegetation and wildlife habitat.

Currently, under the existing conditions, backcountry skiers disturb some wildlife and cause some water quality impacts (as a result of no restrooms being available). If improved transit use results in more backcountry use, there would be an increase in wildlife disturbance and the potential for indirect effects on the watershed. Backcountry use could increase at a similar rate as ski resort use with enhanced bus service. However, neither of the enhanced bus service alternatives is proposing additional backcountry access, only additional transit capacity to the resorts. The actual increase in backcountry use is difficult to predict since it depends on each backcountry skier's willingness to use transit and walk from the ski resorts to access backcountry areas; however, backcountry use could increase.

A literature analysis found that people who rapidly or directly approach wildlife are more distressing for wildlife than are people who approach slowly or indirectly. One source stated that hikers approaching from above and over a ridge are particularly surprising to wildlife. Backcountry skiers follow a similar pattern as hiking since they ascend mountains on skis and descend at high speeds. Backcountry skiing therefore results in less predictable human-wildlife interactions than on-trail skiing and results in a large zone of influence on wildlife. Recent assessments suggest that recreationists, like predators, affect animals' individual fitness and, in turn, population dynamics. This is important to understand and communicate to the public because nonmotorized recreationists tend to believe that their activities are benign due to their dispersal across large areas. However, this wide distribution might actually exacerbate users' disturbance of wildlife (Wrigley, no date).

An increase in the number of backcountry skiers could have a minor impact on the watershed from users not having access to restrooms. The actual change to the watershed from an increase in backcountry use is difficult to predict, but a minor indirect effect is expected.

Summer

The enhanced bus service alternatives would not operate during the summer, so there would be no change to visitor summer use as a result of bus service and no associated indirect effects on ecosystem resources.

As stated in the section titled Summer Recreation on page 20-14, UDOT does not expect the Enhanced Bus Service in Peak-period Shoulder Lane Alternative to substantially increase cyclist use of S.R. 210 because of the addition of the peak-period shoulder lanes. Cyclists would ride in a paved shoulder lane and would have the opportunity to use restrooms at trailheads and the ski resorts. Therefore, UDOT does not expect that any induced cyclist use would degrade water quality in the Little Cottonwood Canyon watershed.

20.4.2.3 Mobility Hubs Alternative

The enhanced bus service alternatives would include two mobility hubs: one at the gravel pit and the other at 9400 South and Highland Drive.

20.4.2.3.1 Gravel Pit

The gravel pit mobility hub would be located at a site that is currently occupied by an active aggregate mine and would include a parking structure of about 1,500 spaces. Cottonwood Heights City's planning of the site would allow for a major commercial and residential development when mining operations cease. Cottonwood Heights City has stated that the mobility hub would complement the development by providing parking and potential patrons who would use the commercial establishments before or after skiing. The City has also stated that the planned development at the gravel pit would occur with or without the mobility hub. Without the mobility hub, the layout of the site would be different, with parking mixed throughout the development instead of in one central location. Because the development envisioned by Cottonwood Heights City would occur with or without the mobility hub, the gravel pit mobility hub would not induce development at the existing site.

What is a mobility hub?

A mobility hub is a location where users can transfer from their personal vehicle to a bus.

What is the gravel pit?

The gravel pit is an existing aggregate (gravel) mine located on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard.

20.4.2.3.2 9400 South and Highland Drive

The 9400 South and Highland Drive location already has a UTA park-and-ride lot, and the area surrounding the park-and-ride lot is fully developed with commercial and residential uses. Therefore, the expanded mobility hub at this location would not induce development in undeveloped areas. Some redevelopment could occur.

20.4.2.4 Avalanche Mitigation Alternatives

The avalanche mitigation alternatives would not induce traffic growth or change the patterns or amount of recreation use in Little Cottonwood Canyon; therefore, no indirect effects are anticipated from the avalanche mitigation alternatives.

20.4.2.5 Trailhead Parking Alternatives

Recreation

With the trailhead parking alternatives, the overall amount of summer parking available in Little Cottonwood Canyon would decrease by between 17 and 429 spaces compared to what is currently available. Under the alternative with the least reduction in parking spaces (17), the current roadside parking would be eliminated by placing no-parking signs within ¼ mile of the trailheads, and the number of parking spaces at existing parking areas would be increased by the number of eliminated parking spots on the roadside. Because overall parking levels would not increase with any of the trailhead parking alternatives, there would be no adverse indirect effects on trailhead use from the enhanced bus service alternatives. However, some recreation users would be negatively affected since the amount of parking at trailheads would be reduced.

Overall, the improvements to trailhead parking and the elimination of roadside parking would benefit recreation users by providing restroom facilities, designated parking areas, and safe parking and trail access. The overall goal of the improved trailhead parking is to focus parking at the smaller areas of the trailheads rather than being distributed widely along S.R. 210. Focusing impacts on a smaller area allows greater efficiencies in management.

The No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative would reduce parking by 429 spaces. This alternative would likely have the greatest benefit to recreation users who seek solitude by reducing the number of people who can access a specific trailhead.

Ecosystem Resources (Water Quality, Vegetation, Soil, and Wildlife)

The trailhead parking alternatives would not increase visitation, so there would be no indirect negative effects from visitation on water quality, vegetation, soil, or wildlife at trailheads. Potential direct and indirect effects on these resources from construction and operation of the improved trailheads are described in Chapter 12, Water Resources, and Chapter 13, Ecosystem Resources.

There would be a potential indirect benefit from improved trailhead parking. Eliminating roadside parking would reduce the indirect effects of “spider web” trails, including the potential for invasive species, soil erosion, litter, and poor sanitation practices caused by recreation users parking along the road and entering the forest at random locations, as they would with the No-Action Alternative. When users park along a road, the resulting unmanaged use can directly disturb riparian habitat, destroy vegetation by creating unauthorized trails, erode stream banks, produce litter and waste, increase the potential for wildlife encounters, and degrade water quality (USDA Forest Service 2016).

Concentrating recreation users to managed trailheads would result in positive effects. The benefits of managed trailheads would include reducing the degradation of riparian habitat, reducing soil erosion, and improving water quality with the introduction of more restrooms and water quality buffers at parking areas. Installing toilets at the trailheads and providing information on kiosks about conservation would improve water quality by reducing poor sanitation practices by users. If toilets are available, users would be less likely to use the riparian area and other drainage features to relieve themselves. Kiosks would inform forest users about ways to have less of an impact on the wilderness and ways to “leave no trace” (USDA Forest Service 2016).

The elimination of roadside parking from the S.R. 209/S.R. 210 intersection to Snowbird Entry 1 would have the greatest indirect beneficial effect on soil erosion, water quality, and wildlife by reducing the number of unmanaged trail networks into the forest and focusing use to authorized trailheads where use can be managed.

20.4.3 Gondola Alternative A (Starting at Canyon Entrance)

Gondola Alternative A is designed to have the same person-carrying capacity from North Little Cottonwood Road to the town of Alta as the enhanced bus service alternatives. Therefore, the indirect effects of Gondola Alternative A would be the same as those of the enhanced bus service alternatives with regard to the indirect effects of the mobility hubs, avalanche mitigation alternatives, and trailhead parking alternatives, as well as indirect effects during the winter on land use, recreation, and ecosystem resources, from North Little Cottonwood Road to the town of Alta.

Gondola Alternative A would not have indirect effects on the Wasatch Boulevard segment of S.R. 210. However, unlike the enhanced bus service alternatives, Gondola Alternative A would operate during the summer, so it would have the potential for additional indirect effects on land use, recreation, and ecosystem resources during the summer. The indirect effects of summer gondola use are described below.

What are gondola base and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's gondola trip. Passengers board and disembark the gondola cabins at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

20.4.3.1 Land Use

Potential summer use of the gondola could increase visitation to the Snowbird and Alta resorts. Most users would stay at the resorts or use the adjacent trails. UDOT does not expect that gondola use would change development patterns in the town of Alta.

20.4.3.2 Recreation

As described in Section 20.4.1.2.2, Summer Visitation, Gondola Alternative A would operate during the summer. During the summer, the price of a ticket to ride the gondola would not be subsidized, which could discourage use since taking a personal vehicle would be faster and less costly. However, the summer operation of the gondola could increase summer visitation by about 198 people per day. Even with the increase in summer users, the resorts would still operate well below their wintertime use. The additional summer users could increase crowds at both resorts including at restaurants, shops, and other resort attractions. This would provide an indirect economic benefit to the resorts.

The additional gondola users might also decide to hike on trails at the resorts. UDOT does not anticipate that all 198 additional users per day would go to one resort, but rather that the additional users would be divided between Alta and Snowbird, with Snowbird receiving the majority because it would be the first gondola stop and has more summer amenities. Also, not all additional users would go hiking; some would stay within the developed resort area. Assuming that the 198 users per day would be spread throughout the day, trail use would not increase substantially enough to detract from users' outdoor recreation experience at the resorts.

To eliminate the potential for mountain bikers to take the gondola up to the Snowbird resort and ride down on unauthorized trails or trails not designed for mountain bike use, users would not be allowed to bring bicycles into the gondola cabins. This could be perceived as a negative impact to mountain bike recreation, but it would benefit wildlife, wildlife habitat, and hikers by not increasing use of unauthorized trails or

increasing bike use on existing trails as a result of the gondola. Bicycles would be prohibited until the USDA Forest Service makes an administrative decision regarding the construction of NFS trails below the resorts for bicycle use.

20.4.3.3 Ecosystem Resources (Water Quality, Vegetation, Soil, and Wildlife)

The most likely impacts to ecosystem resources would be from summer hikers. Given the additional 198 summer users per day as described in Section 20.4.1.2.2, Summer Visitation, the increased trail use with Gondola Alternative A could increase the following effects:

- Soil erosion and sediment delivery to local streams
- Water quality impacts to the watershed
- Loss of vegetation and impacts to sensitive plant species
- Spread of invasive plants
- Potential to disturb wildlife

Because not all 198 additional users per day would go hiking and because any hiking would be spread among the numerous existing trails surrounding the resorts, UDOT does not anticipate substantial indirect effects from summer use of the gondola on water quality, vegetation, soil, or wildlife.

20.4.4 Gondola Alternative B (Starting at La Caille)

The indirect effects of Gondola Alternative B would be the same as those of Gondola Alternative A except for the potential to induce development around the gondola base station at La Caille.

Gondola Alternative B would be located at a future development called the La Caille Center and Villages. The development would be located on about 37.5 acres and would include residential units, restaurants, a winery, a hotel, and shops. The developers would preserve a portion of the development (Superior Peak Phase II) for the Gondola Alternative B base station and 1,500 parking stalls. Noted in the development plan is that “the La Caille Master Plan is not dependent upon the gondola being constructed on this site. Superior Peak Phase II (3-year estimate) will not be constructed until the gondola decision is made, and if it is not chosen it will be sold as individual lots” (CW Management Corporation 2020).

Because the La Caille Center and Villages development would be built with or without Gondola Alternative B, the proposed gondola base station at this location would not induce development, and no indirect effects on land development and associated environmental resources would occur. However, the location of the gondola base station adjacent to the La Caille Center and Villages development could provide an economic benefit to the proposed hotels, shops, and restaurants.

20.4.5 Cog Rail Alternative (Starting at La Caille)

With the Cog Rail Alternative, as described in Section 20.4.1.2.2, Summer Visitation, the cog rail service would operate during the summer, the same as with the gondola alternatives. As with the gondola alternatives, UDOT expects that summer operation of the Cog Rail Alternative could increase summer visitation at the resorts by about 198 people per day in 2050. Therefore, the indirect effects of the Cog Rail Alternative's summer operations on land use, recreation, and ecosystem resources would be the same as those of Gondola Alternative A.

The potential for the Cog Rail Alternative to induce development at the cog rail base station at La Caille would be the same as for the gondola base station with Gondola Alternative B.

What are cog rail base and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's cog rail trip. Passengers board and disembark the cog rail vehicles at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

20.4.6 Tolling or Vehicle Occupancy Restrictions on S.R. 210

Some commenters stated that a toll or a ban on single-occupant vehicles in Little Cottonwood Canyon could cause users to shift to Big Cottonwood Canyon or potentially another resort, thereby impacting other roads or creating additional crowds. As stated in Chapter 6, Economics, for tolling to be effective in reducing congestion on S.R. 210 and to get about 30% of personal vehicle users onto transit, the toll could be between \$20 and \$30 per vehicle (the final cost has not been determined and would be based on travel demand). At that toll rate, about 550 vehicles or about 1,200 skiers (assuming an average vehicle occupancy of 2.17 people) per day might no longer visit the ski resorts in Little Cottonwood Canyon, instead going to other ski resorts (HDR 2020b).

What is travel demand?

Travel demand is the expected number of transportation trips in an area. Travel demand can be met by various modes of travel, such as automobile, bus, rail, carpooling, walking, and cycling.

If tolling or a ban on single-occupant vehicles were implemented in Little Cottonwood Canyon, UDOT would likely implement a similar tolling policy in Big Cottonwood Canyon to reduce the potential for causing greater traffic congestion on S.R. 190. Therefore, it is unlikely that tolling would cause indirect effects from increased use if tolling were implemented. Additionally, with improved travel times from the project alternatives on S.R. 210 in Little Cottonwood Canyon, it is not likely that users would shift to Big Cottonwood Canyon.

There could be a shift of skiers to the other resorts along the Wasatch Front if a toll were implemented in both Big and Little Cottonwood Canyons. It is not possible to know which resorts the skiers would visit to avoid paying a toll in the Cottonwood Canyons. However, given that there are three other resorts within a similar driving time from Salt Lake City, UDOT does not expect tolling to cause either additional roadway congestion or overcrowding at any one resort.

The USDA Forest Service may implement site fees in Little Cottonwood Canyon under the Federal Lands Recreation Enhancement Act. The fees would apply to specific recreation sites such as the Grit Mill and White Pine Trailheads. The proposed UDOT toll would apply only to areas above Snowbird Entry 1, so there would be no toll on users of specific recreation sites below this point. In addition, the UDOT toll would be in effect only during busy morning periods in the winter, so late spring, summer, and fall users would not need

to pay a toll in addition to a site fee for recreation above Snowbird Entry 1. Winter backcountry skiers who park at the end of S.R. 210 to ski might need to pay a toll or subsidized transit fee plus a USDA Forest Service site fee to access winter backcountry skiing. If a recreation site fee is implemented, UDOT would work with the USDA Forest Service to develop a system to prevent backcountry users from having to pay two fees. This system could include UDOT paying a yearly fee for winter operation and maintenance of amenities at the recreation site or potentially constructing the amenities for the USDA Forest Service.

20.4.7 Tolling or Vehicle Occupancy Restrictions on S.R. 190 in Big Cottonwood Canyon

If tolling or a ban on single-occupant vehicles were implemented on S.R. 210 in Little Cottonwood Canyon, UDOT would likely implement similar congestion-management strategies for S.R. 190 in Big Cottonwood Canyon. Similar to S.R. 210, UDOT would also likely implement an improved bus service on S.R. 190 for those users who do not want to pay a toll or carpool. The potential indirect effects on S.R. 190 could be to environmental justice populations from a toll and to all users from the construction and operation impacts from implementing an improved bus service.

20.4.7.1 Indirect Effects on Environmental Justice Populations

The tolling impacts on S.R. 190 would be similar to those described for S.R. 210 (see Chapter 5, Environmental Justice). The toll would likely be in effect in the upper canyon immediately before the Solitude ski resort, thereby allowing continued nontolled access to the lower portions of Big Cottonwood Canyon. The toll would not apply to residents of Big Cottonwood Canyon.

Along with any toll, UDOT would likely implement improved bus service. The improved bus service along with tolling would likely improve travel times to the ski resorts in Big Cottonwood Canyon. The reduction in travel time would benefit all populations including minority and low-income populations that recreate in Big Cottonwood Canyon during the winter. In addition, the improved bus service would provide frequent bus service from a mobility hub, and the travel time and convenience would be the same as taking a personal vehicle, thereby providing efficient access to all populations that want to access the ski resorts. The bus service would run directly from the mobility hub to the ski resorts.

Currently, bus service is provided free for season ski pass holders and resort employees and for a charge of \$5 per trip for non-pass holders. Similar to existing conditions, the improved bus service would cost substantially less than a toll in order to make the service an attractive alternative to using a personal vehicle. The proposed toll rate could range between \$20 and \$30 per vehicle, which many skiers could see as a financial burden. However, because the improved bus service would include a low-cost, convenient alternative to paying the toll with the same travel time as a personal vehicle, it would not be an adverse impact to any populations accessing the ski resorts. Overall, an improved bus service would provide a substantial travel time benefit to all skiers and employees at the resorts. The bus service could be used by backcountry skiers as well.

Because the improved bus service would provide convenient access to all populations and would provide a low-cost alternative to paying a toll, tolling would not cause disproportionately high and adverse effects on any minority or low-income populations wishing to access the ski resorts, in accordance with the provisions of Executive Order 12898 and Federal Highway Administration Order 6640.23a.

Some members of low-income populations might use S.R. 190 to access recreation at Guardsman Pass to snowmobile, backcountry ski, snowshoe, and cross-country ski. This area would not be serviced by the improved bus service, but it would be within the tolled area. The Guardsman Pass area does not receive a high amount of use because of the limited parking along the narrow road, but some low-income populations might use this area. The toll could be in effect during the morning peak period only (7 AM to 10 AM), which would allow low-income populations to recreate after 10 AM to avoid having to pay the toll. With the implementation of these measures, UDOT would reduce the adverse effects on low-income populations from the toll for those wanting to recreate at Guardsman Pass. Therefore, with the proposed mitigation measures, tolling would not cause disproportionately high and adverse effects on any minority or low-income populations that want to use Guardsman Pass, in accordance with the provisions of Executive Order 12898 and Federal Highway Administration Order 6640.23a.

During the winter, the lower portion of Big Cottonwood Canyon (below the Solitude ski resort and outside both the Solitude and Brighton ski resorts) is used by recreationists to snowshoe, backcountry ski, ice climb, hike, and rock climb. With the improved bus service, there would be no bus stops in the lower canyon at trailheads for environmental justice populations as an alternative to paying a toll. Increasing the number of bus stops to address the wintertime lower-canyon users would slow the bus service for the vast majority of users, thereby making the service less attractive as an alternative to paying a toll. Not having an alternative to paying a toll to use the lower canyon to recreate could be an adverse impact to low-income populations. Practicable measures to avoid or reduce these potential adverse effects could include the following:

- Place the toll gantry immediately prior to the Solitude ski resort. This would allow low-income populations wanting to recreate outside the ski resorts in the lower portion of Big Cottonwood Canyon to avoid having to pay the toll.
- Have the toll in effect only during the morning peak period (7 AM to 10 AM), which would allow low-income populations to recreate after 10 AM to avoid having to pay a toll.

With the implementation of these measures, UDOT would reduce the adverse effects on low-income populations from the toll for those wanting to recreate in the lower portion of Big Cottonwood Canyon. Therefore, with the proposed mitigation measures, tolling would not cause disproportionately high and adverse effects on any minority or low-income populations, in accordance with the provisions of Executive Order 12898 and Federal Highway Administration Order 6640.23a.

The travel demand management strategy of a ban on single-occupant vehicles would eliminate single-occupant vehicles from Big Cottonwood Canyon during peak travel periods (7 AM to 10 AM) and would require the single occupants to use the improved bus service to visit the ski resorts. For low-income populations, this strategy would not have a disproportionately high and adverse effect for those wanting to recreate in the lower canyon since they can carpool or wait to recreate after peak periods, similar to other lower-canyon users.

20.4.7.2 Indirect Effects of Improved Bus Service

If UDOT implements a toll or a ban on single-occupant vehicles on S.R. 190, an improved bus service would be implemented. The service would likely start at the gravel pit mobility hub and provide direct bus service to the Solitude and Brighton ski resorts. In Big Cottonwood Canyon, the buses would likely stop at the Solitude ski resort or on the loop at the Brighton ski resort. Some improvements at these locations might be needed for the bus service, but UDOT anticipates that they would occur within existing paved areas. No other stops are anticipated, and UDOT would not provide summer bus service since there would likely not be a summer toll.

At the gravel pit mobility hub, UDOT might need to expand the parking and bus service (including any associated maintenance) area beyond that described for the enhanced bus service alternatives for S.R. 210. This expansion could include increasing the height of parking structure or building a separate structure for S.R. 190 bus service. The construction would occur within the existing gravel pit area. A survey of this area found no wetlands or other biological resources and no cultural resources. With any mobility hub, UDOT would ensure the appropriate water quality treatment. With the additional bus service and vehicles accessing the mobility hub, the amount of air pollutant emissions from vehicles on Wasatch Boulevard would increase. The increased air pollutant emissions along with the S.R. 210 mobility hub traffic could cause local air quality impacts during peak use periods during the winter.

The traffic impacts with the gravel pit mobility hub would be minor. UDOT has designed the gravel pit mobility hub with an interchange that could accommodate the additional traffic from the enhanced S.R. 190 bus service.

20.4.8 Mitigation Measures

The implementation of tolling in Big Cottonwood Canyon could cause an adverse impact to low-income populations wanting to recreate during the winter in the lower canyon (below the ski resorts) or at Guardsman Pass. Practicable measures to avoid or reduce these potential adverse effects could include the following:

- Place the toll gantry immediately prior to the Solitude ski resort. This would allow low-income populations wanting to recreate outside the ski resorts in the lower portion of Big Cottonwood Canyon to avoid having to pay the toll.
- Have the toll in effect only during the morning peak period (7 AM to 10 AM), which would allow low-income populations to recreate after 10 AM to avoid having to pay the toll.

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Chapter 21: Cumulative Impacts

21.1 Introduction

In 2020, the Council on Environmental Quality (CEQ) issued revised regulations for implementing the National Environmental Policy Act (NEPA), which apply to any NEPA process begun after September 14, 2020. The initial Notice of Intent to develop this Little Cottonwood Canyon Environmental Impact Statement (EIS) was published in 2018, and the NEPA process for this EIS has been ongoing since that time. For this reason, the Utah Department of Transportation (UDOT) is conducting the cumulative impact analysis for this EIS based on CEQ's previous implementing regulations, and all citations in this and other chapters of the EIS refer to the prerevision version of the NEPA regulations.

What are cumulative impacts?

Cumulative impacts are the impact to the environment resulting from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions.

Those regulations require an assessment of cumulative impacts as part of the NEPA process. The regulations ensure that the proposed State Route (S.R.) 210 Project and other federal, state, and private actions will be evaluated with regard to cumulative impacts. Cumulative impacts are defined by the CEQ regulations at 40 Code of Federal Regulations (CFR) Section 1508.7. The 1978 CEQ regulations define a *cumulative impact* 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 non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

A cumulative impacts analysis considers the direct and indirect impacts of a proposed project in the context of impacts from other previous, ongoing, and anticipated future actions to determine whether the overall effect of these actions would be substantial.

21.2 Methodology for Determining Cumulative Impacts

UDOT's methodology for determining the cumulative impacts of the action alternatives for the S.R. 210 Project is based on the guidance *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997). This section provides a general overview of the methodology used to conduct the cumulative impacts analysis. The analyses of direct and indirect impacts are provided under the appropriate resource sections in this chapter.

21.2.1 Important Cumulative Impacts Issues Associated with the S.R. 210 Project

The S.R. 210 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. However, according to CEQ’s cumulative impacts guidance, the cumulative impacts analysis should be narrowed to focus on important issues at a national, regional, or local level. The analysis should look at other actions that could have similar effects and whether a particular resource has been historically affected by cumulative actions.

21.2.2 Cumulative Impact Concerns Identified during Scoping

Public and agency scoping meetings were held to help identify issues to be analyzed in this EIS. UDOT reviewed the comments received during the public and agency scoping periods to determine whether any important issues were identified. The public and agencies identified the following main concerns regarding cumulative impacts:

- Continued degradation of the watershed in Little Cottonwood Canyon
- Further degradation to the ecosystem caused by increased visitation and development in Little Cottonwood Canyon
- Further reduction in solitude from increased recreation use on trails in the Wilderness Areas
- Impacts to regional air quality

What is scoping?

Scoping is an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.

21.2.3 Important Cumulative Impacts Issues and Analysis

The CEQ guidance document *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997) states that not all potential cumulative effects issues identified during scoping need to be included 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.

21.2.3.1 Resources Not Requiring a Detailed Cumulative Impact Analysis

Listed below are the resources that could experience direct or indirect impacts from the action alternatives. Based on a review of these resources, UDOT determined that the potential direct and indirect impacts to these resources would be inconsequential to decisions about the action alternatives and do not pertain to issues of local, regional, or national importance.

- **Land Use and Planning.** As described in Chapter 3, Land Use, most of the project improvements would be adjacent to S.R. 210 in urban areas along Wasatch Boulevard and on mostly public lands in Little Cottonwood Canyon. The project as proposed would not induce land development that would change adjacent land uses to S.R. 210. The property acquisition outside the right of way would not change the type or function of land uses surrounding S.R. 210 (these land uses are urban, recreation, wilderness, and open space). The S.R. 210 Project would have inconsequential changes the land use surrounding the existing roadway and in the region. The S.R. 210 Project would not

contribute to cumulative issues important to the project decision or pertain to issues of local, regional, or national importance.

- **Community and Property Impacts.** As described in Chapter 4, Community and Property Impacts, none of the attributes or amenities that define the surrounding communities, such as cohesion, enjoyment of solitude, and community facilities and services, would be substantially changed by the action alternatives. Overall, none of the impacts to community resources except for recreation would contribute to cumulative issues important to the project decision or pertain to issues of local, regional, or national importance.
- **Air Quality.** As described in Chapter 10, Air Quality, overall the S.R. 210 Project would reduce congestion and travel time on S.R. 210 from Fort Union Boulevard to the town of Alta. The project as proposed would reduce personal vehicle use in the winter by 30% on S.R. 210 in Little Cottonwood Canyon. The reduction in congestion, travel time, and personal vehicle use would reduce overall vehicle emissions. In addition, the analysis showed that the S.R. 210 Project would not contribute to any new violations of, increase the frequency or severity of any existing violations of, or delay timely attainment of the National Ambient Air Quality Standards for particulate matter (PM₁₀ or PM_{2.5}).

What is a mobility hub?

A mobility hub is a location where users can transfer from their personal vehicle to a bus.

What is the gravel pit?

The gravel pit is an existing aggregate (gravel) mine located on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard.

Aspects of the project (improvements to Wasatch Boulevard, improvements to S.R. 210 in Little Cottonwood Canyon, and a mobility hub at the gravel pit) are identified in the conforming regional transportation plan (WFRC 2019) as well as in the relevant transportation improvement program (WFRC 2020), which is a cumulative analysis of all proposed transportation projects in the Salt Lake Valley. Because the project would overall reduce vehicle emissions, would not contribute to any new air quality violations, and is part of the transportation conformity requirements, the action alternatives would not contribute to cumulative impacts to air quality.

- **Noise.** As described Chapter 11, Noise, the action alternatives would generally increase noise levels on average by 2 A-weighted decibels (dBA) throughout the noise impact analysis area. People generally cannot detect a 1-to-2-dBA increase in noise levels; therefore, the slight increase in noise levels would be inconsequential to the overall perception of noise by residents and the recreation users adjacent to the action alternatives. This impact would not contribute to cumulative issues important to the project decision or pertain to issues of local, regional, or national importance.
- **Floodplains.** As described in Chapter 14, Floodplains, the action alternatives would fill less than 3 acres of floodplains. Culverts and bridges in regulatory floodplains would be designed to accommodate a 100-year flood (one with a 1% chance of occurring in a given year) in accordance with Federal Emergency Management Agency (FEMA) and local floodplain ordinance criteria. These design standards, together with the proper placement of structures and walls, would reduce the risk that the S.R. 210 improvements would exacerbate flooding conditions. The proposed detention systems along portions of the action alternatives would reduce the stress on the stormwater system compared to the existing conditions, since areas along Wasatch Boulevard currently have no detention facility and stormwater currently discharges directly to adjacent water bodies. Overall, the

less than 3 acres of floodplain impact would be inconsequential to the overall function of the floodplain and stormwater systems. It would not contribute to cumulative issues important to the project decision or pertain to issues of local, regional, or national importance.

In making these determinations, UDOT considered the projects and activities listed in Table 21.2-1, Present and Reasonably Foreseeable Future Actions, on page 21-11 as well as the past and present conditions of the resources near the action alternatives. Because UDOT determined that none of the resources listed above would experience substantial direct or indirect impacts that would contribute to cumulative issues important to the project decision or that would pertain to issues of local, regional, or national importance, no further cumulative impacts analysis was performed for the resources listed above.

21.2.3.2 Resources Requiring Further Cumulative Impact Analysis

Based on the scoping process and the potential for direct and indirect impacts from the S.R. 210 Project, UDOT identified four important cumulative impacts issues that might be pertinent to the decision. These four issues are the focus of the cumulative impacts analysis in this EIS:

- Recreation
- Water resources
- Ecosystem resources
- Visual resources

21.2.4 Geographic Scope for the Analysis

The geographic scope of the cumulative impacts analysis was determined by establishing the area of project impacts and determining the geographic areas occupied by the affected resource. The specific geographic scope of analysis for each resource is listed below and shown in Figure 21.2-1 through Figure 21.2-4):

- **Recreation.** The recreation geographic scope of the analysis is the recreation resources in Little Cottonwood Canyon (designated trails, climbing resources, ski resorts, trailheads, backcountry skiing, and other recreation activities).
- **Water Resources.** The water resources geographic scope of the analysis is upper Little Cottonwood Creek from the Metropolitan Water District of Salt Lake and Sandy's water treatment plant to the creek's headwaters.
- **Ecosystem Resources.** The ecosystem resources geographic scope of the analysis is Little Cottonwood Canyon but includes a discussion of the greater central Wasatch Mountains because past changes in the central Wasatch Mountains influence Little Cottonwood Canyon.
- **Visual Resources.** The visual resources geographic scope of the analysis is the visual resources along Wasatch Boulevard in Cottonwood Heights and in Little Cottonwood Canyon.

Figure 21.2-1. Recreation Geographic Scope of Analysis

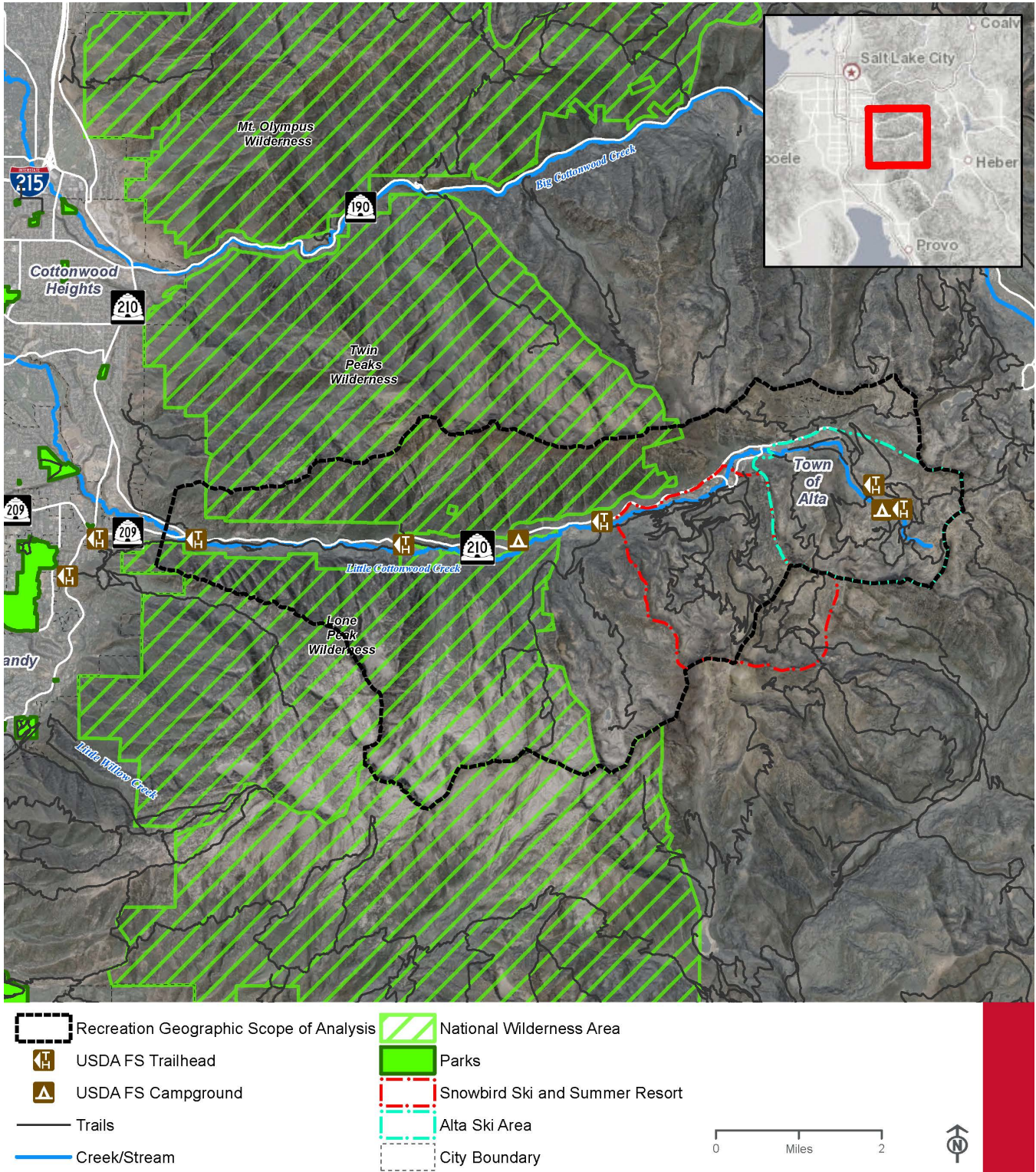
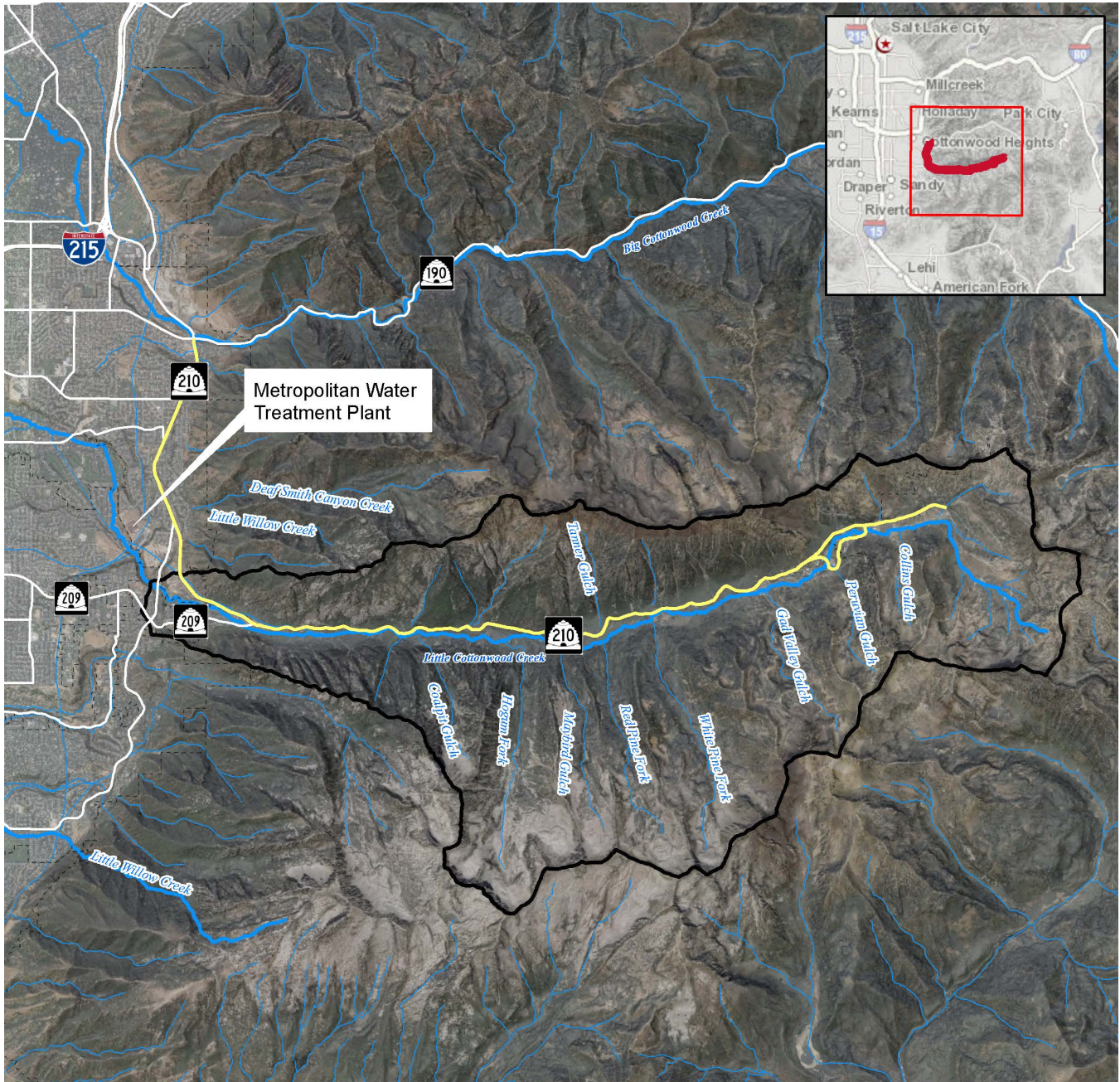


Figure 21.2-2. Water Resources Geographic Scope of Analysis



- LEGEND
- S.R. 210 Study Limits
 - Streams
 - Minor Streams
 - Water Resources Geographic Scope of Analysis



Figure 21.2-3. Ecosystem Resources Geographic Scope of Analysis

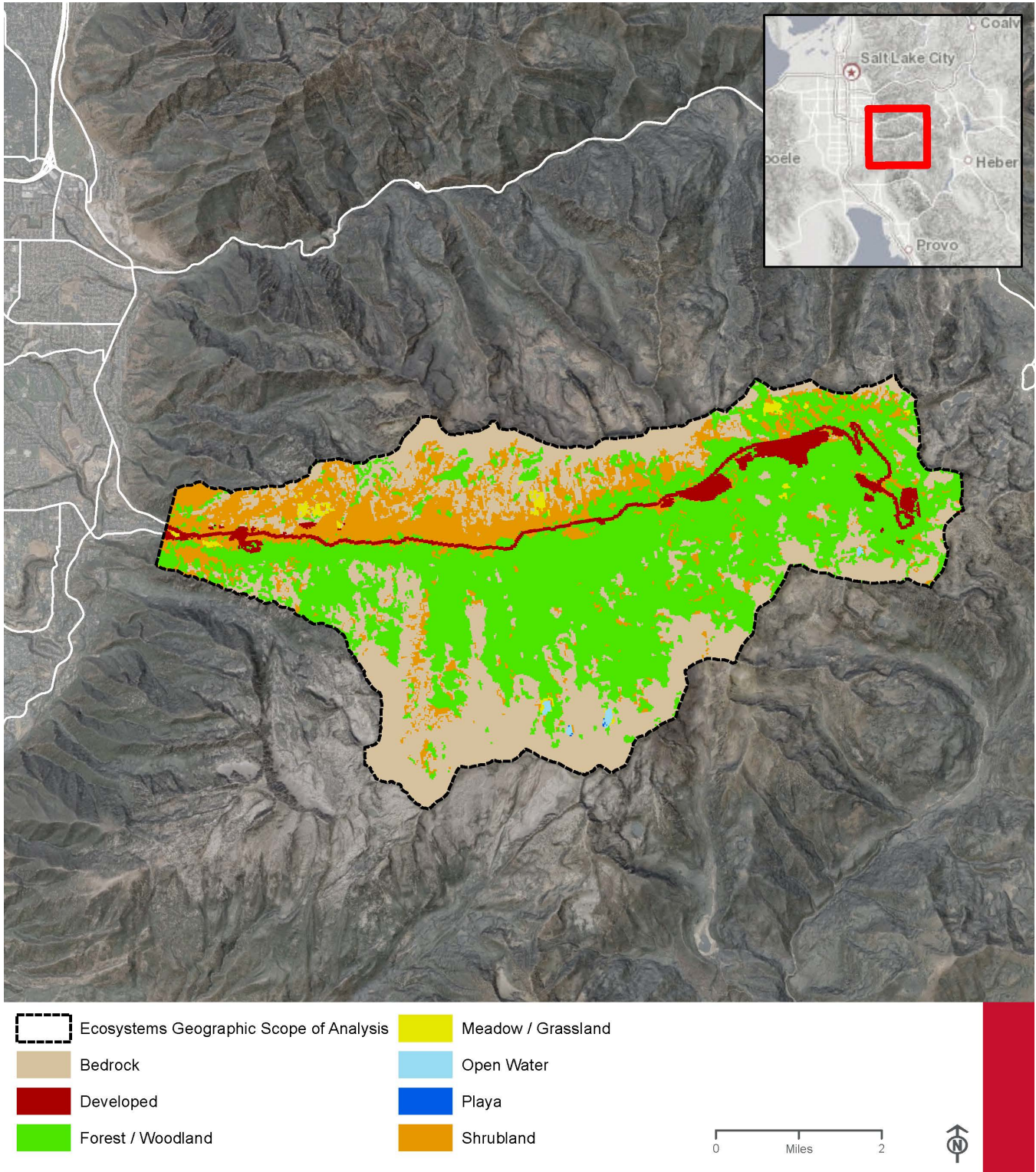


Figure 21.2-4. Visual Resources Geographic Scope of Analysis



 Geographic Scope of Analysis

0 Miles 2



21.2.5 Timeframe for the Analysis

The timeframe for the cumulative impacts analysis includes past and future periods. The period for the past impacts analysis varies by resource depending on the timeframe in which past actions contributed to effects and the availability of historical data. The period for the future impacts analysis extends from the present day to the reasonably foreseeable year of 2050.

The period for the past analysis was determined by the information available for each resource. For some resources, data are available for only the past 20 years, while for other resources data are available back to early Euro-American settlement of the Wasatch Front. The specific past-year timeframe for each resource is listed below:

- Recreation – 2000 to 2050
- Water resources – 1990s to 2050
- Ecosystem resources – Early 1900s to 2050
- Visual resources – 1970s to 2050

21.2.6 Past, Present, and Reasonably Foreseeable Future Actions

This section provides an overview of the past actions and the present and reasonably foreseeable future actions that have contributed or could contribute to cumulative impacts. Many of the baseline conditions relevant to cumulative impacts are described in detail in the relevant chapters of this EIS.

21.2.6.1 Past Actions

S.R. 210 is in Salt Lake County. The county has experienced major urban expansion, resulting in large residential, commercial, and industrial centers along with associated infrastructure such as freeways and surface streets. The 1850 U.S. census found that Salt Lake County had a population of about 6,200 people. The county's population had increased dramatically to about 1.1 million people by 2017, and this steady increase has led to continuing urban expansion.

As a result of this population growth, the area adjacent to S.R. 210 along Wasatch Boulevard is mostly developed with residential land use. There is little remaining land for development. The land in Little Cottonwood Canyon is a mix of natural and wilderness areas on lands managed by the U.S. Department of Agriculture (USDA) Forest Service, private property development, the town of Alta, and ski resorts on both public and private lands. These uses have changed some of the natural and scenic areas in the canyon to more-developed uses.

Although Little Cottonwood Canyon retains much of its natural value, continued heavy recreation use, mining, and development at the ski resorts and in the town of Alta has diminished many of the canyon's natural resources. In turn, the recreation, mining, and urban development in the canyon have degraded the water quality in the canyon's watershed. The substantial recreation opportunities in Little Cottonwood Canyon and its proximity to a large metropolitan area generate about 1.2 million vehicle trips into the canyon per year, which carry about 2.1 million visitors. Visitation into the canyon is equally distributed between winter and summer uses, with winter use more focused on peak ski weekends and holidays, and summer use occurring throughout the season (Mountain Accord 2015).

21.2.6.2 Present and Reasonably Foreseeable Future Actions

UDOT took several steps to determine the present and future actions to consider in the cumulative impacts analysis. The first step involved coordinating with the Wasatch Front Regional Council (WFRC), the area's metropolitan planning organization, to help identify other roadway projects in the vicinity of S.R. 210 that could result in cumulative impacts when combined with the S.R. 210 Project. This step included reviewing environmental documents that were recently completed or are in progress and reviewing WFRC's 2019–2050 *Wasatch Front Regional Transportation Plan* (RTP) (WFRC 2019). The second step was to identify new or planned reconstruction of residential, commercial, and recreation infrastructure and ski resort developments that might be built along S.R. 210 and in Little Cottonwood Canyon. The USDA Forest Service was consulted regarding proposed future projects. UDOT also viewed the Uinta-Wasatch Cache National Forest project website.

Table 21.2-1 lists the present and reasonably foreseeable future actions that were considered in the cumulative impacts analysis. Some of the projects listed in Table 21.2-1 might be outside the geographic scope evaluated for each resource but are included since these actions could influence the cumulative impacts analysis.

Table 21.2-1. Present and Reasonably Foreseeable Future Actions ^a

Project or Activity	Description	Impacts	Project Status
6200 South	Widen from 5 to 7 lanes from 3000 East to Wasatch Boulevard.	<ul style="list-style-type: none"> • Air quality – Project is in a conforming implementation plan. • Water quality – Minimal. UDOT will follow stormwater BMPs. • Floodplains – Project would be designed to minimize stormwater flows per UDOT and Salt Lake City requirements. If floodplains would be affected, UDOT would obtain the appropriate floodplain permit from Salt Lake County or FEMA. 	Planning
3000 East	Widen from 3 to 5 lanes from 6200 South to 7000 South.	<ul style="list-style-type: none"> • Air quality – Project is in a conforming implementation plan. • Water quality – Minimal. project improvements would not be adjacent to any water bodies. UDOT will follow stormwater BMPs. • Floodplains – Project would be designed to minimize stormwater flows per UDOT requirements. If floodplains would be affected, UDOT would obtain the appropriate floodplain permit from Salt Lake County or FEMA. 	Planning
Gravel Pit Development	Cottonwood Heights City is planning to allow commercial and residential development of the gravel pit aggregate mine after operations cease.	<ul style="list-style-type: none"> • Air quality – Could improve air quality by removing the gravel pit operator's contribution to particulate matter in the Salt Lake Valley. Vehicle traffic associated with the new development would increase vehicle emissions. • Water quality – Could improve water quality by having a stormwater system in place for a planned development instead of the current mining operation. • Traffic – Project would increase traffic on Wasatch Boulevard. 	Planning
Fort Union Boulevard	Widen from 3/5 lanes to 5/7 lanes.	<ul style="list-style-type: none"> • Air quality – Project is in a conforming implementation plan. • Water quality – Minimal. UDOT will follow stormwater BMPs. • Floodplains – Project would be designed to minimize stormwater flows per UDOT and Salt Lake City requirements. If floodplains would be affected, UDOT would obtain the appropriate floodplain permit from Salt Lake County or FEMA. 	Planning
Grit Mill and Climbing Master Plan Project (USDA Forest Service 2014)	<ul style="list-style-type: none"> • Construct new trailhead parking lot including interpretative site for climbing access for about 35 vehicles. • Construct new trail segment of 1.4 miles. • Maintain existing core trail routes. • Stabilize routes and belay platforms. 	<ul style="list-style-type: none"> • Air quality – No impact. • Cultural resources – One adverse effect on a historic property. • Water quality – Minimal, with use of BMPs, project improvements would generate no substantial water quality impacts on stream segments in or downstream of the project area. • Threatened and endangered species – None. • Visual – Project would improve scenic integrity. • Wetlands – None. 	Construction complete

(continued on next page)

Table 21.2-1. Present and Reasonably Foreseeable Future Actions ^a

Project or Activity	Description	Impacts	Project Status
Alta Ski Lifts Master Development Plan Improvements Projects (USDA Forest Service 2018)	<ul style="list-style-type: none"> Expand parking. Implement avalanche control. Replace lifts. Add a new lift. Improve ski runs. Expand and improve buildings. 	<ul style="list-style-type: none"> Air quality – No impact. Cultural resources – No adverse effects. Water quality – Minimal, with use of BMPs, project improvements would generate no substantial water quality impacts on stream segments in or downstream of the project area. Wildlife – Slight detrimental impact due to habitat loss. Vegetation – Minor impacts. Potential for introducing invasive species. Threatened and endangered species – None. Visual – Consistent with the “resort natural” setting theme. Wetlands – Project would convert 0.23 acre of wetlands and 5.34 acres of Riparian Habitat Conservation Areas to recreation use. Recreation – More-efficient management of skier density. Safety – No increased risk to backcountry skiers in Wolverine Cirque. 	Environmental Assessment complete.
Patsy Marley Hill Subdivision, Alta, Utah (USDA Forest Service 2020)	<ul style="list-style-type: none"> 25-acre development off Albion Base Road 10 single-family homes 20-space parking structure Widening of Albion Basin Road 	<ul style="list-style-type: none"> Air quality – Project would increase the amount of air pollutant emissions. Water quality – Project would convert open space to residential use and, if this conversion is not mitigated, increase the amount of stormwater runoff. Wildlife – Slight detrimental impact due to habitat loss. Vegetation – Natural vegetation loss. Potential for introducing invasive species. Threatened and endangered species – None. Visual – Would detract from natural setting along Albion Basin Road. Wetlands – Unknown. Recreation – Could reduce winter backcountry skiing access. 	Planning
Giverny Housing Development (9216 Wasatch Boulevard)	<ul style="list-style-type: none"> New 162-unit housing development 	<ul style="list-style-type: none"> Air quality – Project would increase the amount of air pollutant emissions. Water quality – Project would convert open space to residential use and, if this conversion is not mitigated, increase the amount of stormwater runoff. Traffic – Project would increase traffic on Wasatch Boulevard. 	In process

(continued on next page)

Table 21.2-1. Present and Reasonably Foreseeable Future Actions ^a

Project or Activity	Description	Impacts	Project Status
S.R. 190 Tolling and Improved Bus Service	<ul style="list-style-type: none"> Expand parking at the gravel pit. Provide enhanced bus service to ski resorts in Big Cottonwood Canyon. Toll S.R. 190. 	<ul style="list-style-type: none"> Air quality – Project is in a conforming implementation plan. Water quality – Minimal. UDOT will follow stormwater BMPs during construction and operation. Floodplains – No impacts. Wildlife – No impacts. Vegetation – Minor impacts. Potential for introducing invasive species. Threatened and endangered species – None. Wetlands – No impact. Recreation – No impact. 	Planning
La Calle Development	<ul style="list-style-type: none"> 37.5-acre development 75-room hotel Existing and new dining facilities Renovation of existing buildings New residential units 	<ul style="list-style-type: none"> Air quality – Project would increase the amount of air pollutant emissions. Water quality – Project would convert open space to commercial and residential use and, if this conversion is not mitigated, increase the amount of stormwater runoff. Floodplains – Development would be built next to the Little Cottonwood Creek floodplain. Traffic – Project would increase traffic on Wasatch Boulevard and North Little Cottonwood Road. Wildlife – Loss of urban wildlife habitat. Vegetation – Natural vegetation loss. Potential for introducing invasive species. Threatened and endangered species – None. Wetlands – Unknown. Visual – Minor. Continuation of surrounding residential developments. 	Planning
Cottonwood Canyons Developed Site Reconstruction Phase 3	<ul style="list-style-type: none"> Reconstruction of restrooms, water/waste water systems, bridges, parking, trailheads, and signage in both Big and Little Cottonwood Canyons. 	<ul style="list-style-type: none"> Projects are in the planning stage. No environmental impact information is available. The purposes of the projects are to reduce deferred maintenance and provide better overall management. The projects will be managed by the USDA Forest Service. Few environmental impacts are anticipated given the nature of the projects. 	Planning

BMPs = best management practices, FEMA = Federal Emergency Management Agency, UDOT = Utah Department of Transportation

^a In general, the ski resorts consistently discuss potential summer recreation operations with the USDA Forest Service. Once those operations are defined, any new proposals would be analyzed by the USDA Forest Service as they are received.

21.3 Cumulative Impacts Analysis by Resource

As discussed in Section 21.2, Methodology for Determining Cumulative Impacts, UDOT used CEQ guidance (CEQ 1997) to evaluate cumulative impacts. This section provides the foundation for determining the important issues to be evaluated as well as the past, present, and reasonably foreseeable future projects to be considered in the analysis. Detailed information about the affected environment and the direct impacts of the S.R. 210 Project is provided in the following chapters:

- Chapter 4, Community and Property Impacts (recreation resources only)
- Chapter 12, Water Resources
- Chapter 13, Ecosystem Resources
- Chapter 17, Visual Resources

21.3.1 Cumulative Impacts to Recreation

This section evaluates the potential cumulative impacts to recreation resources in Little Cottonwood Canyon from the action alternatives. The geographic scope of the analysis is the recreation resources in Little Cottonwood Canyon (designated trails, climbing resources, ski resorts, trailheads, backcountry skiing, and other recreation activities), and the timeframe for the analysis is 2000 to 2050. 2000 was selected as the start of the analysis period because reliable data are available regarding the number of yearly visitors in Little Cottonwood Canyon.

What are the geographic scope and timeframe of the analysis of cumulative impacts to recreation?

The geographic scope of the analysis is the recreation resources in Little Cottonwood Canyon, and the timeframe for the analysis is 2000 to 2050.

21.3.1.1 Past Conditions of Recreation

Many people choose to live in the Salt Lake City metropolitan area because of the easily accessible and abundant outdoor, year-round recreation opportunities (Utah State University 2015). Little Cottonwood Canyon also draws tourists from outside the region because of its easy access from Salt Lake City International Airport, which is less than 30 miles away.

S.R. 210 is the only road access into Little Cottonwood Canyon. It is a State Scenic Byway that is recognized for its views of dramatic mountain peaks and steep canyon walls. Wilderness Areas are located on both sides of the steep canyon. The canyon also has a small number of residents. Recreation activities in Little Cottonwood Canyon include rock climbing, cycling, camping, picnicking, fly fishing, bow hunting, hiking, running, skiing, ice climbing, and snowshoeing. The canyon is home to two ski and summer resorts, Alta and Snowbird.

The substantial recreation opportunities in Little Cottonwood Canyon and its proximity to a large metropolitan area generate about 1.2 million vehicle trips into the canyon per year, which carry about 2.1 million visitors. Visitation into the canyon is equally distributed between winter and summer uses, with winter use more focused on peak ski weekends and holidays, and summer use occurring throughout the season (Mountain Accord 2015).

Given that the populations of Salt Lake and Utah Counties are expected to grow by 36% and 108%, respectively, through 2050, the number of travelers into Little Cottonwood Canyon will also increase. Because of the vast number of recreation opportunities in the central Wasatch Range, in addition to other

recreation assets throughout the state, the Outdoor Industry Association estimates that the Utah travel, tourism, and recreation industry generated about \$12.3 billion in annual consumer spending, 110,000 jobs, \$3.9 billion in wages and salaries, and \$737 million in state and local tax revenue in 2017 (OIA 2017).

21.3.1.2 Future Trends for Recreation

There are many variables to consider when predicting the number of visitors to Little Cottonwood Canyon in future years, variables such as the availability of parking, trends in recreation use, and how visitors react to crowded recreation activities (that is, whether they adapt to increased crowds or shift to a less crowded location or a different activity). However, it is likely that the yearly visitation will be greater than the 2.1 million visitors per year estimated for 2013 (Lamborn and Burr 2016). In using a formula developed to estimate yearly visitation for 2013, UDOT estimates that the number of visitors to Little Cottonwood Canyon could increase to about 3.4 million by 2050 (Fehr & Peers 2018).

21.3.1.3 Cumulative Recreation Impacts from the Enhanced Bus Service Alternative

The Enhanced Bus Service Alternative would operate during the winter only; there would be no summer operations. Because the Enhanced Bus Service Alternative, including the trailhead parking alternatives, would not increase summer recreation use, it would not contribute to summertime cumulative impacts to recreation.

As described in Section 20.4.2.2, S.R. 210 – North Little Cottonwood Road to Alta, in Chapter 20, Indirect Effects, for winter use, the indirect effects analysis assumes an increased number of visitors based on increasing bus service and assuming that the buses operate to meet the projected traffic volume in the 30th-highest hour, which is expected to occur on about 49 days per year (holiday periods and weekends). With the Enhanced Bus Service Alternative, an additional 2,283 skiers could be divided between the Snowbird and Alta ski resorts on a busy ski day, or about 1,141 skiers per resort on the 49 days.

What is the 30th-highest hour?

The 30th-highest hour is the hour with the 30th-highest projected hourly traffic volumes during the year.

The increase in users caused by the Enhanced Bus Service Alternative could detract from skiers' recreation experience. Note that the analysis assumes that the enhanced bus service would operate at 100% capacity from 7 AM to 12 PM. This is unlikely, so the total number of skiers would likely be less. In addition, some backcountry skiers might take the enhanced bus service to the resorts, which could also increase backcountry use.

The ski resorts would be responsible for managing the increased visitation to the resorts. The National Ski Area Permit Act of 1986, as amended by the Ski Area Recreational Opportunity Enhancement Act of 2011 (16 United States Code Section 497b), directs the U.S. Secretary of Agriculture to permit acreage sufficient and appropriate to accommodate a permittee's needs for ski operations and appropriate ancillary facilities, as determined by the Secretary, and does not explicitly direct the Secretary to set visitor capacity limits for the permitted acreage. Managing visitors' experience and safety is the responsibility of each individual ski area. This management is reflected in a ski area's master development plan, which is required by the standard Forest Service Ski Area Term Special Use Permit, and its operating plan, which lists the ski area's responsibilities for protecting public health, safety, and the environment and for ensuring delivery of high-

quality services. Additionally, the ski resort permits require the resorts to provide appropriate infrastructure to accommodate skiers.

Recreation users' perception of the additional skiers at each resort would vary. Most ski resort users expect some level of crowds and lift wait times. Not all recreationists perceive the environment in the same way; what is a quality ski experience to one person might be entirely undesirable to another. It is not possible to predict each user's recreation experience, but increased use of recreation areas and longer lift lines would likely lower the quality of the recreation experience for most users. The impacts to backcountry use, during which some users might expect some solitude while skiing, would be greater.

Overall, the cumulative impacts from the Enhanced Bus Service Alternative on the recreation experience at the ski resorts and for backcountry skiers along with other past, present, and reasonably foreseeable projects would consist of minor, but continued, incremental reduction in the recreation experience for winter users in upper Little Cottonwood Canyon.

21.3.1.4 Cumulative Recreation Impacts from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

The cumulative impacts to winter recreation use from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative except for the alternative's potential for increase summertime cyclist use of the peak-period shoulder lane. As stated in Chapter 20, Indirect Effects, UDOT does not expect the Enhanced Bus Service in Peak-period Shoulder Lane Alternative to substantially increase cyclist use of S.R. 210 because of the addition of the peak-period shoulder lanes. Cyclists would ride in a paved shoulder lane and would have the opportunity to use restrooms at trailheads and the ski resorts. Therefore, UDOT does not expect the Enhanced Bus Service in Peak-period Shoulder Lane Alternative to substantially contribute to summertime cumulative impacts to recreation.

21.3.1.5 Cumulative Recreation Impacts from Gondola Alternative A (Starting at Canyon Entrance)

The cumulative impacts to winter recreation use with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative. However, Gondola Alternative A would operate during the summer with stops at the Snowbird and Alta ski resorts.

Both the Snowbird and Alta ski resorts are popular summertime destinations with each resort adding new summer amenities to attract recreation users. As described in Section 20.4.1.2.2, Summer Visitation, in Chapter 20, Indirect Effects, the summer operation of the gondola could increase summer visitation to the ski resorts by about 198 people. Even with the increase in summer users, the ski resorts would still operate well below their wintertime use.

The additional summer users could increase crowds at both resorts including at restaurants, shops, and other resort attractions. The additional gondola users might also decide to hike on trails at the resorts. UDOT does not anticipate that all 198 additional users would go to one resort, but rather that the additional users would be divided between Alta and Snowbird, with Snowbird receiving the majority because it would be the first gondola stop and has more summer amenities. During flowering season, some users might visit Albion Basin to view the wildflowers. Not all additional users would go hiking; some would stay within the developed

resort area. Assuming that the 198 users would be spread throughout the day, trail use would not increase in a substantial way that would detract from users' outdoor recreation experience at the resorts.

Overall, the impacts from summertime use of Gondola Alternative A to the recreation experience at the ski resorts and adjacent areas would be very small compared to the impacts of other past, present, and reasonably foreseeable projects, and would not contribute substantially to the cumulative impacts to the recreation experience for summertime users in upper Little Cottonwood Canyon.

21.3.1.6 Cumulative Recreation Impacts from Gondola Alternative B (Starting at La Caille)

The cumulative impacts to winter and summer recreation use with Gondola Alternative B would be the same as with Gondola Alternative A.

21.3.1.7 Cumulative Recreation Impacts from the Cog Rail Alternative (Starting at La Caille)

The cumulative impacts to winter and summer recreation use with the Cog Rail Alternative would be the same as with Gondola Alternative A.

21.3.1.8 Mitigation Measures for Cumulative Impacts to Recreation

As population along the Wasatch Front increases, this increase in population could cause additional pressure from recreation on the Little Cottonwood Creek watershed. To minimize these impacts, the USDA Forest Service, through its management and special-use permitting on National Forest System lands, will continue to implement recreation management to reduce the impacts of visitation on the watershed, specifically in regard to the watershed desired future condition stated in the *Revised Forest Plan: Wasatch-Cache National Forest* (USDA Forest Service 2003).

The USDA Forest Service's decisions responding to increasing recreation demands will first consider desired water quality and riparian conditions and the limited wildlife habitat in the watershed. The USDA Forest Service will make provisions for a wide range of recreation uses including access and sanitation facilities that prevent watershed conditions from deteriorating. Major trailheads and restrooms will be provided and maintained in cooperation with partners such as Salt Lake City. The USDA Forest Service will protect the watershed and educate the public about appropriate behavior in the watershed in cooperation and partnership with other agencies.

21.3.2 Cumulative Impacts to Water Resources

This section describes the cumulative impacts to water quality in Little Cottonwood Canyon from the action alternatives. The geographic scope of the analysis is upper Little Cottonwood Creek from the Metropolitan Water District of Salt Lake and Sandy's (Metropolitan Water) water treatment plant to its headwaters.

The timeframe for the analysis is from the 1990s to 2050. The 1990s were selected as the early date for the analysis based on the availability of data generated by an intensive monitoring program by the Utah Division of Water Quality (UDWQ). The baseline year selected for the analysis is 1998 based on the water quality data used in a quantitative model which was used to estimate in-stream water quality concentrations from the action alternatives as well as the projects listed in Table 21.2-1 above, Present and Reasonably Foreseeable Future Actions, for considerations in this cumulative impacts section.

What are the geographic scope and timeframe of the analysis of cumulative impacts to water resources?

The geographic scope of the analysis is upper Little Cottonwood Creek from the Metropolitan Water treatment plant to its headwaters, and the timeframe for the analysis is from the 1990s to 2050.

21.3.2.1 Past Conditions of Water Resources

UDWQ has included Little Cottonwood Creek on its 303(d) list of impaired water bodies because the creek does not meet standards for metals (cadmium, copper, and zinc) and pH. A total maximum daily load (TMDL) analysis was prepared for zinc in 2002. The TMDL analysis identified historic mining operations and, specifically, discharges from the Howland Tunnel and Wasatch Tunnel as the major sources of zinc loading that caused the zinc impairment. Transportation facilities (roads or parking areas) were not identified in the TMDL analysis as sources of zinc contamination.

According to Metropolitan Water's drinking water source protection plan for Little Cottonwood Creek, mines have been cleared of abandoned equipment, materials, and waste; mine openings have been closed; and the remaining mine tunnel discharges are sufficiently controlled. Given the other additional remedial efforts in the watershed, mines are no longer considered a serious contamination source (Metropolitan Water 2013).

TMDL analyses for cadmium, copper, and pH have not yet been prepared and are ranked as low priorities for development. Therefore, the source of these contaminants, and factors affecting pH levels, are not known. UDOT did not analyze past conditions for these constituents as part of this EIS analysis. However, UDOT used a quantitative baseline water quality model, which incorporates over 20 years of water quality monitoring data and which captures past activities in the watershed, to estimate the cumulative impacts and determine whether the action alternatives would contribute these contaminants at levels that could exceed numeric water quality standards.

What is a 303(d) list?

When a lake, river, or stream fails to meet the water quality standards for its beneficial uses, Section 303(d) of the Clean Water Act requires the State to place the water body on a list of "impaired" waters, known as a 303(d) list, and prepare an analysis called a total maximum daily load (TMDL).

What is a TMDL analysis?

A TMDL analysis determines the sources and allowable load of a given pollutant for that water body and allocates that load among different pollutant sources so that the appropriate actions can be taken and controls implemented to maintain water quality standards.

Pathogenic pollution from human and animal waste is another common contaminant identified by watershed stewards for monitoring and management. Several management practices have been put in place to reduce the potential for pathogenic pollution including restrooms at trailheads and a prohibition on dogs in Little Cottonwood Canyon. Transportation facilities by themselves would not add pathogenic pollution. For more information about increased recreation use from the action alternatives, see Section 21.3.1, Cumulative Impacts to Recreation.

What are pathogens?

As used in this chapter, a pathogen is a bacterium or virus that can cause disease.

21.3.2.2 Future Trends for Water Resources

The addition of impervious areas in the watershed is often used as a proxy for the risks to water quality, because increases in impervious areas can lead to increased runoff and pollutant loadings. The future developments listed in Table 21.2-1 above, Present and Reasonably Foreseeable Future Actions, will add about 45 acres of impervious area based on UDOT's review of the development documents. The increase in impervious surfaces could further degrade water quality in the Little Cottonwood Creek watershed.

21.3.2.3 Action Alternative Cumulative Impact Water Quality Model

UDOT used a water quality model developed by the U.S. Geological Survey (USGS) to assess the potential cumulative impacts of the action alternatives combined with past developments and proposed reasonably foreseeable future projects. The USGS Model is described in Section 12.4.1, Methodology, in Chapter 12, Water Resources. UDOT first established a baseline condition for comparing future projects, as shown in Table 21.3-1. UDOT made the following assumptions regarding inputs to the cumulative impacts model:

- **Runoff concentrations:** Runoff concentrations from all impervious areas were assumed equal to the pollutant concentrations in highway runoff.
- **Discharges:** No existing impervious areas were “disconnected” from the creek. UDOT assumed that 100% of runoff was discharged to the creek just above the Metropolitan Water treatment plant.
- **BMPs:** No BMPs were assumed.

UDOT calculated that there are about 181 acres of existing impervious area in the upper Little Cottonwood Creek watershed. The existing S.R. 210 has about 39 acres of pavement, and there are another 142 acres of additional impervious areas consisting mainly of other roads, parking lots, and driveways. UDOT assumed that runoff from these impervious areas had pollutant concentrations equal to highway stormwater runoff and that 100% of stormwater runoff was mixed with Little Cottonwood Creek just above the Metropolitan Water treatment plant. UDOT then ran the USGS Model to capture the additional impervious areas (and their pollutant loads) from the action alternatives and other projects to determine the risks that numeric water quality standards would be exceeded.

Table 21.3-1. Comparison of New Impervious Areas from the Action Alternatives

In acres

Category	Existing Conditions	Enhanced Bus Service Alternative	Enhanced Bus Service in Peak-period Shoulder Lane Alternative	Gondola Alternative A (Starting at Canyon Entrance)	Gondola Alternative B (Starting at La Caille)	Cog Rail Alternative
Existing impervious area	142	142	142	142	142	142
S.R. 210 existing impervious area	39	39	39	39	39	39
Additional impervious area with action alternatives	0	2	24	4	10	39
Future projects impervious area ^a	0	45	45	45	45	45
Total impervious area	181	228	250	230	236	265

^a New impervious areas: Grit Mill – 0.8 acre (construction completed in 2021); Alta Ski Lifts Master Development Plan Improvement Projects – 3.3 acres; Patsey Marley Hill Subdivision – 3.4 acres; Giverny Development – 26 acres; and La Caille Development – 12 acres.

21.3.2.4 Cumulative Water Resource Impacts from the Enhanced Bus Service Alternative

The Enhanced Bus Service Alternative would add about 2 acres of impervious area for the proposed trailhead improvements. UDOT would add stormwater BMPs pursuant to its *Stormwater Quality Design Manual*.

The USGS Model results presented in Section 12.4.3, Enhanced Bus Service Alternative, in Chapter 12, Water Resources, show that the Enhanced Bus Service Alternative would not degrade Little Cottonwood Creek’s water quality compared to the No-Action Alternative. For more information, see Table 12.4-2, USGS Model Results for the No-Action and Enhanced Bus Service Alternatives, in Chapter 12.

Therefore, the cumulative effects of the Enhanced Bus Service Alternative, when combined with other past and reasonably foreseeable actions, would also not substantially contribute to the degradation of water quality or contribute to water quality impairments for the 17 contaminants of concern (COCs) that were evaluated.

What are contaminants of concern (COCs)?

COCs are pollutants that are typically found in highway stormwater runoff. For more information, see Section 12.4.1.1, Surface Water Quality, in Chapter 12, Water Resources.

21.3.2.5 Cumulative Water Resource Impacts from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

The Enhanced Bus Service in Peak-period Shoulder Lane Alternative would add about 24 acres of impervious area in the Little Cottonwood Creek watershed. Considering only the increased impervious area of this alternative, the results of the USGS Model showed only *de minimis* increases over the No-Action Alternative. Therefore, this alternative would not contribute COC concentrations at levels that would impair Little Cottonwood Creek’s beneficial uses or impair Metropolitan Water’s ability to deliver safe drinking water. The USGS Model results are presented in Section 12.4.4, Enhanced Bus Service in Peak-period Shoulder Lane Alternative, in Chapter 12, Water Resources.

What is a *de minimis* impact?

As used in this chapter, a *de minimis* impact is a minor impact that does not pose a significant risk to water quality.

Table 21.3-2, Cumulative Water Quality Model Results on page 21-27 presents the USGS Model results for the Enhanced Bus Service in Peak-period Shoulder Lane Alternative (24 acres of additional pavement) combined with existing impervious areas and the impervious areas from future projects (45 acres). Table 21.3-2 also presents the model results for the existing conditions (181 acres of impervious area, which includes the existing S.R. 210) for comparison.

What are beneficial uses?

Lakes, rivers, and other water bodies have uses to people and other forms of life called *beneficial uses*. Three beneficial-use designations (1C, 2B, and 3A) apply to Little Cottonwood Creek.

As discussed in Chapter 12, Water Resources, 17 COCs were evaluated. Due to their 303(d) listing, the main COCs are metals (cadmium, copper, and zinc) and pH. The remainder of this section presents the USGS Model results for the cumulative impacts with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative. Also discussed below are the model results for phosphorus because the modeled in-stream concentrations would fall within the numeric standard of phosphorus for the range of storm events reported.

21.3.2.5.1 Cadmium

The USGS Model results for the existing conditions estimated that in-stream cadmium concentrations would range from 0.34 micrograms per liter (µg/L) for the majority of storms (low end or 80% of storm events) to about 0.60 µg/L for the more infrequent storm events (high end or 20% of storm events). Adding the runoff from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative with the runoff from future projects would not change the modeled range of cadmium concentrations (modeled range is 0.33 to 0.60 µg/L) over the existing conditions. The in-stream cadmium concentrations should also not exceed the most stringent numeric standard, which is 1.8 µg/L for beneficial-use classification 3A, for the majority of storm events.

What is beneficial-use classification 3A?

A water classified as 3A is protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chain.

21.3.2.5.2 Copper

The USGS Model results for the existing conditions estimated that in-stream copper concentrations would range from 4.3 µg/L for the majority of storms (low end or 80% of storm events) to about 10.2 µg/L for the more infrequent storm events (high end or 20% of storm events). Adding the runoff from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative with the runoff from future projects would slightly increase the modeled range of copper concentrations (modeled range is 4.47 to 10.99 µg/L) in Little Cottonwood Creek. This represents an increase of about 0.7 µg/L at the high end of the range. The in-stream copper concentrations should not exceed the most stringent numeric standard, which is 13 µg/L for beneficial-use classification 3A, for the majority of storm events.

21.3.2.5.3 Zinc

The USGS Model results for the existing conditions estimated that in-stream zinc concentrations would range from 32.2 µg/L for the majority of storms (low end or 80% of storm events) to about 66.5 µg/L for the more infrequent storm events (high end or 20% of storm events). Adding the runoff from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative with the runoff from future projects would slightly increase the modeled range of zinc concentrations (modeled range is 33.0 to 71.6 µg/L). This represents a maximum increase of about 5.1 µg/L at the high end of the range. The in-stream zinc concentrations would not exceed the most stringent numeric standard, which is 120 µg/L for beneficial-use classification 3A, for the majority of storm events.

21.3.2.5.4 pH

The USGS Model results show *de minimis* decreases in the levels of pH in Little Cottonwood Creek between the existing conditions (7.08–7.88) and the Enhanced Bus Service in Peak-period Shoulder Lane Alternative combined with future projects (7.03–7.86). The reported pH levels are the modeled statistical range that can be expected over a large number of storm events. The model range is within the numeric standard (6.5–9.0) for drinking water sources (beneficial use 1C).

What is beneficial-use classification 1C?

A water classified as 1C is protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water.

21.3.2.5.5 Phosphorus

The USGS Model results for the existing conditions estimated that in-stream phosphorus concentrations would range from 0.015 milligrams per liter (mg/L) for the majority of storms (low end or 80% of storm events) to about 0.105 mg/L for the more infrequent storm events (high end or 20% of storm events). Adding runoff from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative with runoff from future projects would slightly increase the modeled range of phosphorus concentrations (modeled range is 0.016 to 0.138 mg/L) in Little Cottonwood Creek. This represents an increase of about 0.033 mg/L at the high end of the range.

Both the modeled existing conditions and the modeled cumulative impacts for the Enhanced Bus Service in Peak-period Shoulder Lane Alternative with future projects exceed the upper numeric standard threshold at the high end of the modeled range. With the steep gradient of the stream, the short duration of storm events (8 hours on average), and the relatively few storm events that could result, statistically (about 20% of

storms, 10 storms per year, or 3% of total annual stream flow time), higher phosphorus loading (nutrient enrichment) should not cause an ecological response that impairs in-stream water quality.

However, as described in Chapter 12, Water Resources, additional investigations would be required to determine whether existing phosphorus loadings are excessive and are impairing or threatening Little Cottonwood Creek's designated beneficial use or how much additional phosphorus loading might be allowed before an ecological response is likely to occur. A TMDL analysis would also be needed if UDWQ's ongoing monitoring identifies a possible phosphorus impairment in the creek.

21.3.2.5.6 Conclusion

The amount of impervious surface related to the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would increase in conjunction with other past, current, and reasonably foreseeable projects. However, stormwater runoff from this increase would not impair Little Cottonwood Creek's water quality, and the beneficial uses of the water would be maintained.

Note that the USGS Model results for the cumulative impacts analysis did not include BMPs for any of the new impervious surfaces. The use of BMPs, which are required¹ to treat stormwater runoff before it is discharged to receiving waters, would help protect water quality. Overall, UDOT does not expect the Enhanced Bus Service in Peak-period Shoulder Lane Alternative to substantially contribute to cumulative water quality impacts in the Little Cottonwood Creek watershed.

21.3.2.6 Cumulative Water Resource Impacts from Gondola Alternative A (Starting at Canyon Entrance)

Gondola Alternative A would add about 3 acres of new impervious area for the proposed trailhead improvements in Little Cottonwood Canyon, reconfiguring the existing park-and-ride lot at the intersection of S.R. 210 and S.R. 209, and building the gondola base station at the entrance to the canyon. UDOT would add stormwater BMPs pursuant to its *Stormwater Quality Design Manual*. There would be no substantial increase in paved impervious surfaces (parking areas) associated with the gondola towers, the angle station, or the destination stations in Little Cottonwood Canyon.

The USGS Model results presented in Section 12.4.5, Gondola Alternative A (Starting at Canyon Entrance), in Chapter 12, Water Resources, show that Gondola Alternative A would not degrade Little Cottonwood Creek's water quality compared to the No-Action Alternative. For more information, see Table 12.4-3, USGS Model Results for the No-Action and Gondola Alternatives, in Chapter 12. Therefore, the cumulative effects of Gondola Alternative A, when combined with other past and reasonably foreseeable actions, would also not substantially contribute to the degradation of water quality or contribute to water quality impairments for the 17 COCs that were evaluated.

¹ Alta Ordinance 9-4-6, the *Cottonwood Heights Stormwater Management Plan*, and UDOT's *Stormwater Quality Design Manual* all address the required use of stormwater BMPs and would apply to the action alternatives and the identified future developments.

21.3.2.7 Cumulative Water Resource Impacts from Gondola Alternative B (Starting at La Caille)

Gondola Alternative B would add about 14 acres of new impervious area for the proposed trailhead improvements in Little Cottonwood Canyon and for the parking structure and ancillary roads at the gondola base station at La Caille including the improvements to North Little Cottonwood Road near the base station for this alternative. UDOT would add stormwater BMPs pursuant to its *Stormwater Quality Design Manual*.

The USGS Model results presented in Section 12.4.6, Gondola Alternative B (Starting at La Caille), in Chapter 12, Water Resources, show that Gondola Alternative B would not degrade Little Cottonwood Creek's water quality compared to the No-Action Alternative. For more information, see Table 12.4-3, USGS Model Results for the No-Action and Gondola Alternatives, in Chapter 12. Therefore, the cumulative effects of Gondola Alternative B, when combined with other past and reasonably foreseeable actions, would also not substantially contribute to the degradation of water quality or contribute to water quality impairments for the 17 COCs that were evaluated.

21.3.2.8 Cumulative Water Resource Impacts from the Cog Rail Alternative (Starting at La Caille)

The Cog Rail Alternative would add about 39 acres of impervious area in the upper Little Cottonwood Creek watershed. About 10 acres of impervious area would be associated with the roadway improvements and the parking structure at the cog rail base station at La Caille. The cog rail track section would be constructed mostly on ballasted fill, but a few short sections of track would be embedded in the roadway to reduce the footprint around the trailhead parking lots. Track ballast is a porous material, but some runoff is still expected for higher-intensity storm events since stormwater would infiltrate the ballast but would encounter a presumably rock subgrade. UDOT assumed that 70% of stormwater would run off from the ballasted track segments and that 100% of the embedded track would generate runoff. A total impervious area equivalent for the cog rail line is about 23 acres. There would also be about 4 acres of impervious area for an operations and maintenance facility.

Table 21.3-2, Cumulative Water Quality Model Results on page 21-27 presents the USGS Model results for the Cog Rail Alternative (39 acres of additional impervious area) combined with existing impervious areas and the impervious areas from future projects (45 acres). Table 21.3-2 also presents the model results for the existing conditions (181 acres of impervious area, which includes the existing S.R. 210) for comparison.

As discussed in Chapter 12, Water Resources, 17 COCs were evaluated. Due to their 303(d) listing, the main COCs are metals (cadmium, copper, and zinc) and pH. The remainder of this section presents the USGS Model results for the cumulative impacts with the Cog Rail Alternative. Also discussed below are the model results for phosphorus because the modeled in-stream concentrations would fall within the numeric standard of phosphorus for the range of storm events reported.

21.3.2.8.1 Cadmium

The USGS Model results for the existing conditions estimated that in-stream cadmium concentrations would range from 0.34 µg/L for the majority of storms (low end or 80% of storm events) to about 0.60 µg/L for the more infrequent storm events (high end or 20% of storm events). Adding the runoff from the Cog Rail Alternative with the runoff from future projects would not change the modeled range of cadmium concentrations (modeled range is 0.33 to 0.60 µg/L) over the existing conditions. The in-stream cadmium concentrations should not exceed the most stringent numeric standard, which is 1.8 µg/L for beneficial-use classification 3A, for the majority of storm events.

21.3.2.8.2 Copper

The USGS Model results for the existing conditions estimated that in-stream copper concentrations would range from 4.3 µg/L for the majority of storms (low end or 80% of storm events) to about 10.2 µg/L for the more infrequent storm events (high end or 20% of storm events). Adding the runoff from the Cog Rail Alternative with the runoff from future projects would slightly increase the modeled range of copper concentrations (modeled range is 4.49 to 11.2 µg/L) in Little Cottonwood Creek. This represents an increase of about 1 µg/L at the high end of the range. The in-stream copper concentrations should not exceed the most stringent numeric standard, which is 13 µg/L for beneficial-use classification 3A, for the majority of storm events.

21.3.2.8.3 Zinc

The USGS Model results for the existing conditions estimated that in-stream zinc concentrations would range from 32.2 µg/L for the majority of storms (low end or 80% of storm events) to about 66.5 µg/L for the more infrequent storm events (high end or 20% of storm events). Adding the runoff from the Cog Rail Alternative with the runoff from future projects would slightly increase the modeled range of zinc concentrations (modeled range is 33.1 to 72.5 µg/L). This represents a maximum increase of about 6 µg/L at the high end of the range. The in-stream zinc concentrations would not exceed the most stringent numeric standards, which is 120 µg/L for beneficial-use classification 3A, for the majority of storm events.

21.3.2.8.4 pH

The USGS Model results show *de minimis* decreases in the levels of pH in Little Cottonwood Creek between the existing conditions (7.08–7.88) and the Cog Rail Alternative combined with future projects (6.99–7.84). The reported pH levels are the modeled statistical range that can be expected over a large number of storm events. The model range is within the numeric standard (6.5–9.0) for drinking water sources (beneficial use 1C).

21.3.2.8.5 Phosphorus

The USGS Model for the existing conditions estimated that in-stream phosphorus concentrations would range from 0.015 mg/L for the majority of storms (low end or 80% of storm events) to about 0.105 mg/L for the more infrequent storm events (high end or 20% of storm events). Adding runoff from the Cog Rail Alternative with runoff from future projects would slightly increase the modeled range of phosphorus concentrations (modeled range is 0.017 to 0.138 mg/L) in Little Cottonwood Creek. This represents an increase of about 0.033 mg/L at the high end of the modeled range.

Both the modeled existing conditions and the modeled cumulative impacts for the Cog Rail Alternative with future projects exceed the upper numeric standard threshold at the high end of the modeled range. With the steep gradient of the stream, the short duration of storm events (8 hours on average), and the relatively few storm events that could result, statistically (about 20% of storms, 10 storms per year, or 3% of total annual stream flow time), higher phosphorus loading (nutrient enrichment) should not cause an ecological response that impairs in-stream water quality.

However, as described in Chapter 12, Water Resources, additional investigations would be required to determine whether existing phosphorus loadings are excessive and are impairing or threatening Little Cottonwood Creek's designated beneficial uses or how much additional phosphorus loading might be allowed before an ecological response is likely to occur. A TMDL analysis would also be needed if UDWQ's ongoing monitoring identifies a possible phosphorus impairment in the creek.

21.3.2.8.6 Conclusion

The amount of impervious surface associated with the Cog Rail Alternative would increase in conjunction with other past, current, and reasonably foreseeable projects. However, stormwater runoff from this increase would not impair Little Cottonwood Creek's water quality, and the beneficial uses of the water would be maintained.

Note that the USGS Model results for the cumulative impacts analysis did not include BMPs for any of the new impervious surfaces. The use of BMPs, which are required to treat stormwater runoff before it is discharged to receiving waters, would help protect water quality. Overall, UDOT does not expect the Cog Rail Alternative to substantially contribute to cumulative water quality impacts in the Little Cottonwood Creek watershed.

Table 21.3-2. Cumulative Water Quality Model Results

Constituent of Concern	Unit	Modeled Downstream Concentration Range Low End (80% of Storms) – High End (20% of Storms)			Numeric Standards		
		Existing Conditions (runoff from all impervious areas of watershed)	Existing Conditions + Future Projects + Enhanced Bus Service in Peak-period Shoulder Lane Alternative	Existing Conditions + Future Projects + Cog Rail Alternative	Primary or Secondary MCL	Beneficial Use 1C	Beneficial Use 3A
Alkalinity	mg/L	38.0–55.2	36.5–53.8	36.3–53.6	—	—	—
Cadmium	µg/L	0.34–0.60	0.33–0.60	0.33–0.60	5	10	1.8
Calcium	mg/L	18.3–26.6	17.0–26.2	16.8–26.1	—	—	—
Chloride	mg/L	12.6–65.1	12.4–69.5	12.4–70.0	250	—	—
Chromium	µg/L	1.62–3.73	1.68–4.10	1.69–4.18	100	50	16
Copper	µg/L	4.33–10.20	4.47–10.99	4.49–11.19	1,000	—	13
Hardness	mg/L	59.8–96.8	57.4–95.4	56.6–95.1	—	—	—
Lead	µg/L	0.85–5.52	0.94–6.67	0.96–6.86	15	15	65
Magnesium	mg/L	3.73–6.14	3.57–6.05	3.53–6.03	—	—	—
Nitrogen	mg/L	0.19–0.37	0.19–0.38	0.19–0.38	10	10	0.4–0.8
pH	NA	7.08–7.88	7.03–7.86	6.99–7.84	6.5–8.5	6.5–9.0	6.5–9.0
Phosphorus	mg/L	0.015–0.105	0.016–0.138	0.017–0.138	—	—	0.035–0.08
Sulfate	mg/L	11.4–28.1	11.0–27.4	10.9–27.2	1,000	—	—
TDS	mg/L	102.6–205.1	100.7–212.4	100.6–213.1	500	—	—
TSS	mg/L	4.0–38.7	4.6–48.1	4.67–50.3	—	—	—
Water temperature	°C	4.3–9.9	4.6–10.3	4.60–10.3	—	—	20° max, 2° change
Zinc	µg/L	32.2–66.5	33.0–71.6	33.1–72.5	5,000	—	120

°C = degrees Celsius, mg/L = milligrams per liter, µg/L = micrograms per liter, MCL = maximum contaminant level, NA = not applicable, TDS = total dissolved solids, TSS = total suspended solids

21.3.2.9 Mitigation Measures for Cumulative Impacts to Water Resources

All action alternatives and future developments are subject to stormwater quality management plans and ordinances. Alta Ordinance 9-4-6, which would apply to the Patsey Marley Hill Subdivision and the *Alta Lifts Master Plan*, requires erosion control, revegetation, and drainage best practices to address stormwater quality. The *Cottonwood Heights Stormwater Management Plan* is implemented to limit the discharge of pollutants from the Cottonwood Heights storm drain system through the use of minimum control measures and BMPs. UDOT assumes that the *Cottonwood Heights Stormwater Management Plan* would be applied to the Giverny and La Caille developments. UDOT would manage stormwater from its facilities using its *Stormwater Quality Design Manual*. When these stormwater management plans are implemented, stormwater quality would be improved, and the resulting in-stream concentrations of pollutants in Little Cottonwood Creek would be less than those reported in Table 21.3-2 above.

21.3.3 Cumulative Impacts to Ecosystem Resources

This section evaluates the potential cumulative impacts to ecosystem resources from the action alternatives. None of the action alternatives would impact threatened or endangered species, or areas known to have sensitive plant species. More information about the ecosystem resources and the direct and indirect impacts from the action alternatives is provided in Chapter 13, Ecosystem Resources. The geographic scope of the analysis is Little Cottonwood Canyon but includes a discussion of the greater central Wasatch Mountains since past changes in the central Wasatch Mountains influence Little Cottonwood Canyon. The timeframe for the analysis is the early 1900s to 2050.

What are the geographic scope and timeframe of the analysis of cumulative impacts to ecosystem resources?

The geographic scope of the analysis is Little Cottonwood Canyon but includes a discussion of the central Wasatch Mountains, and the timeframe for the analysis is the early 1900s to 2050.

21.3.3.1 Past Conditions of Ecosystem Resources

Little Cottonwood Canyon encompasses about 17,080 acres consisting mostly of forest/woodland, shrubland, meadow/grassland, and bedrock (Table 21.3-3). Little Cottonwood Canyon is part of the central Wasatch Mountains, which also include Parley’s Canyon, Mill Creek Canyon, and Big Cottonwood Canyon. Recreation amenities (trailheads, trails, and climbing areas), ski resorts, housing developments, mining, and roads have all contributed to loss of the natural habitat and fragmentation of forested communities (USDA Forest Service 2013).

Historically, much of the conifer trees in upper Little Cottonwood Canyon were cut during the middle to late 1800s and into the early 1900s. Although many second-growth trees have reached maturity, some of those trees have been removed to accommodate resort and housing developments, roads, and other constructed facilities.

Table 21.3-3. Wildlife Habitat Acreage in the Little Cottonwood Creek Watershed

Habitat Type	Acres	Percentage of Existing Habitat
Developed	604	4%
Forest/woodland	6,620	38%
Shrubland	2,412	14%
Meadow/grassland	1,173	7%
Bedrock	6,245	36%
Open water	26	1%
Total	17,080	100%

The distribution of plant and wildlife species in the central Wasatch Mountains today reflects historical changes to the ecosystem. Despite these changes, the central Wasatch Mountains provide large patches of relatively connected, intact habitats that support moderately high levels of biodiversity compared to adjacent areas. These areas of intact habitats are important for maintaining regional plant and wildlife populations.

However, many native plant and wildlife populations have declined as a result of past development that caused habitat loss and fragmentation. Some plant and wildlife species are rare or declining due to the fragmentation and degradation of the terrestrial and aquatic ecosystems that provide their habitat (Mountain Accord 2014). Additionally, many non-native plant and wildlife species have been introduced and have become established in the central Wasatch Mountains.

Human activity in Little Cottonwood Canyon and in the Central Wasatch Mountains has altered and fragmented wildlife habitat. Consequently, some species of mammals, birds, amphibians, and invertebrates in the Wasatch Mountains have declined as a result of hunting, disease, and habitat loss and fragmentation. The decline in wildlife species indicates how the environment has been substantially modified compared to the conditions before Euro-American settlement.

Noxious weeds and other invasive plants have also affected the health of both terrestrial and aquatic ecosystems by outcompeting native plants, altering the vegetation structure and fire regimes, and decreasing forage quality for wildlife. Infestations are nearly always associated with human activity such as construction, roads, and trails. Efforts are underway in Little Cottonwood Canyon to contain and control existing infestations, but the infestations continue to spread.

21.3.3.2 Future Trends for Ecosystem Resources

Population growth along the Wasatch Front, increased tourism, development, and climate change will continue to stress aquatic and terrestrial ecosystems in the central Wasatch Mountains and these ecosystems' ability to provide the habitat requirements for sensitive plant and wildlife species. In addition to the predicted growth trends, terrestrial and aquatic resources will continue to be affected by many other factors. Potential future effects are uncertain because of the complexity and interdependence of the components of the ecosystems in the central Wasatch Mountains. Though it is difficult to make detailed predictions regarding the health of these ecosystems in the future, increased human use of the central Wasatch Mountains will likely continue to degrade terrestrial and aquatic ecosystem resources.

21.3.3.3 Cumulative Ecosystem Resource Impacts from the Enhanced Bus Service Alternative

With the Enhanced Bus Service Alternative, there would be no improvements to S.R. 210 in Little Cottonwood Canyon. However, if a trailhead parking alternative that includes improving parking or an avalanche mitigation alternative (both of which include snow sheds) is selected, some ecosystem resources would be lost.

The trailhead parking alternatives would remove about 3.25 acres of forest/woodland and shrubland habitat, and the avalanche mitigation alternatives would remove about 6 acres of forest/woodland and shrubland habitat. The trailhead parking alternatives that improve parking would remove about 0.6 acre of Riparian Habitat Conservation Areas (RHCAs), and the avalanche mitigation alternatives would remove about 0.23 acre of RHCAs. All of this habitat would be lost along the existing S.R. 210 or at existing trailheads that

have already experienced some human disturbance. Overall, the loss of forest/woodland, shrubland, and RHCAs would be less than 1% of the total existing habitat and RHCAs in the ecosystem resources impact analysis area.

The trailhead parking alternatives that would improve parking at trailheads would not further impede wildlife movement, but the snow sheds would slightly increase the barrier effect of an area that is likely already avoided by most wildlife because of the steep slopes and existing roadway.

Although the Enhanced Bus Service Alternative would not substantially contribute to the cumulative loss of ecosystem resources, the loss of habitat in combination of with past, present, and reasonably foreseeable future projects (Alta Ski Lifts Master Development Plan Improvement Projects, Patsey Marley Hill Subdivision, and other changes to ski resort operations) would incrementally contribute to cumulative impacts. Overall, the cumulative impacts from the Enhanced Bus Service Alternative along with other past, present, and reasonably foreseeable projects would consist of minor, but continued, fragmentation and loss of ecosystem resources in Little Cottonwood Canyon and the central Wasatch Mountains.

With the Enhanced Bus Service Alternative, the bus service would not operate during the summer, so the alternative would not increase summer recreation opportunities. During the winter, the alternative could increase use at the ski resorts or in the backcountry by about 13%. UDOT expects that the ski resorts could manage the increase in use and thus minimize impacts to ecosystem resources. The increase in backcountry use could cause greater disturbance of wildlife and, combined with other increases in recreation use of Little Cottonwood Canyon, could incrementally add to the stress on wildlife. If it occurs, the increased backcountry ski use in upper Little Cottonwood Canyon caused by the Enhanced Bus Service Alternative would have minor, but continued, cumulative impacts to ecosystem resources in Little Cottonwood Canyon and the central Wasatch Mountains.

21.3.3.4 Cumulative Ecosystem Resource Impacts from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

With the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, S.R. 210 would be widened to include bus shoulder lanes in Little Cottonwood Canyon, which would remove ecosystem resources. Also, if a trailhead parking alternative that includes improving parking or an avalanche mitigation alternative (both of which include snow sheds) is selected, some additional ecosystem resources would be lost.

The Enhanced Bus Service in Peak-period Shoulder Lane Alternative would remove about 33 acres of forest/woodland and shrubland habitat, about 0.29 acre of meadow/grassland habitat, and about 1.44 acres of RHCAs. The trailhead parking alternatives would remove about 3.25 acres of forest/woodland and shrubland habitat, and the avalanche mitigation alternatives would remove about 6 acres of forest/woodland and shrubland habitat. The trailhead parking alternatives that improve parking would remove about 0.6 acre of RHCAs, and the avalanche mitigation alternatives would remove about 0.23 acre. All of this habitat would be lost along the existing S.R. 210 or at existing trailheads that have already experienced some human disturbance. Overall, the loss of forest/woodland, shrubland, meadow/grassland, and RHCAs would be less than 1% of the total existing habitat and RHCAs in the ecosystem resources impact analysis area.

The peak-period shoulder lanes would widen S.R. 210 and further fragment habitat and impede wildlife movement. The snow sheds would also slightly increase the barrier effect in an area that is likely already avoided by most wildlife because of the steep slopes and existing roadway. The trailhead parking alternatives that would improve parking would not further impede wildlife movement or fragment habitat.

Although the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would not substantially contribute to the cumulative loss of ecosystem resources, the loss of resources would be incrementally greater than with the Enhanced Bus Service Alternative. The loss of habitat and RHCAs in combination with past, present, and reasonably foreseeable future projects (Alta Ski Lifts Master Development Plan Improvement Projects, Patsey Marley Hill Subdivision, and other changes to ski resort operations) would incrementally contribute to cumulative impacts.

Overall, the cumulative impacts from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative along with other past, present, and reasonably foreseeable projects would consist of continued fragmentation of ecosystem resources in Little Cottonwood Canyon and the central Wasatch Mountains.

The cumulative impacts from increased winter visitation on ecosystem resources would be the same as with the Enhanced Bus Service Alternative.

21.3.3.5 Cumulative Ecosystem Resource Impacts from Gondola Alternative A (Starting at Canyon Entrance)

With Gondola Alternative A, there would be no improvements to S.R. 210 in Little Cottonwood Canyon, but placing gondola towers and stations in the canyon would remove ecosystem resources. Also, if a trailhead parking alternative that includes improving parking or an avalanche mitigation alternative (both of which include snow sheds) is selected, additional ecosystem resources would be lost.

Gondola Alternative A would remove about 4.5 acres of forest/woodland and shrubland habitat. The trailhead parking alternatives would remove about 3.25 acres of forest/woodland and shrubland habitat, and the avalanche mitigation alternatives would remove about 6 acres of forest/woodland and shrubland habitat. The trailhead parking alternatives that improve parking would remove about 0.6 acre of RHCAs, and the avalanche mitigation alternatives would remove about 0.23 acre of RHCAs. Most of this habitat would be lost along the existing S.R. 210 or at existing trailheads that have already experienced some human disturbance. Overall, the loss of forest/woodland, shrubland, meadow/grassland, and RHCAs would be less than 1% of the total existing habitat and RHCAs in the ecosystem resources impact analysis area.

The gondola towers and stations would not substantially fragment habitat or restrict wildlife movement because they would have a small footprint and would be located mostly in disturbed areas along S.R. 210 or at the ski resorts. The snow sheds would slightly increase the barrier effect in an area that is likely already avoided by most wildlife because of the steep slopes and existing roadway. The trailhead parking alternatives that would improve parking would not further impede wildlife movement or fragment habitat.

Gondola Alternative A would not substantially contribute to the cumulative loss of ecosystem resources. The loss of resources would be incrementally greater than with the Enhanced Bus Service Alternative but less than with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative. The loss of habitat and RHCAs in combination with past, present, and reasonably foreseeable future projects (Alta Ski Lifts Master Development Plan Improvement Projects, Patsey Marley Hill Subdivision, and other changes to ski resort operations) would incrementally contribute to cumulative impacts. Overall, the cumulative impacts from Gondola Alternative A along with other past, present, and reasonably foreseeable projects would consist of minor, but continued, fragmentation of ecosystem resources in Little Cottonwood Canyon and the central Wasatch Mountains.

The cumulative impacts to ecosystem resources from increased visitation during the winter would be the same as with the Enhanced Bus Service Alternative. However, Gondola Alternative A would provide summer service to the ski resorts. As described in Section 20.4.1.2.2, Summer Visitation, in Chapter 20, Indirect Effects, the summer operation of the gondola could increase summer visitation to the ski resorts by about 198 people.

The additional summer users could increase crowds at both resorts including at restaurants, shops, and other resort attractions. The additional users might also decide to hike on trails at the resorts. UDOT does not anticipate that all 198 additional users would go to one resort, but rather that the additional users would be divided between Alta and Snowbird, with Snowbird receiving the majority because it would be the first gondola stop and has more summer amenities. Also, not all additional users would go hiking; some would stay within the developed resort area. It is difficult to predict how many of the additional gondola users would go hiking; however, an increase in trail use could increase soil erosion, loss of vegetation, and the spread of invasive species and potentially disturb wildlife. UDOT expects that the 198 additional users would represent about a 1.4% increase in daily summer visitation on a normal busy weekend (for more information, see Chapter 20, Indirect Effects).

Continued population growth along the Wasatch Front is also anticipated to increase the number of people visiting the central Wasatch Mountains for recreation purposes. Overall visitation in Little Cottonwood Canyon could increase from 2.1 million to 3.4 million over an entire year by 2050. Aquatic ecosystems (for example, lakes, waterfalls, and streams) and adjacent terrestrial ecosystems are popular recreation destinations for hikers and other visitors to the mountains. High levels of use, especially when not appropriately managed, can damage and reduce the functionality of aquatic ecosystems. Increased visitation will strain the limited existing staff, budget, and other agency resources for law enforcement and visitor management. If visitation exceeds the ability of agencies to manage recreational users, the function of these ecosystems could further decline in the future. Although Gondola Alternative A would contribute less than a 2% increase in yearly visitation, it would contribute minor, but continued, cumulative impacts to ecosystem resources in Little Cottonwood Canyon and the central Wasatch Mountains from recreation users.

21.3.3.6 Cumulative Ecosystem Resource Impacts from Gondola Alternative B (Starting at La Caille)

The cumulative impacts to ecosystem resources from Gondola Alternative B in Little Cottonwood Canyon would be the same as from Gondola Alternative A.

21.3.3.7 Cumulative Ecosystem Resource Impacts from the Cog Rail Alternative (Starting at La Caille)

With the Cog Rail Alternative, S.R. 210 in Little Cottonwood Canyon would not be improved, but a cog rail alignment and stations would be placed along S.R. 210 in the canyon, and these elements would remove ecosystem resources. Also, if a trailhead parking alternative that includes improving parking or an avalanche mitigation alternative (both of which include snow sheds) is selected, additional ecosystem resources would be lost.

The Cog Rail Alternative would remove about 63 acres of forest/woodland and shrubland habitat, about 3 acre of meadow/grassland habitat, and about 0.48 acre of RHCAs. The trailhead parking alternatives would remove about 1 acre of shrubland habitat, and the avalanche mitigation alternatives would remove

about 15 acres of forest/woodland and shrubland habitat. The trailhead parking alternatives that improve parking would remove about 0.6 acre of RHCAs, and the avalanche mitigation alternatives would remove about 0.36 acre of RHCAs. All of this habitat would be lost along the existing S.R. 210 or at existing trailheads that have already experienced some human disturbance. Overall, the loss of forest/woodland, shrubland, and meadow/grassland habitat and RHCAs would be less than 1% of the total existing habitat and RHCAs in the ecosystem resources impact analysis area.

The cog rail alignment and stations would not substantially fragment habitat, but the cog rail alignment would include a concrete barrier that would be a barrier to some wildlife movement. The snow sheds would also slightly increase the barrier effect in an area that is likely already avoided by most wildlife because of the steep slopes and existing roadway. The trailhead parking alternatives that would improve parking would not further impede wildlife movement or fragment habitat.

The Cog Rail Alternative would have the highest incremental cumulative impact to ecosystem resources of the action alternatives. This conclusion is based on the Cog Rail Alternative removing the most vegetation, having greatest potential to disrupt wildlife movement, and having greatest potential to disturb wildlife. The loss of habitat and RHCAs in combination with past, present, and reasonably foreseeable future projects (Alta Ski Lifts Master Development Plan Improvement Projects, Patsey Marley Hill Subdivision, and other changes to ski resort operations) would incrementally contribute to cumulative impacts. Overall, the cumulative impacts from the Cog Rail Alternative along with other past, present, and reasonably foreseeable projects would consist of continued fragmentation and loss of ecosystem resources in Little Cottonwood Canyon and in the central Wasatch Mountains.

The cumulative impacts from increased winter and summer visitation would be the same as with Gondola Alternative A.

21.3.3.8 Mitigation Measures for Cumulative Impacts to Ecosystem Resources

Mitigation measures for ecosystem resources are identified in Chapter 13, Ecosystem Resources.

21.3.4 Cumulative Impacts to Visual Resources

This section evaluates the potential cumulative impacts to visual resources along Wasatch Boulevard in Cottonwood Heights and in Little Cottonwood Canyon from the action alternatives. The geographic scope of the analysis is the visual resources along Wasatch Boulevard in Cottonwood Heights and in Little Cottonwood Canyon, and the timeframe for the analysis is the 1970s to 2050.

What are the geographic scope and timeframe of the analysis of cumulative impacts to visual resources?

The geographic scope of the analysis is the visual resources along Wasatch Boulevard in Cottonwood Heights and in Little Cottonwood Canyon, and the timeframe for the analysis is the 1970s to 2050.

21.3.4.1 Past Conditions of Visual Resources

The visual character of the Salt Lake Valley has continued to transform from a mostly natural sagebrush plain to a metropolitan area with expanses of residential, commercial, and industrial development. The communities of Cottonwood Heights and Sandy experienced major population growth from the 1980s to the present, resulting in increasing development at the bases of Big and Little Cottonwood Canyons. The Wasatch Range, which defines the eastern edge of the Salt Lake Valley,

has experienced much less development in part due to its steep terrain as well as large areas being designated as wilderness under two wilderness acts in 1978 and 1984.

As described in Section 21.3.1, Cumulative Impacts to Recreation, S.R. 210 is a scenic byway that provides access to numerous recreation opportunities in Little Cottonwood Canyon. Development in the canyon is mostly associated with recreation amenities (campgrounds, trailheads, and so on), including the Snowbird and Alta ski resorts in the upper canyon. There is also some isolated residential development associated with the Wasatch Resort in the lower portion of the canyon. Most of the canyon does not have the mechanized recreation associated with the ski lifts and other equipment at the ski resorts, and the canyon's character is defined by natural mountain settings accessed from trailheads located along the scenic byway.

21.3.4.2 Future Trends for Visual Resources

Increasing population growth in the Salt Lake Valley will likely lead to more and denser development to facilitate planned growth. With the valley becoming more developed, access to natural settings will become more important for residents as opportunities become more limited. The Wasatch Range, including Little Cottonwood Canyon, will likely experience increased visitation that, without increased capacity in the transportation system, could limit access to high-quality natural settings. In addition, future changes at the ski resorts and some planned future developments could further detract from the visual resources in Little Cottonwood Canyon.

21.3.4.3 Cumulative Visual Impacts from the Enhanced Bus Service Alternative

The Enhanced Bus Service Alternative, when combined with past and present projects and reasonably foreseeable future actions, would modify the landscape character of Little Cottonwood Canyon to become incrementally more developed. Because the alternative would not include any topographic changes along the road, except for the mid-canyon snow sheds and trailhead improvements, the Enhanced Bus Service Alternative would have limited additive cumulative effects.

With the avalanche mitigation alternatives, the local viewshed adjacent to the mid-canyon snow sheds would be modified, and the snow sheds would be visually dominant as viewed from key observation point (KOP) locations (see Chapter 17, Visual Resources). The trailhead improvements associated with the trailhead parking alternatives would be visually subordinate in the landscape except for the improvements at the Lisa Falls Trailhead, which would be more visually prominent in the landscape. The Grit Mill and Climbing Master Plan Project and the trailhead improvements associated with the trailhead parking alternatives would have an overall beneficial impact to visual resources by increasing access to high-quality natural settings.

Most of the reasonably foreseeable future actions that would contribute to cumulative impacts to visual resources would be located at the top of Little Cottonwood Canyon (Alta Ski Lifts Master Development Plan Improvement Projects and Patsey Marley Hill Subdivision) and the entrance to the canyon (La Caille Development) where there are existing residential and commercial developments. Because the Enhanced Bus Service Alternative and reasonably foreseeable future actions are spread out across the canyon, the area viewed as modified in the canyon would become expanded as the mid-canyon snow sheds introduce large built structures into an area defined by its natural and intact landscape character.

These impacts would also continue to influence the management objectives of the Little Cottonwood Canyon State Scenic Byway; however, based on the scale of these projects, the management of the byway to

protect scenic vistas and intrinsic scenic qualities would be diminished but not limited. Overall, the visual change to more developed from the Enhanced Bus Service Alternative along with other past, present, and reasonably foreseeable future actions would represent a moderate change to Little Cottonwood Canyon's natural-appearing visual setting. The Enhanced Bus Service Alternative would have the lowest cumulative impacts to the natural visual resources in Little Cottonwood Canyon.

The proposed improvements to Wasatch Boulevard would be visually subordinate and similar to other infrastructure in the area. No reasonably foreseeable future actions affecting visual resources were identified in this area; however, based on additional development to support increasing population in the Salt Lake Valley, the rural-like character of the benchlands is likely to become increasingly modified through expanding development. The Wasatch Boulevard alternatives would cause a minor cumulative change to the overall urban nature of Cottonwood Heights.

The two mobility hubs (at the gravel pit and at 9400 South and Highland Drive) would be in areas with the same industrial/commercial developed character as surrounding existing development and would cause limited changes to visual resources. Similar to the discussion regarding improvements to Wasatch Boulevard, no reasonably foreseeable future actions affecting visual resources were identified in these areas; however, with the growing population, additional development is likely to occur adjacent to the proposed mobility hubs.

21.3.4.4 Cumulative Visual Impacts from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

The cumulative impacts from the improvements to Wasatch Boulevard and the mobility hubs would be the same as those with the Enhanced Bus Service Alternative.

The Enhanced Bus Service in Peak-period Shoulder Lane Alternative, when combined with past and present projects and reasonably foreseeable future actions, would modify the landscape character of Little Cottonwood Canyon to a greater extent than would the Enhanced Bus Service Alternative. Because the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would include topographic changes along the roadway, in addition to the mid-canyon snow sheds and trailhead improvements, this alternative would have increased additive cumulative effects.

With the avalanche mitigation alternatives, the local viewshed adjacent to the mid-canyon snow sheds and road improvements, as viewed from the Bridge Trailhead, would change, and the snow sheds and roadway improvements would range from being visually prominent to dominating the landscape character. The trailhead improvements associated with the trailhead parking alternatives would be visually subordinate in the landscape except for the improvements at the Lisa Falls Trailhead, which would be more visually prominent in the landscape. The Grit Mill and Climbing Master Plan Project and the trailhead improvements associated with the trailhead parking alternatives would have an overall beneficial impact to visual resources by increasing access to high-quality natural settings.

Most of the reasonably foreseeable future actions that would contribute to cumulative impacts to visual resources would be located at the top of Little Cottonwood Canyon (Alta Ski Lifts Master Development Plan Improvement Projects and Patsey Marley Hill Subdivision) and the entrance to the canyon (La Caille Development) where there are existing residential and commercial developments. Because the Enhanced Bus Service in Peak-period Shoulder Lane Alternative and reasonably foreseeable future actions are spread out across the canyon, the area viewed as modified in the canyon would become expanded as the mid-

canyon snow sheds and road improvements introduce large built structures into an area defined by its natural and intact landscape character. These impacts would also continue to influence the management objectives of the Little Cottonwood Canyon State Scenic Byway; however, based on the scale of these projects, the management of the byway to protect scenic vistas and intrinsic scenic qualities would be diminished but not limited.

Overall, the visual change to more developed from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative along with other past, present, and reasonably foreseeable future actions would represent a moderate to high change to Little Cottonwood Canyon’s natural-appearing visual setting. The Enhanced Bus Service in Peak-period Shoulder Lane Alternative would contribute slightly more to cumulative impacts to the natural visual resources in Little Cottonwood Canyon than the Enhanced Bus Service Alternative but less cumulative impacts than the gondola and cog rail alternatives.

21.3.4.5 Cumulative Visual Impacts from Gondola Alternative A (Starting at Canyon Entrance)

The cumulative impacts from the improvements to Wasatch Boulevard and the mobility hubs would be the same as those with the Enhanced Bus Service Alternative.

The Grit Mill and Climbing Master Plan Project and the trailhead improvements associated with the trailhead parking alternatives would have an overall beneficial impact to visual resources by increasing access to high-quality natural settings.

Gondola Alternative A, when combined with past and present projects and reasonably foreseeable future actions, would modify the landscape character of Little Cottonwood Canyon to become increasingly dominated by ski resort-type infrastructure. At the entrance to the canyon, the alternative would introduce a new gondola base station and gondola towers in addition to planned commercial development including the La Caille Development.

In this location, the setting would become more intensely developed by transportation and commercial uses. Because these projects would be located in areas already viewed as modified, the impacts to the landscape and views from sensitive locations would be less intense than if these projects were implemented in a more intact natural setting.

Views along the Little Cottonwood Canyon State Scenic Byway would become dominated by development because Gondola Alternative A would expand the area characterized by ski resort-type infrastructure, which is currently focused at the two ski resorts at the top of the canyon. The introduction of gondola towers, moving gondola cabins, destination stations, and other associated infrastructure, in addition to the changes associated with the Patsey Marley Hill Subdivision and Alta Ski Lifts Master Development Plan Improvement Projects, would dominate the setting in areas with a natural-appearing setting and would further develop those with a “resort natural” setting. These impacts would also continue to influence the management objectives of the Little Cottonwood Canyon State Scenic Byway.

What are gondola terminal stations, base stations, angle stations, and towers?

As used in the discussions of the gondola alternatives, the term *terminal station* refers to the first and last stations on a passenger’s gondola trip. Passengers board and disembark the gondola cabins at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

The gondola alternatives also include *angle stations*, which are needed to adjust the horizontal direction of the cabin; passengers remain in the cabin as it passes through an angle station.

A *tower* supports the gondola cable.

Based on the scale of these projects, the management of the byway to protect scenic vistas and intrinsic scenic qualities would be constrained and the visitor experience would be degraded.

Overall, the visual change to more developed from Gondola Alternative A along with other past, present, and reasonably foreseeable future actions would represent a high change to Little Cottonwood Canyon's natural-appearing visual setting. The gondola and cog rail alternatives [see Section 21.3.4.7, Cumulative Visual Impacts from the Cog Rail Alternative (Starting at La Caille)] would have the greatest contribution to cumulative impacts to the natural visual resources in Little Cottonwood Canyon.

21.3.4.6 Cumulative Visual Impacts from Gondola Alternative B (Starting at La Caille)

The cumulative impacts associated with Gondola Alternative B would be similar to those associated with Gondola Alternative A except for additional additive cumulative effects at the entrance to Little Cottonwood Canyon. Because of the increased development with this alternative (additional gondola towers, angle station, and parking structure) adjacent to the future La Caille Development, the setting at the entrance to the canyon would become increasingly defined by multistory transportation and commercial structures compared to its existing residential and recreation-focused character.

21.3.4.7 Cumulative Visual Impacts from the Cog Rail Alternative (Starting at La Caille)

The cumulative impacts from the improvements to Wasatch Boulevard and the mobility hubs would be the same as those with the Enhanced Bus Service Alternative.

The Cog Rail Alternative, when combined with past and present projects and reasonably foreseeable future actions, would modify the landscape character of Little Cottonwood Canyon to become increasingly dominated by mechanized recreation. At the entrance to the canyon, this alternative would introduce a new parking structure, a new operations and maintenance yard and building, a reconfigured park-and-ride lot at the intersection of S.R. 209 and S.R. 210, and a new cog rail alignment in the same area as the future La Caille Development.

In this area, the setting would become a high-intensity development zone with multistory transportation and commercial structures. Portions of the Grit Mill and Climbing Master Plan Project would be affected by the Cog Rail Alternative, requiring UDOT to reconfigure the park-and-ride lot, thereby creating a larger area of disturbance. The other portions of the Grit Mill and Climbing Master Plan Project, and the improvements at the Bridge and White Pine Trailheads proposed with this alternative, would have an overall beneficial impact to visual resources by increasing access to high-quality natural settings.

Views along the Little Cottonwood Canyon State Scenic Byway would become dominated by transportation features, including the addition of the cog rail alignment with its cleared geometric right of way and mid- and upper-canyon snow sheds, especially when looking to the north where there would be unobstructed views of the cog rail alignment. Increased planned development at the top of the canyon, from the proposed Patsey Marley Hill Subdivision and Alta Ski Lifts Master Development Plan Improvement Projects, in addition to the cog rail and upper-canyon snow sheds, would create an expanding area characterized by mechanized

What are cog rail base and terminal stations?

As used in the discussions of the Cog Rail Alternative, the term *terminal station* refers to the first and last stations on a passenger's cog rail trip. Passengers board and disembark the cog rail cars at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

recreation where currently this type of development is focused at the two ski resorts. These impacts would also continue to influence the management objectives of the Little Cottonwood Canyon State Scenic Byway. Based on the scale of these projects, the management of the byway to protect scenic vistas and intrinsic scenic qualities would be inhibited and the visitor experience would be degraded.

Overall, the visual change to more developed from the Cog Rail Alternative along with other past, present, and reasonably foreseeable future actions would represent a high change to Little Cottonwood Canyon's natural-appearing visual setting. The cog rail and gondola alternatives [see Section 21.3.3.5, Cumulative Ecosystem Resource Impacts from Gondola Alternative A (Starting at Canyon Entrance), and Section 21.3.3.6, Cumulative Ecosystem Resource Impacts from Gondola Alternative B (Starting at La Caille)] would have the greatest contribution to cumulative impacts to the natural visual resources in Little Cottonwood Canyon.

21.1.1.1 Mitigation Measures for Cumulative Impacts to Visual Resources

In addition to the project-specific mitigation measures listed in Section 17.4.8, Mitigation Measures, in Chapter 17, Visual Resources, the following are recommended mitigation measures to reduce potential adverse cumulative impacts to visual resources:

- For large-scale buildings proposed as part of the action alternatives, design elements to use natural materials and colors to harmonize with the existing residential and recreation character.
- In the upper canyon, design new facilities to blend with the existing resort setting, or natural evolving setting where appropriate, to maintain a cohesive landscape character and avoid expanding the area characterized as a resort setting. For example, the gondola alternatives and the Alta Ski Lifts Master Development Plan Improvement Projects both plan to introduce additional towers into the landscape. To reduce impacts from additional vertical intrusions into the setting, both projects could paint the towers the same natural color to establish a more cohesive landscape character.

21.4 References

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Mountain Accord

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- 2013 Environmental Assessment: Snowbird Gad Valley Improvements. March.
- 2014 Environmental Assessment: Grit Mill and Climbing Master Plan Project. September.
- 2018 Environmental Assessment: Alta Ski Lifts Master Development Plan Improvements Projects. April.
- 2020 Environmental Assessment: Patsey Marley Hill Subdivision Road Way Improvements. February.

Utah State University

- 2015 2014–2015 Central Wasatch Visitor Use Study: Follow-up E-survey, Final Report. July.

[WFRC] Wasatch Front Regional Council

- 2019 Wasatch Front Regional Transportation Plan 2019–2050. https://wfr.org/VisionPlans/RegionalTransportationPlan/Adopted2019_2050Plan/RTP_2019_2050_ADOPTED.pdf.
- 2020 Transportation Improvement Program 2021–2026. <https://wfr.org/programs/transportation-improvement-program/>.

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Chapter 22: Short-term Uses versus Long-term Productivity

22.1 Regulatory Setting

The Council on Environmental Quality's (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) require an Environmental Impact Statement (EIS) to address the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity (40 Code of Federal Regulations [CFR] Section 1502.16). The Federal Highway Administration's (FHWA) 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).

CEQ's NEPA regulations require an EIS to address any irreversible or irretrievable commitments of resources that would be involved in the proposed action if it is implemented (40 CFR Section 1502.16). FHWA's guidelines for environmental documents state that an EIS should discuss in general terms the proposed action's irreversible and irretrievable commitment of resources, including whether the action alternatives might require a similar commitment of natural, physical, human, and fiscal resources (FHWA 1987).

22.2 Short-term Uses versus Long-term Productivity

The local short-term impacts and uses of resources associated with the action alternatives can be compared to the maintenance and enhancement of the long-term productivity for the area. Because the area adjacent to State Route (S.R.) 210 in the Salt Lake Valley is mostly developed or has been affected by past development, the action alternatives would not alter the long-term productivity of the area's natural resources.

The action alternatives would remove some natural resources in Little Cottonwood Canyon, and this removal could be considered an irreversible and irretrievable commitment of resources. The amount of wildlife habitat that would be removed by each action alternative including supporting elements (trailhead parking and avalanche mitigation) would be 13 acres with the Enhanced Bus Service Alternative, 37 acres with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, 17 acres with the gondola alternatives, and 78 acres with the Cog Rail Alternative. The effects of the loss of these resources are described in Chapter 13, Ecosystem Resources.

In general, the short-term use of the forest in Little Cottonwood Canyon by the action alternatives would be a negative impact to the long-term productivity of the land as a natural resource. Forest outside the area converted to project use would remain in conservation or recreation use, and the action alternatives would not alter the long-term productivity of those areas.

The S.R. 210 Project would be consistent with transportation plans and would support regional projections of increases in population. The project would improve the long-term productivity of the area by addressing the transportation needs on S.R. 210.

22.3 References

[FHWA] Federal Highway Administration

1987 Guidance for Preparing and Processing Environmental and Section 4(f) Documents. October.

Chapter 23: Irreversible and Irretrievable Commitment of Resources

Implementing an action alternative would involve a commitment of a range of natural, physical, human, and fiscal resources. Land used for constructing the Selected Alternative would be considered an irreversible commitment of these resources during the time that the land is used for the alternative. (See Chapter 3, Land Use, for a description of the land that would be converted to project use by each action alternative and Chapter 13, Ecosystem Resources, for a description of the effects of the action alternatives on natural resources.) However, if a greater need for use of the land arises, or if the roadway, gondola, or cog rail is no longer needed, the land could be converted to a natural state or another use. At present, there is no reason to believe that such conversion would ever be necessary or desirable.

A considerable amount of fossil fuels, labor, and roadway, gondola, and rail construction materials such as concrete, pavement, aggregate, steel, 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 irretrievable, 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 Selected 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 benefits would consist of improved accessibility and safety, and savings in travel time, all of which are anticipated to outweigh the commitment of these financial resources.

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Chapter 24: Permits, Reviews, Clearances, and Approvals

This chapter lists the federal, state, and local permits, reviews, clearances, and approvals that would or could be required for the State Route (S.R.) 210 Project.

24.1 Federal Permits, Reviews, Clearances, and Approvals

24.1.1 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. Only the Cog Rail Alternative would impact a wetland—0.01 acre of a seep with the upper-canyon snow sheds.

All of the action alternatives would result in impacts to streams (ephemeral, intermittent, and perennial) of between 0.2 and 0.49 acre. The stream impacts would consist of the streams being piped and placed under trailhead or roadway improvements. The piping would require a U.S. Army Corps of Engineers (USACE) Nationwide Permit 14 for Linear Transportation Projects. The permit might be obtained to authorize a loss of waters of the United States less than or equal to 0.5 acre on a crossing-by-crossing basis and subject to a Preconstruction Notice threshold of 0.1 acre of loss provided those waters are not characterized as special aquatic sites. Any permit coverage related to special aquatic sites triggers a Preconstruction Notice regardless of the extent of loss. The Utah Department of Transportation (UDOT) will submit a permit application (as warranted) once funding has been identified to construct the Selected Alternative.

24.1.2 Endangered Species Act Compliance (USFWS)

Under Section 7 of the Endangered Species Act, federal agencies are required to consult with the U.S. Fish and Wildlife Service (USFWS) if their proposed actions or approvals could affect Endangered Species Act-listed species or designated critical habitat.

There are no federally listed threatened and endangered species or designated critical habitat in the area of potential impacts for the action alternatives. Therefore there would be no impacts, and no consultation with USFWS is required.

24.1.3 Bald and Golden Eagle Protection Act (USFWS and Utah Division of Wildlife Resources)

The Bald and Golden Eagle Protection Act prohibits the take, sale, purchase, possession, barter, or transport, or offer to do any of the above, to either bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*) at any time or in any manner (16 United States Code [USC] Sections 668a–d). The Bald and Golden Eagle Protection Act could apply to the S.R. 210 Project if any individual bird or occupied nest of these two eagle species could be affected. The S.R. 210 area including Little Cottonwood Canyon is not considered suitable nesting habitat for bald eagles. Although potentially suitable breeding habitat for golden eagles exists in cliffs in the ecosystem resources impact analysis area, no individual eagles have been observed. UDOT does not expect that an eagle take permit will be required. If nesting eagles are discovered before or during construction, UDOT will coordinate with USFWS to ensure compliance with the Act.

24.1.4 Migratory Bird Treaty Act of 1918 (USFWS and Utah Division of Wildlife Resources)

The action alternatives could affect nests of migratory birds during construction. 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 Chapter 13, Ecosystem Resources, for potential mitigation measures for impacts to migratory birds.

24.1.5 Section 106 of the National Historic Preservation Act (Utah SHPO and ACHP)

For this Environmental Impact Statement (EIS), UDOT is the lead agency under the Section 106 process. Section 106 of the National Historic Preservation Act 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 in or is eligible for inclusion in the National Register of Historic Places is considered a historic property. For projects that could affect a historic property, the federal agency must consult with the relevant State Historic Preservation Officer (SHPO).

For the S.R. 210 Project, UDOT has consulted with the Utah SHPO, who has concurred with UDOT's Determinations of Eligibility and Findings of Effect for historic properties. UDOT has also consulted with the ACHP and coordinated with Native American tribes. No comments were received from the ACHP or Native American tribes regarding specific impacts from the project. UDOT and the Utah SHPO will enter into a Section 106 programmatic agreement or memorandum of agreement regarding the identification and treatment of cultural resources affected by the Preferred Alternative.

24.1.6 Section 4(f) of the Department of Transportation Act (FHWA)

The Section 4(f) regulations (23 Code of Federal Regulations [CFR] Section 774.3) provide that the Federal Highway Administration (FHWA) 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 Section 4(f)?

Section 4(f) of the Department of Transportation Act prohibits the approval of federal transportation projects that use publicly owned parks, recreation areas, wildlife and waterfowl refuges, or historic sites [Section 4(f) properties] unless there is no feasible and prudent alternative and the project includes all possible planning to minimize harm.

For historic sites, a *de minimis* impact means FHWA 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 27, Section 4(f) and Section 6(f) Evaluation, provides a detailed analysis of the Section 4(f) requirements. This evaluation found that all of the action alternatives would require uses of Section 4(f) properties, but all such uses would have *de minimis* impacts and thus could be approved by UDOT acting pursuant to the authority assigned to it by FHWA under 23 USC Section 32. The U.S. Department of Agriculture (USDA) Forest Service, Cottonwood Heights City, and the Utah SHPO are the responsible officials for providing concurrence regarding the use of Section 4(f) properties.

24.1.7 Section 6(f) of the Land and Water Conservation Funds Act (FHWA)

No Section 6(f) properties would be affected by any of the action alternatives.

24.1.8 Conformity Requirements under the Clean Air Act (FHWA)

Chapter 10, Air Quality, provides a detailed analysis of air quality conformity requirements related to the S.R. 210 Project. In summary, the Clean Air Act requires that all regionally significant highway and transit projects in air quality nonattainment areas be included in a “conforming” transportation plan and transportation improvement program.

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. A transportation project is 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 National Ambient Air Quality Standards (NAAQS)
- Increases in the frequency or severity of existing violations of the NAAQS
- Delays in attainment of the NAAQS

For the S.R. 210 Project, the Wasatch Front Regional Council, which is the metropolitan planning organization for portions of S.R. 210, conducted the regional conformity analyses and submitted them to FHWA for a conformity determination. Based on the most recent regional conformity analyses, the S.R. 210 Project conforms to the state implementation plan for all pollutants in applicable nonattainment or maintenance areas. The project must receive a project-level conformity determination from FHWA.

Project-level conformity determinations for PM₁₀ and PM_{2.5} were required for the S.R. 210 Project; therefore, UDOT conducted quantitative hot-spot analyses for PM₁₀ and PM_{2.5} (see Chapter 10, Air Quality). The results of the quantitative hot-spot analyses demonstrated that the S.R. 210 Project would not contribute to any new local violations of the PM₁₀ or PM_{2.5} NAAQS, increase the frequency or severity of any existing violation, or delay timely attainment of the PM₁₀ or PM_{2.5} NAAQS.

UDOT conducted the PM₁₀ or PM_{2.5} analysis according to 40 CFR Section 93.123, *Procedures for Determining Localized CO, PM₁₀, 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 prepared and submitted a *Draft Air Quality Technical Report* (see Appendix 10A, Air Quality Technical Report, for Chapter 10, Air Quality) to the U.S. Environmental Protection Agency (EPA) for review and comment in November 2020. EPA responded in January 2021 that UDOT could proceed with the air quality modeling after making the model adjustments identified in EPA's response (EPA 2021). UDOT incorporated EPA's recommendations in the modeling conducted for the air quality hot-spot analysis (see Chapter 10, Air Quality). Approval of the final project-level conformity determination is made by FHWA.

What are nonattainment and maintenance areas?

A nonattainment area is an area that does not meet the NAAQS for a given air pollutant. A maintenance area is an area previously designated as a nonattainment area that has been redesignated to attainment status and is required to have a maintenance plan.

What are PM₁₀ and PM_{2.5}?

PM₁₀ is particulate matter 10 microns in diameter or less, and PM_{2.5} is particulate matter 2.5 microns in diameter or less.

24.1.9 Federal Land Right-of-way Transfer (FHWA and USDA Forest Service)

In Little Cottonwood Canyon, segments of S.R. 210 cross National Forest System (NFS) land. Proposed improvements on NFS land not already part of the UDOT perfected easement or appropriated by FHWA would be subject to the conditions of 23 USC Section 317, *Appropriation for Highway Purposes of Lands or Interests in Lands Owned by the United States*. Through this appropriation process, the U.S. Secretary of Agriculture can certify that the appropriation of NFS land for transportation use is contrary to the public interest or inconsistent with the purposes for which the NFS land was originally reserved, or agree to the appropriation and transfer of the land to FHWA and UDOT, potentially with stipulated conditions to protect NFS land. If FHWA appropriates the NFS lands, the *Revised Forest Plan: Wasatch-Cache National Forest* (USDA Forest Service 2003) and its management prescription would no longer apply to those lands. However, with the appropriation, the USDA Forest Service might potentially need to amend the *Forest Plan*. The transfer of NFS land would be in the form of a noninclusive right of way that would preserve protected other uses that already exist that do not conflict with highway use.

24.1.10 USDA Forest Service Easement or Special-use Authorization (USDA Forest Service)

If FHWA determines that 23 USC Section 317 would not apply (see Section 24.1.9, Federal Land Right-of-way Transfer) to a specific alternative on NFS land, UDOT would seek an easement or special-use authorization for the Selected Alternative based on input from the USDA Forest Service to allow construction, operation, and maintenance of the Selected Alternative. With an easement or special-use permit, the USDA Forest Service would retain all ownership rights to the land, and UDOT would be authorized to own and operate the Selected Alternative. The easement or special-use authorization would preserve protected other uses that already exist. The easement or special-use authorization might require the USDA Forest Service to amend the *Revised Forest Plan: Wasatch-Cache National Forest* (USDA Forest Service 2003) for any nonconforming uses.

The USDA Forest Service requires special-use authorizations for occupancy or use of NFS lands, including commercial activities. The enhanced bus service, gondola service, or cog rail service could be operated by a public agency or a private vendor. If a commercial vendor is selected to operate the bus or gondola service, a special-use authorization from the USDA Forest Service might be required and would be based on the analysis in this EIS.

24.1.11 Review of Gondola System (FAA)

If a gondola alternative is selected, Form 7460-1, *Notice of Proposed Construction or Alteration*, would need to be submitted to the Federal Aviation Administration (FAA) before construction. FAA's review would occur during the design phase. The review is required for any construction or alteration that is more than 200 feet above the ground. Some of the gondola towers would be taller than 200 feet. The review would determine whether any aircraft warning systems would be required on the gondola towers. In the submission to FAA, UDOT would propose implementing an aircraft detection lighting system.

24.1.12 Contract for Removal of Merchantable Timber (USDA Forest Service)

This permit would be required from the USDA Forest Service for the removal of any timber on NFS lands by the action alternatives. The permit would be required even with the transfer of lands to FHWA.

24.1.13 Permit Authorization for Removal of Forest Product (Rock, Gravel, and Other Resources) (USDA Forest Service)

This permit would be required from the USDA Forest Service for the removal of mineral resources from NFS lands by the action alternatives. The permit would be required even with the transfer of lands to FHWA.

24.2 State Permits, Reviews, Clearances, and Approvals

24.2.1 Stream Alteration Permit (Utah Division of Water Rights)

The Utah Division of Water Rights requires project applicants to obtain a stream alteration permit if a stream crossing by the project would alter the stream's bed and banks. Constructing any new drainage structures at a stream crossing would likely alter the stream's bed and banks as defined by the stream alteration permit program. UDOT anticipates that stream alteration permits would be required for this project.

24.2.2 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 Clean Water Act Section 404 Nationwide Permits (NWP), a State may issue a general certification that applies to all applicants who qualify for coverage under a given NWP. In 2017, the Utah Division of Water Quality (UDWQ) issued a Section 401 certification for the NWPs, including NWP 14, *Linear Transportation Facilities*. UDWQ retained the right to require individual certifications for projects that are likely to have a significant adverse effect on water quality or to degrade waters of the State despite following NWP conditions.

UDOT plans to use coverage under NWP 14 to permit discharges for the S.R. 210 Project. UDOT does not expect UDWQ to require an individual certification given the analysis in this EIS that the action alternatives would not cause significant adverse effects on water quality or degrade any beneficial uses of water bodies.

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

Construction projects that disturb 1 or more acres of land, including projects less than 1 acre that are part of a larger common plan of development or sale, must be covered under the statewide Utah Pollutant Discharge Elimination System (UPDES) construction stormwater permit.

To obtain a UPDES permit, UDOT must submit a notice of intent and fee to UDWQ with operator information, facility location, type of construction, total acres to be disturbed, identification of applicable best management practices (BMPs), and the certification of the responsible party. In addition, the general permit requires UDOT to develop and implement a stormwater pollution prevention plan that includes identification of erosion-control, sediment-control, and good-housekeeping BMPs as well as site-specific measures to protect slopes and natural features, minimize erosion, and prevent eroded sediment from leaving the construction zone.

24.2.4 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, and an air quality approval order would be required for any of the action alternatives. To obtain an air quality approval order, UDOT must submit a notice of intent to the Utah Division of Air Quality describing the construction activities and emissions that would be associated with operating construction equipment. UDOT must include provisions for controlling dust and emission sources, and the permit might require other construction approvals depending on the source and location of aggregate, asphalt, combustion, and/or fuel storage facilities. This permit would be obtained by the contractor before construction.

24.2.5 Certificate of Registration (Utah Division of Wildlife Resources)

A certificate of registration is required by the Utah Division of Wildlife Resources if a proposed action could affect raptor nests. Although UDOT does not anticipate that any raptor nests would be affected by the action alternatives, nests could be established before construction. UDOT will obtain a certificate of registration if needed based on consultation with the Division of Wildlife Resources.

24.2.6 Approval of Remediation Work Plan (UDEQ or EPA)

If a hazardous waste site is found during construction, UDOT would submit a remediation work plan to the regulatory agency (either the Utah Department of Environmental Quality [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. The work plan would also be coordinated with the USDA Forest Service for approval.

24.3 Local Permits and Clearances

24.3.1 Flood-control Permit and Floodplain Development Permit (Local Jurisdictions)

Flood-control permits and floodplain development permits would be required from local jurisdictions if construction, including placement of highway fill and drainage structures at stream crossings, is necessary within the Federal Emergency Management Agency (FEMA) 100-year floodplain boundary.

The Town of Alta, Cottonwood Heights City, and Salt Lake County 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 alternatives would cross several 100-year floodplains, as described in Chapter 14, Floodplains. In accordance with Executive Order 11988, *Floodplain Management*, UDOT must coordinate with FEMA during the construction phase to ensure that local jurisdictions' flood design standards are met and to obtain floodplain development permits from the local jurisdictions.

What is a 100-year floodplain?

A 100-year floodplain is the area around a water body that would be inundated by a 100-year flood. A 100-year flood is a flood with a 1% chance of occurring each year, or one that occurs on average every 100 years.

24.3.2 Salt Lake County and Salt Lake City Permits and Approvals

Portions of the action alternatives would be constructed in a watershed. Potential permits and approvals from Salt Lake County and Salt Lake City are listed in Table 24.4-1.

24.3.3 Construction-related Permits and Clearances (Various Agencies)

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

24.4 Summary of Permits, Reviews, Clearances, and Approvals

Table 24.4-1 lists the permits, reviews, clearances, and approvals that would or could be required for the S.R. 210 Project. These permits, reviews, clearances, and approvals would apply to all of the action alternatives.

Table 24.4-1. Permits, Reviews, Clearances, and Approvals Likely To Be Required for the S.R. 210 Project

Permit	Granting Agency(ies)	Applicant	Application Time	Granting Time	Applicable Portion of Project
Federal Permits, Reviews, Clearances, and Approvals					
Nationwide 14 for Linear Transportation Projects	USACE	UDOT	After the Final EIS	Before construction	Piping of intermittent and ephemeral streams along S.R. 210
Compliance with Section 106 of the National Historic Preservation Act	Utah SHPO and ACHP	UDOT	Concurrent with EIS	Final EIS	Considerations of impacts to historic properties; includes consultation between agencies and interested parties
Federal land right-of-way transfer, easement, or special-use authorization	USDA Forest Service and FHWA	FHWA or UDOT	After the Final EIS	Before construction	Portion of the action alternatives that cross USDA Forest Service land
Forest Service plan amendment	USDA Forest Service	UDOT	After the Final EIS	Before construction	Portion of the action alternatives that cross USDA Forest Service land not appropriated and result in a nonconforming use
Project-level air quality conformity determination	FHWA	UDOT	Final EIS	Final EIS	Operation of mobility hubs, bus service, and cog rail and gondola base stations
Form 7460-1, <i>Notice of Proposed Construction or Alteration</i>	FAA	UDOT	Before final design	Final design	FAA warning lights on gondola towers
Contract for removal of merchantable timber	USDA Forest Service	UDOT	Final EIS	Before construction	Portion of the alternatives on NFS lands
Permit/authorization for removal of forest products (rock, gravel, and so on)	USDA Forest Service	UDOT	Final EIS	Before construction	Portion of the alternatives on NFS lands

(continued on next page)

Table 24.4-1. Permits, Reviews, Clearances, and Approvals Likely To Be Required for the S.R. 210 Project

Permit	Granting Agency(ies)	Applicant	Application Time	Granting Time	Applicable Portion of Project
State Permits, Reviews, Clearances, and Approvals					
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 Selected Alternative
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
Air quality approval order	Utah Division of Air Quality	Contractor	Construction phase	Before construction	Air quality during construction phase (emissions from equipment)
Certificate of registration	Utah Division of Wildlife Resources	Contractor	Construction phase	Before construction	Impacts to raptor nests from construction
Local Permits, Clearances, and Approvals					
Flood-control permit and floodplain development permit	Local jurisdictions	UDOT	Final design phase	Final design phase	Portion of roadway or structure in FEMA floodplain
Construction-related permits	Various agencies	Contractor	Contractor	Before construction	Impacts associated with off-site activities such as activities in construction staging areas, borrow areas, batch plant sites, and so on
Salt Lake City's Watershed Ordinance, Section 17.040, and Salt Lake City surplus water permits	Salt Lake City	UDOT	Final design phase	Final design phase	Approval where water resources are desired for connection to the proposed snow sheds
Salt Lake County Health Regulation 13	Salt Lake County	UDOT	Final design phase	Final design phase	Approval for connection if sanitary facilities are required to connect to sewer system for trailhead restrooms
Salt Lake County Health Regulation 14	Salt Lake County	UDOT	Final design phase	Final design phase	Approval for the use and occupancy of facilities in watersheds in Salt Lake County
Salt Lake County Foothills and Canyons Overlay Zone (Salt Lake County Ordinance, Chapter 19.72), and Mountain Resort Zone (Chapter 19.13)	Salt Lake County	UDOT	Final design phase	Final design phase	Land use approvals would be needed for alternatives in the unincorporated areas of Little Cottonwood Canyon

AHCP = Advisory Council on Historic Preservation, FAA = Federal Aviation Administration, FEMA = Federal Emergency Management Agency, NFS = National Forest System, S.R. = State Route, SHPO = State Historic Preservation Officer, UDOT = Utah Department of Transportation, UPDES = Utah Pollutant Discharge Elimination System, USACE = U.S. Army Corps of Engineers, USDA = U.S. Department of Agriculture

24.5 Limitations on Claims

This section explains how citizens can file claims to ask a court to review agency actions involving permits, licenses, or approvals for a transportation project.

An agency of the U.S. Department of Transportation can publish a notice in the Federal Register, in accordance with 23 USC Section 391(I), stating that one or more federal agencies have taken final actions on permits, licenses, or approvals for a transportation project. If such a notice is published, citizens can file lawsuits to ask a court to review those federal agency actions. These claims must be filed within 150 days after the date of publication of the notice, or within a shorter period of time if one is specified in the federal laws that apply to the specific judicial review that is allowed for the federal agency action. If no notice is published, then the periods of time that are provided by the federal laws governing such claims apply.

24.6 References

[EPA] U.S. Environmental Protection Agency

- 2021 Email from Tim Russ, EPA, to Naomi Kisen, UDOT, regarding review of the Little Cottonwood Canyon Draft Air Quality Technical Report. January 22.

[USDA Forest Service] U.S. Department of Agriculture Forest Service

- 2003 Revised Forest Plan: Wasatch-Cache National Forest. South Jordan, Utah: U.S. Department of Agriculture, Forest Service, Intermountain Region, Uinta-Wasatch-Cache National Forest. [https://www.fs.usda.gov/detailfull/uwcnf/landmanagement/planning/?cid=stelprdb5076923& width=full](https://www.fs.usda.gov/detailfull/uwcnf/landmanagement/planning/?cid=stelprdb5076923&width=full).

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Chapter 25: Mitigation Summary

25.1 Introduction

This chapter provides a summary of the mitigation measures developed to avoid, minimize, rectify, reduce, or compensate impacts from the action alternatives for the State Route (S.R.) 210 Project. Funding for mitigation will be included in the cost of construction for the project with the Utah Department of Transportation (UDOT) having 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 Environmental Impact Statement (EIS) is performed and that appropriate monitoring for effectiveness takes place. If a mitigation measure is determined to be not effective, the contractor will consult with UDOT to develop other appropriate mitigation.

What is the purpose of this chapter?

This chapter provides a summary of the mitigation measures developed to avoid, minimize, rectify, reduce, or compensate impacts from the action alternatives for the S.R. 210 Project.

25.2 Mitigation Measures

25.2.1 Mitigation Measures for Community and Property Impacts

25.2.1.1 Recreation

25.2.1.1.1 S.R. 210 – North Little Cottonwood Road to Alta

Enhanced Bus Service Alternative

No mitigation measures are proposed.

Enhanced Bus Service in Peak-period Shoulder Lane Alternative

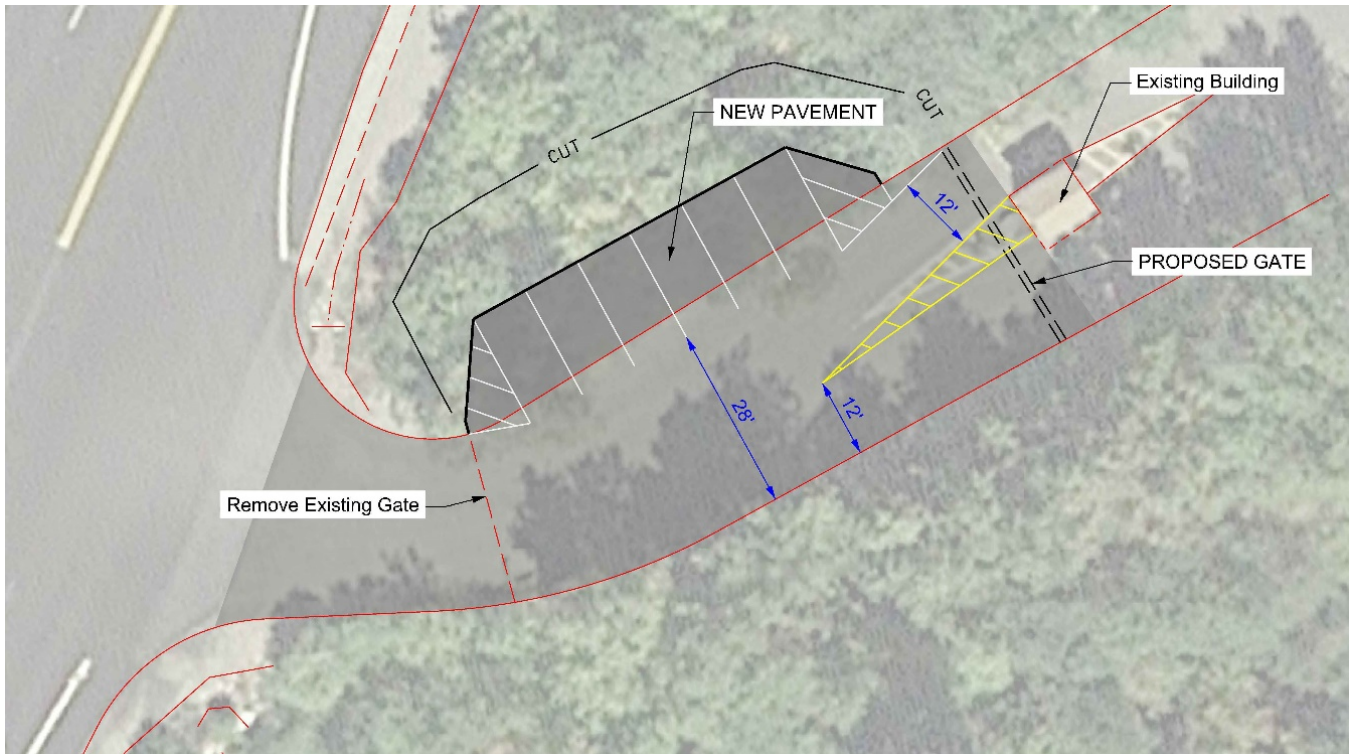
During construction of the peak-period shoulder lanes, access to recreation in Little Cottonwood Canyon would be restricted in specific locations. UDOT will implement a public involvement program to inform recreational users of potential road and recreation site closures.

Given the proximity of climbing boulders to S.R. 210, their use as a climbing resource could be diminished or eliminated. During the final design process for the Selected Alternative, UDOT will look at ways to minimize or avoid impacts to the climbing resources. If a climbing boulder needs to be removed for roadway or rail construction, UDOT will work with the construction contractor to determine whether the boulder can be moved to another location. If moving the boulder is possible, UDOT will coordinate with the USDA Forest Service to find a suitable location in Little Cottonwood Canyon.

As a result of adding the peak-period shoulder lanes, some existing and planned trails used by climbers and hikers would be impacted by removing portions of the trail. To mitigate the impacts to the trails, UDOT will realign any existing named trails at the time of construction to maintain trail connectivity. If this alternative is selected, UDOT will work with the USDA Forest Service and other stakeholders in the design of the trails. Prior to construction, appropriate surveys for cultural resources and sensitive biological resources including wetlands will be conducted so that they can be avoided during trail construction. Once the trail designs are completed, additional environmental documentation might be required before construction.

Access to the Tanners backcountry skiing area would be eliminated with no roadside parking, and the next available parking is at White Pine Trailhead about a mile away. UDOT would mitigate this impact by providing six winter parking spaces at the entrance to the Tanners Flat Campground area, as shown in Figure 25.2-1. There are no cultural resources or important biological resources in the area of the proposed improvements.

Figure 25.2-1. Mitigation for Elimination of Tanners Roadside Parking



Avalanche Mitigation Alternatives

During construction of the snow sheds, access to recreation in Little Cottonwood Canyon would be restricted in the area of snow shed construction. UDOT will implement a public involvement program to inform recreational users of potential road and recreation site closures. UDOT will also look at maintaining access to the White Pine North boulder area on the north side of S.R. 210 as part of the mid-canyon snow sheds and the Main Hellgate, Towers, and East Hellgate climbing areas as part of the upper-canyon snow sheds required for the Cog Rail Alternative.

Trailhead Parking Alternatives

During construction of the trailheads at Gate Buttriss, Bridge, Lisa Falls, and White Pine, access to the trailheads could be restricted during construction. In coordination with the USDA Forest Service, UDOT will implement a public involvement program to inform recreational users of potential trailhead closures. For the trailhead parking alternatives that eliminate parking at the Tanners backcountry skiing area, UDOT will add parking at the entrance to the Tanners Flat Campground as shown in Figure 25.2-1 above. There are no cultural resources or important biological resources in the area of the proposed improvements.

Gondola Alternatives

The first tower at the bottom of Little Cottonwood Canyon (after the Little Cottonwood Canyon park-and-ride lot) and portions of the base station design would be placed on trails developed by the USDA Forest Service and the Salt Lake City Climbers Alliance (Alpenbock Trail, West Leg). To minimize impacts to the trails, the trails will be relocated around the tower, or if possible the tower location will be shifted to avoid the trail during the final design process. If a gondola alternative is selected, UDOT will work with the USDA Forest Service and other stakeholders to design the trails. Prior to construction, appropriate surveys for cultural resources and sensitive biological resources including wetlands will be conducted so that these resources can be avoided during trail construction.

Cog Rail Alternative

During construction of the cog rail system, access to recreation in Little Cottonwood Canyon would be restricted in specific locations. UDOT will implement a public involvement program to inform recreational users of potential road and recreation site closures.

During the final design process and in coordination with the USDA Forest Service, UDOT might identify where pedestrians would be allowed to cross the cog rail alignment to access the Tanners backcountry skiing and climbing area, the Maybird Slide climbing area, and other locations as necessary.

Given the proximity of climbing boulders to S.R. 210, their use as a climbing resource could be diminished or eliminated. During the final design process for the Selected Alternative, UDOT will look at ways to minimize or avoid impacts to the climbing resources. If a climbing boulder needs to be removed for construction, UDOT will work with the construction contractor to determine whether the boulder can be moved to another location. If moving the boulder is possible, UDOT will coordinate with the USDA Forest Service to find a suitable location in Little Cottonwood Canyon.

As a result of the Cog Rail Alternative, some existing and planned trails used by climbers and hikers would be impacted by removing portions of the trail. To mitigate the impacts to the trails, UDOT will realign any existing named trails at the time of construction to maintain trail connectivity. If this alternative is selected, UDOT will work with the USDA Forest Service and other stakeholders to design the trails. Prior to construction, appropriate surveys for cultural resources and sensitive biological resources including wetlands will be conducted so that these resources can be avoided during trail construction.

25.2.1.2 Property Impacts

Property acquisitions will be completed according to the provisions of the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended; the Utah Relocation Assistance Act, Utah Code, Section 57-12; and UDOT's relocation guidelines (UDOT 2016).

25.2.1.3 Other Potential Mitigation Measures

25.2.1.3.1 Gondola Alternatives

Representatives with the Granite Mountain Records Facility were concerned that gondola users might be able to look into their secure facility. UDOT evaluated options to mitigate this concern including adding a gondola tower between towers 2 and 3. This additional tower would lower the view from the gondola cabins such that users could not see into the facility. The tower height of gondola tower 2 (Gondola Alternatives A and B) would be reduced from about 50 meters (164 feet) to 40 meters (131 feet). The new tower, which would be located just east of the entrance road to the facility, would be about 33 meters (108 feet) high. No sensitive biological resources, cultural resources, or recreation features are in the area of the proposed new tower. UDOT will further investigate this mitigation during final design if a gondola alternative is selected.

25.2.2 Mitigation Measures for Impacts to Environmental Justice Populations

With all alternatives, paying a toll would cause an adverse impact to low-income populations wanting to recreate during the winter in the lower canyon (below the ski resorts). Practicable measures to avoid or reduce the potential adverse effects to low-income populations will include one or a combination of the following measures:

- Place the toll gantry immediately prior to Snowbird Entry 1. This would allow low-income populations wanting to recreate outside the ski resorts in the lower portions of Little Cottonwood Canyon to avoid having to pay the toll.
- Have the toll in effect only during the morning peak period (7 AM to 10 AM), which would allow low-income populations to avoid paying the toll by recreating after 10 AM.

25.2.3 Mitigation Measures for Impacts to Economics

25.2.3.1 All Alternatives

For businesses that experience short-term access and visibility problems during construction, a traffic access management plan will be developed and implemented by the construction contractor that maintains the public's access to the business during normal business hours. However, with construction in Little Cottonwood Canyon, it might not be possible to keep the road open all of the time during the summer construction period. UDOT will work with the U.S. Department of Agriculture Forest Service and businesses in Little Cottonwood Canyon to inform them of potential closures and try to avoid closures during peak periods.

For impacts related to strip takes from business properties, the business will receive compensation in accordance with UDOT's right-of-way acquisition practices. Property acquisitions will be completed

according to the provisions of the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the Utah Relocation Assistance Act, Utah Code, Section 57-12.

25.2.4 Mitigation Measures for Impacts to Considerations Related to Pedestrians and Bicyclists

All existing pedestrian and bicyclist facilities that would be temporarily impacted during construction will be relocated as part of the project. Some facilities could be closed during construction. Project construction for pedestrian and bicyclist facilities will be phased to minimize disruptions to the public to the extent feasible. UDOT will also coordinate with the U.S. Department of Agriculture Forest Service, Cottonwood Heights City, Sandy City, the Town of Alta, and Salt Lake County during the final design of the Selected Alternative to mitigate disruptions to pedestrians, cyclists, and trail users. Potential mitigation for disruption will include providing signed on-road detours where feasible, closing facilities during low-use seasons (trail and use dependent), and providing information to the public about trail closures.

UDOT will work with the municipalities and Salt Lake County during the final design of the Selected Alternative to determine whether additional funding is available for new trails or new trail connections to areas where S.R. 210 improvements are made.

If Gondola Alternative B or the Cog Rail Alternative is selected, UDOT will work with Cottonwood Heights City and Salt Lake County on the design of the bicycle path around the gondola or cog rail base station at La Caille to minimize safety conflicts and maintain the quality of this cyclist route. This could include providing a multi-use path from Wasatch Boulevard on the east side of North Little Cottonwood Road around the base station on land designated as open space by Cottonwood Heights City. The multi-use path could provide access for Cottonwood Heights residents to the open space and connect to the existing unofficial trail that continues to the Little Cottonwood Canyon park-and-ride lot at the intersection of S.R. 209 and S.R. 210.

25.2.5 Mitigation Measures for Impacts to Noise

This section discusses UDOT's methodology for evaluating noise-abatement mitigation measures for the traffic noise impacts identified in Section 11.4.3, Enhanced Bus Service Alternative, through Section 11.4.7, Cog Rail Alternative. As stated in Section 11.4.1, Methodology, noise mitigation typically consists of installing a noise wall or other physical barrier that blocks the line of sight from the roadway noise source to nearby receptors.

According to UDOT's noise-abatement policy (UDOT Policy 08A2-01, *Noise Abatement*, revised May 28, 2020), noise abatement will be considered for new highway construction where noise impacts are identified. The goal of noise abatement is to substantially reduce noise, which might or might not result in noise levels below the NAC.

The two primary criteria to consider when evaluating noise-abatement measures are feasibility and reasonableness. Noise abatement will be provided by UDOT only if UDOT determines that noise-abatement measures are *both* feasible and reasonable.

25.2.5.1 Feasibility Factors

The feasibility of noise-abatement measures deals primarily with construction and engineering considerations such as safety, presence of cross streets, sight distance, and access to adjacent properties, among other considerations, including the following.

What is a front-row receptor?

A front-row receptor is a residence in the first row of homes adjacent to a project alternative.

- **Acoustic Feasibility.** Noise abatement must be considered acoustically feasible. This is defined as achieving at least a 5-dBA noise reduction for at least 50% of front-row receptors. A 5-dBA change in noise would be perceptible by most people under normal listening conditions. If a noise-abatement measure is determined by UDOT to be acoustically feasible, then the abatement measure will be evaluated to determine whether its construction is reasonable. If a noise-abatement measure is determined by UDOT to be not feasible, it will not be considered any further.
- **Safety on Urban Non-access-controlled Roads.** UDOT's noise-abatement policy states that, "[t]o avoid a damaged wall from becoming a safety hazard, in the event of a failure, wall height shall be no greater than the distance from the back of curb to the face of [the] proposed wall."

25.2.5.2 Reasonableness Factors

Under UDOT's noise-abatement policy, reasonableness factors must be collectively achieved in order for a noise-abatement measure to be considered "reasonable." If any of the three reasonableness factors (noise-abatement design goal, cost-effectiveness, and viewpoints of property owners and residents) specified in the policy are not achieved, the noise-abatement measure will be considered not reasonable and therefore not included in the project.

- **Noise-abatement Design Goal.** UDOT defines the minimum noise reduction (design goal) from proposed abatement measures to be 7 dBA or greater for at least 35% of front-row receptors. As a result, no abatement measure will be considered reasonable if the noise-abatement design goal cannot be achieved.
- **Cost-effectiveness.** The cost of a noise-abatement measure must be considered reasonable for it to be included in the project. Noise-abatement costs are determined by multiplying a fixed unit cost per square foot by the height and length of the barrier.

For residential receptors (activity category B in Table 11.2-1, UDOT's Noise-abatement Criteria), cost-effectiveness is based on the cost of the abatement measure (for example, a noise wall) divided by the number benefited receptors (dwelling units at which noise is reduced by a minimum of 5 dBA as a result of the abatement measure). Currently, the maximum cost used to determine the reasonableness of a noise-abatement measure is \$30,000 per benefiting residence based on a unit barrier cost of \$20 per square foot of barrier, and \$360 per lineal foot for activity categories A, C, D, or E.

- **Viewpoints of Property Owners and Residents.** If a noise-abatement measure is both feasible and cost-effective, UDOT will also consider the viewpoints of property owners and residents (non-owners) to determine whether the noise-abatement measure is desired. Balloting will be conducted for those noise-abatement measures that both meet the noise-abatement design goal and are cost-effective consistent with the procedures described in UDOT's noise-abatement policy.

25.2.5.3 Noise-abatement Evaluation for the Proposed Alternatives

UDOT evaluated 18 noise walls at locations where noise impacts would occur with the action alternatives. Of the 18 modeled noise barriers for the five action alternatives, 14 met UDOT's feasibility and reasonableness acoustic and cost criteria for all five action alternatives with the Imbalanced-lane Alternative on Wasatch Boulevard, and 13 met UDOT's feasibility and reasonableness acoustic and cost criteria for all five action alternatives with the Five-lane Alternative on Wasatch Boulevard. Maps showing the locations of the noise walls evaluated for the action alternatives and more detailed information is available for each barrier in Appendix 11A, Noise Technical Report.

Table 11.4 2, Barrier Analysis Summary, summarizes the analyzed noise barriers. The locations of the noise barriers are shown in Figure 11.4 - and Figure 11.4-2, Noise Barriers Overview, beginning on page 11-35.

Noise-abatement Consideration during Final Design. The final decision to build a noise barrier will be made on completion of the project design, completion of the public involvement process, and concurrence with UDOT's noise-abatement policy. A barrier identified as recommended for balloting is a barrier that has been shown to be both feasible and reasonable. However, that finding is not a commitment to build a barrier.

25.2.6 Mitigation Measures for Impacts to Water Resources

The following mitigation measures will help ensure that water quality is maintained.

- UDOT or its design consultants will follow UDOT's *Stormwater Quality Design Manual*.
- UDOT or its construction contractors will prepare an SWPPP and obtain a UPDES permit for construction and will monitor restoration efforts for revegetation success.
- UDOT will visually inspect and maintain water quality BMPs to check that they are functioning properly.
 - During construction, inspectors for the project will certify that the BMPs were installed according to contract documents and UDOT standards.
 - After construction, UDOT will document and maintain records of inspections, any deficiencies identified during inspections, and the repairs performed on the BMPs.
- UDOT will work with SLCDPU, Metropolitan Water, and the sewer district to determine the procedures for discharging the fire-suppression water from the snow sheds.
- If a gondola or cog rail alternative is selected, UDOT will ensure that the emergency generators and fuel storage tanks are inspected for damage and evidence of leaks, and if feasible that they include leak-detection systems. The tanks will be dual-walled with secondary containment systems.

SLCDPU and Metropolitan Water (Sandy City) stated that one of their primary water quality concerns is vehicle accidents in which a vehicle leaves the roadway and enters Little Cottonwood Creek, with the result that vehicle fluids directly contaminate the creek and potentially contaminate the water treatment processes. To address this concern, UDOT evaluated 10 years of accident data to determine the primary location(s) of roadway departure accidents within 200 feet of the creek (HDR 2020).

Based on that analysis and to improve both roadway safety and water quality, UDOT will include concrete barriers with all of the action alternatives if the required shoulder and 2-foot safety distance between the

travel lane and barrier can be maintained and if the barriers do not substantially impede UDOT's ability to remove snow from the roadway. Subject to UDOT's final evaluation, the barriers will be located between mileposts 4.9 and 5.7, 6.7 and 7.0, and 8.7 and 9.0. UDOT will work with the USDA Forest Service before installing any barriers to address the Forest Service's concerns about visual impacts.

25.2.7 Mitigation Measures for Impacts to Ecosystem Resources

25.2.7.1 Mitigation Measures for Vegetation Impacts

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

- All fill materials brought onto the construction site will be required to be clean of any chemical contamination per UDOT's General Standard Specifications, Section 02056, *Embankment, Borrow, and Backfill*. Topsoil for landscaping must also be free of weed seeds per UDOT's General Standard Specifications, Section 02912, *Topsoil*.
- Compacted soils will be ripped, stabilized, and reseeded with native seed mixes.
- The contractor will 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*.
- Reseeding with native plants, followed by monitoring seedlings and invasive species until the vegetation has re-established, will mitigate direct-disturbance impacts and reduce the potential for weed invasions. UDOT will be responsible for monitoring and determining when vegetation becomes re-established.
- UDOT will comply with USDA Forest Service requirements by continuing to treat noxious and other invasive weeds on areas disturbed by this project for a period of three growing seasons.
- UDOT will coordinate with the USDA Forest Service to determine the proper methods for disposing of any vegetation slash generated from the Selected Alternative.
- UDOT will coordinate with the USDA Forest Service and follow Salt Lake County Watershed Protection Ordinances regarding the use of any herbicides in Little Cottonwood Canyon.

25.2.7.2 Mitigation Measures for Wildlife Impacts

UDOT will implement the following mitigation measures 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 will be removed during the non-nesting season (about August 15 to April 1). If this is not possible, UDOT or its contractor will 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 will coordinate with the UDOT Natural Resources Manager/Biologist to avoid impacts to migratory birds.
- Coordination with the USDA Forest Service will be conducted to determine any known raptor nests in the helicopter flight path or in areas that could be disturbed by construction activities and to determine when and where preconstruction raptor nest surveys should occur. If active nests are found, UDOT will coordinate with the USDA Forest Service and USFWS regarding protocols to protect the active nests.
- To the extent practicable, gondola towers and lighting design should consider recommendations from the *Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning* (USFWS 2018). Tower lighting should be implemented only if required by FAA, and flashing red lights and an aircraft detection lighting system should be used if allowed.

25.2.7.2.1 Mitigation Measures for Aquatic Resources Impacts

UDOT must submit a preconstruction notification to USACE prior to construction if (1) the loss of waters of the United States exceeds 0.1 acre or (2) there is a discharge in a special aquatic site, including wetlands. Currently, the Enhanced Bus Service in Peak-period Shoulder Lane Alternative is the only alternative that would cause an impact to streams greater than 0.1 acre. The action alternatives would not cause any impacts to wetlands. For the impacts to the streams that require preconstruction notification, USACE may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects.

If preconstruction notification is required by USACE and if compensatory mitigation is required, UDOT will prepare a mitigation plan during the Clean Water Act Section 404 permitting phase of the project. UDOT will discuss mitigation concepts with USACE and the USDA Forest Service that might include the restoration or enhancement, maintenance, and legal protection (for example, through a conservation easements) of riparian areas next to streams that would be affected.

25.2.7.2.2 Mitigation Measures for Impacts to USDA Forest Service Sensitive Species

To comply with USDA Forest Service requirements for sensitive plant species, a preconstruction survey will be completed for all alternatives in areas of ground disturbance and/or where impacts to vegetation would occur. The surveys will be completed during the growing season in 2021. The results of the surveys will be included in the Final EIS and in a separate technical memorandum to the Forest Service.

25.2.7.3 Threatened and Endangered Species Commitments

Because no federally threatened or endangered species and no critical habitat was identified in the ecosystem resources impact analysis area, no mitigation is proposed.

25.2.7.4 Mitigation Measures for Impacts to Riparian Habitation Conservation Areas

Up to about 2.5 acres of riparian habitat within the RHCAs would be converted to transportation use. In accordance with the 2003 *Revised Forest Plan: Wasatch-Cache National Forest*, the following Riparian Management Objectives have been developed for alternatives being analyzed by UDOT for the Little Cottonwood Canyon EIS that would be constructed within, or otherwise impact, RHCAs as defined in the *Forest Plan*. UDOT will implement the following mitigation measures to minimize impacts to riparian habitat:

- Establish vegetation cover and stem density equal to or greater than 90% of preconstruction conditions in disturbed, nonhardened areas.
 - Use only USDA Forest Service–approved seed mixes.
 - In some areas, the USDA Forest Service may reduce re-established tree stand density requirements to improve forest health.
- Structural changes to a stream channel or bed will not induce significant changes in stream velocities.
 - Removing trees outside RHCAs, in areas that are otherwise not hardened, might be subject to Riparian Management Objectives.
 - In some areas, the USDA Forest Service may reduce re-established tree stand density requirements to improve forest health.
- Restore a minimum of 80% of preconstruction effective stream shading within ¼ mile of riparian canopy disturbances along streams.
- Obtain USDA Forest Service approval of BMPs and a stormwater pollution prevention plan prior to submission for Utah Division of Water Quality permitting.
- Follow USDA Forest Service guidelines and requirements for performing inspections of equipment and vehicles for invasive plant and noxious weed species.

25.2.8 Mitigation Measures for Impacts to Floodplains

UDOT and/or its construction contractor will take measures to reduce floodplain impacts and to ensure that the project complies with all applicable regulations. These mitigation measures will include the following:

- The action alternatives would require a number of stream and floodplain crossings in the same locations where they presently exist. Where new or rehabilitated bridges and culverts are included in the design of an alternative, the design will follow FEMA requirements and the requirements of UDOT's *Drainage Manual of Instruction*, where applicable. Where no regulatory floodplain is defined, culverts and bridges will be designed to accommodate a 50-year (2%-annual-chance) or greater-magnitude flood. Where regulatory floodplains are defined, hydraulic structures will be designed to accommodate a 100-year (1%-annual-chance) flood. Energy-dissipation measures will be included in the alternative's design as applicable.
- Stream alteration permits will be obtained for stream crossings as required by the Utah Division of Water Rights. Note that the stream alteration permitting process is a separate process from the floodplain permitting process. The stream alteration permitting process is required to satisfy state regulations and under certain circumstances may 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 will be obtained for all locations where the proposed roadway embankment or structural elements would encroach on a regulatory floodplain, and structures will be designed to meet the more stringent of FEMA requirements and local floodplain ordinances. 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 will 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 following case applies:
 - For areas of Zone A floodplain impacts, the approach will be to analyze existing and proposed conditions and design project features such that compliance is achieved (that is, such that a CLOMR is not required) as much as possible. In these areas, FEMA performed floodplain mapping based on approximate methods. The absence of a detailed study or floodway delineation places the burden on the project proponent (in this case, UDOT) to perform hydrologic and hydraulic analyses consistent with FEMA standards. These analyses will confirm or refine the FEMA floodplain mapping and could increase or decrease the estimate of affected areas.
- UDOT will obtain flood-control permits from Salt Lake County for actions affecting County-controlled waterways, which include Little Cottonwood Creek and Big Cottonwood Creek. UDOT will obtain flood-control permits from Cottonwood Heights City for Unnamed Creek near 3500 East and Unnamed Creek near 9000 South.
- Roadway elevations will be a minimum of 2 feet above adjacent floodplain elevations, where those elevations are defined, so that flooding will not interfere with a transportation facility needed for emergency vehicles or evacuation.
- Walls will be designed and constructed to minimize longitudinal floodplain impacts.

25.2.9 Mitigation Measures for Impacts to Cultural Resources

25.2.9.1 Avalanche Mitigation Alternatives

If either the Snow Sheds with Berms Alternative or the Snow Sheds with Realigned Road Alternative is selected, mitigation measures will include the following:

- Archaeological data recovery for site 42SL419 will be conducted in consultation with the USDA Forest Service and the Utah SHPO.

25.2.9.2 Gondola Alternative A or B

If Gondola Alternative A or B is selected, mitigation measures will include the following:

- Single-pole gondola towers will be used to reduce visual impacts to the Iron Blossam Lodge, the Inn at Snowbird, The Lodge at Snowbird, the Snowbird Center, and the Alta Lodge.
- Construction monitoring will be conducted for sites 42SL52 and 42SL109.
- Archaeological data recovery for site 42SL52 will be conducted in consultation with the USDA Forest Service and the Utah SHPO.

25.2.9.3 Cog Rail Alternative

If the Cog Rail Alternative is selected, mitigation measures will include the following:

- Archaeological data recovery for sites 42SL109 and 42SL419 will be conducted in consultation with the USDA Forest Service and the Utah SHPO.

25.2.10 Mitigation Measures for Impacts to Hazardous Materials and Waste Sites

Site investigations conducted by UDOT during the final design of the Selected Alternative will determine potential hazards, if any, and the appropriate protective measures. In the case of an identified chemical hazard, UDOT will negotiate the site remedy with the property owner before property is acquired and through possible coordination with DERR. If a smelter site or historic mine site in Little Cottonwood Canyon is impacted, UDOT will also coordinate with the U.S. Department of Agriculture Forest Service and the Salt Lake City Department of Public Utilities to address each Department's watershed concerns.

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

During construction, coordination will take place among UDOT or DERR, the construction contractor, and the appropriate property owners. This coordination will 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 will be used to reduce the potential for public or worker exposure to hazardous materials as determined necessary by UDOT.

25.2.11 Mitigation Measures for Impacts to Visual Resources

All aesthetic treatments will be coordinated with the USDA Forest Service landscape architect and implemented in accordance with UDOT Policy 08C-03, *Project Aesthetics and Landscaping Plan Development and Review* (UDOT 2014a); the *UDOT Aesthetics Guidelines* (UDOT 2014b); and the guidelines in the *Cottonwood Canyons Scenic Byways Corridor Management Plan* in coordination with the USDA Forest Service and local municipal agencies. 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; the color of bridges, structures, and retaining walls; and other architectural features, such as railings. UDOT typically evaluates aesthetic treatments during the final design phase of a project after an alternative is selected in the project's Record of Decision and funding has been allocated for the project.

UDOT will consider, on a case-by-case basis and in conjunction with the USDA Forest Service and municipal agencies as appropriate, the following mitigation measures for minimizing the adverse effects of the Selected Alternative on visual resources:

- When siting a facility, incorporate measures to minimize the profile of all facility-related structures, particularly for facilities proposed within the immediate foreground and foreground distance of sensitive viewing locations.
- Use custom-designed gondola structures, buildings, and avalanche-control structures in key areas when such designs would soften the visual impact and blend more effectively with the surroundings.
- Select materials and surface treatments for structures, cog rail, gondola, and roads that repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. Improvements should consider and be consistent with the visual guidelines in the *Cottonwood Canyons Scenic Byways Corridor Management Plan*. For example, if the elements of the Selected Alternative would be viewed against an earthen or other non-sky background, appropriately colored materials will be selected to help blend structures with the elements' backdrop.
- Identify appropriate colors and textures for facility materials by considering both summer and winter appearance, as well as seasons of peak visitor use.
- On structures, use materials, coatings, or paints that have little or no reflectivity.
- Use variable-length tower legs to reduce the cut and fill needed to form a level tower pad.
- Minimize vegetation clearing to the extent practicable, especially adjacent to S.R. 210 or the locations of other sensitive viewers.
- Where vegetation would be cleared, feather the edges to reduce the creation of geometric clearings incongruent with the existing landscape character.

- Use nonreflective gondola cable infrastructure to reduce glare and reflectiveness.
- Design facilities and structures using natural materials (for example, wood or stone) to blend with the “forest” aesthetic.

25.2.12 Mitigation Measures for Construction Impacts

The following mitigation measures will be implemented during construction.

25.2.12.1 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 will be implemented for the specific design for each phase. Future mitigation for subsequent phases will take into account the final design of the Selected Alternative for that phase and any changes in regulations or potential improvements to BMPs at the time of implementation.

25.2.12.2 Mitigation Measures for Public Impacts from Construction

A thorough public information program will be implemented to inform the public about construction activities and to reduce impacts. Information will include work hours and alternate routes. Construction signs will be used to notify drivers about work activities and changes in traffic patterns.

If nighttime construction is required, impacts from lighting will be reduced by aiming construction lights directly at the work area and/or shielding the lights. Utility agreements will be completed to coordinate utility relocations. UDOT will also reach out to owners of property adjacent to construction areas including homeowners who have special-use permits to access their homes on National Forest System lands.

25.2.12.3 Mitigation Measures for Air Quality Impacts from Construction

The contractor will follow the appropriate BMPs included in UDOT’s plans and specifications for roadway and bridge construction. This includes items such as fugitive-dust control and street sweeping (UDOT Standard Specification 01355, *Environmental Compliance*).

25.2.12.4 Mitigation Measures for Water Quality Impacts from Construction

To reduce the temporary impacts to water quality, a UPDES stormwater permit would be required. As part of the requirements of the permit, the contractor will develop and implement a stormwater pollution prevention plan. The plan will identify measures to reduce impacts to receiving waters from construction activities including site grading, materials handling and storage, fueling, and equipment maintenance. As part of the stormwater pollution prevention plan, the contractor will develop a water quality protection BMP implementation and effectiveness and monitoring plan. The development of this plan will be coordinated with the USDA Forest Service and the Salt Lake City Department of Public Utilities.

For disturbance adjacent to or near Little Cottonwood Creek, UDOT will coordinate as appropriate with the Salt Lake City Department of Public Utilities and the USDA Forest Service with respect to BMPs and other measures to minimize runoff and sediment. For construction on National Forest System lands, UDOT will obtain approval from the USDA Forest Service regarding BMPs and will develop a stormwater pollution prevention plan prior to construction.

25.2.12.5 Mitigation Measures for Impacts to Wetlands, Streams, and Wildlife from Construction

Mitigation measures for construction impacts to wetlands, streams, and wildlife are identified in Section 25.2.7, Mitigation Measures for Impacts to Ecosystem Resources.

25.2.12.6 Mitigation Measures for Noise Impacts from Construction

The contractor will comply with all state and local regulations relating to construction noise. The contractor will be required to obtain a UDOT temporary noise permit and to notify the local government authority in advance of any percussive noise activity and for any nighttime work.

25.2.12.7 Mitigation Measures for Visual Impacts from Construction

UDOT will prepare and implement an appropriate seeding vegetation and/or landscaping plan to restore or enhance aesthetics after the project is completed. The plan will be implemented by the contractor. For construction on National Forest System lands, UDOT will coordinate with the USDA Forest Service regarding an acceptable seed mix and other components of the landscaping plan.

25.2.12.8 Mitigation Measures for Construction-related Impacts to Cultural Resources

In accordance with UDOT Standard Specification 01355, *Environmental Compliance*, if cultural resources are discovered during construction, activities in the area of the discovery will immediately stop. The construction contractor will notify UDOT of the nature and exact location of the finding and will 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 State Historic Preservation Office (SHPO) and tribes. 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. For discoveries on National Forest System lands, UDOT will coordinate with the USDA Forest Service regarding the course of action taken for any discoveries. A programmatic agreement might be developed between UDOT, the USDA Forest Service, and the Utah SHPO regarding potential discoveries.

25.2.12.9 Mitigation Measures for Construction-related Discoveries of Hazardous Materials

If contamination is discovered during construction, mitigation measures will be coordinated according to UDOT Standard Specification 01355, *Environmental Compliance*, which directs the construction contractor to stop work and notify UDOT of the possible contamination. Any hazardous materials will be disposed of according to applicable state and federal guidelines.

25.2.12.10 Mitigation Measures for Utility Service Impacts from Construction

UDOT will consult with all utility providers affected by construction to complete utility agreements before construction, and the construction contractor will coordinate with all utility providers to minimize interruptions to utility service. Before beginning work, the contractor is required to contact Blue Stakes to identify the locations of all utilities. The contractor will use care when excavating to avoid unplanned utility disruptions. If utilities are unintentionally disrupted, UDOT will work with the contractor and the utility companies to restore service as quickly as possible. UDOT will coordinate with the USDA Forest Service for the relocation of any utilities on National Forest System lands including those within UDOT's right of way on National Forest System lands.

25.2.12.11 Mitigation Measures for Traffic Impacts from Construction

The contractor will 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, residences, and recreation areas must be maintained and existing roads kept open to traffic.

Even with the implementation of the maintenance-of-traffic plan, traffic congestion would increase over the short term 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. UDOT will coordinate with the USDA Forest Service regarding an appropriate outreach program for notifying the public of potential construction delays and temporary closures of resources (trailheads, campgrounds, or other recreation areas).

25.2.12.12 Mitigation Measures for Economic Impacts from Construction

To the extent practicable, access to businesses will be maintained during the construction and post-construction phases of this project. For each phase of the project, UDOT will 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 will be placed in construction areas to direct drivers to businesses. Other potential mitigation measures for construction impacts could include the following:

- Frequently notify all businesses in the construction area regarding the progress of the construction and upcoming construction events.
- Provide business access signs that identify business access points within the construction limits.
- Hold 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.
- For construction in Little Cottonwood Canyon, avoid activities during peak recreation times such as holidays and weekends.
- To the extent practicable, UDOT will reach out to special-event organizers, permitted commercial activities, outfitters, and guides about construction activities. UDOT will coordinate with the USDA Forest Service with regard to an appropriate outreach program.

25.2.12.13 Mitigation Measures for Invasive Species Impacts from Construction

To mitigate the possible introduction of invasive weeds due to construction activities, the invasive weed BMPs in UDOT's current *Standard Specifications for Road and Bridge Construction* will be implemented, monitored, and included in the plans and specifications for the project. In addition, UDOT will follow USDA Forest Service guidelines for inspecting equipment and vehicles for invasive plant and noxious weed species and will coordinate with the USDA Forest Service regarding any additional required Forest Service noxious and invasive species BMPs to be implemented on National Forest System lands.

- The contractor will follow the noxious weed mitigation and control measures identified in UDOT's Supplemental Specification 02924S, *Invasive Weed Control*.
- The contractor will reduce the potential for weed infestations by strictly following BMPs.
- On National Forest System lands, with the USDA Forest Service's coordination and approval, the contractor will obtain and import certified weed-free soil from a vendor or other certified source, and UDOT will retain the certification documentation in the project files.
- On National Forest System Lands, areas disturbed by construction work will be monitored by UDOT for new invading weeds for a minimum of 3 years, and, when weeds are located, they will be treated or removed immediately.
- The contractor will avoid selecting and placing staging areas in locations that have existing invasive and noxious weed infestations.
- The contractor will avoid selecting borrow areas that have existing invasive and noxious weed infestations.
- The contractor will reseed the construction area with native plants, and UDOT will monitor seedlings to determine when vegetation becomes re-established. This measure will mitigate direct-disturbance impacts and reduce the potential for weed invasions.
- On National Forest System lands, UDOT will use only Forest Service–approved seed mixes.
- Daily or multiple times a day if needed, the contractor will wash vehicles and equipment at a portable wash station set up at the exit of the staging area before the equipment goes into any work locations that are currently weed-free.

25.2.12.14 Mitigation Measures for Construction Staging and Material Borrow Areas

Earth-disturbing activities would be generally confined to the limits of cut and fill, although staging areas and some construction activity might be located outside the limits of cut and fill included in the EIS impacts. Any ground disturbances on National Forest Service lands, including those at staging areas, will comply with the USDA Forest Service requirements listed in this chapter.

25.2.13 Mitigation Measures for Indirect Effects

25.2.13.1 Mitigation Measures for Indirect Effects on Environmental Justice Populations

The implementation of tolling in Big Cottonwood Canyon could cause an adverse impact to low-income populations wanting to recreate during the winter in the lower canyon (below the ski resorts) or at Guardsman Pass. Practicable measures to avoid or reduce these potential adverse effects could include the following:

- Place the toll gantry immediately prior to the Solitude ski resort. This would allow low-income populations wanting to recreate outside the ski resorts in the lower portion of Big Cottonwood Canyon to avoid having to pay the toll.
- Have the toll in effect only during the morning peak period (7 AM to 10 AM), which would allow low-income populations to recreate after 10 AM to avoid having to pay the toll.

25.2.14 Mitigation Measures for Cumulative Impacts

25.2.14.1 Mitigation Measures for Cumulative Impacts to Recreation

As population along the Wasatch Front increases, this increase in population could cause additional pressure from recreation on the Little Cottonwood Creek watershed. To minimize these impacts, the USDA Forest Service, through its management and special-use permitting on National Forest System lands, will continue to implement recreation management to reduce the impacts of visitation on the watershed, specifically in regard to the watershed desired future condition stated in the *Revised Forest Plan: Wasatch-Cache National Forest* (USDA Forest Service 2003).

The USDA Forest Service's decisions responding to increasing recreation demands will first consider desired water quality and riparian conditions and the limited wildlife habitat in the watershed. The USDA Forest Service will make provisions for a wide range of recreation uses including access and sanitation facilities that prevent watershed conditions from deteriorating. Major trailheads and restrooms will be provided and maintained in cooperation with partners such as Salt Lake City. The USDA Forest Service will protect the watershed and educate the public about appropriate behavior in the watershed in cooperation and partnership with other agencies.

25.2.14.2 Mitigation Measures for Cumulative Impacts to Water Resources

All action alternatives and future developments are subject to stormwater quality management plans and ordinances. Alta Ordinance 9-4-6, which would apply to the Patsey Marley Hill Subdivision and the *Alta Lifts Master Plan*, requires erosion control, revegetation, and drainage best practices to address stormwater quality. The *Cottonwood Heights Stormwater Management Plan* is implemented to limit the discharge of pollutants from the Cottonwood Heights storm drain system through the use of minimum control measures and BMPs. UDOT assumes that the *Cottonwood Heights Stormwater Management Plan* would be applied to the Giverny and La Caille developments. UDOT would manage stormwater from its facilities using its *Stormwater Quality Design Manual*. When these stormwater management plans are implemented, stormwater quality would be improved, and the resulting in-stream concentrations of pollutants in Little Cottonwood Creek would be less than those reported in Table 21.3-2, Cumulative Water Quality Model Results.

25.2.14.3 Mitigation Measures for Cumulative Impacts to Ecosystem Resources

Mitigation measures for cumulative impacts to ecosystem resources are identified in Section 25.2.7, Mitigation Measures for Impacts to Ecosystem Resources.

25.2.14.4 Mitigation Measures for Cumulative Impacts to Visual Resources

In addition to the project-specific mitigation measures listed in Section 17.4.8, Mitigation Measures, in Chapter 17, Visual Resources, the following are recommended mitigation measures to reduce potential adverse cumulative impacts to visual resources:

- For large-scale buildings proposed as part of the action alternatives, design elements to use natural materials and colors to harmonize with the existing residential and recreation character.
- In the upper canyon, design new facilities to blend with the existing resort setting, or natural evolving setting where appropriate, to maintain a cohesive landscape character and avoid expanding the area characterized as a resort setting. For example, the gondola alternatives and the Alta Ski Lifts Master Development Plan Improvement Projects both plan to introduce additional towers into the landscape. To reduce impacts from additional vertical intrusions into the setting, both projects could paint the towers the same natural color to establish a more cohesive landscape character.

25.3 References

HDR, Inc.

- 2020 Memorandum on Recommendations for Placing Additional Barrier along S.R. 210. December 21.

[UDOT] Utah Department of Transportation

- 2014a UDOT Policy 08C-03: Project Aesthetics and Landscaping Plan Development and Review. <https://www.udot.utah.gov/main/uconowner.gf?n=3388010425887466>.
- 2014b UDOT Aesthetics Guidelines. <https://www.udot.utah.gov/main/uconowner.gf?n=5361113714159942>. November 5.
- 2016 Relocation Assistance Brochure. https://www.udot.utah.gov/main_old/uconowner.gf?n=200602240821161. October 1.

[USDA Forest Service] United States Department of Agriculture Forest Service

- 2003 Revised Forest Plan: Wasatch-Cache National Forest. South Jordan, Utah: U.S. Department of Agriculture, Forest Service, Intermountain Region, Uinta-Wasatch-Cache National Forest. <https://www.fs.usda.gov/detailfull/uwcnf/landmanagement/planning/?cid=stelprdb5076923&width=full>.

[USFWS] United States Fish and Wildlife Service

- 2018 Recommended Best Practices for Communication Towers Design, Siting, Construction, Operation, Maintenance, and Decommissioning. April.

Chapter 26: Section 4(f) and Section 6(f) Evaluation

26.1 Introduction

This chapter addresses the requirements of Section 4(f) of the Department of Transportation Act of 1966 and Section 6(f) of the Land and Water Conservation Fund Act of 1965 for the State Route (S.R.) 210 Project. Section 4(f) applies to significant publicly owned parks, recreation areas, and wildlife and waterfowl refuges, and to significant publicly or privately owned historic properties. Section 6(f) applies to properties that received financial assistance from the Land and Water Conservation Fund State Assistance Program.

This chapter identifies Section 4(f) resources, determines impacts to those resources, identifies measures to minimize harm where necessary, analyzes the alternative with the least overall harm, and describes the coordination efforts made to address Section 4(f) issues and concerns.

This chapter also discusses efforts and coordination to identify Section 6(f) resources.

Section 4(f)/Section 6(f) Study Area. The Section 4(f)/Section 6(f) study area is the same as the cultural resources impact analysis area described in Chapter 15, Cultural Resources. It is generally based on a 100-foot-wide buffer on either side of S.R. 210, from north of the intersection with Big Cottonwood Canyon Road (milepost [MP] 0.0) and extending southeast to the end of S.R. 210 in the town of Alta (MP 12.5), including the Alta Bypass Road (MP 12.5 to MP 13.6). The study area shifts or widens in some locations to accommodate the topography of Little Cottonwood Canyon and the project alternatives.

The study area also includes the area around the gravel pit adjacent to Wasatch Boulevard north of Fort Union Boulevard and the existing Utah Transit Authority park-and-ride lot at 9400 South and Highland Drive. The study area includes land that could be affected through right-of-way acquisition, easement, or permit.

What is the Section 4(f)/Section 6(f) study area?

The Section 4(f)/Section 6(f) study area is generally based on a 100-foot-wide buffer on either side of S.R. 210, from north of the intersection with Big Cottonwood Canyon Road and extending southeast to the end of S.R. 210 in the town of Alta, including the Alta Bypass Road.

26.2 Regulatory Setting

26.2.1 Section 4(f)

26.2.1.1 Section 4(f) Regulations

Section 4(f) of the Department of Transportation Act of 1966 is codified at 49 United States Code (USC) Section 303, *Policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites*. It governs the use of land from publicly owned parks, recreation areas, wildlife and waterfowl refuges, and public or private historic sites.

The requirements of Section 4(f) apply only to agencies within the U.S. Department of Transportation: the Federal Highway Administration (FHWA), the Federal Transit Administration, the Federal Railroad Administration, and the Federal Aviation Administration. FHWA's Section 4(f) regulations, entitled *Parks, Recreation Areas, Wildlife and Waterfowl Refuges, and Historic Sites*, are codified at 23 Code of Federal Regulations (CFR) Part 774.

NEPA Assignment. Pursuant to 23 USC Section 327, the Utah Department of Transportation (UDOT) has assumed FHWA's responsibilities under the National Environmental Policy Act of 1969 (NEPA) and all or part of the responsibilities of the Secretary of the U.S. Department of Transportation for environmental review, consultation, or other actions required or arising under federal environmental laws, including Section 4(f) and Section 6(f) with respect to the review or approval of highway projects in the state. Therefore, where the law and regulations refer to FHWA or the Secretary of Transportation, UDOT has assumed those responsibilities.

26.2.1.2 Definition of Section 4(f) Properties

A Section 4(f) property is defined as any of the following:

- Parks and recreation areas of national, state, or local significance that are both publicly owned and open to the public
- Publicly owned wildlife and waterfowl refuges of national, state, or local significance that are open to the public to the extent that public access does not interfere with the primary purpose of the refuge
- Historic sites of national, state, or local significance in public or private ownership regardless of whether they are open to the public

Parks and Recreation Areas. Section 4(f) applies to significant publicly owned parks and recreation areas that are open to the public. The land must be officially designated as a park or recreation area, and the officials with jurisdiction of the land must determine that its primary purpose is as a park or recreation area. The term *significant* means that, in comparing the availability and function of the property with the recreation objectives of the agency or community authority, the property in question plays an important role in meeting those objectives. Park and recreation areas that are on privately owned land are not Section 4(f) properties, even if they are open to the public. However, if a governmental body has a permanent easement, or in some cases a long-term lease, UDOT will determine on a case-by-case basis whether Section 4(f) applies.

What is Section 4(f)?

Section 4(f) is an element of law and FHWA regulations that requires a project to avoid the use of protected historic properties and park and recreation areas unless there is no feasible and prudent alternative to such use or unless the lead agency determines that the impacts would be *de minimis*. If the project would use protected properties, all possible planning must be undertaken to minimize harm to these properties.

Section 4(f) can apply to planned parks and recreation areas. Section 4(f) applies when the land is publicly owned and the public agency that owns the property has formally designated and determined it to be significant for park or recreation purposes. The key is whether the planned facility is presently publicly owned, presently formally designated for Section 4(f) purposes, and presently significant.

Section 4(f) applicability for multiple-use public land holdings such as the Uinta-Wasatch-Cache National Forest is defined in 23 CFR Section 774.11(d). Section 4(f) applies only to those portions of lands that function for or are designated in U.S. Department of Agriculture (USDA) Forest Service plans as being for significant park, recreation, or wildlife and waterfowl refuge purposes. The determination regarding which lands so function or are so designated, and the significance of those lands, is made by the USDA Forest Service as the official(s) with jurisdiction. Unofficial paths or trails that are not formally designated or maintained by a public agency are not considered Section 4(f) resources.

Historic Sites. Historic sites include any prehistoric or historic district, site, building, structure, or object. Section 4(f) applies to historic sites that are listed in or eligible for listing in the National Register of Historic Places (NRHP), unless UDOT determines that an exception under 23 CFR Section 774.13 applies. An exception would apply if UDOT concludes that a site eligible for inclusion in the NRHP “is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place” [23 CFR Section 774.13(b)(1)].

26.2.1.3 Determination of Use

Use in the context of Section 4(f) is defined in 23 CFR Section 774.17.

Use. The most common form of use is when land is permanently incorporated into a transportation facility. This occurs either when land from a Section 4(f) property is purchased outright as transportation right of way or when permanent access onto the property such as a permanent easement for maintenance or other transportation-related purpose is granted.

Temporary Occupancy (Use or Exception). A second type of use of Section 4(f) property or resources is a *temporary occupancy*. This results when a Section 4(f) property, in whole or in part, is required for activities related to project construction. With temporary occupancy, the Section 4(f) property is not permanently incorporated into a transportation facility, but the activity is considered to be adverse in terms of the preservation purpose of Section 4(f) law and is therefore considered a Section 4(f) use.

The regulation at 23 CFR Section 774.13(d) exempts from the requirements of Section 4(f) temporary occupancies of land that are so minimal as to not constitute a use within the meaning of Section 4(f). The following conditions must be satisfied:

1. Duration must be temporary, and there should be no change in ownership of the land;
2. The scope of the work must be minor;
3. There are no anticipated permanent adverse physical impacts, nor would there be interference with the protected activities, features, or attributes of the property;
4. The land being used must be fully restored; and
5. There must be documented agreement of the officials with jurisdiction over the Section 4(f) resource regarding the above conditions.

Temporary occupancies of this kind can occur during the construction process and, if they truly cause no interference, are excepted from the requirement for Section 4(f) approval. As stated in the regulations, temporary occupancy also requires written concurrence from the officials with jurisdiction if the exception criteria listed above are applied. If all of the conditions in Section 774.13(d) are met, the temporary occupancy does not constitute a use. However, if one or more of the conditions for the exception cannot be met, then the temporary occupancy of the Section 4(f) property is considered a “use” by the project even though the duration of on-site activities would be temporary and the ownership of the property would not change.

Constructive Use. In addition to actual, physical use of Section 4(f) property or resources (whether through direct use or temporary occupancy), case law and the FHWA regulations at 23 CFR Section 774.15 recognize that an impact to Section 4(f) resources can occur based on a project’s proximity, if the project substantially impairs the value of the Section 4(f) resource. This can also be a “use” and is called *constructive use*. It is defined in the FHWA regulations as occurring

... when the transportation project does not incorporate land from a Section 4(f) resource, but the project’s proximity impacts are so severe that the protected activities, features, or attributes that qualify a property for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes are substantially diminished.
[23 CFR Section 774.15(a)]

A constructive use determination is rare. It is unusual for proximity impacts to be so great that the purpose of the property that qualifies the resource for protection would be substantially diminished. Although UDOT has assumed most of FHWA’s responsibilities for environmental review, consultation, and other actions under Section 4(f), UDOT cannot make a constructive use determination without first consulting with FHWA and obtaining FHWA’s views on such a determination. Per the Memorandum of Understanding between FHWA and UDOT regarding NEPA assignment (FHWA 2017), if FHWA raises an objection, then UDOT agrees not to proceed with a constructive-use determination.

26.2.1.4 Approval Options

Once UDOT determines that a project may use a Section 4(f) property, there are three methods available for UDOT to approve the use:

1. Make a *de minimis* impact determination;
2. Conclude that specific conditions in an approved programmatic Section 4(f) evaluation are met; or
3. Prepare an individual Section 4(f) evaluation and conclude that there is no feasible and prudent alternative that completely avoids the use of the Section 4(f) property, and that the project includes all possible planning to minimize harm.

UDOT has determined that both a *de minimis* impact determination and an individual Section 4(f) evaluation would be applicable for this project. Requirements for making a *de minimis* impact determination and the requirements for making an individual Section 4(f) evaluation are described below. A programmatic Section 4(f) evaluation is not applicable for this project and is not discussed further.

Requirements for Making a Finding of *De Minimis* Impact.

A *de minimis* impact determination is made for the net impact on the Section 4(f) property after considering any measures (such as avoidance, minimization, mitigation, or enhancement measures) to minimize harm to the property.

For historic properties, a *de minimis* impact finding may be made only if there is a finding under the National Historic Preservation Act that a transportation project will have “no adverse effect” or there will be “no historic properties affected” and the State Historic Preservation Officer (SHPO) has concurred with the finding in writing [49 USC Section 303(d)(2) and 23 CFR Section 774.5(b)].

For parks, recreation areas, and wildlife refuges, the Secretary of Transportation may make a finding of *de minimis* impact only if:

- (A) the Secretary has determined, after public notice and opportunity for public review and comment, that the transportation program or project will not adversely affect the activities, features, and attributes of the park, recreation area, or wildlife or waterfowl refuge eligible for protection under this section; and
- (B) the finding of the Secretary has received concurrence from the officials with jurisdiction over the park, recreation area, or wildlife or waterfowl refuge. [49 USC Section 303(d)(3)]

What is a *de minimis* impact?

For historic sites, a *de minimis* impact means that the historic property would not be affected by the project or that the project would have “no adverse effect” on the historic property.

For parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* impact is one that would not adversely affect the activities, features, or attributes of a property that is eligible for protection under Section 4(f).

Requirements for Individual Section 4(f) Evaluations. An individual Section 4(f) evaluation must be completed when approving a project that requires the use of a Section 4(f) property if the use would result in a greater-than-*de minimis* impact and a programmatic Section 4(f) evaluation cannot be applied to the situation. The individual Section 4(f) evaluation requires two findings to approve the use with greater-than-*de minimis* impact [23 CFR Section 774.3(a)]:

1. That there is no feasible and prudent alternative that completely avoids the use of the Section 4(f) property; and
2. That the project includes all possible planning to minimize harm to the Section 4(f) property resulting from the transportation use.

UDOT has determined that an individual Section 4(f) evaluation is required for this project and has documented the evaluation in this chapter. One Section 4(f) property would have a use with greater-than-*de minimis* impact from the avalanche mitigation alternatives as described in Section 26.5, Use of Section 4(f) Resources. More information regarding feasible and prudent avoidance alternatives is provided in Section 26.6, Avoidance Alternatives. More information regarding all possible planning to minimize harm is provided in Section 26.7, Least Overall Harm Analysis, and Section 26.8, Measures to Minimize Harm.

Pursuant to FHWA guidance, an individual Section 4(f) evaluation contained in a Draft EIS is also considered draft, and the conclusions and determinations of the evaluation are considered preliminary (FHWA 2002, Sections 3.3.3.2 and 4.0). UDOT will consider any comments on this draft evaluation and will include the final Section 4(f) evaluation in the Final EIS.

26.2.2 Section 6(f)

The Land and Water Conservation Fund (LWCF) Act of 1965, as amended, is codified at 16 USC Section 4601-4 and subsequent sections. The purpose of the act is to assist in preserving, developing, and ensuring accessibility to outdoor recreation resources for present and future generations. Section 6(f) of this act applies to properties that receive funding from the LWCF State Assistance Program. Section 6(f) includes provisions to protect the federal investment and quality of the resources developed with LWCF assistance. Conversion of a Section 6(f) property to uses other than outdoor recreation (such as transportation uses) requires a replacement property of equal value and approval from the National Park Service. Section 6(f) does not apply to the LWCF Federal Acquisition Program.

26.3 Proposed Action

This section briefly summarizes the project purpose and need and the alternatives under consideration. A detailed discussion of the purpose and need is provided in Chapter 1, Purpose and Need. A detailed discussion of the alternative development and screening process is provided in Chapter 2, Alternatives.

26.3.1 Summary of the Project Purpose and Need

26.3.1.1 Project Purpose

UDOT's purpose for the S.R. 210 Project is reflected in one primary objective for S.R. 210: to substantially improve roadway safety, reliability, and mobility on S.R. 210 from Fort Union Boulevard through the town of Alta for all users on S.R. 210.

26.3.1.2 Need for the Project

The transportation needs in the study area are related primarily to traffic during peak periods, avalanche risk and avalanche mitigation in Little Cottonwood Canyon, multiple on-road users in constrained areas, and anticipated future increases in visitation to Little Cottonwood Canyon as a result of population growth in Utah. The following deficiencies occur on S.R. 210:

- Decreased mobility in winter during the morning (AM) and afternoon (PM) peak travel periods related to visits to ski areas, with the greatest traffic volumes on weekends and holidays and during and after snowstorms.
- Decreased mobility on Wasatch Boulevard resulting from weekday commuter traffic.
- Safety concerns associated with avalanche hazard and traffic delays caused by the current avalanche-mitigation program in Little Cottonwood Canyon. Periodic road closures for avalanche mitigation can cause 2-to-4-hour travel delays or longer, which can cause traffic to back up in the neighborhoods at the entrance of the canyon.

- Limited parking at trailheads and ski areas that leads to roadside parking. The consequences of roadside parking include:
 - Reduced mobility on S.R. 210 near trailheads and at ski areas
 - Loss of shoulder area for cyclists and pedestrians, which forces them into the roadway travel lane and creates a safety concern
 - Creation of informal trailheads that contribute to erosion, mineral soil loss, the spread of invasive weeds, degradation of the watershed, and loss of native vegetation in the canyon
 - Damage to the pavement along the roadway edge, which causes increased soil erosion, runoff into nearby streams, and degradation of the watershed

26.3.2 Alternatives Considered

The evaluation of environmental impacts is organized by primary action alternatives and sub-alternative in this EIS.

26.3.2.1 Primary Action Alternatives

Based on the results of the screening processes, five primary action alternatives were determined to meet the project's purpose and were advanced for detailed evaluation in this EIS. The five primary action alternatives under consideration are summarized below.

The **Enhanced Bus Service Alternative** includes frequent bus service from two mobility hubs, improvements to Wasatch Boulevard, avalanche mitigation alternatives, trailhead parking alternatives, and no winter parking on S.R. 210 near the Snowbird and Alta ski resorts.

The **Enhanced Bus Service in Peak-period Shoulder Lane Alternative** is similar to the Enhanced Bus Service Alternative but also widens S.R. 210 in Little Cottonwood Canyon for an upgraded roadway shoulder that functions as a bus-only travel lane during periods of peak congestion.

Gondola Alternative A (Starting at Canyon Entrance) includes a gondola alignment from the intersection of S.R. 209/S.R. 210 to both the Snowbird and Alta ski resorts. The alternative would include frequent bus service from two mobility hubs to the gondola base station, improvements to Wasatch Boulevard, avalanche mitigation alternatives, trailhead parking alternatives, and no winter parking.

Gondola Alternative B (Starting at La Caille) would be similar to Gondola Alternative A, but an additional segment starting at a base station would be located at a proposed development west of North Little Cottonwood Road, about 0.75 mile northwest of the intersection of S.R. 209 and S.R. 210.

The **Cog Rail Alternative (Starting at La Caille)** would start at a base station located at a proposed development south of North Little Cottonwood Road, about 0.75 mile northwest of the intersection of S.R. 209 and S.R. 210, and would travel on the north side of S.R. 210 to both the Snowbird and Alta ski resorts. The alternative would include frequent bus service from two mobility hubs to the cog rail base station, improvements to Wasatch Boulevard, avalanche mitigation alternatives, trailhead parking alternatives, and no winter parking.

26.3.2.2 Sub-alternatives

In addition, sub-alternatives, or options, would be included in each primary action alternative or could be implemented as a stand-alone improvement. The sub-alternatives under consideration are summarized below.

The **Wasatch Boulevard sub-alternatives** would improve mobility on Wasatch Boulevard from Fort Union Boulevard to North Little Cottonwood Road.

- The Imbalanced-lane Alternative includes one northbound travel lane, two southbound travel lanes, and a center two-way left-turn lane.
- The Five-lane Alternative includes two travel lanes in each direction and a center two-way left-turn lane.

The **Mobility Hubs Alternative** would provide personal vehicle parking to support transit alternatives.

- One mobility hub would be located at the gravel pit on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard.
- A second mobility hub would be located at the existing park-and-ride lot at 9400 South and Highland Drive.

The **avalanche mitigation sub-alternatives** would improve reliability by reducing road closures for avalanche control and would improve safety by reducing the avalanche risk to the traveling public. Two avalanche mitigation alternatives are under evaluation, both of which include snow sheds at three main avalanche paths.

- The Snow Sheds with Berms Alternative includes 300-foot-long, 20-foot-tall guiding berms to direct avalanche flows over the snow sheds to reduce snow shed length.
- The Snow Sheds with Realigned Road Alternative includes realignment of S.R. 210 to the north to reduce fill, improve the ability to tie snow sheds into the mountain, and improve curves and vehicle sight distances.

What is a snow shed?

A snow shed is a rigid concrete and/or steel structure that protects a road by diverting avalanche flows over the top of the structure.

The **trailhead parking sub-alternatives** would improve mobility and safety on S.R. 210 in Little Cottonwood Canyon. The differences between the trailhead parking alternatives are (1) whether trailheads are improved at four trailhead parking areas: the Gate Buttress, Bridge, Lisa Falls, and White Pine Trailheads; and (2) the locations where parking is allowed on the roadside.

- Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative
- Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative
- No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The **No Winter Parking Alternative** would eliminate roadside parking on S.R. 210 during the winter near the Snowbird and Alta ski resorts.

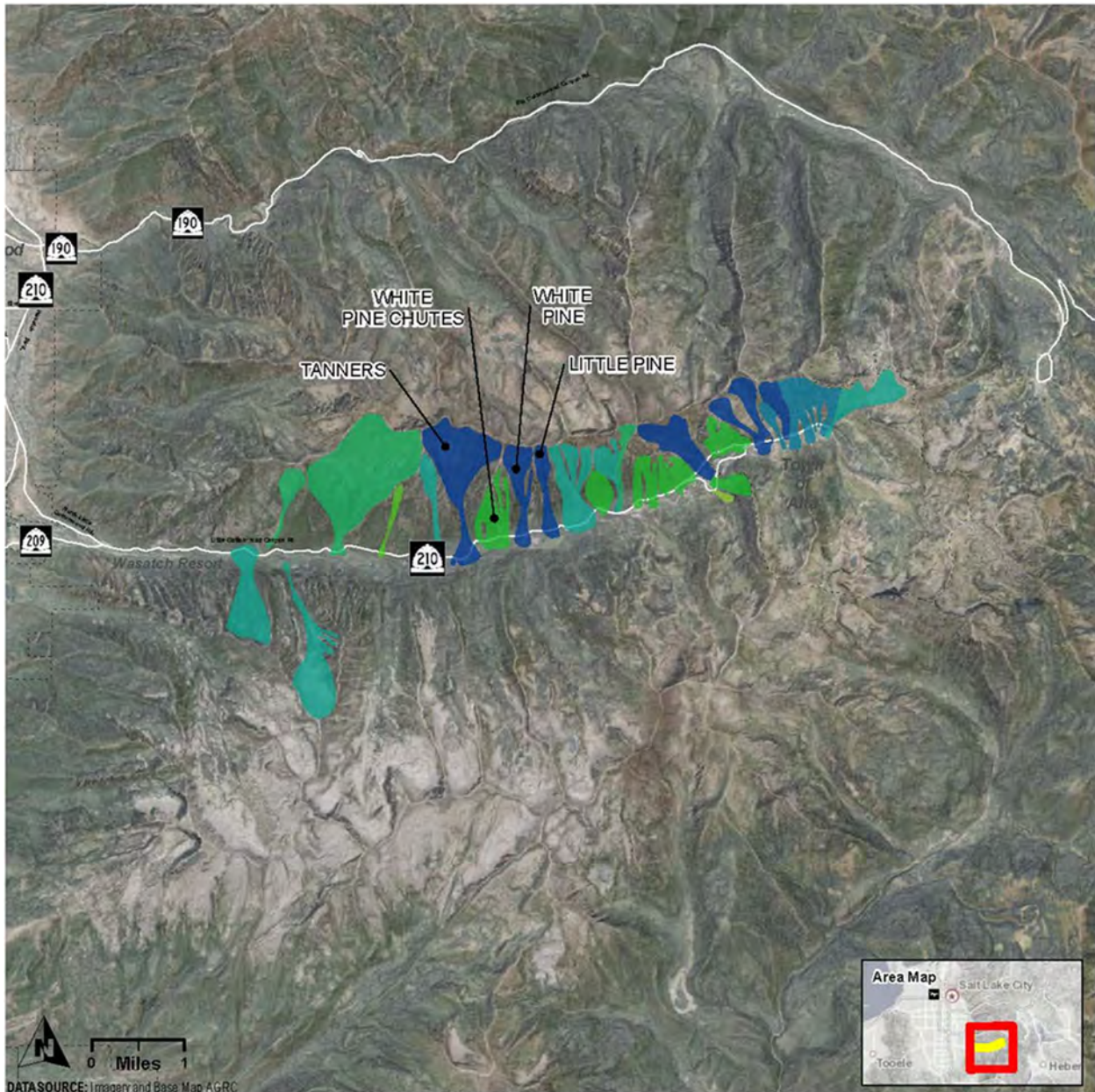
26.3.2.2.1 *Avalanche Mitigation Sub-alternatives*

This section describes the avalanche mitigation alternatives in greater detail because they would result in the use of a Section 4(f) property with greater-than-*de minimis* impacts. This detailed information provides context for the discussion of avoidance alternatives in Section 26.6, Avoidance Alternatives.

Three avalanche paths were identified as the most critical with respect to risk to S.R. 210. These paths, shown in Figure 26.3-1, are the highest priority for avalanche mitigation (Dynamic Avalanche Consulting 2018a).

Two avalanche mitigation alternatives are being evaluated: the Snow Sheds with Berms Alternative and the Snow Sheds with Realigned Road Alternative. Both alternatives include snow sheds for three main avalanche paths (White Pine Chutes, White Pine, and Little Pine). Of all the avalanche mitigation measures evaluated by UDOT, snow sheds offer the most reduction in avalanche risk and would help keep S.R. 210 open more often.







Figure 26.3-1. Avalanche Path Size and Return Interval



DATASOURCE: Imagery and Base Map AGRC

LEGEND

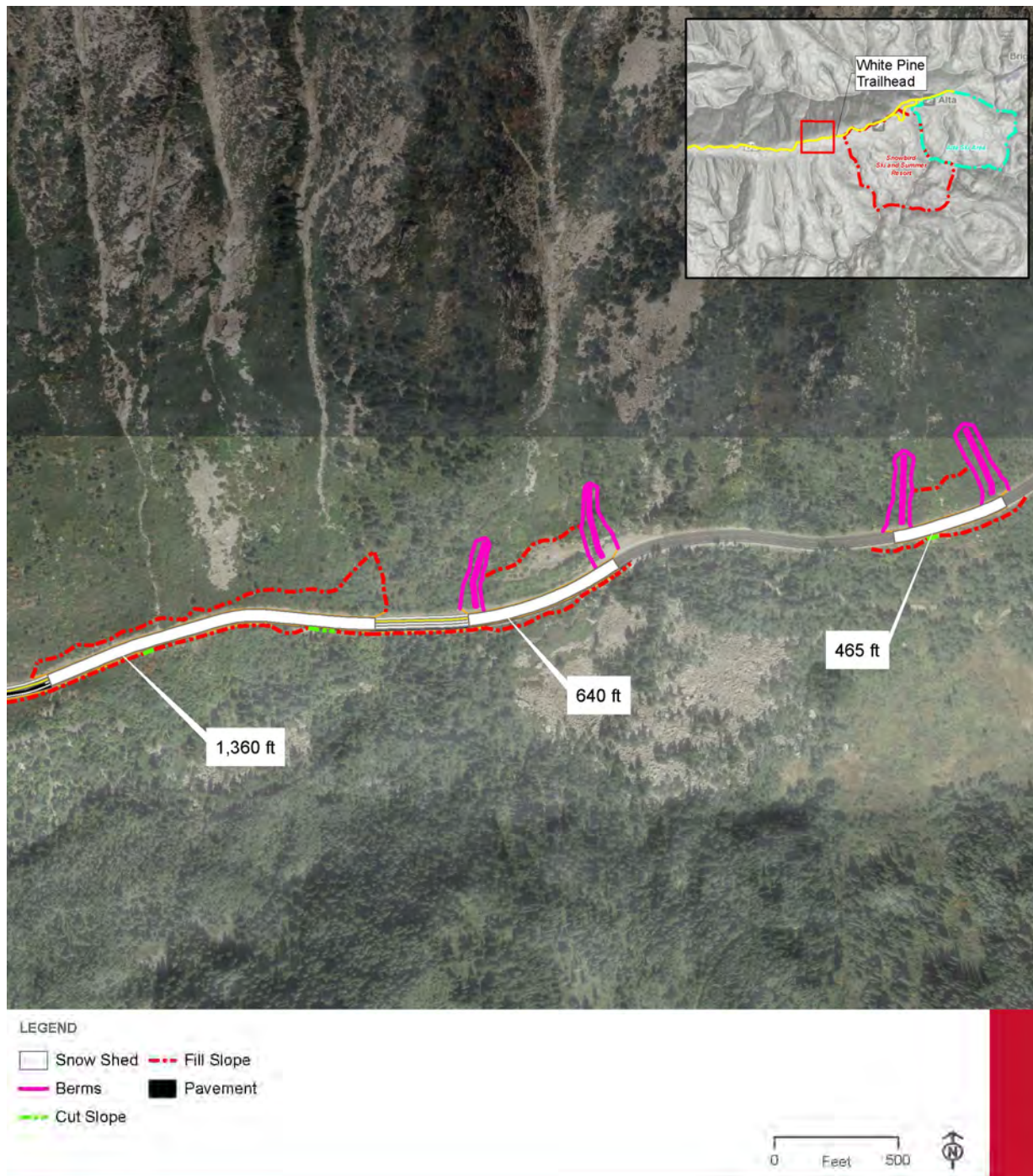
Size of Slide and Return Interval

- | | |
|---|-------------------------------|
|  | Major, Infrequent |
|  | Major, Occasional |
|  | Minor, Occasional |
|  | Significant, Infrequent |
|  | Significant, Frequent |
|  | Major, Occasional to Frequent |
|  | Major, Frequent |

Snow Sheds with Berms Sub-alternative

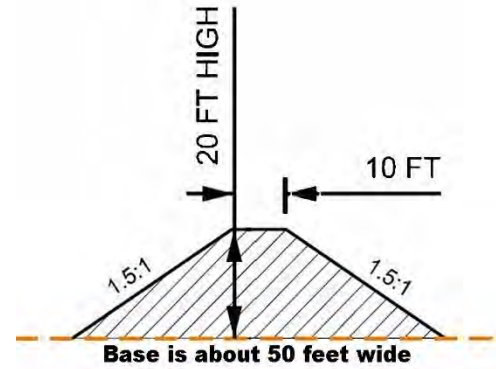
The Snow Sheds with Berms Alternative includes three separate snow sheds as shown in Figure 26.3-2. The White Pine Chutes 1–4 snow shed would be about 1,360 feet long, the White Pine snow shed would be about 640 feet long; and the Little Pine snow shed would be about 465 feet long.

Figure 26.3-2. Avalanche Mitigation Alternatives – Snow Sheds with Berms Alternative



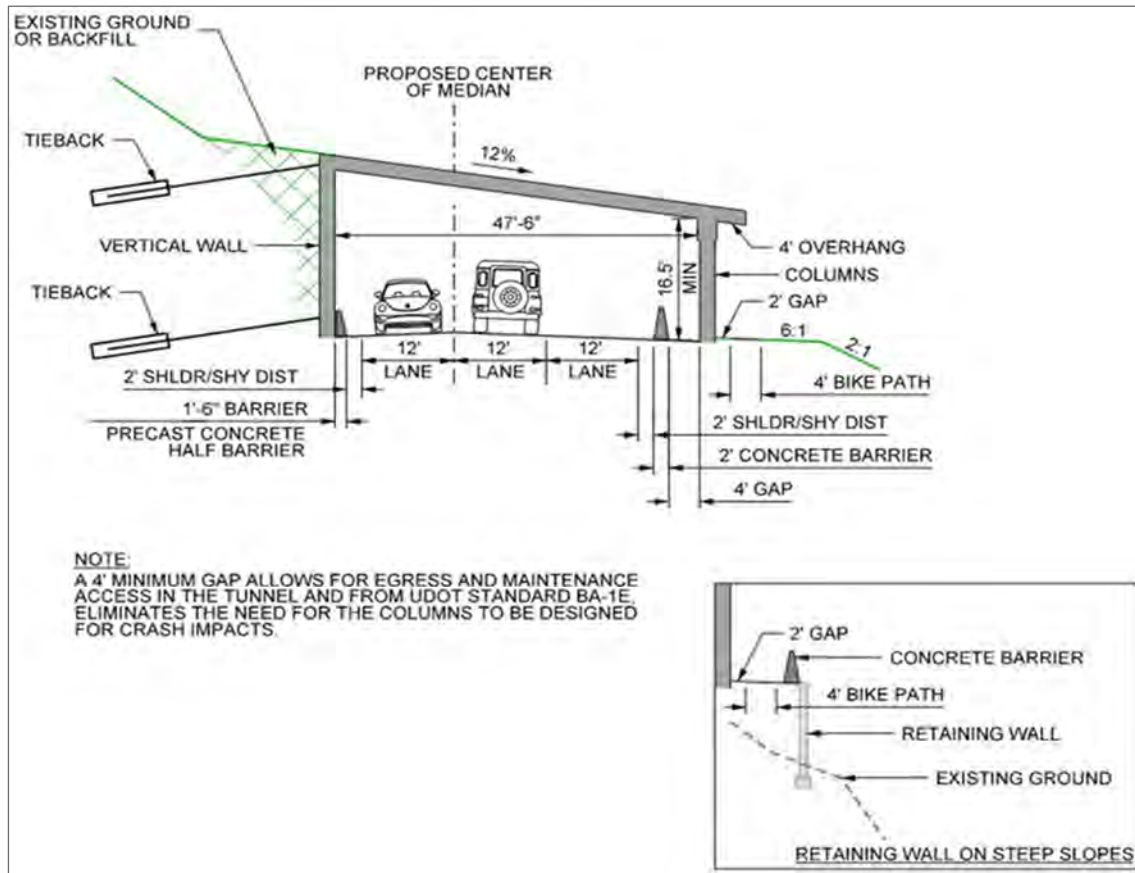
This alternative includes the use of earthen guiding berms at the two eastern snow sheds to direct avalanche flows over the shed and shorten the required length of the snow shed structure, which would reduce costs. The guiding berms would be about 300 feet long and 10 feet wide. The berms would be constructed up the mountain side from the tops of the shed portals and would extend along the avalanche paths to help direct avalanche flows across the tops of the sheds. The berm geometry was assumed to be 20 feet high and 10 feet wide at the top, with 1.5:1 (horizontal:vertical) side slopes. Figure 26.3-3 shows a typical cross-section of the earthen guiding berm.

Figure 26.3-3. Earthen Berm Cross-section



As shown in Figure 26.3-4, the snow shed design would accommodate a bicycle path on the outside of the snow shed; cyclists would also be allowed in the snow sheds. The tie-backs shown in Figure 26.3-4 would be used where the snow shed is close to the mountain. When the snow shed is not close to the mountain, engineered fill would be placed behind the snow shed to allow the avalanche flow to run over the top of the snow shed. The snow shed tie-backs would be placed in the engineered fill.

Figure 26.3-4. Snow Shed Design

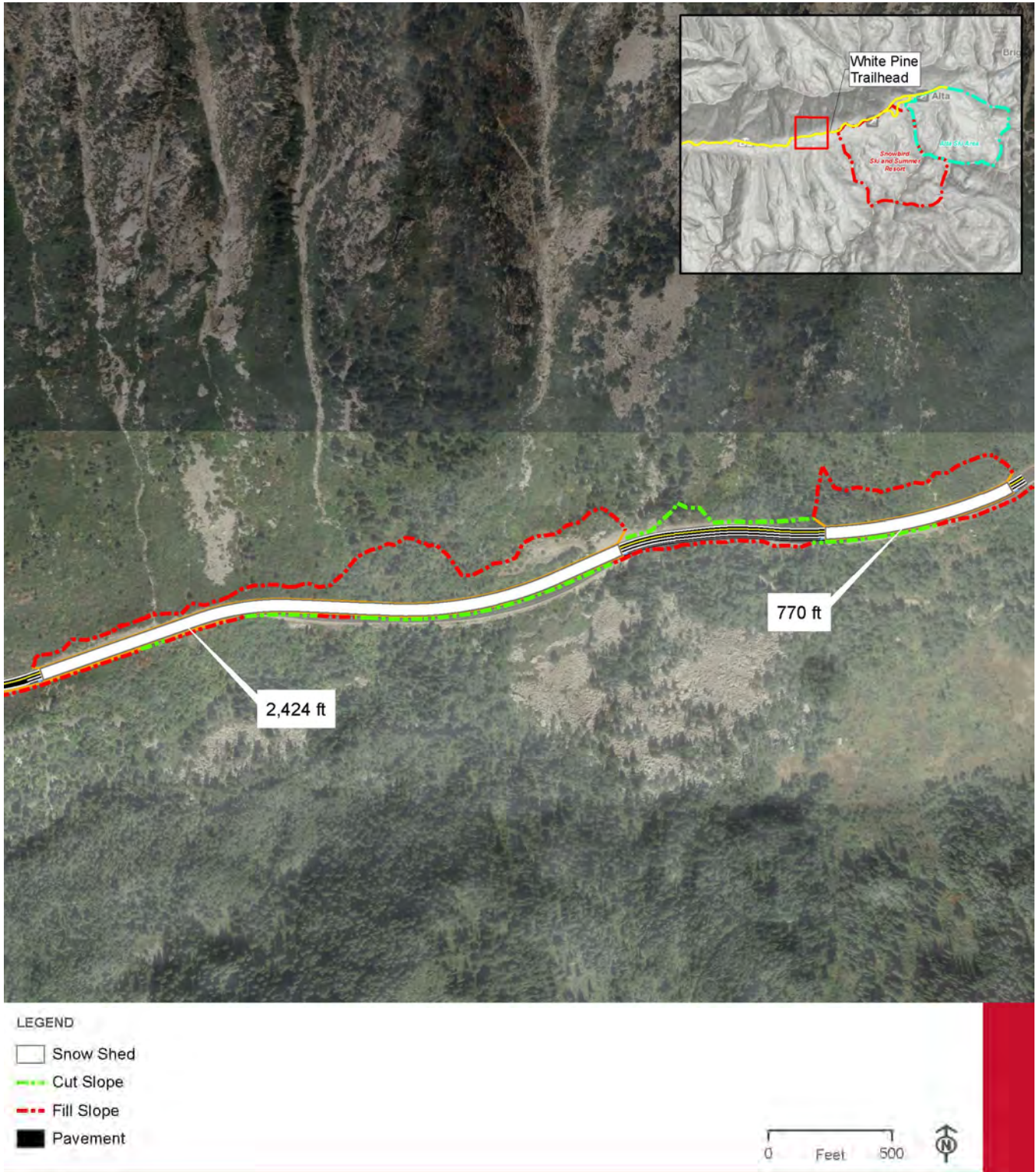


Snow Sheds with Realigned Road Alternative

The Snow Sheds with Realigned Road Alternative includes two snow sheds. The White Pine Chutes and White Pine snow shed would be combined in a single shed about 2,424 feet long, and the Little Pine snow shed would be about 770 feet long to help ensure that avalanche flows pass over the top of the shed. The existing road would be realigned to be closer to the mountain side in order to reduce the amounts of fill needed behind the snow sheds as well as to improve curve radii and sight distances inside the snow sheds.

The sight distances on the existing alignment inside the sheds would be suitable for a design speed of 30 miles per hour (mph). The realigned road with snow sheds would be suitable for a 35-mph design speed. However, the Snow Sheds with Realigned Road Alternative would require UDOT to fully reconstruct the roadway cross-section and potentially relocate all utilities in the project area, including between the sheds and along the roadway leading up to the snow shed zone. Figure 26.3-5 shows this layout.

Figure 26.3-5. Avalanche Mitigation Alternatives – Snow Sheds with Realigned Road Alternative



26.4 Affected Environment

26.4.1 Identification of Section 4(f) Resources

This section discusses the Section 4(f) resources that could be affected by the project alternatives. These resources include historic properties as well as public parks and recreation areas. There are no wildlife or waterfowl refuges in the study area. This section also includes a discussion regarding the resources that were evaluated for Section 4(f) eligibility that ultimately were determined to not be Section 4(f) resources.

26.4.1.1 Identification of Section 4(f) Historic Properties

Section 4(f) applies to historic properties that are included in, or eligible for inclusion in, the NRHP unless UDOT determines that an exception under 23 CFR Section 774.13 applies.

26.4.1.1.1 Section 4(f) Historic Buildings

A field survey and architectural assessment of the study area identified 84 historic buildings that are included in or eligible for inclusion in the NRHP. During the survey, 5 additional properties with potentially eligible historic buildings could not be evaluated because they were not visible from the public right of way. These 5 properties are considered eligible for the purpose of this evaluation. All 89 historic buildings are considered Section 4(f) properties and are shown in Figure 26.4-1 through Figure 26.4-11.

For a detailed description of these historic buildings and the process used under Section 106 of the National Historic Preservation Act to determine a resource's eligibility for the NRHP, see Chapter 15, Cultural Resources. The Utah SHPO concurred with the eligibility and effects determinations made by UDOT in the Determinations of Eligibility and Findings of Effect (DOE/FOE) on May 14, 2021. A copy of the concurrence letter is included in Appendix 15B, Determinations of Eligibility and Findings of Effect.

Figure 26.4-1. Section 4(f) Resources (1 of 11)



Section 4(f) Resources

- | | | |
|--|-----------------------|--------------------------------------|
| Study Area Boundary | Campgrounds | Ski Resorts Special Use Permit Areas |
| Historic Structure Eligible/Contributing | Campground Boundaries | Parks |
| Historic Structure Eligible/Significant | Trailheads | |
| Historic-Age Resources Not Visible | Trailhead Boundaries | |
| | Trails | |

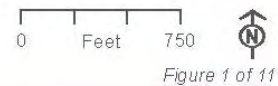
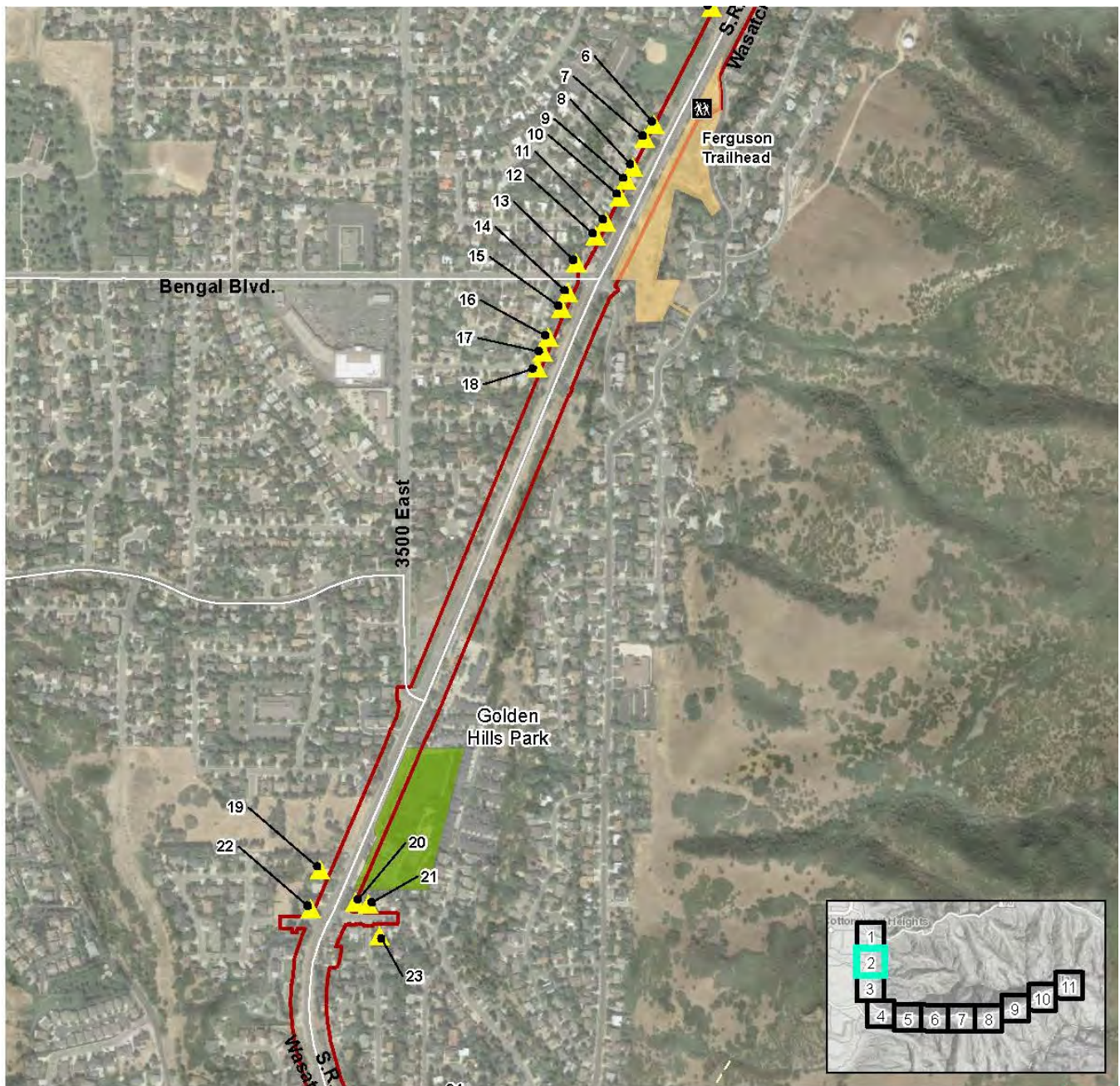


Figure 1 of 11

Figure 26.4-2. Section 4(f) Resources (2 of 11)



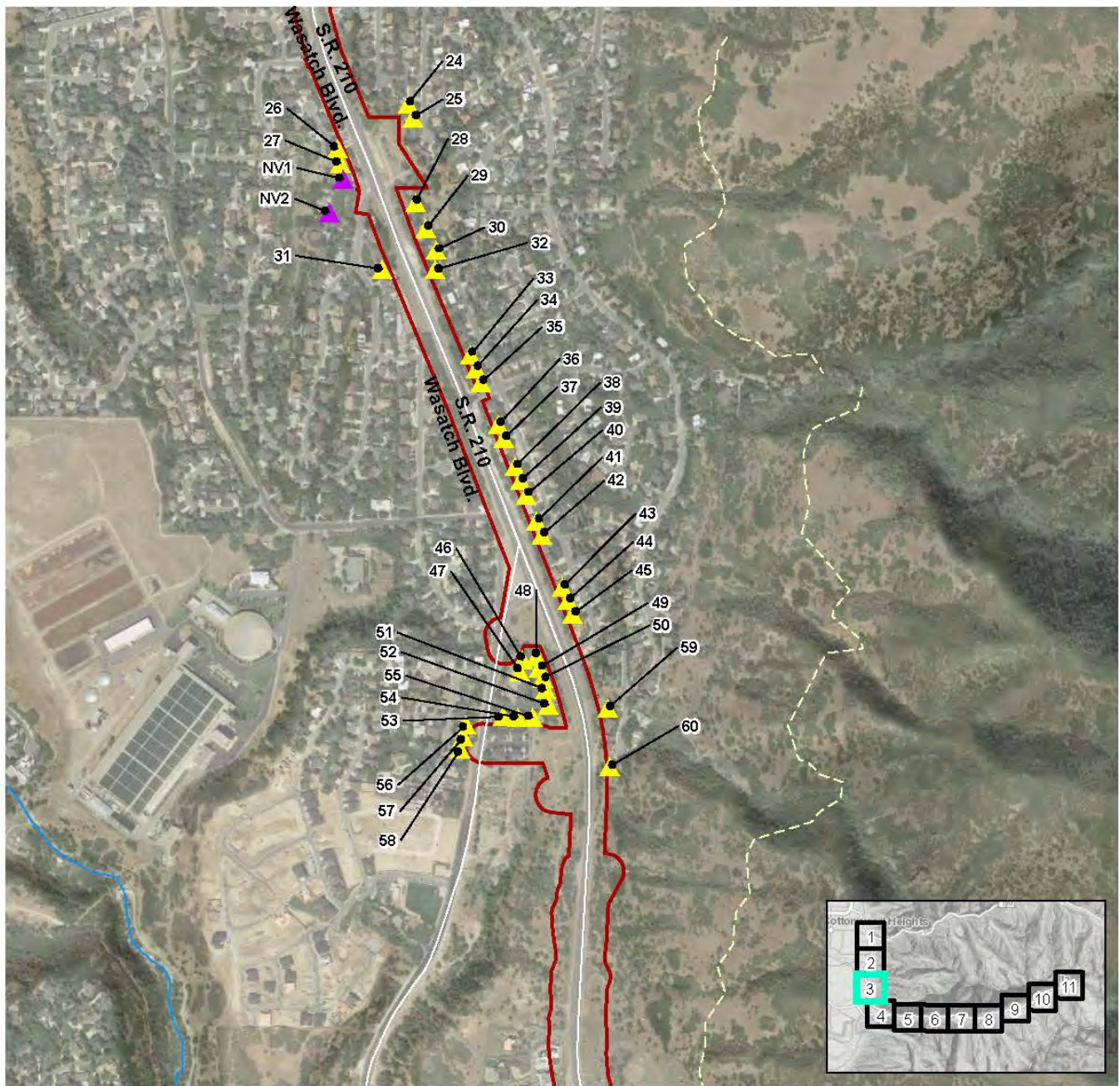
Section 4(f) Resources

- | | | |
|--|-----------------------|--------------------------------------|
| Study Area Boundary | Campgrounds | Ski Resorts Special Use Permit Areas |
| Historic Structure Eligible/Contributing | Campground Boundaries | Parks |
| Historic Structure Eligible/Significant | Trailheads | Trailhead Boundaries |
| Historic-Age Resources Not Visible | Trails | |



Figure 2 of 11

Figure 26.4-3. Section 4(f) Resources (3 of 11)



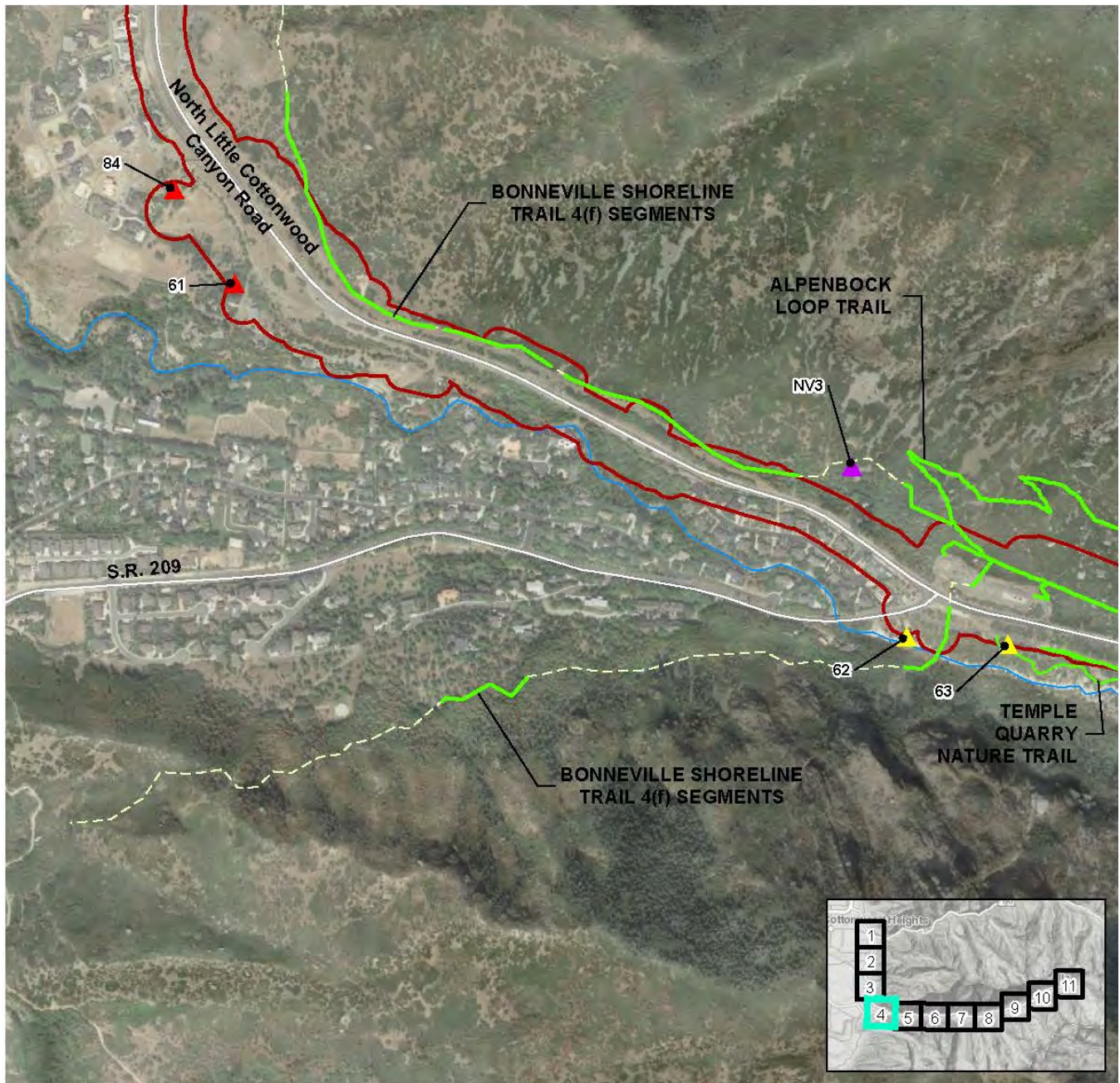
Section 4(f) Resources

- | | | |
|--|-----------------------|--------------------------------------|
| Study Area Boundary | Campgrounds | Ski Resorts Special Use Permit Areas |
| Historic Structure Eligible/Contributing | Campground Boundaries | Parks |
| Historic Structure Eligible/Significant | Trailheads | |
| Historic-Age Resources Not Visible | Trailhead Boundaries | |
| | Trails | |



Figure 3 of 11

Figure 26.4-4. Section 4(f) Resources (4 of 11)



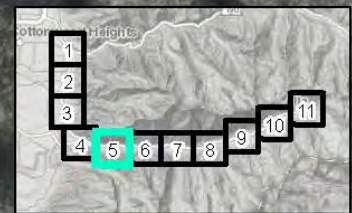
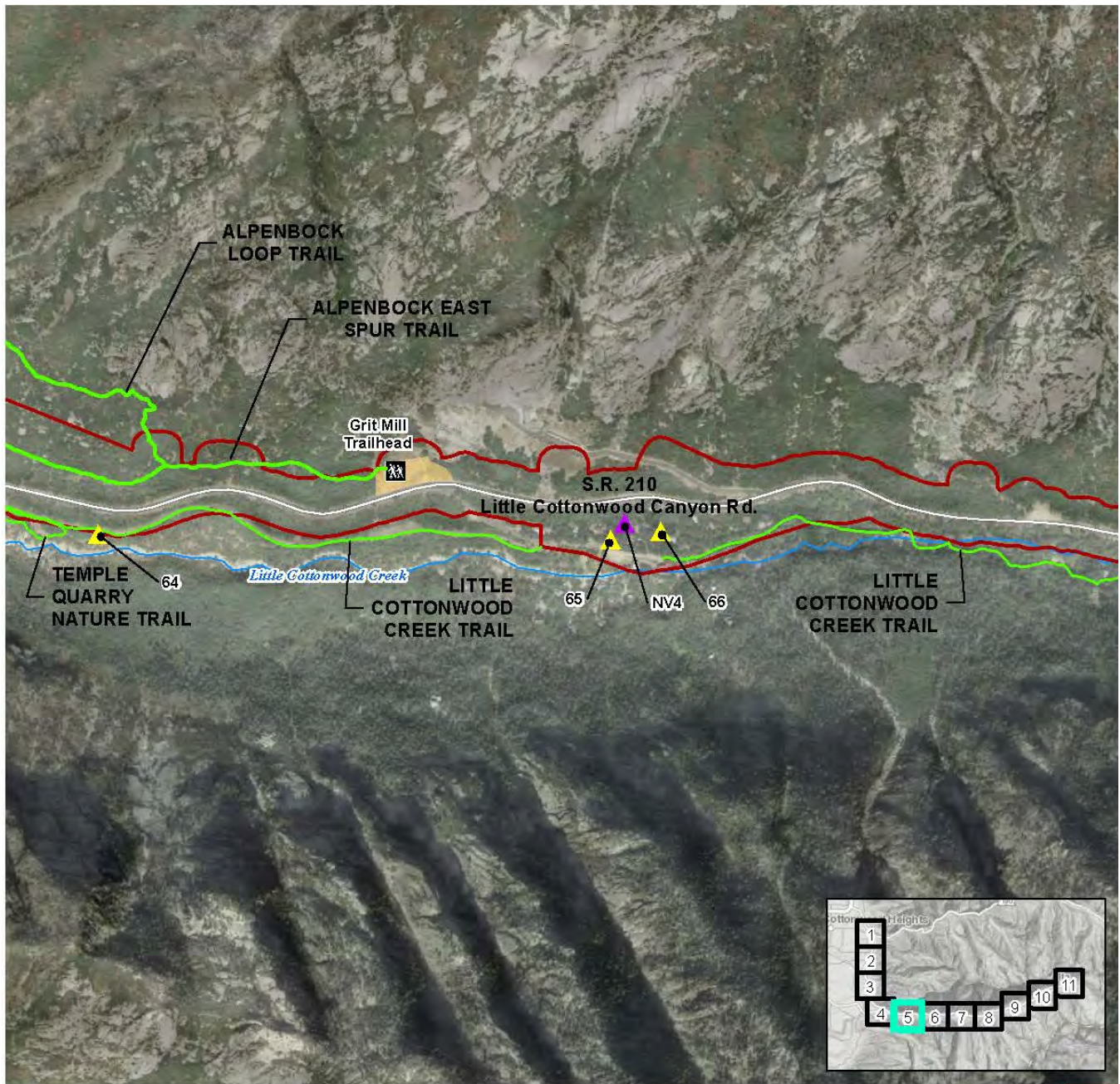
Section 4(f) Resources

- | | | |
|--|-----------------------|--------------------------------------|
| Study Area Boundary | Campgrounds | Ski Resorts Special Use Permit Areas |
| Historic Structure Eligible/Contributing | Campground Boundaries | Parks |
| Historic Structure Eligible/Significant | Trailheads | |
| Historic-Age Resources Not Visible | Trailhead Boundaries | |
| | Trails | |



Figure 4 of 11

Figure 26.4-5. Section 4(f) Resources (5 of 11)



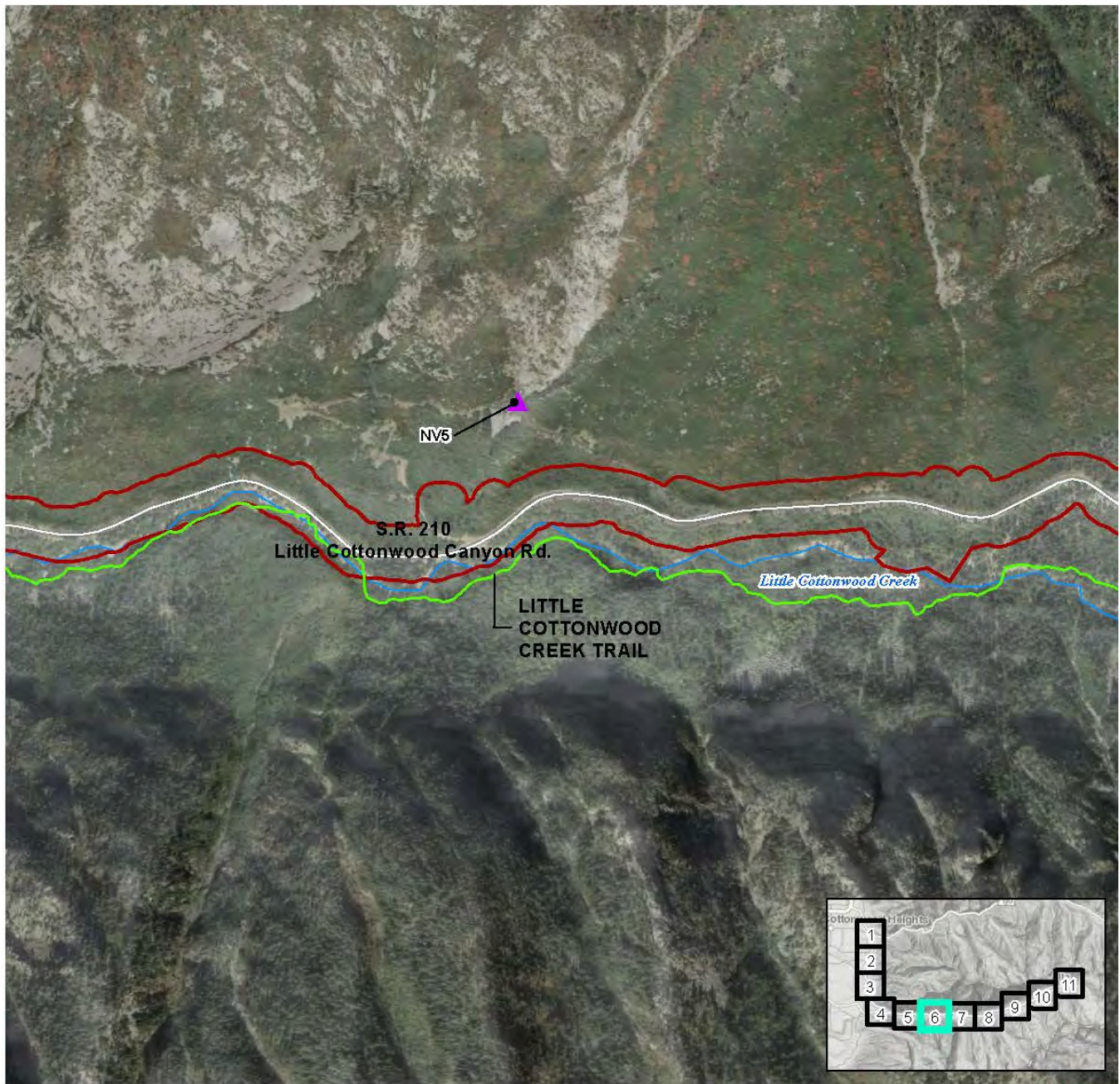
Section 4(f) Resources

- | | | |
|--|-----------------------|--------------------------------------|
| Study Area Boundary | Campgrounds | Ski Resorts Special Use Permit Areas |
| Historic Structure Eligible/Contributing | Campground Boundaries | Parks |
| Historic Structure Eligible/Significant | Trailheads | |
| Historic-Age Resources Not Visible | Trailhead Boundaries | |
| | Trails | |



Figure 5 of 11

Figure 26.4-6. Section 4(f) Resources (6 of 11)



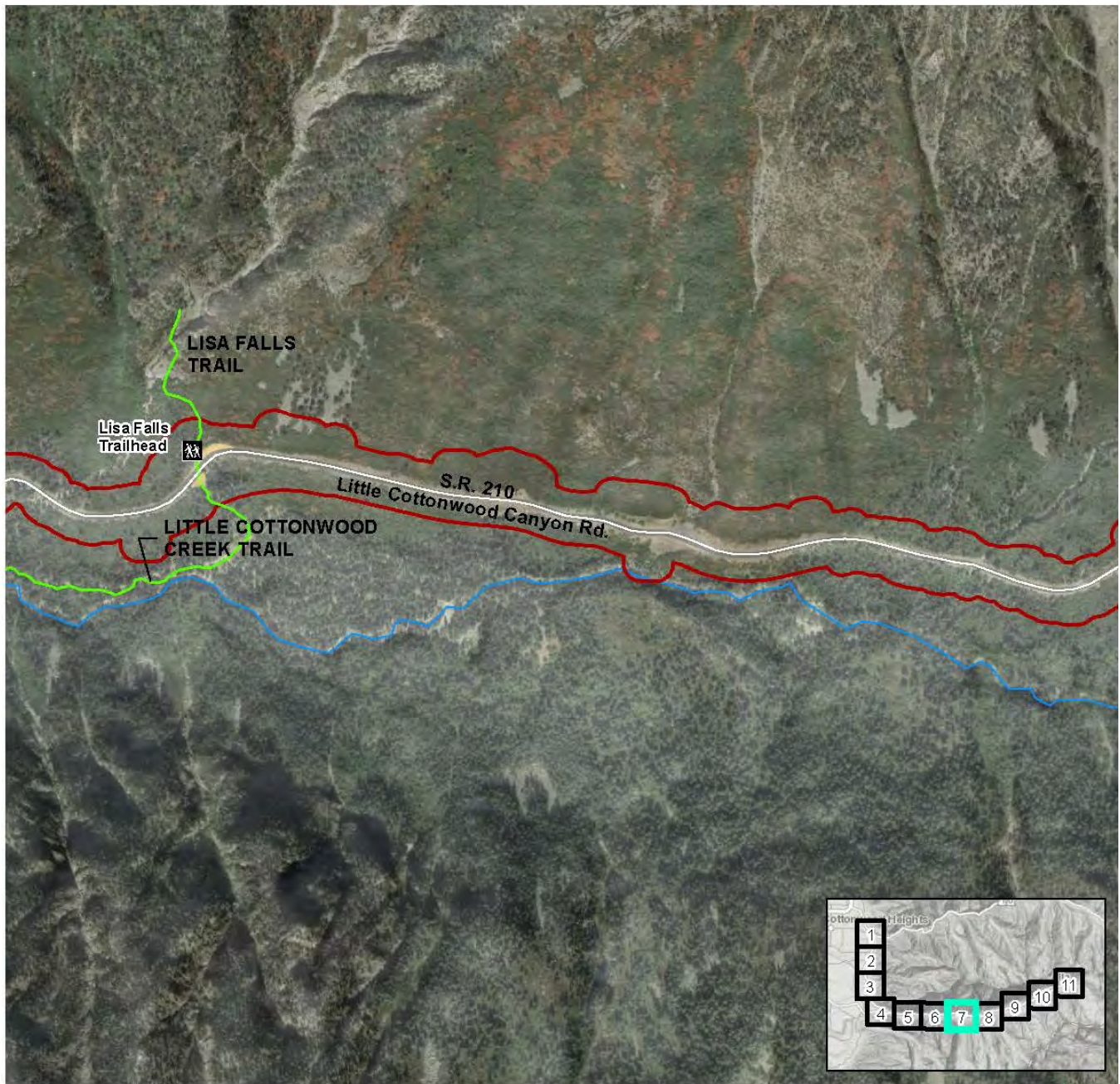
Section 4(f) Resources

- | | | |
|--|-----------------------|--------------------------------------|
| Study Area Boundary | Campgrounds | Ski Resorts Special Use Permit Areas |
| Historic Structure Eligible/Contributing | Campground Boundaries | Parks |
| Historic Structure Eligible/Significant | Trailheads | |
| Historic-Age Resources Not Visible | Trailhead Boundaries | |
| | Trails | |



Figure 6 of 11

Figure 26.4-7. Section 4(f) Resources (7 of 11)



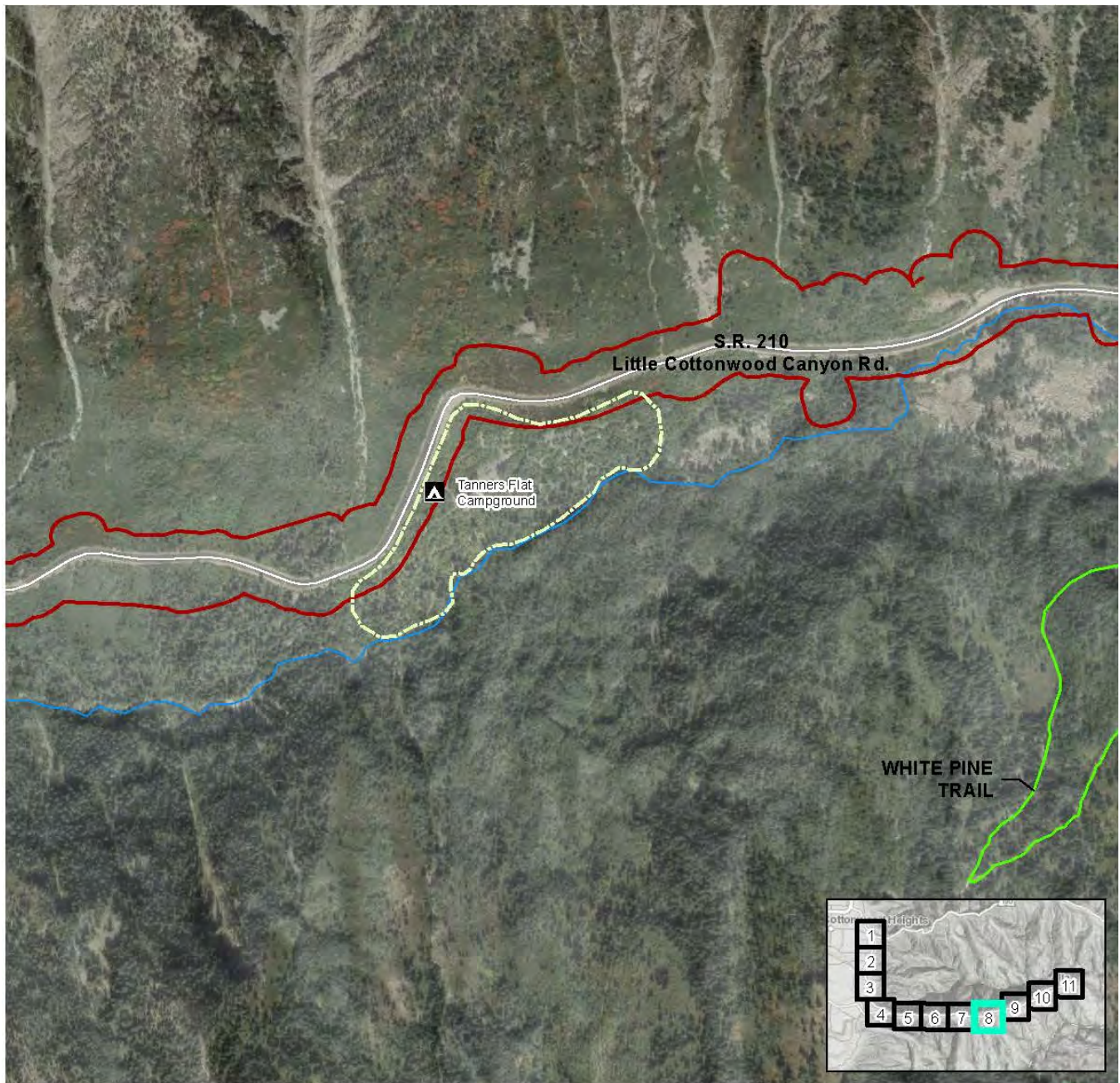
Section 4(f) Resources

- | | | |
|--|-----------------------|--------------------------------------|
| Study Area Boundary | Campgrounds | Ski Resorts Special Use Permit Areas |
| Historic Structure Eligible/Contributing | Campground Boundaries | Parks |
| Historic Structure Eligible/Significant | Trailheads | |
| Historic-Age Resources Not Visible | Trailhead Boundaries | |
| | Trails | |



Figure 7 of 11

Figure 26.4-8. Section 4(f) Resources (8 of 11)



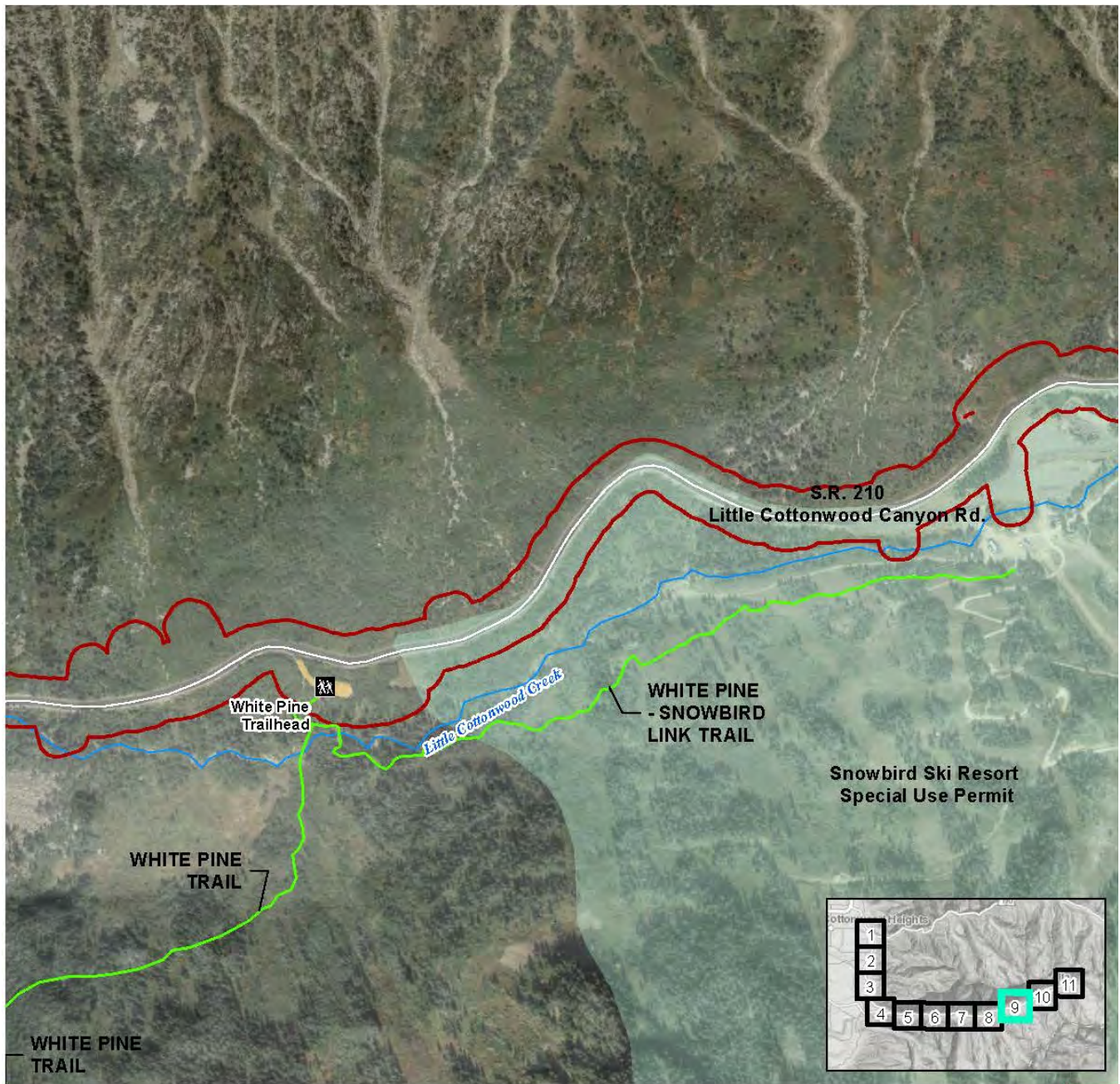
Section 4(f) Resources

- | | | |
|--|-----------------------|--------------------------------------|
| Study Area Boundary | Campgrounds | Ski Resorts Special Use Permit Areas |
| Historic Structure Eligible/Contributing | Campground Boundaries | Parks |
| Historic Structure Eligible/Significant | Trailheads | |
| Historic-Age Resources Not Visible | Trailhead Boundaries | |
| | Trails | |



Figure 8 of 11

Figure 26.4-9. Section 4(f) Resources (9 of 11)



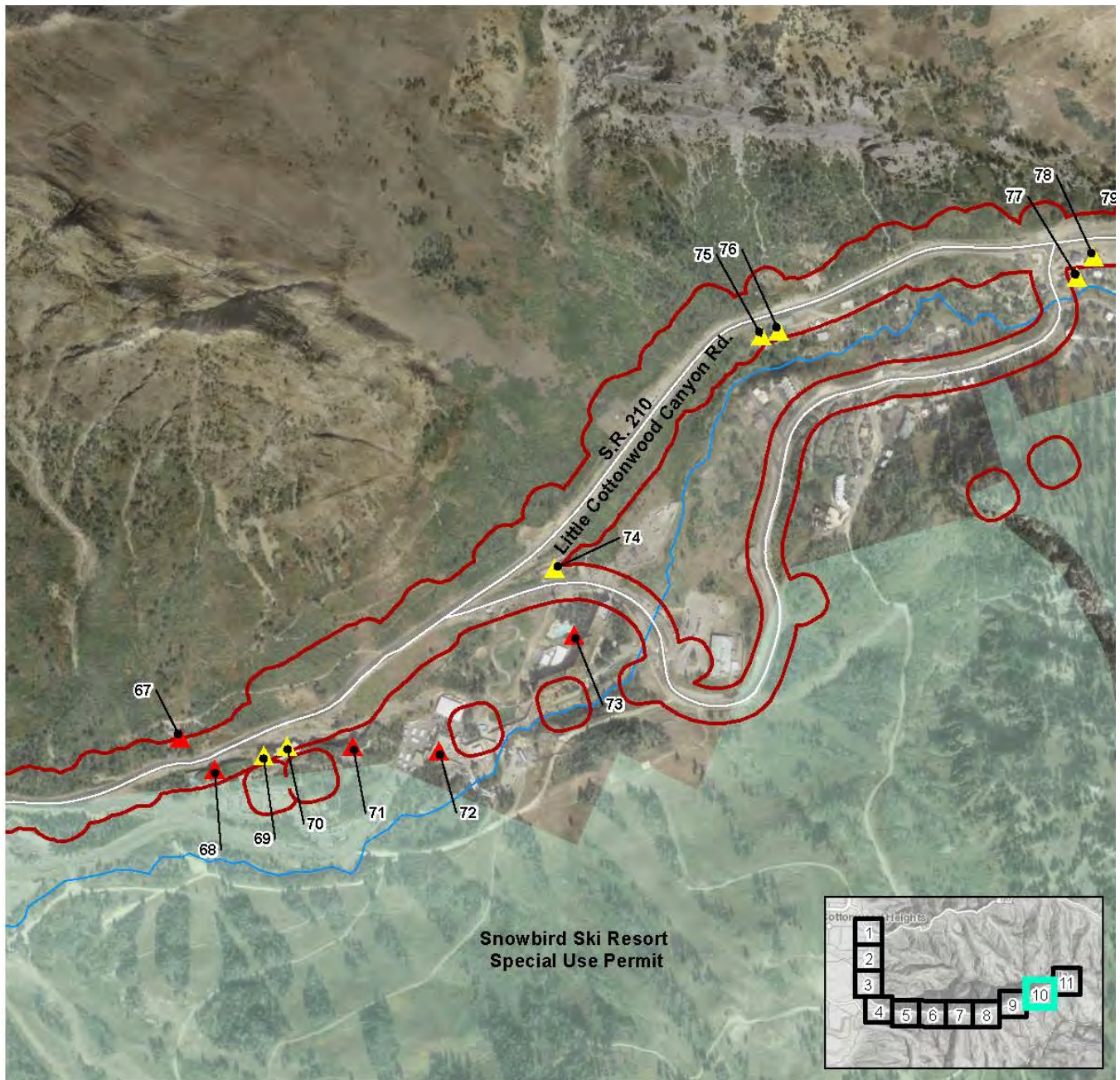
Section 4(f) Resources

- | | | |
|--|-----------------------|--------------------------------------|
| Study Area Boundary | Campgrounds | Ski Resorts Special Use Permit Areas |
| Historic Structure Eligible/Contributing | Campground Boundaries | Parks |
| Historic Structure Eligible/Significant | Trailheads | |
| Historic-Age Resources Not Visible | Trailhead Boundaries | |
| | Trails | |



Figure 9 of 11

Figure 26.4-10. Section 4(f) Resources (10 of 11)



Section 4(f) Resources

- | | | |
|--|-----------------------|--------------------------------------|
| Study Area Boundary | Campgrounds | Ski Resorts Special Use Permit Areas |
| Historic Structure Eligible/Contributing | Campground Boundaries | Parks |
| Historic Structure Eligible/Significant | Trailheads | |
| Historic-Age Resources Not Visible | Trailhead Boundaries | |
| | Trails | |

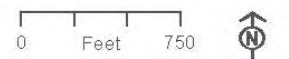
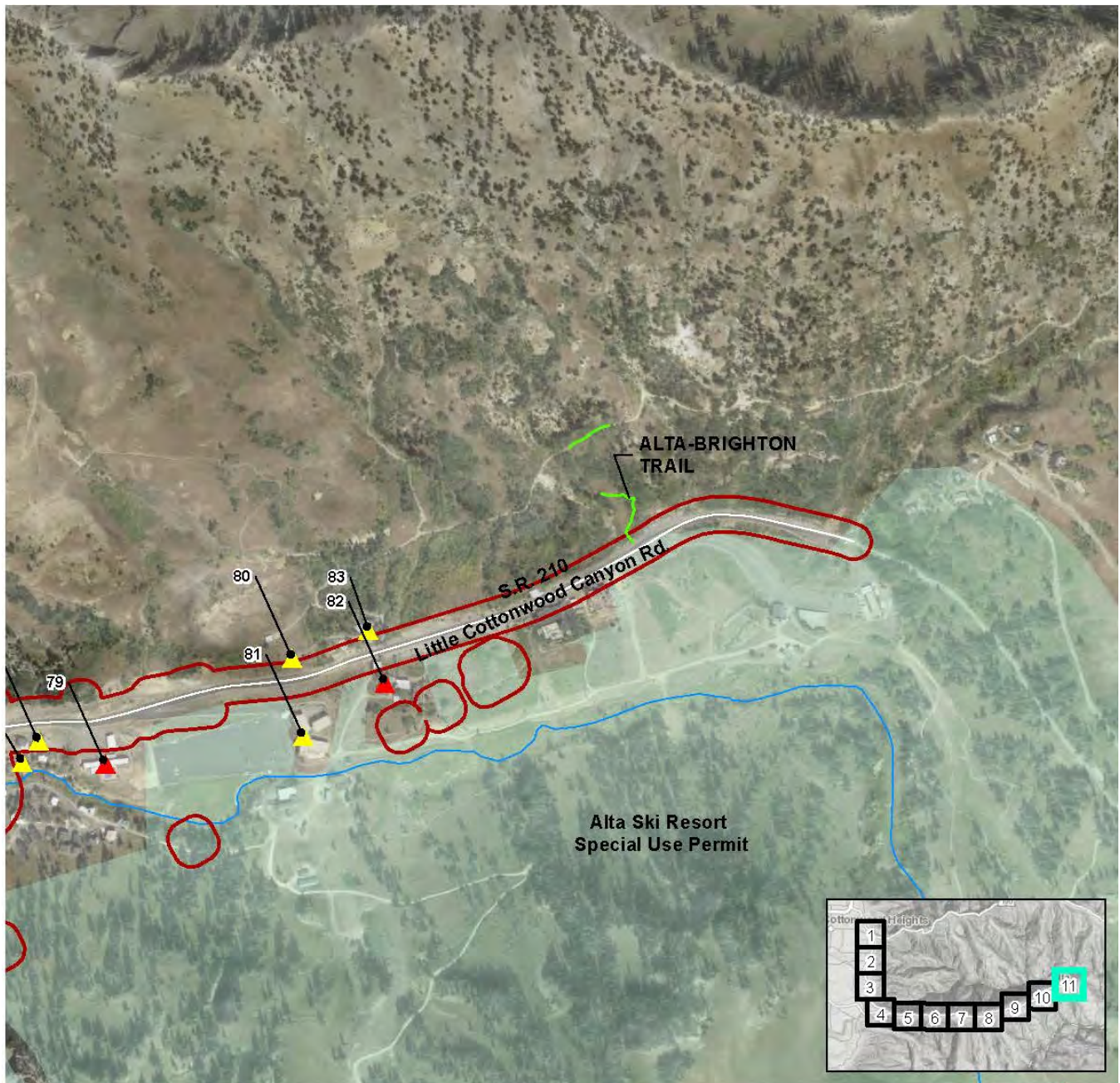


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Figure 26.4-11. Section 4(f) Resources (11 of 11)



Section 4(f) Resources

- | | | |
|--|-----------------------|--------------------------------------|
| Study Area Boundary | Campgrounds | Ski Resorts Special Use Permit Areas |
| Historic Structure Eligible/Contributing | Campground Boundaries | Parks |
| Historic Structure Eligible/Significant | Trailheads | |
| Historic-Age Resources Not Visible | Trailhead Boundaries | |
| | Trails | |

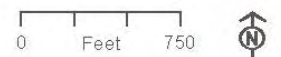


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26.4.1.1.2 Archaeological Sites

Eight eligible archaeological sites located in the study area could be impacted by the action alternatives as listed in Table 26.4-1. The regulation at 23 CFR Section 774.13(b)(1) states that Section 4(f) does not apply if UDOT determines, after consultation with the SHPO, that "... the archeological resource is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place."

UDOT determined that an exception under 23 CFR Section 774.13 applies to seven of the archaeological sites, as described in Table 26.4-1. UDOT notified the Utah SHPO in the DOE/FOE of its proposed findings that these archaeological sites do not warrant preservation in place. The Utah SHPO concurred on May 14, 2021 (Appendix 15B, Determinations of Eligibility and Findings of Effect).

Table 26.4-1. Section 4(f) Applicability for NRHP-eligible Archaeological Sites

Site No.	Site Name	NRHP Evaluation	Considerations	Section 4(f) Resource?
42SL52	Town Site of Alta	Eligible (Criteria A and D)	Eligible under Criterion A for its association with early mining, exploration, and settlement patterns of the Wasatch Mountains and the Salt Lake Valley. Eligible under Criterion D for the information that can be learned from intact buried deposits at the site. However, the site does not warrant preservation in place due to heavy impacts from erosion and modern construction. The integrity of feeling, workmanship, materials, and setting are not retained. Therefore, site qualifies for the exception under 23 CFR Section 774.13.	No
42SL109	Little Cottonwood Grit Mill Property	Eligible (Criteria A and D)	Eligible under Criterion A for its association with early mining, exploration, and settlement patterns in the Salt Lake Valley. Eligible under Criterion D for the information that can be learned from remaining evidence of quarry activity and from potential features in areas that were not accessible during the survey. However, the site does not warrant preservation in place due to extensive modern impacts and continual, heavy recreational public use. The integrity of feeling, design, and setting are not retained. Therefore, site qualifies for the exception under 23 CFR Section 774.13.	No
42SL419	D&RGW Railroad/Wasatch & Jordan Valley Railroad/Salt Lake & Alta	Eligible (Criterion A)	Eligible under Criterion A for its association with early mining, exploration, and settlement patterns in the Wasatch Mountains and the Salt Lake Valley. The majority of the site's contents have likely been destroyed by the construction of S.R. 210. However, two disconnected segments of retaining wall remain intact: an eastern segment (known colloquially as the "China Wall") and a western segment near White Pine Fork. These remaining segments retain their integrity of location, materials, workmanship, and design. The site warrants preservation in place.	Yes

(continued on next page)

Table 26.4-1. Section 4(f) Applicability for NRHP-eligible Archaeological Sites

Site No.	Site Name	NRHP Evaluation	Considerations	Section 4(f) Resource?
42SL549	Whitmore Temple Granite Power Plant	Eligible (Criterion A)	Eligible under Criterion A for its association with early mining, exploration, resource use, and settlement patterns in the Wasatch Mountains and the Salt Lake Valley. However, the site does not warrant preservation in place due to partial demolition and heavy public use. The integrity of design, workmanship, and setting are not retained.	No
42SL740	Alta Prince of Wales Road	Eligible (Criteria A, C, and D)	Eligible under Criterion A for its association with early mining, exploration, and settlement patterns in the Wasatch Mountains and the Salt Lake Valley. Eligible under Criterion C because it is characteristic of historic mining roads and is unique because it links Big and Little Cottonwood Canyons at their east ends. Eligible under Criterion D for the information that can be learned from historical research. However, the site does not warrant preservation in place due to modern developments. The integrity of feeling and setting are not retained. Therefore, site qualifies for the exception under 23 CFR Section 774.13.	No
42SL830	Salt Lake to Alta Road/S.R. 210	Eligible (Criterion A)	Eligible under Criterion A for its association with early mining, exploration, and settlement patterns in the Wasatch Mountains and the Salt Lake Valley. However, the site does not warrant preservation in place. No aspects of integrity (other than location) are present due to complete and ongoing modernization.	No
42SL860	Emma Mine–Bay City Tunnel	Eligible (Criteria A and C)	Eligible under Criterion A for its association with early mining, development, and trade at the local, national, and international levels. Eligible under Criterion C because it still embodies the characteristics of an intact hard-rock mine of its period. However, the only aspect of the site that is located within the study area, the entrance building, was built in the modern period and does not contribute to the eligibility of the overall site.	No
42SL916	Little Cottonwood Quarry Trail	Eligible (Criterion A)	Eligible under Criterion A for its association with early mining, exploration, and settlement patterns in the Wasatch Mountains and the Salt Lake Valley. However, the site does not warrant preservation in place. Trail improvement has destroyed the fabric of the original road along with integrity of design, materials, and workmanship.	No

26.4.1.2 Identification of Section 4(f) Public Parks and Recreation Resources

Section 4(f) applicability for parks and recreation resources is described in Section 26.2.1.2, Definition of Section 4(f) Properties.

26.4.1.2.1 Properties Not Evaluated for Section 4(f) Eligibility

In 2020, Utah Open Lands, a nonprofit land trust, purchased a 25.21-acre property on the northeast side of North Little Cottonwood Road. The property is referred to as the Cottonwood Heights Bonneville Shoreline Trail property and is located at about MP 3, or about 1 mile northwest of the intersection with S.R. 209. The proposed Bonneville Shoreline Trail is planned to cross this property, and a trailhead is planned to be built on the property. UDOT did not make a determination regarding the Section 4(f) eligibility of this property because the action alternatives would avoid it entirely.

26.4.1.2.2 Properties Evaluated but Determined Not To Be Section 4(f) Properties

The following properties were evaluated but were determined not to be Section 4(f) properties.

Ball Field at 6325 E. Dover Hills Drive. The ball field located north of Golden Hills Park and west of the existing S.R. 210 is owned by the Church of Jesus Christ of Latter-day Saints as part of its adjacent property at 6325 E. Dover Hills Drive. Since this recreation area is not publicly owned, it is not a Section 4(f) property and is therefore not discussed further in this chapter.

Scenic Byways. The study area includes two scenic byways: S.R. 210 and S.R. 190. Little Cottonwood Canyon Road (S.R. 210) from S.R. 209 to the eastern project terminus in the town of Alta is designated as a scenic byway recognized for its views of dramatic mountain peaks and steep canyon walls. S.R. 190 is a scenic byway through Big Cottonwood Canyon; its western terminus is at the northern terminus of the S.R. 210 Project at the intersection of Wasatch Boulevard and Fort Union Boulevard. In accordance with Question 22 of FHWA's *Section 4(f) Policy Paper* (FHWA 2012), designating a road as a scenic byway does not create a park or recreation area as defined under Section 4(f); therefore, neither scenic byway is considered a Section 4(f) property.

Bicycle Lanes. S.R. 210 is signed and striped for bicycle lanes from Fort Union Boulevard to S.R. 209. The bicycle lanes are designated as Category 2 bicycle lanes in the Cottonwood Heights *Bicycle and Trails Master Plan* (Cottonwood Heights City, no date). Category 2 bicycle lanes are separate, exclusive bicycle on-street facilities. Because the primary function of Category 2 bicycle lanes is for transportation, not recreation, they are not a considered Section 4(f) resource.

Proposed Bonneville Shoreline Trail. This trail is planned to ultimately run 280 miles from Nephi, Utah, to the Utah–Idaho border along the shoreline of ancient Lake Bonneville. Several segments have been constructed, but the trail has not been constructed in its entirety. In the study area, the trail is proposed to run parallel to and east of Wasatch Boulevard from S.R. 190 to North Little Cottonwood Road, then east and north of North Little Cottonwood Road to the entrance to Little Cottonwood Canyon, where it would cross S.R. 210. Section 4(f) does not apply to segments of the trail that are not currently publicly owned. Table 26.4-2 on page 26-31 lists segments of the trail in the study area that qualify for protection under Section 4(f) because they either are publicly owned or have a publicly owned easement that allows public access.

Snowbird Resort. Snowbird Resort is a year-round resort at the top of Little Cottonwood Canyon. The 2,630-acre resort is privately owned and is located on a combination of private and National Forest System (NFS) land that is open to the public. It operates under a special-use permit from the USDA Forest Service. Facilities include ski lifts and a tram, four lodges, shops, restaurants, a conference center, ski areas and avalanche-control facilities, hiking trails, and other recreation facilities such as an alpine slide. Portions of the resort located on NFS land are considered part of a multiple-use land holding. Section 4(f) applies only to portions of the resort that are on NFS land and are identified on the resort's USDA Forest Service special-use permit as being used primarily for public parks or recreation. Section 4(f) does not apply to portions of the resort that are on privately owned land, undeveloped portions of the resort that are on NFS land, or resort facilities on NFS land that are not used primarily for recreation. Facilities in the study area that are not used primarily for recreation and are therefore not Section 4(f) resources include ski area maintenance and storage buildings, the fire station, restaurants, and lodges. Table 26.4-2 on page 26-31 lists facilities in the study area that are identified on Snowbird's special-use permit and are used primarily for recreation.

Alta Ski Area. Alta Ski Area is a year-round resort at the top of Little Cottonwood Canyon. The 2,130-acre area is privately owned and is located on a combination of private and NFS land that is open to the public. It operates under a special-use permit from the USDA Forest Service. Facilities include ski lifts and tows, restaurants, ski area and avalanche-control facilities, and hiking trails. Portions of the resort located on NFS land are considered part of a multiple-use land holding. Section 4(f) applies only to portions of the resort that are on NFS land and are identified on the resort's USDA Forest Service special-use permit as being used primarily for public parks or recreation. Section 4(f) does not apply to portions of the resort that are on privately owned land, undeveloped portions of the resort that are on NFS land, or resort facilities on NFS land that are not used primarily for recreation. Facilities in the study area that are not used primarily for recreation and are therefore not Section 4(f) resources include administration and office buildings and employee housing. Table 26.4-2 on page 26-31 lists facilities in the study area that are identified on Alta's special-use permit and are used primarily for recreation.

Dispersed Climbing Resources. Section 4(f) applies only to portions of multiple-use public lands that are designated as or function for significant park or recreation purposes. The USDA Forest Service determined that the climbing boulders or groups of boulders identified as Parking Lot West, Bathroom Boulder, Secret Garden, Cabbage Patch, Syringe, 5-Mile, and All Thumbs do not meet the applicability requirements of 23 CFR Section 774.11(d). For this reason, these boulders are not Section 4(f) resources [USDA Forest Service 2020; see the correspondence in Appendix 26A, USDA Forest Service Letter Regarding Section 4(f) Determination for Climbing Boulders, dated September 15, 2020]. The Gate Buttress climbing area is located on private land and is not considered a Section 4(f) resource.

Bridge Trailhead. The Bridge Trailhead is a trailhead improvement proposed as part of this project. It is not considered a Section 4(f) resource because there is no existing trailhead, and the trail connecting to the Little Cottonwood Creek Trail is not formally identified on USDA Forest Service maps. Additionally, no trailhead is planned for this area except the trailhead proposed in this Environmental Impact Statement (EIS).

26.4.1.2.3 Parks or Recreation Resources Determined To Be Section 4(f) Resources

The study area includes several park or recreation resources that were determined to be Section 4(f) resources. Section 4(f) recreation resources in the urban portion of the study area include a park and two trails. Trailheads for Section 4(f) trails are necessary to support the recreation use and are also protected under Section 4(f) as long as they are on publicly owned land and are open to the public.

The Uinta-Wasatch-Cache National Forest is a multiple-use public land holding. Areas on USDA Forest Service land that function for or are identified in an official plan as being used primarily for recreation, and are significant for such purposes, are Section 4(f) resources. Section 4(f) resources were identified on the *Tri-Canyon Trails Map* (USDA Forest Service 2017), in the *Grit Mill Decision Notice and Climbing Master Plan* (USDA Forest Service 2014), and through coordination with the USDA Forest Service. These resources include trails, trailheads, and a campground.

Section 4(f) also applies to portions of the Snowbird and Alta resorts that are on NFS land and are identified on the resorts' USDA Forest Service special-use permits as being used primarily for public parks or recreation. In the study area, these elements consist of parking areas (which are needed to support recreation use), a tennis court near Snowbird's Iron Blossam Lodge, and Alta's transfer tow (a rope tow that runs between the Sunnyside and Collins lifts). Other ski lifts, rope tows, and recreation facilities such as Snowbird's alpine slide are either outside the study area or on private land, so they are not listed as Section 4(f) recreation resources in the study area in Table 26.4-2. The Section 4(f) recreation resources in the study area are shown in Figure 26.4-1 through Figure 26.4-11, Section 4(f) Resources, above and described in Table 26.4-2 below.

Table 26.4-2. Section 4(f) Recreation Resources in the Study Area

Recreation Resource	Description and/or Location	Ownership and/or Management	Activities, Features, and Attributes
S.R. 210 – Wasatch Boulevard			
Big Cottonwood Canyon Trail	Existing urban trail/shared-use pathway extending from Holladay to the park-and-ride lot at the entrance to Big Cottonwood Canyon	Land ownership is a combination of private and municipally owned land managed by Cottonwood Heights City.	Paved multi-use trail designed for use by cyclists, joggers, etc. Interpretive signs provide the history of the area.
Ferguson Trailhead off Prospector Drive	Supplemental trailhead for Ferguson Canyon Trail with access off Prospector Drive at about 7650 South	Land is owned by Salt Lake County and managed by Cottonwood Heights City.	Trailhead is currently a 0.14-acre unpaved parking lot on a 3.10-acre parcel. Cottonwood Heights City plans to expand and improve the trailhead and make it the primary trailhead for Ferguson Canyon. Planned improvements span 6.45 acres and include a formal paved parking lot, a restroom, walking paths, and a multi-use path on the east side of Wasatch Boulevard.
Golden Hills Park	5.3-acre park at 8303 S. Wasatch Boulevard (S.R. 210 approximate MP 1.3)	Park is owned and managed by Cottonwood Heights City.	Pavilion for 30 people, a playground, walking path, restrooms, and a tennis court.

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Table 26.4-2. Section 4(f) Recreation Resources in the Study Area

Recreation Resource	Description and/or Location	Ownership and/or Management	Activities, Features, and Attributes
S.R. 210 – North Little Cottonwood Road to Alta			
Tanners Flat Campground	Existing USDA Forest Service campground south of S.R. 210 about 4 miles up Little Cottonwood Canyon near MP 8.1	Campground is on federal land managed by the USDA Forest Service.	Campground is set among pine, aspen, oak, and maple trees with Little Cottonwood Creek running along the edge. There are 31 single sites, 3 double sites, 4 group sites, bathroom facilities, a volleyball court, and an amphitheater. Campground is open from late May through late September and is closed during the winter.
Bonneville Shoreline Trail	Planned trail that follows the shoreline of ancient Lake Bonneville	Segments in the study area that qualify for Section 4(f) include: <ul style="list-style-type: none"> • Segments on USDA Forest Service land at the entrance to Little Cottonwood Canyon, crossing S.R. 210 near the intersection with S.R. 209 • Segment on land recently purchased by Utah Open Lands on the east side of North Little Cottonwood Road (parcel ownership will be transferred to Cottonwood Heights City with a conservation easement held by Utah Open Lands) 	Mixed-use (biking/hiking) recreation trail. Connections are planned at two existing trailheads in the study area: the Little Cottonwood Canyon park-and-ride lot and the Temple Quarry Trailhead. A new trailhead is planned to be located somewhere on the land recently purchased by Utah Open Lands.
Alpenbock Loop Trail (USDA Forest Service #1020)	Existing 1.0-mile loop trail on the north side of S.R. 210 at the entrance to Little Cottonwood Canyon near MP 3.9	Trail is on federal land managed by the USDA Forest Service.	Existing unpaved loop trail providing access to rock-climbing routes and bouldering areas from trailheads on both ends of the park-and-ride lot.
Alpenbock East Spur Trail	Planned 0.2-mile spur trail on the north side of S.R. 210 connecting the Alpenbock Loop Trail to the planned Grit Mill trailhead	Trail will be on federal land managed by the USDA Forest Service.	The USDA Forest Service plans to construct a new trail segment in summer 2021 connecting the existing Alpenbock Loop Trail to the Grit Mill Trailhead. This trail will provide formal access to climbing routes and bouldering areas.
Grit Mill Trailhead	Trailhead at the Grit Mill (MP 4.5)	Trailhead is on federal land managed by the USDA Forest Service.	Trailhead parking area with a restroom and interpretive site providing access to rock-climbing routes.
Temple Quarry Nature Trail (USDA Forest Service #1000)	Existing 0.3-mile loop trail on the south side of S.R. 210 at the entrance to Little Cottonwood Canyon near MP 3.9	Trail is on federal land managed by the USDA Forest Service.	Existing amphitheater and paved interpretive trail beginning at the Temple Quarry Trailhead on the south side of S.R. 210 at the intersection with S.R. 209.

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Table 26.4-2. Section 4(f) Recreation Resources in the Study Area

Recreation Resource	Description and/or Location	Ownership and/or Management	Activities, Features, and Attributes
Little Cottonwood Creek Trail (USDA Forest Service #1001)	Existing 3.3-mile trail parallel to Little Cottonwood Creek starting at the entrance to Little Cottonwood Canyon near MP 3.9	Trail crosses or abuts private land for short sections but is mainly on federal land. The USDA Forest Service manages the trail.	Existing unpaved hiking and mountain biking trail beginning at the Temple Quarry Trailhead on the south side of S.R. 210 at the intersection with S.R. 209. The trail runs along Little Cottonwood Creek parallel to and south of S.R. 210.
Lisa Falls Trail (USDA Forest Service #1012)	Existing 1.1-mile trail on the north side of S.R. 210 starting near MP 6.7	Trail is on federal land managed by the USDA Forest Service.	Existing unpaved hiking trail beginning at the Lisa Falls Trailhead near MP 6.7 and ending at the Lisa Falls waterfall.
White Pine Trail (USDA Forest Service #1002)	Existing 5.0-mile trail on the south side of S.R. 210 starting near MP 9.2	Trail is on federal land managed by the USDA Forest Service.	Existing unpaved hiking and mountain biking trail extending 5.0 miles from the White Pine trailhead near MP 9.2 to White Pine Lake. The White Pine Trailhead also serves Red Pine (USDA Forest Service #1003), Maybird (USDA Forest Service #1004), and White Pine–Snowbird Link (USDA Forest Service #1014). This is a major area for backcountry skiing in winter.
Alta Brighton Trail (USDA Forest Service #1007)	Existing 1.7-mile trail on the north side of S.R. 210 starting near MP 12.3	Trail crosses private and federal land. The USDA Forest Service manages the trail.	Existing hiking trail extending 1.7 miles from the Flagstaff Trailhead on the north side of S.R. 210 near MP 12.3 to Twin Lakes Reservoir in Big Cottonwood Canyon. This is a major area for backcountry skiing in winter. The Flagstaff Trailhead also serves Snakepit Trail (USDA Forest Service #1015) and Albion Meadows Trail (USDA Forest Service #1006).
Recreation facilities at Snowbird Resort	Facilities on NFS land and identified in Snowbird's special-use permit that are used primarily for recreation	Snowbird Resort is a privately owned and managed resort on a combination of private and NFS land and is operated under a special-use permit from the USDA Forest Service.	Ski resort parking within the special-use permit area (needed to support other recreation facilities) and tennis courts near the Iron Blossam Lodge.
Recreation facilities at Alta Ski Area	Facilities on NFS land and identified in Alta's special-use permit that are used primarily for recreation	Alta Ski Area is privately owned and managed ski area on a combination of private and NFS land and is operated under a special-use permit from the USDA Forest Service.	Ski resort parking within the special-use permit area (needed to support other recreation facilities) and the transfer tow (a rope tow that runs between the Sunnyside and Collins lifts).

26.4.2 Identification of Section 6(f) Resources

There are no Section 6(f) resources in the study area. The Utah State database of LWCF State Assistance Program locations was searched, returning no results in the study area. Two parcels adjacent to S.R. 210 at the entrance to Little Cottonwood Canyon were purchased with funds from the LWCF Federal Acquisition Program to consolidate federal ownership within the NFS boundary. Section 6(f) applies only to properties that receive assistance from the LWCF State Assistance Program, not the LWCF Federal Acquisition Program. Therefore, these parcels are not considered Section 6(f) resources (USDA Forest Service 2019). Section 6(f) resources are not discussed further in this chapter.

26.5 Use of Section 4(f) Resources

The following sections describe the impacts of the No-Action and action alternatives on Section 4(f) properties. For each Section 4(f) property, there can be one of the following findings related to use by a project alternative:

- Use with greater-than-*de minimis* impact
- Use with *de minimis* impact
- Use as a result of temporary occupancy
- Temporary occupancy with impacts so minimal as to not constitute a use
- Constructive use (proximity impact if the alternative is adjacent)
- No use
- Exception to the requirement for Section 4(f) approval

Use, *de minimis* impact, temporary occupancy, constructive use, and relevant exceptions for this project are defined in the Section 4(f) regulations and guidance cited in Section 26.2, Regulatory Setting. Both of the avalanche mitigation sub-alternatives (which would be included with the primary action alternatives) would result in a use with greater-than-*de minimis* impact of one Section 4(f) property. The other sub-alternatives would result in either uses with *de minimis* impact or temporary occupancy with impacts so minimal as to not constitute a use. None of the primary action alternatives or sub-alternatives would result in constructive use.

26.5.1 No-Action Alternative

The No-Action Alternative would not require acquisition of right of way and would result in no uses of Section 4(f) properties.

26.5.2 Enhanced Bus Service Alternative

This section describes the impacts to Section 4(f) resources from the Enhanced Bus Service Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

26.5.2.1 S.R. 210 – Wasatch Boulevard

This section describes the impacts to Section 4(f) resources from the Imbalanced-lane Alternative and the Five-lane Alternative, which would both widen the Wasatch Boulevard segment of S.R. 210.

26.5.2.1.1 Imbalanced-lane and Five-lane Alternatives

The Imbalanced-lane and Five-lane Alternatives would have similar impacts to Section 4(f) resources. However, the Five-lane Alternative would add one additional travel lane, which would require about 12 feet more pavement width than the Imbalanced-lane Alternative. As a result of the additional pavement width, the Five-lane Alternative would have slightly greater impacts to three Section 4(f) properties compared to the Imbalanced-lane Alternative.

Section 4(f) Historic Properties

The Imbalanced-lane Alternative and the Five-lane Alternative would each have six uses with *de minimis* impacts (land acquisition without impacting the historic building) and three temporary occupancies with no use (temporary construction easement with minimal impact and without land acquisition) along Wasatch Boulevard. Table 26.5-1 describes the use of each Section 4(f) historic property. Unless noted in the table, the impacts for both alternatives would be the same. Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect). For more information regarding how property impacts were assessed, see Chapter 4, Community and Property Impacts. For more information regarding how effects were determined under Section 106 of the National Historic Preservation Act, see Chapter 15, Cultural Resources.

Table 26.5-1. Use of Section 4(f) Historic Properties by the Wasatch Boulevard Imbalanced-lane and Five-lane Alternatives with the Enhanced Bus Service Alternative

ID	Address	Property Description	UDSH Rating ^a	Section 106 Effect Determination	Description of Use	Section 4(f) Use / Impact
3	7527 S. Brighton Point Drive	One-story contemporary-style single-family dwelling	EC	No adverse effect	Widening Wasatch Boulevard would require acquisition of ~0.17 acre from the property and a temporary construction easement of ~0.09 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
4	7537 S. Brighton Point Drive	One-story ranch-style single-family dwelling	EC	No adverse effect	Widening Wasatch Boulevard would require acquisition of ~0.12 acre from the property and a temporary construction easement of ~0.04 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
5	7561 S. Brighton Point Drive	One-story ranch-style single-family dwelling	EC	No adverse effect	Widening Wasatch Boulevard would require acquisition of ~0.08 acre from the property and a temporary construction easement of ~0.01 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact

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Table 26.5-1. Use of Section 4(f) Historic Properties by the Wasatch Boulevard Imbalanced-lane and Five-lane Alternatives with the Enhanced Bus Service Alternative

ID	Address	Property Description	UDSH Rating ^a	Section 106 Effect Determination	Description of Use	Section 4(f) Use / Impact
19	8296 S. Wasatch Boulevard	One-story early ranch-style single-family dwelling	EC	No adverse effect	Widening Wasatch Boulevard would require acquisition of ~0.04 acre from the property for the Imbalanced-lane Alternative or ~0.06 acre for the Five-lane Alternative, and a temporary construction easement of ~0.02 acre for both alternatives. The historic building would not be affected.	Yes / <i>de minimis</i> impact
20	3461 E. Kings Hill Drive	One-and-a-half-story split-level-style single-family dwelling	EC	No adverse effect	Widening Wasatch Boulevard would require a temporary construction easement of ~0.02 acre. The historic building would not be affected.	No (temporary occupancy) / NA
21	3475 E. Kings Hill Drive	One-and-a-half-story split-level-style single-family dwelling	EC	No adverse effect	Widening Wasatch Boulevard would require a temporary construction easement of less than 0.01 acre. The historic building would not be affected.	No (temporary occupancy) / NA
22	8342 S. Wasatch Boulevard	One-story ranch-style single-family dwelling	EC	No adverse effect	Widening Wasatch Boulevard would require acquisition of ~0.03 acre from the property for the Imbalanced-lane Alternative or ~0.05 acre for the Five-lane Alternative, and a temporary construction easement of ~0.05 acre for the Imbalanced-lane Alternative or ~0.04 acre for the Five-lane Alternative. The historic building would not be affected.	Yes / <i>de minimis</i> impact
36	8800 S. Alpen Way	One-story ranch-style single-family dwelling	EC	No adverse effect	Widening Wasatch Boulevard would require acquisition of ~0.01 acre from the property. The historic building would not be affected.	Yes / <i>de minimis</i> impact
NV2 ^b	8640 S. Russel Park Road	Potential historic-age building	Not evaluated	No adverse effect	Widening Wasatch Boulevard would require a temporary construction easement of ~0.06 acre. The potentially historic building would not be affected.	No (temporary occupancy) / NA

~ = approximately; NA = not applicable

^a Utah Division of State History (UDSH) rating for historic structures: EC = eligible/contributing. For more information, see Chapter 15, Cultural Resources.

^b Salt Lake County Assessor data indicated this legal parcel as potentially having a historic-age building; however, the resource was not visible enough from the public right of way to evaluate it for Section 4(f) impacts.

Section 4(f) Recreation Resources

The Imbalanced-lane and the Five-lane Alternatives would each have two uses with *de minimis* impacts (land acquisition without impacting the features, attributes, or activities of the resource) to two Section 4(f) recreation resources along Wasatch Boulevard as described in Table 26.5-2. Figures showing impacts are available in the Section 4(f) *de minimis* correspondence (Appendix 26B, *De Minimis* Correspondence).

Table 26.5-2. Use of Section 4(f) Recreation Resources by the Wasatch Boulevard Imbalanced-lane and Five-lane Alternatives with the Enhanced Bus Service Alternative

Resource	Description of Use	Section 4(f) Use / Impact
Ferguson Trailhead off Prospector Drive	<p>If Wasatch Boulevard were to be widened before planned trailhead improvements are constructed, ~0.02 acre of the existing ~0.14-acre parking area would be acquired. UDOT would reconstruct the dirt parking area so that there would be no net loss of parking spaces.</p> <p>If Wasatch Boulevard were to be widened after planned trailhead improvements are constructed, ~1.05 acre of the 6.45-acre planned trailhead would be acquired to accommodate the proposed multi-use path on the east side of Wasatch Boulevard. A temporary construction easement of ~0.59 acre would be required. UDOT would coordinate with Cottonwood Heights City during the Ferguson Trailhead design process to ensure that the location of the multi-use trail proposed with the Imbalanced-lane and Five-lane Alternatives is considered during development of the park plan.</p>	Yes / <i>de minimis</i> impact
Golden Hills Park	About 0.63 acre for the Imbalanced-lane Alternative or ~0.65 acre for the Five-lane Alternative of the 5.3-acre park would be acquired to accommodate widening Wasatch Boulevard. Most of the impact would occur as a result of constructing a multi-use trail. There would be no impact to park activities or features (parking, pavilion, path, restroom, playground, or tennis court). The proposed multi-use trail on the east side of Wasatch Boulevard would connect to park trails.	Yes / <i>de minimis</i> impact

Source: Calculated from geographic information systems (GIS)-based inventory
~ = approximately

26.5.2.2 S.R. 210 – North Little Cottonwood Road to Alta

With the Enhanced Bus Service Alternative, there would be no change to the existing S.R. 210 roadway from North Little Cottonwood Road to the town of Alta. No right of way would be acquired in Little Cottonwood Canyon, so there would be no use of Section 4(f) historic properties or Section 4(f) recreation resources.

26.5.2.3 Mobility Hubs Alternative

The Enhanced Bus Service Alternative includes two mobility hubs: a mobility hub at the gravel pit and a mobility hub at the park-and-ride lot at 9400 South and Highland Drive.

What is a mobility hub?

A mobility hub is a location where users can transfer from their personal vehicle to a bus.

26.5.2.3.1 Gravel Pit

Right of way would be required to accommodate the mobility hub at the gravel pit.

What is the gravel pit?

The gravel pit is an existing aggregate (gravel) mine located on the east side of Wasatch Boulevard between 6200 South and Fort Union Boulevard.

Section 4(f) Historic Properties

The interchange connecting the gravel pit mobility hub to Wasatch Boulevard would require right-of-way acquisition from one Section 4(f) historic property: the Old Mill. This would result in one use with a *de minimis* impact (land acquisition without impacting the historic building). Table 26.5-3 describes the use. Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

Table 26.5-3. Use of Section 4(f) Historic Properties by the Gravel Pit Mobility Hub with the Enhanced Bus Service Alternative

ID	Address	Property Description	UDSH Rating ^a	Section 106 Effect Determination	Description of Use	Section 4(f) Use / Impact
1	6851 S. Big Cottonwood Canyon Road	Three-and-a-half-story vernacular Granite Paper Mill (Old Mill)	ES	No adverse effect	Construction of an interchange at the gravel pit would require acquisition of ~4.01 acres from the property. The historic building would not be affected.	Yes / <i>de minimis</i> impact

~ = approximately

^a Utah Division of State History (UDSH) rating for historic structures: ES = eligible/significant. For more information, see Chapter 15, Cultural Resources.

Section 4(f) Recreation Resources

Constructing the mobility hub at the gravel pit would result in no impacts to or use of Section 4(f) recreation resources.

26.5.2.3.2 9400 South and Highland Drive

The 9400 South and Highland Drive mobility hub would not require acquisition of right of way and would result in no uses of Section 4(f) historic properties or Section 4(f) recreation resources.

26.5.2.4 Avalanche Mitigation Alternatives

The Enhanced Bus Service Alternative includes two alternatives for avalanche mitigation: the Snow Sheds with Berms Alternative and the Snow Sheds with Realigned Road Alternative.

26.5.2.4.1 Snow Sheds with Berms Alternative

Section 4(f) Historic Properties

The Snow Sheds with Berms Alternative would impact one Section 4(f) historic property, site 42SL419, resulting in a use with greater-than-*de minimis* impact. Table 26.5-4 describes the use. Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

Table 26.5-4. Use of Section 4(f) Historic Properties by Snow Sheds with Berms with the Enhanced Bus Service Alternative

Site Number	Site Name/Description	NRHP Criteria	Section 106 Effect Determination	Description of Use	Section 4(f) Use / Impact
42SL419	D&RGW Railroad/ Wasatch & Jordan Valley Railroad/Salt Lake & Alta	Criterion A	Adverse effect	Impacts would include ~0.19 acre of disturbance for the snow sheds and berms. Segments of intact retaining wall (known colloquially as the "China Wall") would be removed.	Yes / Greater-than- <i>de minimis</i> impact

~ = approximately

Section 4(f) Recreation Resources

No land would be required from recreation resources for the proposed snow sheds. Therefore, there would be no use of Section 4(f) recreation resources from the Snow Sheds with Berms Alternative.

26.5.2.4.2 Snow Sheds with Realigned Road Alternative

The impact from the Snow Sheds with Realigned Road Alternative would be the same as from the Snow Sheds with Berms Alternative. There would be a use of one Section 4(f) historic property, site 42LS419, with greater-than-*de minimis* impact. There would be no use of Section 4(f) recreation resources.

26.5.2.5 Trailhead Parking Alternatives

The Enhanced Bus Service Alternative includes three alternatives to address trailhead parking:

- Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative
- Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative
- No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

Trailhead parking improvements are proposed at four trailhead parking areas: the Gate Buttriss, Bridge, Lisa Falls, and White Pine Trailheads. Trailhead parking improvements do not include bus service to the trailheads. As described above in Table 26.4-2, Section 4(f) Recreation Resources in the Study Area, the Lisa Falls Trail and White Pine Trail are Section 4(f) resources. The Gate Buttriss and Bridge Trailheads are not considered Section 4(f) resources as described in Section 26.4.1.2.2, Properties Evaluated but Determined Not To Be Section 4(f) Properties.

26.5.2.5.1 Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative

Section 4(f) Historic Properties

There are no Section 4(f) historic properties in the vicinity of the proposed trailhead improvements. There would be no use of Section 4(f) historic properties with any of the trailhead parking alternatives.

Section 4(f) Recreation Resources

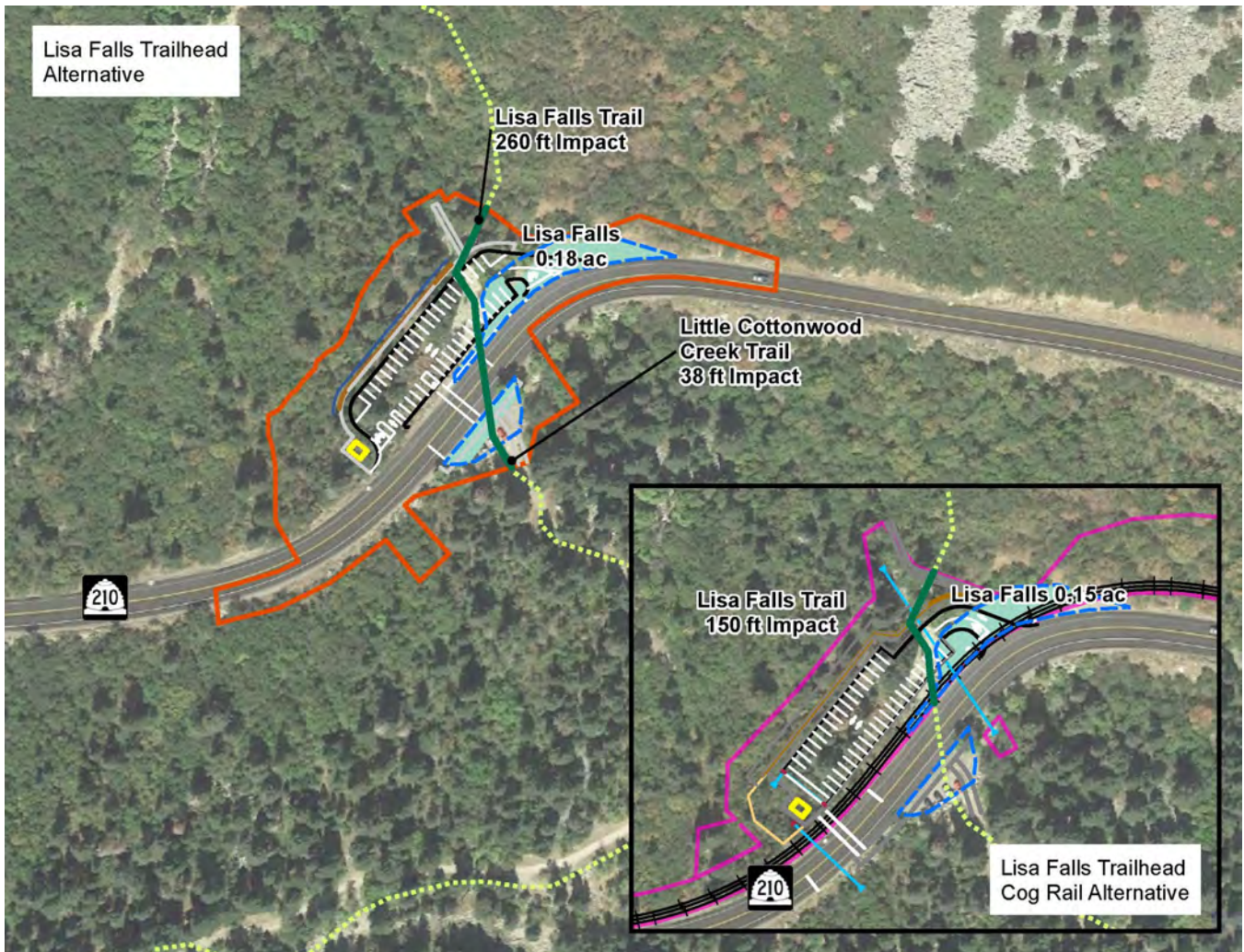
The trailhead improvements proposed with this trailhead parking alternative would have a use with *de minimis* impact (land acquisition without impacting the features, attributes, or activities) to two Section 4(f) recreation resources as described in Table 26.5-5. Impacts to the Lisa Falls Trail and Trailhead are shown in Figure 26.5-1. Impacts to the White Pine Trail and Trailhead are shown in Figure 26.5-2.

Table 26.5-5. Use of Section 4(f) Recreation Resources by the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative with the Enhanced Bus Service Alternative

Resource	Description of Use	Section 4(f) Use / Impact
Lisa Falls Trail	Existing trailhead parking in informal dirt pullouts on north and south sides of the road (17 parking spots total) would be consolidated into a larger formal parking lot on the north side of the road (41 parking spots). Roadside parking would be eliminated to reduce the safety conflicts among pedestrians, bicyclists, and vehicles. An advance warning sign would be provided for pedestrians to cross the road to reach the Little Cottonwood Creek Trailhead. Restrooms would be added. About 260 feet of trail would be impacted, and ~0.18 acre of the existing trailhead parking area would be acquired for trailhead improvements. During construction, the trailheads could be closed or access could be limited, resulting in a temporary impact. Depending on the final design and geotechnical studies, additional walls might be used to further reduce construction impacts from cut slopes.	Yes / <i>de minimis</i> impact
White Pine Trail	The existing trailhead parking lot would be expanded from 52 parking spots to 144 parking spots. Additional restrooms would be added. The single entrance to the parking lot would be replaced with a one-way-entrance and a one-way-exit. Roadside parking would be eliminated to reduce the safety conflicts among pedestrians, bicyclists, and vehicles. About 2.6 acres of USDA Forest Service land would be required for trailhead improvements. During construction, the trailheads could be closed or access could be limited, resulting in a temporary impact.	Yes / <i>de minimis</i> impact

~ = approximately

Figure 26.5-1. Use of Lisa Falls Trail and Trailhead with the Trailhead Improvement Alternatives and the Cog Rail Alternative



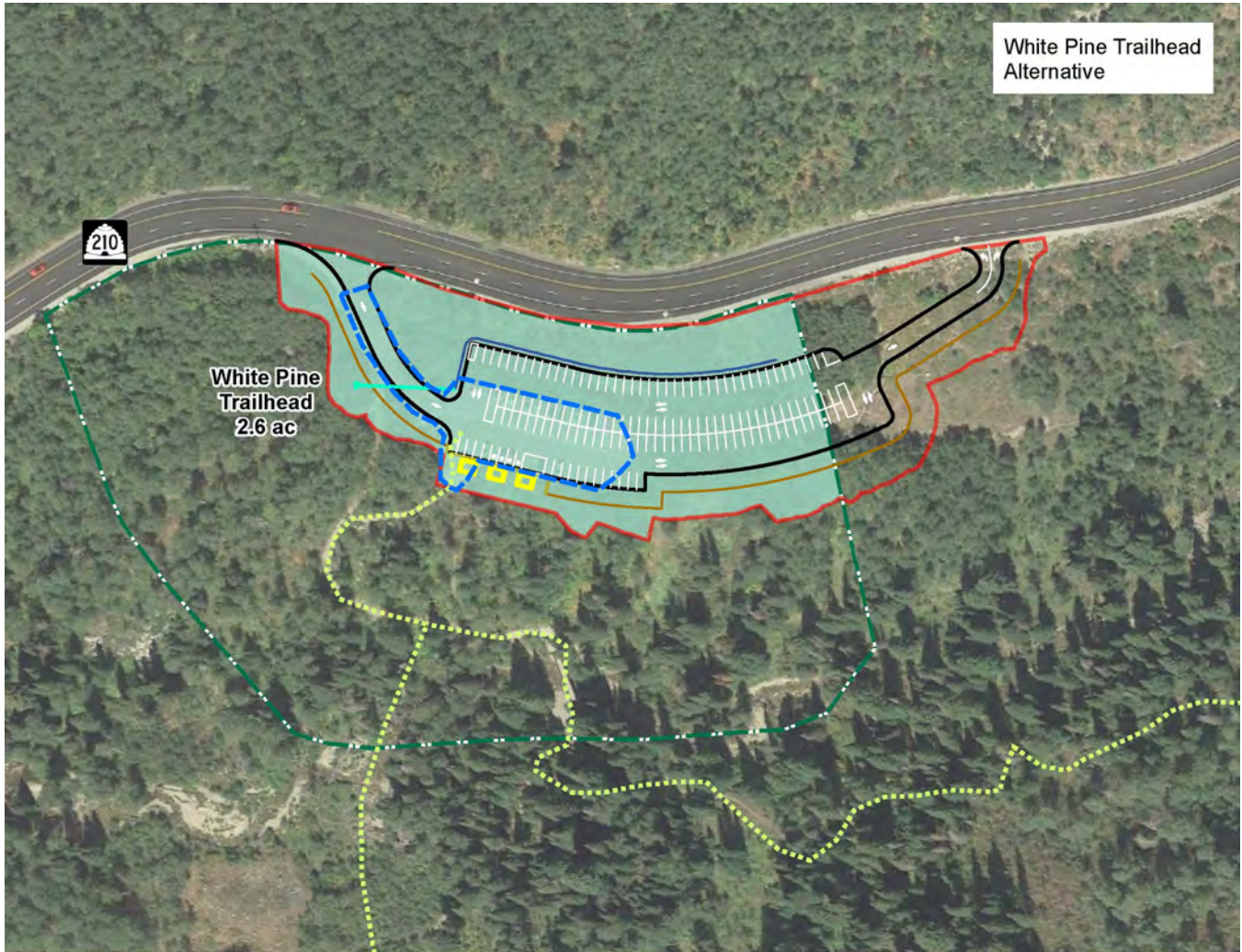
Legend

- NFS Trails
- Alternative Trail Impacts
- Cog Rail Alternative Impact Boundary
- Lisa Falls Trailhead Alternative
- Current Approximate Parking Lot Boundary
- Recreation Site Impact Estimate
- Cog Rail Alternative Alignment
- Restroom
- Edge of Pavement
- Sidewalks
- Retaining Walls
- Ditches
- Pavement Striping



0 200 Feet

Figure 26.5-2. Use of White Pine Trail and Trailhead with the Trailhead Improvement Alternatives



Legend

- ⋯ NFS Trails
- Current Approximate Parking Lot Boundary
- White Pine Trailhead Boundary
- Recreation Site Impact Estimate
- White Pine Trailhead Alternative
- Restrooms
- Curb and Gutter
- Edge of Pavement
- Trail/Pathway
- Ditches
- Drainage Pipe
- Pavement Striping



0 200 Feet

26.5.2.5.2 Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The Section 4(f) uses of recreation resources by this trailhead parking alternative would be the same as from the Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative. Roadside parking for other Section 4(f) recreation resources in the canyon (for example, Tanners Flat Campground) would be eliminated. However, roadside parking is not considered a recreation resource or protected under Section 4(f).

26.5.2.5.3 No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

This trailhead parking alternative would not require acquisition of right of way and would have no uses of Section 4(f) properties.

26.5.2.6 No Winter Parking Alternative

The No Winter Parking Alternative would not require acquisition of right of way and would have no uses of Section 4(f) properties. About 230 roadside parking spots near the ski resorts would be eliminated during winter. There would be no impact to ski resort parking within the special-use permit areas. Roadside parking is not protected under Section 4(f).

26.5.3 Enhanced Bus Service in Peak-period Shoulder Lane Alternative

This section describes the impacts to Section 4(f) resources from the Enhanced Bus Service in Peak-period Shoulder Lane Alternative, which includes improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 from North Little Cottonwood Road to the town of Alta, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

26.5.3.1 S.R 210 – Wasatch Boulevard

The impacts to Section 4(f) resources from the Imbalanced-lane and Five-lane Alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

26.5.3.2 S.R 210 – North Little Cottonwood Road to Alta

Implementing peak-period shoulder lanes in Little Cottonwood Canyon would require widening S.R. 210 and acquiring right of way.

26.5.3.2.1 Section 4(f) Historic Properties

Adding peak-period shoulder lanes would result in seven uses with *de minimis* impacts (land acquisition without impacting the historic building) and four temporary occupancies with no use (temporary construction easement with minimal impact and without land acquisition) from North Little Cottonwood Road to the town

of Alta. Table 26.5-6 describes the use of each Section 4(f) historic property. Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

Table 26.5-6. Use of Section 4(f) Historic Properties from North Little Cottonwood Road to Alta with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

ID	Address	Property Description	UDSH Rating ^a	Section 106 Effect Determination	Description of Use	Section 4(f) Use / Impact
61	3742 E. North Little Cottonwood Road	One-and-a-half-story Victorian Eclectic-style single-family dwelling	ES	No adverse effect	Widening North Little Cottonwood Road would require a temporary construction easement of ~0.19 acre. The historic building would not be affected.	No (temporary occupancy) / NA
63	4700 E. Little Cottonwood Canyon	Temple Granite Quarry Historical Marker	EC	No adverse effect	Widening Little Cottonwood Canyon Road would require a temporary construction easement of ~0.71 acre. The historical marker would not be affected.	No (temporary occupancy) / NA
64	4526 E. Little Cottonwood Canyon	One-story 20th-century other-style hydroelectric energy facility (Whitmore Power Plant)	ES	No adverse effect	Widening Little Cottonwood Canyon Road would require a temporary construction easement of ~0.01 acre. The historic building would not be affected.	No (temporary occupancy) / NA
66	5002 E. Little Cottonwood Canyon	One-and-a-half-story Tudor-style single-family dwelling	EC	No adverse effect	Widening Little Cottonwood Canyon Road would require a temporary construction easement of ~0.02 acre. The historic building would not be affected.	No (temporary occupancy) / NA
67	9111 E. Little Cottonwood Canyon	Two-story Organic-style single dwelling	ES	No adverse effect	Widening Little Cottonwood Canyon Road would require acquisition of less than 0.01 acre and a temporary construction easement of ~0.01 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
68	9121 E. Snowbird Center Drive	Eleven-story Brutalist-style timeshare/condominium (Iron Blossam Lodge)	ES	No adverse effect	Widening Little Cottonwood Canyon Road would require acquisition of ~0.12 acre from the property and a temporary construction easement of ~0.13 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
69	9180 E. Lodge Drive	Two-story Brutalist-style condominium	ES	No adverse effect	Widening Little Cottonwood Canyon Road would require acquisition of ~0.05 acre from the property and a temporary construction easement of ~0.03 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact

(continued on next page)

Table 26.5-6. Use of Section 4(f) Historic Properties from North Little Cottonwood Road to Alta with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

ID	Address	Property Description	UDSH Rating ^a	Section 106 Effect Determination	Description of Use	Section 4(f) Use / Impact
70	9202 E. Lodge Drive	Seven-story Brutalist-style hotel/condominium (The Inn at Snowbird)	ES	No adverse effect	Widening Little Cottonwood Canyon Road would require acquisition of less than 0.01 acre from the property and a temporary construction easement of less than 0.01 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
71	9260 E. Lodge Drive	Seven-story Brutalist-style hotel/condominium (The Lodge at Snowbird)	ES	No adverse effect	Widening Little Cottonwood Canyon Road would require acquisition of ~0.10 acre from the property and a temporary construction easement of ~0.35 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
72	9385 S. Snowbird Center Drive	Three-story Brutalist-style commercial and recreation/culture building (Snowbird Center)	ES	No adverse effect	Widening Little Cottonwood Canyon Road would require acquisition of ~0.05 acre from the property and a temporary construction easement of ~0.78 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
NV5 ^b	6279 E. Little Cottonwood Canyon	Potential historic-age building (Perpetual Storage)	Not evaluated	No adverse effect	Widening Little Cottonwood Canyon Road would require acquisition of ~0.06 acre from the property and a temporary construction easement of ~0.82 acre. The potentially historic building would not be affected.	Yes / <i>de minimis</i> impact

~ = approximately; NA = not applicable

^a Utah Division of State History (UDSH) rating for historic structures: EC = eligible/contributing; ES = eligible/significant. For more information, see Chapter 15, Cultural Resources.

^b Salt Lake County Assessor data indicated this legal parcel as potentially having a historic-age building; however, the resource was not visible enough from the public right of way to evaluate it for Section 4(f) impacts.

26.5.3.2.2 Section 4(f) Recreation Resources

Adding peak-period shoulder lanes on S.R. 210 from North Little Cottonwood Road to the town of Alta would result in three uses with *de minimis* impacts (land acquisition without impacting the features, attributes, or activities) and three temporary occupancies with no use (temporary construction easement with minimal impact and without land acquisition) to seven Section 4(f) recreation resources as described in Table 26.5-7. Impacts to the Alpenbock Loop Trail, Temple Quarry Nature Trail, and Grit Mill Trailhead are shown in Figure 26.5-3. Impacts to Tanners Flat Campground, the Lisa Falls Trail, and the White Pine Trail are shown in Figure 26.5-4. The peak-period shoulder lanes would be constructed during the summer over a 2-to-3-year construction period. During construction, trailheads could be temporarily closed, which could limit access to the trails.

Table 26.5-7. Use of Section 4(f) Recreation Resources from North Little Cottonwood Road to Alta with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative

Resource	Description of Use	Section 4(f) Use / Impact
Alpenbock Loop Trailhead (USDA Forest Service #1020)	Widening Little Cottonwood Canyon Road would require ~0.11 acre of land to be transferred to, and a temporary construction easement of ~0.24 acre from, the USDA Forest Service. The land required is located between the park-and-ride lot, which is the trailhead for the Alpenbock Loop Trail, and S.R. 210. There would be no impacts to parking spots, the restroom, the bus shelter, or trails. A climbing boulder, referred to as Parking Lot West, would be removed.	Yes / <i>de minimis</i> impact
Temple Quarry Nature Trailhead (USDA Forest Service #1000)	Widening Little Cottonwood Canyon Road would require a temporary construction easement of ~0.40 acre from the USDA Forest Service. The land required is located between the Temple Quarry Nature Trailhead and S.R. 210. There would be no impacts to parking spots, the restroom, or trails. Access to the trail would be maintained during construction.	No (temporary occupancy) / NA
Bonneville Shoreline Trail	The planned Bonneville Shoreline Trail includes connections to the park-and-ride lot (Alpenbock Loop Trailhead) and the Temple Quarry Nature Trailhead. Impacts to these trailheads are discussed above in this table. The planned Bonneville Shoreline Trail could still connect to both trailheads. Thus, there would be no use of the Bonneville Shoreline Trail.	No use
Grit Mill Trailhead	Widening Little Cottonwood Canyon Road would require appropriation of ~0.03 acre and a temporary construction easement of ~0.12 acre from the USDA Forest Service. The land required is located between the planned parking lot and S.R. 210. There would be no impacts to parking spots, the restroom, or trails.	Yes / <i>de minimis</i> impact
Tanners Flat Campground	Widening Little Cottonwood Canyon Road would require a temporary construction easement of ~0.49 acre from the USDA Forest Service. The land required is located between the campground features and S.R. 210. There would be no impacts to campground features such as campsites, bathroom facilities, volleyball court, and amphitheater. Some vegetation adjacent to S.R. 210 might be removed during construction. All disturbed areas would be revegetated.	No (temporary occupancy) / NA
Lisa Falls Trail (USDA Forest Service #1012)	Widening Little Cottonwood Canyon Road would require ~0.16 acre of land transferred to, and a temporary construction easement of ~0.02 acre from, the USDA Forest Service. The total number of parking spots would not be reduced.	Yes / <i>de minimis</i> impact
White Pine Trail (USDA Forest Service #1002) Trailhead	Widening Little Cottonwood Canyon Road would require a temporary construction easement of ~0.15 acre from the USDA Forest Service. The land required is located between the parking lot and S.R. 210. There would be no impacts to parking spots, the restroom, or trails.	No (temporary occupancy) / NA

~ = approximately; NA = not applicable

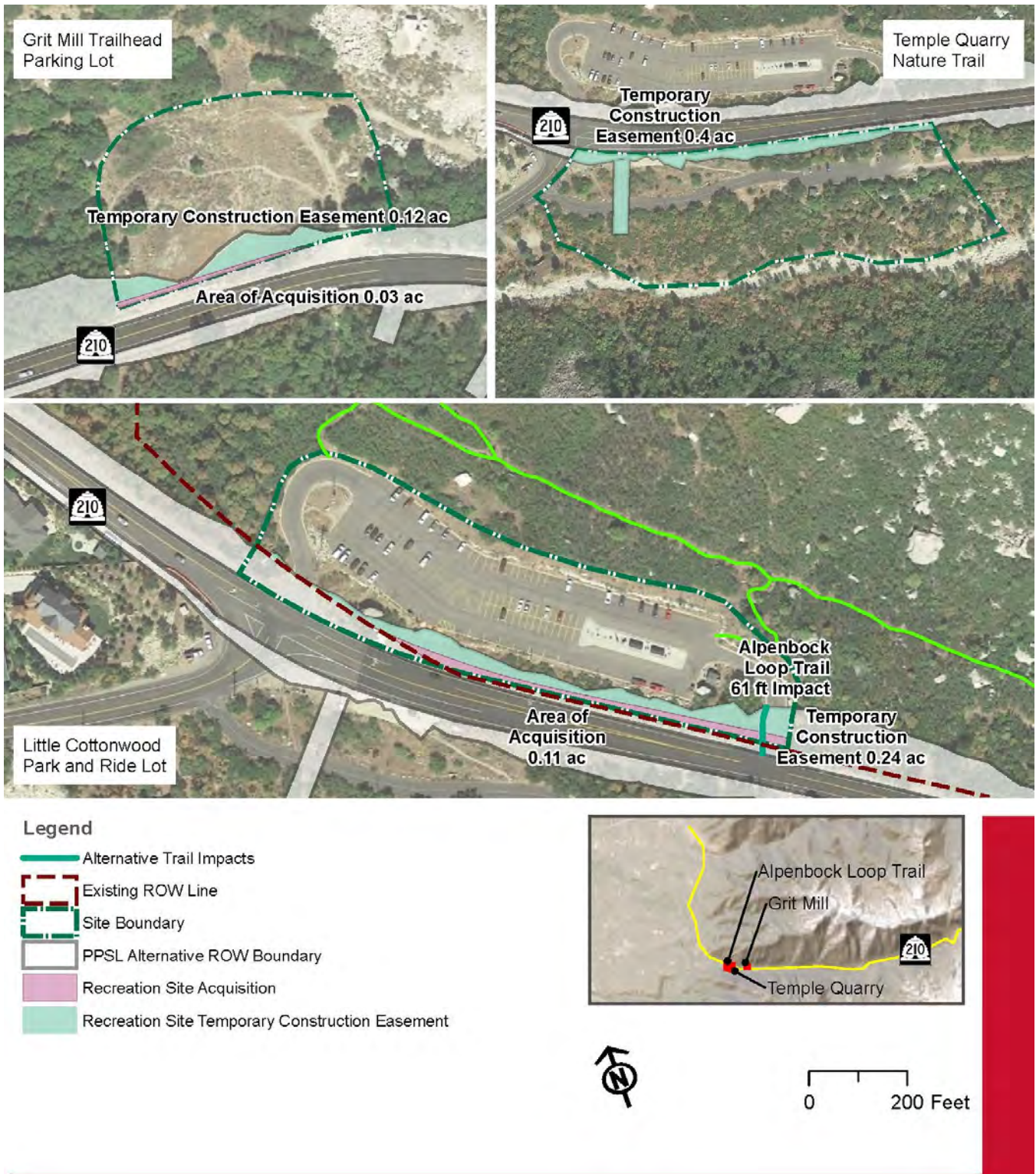
26.5.3.3 Mobility Hubs Alternative

The impacts from the mobility hubs with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

26.5.3.4 Avalanche Mitigation Alternatives

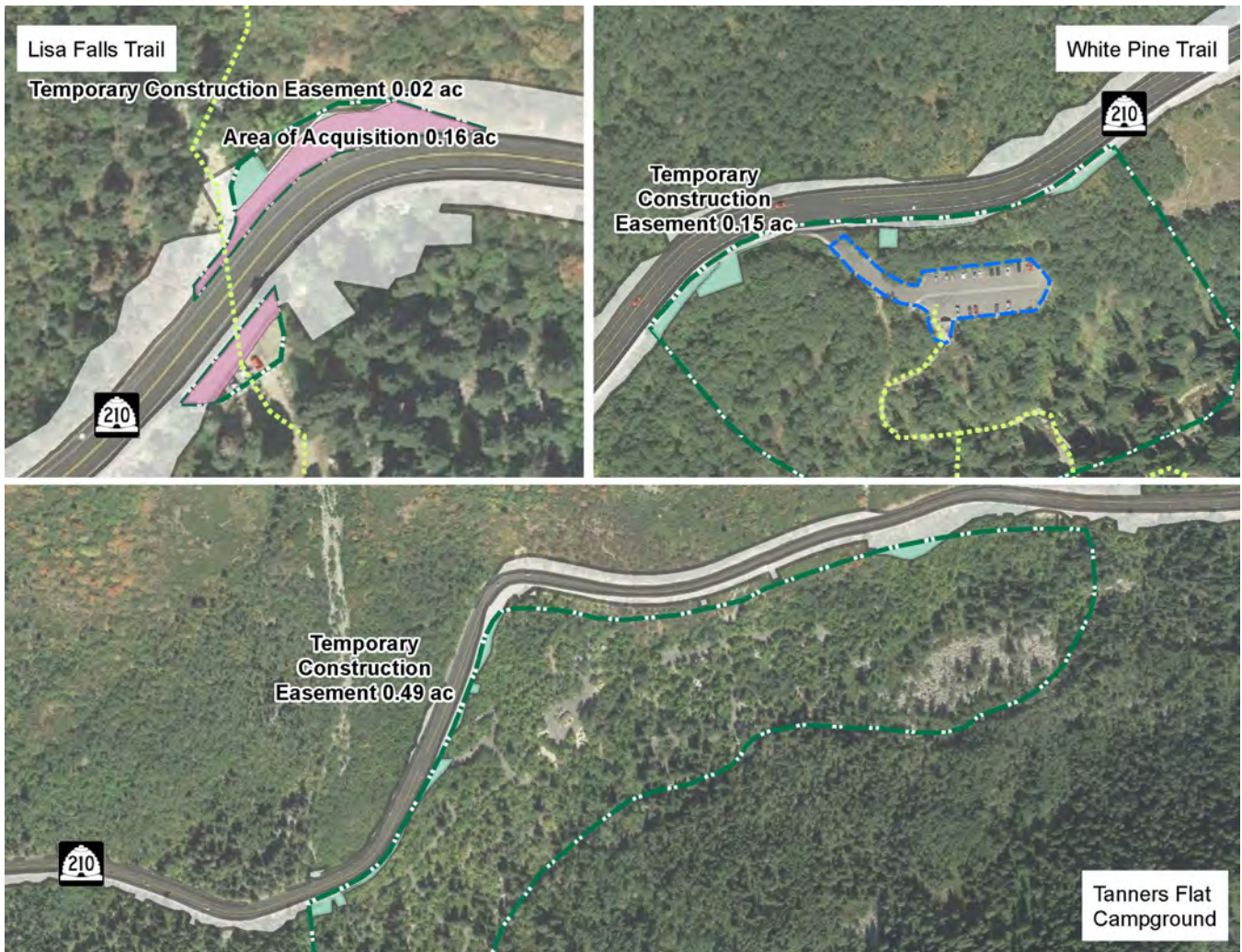
The impacts from the avalanche mitigation alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

Figure 26.5-3. Use of the Alpenbock Loop Trail, Temple Quarry Nature Trail, and Grit Mill Trailhead with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative



ROW = right of way; PPSL = peak-period shoulder lane

Figure 26.5-4. Use of Tanners Flat Campground, Lisa Falls Trail, and White Pine Trail with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative



Legend

- - - NFS Trails
- Alternative Trail Impacts
- Current Approximate Parking Lot Boundary
- Recreation Site Acquisition
- Recreation Site Temporary Construction Easement
- Site Boundary
- PPSL Alternative ROW Boundary



0 200 Feet

NFS = National Forest System; ROW = right of way; PPSL = peak-period shoulder lane

26.5.3.5 Trailhead Parking Alternatives

The impacts to Section 4(f) resources from the trailhead parking alternatives with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative. Some of the trailhead parking alternatives would eliminate roadside parking that is used to access Section 4(f) resources. However, roadside parking is not part of a recreation resource or protected under Section 4(f).

26.5.3.6 No Winter Parking Alternative

The impacts to Section 4(f) resources from the No Winter Parking Alternative with the Enhanced Bus Service in Peak-period Shoulder Lane Alternative would be the same as with the Enhanced Bus Service Alternative.

26.5.4 Gondola Alternative A (Starting at Canyon Entrance)

This section describes the impacts to Section 4(f) resources from Gondola Alternative A, which includes a gondola alignment from the entrance to Little Cottonwood Canyon to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

26.5.4.1 S.R 210 – Wasatch Boulevard

The impacts from the Imbalanced-lane and Five-lane Alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

26.5.4.2 S.R 210 – North Little Cottonwood Road to Alta

With Gondola Alternative A, there would be no change to the existing S.R. 210 roadway from North Little Cottonwood Road to the town of Alta. The gondola base station would be located at the existing Little Cottonwood Canyon park-and-ride lot at the intersection of S.R. 209 and S.R. 210. Right-of-way acquisition or an easement would be required for the gondola stations, towers, and gondola alignment. Where the gondola alignment crosses privately owned land, property would be acquired for the towers and stations, and a perpetual easement would be obtained for land under the gondola cables.

UDOT does not currently know what type of right-of-way instrument (appropriation, easement, or special-use permit) would be used where the gondola alignment crosses USDA Forest Service land. Regardless of the right-of-way instrument used, UDOT assumes that land needed to construct the gondola towers and stations would be permanently incorporated into a transportation facility. In other words, gondola towers and stations located on a Section 4(f) property would result in a direct use. UDOT does not currently know whether an easement for the gondola alignment would include property rights for the land beneath the cables or aerial

What are gondola base, angle, and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's gondola trip. Passengers board and disembark the gondola cabins at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

The gondola alternatives also include *angle stations*, which are needed to adjust the horizontal direction of the cabin; passengers remain in the cabin as it passes through an angle station.

A *tower* supports the gondola cable.

rights only. Therefore, UDOT does not know whether land associated with a Section 4(f) property under the cables would be permanently incorporated into a transportation facility, thereby resulting in a direct use.

This Section 4(f) analysis assumes that the gondola easement would result in a direct use of land under the cables. If the right-of-way instrument ultimately used for the gondola system would not result in a direct use of the land under the cables (that is, aerial rights only), a constructive-use evaluation would be appropriate to determine whether proximity impacts from the gondola cabins passing overhead would result in a constructive use.

Constructive use occurs when a transportation project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. Use with *de minimis* impact occurs when land is permanently incorporated into a transportation facility but the project would not adversely affect the activities, features, or attributes that make these resources eligible for Section 4(f) protection. When a *de minimis* impact finding has been made based on the assumption that the easement beneath the gondola alignment would result in a use, it is a foregone conclusion that there could not be a constructive use with an aerial easement.

26.5.4.2.1 Section 4(f) Historic Properties

Gondola Alternative A would result in five uses with *de minimis* impacts (land acquisition without impacting the historic building) from North Little Cottonwood Road to the town of Alta. Table 26.5-8 describes the uses of each Section 4(f) historic property. Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

Table 26.5-8. Use of Section 4(f) Historic Properties from North Little Cottonwood Road to Alta with Gondola Alternative A

ID	Address	Property Description	UDSH Rating ^a	Section 106 Effect Determination	Description of Use	Section 4(f) Use / Impact
70	9202 E. Lodge Drive	Seven-story Brutalist-style hotel/condominium (The Inn at Snowbird)	EC	No adverse effect	The alternative would require an easement of ~0.01 acre under the gondola cables. The historic building would not be affected.	Yes / <i>de minimis</i> impact
71	9260 E. Lodge Drive	Seven-story Brutalist-style hotel/condominium (The Lodge at Snowbird)	ES	No adverse effect	The alternative would require an easement of ~0.40 acre under the gondola cables. The historic building would not be affected.	Yes / <i>de minimis</i> impact
72	9385 S. Snowbird Center Drive	Three-story Brutalist-style commercial and recreation/culture building (Snowbird Center)	ES	No adverse effect	The alternative would require an easement of ~1.31 acre under the gondola cables and acquisition of ~0.15 acre for a gondola tower. The historic building would not be affected.	Yes / <i>de minimis</i> impact
82	10230 E. Little Cottonwood Road	Three-story mixed-style (cross-gabled ski chalet and International style) hotel (Alta Lodge)	ES	No adverse effect	The alternative would require an easement of ~0.35 acre under the gondola cables and acquisition of ~0.06 acre for a gondola tower. The historic building would not be affected.	Yes / <i>de minimis</i> impact
NV5 ^b	6279 E. Little Cottonwood Canyon	Potential historic-age building (Perpetual Storage)	Not evaluated	No adverse effect	The alternative would require an easement of ~2.01 acres under the gondola cables and acquisition of ~0.15 acre for a gondola tower. The building would not be affected.	Yes / <i>de minimis</i> impact

~ = approximately

^a Utah Division of State History (UDSH) rating for historic structures: EC = eligible/contributing; ES = eligible/significant. For more information, see Chapter 15, Cultural Resources.

^b Salt Lake County Assessor data indicated this legal parcel as potentially having a historic-age building; however, the resource was not visible enough from the public right of way to evaluate it for Section 4(f) impacts.

26.5.4.2.2 Section 4(f) Recreation Resources

Gondola Alternative A would have six uses with *de minimis* impacts (land acquisition without impacting the features, attributes, or activities) to Section 4(f) recreation resources from North Little Cottonwood Road to the town of Alta as described in Table 26.5-9. Five of the Section 4(f) resources that would be impacted are USDA Forest Service facilities (a campground, trails, and trailheads). There would also be a use with *de minimis* impacts to Section 4(f) resources at Snowbird. The only facilities qualifying for Section 4(f) protection at Snowbird in the study area are parking areas and a tennis court. Impacts to Tanners Flat Campground are shown in Figure 26.5-5. Impacts to the Alpenbock Loop Trailhead are shown in Figure 26.5-6. Figures showing impacts to other Section 4(f) recreation resources are available in the Section 4(f) *de minimis* correspondence (Appendix 26B, *De Minimis* Correspondence).

Table 26.5-9. Use of Section 4(f) Recreation Resources from North Little Cottonwood Road to Alta with Gondola Alternative A

Resource	Description of Use	Section 4(f) Use / Impact
Tanners Flat Campground	<p>No stations or towers would be located in the campground; there would be no physical impacts to the campground or its features. The gondola system would require a ~4.27-acre easement or special-use permit from the USDA Forest Service where the gondola cables pass over the campground for ~2,300 feet. The easement would be ~82 feet wide.</p> <p>Tanners Flat Campground is open from late May through late September. During the summer, the gondola could operate from about 8 AM to 8 PM (final operating times would be determined once the gondola is in operation). There would be visual impacts as campground users see gondola cabins moving overhead, as well as privacy impacts related to being viewed by passengers in the cabins as they pass by. The visual impacts would vary from one campsite to another; the gondola cabins would be obscured by vegetation in some areas. Gondola cabins would be visible moving through openings in the trees from the amphitheater and volleyball court.</p> <p>The noise levels from the gondola system would be about 50 A-weighted decibels (dBA) (similar to a quiet office environment) or less than noise generated by vehicles on S.R. 210 (50 to 60 dBA) or the nearby Little Cottonwood Creek (see Chapter 11, Noise, for more details). To minimize impacts to campers, the gondola would not operate during the Tanners Flat Campground quiet hours of 10 PM to 7 AM. Different recreational user groups have different thresholds for sensory impacts. The gondola's summer operation could shift campground users toward a user group with a higher tolerance for development. For example, users could shift from tent campers to RV campers. During construction of the gondola system, temporary impacts would occur due to elevated noise levels from construction equipment.</p>	Yes / <i>de minimis</i> impact
Alpenbock Loop Trail (USDA Forest Service #1020)	<p>The gondola base station would be located at the park-and-ride lot. This lot is used by skiers who want to carpool to the resorts as well as by climbers accessing the Alpenbock Loop Trail. The gondola would require a ~1.08-acre easement or special-use permit from the USDA Forest Service under the gondola cables and ~2.87 acres to construct the base station.</p> <p>The total number of parking spaces would be reduced from about 160 to 95, but continued access for Alpenbock Trail users would be maintained. Some of the parking spaces would be marked for Alpenbock Trail users only. About 460 feet of trail would be realigned. Connectivity from the reconstructed parking lot to the existing trail would be maintained. Additionally, a tower would be constructed near the east end of the trail, and the gondola cables would pass over the trail.</p>	Yes / <i>de minimis</i> impact
Bonneville Shoreline Trail	<p>The planned Bonneville Shoreline Trail includes a connection to the park-and-ride lot (Alpenbock Loop Trailhead). Impacts to the trailhead are discussed above in Section 26.5.3.2.2, Section 4(f) Recreation Resources. The planned Bonneville Shoreline Trail could still connect to the reconstructed Alpenbock Loop Trailhead. Thus, there would be no use of the Bonneville Shoreline Trail.</p>	No use
Grit Mill Trailhead	<p>No stations or towers would be located within the Grit Mill Trailhead; there would be no physical impacts to the parking area, restroom, interpretive site, or trails. The gondola system would require a ~0.66-acre easement or special-use permit from the USDA Forest Service where the gondola cables pass over the parking area.</p>	Yes / <i>de minimis</i> impact
Little Cottonwood Creek Trail (USDA Forest Service #1001)	<p>The gondola system would require an easement or special-use permit from the USDA Forest Service where the gondola cables pass over ~100 feet of the Little Cottonwood Creek Trail. The location of the crossing would be near the east end of the trail near the Lisa Falls Trailhead. There would be no physical impact to the trail.</p>	Yes / <i>de minimis</i> impact

(continued on next page)

Table 26.5-9. Use of Section 4(f) Recreation Resources from North Little Cottonwood Road to Alta with Gondola Alternative A

Resource	Description of Use	Section 4(f) Use / Impact
White Pine Trail (USDA Forest Service #1002)	No gondola stations or towers would be located within the White Pine Trailhead; there would be no physical impacts to the parking area, restroom, or trails. The gondola system would require a ~0.75-acre easement or special-use permit from the USDA Forest Service where the gondola cables pass over the parking area.	Yes / <i>de minimis</i> impact
Section 4(f) resources at Snowbird	The gondola cables would pass over parking and tennis courts within Snowbird's special-use permit area. About eight parking spaces near the Iron Blossam Lodge would be removed to construct a gondola tower. The tennis court would not be impacted.	Yes / <i>de minimis</i> impact
Section 4(f) resources at Alta	The gondola system would require an easement or special-use permit from the USDA Forest Service where the gondola cables pass over the transfer tow.	Yes / <i>de minimis</i> impact

Source: Calculated from GIS-based inventory
~ = approximately

26.5.4.3 Mobility Hubs Alternative

The impacts from the mobility hubs with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

26.5.4.4 Avalanche Mitigation Alternatives

The impacts from avalanche mitigation alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

26.5.4.5 Trailhead Parking Alternatives

The impacts from the trailhead parking alternatives with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

26.5.4.6 No Winter Parking Alternative

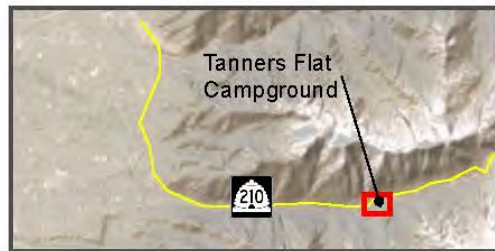
The impacts from the No Winter Parking Alternative with Gondola Alternative A would be the same as with the Enhanced Bus Service Alternative.

Figure 26.5-5. Use of Tanners Flat Campground with Gondola Alternatives A and B



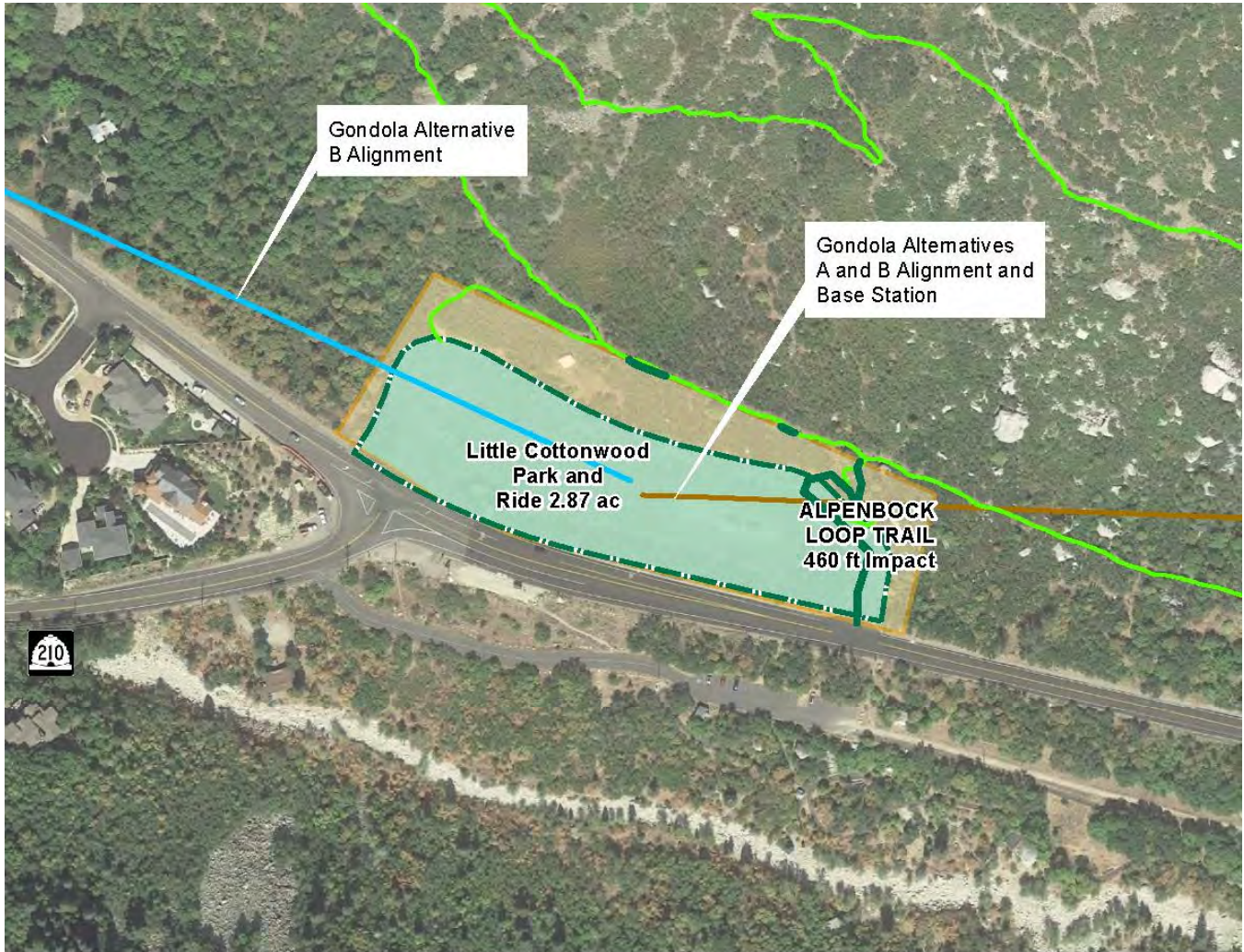
Legend

- | | | | |
|--|--------------|--|--|
| | Amphitheater | | Tanners Flat Campground Recreation Site Boundary |
| | Group Site | | Gondola Alternatives A and B Station and Tower Locations |
| | Restroom | | Gondola Alternatives A and B Alignment |
| | Tent Site | | Recreation Site Impact Estimate |
| | Water | | |
| | Yurt Site | | |



0 200 Feet

Figure 26.5-6. Use of Alpenbock Loop Trail with Gondola Alternatives A and B



Legend

- Alternative Trail Impacts
- Alpenbock Trails
- Gondola Alternatives A and B Alignment
- Gondola Alternative B Alignment
- Gondola Alternatives A and B Station and Tower Locations
- Recreation Site Impact Estimate
- Little Cottonwood Park and Ride Boundary



0 200 Feet

26.5.5 Gondola Alternative B (Starting at La Caille)

This section describes the impacts to Section 4(f) resources from Gondola Alternative B, which includes a gondola alignment from La Caille to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

The impacts to Section 4(f) resources from Gondola Alternative B would be the same as with Gondola Alternative A except for the additional 0.75 mile of gondola alignment. This section discusses the impacts to Section 4(f) resources from this additional 0.75 mile of alignment.

26.5.5.1.1 Section 4(f) Historic Properties

Gondola Alternative B would result in three additional uses with *de minimis* impacts (land acquisition without impacting the historic building) to Section 4(f) historic properties (compared to Gondola Alternative A) at the base station at La Caille as described in Table 26.5-10. Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

Table 26.5-10. Use of Section 4(f) Historic Properties at the Base Station at La Caille with Gondola Alternative B

ID	Address	Property Description	UDSH Ratings ^s	Section 106 Effect Determination	Description of Use	Section 4(f) Use / Impact
61	3742 E. North Little Cottonwood Road	One-and-a-half-story Victorian Eclectic-style single-family dwelling	ES	No adverse effect	Constructing the gondola base station at La Caille would require acquisition of ~0.43 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
84	9338 S. North Little Cottonwood Road	One-and-a half story side-passage type Victorian Eclectic-style single family dwelling	ES	No adverse effect	Constructing the gondola base station at La Caille would require acquisition of ~0.04 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
NV3 ^b	4261 Little Cottonwood Road	Potential historic-age building	Not evaluated	No adverse effect	Constructing the gondola base station at La Caille would require an easement of ~0.16 acre under the gondola cables. The building would not be affected.	Yes / <i>de minimis</i> impact

~ = approximately

^a Utah Division of State History (UDSH) rating for historic structures: ES = eligible/significant. For more information, see Chapter 15, Cultural Resources.

^b Salt Lake County Assessor data indicated this legal parcel as potentially having a historic-age building; however, the resource was not visible enough from the public right of way to evaluate it for Section 4(f) impacts.

26.5.5.1.2 Section 4(f) Recreation Resources

Gondola Alternative B would have no additional impacts to Section 4(f) recreational properties at the base station at La Caille.

26.5.6 Cog Rail Alternative (Starting at La Caille)

This section describes the impacts to Section 4(f) resources from the Cog Rail Alternative, which includes a cog rail alignment from La Caille to the Snowbird and Alta ski resorts, improvements to the Wasatch Boulevard segment of S.R. 210, improvements to the segment of S.R. 210 on North Little Cottonwood Road, two mobility hubs, avalanche mitigation alternatives, trailhead parking alternatives, and the No Winter Parking Alternative.

What are cog rail base and terminal stations?

As used in this chapter, the term *terminal station* refers to the first and last stations on a passenger's cog rail trip. Passengers board and disembark the cog rail vehicles at the terminal stations.

The *base station* is the terminal station at the bottom of the canyon, and a *destination station* is a terminal station at the top of the canyon.

26.5.6.1 S.R. 210 – Wasatch Boulevard

The Section 4(f) impacts from the Imbalanced-lane and Five-lane Alternatives with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative.

26.5.6.2 S.R. 210 – North Little Cottonwood Road to Alta

The proposed cog rail system would include a base station at La Caille and an operations and maintenance facility at the existing Little Cottonwood Canyon park-and-ride lot (at the intersection of S.R. 209 and S.R. 210). The operations and maintenance facility would provide cog rail service, fueling, and administrative offices. The cog rail would operate on the north side of S.R. 210 in Little Cottonwood Canyon.

26.5.6.2.1 Section 4(f) Historic Properties

The Cog Rail Alternative would have seven uses with *de minimis* impacts (land acquisition without impacting the historic building) and one temporary occupancy with no use (temporary construction easement with minimal impact and without land acquisition) from North Little Cottonwood Road to the town of Alta. Table 26.5-11 describes the uses of each Section 4(f) historic property. Figures showing impacts are available in the DOE/FOE (Appendix 15B, Determinations of Eligibility and Findings of Effect).

26.5.6.2.2 Section 4(f) Recreation Resources

The Cog Rail Alternative would have four uses with *de minimis* impacts (land acquisition without impacting the features, attributes, or activities) and four temporary occupancies with no use (temporary construction easement with minimal impact and without land acquisition) to Section 4(f) recreation resources from North Little Cottonwood Road to the town of Alta as described in Table 26.5-12. Impacts to the Alpenbock Loop Trailhead are shown in Figure 26.5-7. Impacts to other Section 4(f) resources are shown in the Section 4(f) *de minimis* correspondence (Appendix 26B, *De Minimis* Correspondence). The cog rail tracks would be constructed during the summer over a 2-to-3-year construction period. During construction, trailheads could be temporarily closed, which could limit access to the trail.

Table 26.5-11. Use of Section 4(f) Historic Properties from North Little Cottonwood Road to Alta with the Cog Rail Alternative

ID	Address	Property Description	UDSH Rating ^a	Section 106 Effect Determination	Description of Use	Section 4(f) Use / Impact
61	3742 E. North Little Cottonwood Road	One-and-a-half-story Victorian Eclectic-style single-family dwelling	ES	No adverse effect	Constructing the cog rail base station would require acquisition of ~0.43 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
63	4700 E. Little Cottonwood Road	Temple Granite Quarry Historical Marker	EC	No adverse effect	Constructing the cog rail tracks would require a temporary construction easement of ~0.14 acre. The historical marker would not be affected.	No (temporary occupancy) / NA
67	9111 E. Little Cottonwood Canyon	Two-story Organic-style single dwelling	ES	No adverse effect	Constructing the cog rail tracks would require acquisition of ~0.08 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
68	9121 E. Snowbird Center Drive	Eleven-story Brutalist-style timeshare/condominium (Iron Blossam Lodge)	ES	No adverse effect	Constructing the cog rail tracks would require acquisition of ~0.36 acre from the property. The historic building would not be affected.	Yes / <i>de minimis</i> impact
72	9385 S. Snowbird Center Drive	Three-story Brutalist-style commercial and recreation/culture building (Snowbird Center)	ES	No adverse effect	Constructing the cog rail tracks would require acquisition of ~1.61 acres and a temporary construction easement of ~0.02 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
84	9338 S. North Little Cottonwood Road	One-and-a-half story side-passage-type Victorian Eclectic-style single family dwelling	ES	No adverse effect	Constructing the cog rail base station would require acquisition of ~0.04 acre. The historic building would not be affected.	Yes / <i>de minimis</i> impact
NV3 ^b	4261 Little Cottonwood Road	Potential historic-age building	Not evaluated	No adverse effect	Constructing the cog rail tracks would require acquisition of ~0.03 acre. The building would not be affected.	Yes / <i>de minimis</i> impact
NV5 ^b	6279 E. Little Cottonwood Canyon	Potential historic-age building (Perpetual Storage)	Not evaluated	No adverse effect	Constructing the cog rail tracks would require acquisition of ~2.22 acres and a temporary construction easement of ~1.23 acres. The building would not be affected.	Yes / <i>de minimis</i> impact

~ = approximately; NA = not applicable

^a Utah Division of State History (UDSH) rating for historic structures: EC = eligible/contributing; ES = eligible/significant. For more information, see Chapter 15, Cultural Resources.

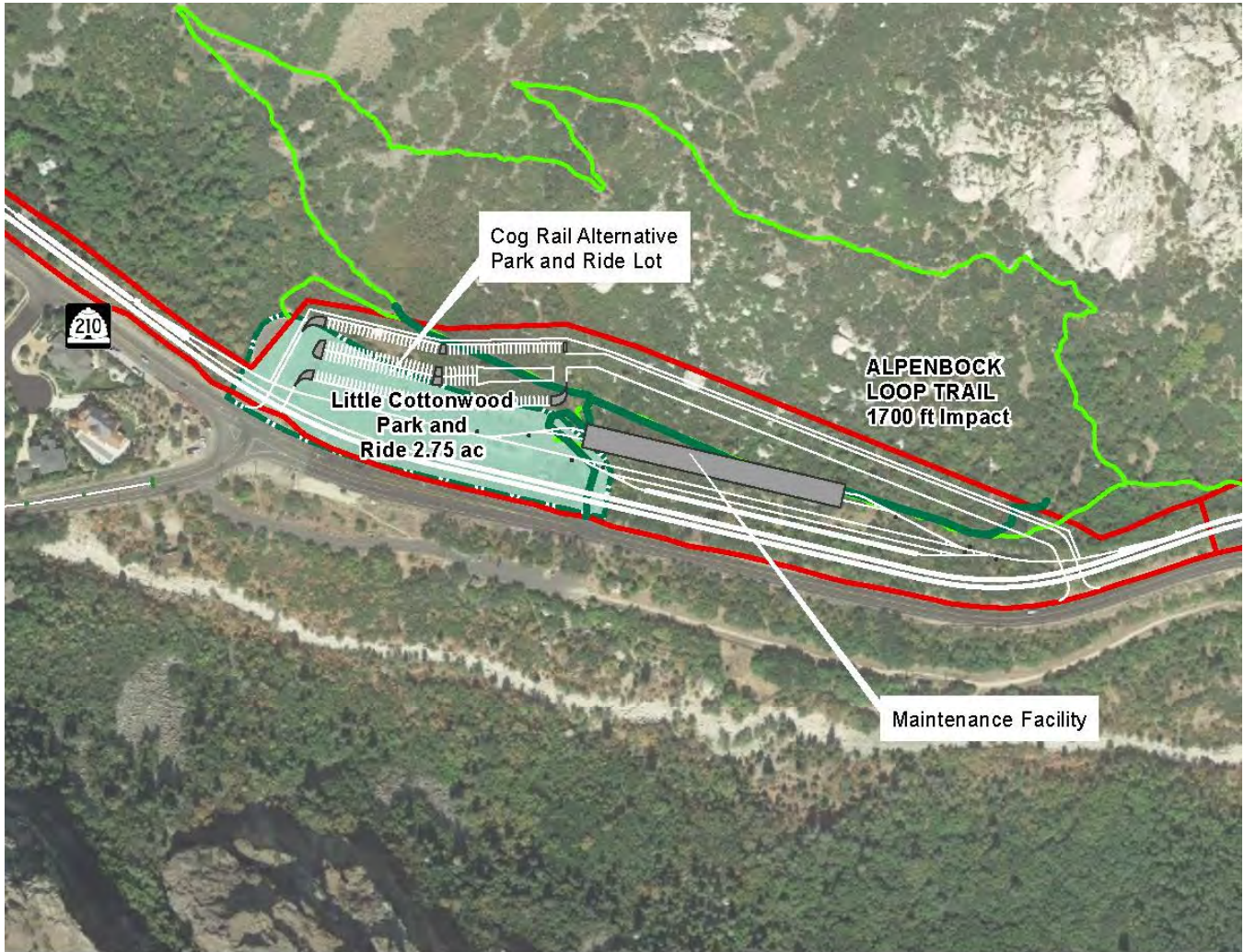
^b Salt Lake County Assessor data indicated these legal parcels as potentially having historic-age buildings; however, the resources were not visible enough from the public right of way to evaluate them for Section 4(f) impacts.

Table 26.5-12. Use of Section 4(f) Recreation Resources from North Little Cottonwood Road to Alta with the Cog Rail Alternative

Resource	Description of Use	Section 4(f) Use / Impact
Tanners Flat Campground	Constructing the cog rail tracks would require a temporary construction easement of ~0.03 acre from the USDA Forest Service. The land required is located between the campground features and S.R. 210. There would be no impacts to campground features such as campsites, bathroom facilities, volleyball court, and amphitheater.	No (temporary occupancy) / NA
Alpenbock Loop Trail (USDA Forest Service #1020)	The cog rail operations and maintenance facility would be located in the existing 160-parking-space Little Cottonwood Canyon park-and-ride lot, which also provides parking access to the Alpenbock Loop Trail. Constructing the operations and maintenance facility would require ~2.75 acres of land from the USDA Forest Service at the park and-ride-lot. The lot would be reconstructed to include a restroom and about the same number of parking spaces as under current conditions. About 1,700 feet of trail would be realigned. Connectivity from the reconstructed parking lot to the existing trail would be maintained. Two climbing boulders, Parking Lot West and Bathroom Boulder, would be removed.	Yes / <i>de minimis</i> impact
Grit Mill Trailhead	Constructing the cog rail tracks would require ~0.74 acre of land from the USDA Forest Service. The trailhead would be reconstructed to include a restroom and about the same number of parking spaces. Connectivity from the reconstructed trailhead to the planned Alpenbock East Spur Trail would be maintained.	Yes / <i>de minimis</i> impact
Temple Quarry Nature Trail (USDA Forest Service #1000)	Constructing the cog rail tracks would require a temporary construction easement of ~0.12 acre from the USDA Forest Service. The easement would span the access road to the trailhead. There would be no impacts to the trail or trailhead features such as parking or restroom facilities.	No (temporary occupancy) / NA
Bonneville Shoreline Trail	The planned Bonneville Shoreline Trail includes connections to the park-and-ride lot (Alpenbock Loop Trailhead) and Temple Quarry Nature Trailhead. Impacts to these trailheads are discussed above in the table. UDOT would work with the USDA Forest Service to ensure that ~550 feet of trail could be realigned to provide continuity on the northeast side of S.R. 210 across the road from the cog rail base station at La Caille.	Yes / <i>de minimis</i> impact
Little Cottonwood Creek Trail (USDA Forest Service #1001)	The Little Cottonwood Creek Trail begins at the Temple Quarry Nature Trail Trailhead. Impacts would be the same as described for the Temple Quarry Nature Trail above.	No (temporary occupancy) / NA
Lisa Falls Trail (USDA Forest Service #1012)	As part of the cog rail design, the dirt pullout that serves as the Lisa Falls Trailhead would be reconstructed to include restroom facilities and designated parking areas. About 150 feet of trail would be impacted, and ~0.15 acre of the existing trailhead parking area would be acquired for trailhead improvements. The overall access to Lisa Falls Trail would be improved compared to existing conditions.	Yes / <i>de minimis</i> impact
White Pine Trail (USDA Forest Service #1002)	Constructing the cog rail tracks would require a temporary construction easement of ~0.03 acre from the USDA Forest Service. The easement would be located adjacent to S.R. 210 west of the access road. It would not affect the trail, access to the trailhead, or trailhead features such as parking or restroom facilities.	No (temporary occupancy) / NA

Source: Calculated from GIS-based inventory
~ = approximately; NA = not applicable

Figure 26.5-7. Use of Alpenbock Loop Trail with the Cog Rail Alternative



Legend

-  Cog Rail Alternative Impact Boundary
-  Alternative Trail Impacts
-  Alpenbock Trails
-  Recreation Site Impact Estimate
-  Little Cottonwood Park and Ride Boundary



0 200 Feet

26.5.6.3 Mobility Hubs Alternative

The impacts from the mobility hubs with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative.

26.5.6.4 Avalanche Mitigation Alternatives

The Section 4(f) impacts from the avalanche mitigation alternatives with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative for the mid-canyon snow sheds. However, with the Cog Rail Alternative, an additional snow shed would be constructed in the upper canyon between the west-end and east-end connections of the Alta Bypass Road to S.R. 210 to minimize avalanche risk to the cog rail system. Constructing this snow shed would require right-of-way acquisition and a temporary construction easement from one historic property (ID# 72, The Snowbird Center). The upper-canyon snow shed is integral to the Cog Rail Alternative; the alternative would not be constructed without it. For this reason, impacts from the snow shed were not calculated separately. Impacts related to this snow shed are included with the cog rail impacts described in Table 26.5-11 above, Use of Section 4(f) Historic Properties from North Little Cottonwood Road to Alta with the Cog Rail Alternative.

26.5.6.5 Trailhead Parking Alternatives

The Cog Rail Alternative would have a use with *de minimis* impact to the Lisa Falls Trailhead and temporary occupancy of the White Pine Trailhead. The Lisa Falls Trailhead would be reconstructed as part of the cog rail design. Impacts to the Lisa Falls Trailhead are described in Table 26.5-12 above, Use of Section 4(f) Recreation Resources from North Little Cottonwood Road to Alta with the Cog Rail Alternative. The impacts from the Cog Rail Alternative to the White Pine Trailhead would be the same as with the Enhanced Bus Service Alternative.

26.5.6.6 No Winter Parking Alternative

The impacts from the No Winter Parking Alternative with the Cog Rail Alternative would be the same as with the Enhanced Bus Service Alternative.

26.6 Avoidance Alternatives

Unless the use of land from a Section 4(f) property is determined to have a *de minimis* impact, UDOT must determine that no feasible and prudent avoidance alternative exists before approving the use of such land (23 CFR Section 774.3). The only Section 4(f) property that would be used with a greater-than-*de minimis* impact is archaeological site 42SL419 (a historic railroad with intact retaining wall segments known colloquially as the “China Wall”). Site 42SL419 would have a use with a greater-than-*de minimis* impact with either of the avalanche mitigation sub-alternatives. This section evaluates whether a feasible and prudent avoidance alternative exists that completely avoids the use of site 42SL419.

According to 23 CFR Section 774.17, the definition of a “feasible and prudent avoidance alternative” is one that avoids using Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting the Section 4(f) property. An alternative is not feasible if it cannot be built as a matter of sound engineering judgment. Multiple factors listed in 23 CFR Section 774.17

that must be considered in determining whether an avoidance alternative is not prudent. An alternative is not prudent if:

1. It compromises the project to a degree that is unreasonable to proceed with the project in light of its stated purpose and need;
2. It results in unacceptable safety or operational problems;
3. After reasonable mitigation, it still causes:
 - a. Severe social, economic, or environmental impacts;
 - b. Severe disruption to established communities;
 - c. Severe disproportionate impacts to minority or low income populations; or
 - d. Severe impacts to environmental resources protected under other federal statutes;
4. It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
5. It causes other unique problems or unusual factors; or
6. It involves multiple factors in paragraphs 1 through 5 of this definition, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

Also, the *Section 4(f) Policy Paper* states that “a project alternative that avoids one Section 4(f) property by using another Section 4(f) property is not an avoidance alternative” (FHWA 2012).

26.6.1 No Avalanche Mitigation

Per FHWA guidance, evaluation of avoidance alternatives should include a no-action alternative. For this analysis, the no-action alternative would not include any avalanche mitigation measures. It would not result in use of site 42LS419. However, it would not meet the purpose of and need for the project. Avalanche mitigation is required for all of the primary action alternatives to improve reliability related to road closures and to improve safety associated with avalanche hazards. Because it would not meet the purpose of and need for the project, it is not a prudent alternative.

26.6.2 Active Avalanche Mitigation

When evaluating avalanche mitigation alternatives, UDOT first considered passive and active avalanche-control measures. Active measures include blasting using artillery or explosives to create a controlled avalanche release, during which time the road is closed. UDOT currently uses active measures to control avalanches, which requires closing S.R. 210 during avalanche-control processes. Passive measures include placing snow sheds over the road, building walls to stop avalanches from impacting the road, or realigning the road outside the avalanche path. Passive measures normally do not require closing the road.

Active avalanche mitigation would not result in use of site 42LS419. However, it would not meet the purpose of and need for the project. The project purpose requires that avalanche mitigation improve S.R. 210's reliability by substantially reducing the number of days and hours when the road is closed for avalanche control and incidents. Because active measures would still require road closure during the avalanche-mitigation process (as with the existing conditions) and would not reduce the number of days or hours of closure, they were eliminated from detailed consideration. Because the active avalanche mitigation would not meet the purpose of and need for the project, it is not a prudent alternative.





26.6.3 Passive Avalanche Mitigation (Other than Snow Sheds)

Multiple passive avalanche mitigation alternatives were considered including snow-supporting structures, roadway realignment, and deflection and stopping walls. Table 26.6-1 lists the preliminary passive avalanche mitigation alternatives that could avoid the use of site 42SL419.

UDOT conducted a preliminary review of each passive avalanche mitigation alternative to determine whether the avalanche mitigation could substantially reduce the hours and days of closure caused by the type of avalanche that typically occurs in Little Cottonwood Canyon. In Little Cottonwood Canyon, the nature of the terrain (typically gullied and/or with smooth ground cover) and often dry snow characteristics result in very fast-moving, turbulent, mixed-flow avalanches, which have a basal dense flow component and a turbulent powder component. Wet flows are also common in the spring. This analysis is based on a review of the avalanche mitigation alternatives conducted by Dynamic Avalanche Consulting (2018a, 2018b).

Little Cottonwood Canyon is in the Uinta-Wasatch-Cache National Forest. The canyon is home to two National Wilderness Areas: Twin Peaks Wilderness to the north of S.R. 210 and Lone Peak Wilderness to the south. The Wilderness Act does not allow permanent structures within a wilderness. Therefore, as part of the preliminary review of passive avalanche mitigation alternatives, UDOT determined that any alternative that would conflict with the Wilderness Act by requiring construction of a significant structure or fence in a wilderness area is not prudent.

Table 26.6-1. Passive Avalanche Mitigation Avoidance Alternatives

Avalanche Mitigation Alternative	Description	Description
<p>Snow-supporting Structures Alternative</p>	<p>Snow-supporting structures are placed in the avalanche starting zone to hold the snow in place and prevent avalanches. Modern snow-supporting structures are now typically constructed using anchored wire nets either with one single anchor point or with supporting posts.</p>	
<p>Road Realignment and Bridges Alternative</p>	<p>S.R. 210 would be realigned to facilitate structures that would be built so that the avalanche flows could pass under the roadway to eliminate risk, or S.R. 210 would be realigned to move the road outside the avalanche path.</p>	
<p>Earth Berms Alternative (Stopping Dams and Diversion Berms)</p>	<p>Earth berms are large, earth-fill structures that are constructed in the runout zone to divert or stop avalanche flows. Berms that stop avalanches are called stopping dams, and berms that divert flow are called diversion berms. Berms are typically constructed of compacted earth, but other materials such as geotextiles and facing units (for example, gabions, concrete blocks, or stacked rock) can be used to create a steep upslope face and reduce the amount of fill needed. The “China Wall” at the base of the White Pine path is an example of an earth-fill berm with stone facing.</p>	
<p>Stopping Walls Alternative</p>	<p>Stopping walls are constructed to stop avalanche dense flows in the runout zone typically adjacent to a highway or structure that is to be protected. Stopping walls can be reinforced concrete, concrete blocks, snow fence/catcher, and/or driven piles with cross members. Stopping walls are typically constructed where there are space restrictions; otherwise, earth-fill diversions or stopping dams tend to be more economical and can be constructed much higher.</p>	

26.6.3.1 Snow-supporting Structures Alternative

With this alternative, snow-supporting structures could be applied in many of the avalanche starting zone areas above Little Cottonwood Canyon. However, this option would require the structure to be placed in a designated Wilderness Area, which conflicts with the Wilderness Act. Because snow-supporting structures would need to be placed in a Wilderness Area, they were considered not prudent.

26.6.3.2 Road Realignment and Bridges Alternative

With this alternative, S.R. 210 would be realigned and bridges would be built so that avalanches would not impact the roadway. This configuration can be achieved by rerouting the roadway (away from the avalanche paths) or, in the right circumstances, spanning the avalanche paths with bridges. Although road realignment and bridges would prevent most avalanches from impacting the road, there would still be powder avalanche risk that would require UDOT to perform active avalanche control, and this risk would require road closure (Dynamic Avalanche Consulting 2018b). The road realignment would also require an increase in the S.R. 210 road grade from 8% to about 9.5%, which would increase the risk for slide offs and incidents in icy conditions with the steeper grade. Based on the need to have an active avalanche program to reduce the risk of powder avalanches and the increase in road grade, UDOT determined that the Road Realignment and Bridges Alternative not feasible. Figure 26.6-1 shows the potential road realignment with bridges.

The Road Realignment and Bridges Alternative was determined not feasible, but the road realignment would also need to be realigned into the Tanners Flat Campground, which is also a Section 4(f) property. With the realignment, most of the camp sites would be eliminated, resulting in a Section 4(f) use with a greater-than-*de minimis* impact. Therefore, this alternative would not be considered an avoidance alternative.

A second alignment was also suggested that would cross Little Cottonwood Creek south of the Tanners Flat Campground, run on the south side of the canyon, and cross the creek to reconnect with S.R. 210 west of Snowbird Entry 1. This alternative was determined not prudent since it would cross into the Lone Peak Wilderness.

Figure 26.6-1. Road Realignment and Bridges Alternative



LEGEND

- Mileposts
- Road Realignment
- ▲ Tanners Flat Campground
- Avalanche Paths
- - - Snowbird Ski and Summer Resort

26.6.3.3 Earth Berms Alternative

Berms need to be constructed tall enough to either stop an avalanche flow or divert it. The height is determined by the sum of the height of snow on the ground, the height of previous deposits, the avalanche flow height, and, most importantly, the speed of the avalanche, which determines the run-up height of the avalanche flow on the berm. Avalanche flows would run up higher on a stopping dam where the dam is oriented perpendicular to the flow compared to a diversion berm, where the berm is oriented obliquely to the flow direction.

In Little Cottonwood Canyon, the nature of the terrain (typically gullied and/or with smooth ground cover) and often dry snow characteristics result in very fast-moving, turbulent, mixed-flow avalanches, which have a basal dense flow component and a turbulent powder component. Wet flows are also common in the spring. Because of the fast-moving avalanches, diversion and stopping berms need to be very high to be effective for the dense flow and would typically be ineffective for stopping or diverting the powder component. Berm walls were determined not to be feasible because they would not be effective for very fast-moving avalanches and would be overtopped by powder avalanche flows, which could become airborne below the berm. Diversion berms were not considered feasible because the berm would divert avalanche flows to adjacent areas, which could reduce the hazard in one path and increase the risk in others, thereby not changing the overall risk (Dynamic Avalanche Consulting 2018a).

26.6.3.4 Stopping Walls Alternative

The Little Cottonwood Canyon corridor was reviewed to determine areas where stopping walls would be feasible. The avalanche paths produce fast-moving, turbulent avalanches that would simply overtop these structures, and active avalanche control would still be needed to reduce risk to acceptable levels. Therefore, stopping walls were determined not to be feasible (Dynamic Avalanche Consulting 2018b).

26.6.4 Design Changes

Design changes were evaluated to determine whether the locations or sizes of the snow sheds proposed with the avalanche mitigation sub-alternatives could be modified in a manner that would avoid a greater-than-*de minimis* impact to site 42SL419.

26.6.4.1 Snow Shed Location

Site 42SL419 is within the White Pine avalanche chute, which is considered a high-risk avalanche path with respect to S.R. 210 (Dynamic Avalanche Consulting 2018a). To meet the screening criteria for avalanche mitigation of improving S.R. 210's reliability by substantially reducing the number of days and hours when the road is closed for avalanche mitigation, the White Pine avalanche chute must have passive mitigation. Moving the snow shed outside the White Pine avalanche chute is not feasible.

Snow sheds are designed to allow avalanche flows to pass over the top of the shed rather than hitting the side of the shed. This requires fill to be placed behind the snow shed, and the fill would bury site 42SL419. Realigning the road to the south (farther away from site 42SL419) would still result in the site being buried to maintain the hill slope over the snow shed. Therefore, realigning the road to the south is not an avoidance alternative.

26.6.4.2 Snow Shed Size

Using field-based avalanche path mapping combined with desk-based avalanche modelling, a review of historical records and photographs, and discussions with UDOT avalanche forecasters, the minimum estimated length of snow shed that covers the White Pine avalanche chute would need to be 640 feet if the snow shed included guiding berms. A 640-foot-long snow shed would impact site 42SL419. A shorter snow shed that would avoid site 42SL419 would result in the avalanche still impacting S.R. 210 and causing the avalanche to overtop the snow shed entrances; therefore, a shorter-length snow shed that would avoid site 42SL419 would not be feasible.

26.7 Least Overall Harm Analysis

Because there is no feasible and prudent avoidance alternative to using site 42SL419, in accordance with 23 CFR Section 774.3(c), UDOT may approve from the remaining alternatives that would use the site only the one that:

1. Causes the least overall harm in light of the statute's preservation purpose. The least overall harm is determined by balancing the following factors:
 - a. The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
 - b. The relative severity of the remaining harm, after mitigation to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
 - c. The relative significance of each Section 4(f) property;
 - d. The views of the official(s) with jurisdiction over each Section 4(f) property;
 - e. The degree to which each alternative meets the purpose of and need for the project;
 - f. After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
 - g. Substantial differences in costs among alternatives.
2. The alternative selected must include all possible planning, as defined in 23 CFR Section 774.17, to minimize harm to Section 4(f) property.

Each of the avalanche mitigation sub-alternatives is analyzed below in terms of the factors above to determine which would cause the least overall harm.

26.7.1 Ability to Mitigate Adverse Impacts

The first factor is the ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property). Both avalanche mitigation sub-alternatives would result in the same impacts to one Section 4(f) property, site 42SL419. The eastern segment of this site consisting of intact retaining wall (known colloquially as the "China Wall") would be removed. Mitigation for both avalanche mitigation sub-alternatives would be the same—archaeological data recovery conducted in consultation with the USDA Forest Service and the Utah SHPO. Both avalanche mitigation sub-alternatives perform equally with respect to this factor.

26.7.2 Relative Severity of the Remaining Harm to Each Section 4(f) Property

The second factor is the relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection. Because the impacts and mitigation would be the same for both avalanche mitigation sub-alternatives, they perform equally with respect to this factor.

26.7.3 Relative Significance of Each Section 4(f) Property

The third factor is the relative significance of each Section 4(f) property. Both avalanche mitigation sub-alternatives would impact the same Section 4(f) property, site 42SL419. Therefore, both avalanche mitigation sub-alternatives perform equally with respect to this factor.

26.7.4 Views of the Officials with Jurisdiction over Each Section 4(f) Property

The fourth factor is the views of the officials with jurisdiction over each Section 4(f) property. The Utah SHPO is the official with jurisdiction over historic Section 4(f) properties including site 42SL419. Because there is only one Section 4(f) property used by both avalanche mitigation sub-alternatives, and the impacts and mitigation are the same, the views of the officials with jurisdiction would also be the same for both alternatives. Therefore, both avalanche mitigation sub-alternatives perform equally with respect to this factor.

26.7.5 Degree to Which Each Alternative Meets the Purpose and Need

The fifth factor is the degree to which each alternative meets the purpose of and need for the project. UDOT analyzed the transportation performance of each avalanche mitigation sub-alternative to determine how well the alternative would meet the purpose of and need for the project. The evaluation included the degree to which each alternative would meet the following objectives:

- Substantially reduce the number of hours and/or days during which avalanches delay users.
- Substantially reduce the avalanche hazard for roadway users.

As shown in Table 26.7-1, the two avalanche mitigation sub-alternatives would equally meet UDOT's objectives. Therefore, both avalanche mitigation sub-alternatives perform equally with respect to this factor. However, the Snow Sheds with Realigned Road Alternative would straighten the S.R. 210 roadway in the immediate area of the snow sheds (the Snow Sheds with Berms Alternative would leave the road in its current configuration), thereby improving vehicle safety by providing better driver sight distance in the sheds.

Table 26.7-1. S.R. 210 – Average Days and Hours of Road Closures with the No-Action Alternative and Avalanche Mitigation Sub-alternatives (2050)

Alternative	Average Days of Closures	Average Hours of Closures	Avalanche Hazard Index ^a
No-Action	10.5 to 21	56 to 108+	96
Snow Sheds with Berms	4 to 6	2 to 11	59
Snow Sheds with Realigned Road	4 to 6	2 to 11	59

^a Avalanche hazard index. <1 = very low; 1 to 10 = low; 10 to 40 = moderate; 40 to 150 = high; >150 = very high.

26.7.6 After Reasonable Mitigation, Magnitude of any Adverse Impacts to Resources not Protected by Section 4(f)

The sixth factor is the magnitude of any adverse impacts (after reasonable mitigation) to resources not protected by Section 4(f). Table 26.7-2 compares the no-action and avalanche mitigation sub-alternatives for the resources evaluated in the Draft EIS.

As shown in the table, the environmental impacts of the two avalanche mitigation sub-alternatives would be similar, with the main difference being that the Snow Sheds with Berms Alternative would have a greater visual impact because the berms would extend 300 feet up the mountainside at a height of up to 20 feet. Visual impacts are an important consideration. Concerns regarding visual impacts were a major component of scoping, and S.R. 210 is a state scenic byway.

In addition, the impacts to Riparian Habitat Conservation Areas would be 0.14 acre with the Snow Sheds with Realigned Road Alternative compared to 0.23 acre with the Snow Sheds with Berms Alternative. The USDA Forest Service has defined Riparian Habitat Conservation Areas as important areas to conserve to help protect the overall health of the watershed and ecosystems.

The Snow Sheds with Realigned Road Alternative would result in greater impacts to wildlife habitat and floodplains compared to the Snow Sheds with Berms Alternative. However, the wildlife habitat impacted would be adjacent to the road and low quality. The floodplains impacted would also be adjacent to the road. Impacts to Riparian Habitat Conservation Areas are considered to be of greater consequence than impacts to floodplains.

Because of the greater visual impacts and impacts to Riparian Habitat Conservation Areas, UDOT determined that the Snow Sheds with Realigned Road Alternative performs better than the Snow Sheds with Berms Alternative with respect to this factor.

Table 26.7-2. Environmental Impacts of the No-Action Alternative and Avalanche Mitigation Sub-alternatives

Impact Category	Unit	No-Action Alternative	Snow Sheds with Berms	Snow Sheds with Realigned Road
Land converted to transportation use	Acres	0	15	19
Residential relocations	Number	0	0	0
Business relocations	Number	0	0	0
Recreation areas affected	Number	0	0	0
Community facilities affected	Number	0	0	0
Environmental justice impacts	Yes/No	No	No	No
Economic impacts	Yes/No	Yes	No	No
Existing trails affected	Number	0	0	0
Climber boulders and trails affected	Number	0	0	0
Air quality impacts above regulations	Yes/No	No	No	No
Receptors with modeled noise levels above criteria	Number	0	0	0
Wildlife habitat impacted	Acres	0	6	10
Threatened and endangered species	Yes/No	No	No	No
Increase in impervious surface	Number	0	0	0
Water quality standards exceeded	Yes/No	No	No	No
Impacts to waters of the United States	Acres	0	0	0
Impacts to intermittent, perennial, and ephemeral streams	Acres	0	0.01	0.01
Impact to Riparian Habitat Conservation Areas	Acres	0	0.23	0.14
Adverse impacts to cultural resources	Number	0	1	1
Hazardous waste sites affected	Number	0	0	0
Floodplain impacts	Acres	0	0.01	0.14
Visual change	Category	None	High	High

26.7.7 Substantial Differences in Costs among the Alternatives

The seventh and last factor is substantial differences in costs among alternatives. Table 26.7-3 shows the estimated construction costs of the avalanche mitigation sub-alternatives. As shown in the table, the Snow Sheds with Berms Alternative would cost less than the Snow Sheds with Realigned Road Alternative. A 19% cost difference is notable but is not considered enough under the circumstances to be a substantial difference in cost—in other words, the costs are essentially similar.

Table 26.7-3. Preliminary Construction Cost Estimates for the Avalanche Mitigation Sub-alternatives

In millions of 2020 dollars

Alternative	Construction Cost Estimate
Snow Sheds with Berms	72
Snow Sheds with Realigned Road	86

26.7.8 Preliminary Conclusions for the Least Overall Harm and Section 4(f) Evaluation

By balancing these seven factors, UDOT has made the preliminary determination that the Snow Sheds with Realigned Road Alternative would cause the least overall harm in light of the preservation purpose of 49 United States Code (USC) Section 303. Balancing these factors allows UDOT to make project decisions in the best overall public interest.

- Both avalanche mitigation sub-alternatives perform equally with respect to the first four factors concerning the degree of harm to Section 4(f) properties.
- Both avalanche mitigation sub-alternatives meet the project purpose and need equally. However, the Snow Sheds with Realigned Road Alternative would provide better driver sight distance in the sheds, thereby providing a safer alternative compared to the Snow Sheds with Berms Alternative.
- The Snow Sheds with Realigned Road Alternative would result in fewer impacts to resources not protected by Section 4(f) including visual resources and Riparian Habitat Conservation Areas.
- The Snow Sheds with Realigned Road Alternative would cost more than the Snow Sheds with Berms Alternative. However, UDOT does not believe that the additional cost outweighs the other factors listed above.

Overall, UDOT has made the preliminary determinations that there is no feasible and prudent avoidance alternative to the use of site 42SL419, that the project has included all possible planning to minimize harm to Section 4(f) properties, and that the Snow Sheds with Realigned Road Alternative is the alternative with the least overall harm. Accordingly, UDOT has also identified the Snow Sheds with Realigned Road Alternative as the preferred alternative for NEPA purposes.

26.8 Measures to Minimize Harm

Avoidance, minimization, and mitigation measures for Section 4(f) properties have been considered during the development of the action alternatives and were incorporated into all of the action alternatives, including those determined to have uses with only *de minimis* impacts. *De minimis* impact determinations are based on the degree of impact after the inclusion of any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) to address the Section 4(f) use (that is, the net impact). After considering measures to minimize harm, UDOT has determined that the S.R. 210 Project would not result in constructive use of Section 4(f) resources.

26.8.1 Section 4(f) Historic Properties

Table 26.8-1 describes the proposed measures to minimize harm to Section 4(f) historic properties.

Table 26.8-1. Measures to Minimize Harm to Section 4(f) Historic Properties

Section 4(f) Historic Property	Alternatives with Effect	Avoidance, Minimization, and Mitigation
Historic properties on Wasatch Boulevard	<ul style="list-style-type: none"> Imbalanced-lane Alternative Five-lane Alternative 	<ul style="list-style-type: none"> Widening mainly to the east side of Wasatch Boulevard Retaining walls in select locations
Historic properties at La Caille base station (ID# 61, 84)	<ul style="list-style-type: none"> Gondola Alternative B Cog Rail Alternative 	<ul style="list-style-type: none"> Access road aligned to minimize impacts to historic parcel
Historic properties along S.R. 210 in lower canyon (ID# 63, 64, 66)	<ul style="list-style-type: none"> Enhanced Bus Service in Peak-period Shoulder Lane Alternative Cog Rail Alternative 	<ul style="list-style-type: none"> Widening mainly to the north side of S.R. 210 Retaining walls in select locations
9111 E. Little Cottonwood Canyon Road (ID# 67)	<ul style="list-style-type: none"> Enhanced Bus Service in Peak-period Shoulder Lane Alternative Cog Rail Alternative 	<ul style="list-style-type: none"> Shift in roadway alignment Retaining wall During final design, UDOT would work with property owner to reconstruct parking area
Historic Snowbird Lodges: Iron Blossam, The Inn at Snowbird, The Lodge at Snowbird (ID# 68, 69, 70, 71)	<ul style="list-style-type: none"> Enhanced Bus Service in Peak-period Shoulder Lane Alternative Cog Rail Alternative 	<ul style="list-style-type: none"> Retaining wall
Historic Snowbird Lodges: Iron Blossam, The Inn at Snowbird, The Lodge at Snowbird (ID# 68, 69, 70, 71)	<ul style="list-style-type: none"> Gondola alternatives 	<ul style="list-style-type: none"> Gondola tower would be located to reduce visual impacts from the historic lodges toward the mountain Single-pole gondola tower would be used in place of lattice tower to reduce visual impacts
Snowbird Center (ID# 72)	<ul style="list-style-type: none"> Gondola alternatives 	<ul style="list-style-type: none"> Gondola tower would be located to avoid impacts to Snowbird Center Single-pole gondola tower would be used in place of lattice tower to reduce visual impacts
Alta Lodge (ID# 82)	<ul style="list-style-type: none"> Gondola alternatives 	<ul style="list-style-type: none"> Gondola tower would be located to reduce visual impacts from the historic lodge toward the mountain Single-pole gondola tower would be used in place of lattice tower to reduce visual impacts

26.8.2 Section 4(f) Recreation Resources

Table 26.8-2 describes the proposed measures to minimize harm to Section 4(f) recreation properties. During the final design of the Selected Alternative(s), UDOT will work with USDA Forest Service to evaluate interpretive opportunities to mitigate impacts to Section 4(f) recreation resources on NFS land. Interpretive opportunities could include information about the history of recreation in Little Cottonwood Canyon or recreation opportunities presented on a kiosk or delivered on transit systems.

Table 26.8-2. Measures to Minimize Harm to Section 4(f) Recreation Properties

Resource	Alternatives with Effect	Avoidance, Minimization, and Mitigation
Site 42SL419	<ul style="list-style-type: none"> • Snow Sheds with Berms Alternative • Snow Sheds with Realigned Road Alternative 	<ul style="list-style-type: none"> • See Section 26.6, Avoidance Alternatives. • Archaeological data recovery for site 42SL419 will be conducted in consultation with the USDA Forest Service and the Utah SHPO.
Ferguson Trailhead off Prospector Drive	<ul style="list-style-type: none"> • Imbalanced-lane Alternative • Five-lane Alternative 	<ul style="list-style-type: none"> • UDOT will coordinate with Cottonwood Heights City during the Ferguson Trailhead design process to ensure that the location of the multi-use trail is considered during development of the park plan. • If planned trailhead improvements are not constructed prior to widening Wasatch Boulevard, UDOT would regrade the existing parking lot to maintain the number of parking spaces.
Golden Hills Park	<ul style="list-style-type: none"> • Imbalanced-lane Alternative • Five-lane Alternative 	<ul style="list-style-type: none"> • Impacts to park features (parking, playground, walking path, restrooms) would be avoided. • All disturbed areas would be revegetated.
Tanners Flat Campground	<ul style="list-style-type: none"> • Gondola alternatives 	<ul style="list-style-type: none"> • No towers or stations would be located in campground (gondola cabins would pass overhead). • The gondola would not operate during campground quiet hours of 10 PM to 7 AM. • During final design, a landscape architect would evaluate impacts at each site. Potential mitigation could include the following: <ul style="list-style-type: none"> ○ Reconfiguring sites to visually shield tables and fire pits from the gondola cabins overhead ○ Relocating the group area to a location with less visual impact ○ Redesigning sites to accommodate different user groups ○ Adding shade structures or pavilions to screen sites from visual impacts ○ Planting trees to create a visual screen over time
Tanners Flat Campground	<ul style="list-style-type: none"> • Enhanced Bus Service in Peak-period Shoulder Lane Alternative • Cog Rail Alternative 	<ul style="list-style-type: none"> • No impacts to campground features (for example, campsites, bathroom facilities, volleyball court or amphitheater). • Enhanced bus service would not operate in the summer when the campground is open. • The cog rail would not operate during campground quiet hours of 10 PM to 7 AM.

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Table 26.8-2. Measures to Minimize Harm to Section 4(f) Recreation Properties

Resource	Alternatives with Effect	Avoidance, Minimization, and Mitigation
Alpenbock Loop Trail (USDA Forest Service #1020) Alpenbock East Spur Trail Bonneville Shoreline Trail	<ul style="list-style-type: none"> Enhanced Bus Service in Peak-period Shoulder Lane Alternative 	<ul style="list-style-type: none"> No impacts to parking spots, the restroom, bus shelter, or trails. UDOT would work with the USDA Forest Service and the contractor to provide trail access during construction as much as possible. In coordination with the USDA Forest Service, UDOT would implement a public involvement program to inform potential recreation users of potential temporary trailhead closures during construction.
Alpenbock Loop Trail (USDA Forest Service #1020) Alpenbock East Spur Trail Bonneville Shoreline Trail	<ul style="list-style-type: none"> Gondola alternatives Cog Rail Alternative 	<ul style="list-style-type: none"> The park-and-ride lot would be reconstructed to accommodate 105 parking spaces with the gondola alternatives or 160 spaces with the Cog Rail Alternative. Restroom facility would be reconstructed. Trail would be realigned, but access would be maintained. UDOT would work with the USDA Forest Service and the contractor to provide trail access during construction as much as possible. In coordination with the USDA Forest Service, UDOT would implement a public involvement program to inform potential recreation users of potential temporary trailhead closures during construction.
Grit Mill Trailhead	<ul style="list-style-type: none"> Enhanced Bus Service in Peak-period Shoulder Lane Alternative 	<ul style="list-style-type: none"> No impacts to planned parking spots, restroom, or trails. UDOT would work with the USDA Forest Service and the contractor to provide trail access during construction as much as possible. In coordination with the USDA Forest Service, UDOT would implement a public involvement program to inform potential recreation users of potential temporary trailhead closures during construction.
Grit Mill Trailhead	<ul style="list-style-type: none"> Gondola alternatives 	<ul style="list-style-type: none"> No towers or stations located at the trailhead (gondola cabins would pass overhead).
Grit Mill Trailhead	<ul style="list-style-type: none"> Cog Rail Alternative 	<ul style="list-style-type: none"> Trailhead would be reconstructed to include a restroom facility and about the same number of parking spaces as the currently planned trailhead. UDOT would work with the USDA Forest Service and the contractor to provide trail access during construction as much as possible. In coordination with the USDA Forest Service, UDOT would implement a public involvement program to inform potential recreation users of potential temporary trailhead closures during construction.
Temple Quarry Nature Trail (USDA Forest Service #1000) Little Cottonwood Creek Trail (USDA Forest Service #1001) Bonneville Shoreline Trail	<ul style="list-style-type: none"> Enhanced Bus Service in Peak-period Shoulder Lane Alternative Cog Rail Alternative 	<ul style="list-style-type: none"> No impacts to trailhead parking spots, restroom, or trails. UDOT would work with the USDA Forest Service and the contractor to provide trail access during construction as much as possible. In coordination with the USDA Forest Service, UDOT would implement a public involvement program to inform potential recreation users of potential temporary trailhead closures during construction.
Little Cottonwood Creek Trail (USDA Forest Service #1001)	<ul style="list-style-type: none"> Gondola alternatives 	<ul style="list-style-type: none"> No towers or stations located on trail (gondola cabins would pass overhead).

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Table 26.8-2. Measures to Minimize Harm to Section 4(f) Recreation Properties

Resource	Alternatives with Effect	Avoidance, Minimization, and Mitigation
Lisa Falls Trail (USDA Forest Service #1012)	<ul style="list-style-type: none"> Trailhead parking alternatives 	<ul style="list-style-type: none"> Informal parking would be consolidated into a larger formal lot with additional parking spaces. Restrooms would be added. UDOT would work with the USDA Forest Service and the contractor to provide trail access during construction as much as possible. In coordination with the USDA Forest Service, UDOT would implement a public involvement program to inform potential recreation users of potential temporary trailhead closures during construction.
Lisa Falls Trail (USDA Forest Service #1012)	<ul style="list-style-type: none"> Enhanced Bus Service in Peak-period Shoulder Lane Alternative 	<ul style="list-style-type: none"> Widening S.R. 210 would have minor impacts, but the total number of parking spots would not be reduced. UDOT would work with the USDA Forest Service and the contractor to provide trail access during construction as much as possible. In coordination with the USDA Forest Service, UDOT would implement a public involvement program to inform potential recreation users of potential temporary trailhead closures during construction.
Lisa Falls Trail (USDA Forest Service #1012)	<ul style="list-style-type: none"> Cog Rail Alternative 	<ul style="list-style-type: none"> Informal parking would be reconstructed to include restroom facilities and designated parking areas. UDOT would work with the USDA Forest Service and the contractor to provide trail access during construction as much as possible. In coordination with the USDA Forest Service, UDOT would implement a public involvement program to inform potential recreation users of potential temporary trailhead closures during construction.
White Pine Trail (USDA Forest Service #1002)	<ul style="list-style-type: none"> Trailhead parking alternatives 	<ul style="list-style-type: none"> Parking lot would be expanded to provide additional parking spaces. The single entrance would be replaced with a one-way-entrance and a one-way exit. UDOT would work with the USDA Forest Service and the contractor to provide trail access during construction as much as possible. In coordination with the USDA Forest Service, UDOT would implement a public involvement program to inform potential recreation users of potential temporary trailhead closures during construction.
	<ul style="list-style-type: none"> Enhanced Bus Service in Peak-period Shoulder Lane Alternative Cog Rail Alternative 	<ul style="list-style-type: none"> No impacts to parking spaces, restroom, or trail. UDOT would work with the USDA Forest Service and the contractor to provide trail access during construction as much as possible. In coordination with the USDA Forest Service, UDOT would implement a public involvement program to inform potential recreation users of potential temporary trailhead closures during construction.
	<ul style="list-style-type: none"> Gondola alternatives 	<ul style="list-style-type: none"> No towers or stations located in trailhead (gondola cabins would pass overhead).
Parking within the special-use permit area at Snowbird	<ul style="list-style-type: none"> Gondola alternatives 	<ul style="list-style-type: none"> During the final design of the Selected Alternative(s), UDOT would work to minimize the loss of parking for tower construction near the Iron Blossam Lodge.
Transfer tow at Alta	<ul style="list-style-type: none"> Gondola alternatives 	<ul style="list-style-type: none"> During the final design of the Selected Alternative(s), UDOT would work to minimize impacts to infrastructure at Alta such as the transfer tow to ensure that the gondola system does not interfere with the infrastructure's operation.

26.9 Coordination

Chapter 27, Public and Agency Consultation and Coordination, summarizes the meetings held with the public and agencies, including Cottonwood Heights City and the USDA Forest Service, during the development of the action alternatives and the preparation of this EIS. Chapter 15, Cultural Resources, includes summaries of coordination efforts specific to historic resources and the National Historic Preservation Act.

26.9.1 Section 4(f) Historic Properties

UDOT coordinated with the Utah SHPO, the official with jurisdiction over Section 4(f) historic properties, regarding UDOT's Determinations of Eligibility and Findings of Effect (DOE/FOE). Under a 2007 programmatic agreement between the Advisory Council on Historic Protection, FHWA, the Utah SHPO, and UDOT regarding Section 4(f) *de minimis* determinations, the SHPO is notified of UDOT's intent to make a Section 4(f) *de minimis* impact determination when there is a Section 106 finding of no adverse effect. Because of this agreement, *de minimis* impact determinations became effective when the SHPO concurred with the DOE/FOE on May 14, 2021, available in Appendix 15B, Determinations of Eligibility and Findings of Effect.

26.9.2 Section 4(f) Recreation Resources

UDOT coordinated with Cottonwood Heights City and the USDA Forest Service, the agencies with jurisdiction over Section 4(f) recreation resources in the study area. Coordination occurred through discussions at meetings and email correspondence. UDOT anticipates further consultation and coordination with the officials with jurisdiction over the Section 4(f) properties regarding UDOT's intent to make a *de minimis* impact determination.

Prior to making a *de minimis* impact determination for a Section 4(f) recreation resource, UDOT must inform the official with jurisdiction over that resource of its intent to make a *de minimis* impact determination. UDOT must provide public notice and an opportunity for public review and comment concerning the effects on the protected activities, features, or attributes of the property. UDOT will give the public an opportunity to review and comment on this project, including its impacts to Section 4(f) properties and UDOT's proposed *de minimis* impact determinations, during the public comment period for this Draft EIS.

Following an opportunity for public review and comment, the official with jurisdiction over the Section 4(f) resource must concur in writing that the project will not adversely affect the activities, features, or attributes that make the property eligible for Section 4(f) protection. UDOT can then finalize any *de minimis* impact findings concurred with by the official with jurisdiction and approve the use of the Section 4(f) property. *De minimis* impact concurrence letters, which will be updated following review and comments on the Draft EIS, are available in Appendix 26B, *De Minimis* Correspondence.

26.10 References

Cottonwood Heights City

No date Bicycle and Trails Master Plan.

Dynamic Avalanche Consulting

2018a Snow Avalanche Hazard Baseline Conditions Report. July 3.

2018b Snow Avalanche Hazard Improvement Options Report. October 4.

[FHWA] Federal Highway Administration

2012 Section 4(f) Policy Paper. July 20.

2017 Memorandum of Understanding between the Federal Highway Administration and the Utah Department of Transportation Regarding the State of Utah's Participation in the Surface Transportation Project Delivery Program Pursuant to 23 USC 317. January 17.

[USDA Forest Service] United States Department of Agriculture Forest Service

2014 Decision Notice and FONSI [Finding of No Significant Impact] for the Grit Mill and Climbing Master Plan Project, Salt Lake Ranger District, Uinta-Wasatch-Cache National Forest, Salt Lake County, Utah. September.

2017 Tri-Canyon Trails [map]. Prepared by the Salt Lake City Ranger District, Uinta-Wasatch-Cache National Forest, Intermountain Region. May.

2019 Email from Nate Lewis, USDA Forest Service Intermountain Region, to Andrea Clayton of HDR regarding Section 6(f) parcels. August 27.

2020 Letter from David Whittekiend, Uinta-Wasatch-Cache National Forest, to Josh Van Jura of UDOT regarding Section 4(f) applicability for climbing boulders. September 15.

APPENDIX 26A

USDA Forest Service Letter Regarding Section 4(f)
Determination for Climbing Boulders



File Code: 1950; 2330
Date: September 15, 2020

Mr. Josh Van Jura
Little Cottonwood Canyon EIS Project Manager
Utah Department of Transportation
PO Box 141245
Salt Lake City, UT 84114-1245

Dear Mr. Van Jura,

The Utah Department of Transportation (UDOT) recently asked the USDA Forest Service whether specific boulders on National Forest System (NFS) lands in Little Cottonwood Canyon qualify for protection under Section 4(f) of the U.S. Department of Transportation Act of 1966. In response, the Uinta-Wasatch-Cache National Forest has determined that the following boulders or groups of boulders identified as Parking Lot-West, Bathroom Boulder, Secret Garden, Cabbage Patch, Syringe, 5-Mile, and All Thumbs, do not appear to meet the applicability requirements of 23 CFR §774.11(d) and therefore do not qualify for protection under Section 4(f) of the Transportation Act.

While the Forest Service recognizes that the identified boulders provide convenient recreation opportunities for climbers, the climbing boulders do not play a significant role in the function or availability of the Uinta-Wasatch-Cache National Forest, and are not specifically managed, protected, or otherwise designated in the Forest Plan as a significant recreation resource. Furthermore, other similar recreation opportunities exist in the vicinity of these boulders, and across the Uinta-Wasatch-Cache National Forest.

Although the identified boulders do not qualify for protection under Section 4(f) of the Transportation Act, the Forest Service requests that UDOT attempt to preserve these boulders and/or consider relocating boulders, as technically and financially feasible, to maintain recreational opportunities for forest visitors if the current locations of one or more of these boulders conflict with future transportation system improvements.



If you have any questions, please do not hesitate to contact our UDOT Liaison, Mr. Lance Kovel, at 801-999-2131 or lance.kovel@usda.gov

Sincerely,

X

DAVID WHITTEKIEND
Forest Supervisor

APPENDIX 26B

De Minimis Correspondence



State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

January 19, 2021

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

TERIANNE S. NEWELL, P.E.
Deputy Director of Planning and Investment

LISA J. WILSON, P.E.
Deputy Director of Engineering and Operations

Mike Peterson
Mayor
Cottonwood Heights City
2277 E. Bengal Blvd.
Cottonwood Heights, UT 84121

Subject: UDOT Project No. S-R299(281), Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah (PIN 16092)
DRAFT Section 4(f) De Minimis Impact Concurrence Request

Dear Mr. Peterson:

The purpose of this letter is to notify you that the Utah Department of Transportation (UDOT) intends to make *de minimis* impact findings regarding two Section 4(f) recreation resources under your jurisdiction, and to request your concurrence that the Little Cottonwood Canyon Project (also referred to as the S.R. 210 Project) would not adversely affect the activities, features, or attributes that make these resources eligible for Section 4(f) protection.

These *de minimis* impact findings are pursuant to Section 4(f) of the Department of Transportation Act of 1966; Section 6009 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU); and 23 Code of Federal Regulations Part 774. The review, consultation, and other actions required by these laws and rules are being carried out by UDOT pursuant to 23 United States Code Section 327 and a Memorandum of Understanding dated January 17, 2017, and executed by the Federal Highway Administration and UDOT.

UDOT is preparing an EIS for Little Cottonwood Canyon and Wasatch Boulevard in partnership with the U.S. Department of Agriculture (USDA) Forest Service to provide an integrated transportation system that improves the reliability, mobility, and safety for residents, visitors, and commuters who use State Route (S.R.) 210. The proposed project study area extends from the intersection of S.R. 210 and S.R. 190/Fort Union Boulevard in Cottonwood Heights, to the terminus of S.R. 210 in the town of Alta. Transportation improvements are needed to address congestion, improve safety for all users, and enhance the availability of public transportation options in Little Cottonwood Canyon.

Action Alternatives

Five action alternatives are being evaluated in detail in the Draft EIS:

- Enhanced Bus Service Alternative
- Enhanced Bus Service in Peak-period Shoulder Lane (PPSL) Alternative
- Gondola Alternative A (Starting at Canyon Entrance)
- Gondola Alternative B (Starting at La Caille)
- Cog Rail Alternative (Starting at La Caille)

All five action alternatives would require widening Wasatch Boulevard. There are two sub-alternatives under consideration for how to widen Wasatch Boulevard: the Imbalanced-lane Alternative and the Five-lane Alternative. Both of these sub-alternatives include a multi-use path on the east side of Wasatch Boulevard.

Detailed information regarding the alternatives is available on the project website at www.littlecottonwoodeis.udot.utah.gov. Avoidance, minimization, and mitigation measures have been considered during the development of the action alternatives and were incorporated into all of the action alternatives. All five of the action alternatives would result in a *de minimis* impact to Section 4(f) recreation resources under your jurisdiction as described below.

Section 4(f) Recreation Resources

Section 4(f) applies to significant publicly owned parks and recreation areas that are open to the public. The land must be officially designated as a park or recreation area, and the officials with jurisdiction of the land must determine that its primary purpose is as a park or recreation area. UDOT has identified two Section 4(f) recreation resources under Cottonwood Heights City's jurisdiction potentially affected by this project: Prospector Park Trailhead and Golden Hills Park.

De Minimis Impact Definition

For a recreation resource, a *de minimis* impact is one that would not adversely affect the features, attributes, or activities of a property that qualify the resource for protection under Section 4(f). *De minimis* impact determinations are based on the degree of impact after the inclusion of any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) to address the Section 4(f) use (that is, the net impact).

Ferguson Trailhead off Prospector Drive

The Ferguson Trailhead off Prospector Drive is a supplemental overflow trailhead for the Ferguson Canyon Trail with access off Prospector Drive at about 7650 South. The land is owned by Salt Lake County, but the trailhead is managed by Cottonwood Heights City. The trailhead currently consists of a 0.14-acre unpaved lot on a 3.10-acre parcel. Cottonwood Heights City is planning to improve the trailhead at this location and make it the primary trailhead for Ferguson Canyon. Planned improvements span 6.45 acres on multiple adjoining parcels and include a formal paved parking lot, a restroom, and walking paths. Conceptual plans for the trailhead also include a multi-use path on the east side of Wasatch Boulevard. See Figure 1. Cottonwood Heights City's Ferguson Trailhead Concept Plan.

Widening Wasatch Boulevard would result in *de minimis* impacts to the Ferguson Trailhead off Prospector Drive. With both the Imbalanced-lane and Five-lane Alternatives, about 1.05 acre of the 6.45-acre planned trailhead would be acquired to accommodate the proposed multi-use path on the east side of Wasatch Boulevard. A temporary construction easement of 0.59 acre would be required. See Figure 2. Use of Ferguson Trailhead off Prospector Drive with the Imbalanced-lane and Five-lane Alternatives.

UDOT will coordinate with Cottonwood Heights City during the Ferguson Trailhead design process to ensure that the location of the multi-use trail proposed with the Imbalanced-lane and Five-lane Alternatives is considered during development of the park plan. If planned trailhead improvements are not constructed prior to widening Wasatch Boulevard, UDOT would regrade the exiting parking lot to maintain the number of parking spaces.

Golden Hills Park

Golden Hills Park is located at 8303 S. Wasatch Boulevard. The 5.3-acre park is owned and managed by Cottonwood Heights City. Park features include a pavilion for 30 people, a playground, a walking path, restrooms, and a tennis court.

Widening Wasatch Boulevard would result in *de minimis* impacts to the Golden Hills Park. With the Imbalanced-lane Alternative, about 0.63 acre would be acquired. With the Five-lane Alternative, about 0.65 acre would be acquired. The acquisition for both alternatives would occur in the open landscaped area on the western frontage of the park. The driveway would need to be reconstructed with both alternatives. There would be no impact to park activities or features (parking, pavilion, path, restroom, playground, or tennis court) with either alternative. The proposed trail on the east side of Wasatch Boulevard would connect to park trails. See Figure 3, Use of Golden Hills Park with the Imbalanced-lane and Five-lane Alternatives.

Public Notice and Opportunity for Public Comment

Prior to making a *de minimis* impact determination, UDOT will provide public notice and an opportunity for public review and comment concerning the effects on the protected activities, features, or attributes of Section 4(f) recreation resources. This opportunity will be provided in conjunction with the opportunity for public review of and comments on the Draft EIS.

Request for Concurrence

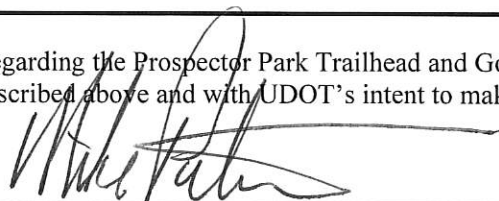
Following the public review and comment period for the Draft EIS, UDOT will review comments related to the Section 4(f) recreation resources in this letter and revise the impact finding if necessary. At that point, we will ask you for an updated concurrence. If you have any questions, please contact me at (801) 910-2035 or lizrobinson@utah.gov.

Sincerely,



Liz Robinson
Cultural Resources Program Manager
Utah Department of Transportation

Regarding the Prospector Park Trailhead and Golden Hills Park, I concur with the Section 4(f) evaluation described above and with UDOT's intent to make a Section 4(f) *de minimis* impact finding.



Mike Peterson
Mayor
Cottonwood Heights City

3/1/2021
Date



Ferguson Trailhead
Concept Plan

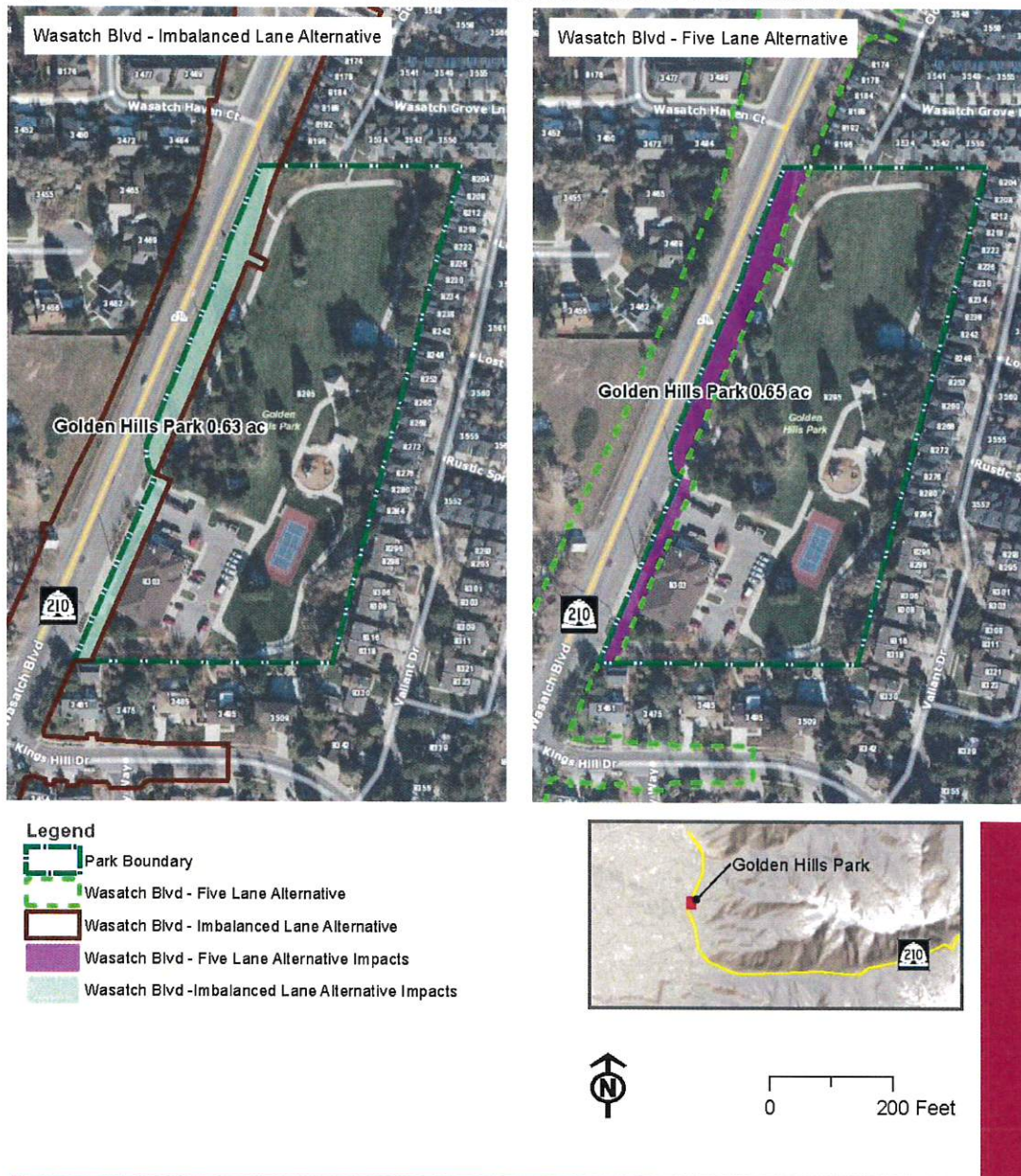


Figure 1. Cottonwood Heights City's Ferguson Trailhead Concept Plan

Figure 2. Use of Ferguson Trailhead off Prospector Drive with the Imbalanced-lane and Five-lane Alternatives



Figure 3. Use of Golden Hills Park with the Imbalanced-lane and Five-lane Alternatives





March 1, 2021

Liz Robinson, Utah Department of Transportation Cultural Resources Program Manager
Delivered via email to Vince Izzo, EIS Project Manager

Ms. Robinson,

As an addendum to my signature to your January 19, 2021 requesting concurrence with Section 4(f) De Minimus Impacts for the Little Cottonwood Canyon Environmental Impact Statement, and for the project record, I would like to clarify my understanding of providing signed concurrence as requested:

- My signature of this document should not signify my, or the city of Cottonwood Heights' support for any one of the current alternatives in the EIS process. As a city, we continue to review all alternatives and discuss potential impacts with UDOT project officials.
- My signature of this document should not preclude further discussion from taking place regarding the specific impacts to each of the sites referenced in your letter. As a preferred alternative is developed and refined, I request that the city continue to take part in design and engineering discussions in these specific areas and throughout the Wasatch Boulevard corridor.
- The property impacted in Figure 1, and a portion of the property shown in Figure 3 (the fire station), is owned by Salt Lake County. While the city is planning improvements to the Ferguson Trailhead property depicted in Figure 1, my signature does not represent full concurrence by Salt Lake County officials. I recommend that UDOT take proper steps to involve the County as needed.

Thank you for the opportunity to review these impacts and for further discussion of the impacts with the EIS project team.

Sincerely,

Michael J Peterson
Mayor Cottonwood Heights



State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

TERIANNE S. NEWELL, P.E.
Deputy Director of Planning and Investment

LISA J. WILSON, P.E.
Deputy Director of Engineering and Operations

March 3, 2021

Walt Gilmore
Associate Division Director – Planning and Development
Salt Lake County Parks & Recreation
2001 South State Street S4-700
Salt Lake City, UT 84190

Subject: UDOT Project No. S-R299(281), Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah (PIN 16092)
DRAFT Section 4(f) De Minimis Impact Concurrence Request

Dear Mr. Gilmore:

The purpose of this letter is to notify you that the Utah Department of Transportation (UDOT) intends to make *de minimis* impact findings regarding a Section 4(f) recreation resources under your jurisdiction, and to request your concurrence that the Little Cottonwood Canyon Project (also referred to as the S.R. 210 Project) would not adversely affect the activities, features, or attributes that make these resources eligible for Section 4(f) protection.

This *de minimis* impact finding is pursuant to Section 4(f) of the Department of Transportation Act of 1966; Section 6009 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU); and 23 Code of Federal Regulations Part 774. The review, consultation, and other actions required by these laws and rules are being carried out by UDOT pursuant to 23 United States Code Section 327 and a Memorandum of Understanding dated January 17, 2017, and executed by the Federal Highway Administration and UDOT.

UDOT is preparing an EIS for Little Cottonwood Canyon and Wasatch Boulevard in partnership with the U.S. Department of Agriculture (USDA) Forest Service to provide an integrated transportation system that improves the reliability, mobility, and safety for residents, visitors, and commuters who use State Route (S.R.) 210. The proposed project study area extends from the intersection of S.R. 210 and S.R. 190/Fort Union Boulevard in Cottonwood Heights, to the terminus of S.R. 210 in the town of Alta. Transportation improvements are needed to address congestion, improve safety for all users, and enhance the availability of public transportation options in Little Cottonwood Canyon.

Action Alternatives

Five action alternatives are being evaluated in detail in the Draft EIS:

- Enhanced Bus Service Alternative
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- Gondola Alternative A (Starting at Canyon Entrance)
- Gondola Alternative B (Starting at La Caille)
- Cog Rail Alternative (Starting at La Caille)

All five action alternatives would require widening Wasatch Boulevard. There are two sub-alternatives under consideration for how to widen Wasatch Boulevard: the Imbalanced-lane Alternative and the Five-lane Alternative. Both of these sub-alternatives include a multi-use path on the east side of Wasatch Boulevard.

Detailed information regarding the alternatives is available on the project website at www.littlecottonwoodeis.udot.utah.gov. Avoidance, minimization, and mitigation measures have been considered during the development of the action alternatives and were incorporated into all of the action alternatives. All five of the action alternatives would result in a *de minimis* impact to a Section 4(f) recreation resources under your jurisdiction as described below.

Section 4(f) Recreation Resources

Section 4(f) applies to significant publicly owned parks and recreation areas that are open to the public. The land must be officially designated as a park or recreation area, and the officials with jurisdiction of the land must determine that its primary purpose is as a park or recreation area. UDOT has identified one Section 4(f) recreation resources under Salt Lake County's jurisdiction potentially affected by this project: Ferguson Trailhead off Prospector Drive.

De Minimis Impact Definition

For a recreation resource, a *de minimis* impact is one that would not adversely affect the features, attributes, or activities of a property that qualify the resource for protection under Section 4(f). *De minimis* impact determinations are based on the degree of impact after the inclusion of any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) to address the Section 4(f) use (that is, the net impact).

Ferguson Trailhead off Prospector Drive

The Ferguson Trailhead off Prospector Drive is a supplemental overflow trailhead for the Ferguson Canyon Trail with access off Prospector Drive at about 7650 South. The land is owned by Salt Lake County, but the trailhead is managed by Cottonwood Heights City. The trailhead currently consists of a 0.14-acre unpaved lot on a 3.10-acre parcel. Cottonwood Heights City is planning to improve the trailhead at this location and make it the primary trailhead for Ferguson Canyon. Planned improvements span 6.45 acres on multiple adjoining parcels and include a formal paved parking lot, a restroom, and walking paths. Conceptual plans for the trailhead also include a multi-use path on the east side of Wasatch Boulevard. See Figure 1. Cottonwood Heights City's Ferguson Trailhead Concept Plan.

Widening Wasatch Boulevard would result in *de minimis* impacts to the Ferguson Trailhead off Prospector Drive. With both the Imbalanced-lane and Five-lane Alternatives, about 1.05 acre of the 6.45-acre planned trailhead would be acquired to accommodate the proposed multi-use path on the east side of Wasatch Boulevard. A temporary construction easement of 0.59 acre would be

required. See Figure 2. Use of Ferguson Trailhead off Prospector Drive with the Imbalanced-lane and Five-lane Alternatives. UDOT will coordinate with Cottonwood Heights City during the Ferguson Trailhead design process to ensure that the location of the multi-use trail proposed with the Imbalanced-lane and Five-lane Alternatives is considered during development of the park plan. If planned trailhead improvements are not constructed prior to widening Wasatch Boulevard, UDOT would regrade the exiting parking lot to maintain the number of parking spaces.

Public Notice and Opportunity for Public Comment

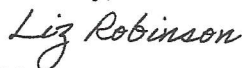
Prior to making a *de minimis* impact determination, UDOT will provide public notice and an opportunity for public review and comment concerning the effects on the protected activities, features, or attributes of Section 4(f) recreation resources. This opportunity will be provided in conjunction with the opportunity for public review of and comments on the Draft EIS.

Request for Concurrence

Following the public review and comment period for the Draft EIS, UDOT will review comments related to the Section 4(f) recreation resources in this letter and revise the impact finding if necessary. At that point, we will ask you for an updated concurrence.

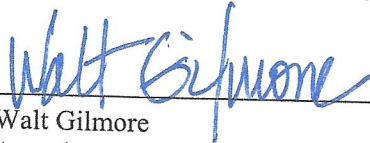
We requested concurrence from Cottonwood Heights City because they manage the Ferguson Trailhead off Prospector Drive and are planning improvements. The City provided concurrence and recommended we coordinate with you as well. A copy of Cottonwood Height's concurrence is attached. If you have any questions, please contact me at (801) 910-2035 or lizrobinson@utah.gov.

Sincerely,



Liz Robinson
Cultural Resources Program Manager
Utah Department of Transportation

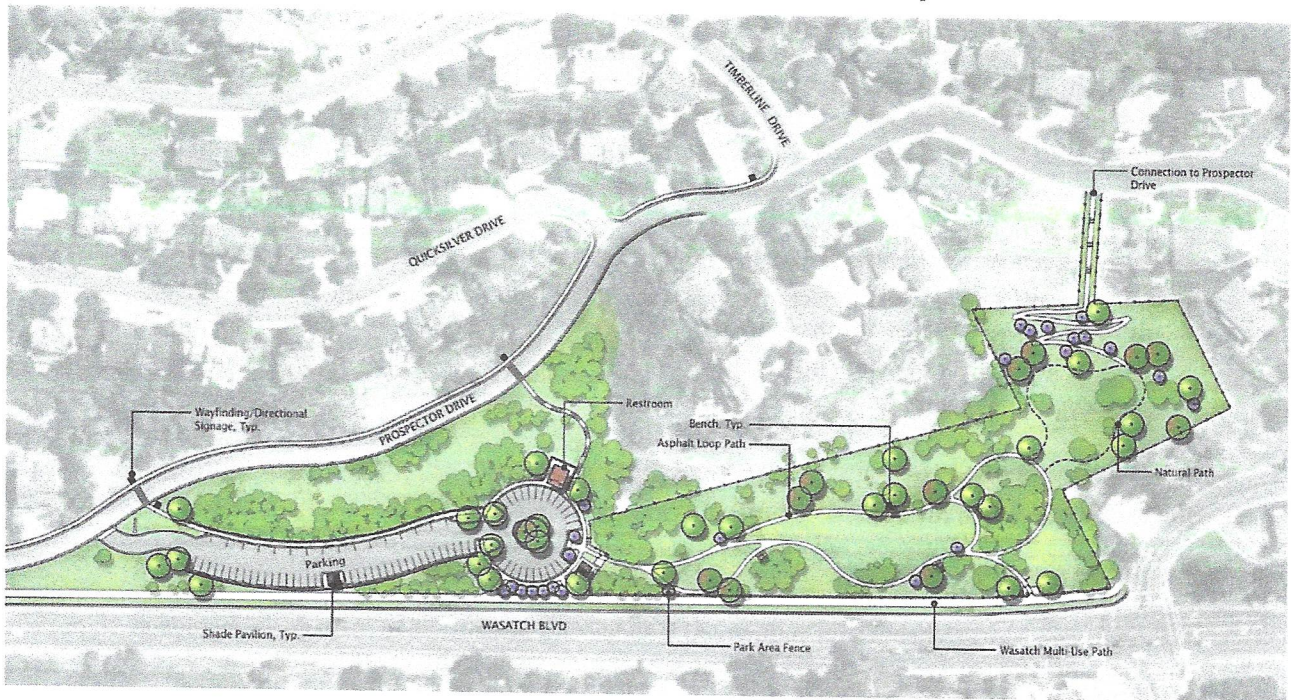
Regarding the Prospector Park Trailhead, I concur with the Section 4(f) evaluation described above and with UDOT's intent to make a Section 4(f) *de minimis* impact finding.



Walt Gilmore
Associate Division Director – Planning & Development
Salt Lake County Parks & Recreation

18 March 2021
Date

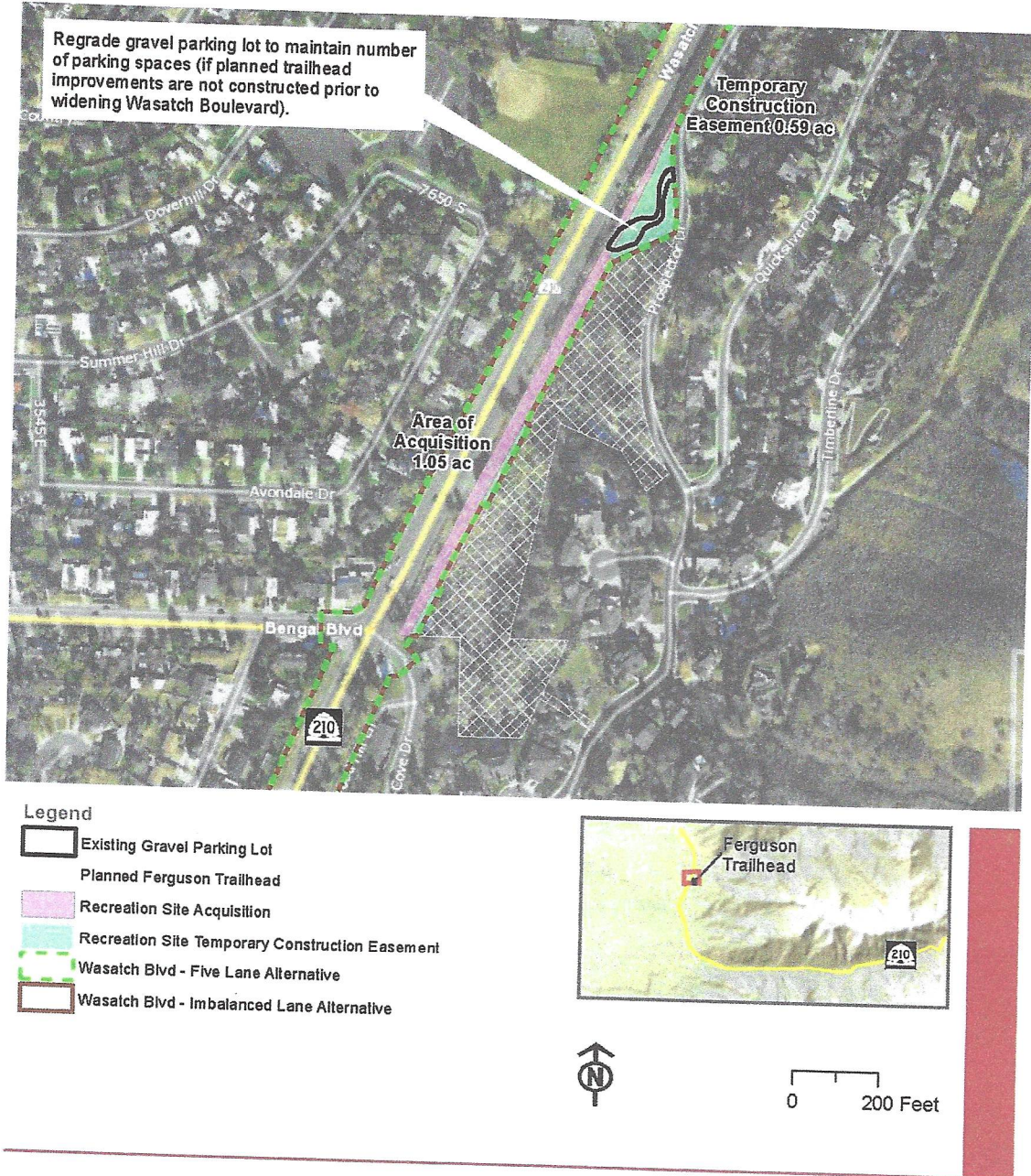
Figure 1. Cottonwood Heights City's Ferguson Trailhead Concept Plan



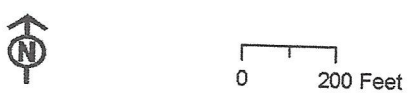
Ferguson Trailhead
Concept Plan



Figure 2. Use of Ferguson Trailhead off Prospector Drive with the Imbalanced-lane and Five-lane Alternatives



- Legend**
- Existing Gravel Parking Lot
 - Planned Ferguson Trailhead
 - Recreation Site Acquisition
 - Recreation Site Temporary Construction Easement
 - Wasatch Blvd - Five Lane Alternative
 - Wasatch Blvd - Imbalanced Lane Alternative





State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

TERIANNE S. NEWELL, P.E.
Deputy Director of Planning and Investment

LISA J. WILSON, P.E.
Deputy Director of Engineering and Operations

March 17, 2021

David Whittekiend
Uinta-Wasatch-Cache National Forest Supervisor
U.S. Department of Agriculture Forest Service
857 W. South Jordan Parkway
South Jordan, UT 84095

Subject: UDOT Project No. S-R299(281), Little Cottonwood Canyon Environmental Impact Statement, Salt Lake County, Utah (PIN 16092)
DRAFT Section 4(f) *De Minimis* Impact and Temporary Occupancy Concurrence Request

Dear Mr. Whittekiend:

The purpose of this letter is to notify you that the Utah Department of Transportation (UDOT) intends to make *de minimis* impact and temporary occupancy findings regarding multiple Section 4(f) recreation resources under your jurisdiction, and to request your concurrence that the Little Cottonwood Canyon Project (also referred to as the S.R. 210 Project) would not adversely affect the activities, features, or attributes that make these resources eligible for Section 4(f) protection.

These *de minimis* impact and temporary occupancy findings are pursuant to Section 4(f) of the Department of Transportation Act of 1966; Section 6009 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), and 23 Code of Federal Regulations (CFR) Part 774. The review, consultation, and other actions required by these laws and rules are being carried out by UDOT pursuant to 23 United States Code Section 327 and a Memorandum of Understanding dated January 17, 2017, and executed by the Federal Highway Administration and UDOT.

Project Description

UDOT is preparing an EIS for Little Cottonwood Canyon and Wasatch Boulevard in cooperation with the U.S. Department of Agriculture (USDA) Forest Service to provide an integrated transportation system that improves the reliability, mobility, and safety for residents, visitors, and commuters who use State Route (S.R.) 210. The proposed project study area extends from the intersection of S.R. 210 and S.R. 190/Fort Union Boulevard in Cottonwood Heights to the terminus of S.R. 210 in the town of Alta. Transportation improvements are needed to address congestion, improve safety for all users, and enhance the availability of public transportation options in Little Cottonwood Canyon.

Primary Alternatives and Sub-alternatives

Five primary alternatives are being evaluated in detail in the Draft EIS:

- Enhanced Bus Service Alternative
- Enhanced Bus Service in Peak-period Shoulder Lane (PPSL) Alternative
- Gondola Alternative A (Starting at Canyon Entrance)
- Gondola Alternative B (Starting at La Caille)
- Cog Rail Alternative (Starting at La Caille)

Various sub-alternatives could be incorporated into the five primary alternatives. The sub-alternatives that could impact Section 4(f) recreation resources under your jurisdiction are the three trailhead parking alternatives:

- Trailhead Improvements and No S.R. 210 Roadside Parking within ¼ Mile of Trailheads Alternative
- Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative
- No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative

The two trailhead improvement alternatives listed above include the same improvements at the Lisa Falls and White Pine Trailheads. The difference between the two alternatives is where roadside parking would be allowed, which is not relevant to Section 4(f). For the purpose of this letter, these two trailhead improvement alternatives are discussed together.

Detailed information regarding all of the alternatives is available on the project website at www.littlecottonwoodeis.udot.utah.gov. Avoidance, minimization, and mitigation measures have been considered during the development of the alternatives and were incorporated into all of the alternatives. All five of the primary alternatives and both trailhead improvement sub-alternatives would result in a *de minimis* impact to and/or temporary occupancy of one or more Section 4(f) recreation resource under your jurisdiction as described below.

Section 4(f) Recreation Resources

Section 4(f) applies to significant publicly owned parks and recreation areas that are open to the public. The land must be officially designated as a park or recreation area, and the officials with jurisdiction of the land must determine that its primary purpose is as a park or recreation area. Section 4(f)'s applicability for multiple-use public land holdings such as the Uinta-Wasatch-Cache National Forest is defined in 23 CFR Section 774.11(d). Section 4(f) applies only to those portions of lands that function for—or are designated in USDA Forest Service plans as being for—significant park, recreation, or wildlife and waterfowl refuge purposes.

When land from a Section 4(f) property is permanently incorporated into a transportation facility, it constitutes a use of that resource. A use could result from appropriation of land, an easement, or a permit. UDOT has identified 12 Section 4(f) recreation resources under USDA Forest Service jurisdiction potentially used by this project:

- Tanners Flat Campground
- Alpenbock Loop Trail (USDA Forest Service #1020)
- Grit Mill Trailhead
- Alpenbock East Spur Trail
- Temple Quarry Nature Trail (USDA Forest Service #1000)
- Little Cottonwood Creek Trail (USDA Forest Service #1001)
- Planned Bonneville Shoreline Trail
- Lisa Falls Trail (USDA Forest Service #1012)
- White Pine Trail (USDA Forest Service #1002)
- Alta Brighton Trail (USDA Forest Service #1007)

- Recreation facilities within Snowbird's special-use permit area
- Recreation facilities within Alta's special-use permit area

De Minimis Impact Definition

For a recreation resource, a *de minimis* impact is one that would constitute a use of the resource but would not adversely affect the features, attributes, or activities of a property that qualify the resource for protection under Section 4(f). *De minimis* impact determinations are based on the degree of impact after the inclusion of any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) to address the Section 4(f) use (that is, the net impact).

Temporary Occupancy Definition

Temporary occupancy occurs when a recreation resource is impacted during construction but the impacts are so minimal that they do not constitute a use within the meaning of Section 4(f). The following conditions must be satisfied:

1. The duration must be temporary, that is, less than the time needed for construction of the project, and there should be no change in ownership of the land;
2. The scope of the work must be minor, that is, both the nature and the magnitude of the changes to the Section 4(f) property are minimal;
3. There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property on either a temporary or permanent basis;
4. The land being used must be fully restored, that is, the property must be returned to a condition which is at least as good as that which existed prior to the project; and
5. There must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.

Alpenbock Loop Trail (USDA Forest Service #1020)

The Alpenbock Loop Trail is a 1.0-mile loop trail on the north side of S.R. 210 at the entrance to Little Cottonwood Canyon. The unpaved trail can be accessed from either end of the park-and-ride lot near the intersection with S.R. 209 and provides access to rock-climbing routes and bouldering areas. Impacts to the Alpenbock Loop Trail would be concentrated at the park-and-ride lot trailhead as described in Table 1.

Table 1. Use of Alpenbock Loop Trail

Alternative	Description of Use	Type of Use
Enhanced Bus Service	None	No use
Enhanced Bus Service in PPSL	Widening Little Cottonwood Canyon Road would require ~0.11 acre of land and a temporary construction easement of ~0.24 acre from the USDA Forest Service. The land required is located between the park-and-ride lot, which is the trailhead for the Alpenbock Loop Trail, and S.R. 210. There would be no impacts to parking spaces, the restroom, the bus shelter. About 61 feet of trail would be removed. A climbing boulder, referred to as Parking Lot West, would be removed.	Use with <i>de minimis</i> impact
Gondola A, Gondola B	<p>The gondola base station would be located at the park-and-ride lot. This lot is used by skiers who want to carpool to the resorts as well as by climbers accessing the Alpenbock Loop Trail. The gondola system would require a ~1.08-acre easement or a special-use permit from the USDA Forest Service under the gondola cables and ~2.87 acres to construct the base station.</p> <p>The total number of parking spaces would be reduced from about 160 to 95, but continued access for Alpenbock Loop Trail users would be maintained. Some of the parking spaces would be marked for Alpenbock Loop Trail users only. About 460 feet of trail would be realigned. Connectivity from the reconstructed parking lot to the existing trail would be maintained. Additionally, a gondola tower would be constructed near the east end of the trail, and the gondola cables would pass over the trail. See Figure 2, Use of Alpenbock Loop Trail with Gondola Alternative A or B.</p>	Use with <i>de minimis</i> impact
Cog Rail	The cog rail operations and maintenance facility would be located in the existing 160-parking-space Little Cottonwood Canyon park-and-ride lot, which also provides parking access to the Alpenbock Loop Trail. Constructing the operations and maintenance facility would require ~2.75 acres of land from the USDA Forest Service at the park and-ride-lot. The lot would be reconstructed to include a restroom and about the same number of parking spaces as under current conditions. About 1,700 feet of trail would be realigned. Connectivity from the reconstructed parking lot to the existing trail would be maintained. Two climbing boulders, Parking Lot West and Bathroom Boulder, would be removed. See Figure 3, Use of Alpenbock Loop Trail with the Cog Rail Alternative.	Use with <i>de minimis</i> impact

Tanners Flat Campground

Tanners Flat Campground is a USDA Forest Service campground south of S.R. 210 about 4 miles up Little Cottonwood Canyon. There are 31 single sites, 3 double sites, 4 group sites, bathroom facilities, a volleyball court, and an amphitheater. The campground is open from late May through late September and is closed during the winter. Impacts to Tanners Flat Campground are described in Table 2.

Table 2. Use of Tanners Flat Campground

Alternative	Description of Use	Type of Use
Enhanced Bus Service	None	No use
Enhanced Bus Service in PPSL	Temporary construction easement of ~0.49 acre adjacent to S.R. 210. There would be no impacts to campground features such as campsites, bathroom facilities, volleyball court, and amphitheater.	Temporary occupancy with no use
Gondola A, Gondola B	<p>No gondola stations or towers would be located in the campground; there would be no physical impacts to the campground or its features. A ~4.27-acre easement or a special-use permit would be required where the gondola cables pass over the campground. See Figure 1, Use of Tanners Flat Campground with Gondola Alternative A or B.</p> <p>During the summer, the gondola could operate from about 8 AM to 8 PM. There would be visual impacts as campground users see gondola cabins moving overhead, as well as privacy impacts related to campground users being viewed by cabin passengers as they pass by. The visual impacts would vary from one campsite to another; the gondola cabins would not be visible from every site.</p> <p>The noise levels from the gondola system would be about 50 A-weighted decibels (dBA) (similar to a quiet office environment), or less than noise generated by vehicles on S.R. 210 (50 to 60 dBA) or nearby Little Cottonwood Creek. To minimize impacts to campers, the gondola would not operate during the Tanners Flat Campground quiet hours of 10 PM to 7 AM.</p> <p>Different recreational user groups have different thresholds for sensory impacts. The gondola's summer operation could shift campground users toward a user group with a higher tolerance for development. For example, users could shift from tent campers to recreational vehicle (RV) campers.</p> <p>During the final design of a gondola alternative, a landscape architect would evaluate impacts at each site. Potential mitigation could include the following:</p> <ul style="list-style-type: none"> • Reconfiguring sites to visually shield tables and fire pits from the gondola cabins overhead • Relocating the group area to a location with less visual impact • Redesigning sites to accommodate different user groups • Adding shade structures or pavilions to screen sites from visual impacts • Planting trees to create a visual screen over time 	Use with <i>de minimis</i> impact
Cog Rail	Temporary construction easement of ~0.03 acre adjacent to S.R. 210. There would be no impacts to campground features such as campsites, bathroom facilities, volleyball court, and amphitheater.	Temporary occupancy with no use

Grit Mill Trailhead

The Grit Mill Trailhead is a recently approved trailhead on the north side of S.R. 210 about 0.6 mile up Little Cottonwood Canyon. Trailhead improvements include a formal parking lot, a restroom, and an interpretive site. The trailhead provides access to rock-climbing routes and bouldering areas. Construction began in the fall of 2020. Impacts to the Grit Mill Trailhead are described in Table 3.

Table 3. Use of Grit Mill Trailhead

Alternative	Description of Use	Type of Use
Enhanced Bus Service	None	No use
Enhanced Bus Service in PPSL	Widening Little Cottonwood Canyon Road would require ~0.03 acre of land and a temporary construction easement of ~0.12 acre from the USDA Forest Service. The land required is located between the parking lot and S.R. 210. There would be no impacts to parking spaces, the restroom, or trails. See Figure 4, Use of Grit Mill Trailhead with Enhanced Bus Service in PPSL Alternative, Gondola Alternatives A and B, or Cog Rail Alternative.	Use with <i>de minimis</i> impact
Gondola A, Gondola B	No gondola stations or towers would be located within the Grit Mill Trailhead footprint; there would be no physical impacts to the parking area, restroom, interpretive site, or trails. The gondola system would require a ~0.66-acre easement or a special-use permit from the USDA Forest Service where the gondola cables pass over the parking area. See Figure 4.	Use with <i>de minimis</i> impact
Cog Rail	Constructing the cog rail tracks would require of ~0.74 acre of land from the USDA Forest Service. The trailhead would be reconstructed to include a restroom and about the same number of parking spaces. Connectivity from the reconstructed trailhead to the planned Alpenbock East Spur Trail would be maintained. See Figure 4.	Use with <i>de minimis</i> impact

Alpenbock East Spur Trail

The Alpenbock East Spur Trail is a planned 0.2-mile spur on the north side of S.R. 210 connecting the Alpenbock Loop Trail to the Grit Mill Trailhead. This trail will provide formalized access to climbing routes and bouldering areas. Impacts to the Alpenbock East Spur Trail would be concentrated at the trailheads on either end as described above in Table 1 and Table 3.

Temple Quarry Nature Trail (USDA Forest Service #1000)

The Temple Quarry Nature Trail is a 0.3-mile loop trail at the bottom of Little Cottonwood Canyon. The paved interpretive trail begins at the Temple Quarry Nature Trail Trailhead on the south side of S.R. 210 at the intersection with S.R. 209. The trail is wheelchair-accessible and has an amphitheater with seating for about 35 people. Impacts to the Temple Quarry Nature Trail are described in Table 4.

Table 4. Use of Temple Quarry Nature Trail

Alternative	Description of Use	Type of Use
Enhanced Bus Service	None	No use
Enhanced Bus Service in PPSL	Widening Little Cottonwood Canyon Road would require a temporary construction easement of ~0.40 acre from the USDA Forest Service. The land required is located between the Temple Quarry Nature Trail Trailhead and S.R. 210. There would be no impacts to parking spaces, the restroom, or trails. Access to the trail would be maintained during construction. See Figure 5, Use of Temple Quarry Nature Trail with Enhanced Bus Service in PPSL Alternative or Cog Rail Alternative.	Temporary occupancy with no use
Gondola A, Gondola B	None	No use
Cog Rail	Constructing the cog rail tracks would require a temporary construction easement of ~0.12 acre from the USDA Forest Service. The easement would span the access road to the trailhead. There would be no impacts to the trail or trailhead features such as parking or restroom facilities. See Figure 5.	Temporary occupancy with no use

Little Cottonwood Creek Trail (USDA Forest Service #1001)

The Little Cottonwood Creek Trail is a 3.3-mile unpaved hiking and mountain biking trail parallel to Little Cottonwood Creek. It starts at the Temple Quarry Nature Trail Trailhead on the south side of S.R. 210 at the intersection with S.R. 209. The out-and-back trail ends across the creek from the ruins of an old power plant. There is also access to the upper trail from the Lisa Falls Trailhead. Impacts to the Little Cottonwood Creek Trail are described in Table 4.

Table 5. Use of Little Cottonwood Creek Trail

Alternative	Description of Use	Type of Use
Enhanced Bus Service	None	No use
Enhanced Bus Service in PPSL	The Little Cottonwood Creek Trail begins at the Temple Quarry Nature Trail Trailhead. Impacts would be the same as described for the Temple Quarry Nature Trail above.	Temporary occupancy with no use
Gondola A, Gondola B	The gondola system would require an easement or special-use permit from the USDA Forest Service where the gondola cables pass over ~100 feet of the trail segment connecting the Little Cottonwood Creek Trail to the Lisa Falls Trailhead. There would be no physical impact to the trail.	Use with <i>de minimis</i> impact
Cog Rail	The Little Cottonwood Creek Trail begins at the Temple Quarry Nature Trail Trailhead. Impacts would be the same as described for the Temple Quarry Nature Trail above.	Temporary occupancy with no use

Planned Bonneville Shoreline Trail

The Bonneville Shoreline Trail is a planned mixed-use (biking and hiking) trail that follows the shoreline of ancient Lake Bonneville. To qualify for Section 4(f) protection, the planned trail must be (1) significant, (2) on publicly owned land, and (3) formally designated by the public agency that owns the land. The planned segments on USDA Forest Service land at the entrance to Little Cottonwood Canyon are considered Section 4(f) resources. The planned trail includes connections to the park-and-ride lot at the entrance to Little Cottonwood Canyon (Alpenbock Loop Trailhead) and the Temple Quarry Nature Trail Trailhead. Impacts to these trailheads are discussed above in Table 1 and Table 4.

Table 6. Use of Planned Bonneville Shoreline Trail

Alternative	Description of Use	Type of Use
Enhanced Bus Service	None.	No use
Enhanced Bus Service in PPSL	The planned Bonneville Shoreline Trail includes connections to the park-and-ride lot (Alpenbock Loop Trailhead) and the Temple Quarry Nature Trailhead. Impacts to these trailheads are discussed above (Table 1 and Table 4). The planned Bonneville Shoreline Trail could still connect to both trailheads. Thus, there would be no use of the Bonneville Shoreline Trail.	No Use
Gondola A, Gondola B	The planned Bonneville Shoreline Trail includes a connection to the park-and-ride lot (Alpenbock Loop Trailhead). Impacts to trailhead are discussed above (Table 1). The planned Bonneville Shoreline Trail could still connect to the reconstructed Alpenbock Loop Trailhead. Thus, there would be no use of the Bonneville Shoreline Trail.	No Use
Cog Rail	UDOT would work with the USDA Forest Service during final design to accommodate or realign ~550 feet of planned trail on USDA Forest Service land on the northeast side of S.R. 210 across the road from the cog rail base station at La Caille.	Use with <i>de minimis</i> impact

Lisa Falls Trail (USDA Forest Service #1012)

The Lisa Falls Trail is a 0.2-mile unpaved hiking trail on the north side of S.R. 210 about 2.8 miles up Little Cottonwood Canyon. Trailhead parking consists of informal dirt pullouts on the north and south sides of the road. The trail begins on the north side of the road and ends at the Lisa Falls waterfall. The area is popular with rock climbers. Impacts to the Lisa Falls Trail would be concentrated at the trailhead as described in Table 7.

Table 7. Use of Lisa Falls Trail

Alternative	Sub-alternative(s)	Description of Use	Type of Use
Enhanced Bus Service	Trailhead improvements	Existing trailhead parking in informal dirt pullouts on the north and south sides of the road (17 parking spaces total) would be consolidated into a larger formal parking lot on the north side of the road (41 parking spaces). Roadside parking would be eliminated to reduce the safety conflicts among pedestrians, bicyclists, and vehicles. An advance-warning sign would be provided for pedestrians to cross the road to reach the Little Cottonwood Creek Trailhead. Restrooms would be added. About 260 feet of the Lisa Falls Trail and about 38 feet of trail connecting to the Little Cottonwood Creek Trail would be removed. Trailhead improvements would require ~0.18 acre of the existing trailhead parking area.	Use with <i>de minimis</i> impact

Alternative	Sub-alternative(s)	Description of Use	Type of Use
		During construction, the trailheads could be closed or only limited portions open, resulting in a temporary impact. See Figure 6, Use of Lisa Falls Trail with the Trailhead Improvement Alternatives or the Cog Rail Alternative.	
	No trailhead improvements	There would be no impacts with the Enhanced Bus Service Alternative combined with the No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative.	No use
Enhanced Bus Service in PPSL	Trailhead improvements	The Enhanced Bus Service in PPSL Alternative could include the trailhead improvement alternatives as described for the Enhanced Bus Service Alternative above.	Use with <i>de minimis</i> impact
	No trailhead improvements	Widening Little Cottonwood Canyon Road would result in minor impacts to the dirt pullout, but the total number of parking spaces would not be reduced.	Use with <i>de minimis</i> impact
Gondola A, Gondola B	Trailhead improvements	Gondola Alternatives A and B could include the trailhead improvement alternatives as described for the Enhanced Bus Service Alternative above.	Use with <i>de minimis</i> impact
	No trailhead improvements	There would be no impacts from Gondola Alternatives A and B combined with the No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative.	No use
Cog Rail		As part of the cog rail design, the dirt pullout that serves as the Lisa Falls Trailhead would be reconstructed to include restroom facilities and designated parking areas. About 150 feet of trail would be removed, and ~ 0.15 acre of USDA Forest Service land would be required through an easement or permit for trailhead improvements. The overall access to the Lisa Falls Trail would be improved compared to existing conditions. See Figure 6.	Use with <i>de minimis</i> impact

White Pine Trail (USDA Forest Service #1002)

The White Pine Trail is a 5.0-mile hiking and mountain biking trail on the south side of S.R. 210 about 5.6 miles up Little Cottonwood Canyon. The trail starts at a paved parking lot with a restroom and ends at White Pine Lake. The White Pine Trailhead also serves Red Pine Trail (USDA Forest Service #1003), Maybird Trail (USDA Forest Service #1004), and the White Pine–Snowbird Link Trail (USDA Forest Service #1014). This is an area for backcountry skiing and other uses during the winter. Impacts to the White Pine Trail would be concentrated at the trailhead as described in Table 8.

Table 8. Use of White Pine Trail

Alternative	Sub-alternative(s)	Description of Use	Type of Use
Enhanced Bus Service	Trailhead improvements	The existing trailhead parking lot would be expanded from 52 parking spaces to 144 parking spaces. Additional restrooms would be added. The single entrance to the parking lot would be replaced with a one-way-entrance and a one-way-exit. Roadside parking would be eliminated to reduce the safety conflicts among pedestrians, bicyclists, and vehicles. About 2.60 acres of USDA Forest Service land would	Use with <i>de minimis</i> impact

Alternative	Sub-alternative(s)	Description of Use	Type of Use
		be required for trailhead improvements. During construction, the trailheads could be closed or only limited portions open, resulting in a temporary impact. See Figure 7, Use of White Pine Trail with the Trailhead Improvement Alternatives.	
	No trailhead improvements	There would be no impacts to the White Pine Trail with the Enhanced Bus Service Alternative combined with the No Trailhead Improvements and No Roadside Parking from S.R. 209/S.R. 210 Intersection to Snowbird Entry 1 Alternative.	No use
Enhanced Bus Service in PPSL	Trailhead improvements	The Enhanced Bus Service in PPSL Alternative could include the trailhead improvement alternatives as described for the Enhanced Bus Service Alternative above.	Use with <i>de minimis</i> impact
	No trailhead improvements	Widening Little Cottonwood Canyon Road would require a temporary construction easement of ~0.15 acre from the USDA Forest Service. The land required is located between the parking lot and S.R. 210. There would be no impacts to parking spaces, the restroom, or trails.	Temporary occupancy with no use
Gondola A, Gondola B	Trailhead improvements	Gondola Alternatives A and B could include the trailhead improvement alternatives as described for the Enhanced Bus Service Alternative above.	Use with <i>de minimis</i> impact
	No trailhead improvements	No gondola stations or towers would be located within the White Pine Trailhead footprint; there would be no physical impacts to the parking area, restroom, or trails. The gondola system would require a ~0.75-acre easement or special-use permit from the USDA Forest Service where the gondola cables pass over the parking area.	Use with <i>de minimis</i> impact
Cog Rail	Trailhead improvements	The Cog Rail Alternative could include the trailhead improvement alternatives as described for the Enhanced Bus Service Alternative above.	Use with <i>de minimis</i> impact
	No trailhead improvements	Constructing the cog rail tracks would require a temporary construction easement of 0.03 acre from the USDA Forest Service. The easement would be located adjacent to S.R. 210 west of the access road. This alternative would not affect the trail, access to the trailhead, or trailhead features such as parking or restroom facilities.	Temporary occupancy with no use

Alta Brighton Trail (USDA Forest Service #1007)

The Alta-Brighton Trail is a 1.7-mile hiking trail on the north side of S.R. 210 about 8.4 miles up Little Cottonwood Canyon. It starts at the Flagstaff Trailhead on the north side of S.R. 210 near the entrance to Alta's upper parking lot and ends at Twin Lakes Reservoir in Big Cottonwood Canyon. This is a major area for backcountry skiing in winter. The Flagstaff Trailhead also serves Snakepit Trail (USDA Forest Service #1015) and Albion Meadows Trail (USDA Forest Service #1006). There would be no impacts to the Alta Brighton Trail from any of the action alternatives.

Recreation Facilities within Snowbird's Special-use Permit Area

Snowbird is a privately owned year-round ski and summer resort located about 7 miles up Little Cottonwood Canyon. Land ownership is a combination of privately owned land and land leased from the

USDA Forest Service. The resort operates under a special-use permit. The resort is considered a multiple-use public land holding per 23 CFR Section 774.11(d). Recreation facilities that are on National Forest land and designated in the USDA Forest Service special-use permit as being used primarily for public parks or recreation are considered Section 4(f) properties. Section 4(f) resources within the study area and the special-use permit area include parking (needed to support recreation) and a tennis court near the Iron Blossam Lodge. Impacts to Section 4(f) recreation facilities are described in Table 9.

Table 9. Use of Section 4(f) Recreation Resources at Snowbird

Alternative	Description of Use	Type of Use
Enhanced Bus Service	None	No use
Enhanced Bus Service in PPSL	None	No use
Gondola A, Gondola B	The gondola system would require an easement or special-use permit from the USDA Forest Service where the gondola cables pass over parking and the tennis court.. About eight parking spaces near the Iron Blossam Lodge would be removed to construct a gondola tower.	Use with <i>de minimis</i> impact
Cog Rail	None	No use

Recreation Facilities within Alta's Special-use Permit Area

Alta is a privately owned year-round ski and summer resort located at the top of Little Cottonwood Canyon. Land ownership is a combination of privately owned land and land leased from the USDA Forest Service. The resort operates under a special-use permit. The resort is considered a multiple-use public land holding per 23 CFR Section 774.11(d). Recreation facilities that are on National Forest land and designated in the USDA Forest Service special-use permit as being used primarily for public parks or recreation are considered Section 4(f) properties. Section 4(f) resources within the study area and the special-use permit area include parking (needed to support recreation) and the transfer tow (rope tow that runs between Sunnyside and Collins lifts). Impacts to Section 4(f) recreation facilities are described in Table 10.

Table 10. Use of Section 4(f) Recreation Resources at Alta

Alternative	Description of Use	Type of Use
Enhanced Bus Service	None	No use
Enhanced Bus Service in PPSL	None	No use
Gondola A, Gondola B	The gondola system would require an easement or special-use permit from the USDA Forest Service where the gondola cables pass over the transfer tow.	Use with <i>de minimis</i> impact
Cog Rail	None	No use

Public Notice and Opportunity for Public Comment

Prior to making a *de minimis* impact determination, UDOT will provide public notice and an opportunity for public review and comment concerning the effects on the protected activities, features, or attributes of Section 4(f) recreation resources. This opportunity will be provided in conjunction with the opportunity for public review of and comments on the Draft EIS.

Request for Concurrence

Following the public review and comment period for the Draft EIS, UDOT will review comments related to the Section 4(f) recreation resources and revise the impact finding if necessary. At that point, we will ask you for an updated concurrence. If you have any questions, please contact me at (801) 910-2035 or lizrobinson@utah.gov.

Sincerely,



Liz Robinson
Cultural Resources Program Manager
Utah Department of Transportation

I concur with the Section 4(f) evaluation described above and with UDOT's intent to make a Section 4(f) *de minimis* impact or temporary occupancy finding for the following resources:

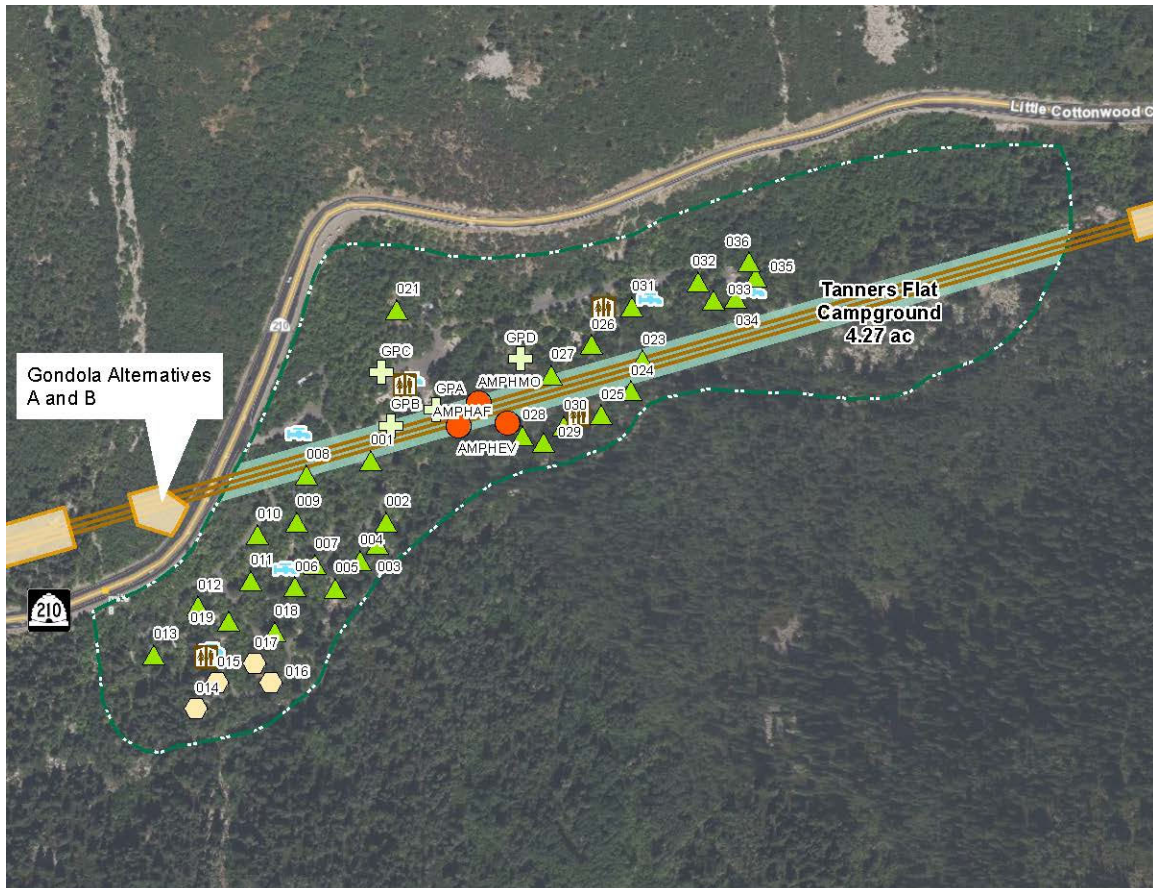
- Tanners Flat Campground
- Alpenbock Loop Trail (USDA Forest Service #1020)
- Grit Mill Trailhead
- Alpenbock East Spur Trail
- Temple Quarry Nature Trail (USDA Forest Service #1000)
- Little Cottonwood Creek Trail (USDA Forest Service #1001)
- Planned Bonneville Shoreline Trail
- Lisa Falls Trail (USDA Forest Service #1012)
- White Pine Trail (USDA Forest Service #1002)
- Alta Brighton Trail (USDA Forest Service #1007)
- Recreation facilities within Snowbird's special-use permit area
- Recreation facilities within Alta's special-use permit area

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for _____
David Whittekiend
Uinta-Wasatch-Cache National Forest Supervisor
U.S. Department of Agriculture Forest Service

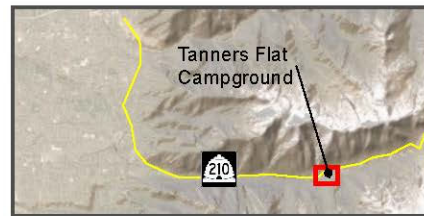
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Figure 1. Use of Tanners Flat Campground with Gondola Alternative A or B



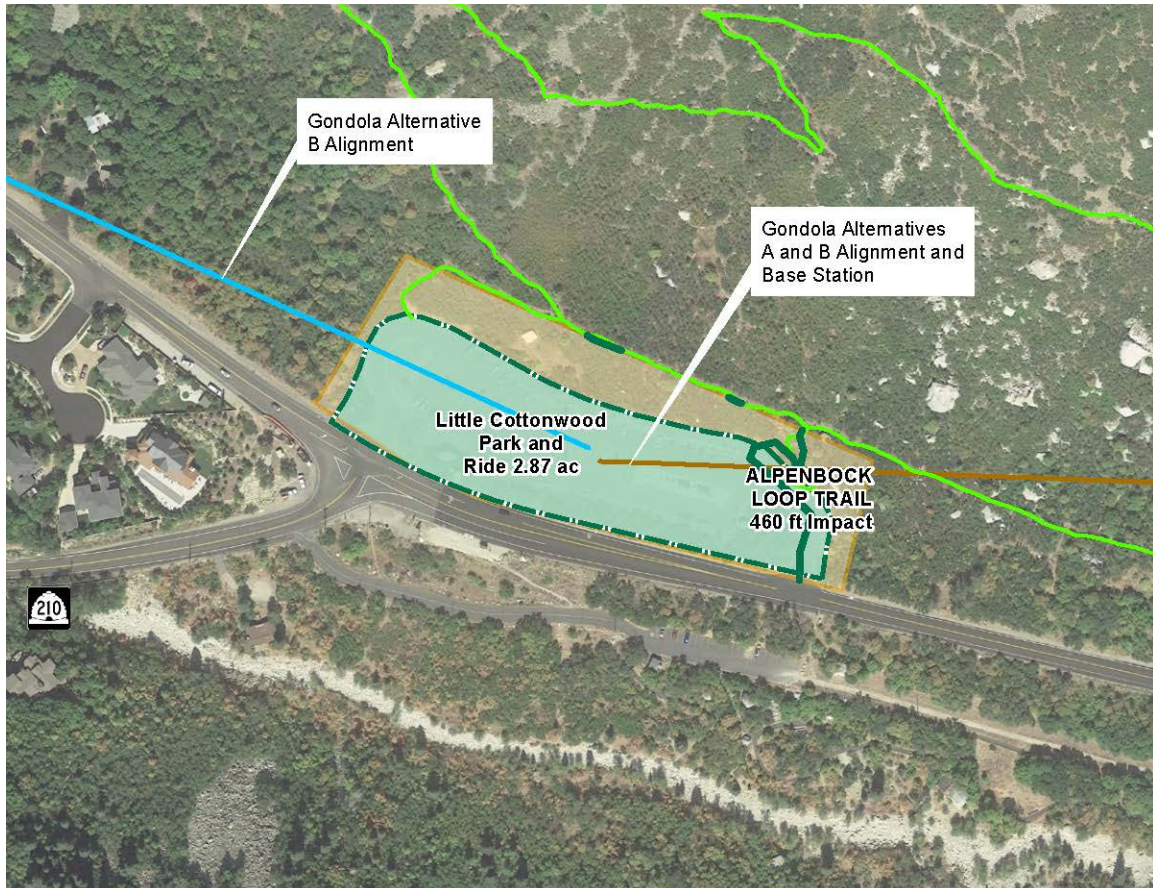
Legend

- Amphitheater
- Group Site
- Restroom
- Tent Site
- Water
- Yurt Site
- Tanners Flat Campground Recreation Site Boundary
- Gondola Alternatives A and B Station and Tower Locations
- Gondola Alternatives A and B Alignment
- Recreation Site Impact Estimate



0 200 Feet

Figure 2. Use of Alpenbock Loop Trail with Gondola Alternative A or B

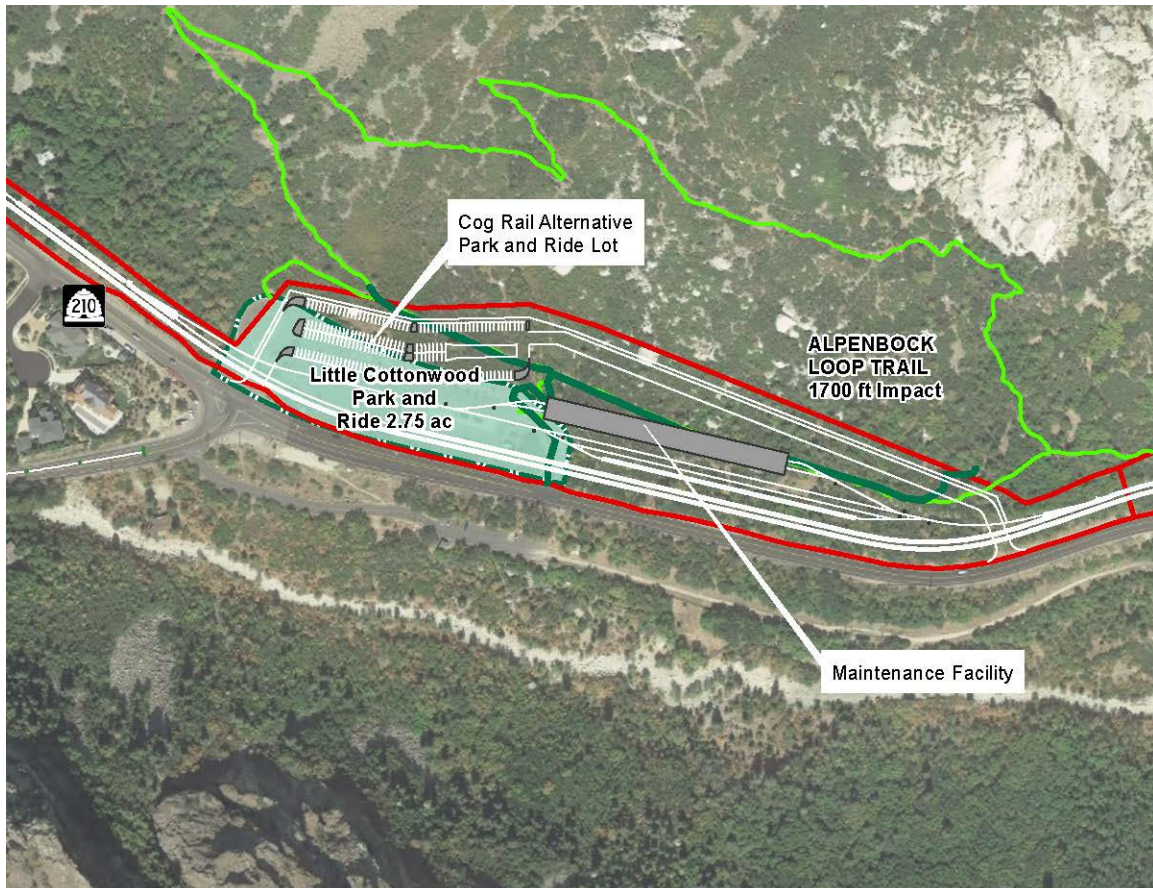


Legend

- Alternative Trail Impacts
- Alpenbock Trails
- Gondola Alternatives A and B Alignment
- Gondola Alternative B Alignment
- Gondola Alternatives A and B Station and Tower Locations
- Recreation Site Impact Estimate
- Little Cottonwood Park and Ride Boundary



Figure 3. Use of Alpenbock Loop Trail with the Cog Rail Alternative



Legend

-  Cog Rail Alternative Impact Boundary
-  Alternative Trail Impacts
-  Alpenbock Trails
-  Recreation Site Impact Estimate
-  Little Cottonwood Park and Ride Boundary



0 200 Feet

Figure 4. Use of Grit Mill Trailhead with Enhanced Bus Service in PPSL Alternative, Gondola Alternatives A and B, or Cog Rail Alternative

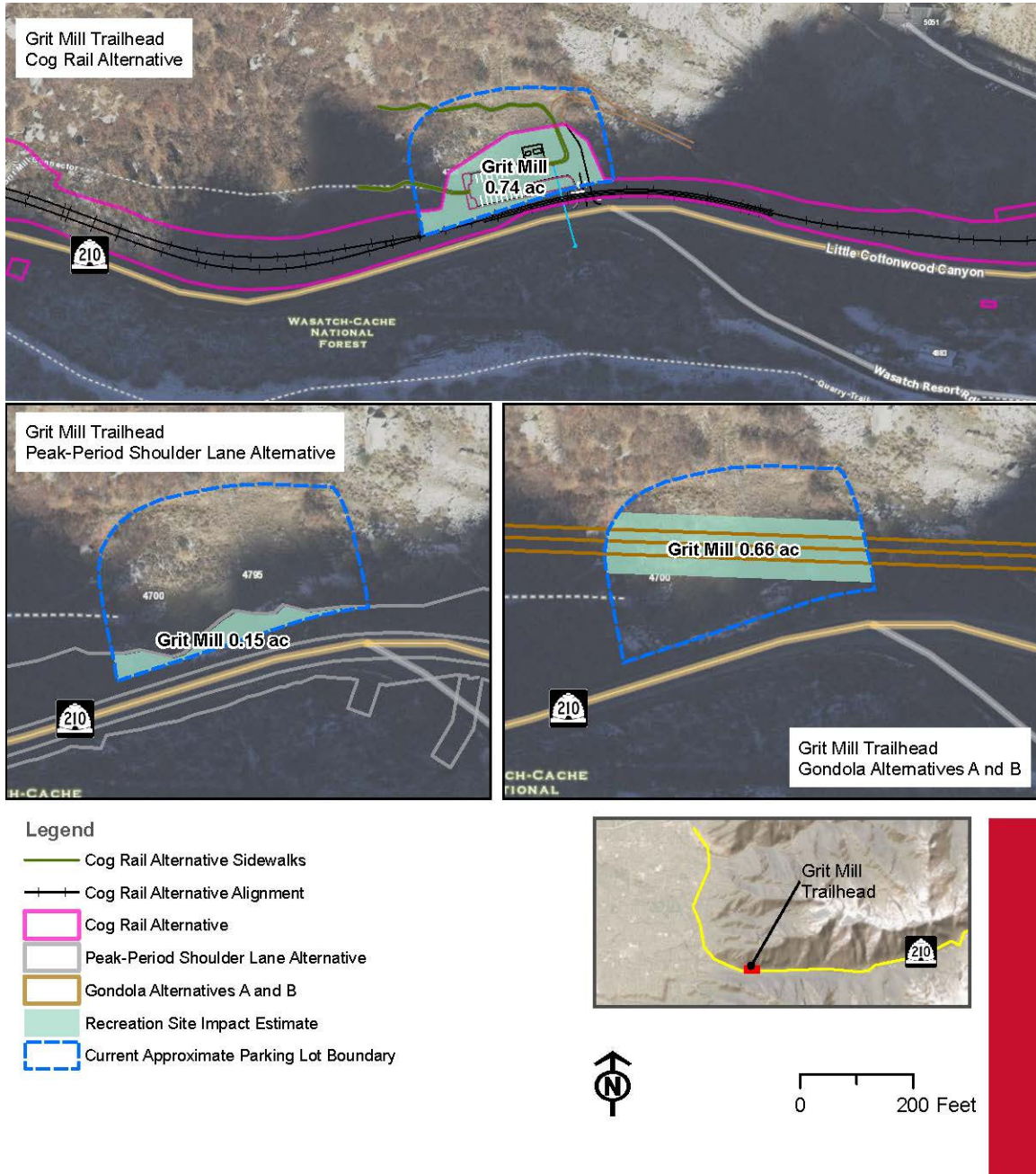


Figure 5. Use of Temple Quarry Nature Trail with Enhanced Bus Service in PPSL Alternative or Cog Rail Alternative

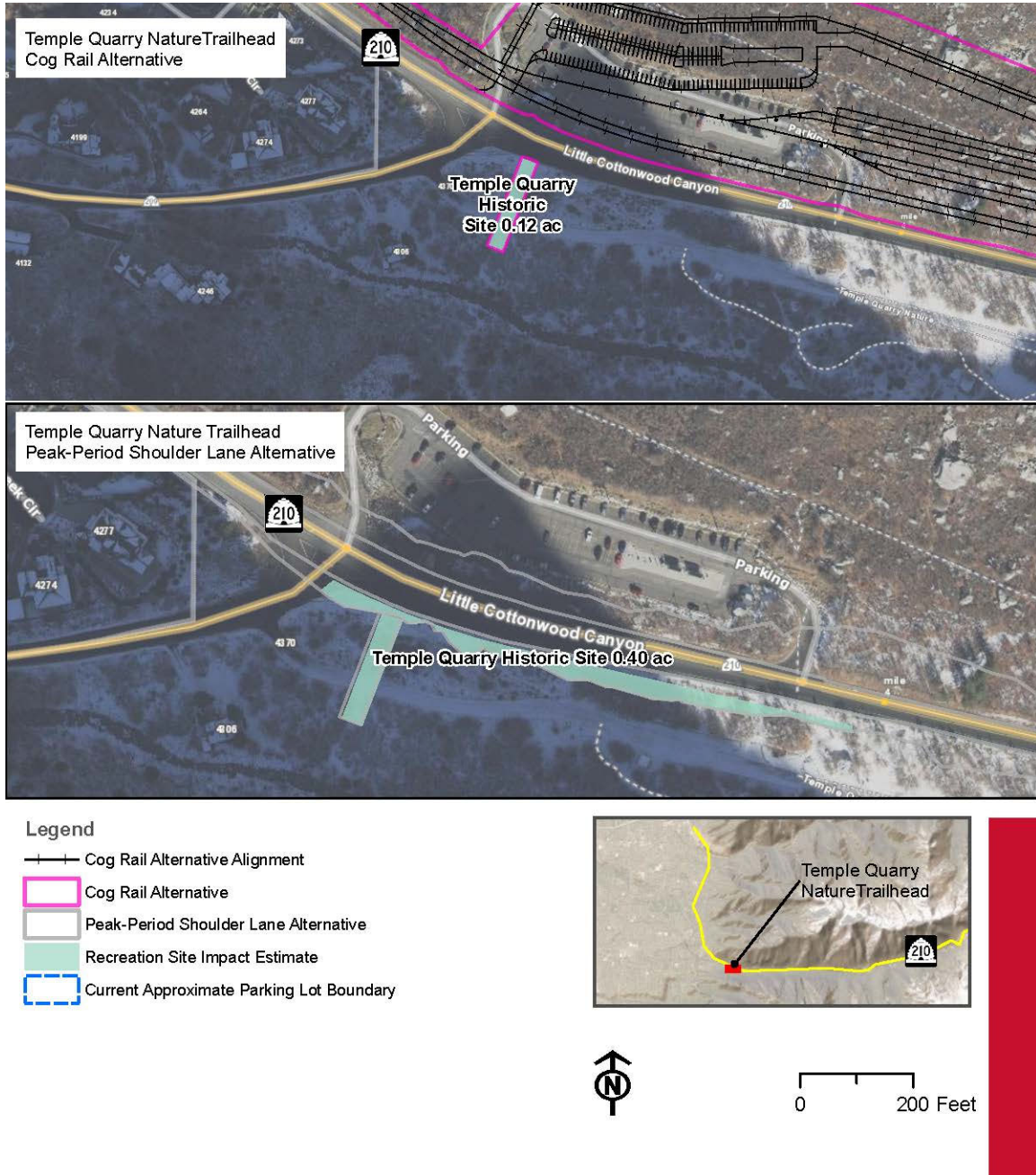


Figure 6. Use of Lisa Falls Trail with the Trailhead Improvement Alternatives or the Cog Rail Alternative

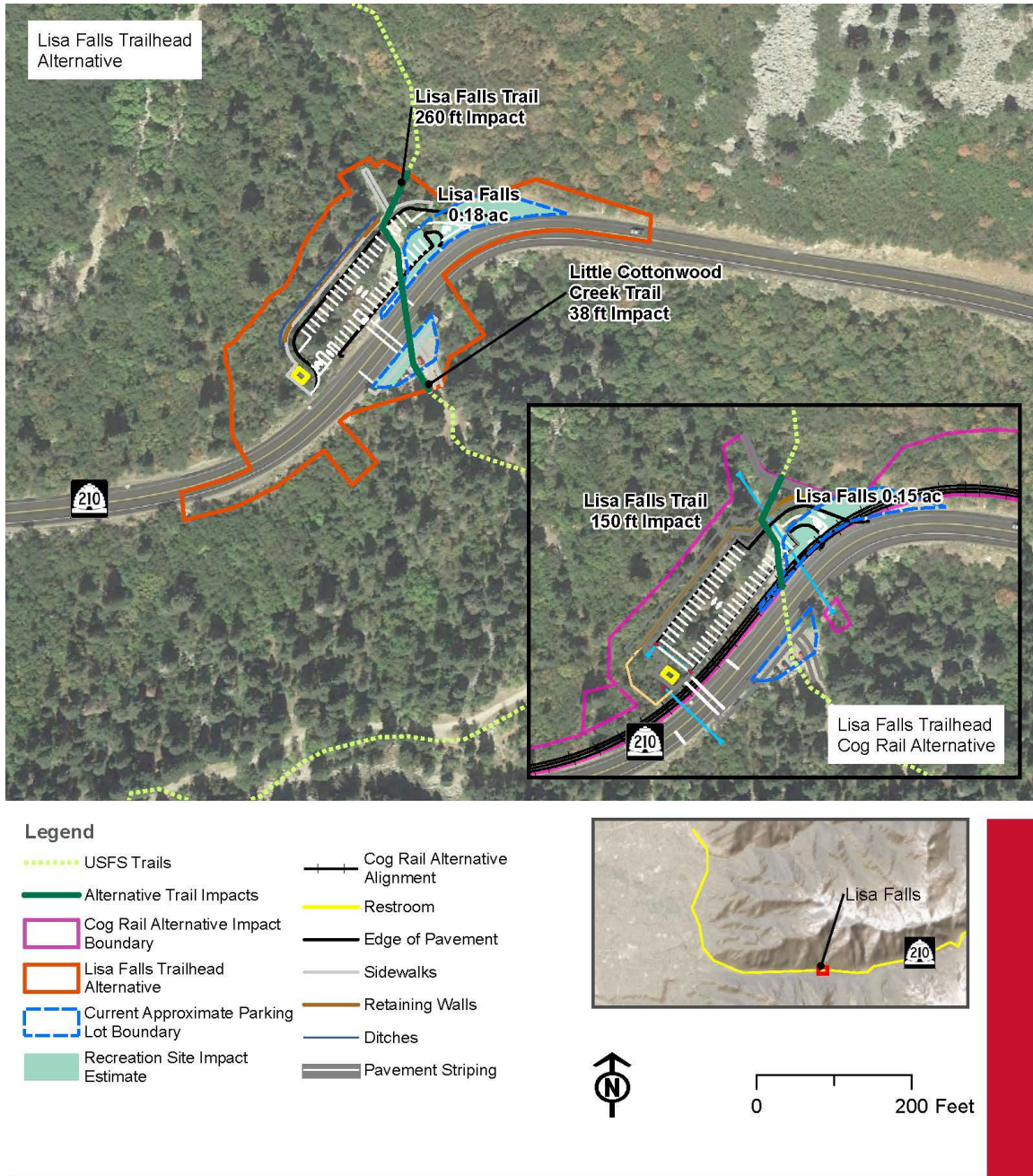
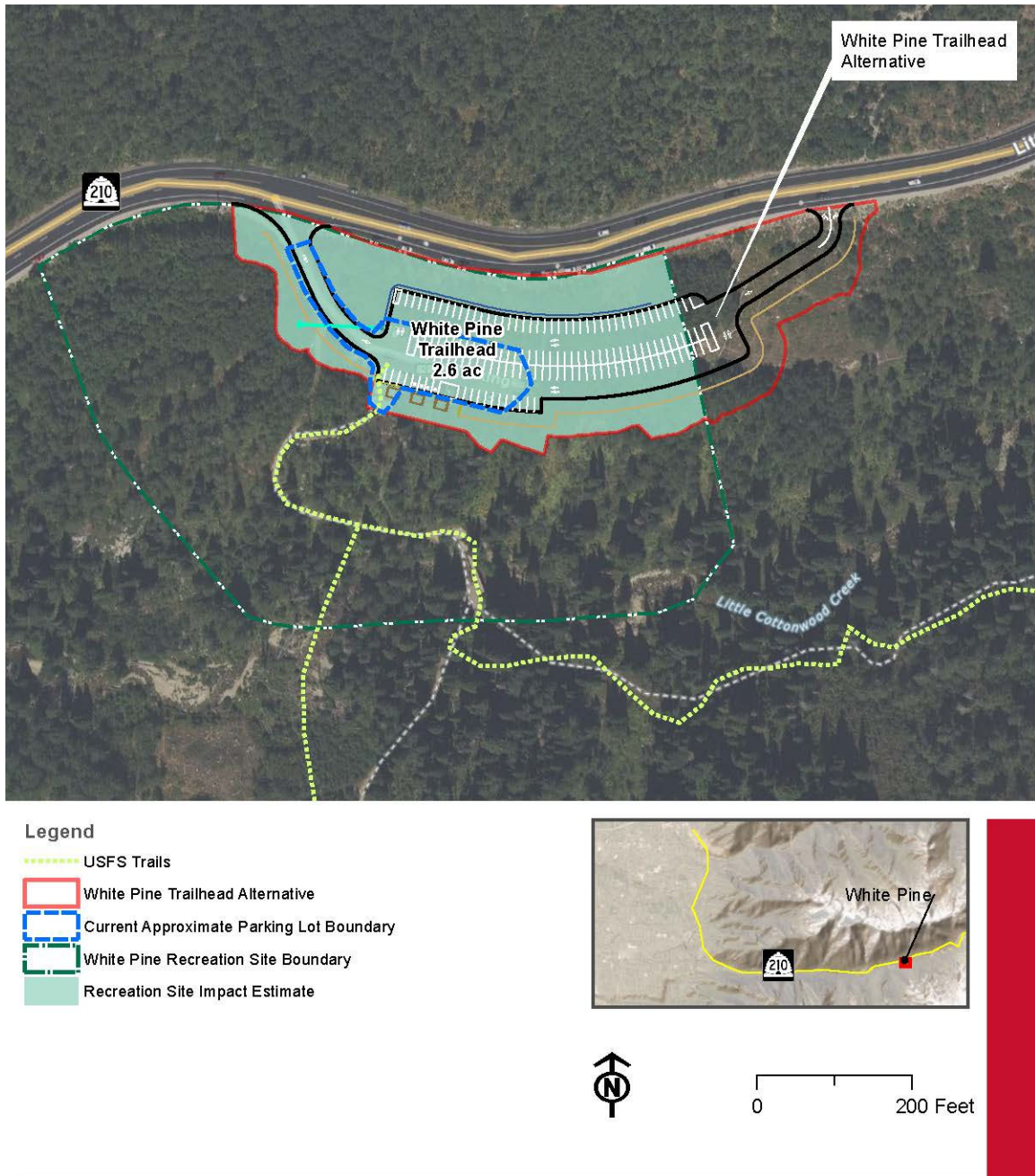


Figure 7. Use of White Pine Trail with the Trailhead Improvement Alternatives



Chapter 27: Public and Agency Consultation and Coordination

27.1 Introduction

This chapter describes the public and agency coordination for the Little Cottonwood Canyon Environmental Impact Statement (EIS). An EIS is typically led by a federal agency because the National Environmental Policy Act (NEPA) is required only for federal actions. In the case of transportation projects that involve federal funding or approval of improvements to the highway system, this agency is the Federal Highway Administration (FHWA).

However, for highway transportation projects in Utah, the Utah Department of Transportation (UDOT) has been assigned the authority to carry out FHWA's responsibility under NEPA and other specified federal environmental laws, including the authority to act as the lead agency for preparing EISs. This assignment was made pursuant to 23 United States Code (USC) Section 327 and is documented in a January 17, 2017, Memorandum of Understanding between FHWA and UDOT. As the lead agency, UDOT is responsible for preparing the Little Cottonwood Canyon EIS, including the requirements for conducting and documenting public and agency coordination and consultation (<https://udot.utah.gov/connect/about-us/program-development-group/environmental-division>).

Who is the lead agency for the Little Cottonwood Canyon EIS?

Pursuant to a memorandum executed by FHWA and UDOT, UDOT is the lead agency responsible for preparing this EIS and carrying out many of the consultation requirements described in this chapter.

27.2 Regulatory Setting

FHWA's guidance for preparing EISs states that an EIS should contain copies of pertinent correspondence with each cooperating agency, other agencies, and the public. It should summarize (1) the early coordination process, including scoping; (2) the meetings with community groups (including minority and nonminority interests) and individuals; and (3) the key issues and pertinent information received from the public and government agencies through these efforts (FHWA 1987).

What is scoping?

Scoping is the formal early coordination process required by the Council on Environmental Quality's 1979 regulations (40 CFR Section 1501.7). It is an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.

27.3 Public and Agency Involvement

Public and agency involvement is important to the success of any project that could affect the community. The planning for the Little Cottonwood Canyon EIS involved extensive coordination and consultation with the affected community, agencies, and other stakeholders. The affected community includes not only the residents and businesses but also landowners, individuals, groups, tribes, and others interested in the project study area.

The planning process was structured and implemented to ensure that all relevant factors were considered, including the affected community's concerns and issues related to the project's purpose and need, engineering solutions, social impacts, environmental impacts, economic effects, and other issues of concern to the community.

27.3.1 Public Outreach Activities and Information Exchange

The goal of the public and agency involvement program and process as a part of NEPA is to gather input from the local community, tribes, and government leadership to help inform the decisions regarding the impacts and implementation of a Preferred Alternative. The public and agency involvement process is open to ensure that interested parties have an opportunity to be involved in planning. Stakeholders had an opportunity to direct, review, and comment on the EIS analysis and results at major milestones reached during the course of the study.

Note that the public involvement process under NEPA is not meant to be a vote-casting or vote-counting process. The information provided through comments during the NEPA process benefits the decision-makers by providing them with relevant information about how the proposed alternative actions are expected to affect the environment, what kind of alternatives or mitigation measures might be appropriate to analyze or require, what resources are important to the stakeholders, and other information. The intent of NEPA, including public comments, is to increase the quantity and quality of information available to decision-makers about the consequences of the proposed action.

What is the intent of NEPA?

The intent of NEPA, including public comments, is to increase the quantity and quality of information available to decision-makers about the consequences of the proposed action.

The public involvement plan for the S.R. 210 Project is available as Appendix A of the *Little Cottonwood Canyon EIS Coordination Plan* (<https://littlecottonwoodeis.udot.utah.gov/wp-content/uploads/2020/05/Little-Cottonwood-EIS-Coordination-Plan-2019-06-14.pdf>).

27.3.2 Outreach Compliance with Federal Laws

The public and agency involvement program was conducted in a manner consistent with NEPA and the regulations in Section 106 of the National Historic Preservation Act. This program was also designed to be consistent with 23 USC Section 139, *Efficient Environmental Reviews for Project Decision-making*, and the corresponding regulations and guidelines of FHWA.

The preparation of this EIS followed these laws by reaching out to the agencies, the public, and other stakeholders and providing an opportunity for input into and collaboration on the processes of defining the project purpose and need and identifying potential alternatives.

27.4 Initial Coordination (Notices of Intent)

A lead agency must publish a Notice of Intent (NOI) to prepare an EIS. The NOI is a requirement of the Council on Environmental Quality's regulation at 40 Code of Federal Regulations (CFR) Section 1501.9 that initiates the mandated scoping process for all EISs. This notice provides a short description of the project, the proposed action, and preliminary alternatives. The NOI also describes the scoping process, identifies any upcoming formal public meetings that are associated with the project, and includes the name, address, and phone number of a contact person.

For the Little Cottonwood Canyon EIS process, three NOIs were published.

27.4.1 First NOI: March 9, 2018

On March 9, 2018, FHWA, on behalf of UDOT, published an NOI to prepare the Little Cottonwood Canyon EIS for proposed improvements to State Route (S.R.) 210 (Federal Register Vol. 83, No. 47, page 10545). The NOI stated UDOT's proposal to make operational improvements, introduce demand-management measures such as tolling, and facilitate implementation of improved public transit service on S.R. 210. UDOT requested public and agency input to the scope of the EIS during a 57-day scoping period from March 9 to May 4, 2018.

27.4.2 Second NOI: March 5, 2019

After reviewing scoping comments and the need for the project, UDOT revised the scope of this EIS to focus on making operational improvements to key intersections in Little Cottonwood Canyon, enhancing safety, and improving wintertime mobility through avalanche mitigation, improving parking at existing U.S. Department of Agriculture (USDA) Forest Service trailheads, and making roadway improvements to Wasatch Boulevard from S.R. 190/Fort Union Boulevard to North Little Cottonwood Road. FHWA, on behalf of UDOT, published a revised NOI on March 5, 2019 (Federal Register Vol. 84, No. 43, page 7967), describing UDOT's revised scope for the project and initiating a new scoping process. Comments on the revised NOI were due on May 3, 2019.

27.4.3 Third NOI: May 15, 2019

As part of the release of the March 5, 2019, revised NOI, UDOT invited public and agency comments during a scoping period from March 5 to May 3, 2019, which included a public scoping meeting on April 9, 2019.

Just prior to the initiation of this scoping period, the Wasatch Front Regional Council (WFRC) released a draft version of its 2019–2050 *Wasatch Front Regional Transportation Plan* (RTP), which included project R-S-53 to widen Little Cottonwood Canyon Road (S.R. 210) from two to three lanes from Wasatch Boulevard to the end of the canyon. This project was not included in WFRC's previous 2015–2040 RTP. The draft 2019–2050 RTP also included a project to implement special bus service in Little Cottonwood Canyon.

What is the Wasatch Front Regional Council (WFRC)?

WFRC is the designated metropolitan planning organization for the Wasatch Front. WFRC works with stakeholders to develop the *Wasatch Front Regional Transportation Plan*, which is the region's plan for highway, transit, and other transportation-related improvements to meet the area's growing transportation needs over the next 30 years.

After reviewing the draft 2019–2050 RTP, UDOT revised the scope of the Little Cottonwood Canyon EIS. The revised scope included the same elements from the March 5, 2019, revised NOI plus the addition of the two projects on S.R. 210 in Little Cottonwood Canyon from the draft 2019–2050 RTP. The third NOI was published on May 15, 2019 (Federal Register Vol. 94, No. 94, page 21895).

To ensure that the public was informed about UDOT’s intention to analyze widening Little Cottonwood Canyon Road in the EIS, UDOT sent an email to interested stakeholders and agencies and held an agency scoping meeting on April 3, 2019, notifying them of the change in EIS focus. In addition, the change in EIS focus was included in project information provided at the April 9, 2019, public scoping meeting. The scoping period for public comments was extended from May 3 to June 14, 2019, to allow additional time for the public and agencies to comment on the third NOI.

27.5 Agency Coordination

Throughout the EIS process, UDOT coordinated with federal, state, and local agencies that oversee the management of natural resources in the project study area. Since these agencies oversee impacts and issue permits regarding their resource areas, it is important to include them from the initial scoping activities throughout the project’s development. In this way, issues are identified early so that they can be properly considered and, if necessary, avoided, minimized, or mitigated as the project progresses.

During the EIS scoping period for the first (March 9, 2018) NOI, the agencies were notified of the consultation and coordination requirements in 23 USC Section 139 at the agency scoping meeting that was held in Salt Lake City on April 9, 2018. The preparation of this EIS meets the intent of this law because UDOT reached out to agencies and gave them an opportunity to provide input into and collaborate on the processes of defining the project’s purpose and need and identifying potential alternatives.

As part of the release of the second NOI on March 5, 2019, a second agency scoping meeting was held in Salt Lake City on April 3, 2019. Information from both agency scoping meetings was used to inform the development of this EIS.

27.5.1 Coordination Plan

The purpose of the *Little Cottonwood Canyon EIS Coordination Plan* was to identify the coordination that UDOT would undertake with the federal, state, and local agencies who agreed to be participating or cooperating agencies during the NEPA process for the Little Cottonwood Canyon EIS in accordance with 23 USC Section 139. The *Coordination Plan* defined the roles and expectations of the participating and cooperating agencies and established a commitment to review the EIS at specific milestones. The public was notified of the availability of the *Coordination Plan* at the public scoping meeting (see Section 27.7.2, Public Scoping) as part of the scoping period for the March 9, 2018, NOI.

As part of the release of the March 5, 2019, NOI, UDOT revised and released the *Coordination Plan* for agency and public review in June 2019.

Since that time, the members of the UDOT team and participating and cooperating team members changed, with UDOT announcing a new project manager and several of the agencies announcing a new point of contact. Following these changes, UDOT revised the *Coordination Plan* in July 2020 and placed it on the project website (<https://littlecottonwoodeis.udot.utah.gov>) for review.

27.5.2 Identification of Participating and Cooperating Agencies

Agencies that would have permitting or other authority for the S.R. 210 Project were invited to participate in the project planning process as NEPA cooperating agencies.

In addition, federal and nonfederal agencies that might have an interest in the project but not necessarily permitting authority were invited to participate in the project planning process as participating agencies. These agencies were invited to become participating agencies in the environmental review process according to 23 USC Section 139.

The roles and responsibilities of cooperating and participating agencies include but are not limited to:

- Participating in the NEPA process starting at the earliest possible time, especially with regard to the development of the purpose and need statement, range of alternatives, methodologies, and Preferred Alternative.
- Identifying, as early as practicable, any issues of concern regarding the project's potential environmental or socioeconomic impacts. Participating agencies are also allowed to participate in an issue-resolution process.
- Providing meaningful and timely input on unresolved issues.
- Participating in the scoping process.

Other federal, state, and local agencies and organizations (referred to as nonparticipating agencies and organizations) were contacted as necessary to obtain information about the study area and any issues or concerns they had.

27.5.2.1 Cooperating Agencies

A *cooperating agency* is defined in 40 CFR Section 1508.5 of the Council on Environmental Quality's NEPA regulations as a federal agency, other than a lead agency, that has jurisdiction by law or special expertise with respect to environmental impacts involved in a proposed project or project alternative. Their selection and responsibilities are defined in 40 CFR Section 1501.6. All cooperating agencies are participating agencies by definition.

As part of the release of the first (March 9, 2018) NOI, UDOT sent invitation letters to five federal agencies (Advisory Council on Historic Preservation, U.S. Army Corps of Engineers, USDA Forest Service, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service) and two local agencies (Salt Lake City Department of Public Utilities and Utah Transit Authority) on March 7, 2018, inviting them to be either a cooperating agency or a participating agency. The U.S. Army Corps of Engineers, the USDA Forest Service, the U.S. Environmental Protection Agency, the Salt Lake City Department of Public Utilities, and the Utah Transit Authority accepted the invitation to be a cooperating agency.

As part of the release of the second (March 5, 2019) NOI, UDOT sent a letter on February 27, 2019, to the cooperating agencies that accepted the March 7, 2018, invitation informing them of the revised NOI and

What is a cooperating agency?

A cooperating agency is any federal agency, other than a lead agency, that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed project or project alternative. All cooperating agencies are participating agencies by definition.

second EIS scoping period. The letter noted the revised scope of the EIS process. The letter also stated that UDOT intended to continue the process with the list of agencies that accepted cooperating and/or participating agency status as part of the first (March 9, 2018) NOI, unless the agency wished to change its status of being a cooperating and/or participating agency. None of the agencies changed its cooperating agency status.

27.5.2.2 Participating Agencies

A *participating agency* is defined as a federal or nonfederal agency “that might have an interest in the project.” The selection and responsibilities for participating agencies are defined in 23 USC Section 139 and differ from those defined for cooperating agencies. For instance, participating agencies are given an opportunity to help develop the project’s purpose and need statement and the range of alternatives considered as well as the coordination plan and the schedule for the project. A participating agency is not necessarily also a cooperating agency.

What is a participating agency?

A participating agency is a federal or nonfederal agency that might have an interest in the project. A participating agency is not necessarily also a cooperating agency.

As part of the release of the first (March 9, 2018) NOI, UDOT sent invitation letters on March 7, 2018, to the 7 agencies listed in Section 27.5.2.1, Cooperating Agencies, as well as 37 additional state agencies, regional governments or agencies, and local governments inviting them to participate in the environmental review process as a participating agency. Letters for the state agencies were sent through the Governor’s Office of Management and Budget, Resource Development Coordinating Committee (RDCC), since UDOT’s environmental process guidelines state that requests for state agencies to become participating agencies should be processed through RDCC. Of the agencies invited to be participating agencies, 17 accepted the invitation. The participating agencies are:

- U.S. Fish and Wildlife Service
- Governor’s Office, Public Lands Policy Coordinating Office, Resource Development Coordinating Committee (RDCC)
- Utah Division of Air Quality
- Utah Division of Forestry, Fire and State Lands
- Utah Division of Indian Affairs
- Utah Division of Water Quality
- Utah Office of Tourism
- Salt Lake County, Planning and Development
- Salt Lake County, Public Works and Municipal Services Department, Engineering Division
- Salt Lake County, Regional Transportation, Housing and Economic Development
- Cottonwood Heights City
- Murray City
- Sandy City
- Town of Alta
- Central Wasatch Commission
- Metropolitan Water District of Salt Lake and Sandy
- Wasatch Front Regional Council

As part of the release of the second (March 5, 2019) NOI, UDOT sent letters on February 27, 2019, to the participating agencies that accepted the March 7, 2018, invitation informing them of the revised NOI and second EIS scoping period. The letter noted that the EIS process had been focused on fewer improvements that were practicable and implementable. The letter also stated that UDOT intended to continue the process

with the list of agencies that accepted cooperating and/or participating agency status as part of the March 9, 2018, NOI unless the agency wished to change its status of being a cooperating and/or participating agency. None of the agencies changed its participating agency status.

27.5.2.3 Tribes

Because of the potential for cultural resources near the project study area, invitations to be participating agencies were sent on March 7, 2018, and on February 27, 2019, to the Cedar Band of Paiutes, Confederated Tribes of the Goshute Reservation, Eastern Shoshone Tribe of the Wind River Reservation, Northwest Band of the Shoshone Nation, Shivwits Band of the Paiute Indian Tribe of Utah, Shoshone-Bannock Tribe of the Fort Hall Reservation, Skull Valley Band of Goshutes, and Ute Indian Tribe of the Uintah and Ouray Reservation. The tribes were provided project information and invited to attend the agency scoping meeting. None of the tribes responded to the request to become a participating agency.

27.6 Agency Scoping

27.6.1 April 9, 2018, Agency Scoping Meeting

On March 7, 2018, as part of the release of the first (March 9, 2018) NOI, UDOT sent invitation letters to the agencies listed in Section 27.5.2.1, Cooperating Agencies, as well as 37 additional state agencies, regional governments or agencies, and local governments inviting them to participate in the environmental review process as a cooperating and/or participating agency and notifying them of the agency scoping meeting scheduled for April 9, 2018. These letters invited agency representatives to attend the meeting, requested agency involvement as a cooperating or participating agency for the Little Cottonwood Canyon EIS, and solicited agency comments on the resources in the project study area. In addition, the tribes listed in Section 27.5.2.3, Tribes, were invited to the agency scoping meeting. Table 27.6-1 lists the agencies that attended the first agency scoping meeting.

Table 27.6-1. Attendees of the April 9, 2018, Agency Scoping Meeting

Attendees	
U.S. Army Corps of Engineers	Utah Transit Authority
U.S. Department of Agriculture Forest Service	Salt Lake County
U.S. Environmental Protection Agency	Cottonwood Heights City
Governor's Office, Public Lands Policy Coordinating Office, Resource Development Coordinating Committee (RDCC)	Salt Lake City Department of Public Utilities
Utah Division of Air Quality	Sandy City
Utah Division of Forestry, Fire and State Lands	Town of Alta
Utah Division of Indian Affairs	Central Wasatch Commission
Utah Division of Water Quality	Metropolitan Water District of Salt Lake and Sandy
Utah Office of Tourism	Wasatch Front Regional Council

A brief presentation was given that included a project overview as well as the requirements of being a cooperating and/or participating agency. The materials that were discussed at the meeting included the purpose of and need for the project, potential alternatives, alternatives screening, indirect impacts, and other issues pertaining to the S.R. 210 Project. In addition, to help identify potential issues, UDOT completed an environmental checklist with input from the agencies. The meeting minutes, a summary of the comments received, and the meeting notification materials are included in the July 12, 2018, *Little Cottonwood Canyon EIS Scoping Summary Report*, which is available on the project website (<https://littlecottonwoodeis.udot.utah.gov>).

27.6.2 April 3, 2019, Agency Scoping Meeting

On February 27, 2019, as part of the release of the second (March 5, 2019) NOI, UDOT sent letters to the cooperating and participating agencies listed in Section 27.5.2, Identification of Participating and Cooperating Agencies, inviting them to attend a second agency scoping meeting scheduled for April 3, 2019. These letters invited agency representatives to attend the meeting, requested agency involvement as a cooperating or participating agency, and solicited agency comments on the resources in the project study area. Table 27.6-2 lists the agencies that attended the second agency scoping meeting.

Table 27.6-2. Attendees of the April 3, 2019, Agency Scoping Meeting

Attendees	
U.S. Army Corps of Engineers	Cottonwood Heights City
U.S. Department of Agriculture Forest Service	Murray City
Utah Division of Air Quality	Salt Lake City Department of Public Utilities
Utah Office of Tourism	Central Wasatch Commission
Utah Transit Authority	Metropolitan Water District of Salt Lake and Sandy
Salt Lake County	Wasatch Front Regional Council

A brief presentation was given that included a project overview. The materials that were discussed at the meeting included the purpose of and need for the project, potential alternatives, alternatives screening, indirect impacts, and other issues pertaining to the project. In addition, to help identify potential issues, UDOT completed an environmental checklist with input from the agencies. Following the meeting, an email was sent to all of the participating and cooperating agencies that both attended and did not attend the April 3, 2019, meeting with a copy of the presentation and a fact sheet about the project. The meeting minutes, a summary of the comments received, and the meeting notification materials are included in the September 27, 2019, *Little Cottonwood Canyon EIS Scoping Summary Report*, which is available on the project website (<https://littlecottonwoodeis.udot.utah.gov>).

27.6.3 Additional Agency Coordination

UDOT used the agency comments received during the scoping period, along with other transportation and environmental data and the analysis collected during the environmental studies, to help identify the purpose of and need for the project, refine alternatives, and make decisions regarding the methodology for the alternatives analysis.

27.6.4 Opportunities for the Cooperating and Participating Agencies to Help Develop the Project Purpose and Need Statement

27.6.4.1 March 11, 2019, Purpose and Need Statement

The statute at 23 USC Section 139 requires an opportunity for cooperating and participating agencies to help develop a project’s purpose and need statement. On March 11, 2019, as part of the second (March 5, 2019) scoping period, UDOT published a draft of the project purpose and need statement for review by the agencies and the public through June 17, 2019. Members of the public and agencies were encouraged to provide comments by email, on the project website, and by postal mail. UDOT received two comments on the draft purpose and need statement. The draft purpose and need statement was also discussed at the agency scoping meeting on April 3, 2019.

27.6.4.2 November 4, 2019, Purpose and Need Statement

Based on comments received on the March 11, 2019, purpose and need statement and the revised scope of the project described in the third (May 15, 2019) NOI, UDOT revised the purpose and need statement. A notice about the comment period for the revised purpose and need statement was sent to cooperating and participating agencies on October 11, 2019, notifying the agencies of the comment period from November 4 through December 13, 2019, and an agency meeting to discuss the revised purpose and need statement on October 30, 2019.

Table 27.6-3 lists the agencies that attended the meeting. Darker blue shading indicates agencies that provided comments on the purpose and need statement during the comment period.

Table 27.6-3. Attendees of the October 30, 2019, Agency Meeting

Attendees	
U.S. Army Corps of Engineers	Salt Lake County
U.S. Department of Agriculture Forest Service	Cottonwood Heights City
U.S. Environmental Protection Agency	Murray City
Utah Division of Air Quality	Salt Lake City Department of Public Utilities
Utah Division of Water Quality	Sandy City
Utah Office of Tourism	Central Wasatch Commission
Utah Public Lands Policy Coordinating Office	Metropolitan Water District of Salt Lake and Sandy
Utah Transit Authority	Wasatch Front Regional Council

Darker blue shading indicates agencies that provided comments on both the purpose and need statement and the *Alternatives Screening Methodology Report*.

27.6.5 Opportunities for the Cooperating and Participating Agencies To Help Define the Range of Alternatives

27.6.5.1 March 11, 2019, Alternatives Screening Methodology Report

The statute at 23 USC Section 139 requires an opportunity for cooperating and participating agencies to help define the range of alternatives. On March 11, 2019, UDOT published a draft of the *Alternatives Screening Methodology Report* for review by the agencies and the public through June 14, 2019. Members of the public and agencies were encouraged to provide comments by email, on the project website, and by postal mail. UDOT received two comments on the draft *Alternatives Screening Methodology Report*. The report was also discussed at the agency scoping meeting on April 3, 2019.

27.6.5.2 November 4, 2019, Alternatives Screening Methodology Report

Based on comments received on the March 11, 2019, *Alternatives Screening Methodology Report* and the revised scope of the project described in the third (May 15, 2019) NOI, UDOT revised the *Alternatives Screening Methodology Report*. A notice about the comment period for the revised report was sent to cooperating and participating agencies on October 11, 2019, notifying them of the comment period from November 4 through December 13, 2019, and an agency meeting to discuss the report on October 30, 2019.

Table 27.6-3 above lists the agencies that attended the meeting. Darker blue shading indicates agencies that provided comments on the *Alternatives Screening Methodology Report* during the comment period.

27.6.5.3 June 8, 2020, Alternatives Screening Report

Based on the alternatives suggested by the public and agencies during the scoping periods, the review of the purpose and need statement, and the review of the *Alternatives Screening Methodology Report*, UDOT conducted an alternatives development and screening process. The results of this process were published in the *Alternatives Screening Report* for agency and public review on June 8, 2020. The review and comment period was open from June 8 through July 10, 2020. UDOT sent notifications of the release of the *Alternative Screening Report* for review by email on May 11, 2020. In addition, UDOT held an agency meeting online on June 4, 2020, to go over the results of the report. At the meeting, UDOT provided an overview of the alternatives considered, the screening process, and the results of the screening process.

Table 27.6-4 shows the agencies that attended on online meeting. The meeting was held online because of social distancing requirements related to the Coronavirus Disease 2019 (COVID-19) pandemic.

Table 27.6-4. Attendees of the June 4, 2020, Online Alternatives Development Meeting

Attendees	
U.S. Army Corps of Engineers	Utah Transit Authority
U.S. Department of Agriculture Forest Service	Salt Lake County
U.S. Environmental Protection Agency	Cottonwood Heights City
Utah Division of Air Quality	Salt Lake City Department of Public Utilities
Utah Division of Indian Affairs	Sandy City Water Department
Utah Division of Water Quality	Town of Alta
Utah Office of Tourism	Central Wasatch Commission
Utah Public Lands Policy Coordinating Office	Metropolitan Water District of Salt Lake and Sandy

27.6.6 Coordination and Consultation Required by Section 106 of the National Historic Preservation Act

Section 106 of the National Historic Preservation Act (codified at 54 USC Section 306108) requires federal agencies that fund, permit, or are otherwise involved in a project (for example, as a landowner) to consider the impacts that the federal undertaking would have on historic and archaeological resources. Pursuant to the Memorandum of Understanding by which FHWA assigned certain of its authorities to UDOT, UDOT is responsible for compliance with Section 106 for the S.R. 210 Project and is conducting the compliance process as part of this EIS.

The regulations at 36 CFR Part 800, commonly referred to as the Section 106 regulations, implement the National Historic Preservation Act and describe the process through which the above actions are carried out. This process includes steps for consulting with state and/or tribal historic preservation officers, the Advisory Council on Historic Preservation, Native American tribes, and other interested parties.

For the S.R. 210 Project, in addition to federal and state agencies, UDOT consulted with several other entities with direct interest in historic architectural properties or archaeological resources that could be affected by the action alternatives. Agencies with direct jurisdiction over land within or adjacent to the action alternatives were also consulted. These entities included certified local governments (CLGs), historical societies and organizations, and mayors or town councils where no CLG or historical society exists. CLGs are entities that meet historic preservation standards established by the National Park Service and the State Historic Preservation Office (SHPO), that act under the guidance of the SHPO, and that can be federally funded through the SHPO.

What is an undertaking?

An undertaking is a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency, those carried out with federal financial assistance, and those requiring a federal permit, license, or approval.

What are interested parties?

Interested parties include property owners, local historic preservation societies, and neighborhood associations with a demonstrated interest in the project.

UDOT contacted the following groups by letter, invited them to become consulting parties for the project, and invited them to provide information about architectural and archaeological resources of importance to their communities or organizations:

- Alta Community Enrichment
- Alta Historical Society
- Cottonwood Canyons Foundation
- Cottonwood Heights CLG
- Cottonwood Heights Historic Committee
- Friends of Alta
- Salt Lake City CLG
- Save Our Canyons
- The Church of Jesus Christ of Latter-day Saints, Church History Department
- Wasatch Mountain Club

UDOT's consultation with the agencies, municipalities, and CLGs focused on soliciting information about the known or potential presence of historic architectural properties and archaeological resources in the areas that could be directly or indirectly affected by the action alternatives. To date, none of the above groups has identified any specific concerns in the project's area of potential effects.

27.6.7 Tribal Consultation

The National Historic Preservation Act and Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, require that federal agencies involved in a project that could affect resources of importance to Native American tribes must consult with those tribes when the location of the federal undertaking is within an area of traditional use for the tribe and/or could affect resources of cultural, religious, or traditional importance to the tribe. This consultation is to occur at a government-to-government level in recognition of the sovereign status of the tribes.

Under the January 17, 2017, Memorandum of Understanding executed between FHWA and UDOT, FHWA has assigned most of its responsibilities in the environmental review process to UDOT, but FHWA has retained its responsibility for government-to-government consultation with Native American tribes under Section 106 of the National Historic Preservation Act. In accordance with the Memorandum of Understanding, UDOT is responsible for carrying out most of the responsibilities of a federal agency in the Section 106 process, including notifying Native American tribes. If a tribe requests government-to-government consultation with the federal government, FHWA would be responsible for carrying out that consultation directly with the tribe.

UDOT provided notification of the S.R. 210 Project and EIS to the tribal chairperson or president, and to the tribal historic preservation officer, of the Cedar Band of Paiutes, Confederated Tribes of the Goshute Reservation, Eastern Shoshone Tribe of the Wind River Reservation, Northwest Band of the Shoshone Nation, Shivwits Band of the Paiute Indian Tribe of Utah, Shoshone-Bannock Tribe of the Fort Hall Reservation, Skull Valley Band of Goshutes, and Ute Indian Tribe of the Uintah and Ouray Reservation. Notification included written correspondence inviting the tribes to participate in consultation on the project. The following specific correspondences were sent:

- **Letter on March 7, 2018.** The letter included an invitation to become a consulting party in the Section 106 process and a brief description of the project.
- **Letter on February 27, 2019.** The letter included information about the release of a revised Notice of Intent, project study area, potential project alternatives, and date and time of a scoping meeting.
- **Email on April 4, 2019.** The email included information about the release of a revised Notice of Intent and two attachments—one a presentation about the project that included information about the study area and potential alternatives and the other a fact sheet detailing why the project is needed.
- **Letter on April 5, 2019.** The letter provided new information regarding the release of a revised Notice of Intent and changes to the project including the potential to add vehicle capacity to S.R. 210 in Little Cottonwood Canyon.
- **Letter on June 21, 2019.** The letter included an updated invitation to become a Section 106 consulting party and information about the revised Notice of Intent published in the Federal Register on May 15, 2019.

One tribe responded to the letters and email. The Shoshone-Bannock Tribe of the Fort Hall Reservation responded to the February 27, 2019, letter and requested copies of the cultural resources survey conducted for the area. UDOT provided the project archaeological survey report to the tribe in February 2021 after the surveys were completed. The tribe also asked that the tribes be notified of any inadvertent discoveries during project implementation, which has been included in the project mitigation per the tribe's request.

In addition to receiving the letters and email listed above, the tribes were also included in the general email list for the project and received the notifications described in this chapter for each stage of the EIS process. To date, none of the tribes has identified any specific sites, resources, or traditional cultural places of concern in the project's area of potential effects. To date, no tribe has requested direct government-to-government consultation with FHWA.

27.6.8 Coordination with Providers of Environmental Justice Services

A primary goal of environmental justice coordination is to reach low-income and minority populations that have historically not been able to participate in the transportation decision-making process as readily as other groups. UDOT made specific efforts to contact all people living along and adjacent to S.R. 210, including any low-income or minority populations.

Representatives with public agencies, social services, and nonprofit organizations were contacted and interviewed to identify low-income, minority, and homeless populations in and around the environmental justice impact analysis area (for more information, see Chapter 5, Environmental Justice). This included outreach to the following County, Cities, and Town that currently provide services in this area:

- Salt Lake County
- Cottonwood Heights City
- Sandy City
- Town of Alta

Other public involvement and outreach efforts included the following:

- **Public Meetings.** During the development of this Draft EIS, two different series of public meetings (scoping and alternatives development) were held. Meetings were announced in local media outlets and through city websites.
- **Email Update List.** Members of the public who wanted to receive project information by email were sent regular updates about the project. These updates notified recipients about new information on the project website, upcoming events, and major project milestones.
- **Telephone Comment Line.** A telephone comment line recorded messages from people who called in their comments. A record was kept of all comments, and people who requested a response were contacted within a few days of their call. The telephone number was advertised on all communication materials including fact sheets, newsletters, brochures, display advertisements, and information displays. Fliers and comment forms also have contact information for Spanish speakers to get project information.
- **Project Website.** The project website (<https://littlecottonwoodeis.udot.utah.gov>) was used to provide public access to timely information about the project and to allow quick, easy interaction with UDOT team members. The public was able to read information about the project, including the plans under consideration, and submit their comments online. Although the website was not a primary communication method for those who do not have internet access, it was an important way for those who do have access to become involved in the project. The project website was also available in Spanish. UDOT also coordinated with local municipalities to post links on their websites that send the public to the S.R. 210 Project website if they want more information.
- **Social Media.** UDOT provided project updates and posted notification of public meetings and comment periods on Facebook, Twitter, and Instagram.

What is environmental justice?

Environmental justice is a term used to describe the fair and equitable treatment of minority and low-income people with regard to federally funded projects and activities.

27.6.9 Meetings with City and County Councils

During the scoping process for the first (March 9, 2018) NOI, UDOT presented at one town council meeting, one city council meeting, and one county council meeting. UDOT presented to the Town of Alta Council on April 12, 2018; the Sandy City Council on April 17, 2018; and the Salt Lake County Council on April 24, 2018. The presentations included information regarding the project's purpose and need, alternatives, environmental review process, and schedule.

During the scoping process for the second (March 5, 2019) NOI, UDOT presented to the Town of Alta Council on April 11, 2019; the Sandy City Council on April 23, 2019; the Salt Lake County Council on June 11, 2019; the Salt Lake City Council on June 11, 2019; and the Cottonwood Heights City Council on April 2, 2019. UDOT encouraged councils to submit scoping comments.

At each major EIS milestone following the scoping process (purpose and need statement and alternatives development), UDOT met with the town, city, and county councils. For more information, see Section 27.7.3, Purpose and Need Public Review and Comment Periods, and Section 27.7.4, Alternatives Development Process.

27.6.10 Meetings with the Cottonwood Heights City Planning and Engineering Departments

During the Draft EIS process, UDOT meet with members of the Cottonwood Heights City planning and engineering departments to discuss development of the Wasatch Boulevard alternatives and issues important to their residents. UDOT worked with Cottonwood Heights City to ensure that elements of its *Wasatch Boulevard Corridor Master Plan* were considered in developing alternatives. UDOT scheduled meetings at least monthly with Cottonwood Heights City throughout development of this Draft EIS.

27.6.11 Meetings with the Salt Lake City Department of Public Utilities

During the Draft EIS process, UDOT meet with staff from the Salt Lake City Department of Public Utilities to discuss water quality and stormwater runoff issues related to the watershed in Little Cottonwood Canyon. Staff with the Department of Public Utilities stated in these meetings the importance of the watershed in Little Cottonwood Canyon to Salt Lake City's water supply. During the meetings, the attendees discussed best management practices related to stormwater runoff. UDOT scheduled monthly meetings with the Department of Public Utilities throughout the development of this Draft EIS.

27.6.12 Meetings with the USDA Forest Service

During the Draft EIS process, UDOT regularly met with staff from the USDA Forest Service to discuss issues related to project impacts to National Forest System land in Little Cottonwood Canyon. The meetings included exchanges of information about existing conditions and discussions about the methodology for the environmental analysis, potential alternatives to be considered in the EIS, and land transfers and easements.

27.6.13 Meetings with the Utah Transit Authority

During the Draft EIS process, UDOT regularly met with staff from the Utah Transit Authority (UTA) to discuss issues related to the development of transit alternatives. UTA provided technical expertise regarding the operation of bus service and rail service including maintenance. This expertise allowed UDOT to develop transit alternatives that could be operated by UTA.

27.7 Public Involvement

In addition to agency coordination, public participation is important to developing sound recommendations and selecting alternatives that are supported by the community. UDOT's commitment at the beginning of this environmental review process was to proactively involve the public so decisions could be made that reflect the goals of those who live, work, and travel in the project study area. Throughout this process, UDOT has kept the public informed and has incorporated their feedback.

UDOT designed this EIS process to comply with public involvement requirements under NEPA and 23 USC Section 139 by reaching out to the public and giving the public an opportunity to provide input into and collaborate on the processes of defining the project purpose and need statement, identifying potential alternatives, and seeking an understanding of how a Preferred Alternative or Alternatives was selected.

27.7.1 Coordination and Public Involvement Plan

The *Little Cottonwood Canyon EIS Coordination Plan* included a public involvement element that introduced several strategies to inform the public about the project, develop an understanding of how a Preferred Alternative or Alternatives was selected, and address agency and public issues during the course of the EIS process. The goals of this plan were to:

- Provide a way for stakeholder agencies and the public to have direct and meaningful impacts on the project.
- Develop and implement a communication strategy that includes the public in the decision-making process and provides an early opportunity to comment and raise issues throughout the project's different phases and milestones.
- Identify stakeholder issues and concerns early and throughout the study process to avoid potential delaying issues.
- Increase awareness about the S.R. 210 Project.

The *Coordination Plan* ensured that UDOT worked with the public to address their concerns and suggestions and that these concerns and suggestions were directly reflected in the alternatives that were developed. The plan also ensured that UDOT provided feedback regarding how the public's input influenced the decisions made during the EIS process. The plan was updated throughout the process.

The *Little Cottonwood Canyon EIS Coordination Plan* is available on the project website (<https://littlecottonwoodeis.udot.utah.gov>).

27.7.2 Public Scoping

As the first step in the NEPA process, scoping uses public and agency participation to develop possible solutions and identify issues regarding a proposed project. Scoping also helps determine the needs, objectives, resources, constraints, potential alternatives, and any additional requirements for screening criteria used to screen the preliminary alternatives.

UDOT relies on public comments made during scoping to help identify issues as well as to gauge public sentiment about the proposed improvements. Because the alternatives under consideration for this project could affect owners of property adjacent to the action alternatives as well as the public along the Wasatch Front, a combination of measures was taken to ensure that the public was notified about the project and invited to participate in the process.

27.7.2.1 Scoping Period for the First (March 9, 2018) NOI

27.7.2.1.1 Notifications

The scoping period for the first NOI was initiated with the Federal Register notice on March 9, 2018, and ended on May 4, 2018. The following methods were used to notify the general public of the public scoping meeting and activities:

- Advertisements were placed in the following publications:
 - *Deseret News*, March 27 and April 3, 2018
 - *The Salt Lake Tribune*, March 27 and April 3, 2018
- Information regarding the public meeting and the scoping period was posted on the S.R. 210 Project website and UDOT social media sites (Facebook, Instagram, and Twitter) on March 27; April 3, 6, 9, 10, 13, 17, 19, 24, 26, and 27; and May 2 and 4, 2018.
- An email notice was sent to the UDOT mailing list on March 27 and April 6, 2018.
- A UDOT press release was sent to local media outlets on April 9, 2018, as a reminder of the public meeting on April 10, 2018.

27.7.2.1.2 Public Scoping Meeting

UDOT held a public scoping meeting on April 9, 2018, at the Cottonwood Heights City offices in Cottonwood Heights, Utah. The meeting was held in an open-house format with an interactive workshop from 4:00 PM to 8:00 PM.

The public scoping meeting included the following elements:

- The public was encouraged but not required to sign in at the registration desk.
- On entering the meeting room, each participant was given a brief explanation of the meeting format, information about how to submit comments, and details about where to find additional information about the project.
- Comment sheets were made available to each participant.
- Participants were encouraged to leave their comments.
- A project video summarizing the project was running continuously.
- Project staff members were available to answer questions and provide information.
- Four stations were set up with scroll maps of the project area, which included artist's renditions of potential improvements that could be considered. Meeting participants were encouraged to draw their ideas on the maps and make notes of issues and concerns.
- Two computer stations were available for commenters to identify specific areas on a map and record their comment.
- Commenters could give comments via a video interview.

About 158 people attended the April 9, 2018, public scoping meeting. During the scoping process, UDOT received more than 400 individual comment submissions from the public and agencies. The majority of the comments were related to alternatives for reducing congestion, improving the transit system, providing parking, and increasing safety for motorists and cyclists. Several comments expressed concern for natural resources and water quality in Little Cottonwood Canyon. Many commenters were concerned about impacts to neighborhoods along Wasatch Boulevard.

27.7.2.1.3 2018 Scoping Summary Report

UDOT prepared a *Scoping Summary Report* summarizing the public and agency input that was gathered during the first scoping period, which ran from March 9 through May 4, 2018. The 2018 *Scoping Summary Report* summarizes the agency and public scoping activities and comments received, and the report's appendices contain all scoping materials, including the meeting sign-in sheet, fact sheet, display boards, and copies of comments received during the 2018 scoping period. The 2018 *Scoping Summary Report* is available on the project website (<https://littlecottonwoodeis.udot.utah.gov>).

27.7.2.1.4 Other Scoping Period Outreach

During the first scoping period, UDOT met with the following stakeholders to inform them about the Little Cottonwood Canyon EIS and obtain input on issues important to their interests:

- Snowbird ski resort, March 21, 2018
- Alta ski resort, March 27, 2018
- Canyon Trail Users, March 28, 2018
- Cottonwood Heights residents, March 29, 2018
- Salt Lake City Department of Public Utilities, April 4, 2018
- Save Our Canyons, April 4, 2018 (this meeting included members of the following organizations: Friends of Alta, League of Women Voters, Salt Lake City Alliance, Salt Lake Climbers Alliance, Salt Lake County Planning, Sierra Club, Utah Native Plants, Utahns for Better Transportation, Wasatch Alta Club, Wasatch Backcountry Alliance, and Wild Utah Project)
- Granite Community neighborhood, April 25, 2018

27.7.2.2 Scoping Periods for the Second and Third (March 5, 2019, and May 15, 2019) NOIs

27.7.2.2.1 Notifications

The scoping period for the second NOI was initiated with the Federal Register notice on March 5, 2019, and was planned to end on May 3, 2019. With the release of the third NOI on May 15, 2019, the end of this scoping period was extended to June 14, 2019. The following methods were used to notify the general public of the public scoping meeting and activities:

- Advertisements were placed in the following publications:
 - *Deseret News*, March 26 and April 2, 2019
 - *The Salt Lake Tribune*, March 26 and April 2, 2019
- Information regarding the public meeting and the scoping period was posted on the S.R. 210 Project website and UDOT social media sites (Facebook, Instagram, and Twitter) on March 18; April 8, 9, 10, 23, 25, and 26; May 17, 21, and 29; and June 7, 11, 12, 13, and 14, 2019.
- Email notices were sent to the UDOT mailing list on March 10, April 23, May 15, and June 14, 2019.

27.7.2.2.2 Public Scoping Meeting

UDOT held a public scoping meeting on April 9, 2019, at the Cottonwood Heights City offices in Cottonwood Heights, Utah. The meeting was held in an open-house format with an interactive workshop from 4 PM to 8 PM.

The public scoping meeting included the following elements related to the EIS:

- The public was encouraged but not required to sign in at the registration desk.
- On entering the meeting room, each participant was given a brief explanation of the meeting format, information about how to submit comments, and details about where to find additional information about the project.
- Comment sheets were made available to each participant.
- Participants were encouraged to leave their comments.
- A project video summarizing the project was running continuously.
- Project staff members were available to answer questions and provide information.
- Four stations were set up with scroll maps of the project area. The scroll maps presented preliminary concepts that would address identified needs related to mobility, avalanche risk, and trailhead parking. Meeting participants were encouraged to make notes on the maps regarding issues and concerns related to the project study area and the preliminary concepts.
- Two computer stations were available for commenters to identify specific areas on a map and record their comment.
- Commenters could give comments via a video interview.

About 400 people attended the second public scoping meeting. During the second scoping period, UDOT received more than 1,100 individual comment submissions from the public and agencies. The majority of the comments were related to alternatives for reducing congestion, improving the transit system, providing parking, and increasing safety for motorists and cyclists. Several comments expressed concern for natural resources and water quality in Little Cottonwood Canyon. Many commenters were concerned about impacts to neighborhoods along Wasatch Boulevard.

27.7.2.2.3 2019 Scoping Summary Report

UDOT prepared a *Scoping Summary Report* summarizing the public and agency input that was gathered during the second scoping period, which ran from March 5 through June 14, 2019. The *2019 Scoping Summary Report* summarizes the agency and public scoping activities and comments received, and the report's appendices contain all scoping materials, including the meeting sign-in sheet, fact sheet, display boards, and copies of comments received during the 2019 scoping period. The *2019 Scoping Summary Report* is available on the project website (<https://littlecottonwoodeis.udot.utah.gov>).

27.7.2.2.4 Other Scoping Period Outreach

In January 2019, prior to the start of the 2019 scoping period, UDOT met with the following stakeholders to inform them about the revised NOI for the Little Cottonwood Canyon EIS and obtain input on issues important to their interests:

- Alta ski resort, January 8, 2019
- Town of Alta, January 8, 2019
- Big Cottonwood Community Council, January 9, 2019
- Cottonwood Heights residents, January 9, 2019
- Salt Lake City Public Utilities, January 9, 2019
- Snowbird ski resort, January 9, 2019
- Granite Community residents, January 15, 2019
- Save Our Canyons, January 16, 2019 (this meeting included members of the following organizations: League of Women Voters, Salt Lake Climbers Alliance, Sierra Club, Utahns for Better Transportation, Wasatch Backcountry Alliance, and Wild Utah Project)

27.7.3 Purpose and Need Public Review and Comment Periods

27.7.3.1 March 11, 2019, Purpose and Need Statement

The statute at 23 USC Section 139 requires an opportunity for the public and agencies to help develop a project's purpose and need statement. On March 11, 2019, as part of the second (March 5, 2019) scoping period, UDOT published a draft of the project purpose and need statement for review by the agencies and the public through June 17, 2019. Members of the public and agencies were encouraged to provide comments by email, on the project website, and by postal mail.

27.7.3.2 November 4, 2019, Purpose and Need Statement

Based on comments received on the March 11, 2019, purpose and need statement and the revised scope of the project described in the third (May 15, 2019) NOI, UDOT revised the purpose and need statement. The revised purpose and need statement was posted on the project website on November 6, 2019. A notice about the comment period for the revised purpose and need statement was sent to the public on November 6, 2019. The notification provided a link to the document on the project website, an overview of the project purpose and need, and a reminder that comments were due by December 13, 2019. About 350 comments were received during the comment period.

Following the comment period, UDOT published a Frequently Asked Questions and Responses document on the project website along with the comments received. Comments focused on expanding the project to include Big Cottonwood Canyon, the purpose being too narrowly focused, and statements that the project purpose should include protecting environmental resources.

27.7.4 Alternatives Development Process

27.7.4.1 Public Review and Comment Periods for the Alternatives Development and Screening Methodology Report

27.7.4.1.1 March 11, 2019, Alternatives Screening Methodology Report

According to 23 USC Section 139, the public must be provided the opportunity to help define the range of alternatives. On March 11, 2019, UDOT published a draft of the *Alternatives Screening Methodology Report* for review by the agencies and the public through June 14, 2019. Members of the public and agencies were encouraged to provide comments by email, on the project website, and by postal mail. The comments were provided as part of the scoping comment period from March 5, 2019, through June 14, 2019.

27.7.4.1.2 November 4, 2019, Alternatives Screening Methodology Report

Based on comments received on the March 11, 2019, *Alternatives Screening Methodology Report* and the revised scope of the project described in the third (May 15, 2019) NOI, UDOT revised the *Alternatives Screening Methodology Report*. A notice about the comment period for the revised report was sent to the public on November 6, 2019. The notification provided a link to the document on the project website, an overview of the project's purpose and need, and a reminder that comments were due on December 13, 2019. About 350 comments were received during the comment period. Following the comment period, a Frequently Asked Questions and Responses document was published on the project website along with the comments received.

Comments stated that the alternatives screening criteria should include protecting natural resources including evaluating impacts to the watershed, wildlife, natural habitats, and air quality. Others commented that the screening criteria should include a visitor capacity analysis to determine the number of people that the resources in the Little Cottonwood Canyon can receive before resources become seriously degraded. The commenters said that, by determining the canyon's carrying capacity, the alternatives could be developed to avoid impacts to the watershed and other natural resources.

27.7.4.1.3 Public Review and Comment Period for the Alternatives Screening Report

Based on the alternatives suggested by the public and agencies during the scoping periods, the review of the purpose and need statement, and the review of the *Alternatives Screening Methodology Report*, UDOT conducted an alternatives development and screening process. The results of this process were published in the *Alternatives Screening Report* for agency and public review on June 8, 2020. The review and comment period was from June 8 through July 10, 2020. The following methods were used to notify the general public of the release of the *Alternatives Screening Report* and the associated public meetings as follows:

- Advertisements were placed in the following publications:
 - *Deseret News*, June 8 and June 15, 2020.
 - *The Salt Lake Tribune*, June 8 and June 15, 2020
- Information regarding the public meeting and the scoping period was posted on the S.R. 210 Project website and UDOT social media sites (Facebook, Instagram, and Twitter) on June 4 and June 8, 2020.
- Email notices were sent to the UDOT mailing list on June 4, June 8, and June 15, 2020.
- A UDOT press release was sent to local media outlets on June 4, 2020, as a reminder of the public meetings on June 22, 23, and 24, 2020.

Because of the COVID-19 pandemic, UDOT altered the format of the public meetings to follow social distancing guidelines as follows:

- **June 22, 2020: Virtual online meeting from 6 to 8 PM.** Notification about the meeting and participant guidelines were posted on the project website and social media and were emailed on June 15, 19, and 22, 2020. The meeting format was a presentation followed by a question-and-answer period. About 190 people attended this online meeting, and about 193 comments or discussion topics were submitted during the meeting. UDOT responded to as many of the comments as possible before the meeting ended at 8 PM.
- **June 23, 2020: Virtual online meeting from 6 to 8 PM.** Notification about the meeting and participant guidelines were posted on the project website and social media and were emailed on June 15, 19, and 23, 2020. The meeting format was a presentation followed by a question-and-answer period. About 100 people attended this online meeting, and about 344 comments or discussion topics were submitted during the meeting. UDOT responded to as many of the comments as possible before the meeting ended at 8 PM.
- **June 24, 2020: In-person meeting from 6 to 8 PM.** This meeting was held for members of the public who did not have internet access. Notification about the meeting and participant guidelines were posted the project website and social media and were emailed on June 15 and 19, 2020. Attendees needed to make reservations prior to the meeting, and the meeting was limited to 50 people. The meeting format was a presentation followed by a question-and-answer period. Two people attended the meeting.

About 295 people attended the three public meetings. During the comment period for the *Alternatives Screening Report*, UDOT received about 6,500 individual comment submissions from the public and agencies. The majority of the comments were related to the need for transportation improvements, visual impacts, water quality impacts, overcrowding in Little Cottonwood Canyon, and year-round access. Commenters also provided comments relating to support for or opposition to a specific alternative, concerns about tolling, the need for summer transit service, and statements that a visitor capacity analysis should be conducted. Some commenters provided additional alternatives for UDOT to consider.

In addition to the public meetings held during the 35-day public review period for the [Alternatives Screening Report](#), UDOT met with the following stakeholders through online meetings to present the findings of the report:

- Utah Office of Tourism, June 4, 2020
- Business community representatives, June 8, 2020
- Town of Brighton, June 9, 2020
- Alta, Brighton, Solitude and Snowbird Ski Resorts, June 12, 2020
- Central Wasatch Commission Board, June 15, 2020
- Save Our Canyons Coalition, June 15, 2020
- Lower Little Cottonwood Canyon Businesses/Access, June 16, 2020
- Sandy City Council, June 16, 2020
- Salt Lake City Department of Public Utilities, June 19, 2020
- Town of Alta staff, June 24, 2020
- Cottonwood Heights/Granite residents, June 29, 2020
- Salt Lake County Council, June 30, 2020
- Granite Community Council, July 2, 2020
- Cottonwood Heights City Council, July 7, 2020
- Salt Lake City Council, July 7, 2020
- Town of Alta Council, July 8, 2020
- Holladay City Council, July 9, 2020

On September 20, 2020, all comments received during the comment period and a [Frequently Asked Questions and Responses](#) document were published on the project website. An email announcing the availability of the comments and frequently asked questions was sent to agencies and the public, and notifications were posted on social media.

27.7.4.2 Alternatives Screening Report Addendum

During the public comment period for the June 8, 2020, *Alternatives Screening Report*, UDOT identified several new alternatives that should be put through the screening process. As a result, UDOT prepared an [Alternatives Screening Report Addendum](#). The addendum was placed on the project website on November 20, 2020. A public email notification was sent to the project email database announcing that the addendum was available.

27.7.5 USDA Forest Service Amendment Process

On April 23, 2021, the USDA Forest Service published a notice that the Forest Service might need to make a decision to authorize the use of National Forest System land outside the right of way to be appropriated by FHWA and to amend the *Revised Forest Plan: Wasatch-Cache National Forest* (USDA Forest Service 2003) for that use if the use is inconsistent with the current *Forest Plan* (Federal Register Vol. 86, No. 77, page 21683).

Concurrent with the publication of this notice in the Federal Register, UDOT placed a legal advertisement in *The Salt Lake Tribune* and the *Deseret News* (April 23, 2021), and UDOT sent an email to the project email database announcing the notice (April 23, 2021). The notice was also made available on the project website.

27.7.6 Other Public Outreach

Additional outreach activities have been occurring throughout the EIS process; some examples are listed below.

- **Social media.** UDOT provided project updates and posted notifications of public meetings and comment periods on Facebook, Twitter, and Instagram in order to reach members of the public who do not receive email notifications.
- **Frequently asked questions and public comments.** At the end of the two scoping periods, the comment period for the purpose and need statement and the *Alternatives Screening Methodology Report*, and comment period for the *Alternatives Screening Report*, UDOT posted all public comments received. UDOT also produced a response document to frequently asked questions during each comment period. Emails were sent notifying the public when the materials were posted on the project website.
- **Scoping summary reports posted on the project website.** In July 2018 and September 2019, UDOT posted the *Scoping Summary Report* for each scoping period and sent an email to the project email list to notify stakeholders that the report was available for review.
- **Notices of Intent.** All three NOIs were posted on the project website.
- **Open-house materials.** Materials used in the scoping open houses and in the release of the *Alternatives Screening Report* were posted on the project website.
- **Stakeholder meetings.** At key project milestones, UDOT held meetings with various stakeholder groups to provide a project update and share information about the information released at that milestone. Table 27.7-1 summarizes these meetings.

Table 27.7-1. Stakeholder Meetings at Key Project Milestones

Stakeholder or Project Milestone	Scoping Period	Scoping Period, Purpose and Need Statement, and Alternatives Screening Methodology Report	Revised Purpose and Need Statement and Revised Alternatives Screening Methodology Report	Draft Alternatives Screening Report
Project Milestones				
Public engagement period	3/9/2018–5/14/2018	3/5/2019–6/14/2019	11/4/2019–12/13/2019	6/4/2020–7/10/2020
Agency coordination meeting	4/9/2018	4/3/2019	10/30/2019	6/4/2020 8/19/2020
Stakeholders				
Salt Lake County Council	4/24/2018	6/11/2019		6/30/2020
Town of Alta			12/10/2019	
Town of Brighton		1/9/2019	11/14/2019	6/9/2020
Alta Town Council	4/12/2018	4/11/2019	11/13/2019	7/8/2020
Cottonwood Heights City Council	4/24/2018	4/2/2019	11/19/2019	7/7/2020
Granite Community Council		3/6/2019	11/6/2019 11/20/2019	7/2/2020
Holladay City Council				7/9/2020
Salt Lake City Council		6/11/20219		7/7/2020
Salt Lake City Dept. of Public Utilities			11/19/2020	6/19/2020
Sandy City Council	4/17/2018	4/23/2019	12/10/2019	6/16/2020
Central Wasatch Commission	3/28/2018	4/17/2019 5/6/2019	11/18/2019	6/15/2020
Friends of Alta	4/4/2018			6/15/2020
League Women of Voters	4/4/2018			6/15/2020
Lower Little Cottonwood Canyon Businesses/Access	3/30/2018	4/30/2019	11/26/219	6/16/2020
Mountainous Planning Commission			12/5/2019	8/6/2020
Salt Lake Climbers Alliance	4/4/2018	5/1/2019		6/15/2020
Save Our Canyons Coalition	4/4/2018		11/13/2019	6/15/2020
Utahns for Better Transportation	4/4/2018			6/15/2020
Wasatch Backcountry Alliance	4/4/2018			4/14/2020 6/15/2020
Wasatch Mountain Club	4/4/2018			6/15/2020
Cottonwood Heights residents	3/29/2018	4/8/2020	11/13/2019 11/25/2019	6/29/2020

(continued on next page)

Table 27.7-1. Stakeholder Meetings at Key Project Milestones

Stakeholder or Project Milestone	Scoping Period	Scoping Period, Purpose and Need Statement, and Alternatives Screening Methodology Report	Revised Purpose and Need Statement and Revised Alternatives Screening Methodology Report	Draft Alternatives Screening Report
Granite Community residents	3/29/2018		11/18/2019	6/29/2020
Alta ski resort	3/27/2018	1/8/2019	12/2/2019	6/12/2020
Brighton ski resort			12/2/2019	6/12/2020
Snowbird ski resort	3/26/2018	1/9/2019	12/2/2019	6/12/2020
Solitude ski resort			12/2/2019	6/12/2020

27.8 Project Website

The S.R. 210 Project website, <https://littlecottonwoodeis.udot.utah.gov>, is accessible through the navigation menu on the home page of UDOT’s website. The project website allows the public to view current project information. The website provides all project-related materials and is updated periodically as new information becomes available. Comments can be submitted to the project’s public involvement coordinator through the website at any time.

27.9 References

[FHWA] Federal Highway Administration

1987 Guidance for Preparing and Processing Environmental and Section 4(f) Documents. October.

[USDA Forest Service] U.S. Department of Agriculture Forest Service

2003 Revised Forest Plan: Wasatch-Cache National Forest. South Jordan, Utah: U.S. Department of Agriculture, Forest Service, Intermountain Region, Uinta-Wasatch-Cache National Forest. <https://www.fs.usda.gov/detailfull/uwcnf/landmanagement/planning/?cid=stelprdb5076923&width=full>.

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Chapter 28: U.S. Department of Agriculture Forest Service Forest Plan Amendments

28.1 Introduction

This chapter discusses the potential amendments to the U.S. Department of Agriculture (USDA) Forest Service's 2003 *Revised Forest Plan: Wasatch-Cache National Forest (Forest Plan)*; USDA Forest Service 2003 associated with the action alternatives described in Chapter 2, Alternatives. Only those portions of the action alternatives that are located on National Forest System (NFS) lands are discussed in this chapter.

All actions authorized by the USDA Forest Service on NFS lands must be consistent with the approved forest plan. If a proposed project-specific action is not consistent with or does not conform to the forest plan, the Forest Supervisor may modify the proposed action to make it conform to or be consistent with the plan, reject the proposed action, or amend the plan such that the action will be consistent with the plan as amended.

Implementation of any of the action alternatives described in Chapter 2, Alternatives, would require an amendment to the *2003 Revised Forest Plan: Wasatch-Cache National Forest*, regardless of the specific authorities used by the Forest Service to authorize the use of NFS lands. However, the nature of the inconsistencies with the *Forest Plan* would vary by alternative, as described in this chapter.

Under 23 United States Code (USC) Section 317, the Federal Highway Administration (FHWA) is authorized under certain conditions to cause the transfer of highway easements over federal land to state transportation departments such as the Utah Department of Transportation (UDOT). The appropriation of NFS lands by FHWA and the transfer of these lands to UDOT would be in the form of a nonexclusive right of way for highway purposes. The Forest Service would still administer the appropriated lands, but UDOT would have an easement on these lands for highway purposes. If the proposed use on the appropriated lands is not consistent with the *Forest Plan*, a plan amendment would be required to allow the appropriation.

If NFS land is not appropriated and an action alternative is selected, UDOT would be required to obtain a special-use authorization (easement or special-use permit) from the Forest Service under 36 Code of Federal Regulations (CFR) Part 251 for those uses occurring on NFS lands. If the proposed use on NFS land is not consistent with the *Forest Plan*, a plan amendment would be required for the Forest Service to authorize these uses.

For the State Route (S.R.) 210 Project, UDOT in coordination with the USDA Forest Service identified each potential situation of nonconformance or inconsistency with the *Forest Plan* through a comparison to the

What is the purpose of this chapter?

This chapter discusses the potential amendments to the USDA Forest Service's 2003 *Revised Forest Plan: Wasatch-Cache National Forest* associated with the action alternatives.

Forest Plan. Where an alternative or component of an alternative would be inconsistent with the *Forest Plan*, UDOT in coordination with the USDA Forest Service developed a project-specific plan amendment that would allow authorization. The Forest Service's land use planning regulations require that an Environmental Impact Statement (EIS) identify those plan amendments that best meet multiple-use and sustained-yield mandates in the National Forest Management Act. Plan amendments would be implemented only for the alternative(s) selected in the Record of Decision for the project.

28.2 Forest Plan Amendment Process

The Forest Service prepares land and resource management plans in accordance with the National Forest Management Act and the regulations in 36 CFR Part 219. The 2003 *Revised Forest Plan: Wasatch-Cache National Forest* was prepared with the Forest Service 1982 forest planning regulations. If the Forest Service decides to amend the plan to address issues discussed in this EIS, it would do so with the 2012 planning rule and regulations at 36 CFR Part 219. The requirements of the 2012 planning rule and regulations are described in the following sections.

28.2.1 Public Involvement

The inclusions of the potential project-specific plan amendment are subject to public review and the procedures in the federal regulations at 36 CFR Sections 219.4 and 219.16. The inclusion of the project-specific amendments in this EIS meets that intent. If a project-specific plan amendment is approved in a decision document, the administrative review process would apply, which would be the objection process at 36 CFR Part 218.

The responsible official must provide opportunities to the public for participating in the plan amendment process. When developing opportunities for public participation, the responsible official must take into account the discrete and diverse roles, jurisdictions, responsibilities, and skills of interested and affected parties; the accessibility of the process, opportunities, and information; and the cost, time, and available staffing [36 CFR Section 219.4(a)].

For each plan amendment, a public notice must identify the Forest Service planning rule provisions that are likely to be directly related to and therefore applicable to the plan amendment. The notice must also identify the applicable administrative review process for the Forest Service decision regarding the actions on NFS lands and the plan amendment.

The Forest Service published a Federal Register notice on April 23, 2021, notifying the public of the previous Notices of Intent published by FHWA on March 9, 2018, March 5, 2019, and May 15, 2019, regarding the preparation of this EIS. The Forest Service's Federal Register notice also notified the public of the potential for a plan amendment and the required administrative review process.

Under 36 CFR Section 219.16(b), when a plan amendment is approved by the Forest Service in a decision document approving a project or activity and the amendment applies only to the project or activity, the notification requirements for the project or activity apply. The required 45-day opportunity for comment on this Draft EIS will be provided. Comments received on the plan amendments during the Draft EIS comment period will be considered in the Final EIS.

28.2.2 Forest Plan Amendment Requirements

Plan amendments may be broad or narrow, depending on the need for change, and should be used to keep plans current and to adapt to new information or changing conditions. The responsible official decides whether and how to amend the plan and determines the scope and scale of any amendment. The responsible official must do the following for every plan amendment [36 CFR Section 219.13(b)]:

- Base the amendment on a preliminary identification of the need to change the plan.
- Provide opportunities for public participation and public notification.
- Amend the plan consistent with the Forest Service's National Environmental Policy Act (NEPA) procedures.
- Follow the applicable format for plan components set out in the planning regulations for the plan direction added or modified by the amendment.
- Determine which specific substantive requirement(s) within the planning regulations is (are) directly related to the plan direction being added, modified, or removed by the amendment, and apply such requirement(s) within the scope and scale of the amendment.
- For an amendment to a plan developed or revised under a prior planning regulation, if species of conservation concern (SCC) have not been identified for the plan area and if scoping or a NEPA effects analysis for the proposed amendment reveals substantial adverse impacts to a specific species, or if the proposed amendment would substantially lessen protection for a specific species, the responsible official must determine whether such species is a potential SCC, and, if so, apply 36 CFR Section 219.9(b) with respect to that species as if it were an SCC.

As discussed in its Federal Register notice, the Forest Service determined that the substantive requirements of the 2012 planning rule likely to be directly related and, therefore, applicable to the *Forest Plan* amendment are 36 CFR Sections 219.10(a)(1) and (3), scenery and transportation corridors.

The 2012 planning rule also requires the Forest Service to determine whether a plan amendment is considered a significant change in the plan for the purposes of the National Forest Management Act and therefore requires a 90-day comment period for the proposed plan and Draft EIS [36 CFR Section 219.13(b)(3)]. Because the potential *Forest Plan* amendments would be project-specific, one-time exceptions to the *Forest Plan* requirements and would not change the existing management prescriptions, the Forest Service has determined that the proposed plan amendments would not be significant changes to the *Forest Plan*.

28.2.3 Administrative Review Process

The Forest Service's planning regulations include a predecisional administrative review (referred to in this chapter as *objection*) process for plan amendments. This process gives an individual or entity an opportunity for an independent Forest Service review and resolution of issues before a plan amendment is approved.

If the Forest Service amends the 2003 *Revised Forest Plan: Wasatch-Cache National Forest*, it would use the 36 CFR Part 219 predecisional administrative review process. Individuals and entities who have submitted substantive formal comments related to the proposed plan amendment during the opportunities for public comment as provided in 36 CFR Part 219, Subpart A, would be eligible to file an objection. Further details regarding who is eligible to file an objection can be found at 36 CFR Section 210.53. A complete list of what information an objection must include can be found at 36 CFR Section 219.54(c).

Written objections, including any attachments, must be filed within 60 days following the publication date of the draft decision for the proposed plan amendment. The reviewing officer must issue a written response to the objector(s) concerning their objection(s) within 90 days of the end of the objection-filing period. The responsible official will not issue a decision document concerning the proposed plan amendment until the reviewing officer has responded in writing to all objections.

What is an objection?

An objection is a predecisional administrative review process for plan amendments that gives an individual or entity an opportunity for an independent Forest Service review and resolution of issues before a plan amendment is approved.

28.3 Potential Forest Plan Amendments

This section presents relevant forest planning definitions; presents relevant standards and definitions from the 2003 *Revised Forest Plan: Wasatch-Cache National Forest* that have been identified as inconsistent with one or more of the action alternatives described in Chapter 2, Alternatives; and describes the potential *Forest Plan* amendments that might be required to authorize the action alternatives.

28.3.1 Definitions from Forest Planning Regulations

The Forest Service planning regulations at 36 CFR Part 219 require that all forest plans include desired conditions, objectives, standards, guidelines, and suitability of lands as plan components. A plan may also include goals as plan components.

Adhering to the standards in the forest plan is mandatory; inconsistencies between a standard and a proposed use would trigger the need for a plan amendment. Inconsistencies between a proposed use and a desired future condition, objective, guideline, or goal do not necessarily trigger the need for a plan amendment. Any inconsistencies with uses proposed as part of the action alternatives and *Forest Plan* desired future conditions, objectives, guidelines, standards, and goals are described in the relevant resource chapters of this EIS.

- **Desired Condition:** A desired condition is a description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be determined, but do not include completion dates.
- **Objective:** An objective is a concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Objectives should be based on reasonably foreseeable budgets.
- **Standard:** A standard is a mandatory constraint on project and activity decision-making, established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements.
- **Guideline:** A guideline is a constraint on project and activity decision-making that allows for departure from its terms, so long as the purpose of the guideline is met. Guidelines are established to help achieve or maintain a desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements.
- **Suitability of Lands:** Specific lands within a plan area will be identified as suitable for various multiple uses or activities based on the desired conditions applicable to those lands. The plan will also identify lands within the plan area as not suitable for uses that are not compatible with desired conditions for those lands. The suitability of lands need not be identified for every use or activity. Suitability identifications may be made after considering historic uses and issues that have arisen during the planning process.
- **Goal:** A goal is a broad statement of intent, other than a desired condition, usually related to a process or interaction with the public. Goals are expressed in broad, general terms but do not include completion dates.

28.3.2 Relevant Standards and Definitions from the 2003 Revised Forest Plan: Wasatch-Cache National Forest

This section contains relevant standards and definitions from the *2003 Revised Forest Plan: Wasatch-Cache National Forest* with which one or more of the action alternatives described in Chapter 2, Alternatives, were determined to be inconsistent.

28.3.2.1 Standard S3.1W – Watershed Emphasis

The *2003 Revised Forest Plan: Wasatch-Cache National Forest* establishes a watershed emphasis management area. In this area, the emphasis is on maintaining or improving the quality of watershed conditions and aquatic habitats. Watershed function and aquatic habitat values are recognized as important and might require restoration to reach desired conditions. Areas of municipal watershed and public drinking water sources will be managed to maintain or improve soil processes and watershed conditions. Where improvement is needed, it is achieved by implementing watershed improvement projects and by applying soil and water conservation practices to land-disturbing activities (USDA Forest Service 2003, page 4-69).

The *Forest Plan* applies Standard 3.1W to the watershed emphasis area. Standard 3.1W states:

- **S3.1W.** Timber harvest, road construction, and new recreation facility development are not allowed (USDA Forest Service 2003, page 4-69).

Relevant definitions from the *Forest Plan* that apply to the Forest Service's interpretation of Standard S3.1W are the following:

- **Road construction** refers to activity that results in the addition of forest classified or temporary road miles. *Road* is defined as a motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road can be classified, unclassified, or temporary (USDA Forest Service 2003, page 4-61).
- **Travelway** represents linear concentrations of public viewing including freeways, highways, roads, railroads, trails, commercial flight paths, rivers, canals, and other waterways (USDA Forest Service 2003, page GL-25).
- **New recreation development** refers to major structural public-use facilities such as campgrounds and trailheads. It does not refer to construction within already established developed recreation sites. Trails and single restrooms are not considered recreation development for these descriptions (USDA Forest Service 2003, page 4-61).

28.3.2.2 Standard S22 – Scenery Management

The 2003 *Revised Forest Plan: Wasatch-Cache National Forest* establishes standards and guidelines for scenery management.

The *Forest Plan* applies Standard S22 to the entire forest. Standard S22 states:

- **S22.** Management actions that would result in a scenic integrity level of Unacceptably Low are prohibited in all Landscape Character Themes (USDA Forest Service 2003, page 4-48).

Relevant definitions from the *Forest Plan* that apply to the Forest Service’s interpretation of Standard S22 are the following:

- **Unacceptably Low scenic integrity** refers to landscapes where the valued landscape character being viewed appears extremely altered. Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern, or scale from the landscape character. Landscapes at this level of integrity need rehabilitation. This level should be used only to inventory existing integrity. It must not be used as a management objective (USDA Forest Service 1995).

28.3.3 Identified Inconsistencies between Uses Proposed as Part of the Action Alternatives and the 2003 Revised Forest Plan: Wasatch-Cache National Forest

This section describes inconsistencies that were identified by the Forest Service between uses or components of the action alternatives described in Chapter 2, Alternatives, and the 2003 *Revised Forest Plan: Wasatch-Cache National Forest*.

28.3.3.1 Appropriation of National Forest System Lands for Highway Use

If NFS lands are appropriated for highway use by FHWA in accordance with 23 USC Section 317 and pursuant to requirements of Section III.A in the 1998 Memorandum of Understanding between the Forest Service and FHWA, this appropriation would be inconsistent with *Forest Plan* Standard S3.1W because road construction in Management Prescription 3.1W is not allowed outside lands previously appropriated by FHWA.

Although the Forest Service is currently unaware whether a cog rail transportation system would fall under the authority of FHWA (pending FHWA’s determination), a train engine is a motorized vehicle that travels on a travelway, which is inclusive of railroads as defined in the *Forest Plan* (USDA Forest Service 2003, page GL-25). This, combined with the fact that the majority of the proposed alignment for the Cog Rail Alternative is adjacent to and integrated into the proposed road prism, indicates that constructing the Cog Rail Alternative could be considered road construction under the definition of *travelway* in the *Forest Plan*.

28.3.3.2 Construction, Expansion, or Reconstruction of Trailheads

Constructing the proposed new trailheads (Bridge and Lisa Falls Trailheads), expanding an existing trailhead (White Pine Trailhead), reconstructing trailheads as part of the Cog Rail Alternative (Grit Mill and Alpenbock Trailheads), and reconstructing a trailhead as part of a gondola alternative (Alpenbock Trailhead) would be inconsistent with *Forest Plan* Standard S3.1W because developing a new recreation facility is not allowed outside existing recreation facilities in areas under Management Prescription S3.1W.

28.3.3.3 Construction of Snow Sheds, Shoulder Lanes, or Cog Rail Tracks

Constructing snow sheds with or without berms, constructing shoulder lanes on S.R. 210, and/or constructing cog rail tracks adjacent to S.R. 210 would be inconsistent with *Forest Plan* Standard S3.1W because road construction in Management Prescription 3.1W is not allowed for proposed actions outside lands previously appropriated by FHWA or for actions not otherwise authorized within existing FHWA easements.

Although the Forest Service is currently unaware whether a cog rail transportation system would fall under the authority of FHWA (pending FHWA's determination), a train engine is a motorized vehicle that travels on a travelway, which is inclusive of railroads as defined in the *Forest Plan* (USDA Forest Service 2003, page GL-25). This, combined with the fact that the majority of the proposed alignment for the Cog Rail Alternative is adjacent to and integrated into the proposed road prism, indicates that constructing the Cog Rail Alternative could be considered road construction under the definition of *travelway* in the *Forest Plan*.

28.3.3.4 Construction of Cog Rail Tracks or Peak-period Shoulder Lanes

Constructing cog rail tracks or peak-period shoulder lanes would be inconsistent with *Forest Plan* Standard S22 because these actions would result in a scenic integrity level of Unacceptably Low within an area with a Scenic Integrity Objective of High.

28.3.4 Potential Forest Plan Amendment Language

The amendment(s) to the 2003 *Revised Forest Plan: Wasatch-Cache National Forest* would add the following language to Standards S3.1W and S22, depending on the Selected Alternative(s):

- This standard does not apply to the activities approved for the Utah Department of Transportation's S.R. 210 Project (Record of Decision, [date]).

See Section 28.3.5 below for the standard(s) to which the above language would be added based on the Selected Alternative(s).

28.3.5 Summary of Potential Forest Plan Amendments by Action Alternative

Table 28.3-1 lists the project components and actions that would be inconsistent with the 2003 *Revised Forest Plan: Wasatch-Cache National Forest* and for which a plan amendment might be required for each alternative described in Chapter 2, Alternatives. The table includes the applicable standards with which each project component or action would be inconsistent, the reason each project component or action would be inconsistent with these standards, and the alternatives with which each project component or action is associated.

Table 28.3-1. Potential Forest Plan Amendments Associated with the Proposed Project Components and Actions and Primary Alternatives Analyzed in the Draft EIS

Project Component or Action	Forest Plan Standard	Area of Resource Conflict or Amendment Consideration	Primary Alternative				Cog Rail Alternative
			Enhanced Bus Service Alternative	Enhanced Bus Service in Peak-period Shoulder Lane Alternative	Gondola Alternative A (Starting at Canyon Entrance)	Gondola Alternative A (Starting at La Caille)	
FHWA appropriation of NFS lands	Not applicable	FHWA appropriation of NFS lands for highway purposes ^a		✓ ^b	✓ ^b	✓ ^b	✓ ^b
Snow sheds and berm construction	S3.1W ^c	Road construction	✓	✓	✓	✓	✓
Snow sheds and realigned road construction	S3.1W ^c	Road construction	✓	✓	✓	✓	✓
New trailhead development – Bridge and/or Lisa Falls Trailhead(s)	S3.1W ^c	New recreation facility development	✓	✓	✓	✓	✓
Expansion of existing White Pine Trailhead	S3.1W ^c	New recreation facility development	✓	✓	✓	✓	✓
Reconstruction of Grit Mill Trailhead ^d	S3.1W ^c	New recreation facility development					✓
Reconstruction of Alpenbock Trailhead ^e	S3.1W ^c	New recreation facility development			✓		✓
Peak-period shoulder lane construction	S3.1W ^c	Road construction		✓			
Cog rail track construction	S3.1W ^c	Road construction					✓
Cut-and-fill slopes	S22 ^f	Scenic integrity level		✓			✓

^a Reference: USDA Forest Service and FHWA 1998

^b Pending FHWA's determination of proposed actions eligible for appropriation of NFS lands under 23 USC Section 317.

^c S3.1W: Timber harvest, road construction, and new recreation facility development are not allowed (USDA Forest Service 2003, page 4-69).

^d Reconstructing the Grit Mill Trailhead within Management Prescription 3.1W might be required to mitigate impacts under Section 4(f) of the Department of Transportation Act of 1966.

^e Reconstructing the Alpenbock Trailhead within Management Prescription 3.1W might be required to mitigate impacts under Section 4(f) of the Department of Transportation Act of 1966 associated with constructing a gondola base station, gondola angle station, or cog rail operations and maintenance facility at the location of the current trailhead.

^f S22: Management actions that would result in a scenic integrity level of Unacceptably Low are prohibited in all Landscape Character Themes (USDA Forest Service 2003, page 4-48).

28.4 Environmental Impacts of the Potential Forest Plan Amendments

The potential *Forest Plan* amendments are proposed as project-specific, one-time exceptions to *Forest Plan* requirements. The potential *Forest Plan* amendments would not provide opportunities for future development on NFS lands beyond those developments analyzed in this EIS and approved in the decision. Because the site-specific potential amendments would be applicable only to the S.R. 210 Project and would not establish a precedent for other potential amendments, the amendments are nonsignificant. The environmental impacts of the amendments would be the same as the impacts of each applicable action alternative analyzed in this EIS.

28.5 References

[USDA Forest Service] U.S. Department of Agriculture, Forest Service

- 1995 Agriculture Handbook Number 701, Landscape Aesthetics: A Handbook for Scenery Management.
- 2003 Revised Forest Plan: Wasatch-Cache National Forest. South Jordan, Utah: U.S. Department of Agriculture, Forest Service, Intermountain Region, Uinta-Wasatch-Cache National Forest. <https://www.fs.usda.gov/detailfull/uwcnf/landmanagement/planning/?cid=stelprdb5076923&width=full>.

[USDA Forest Service and FHWA] U.S. Department of Agriculture, Forest Service, and U.S. Department of Transportation, Federal Highway Administration

- 1998 Memorandum of Understanding Between United States Department of Agriculture, Forest Service, and United States Department of Transportation, Federal Highway Administration, Regarding the Appropriation and Transfer of National Forest System Lands for Highway Purposes.

Chapter 29: List of Preparers

The following preparers played a significant role in the composition of this EIS. Because of the nature of this project, the list includes lead agencies, sponsoring agencies, outside consultants, and firms that were involved in and consulted regarding the S.R. 210 Project.

Name and Title	Project Role	Education	Years of Experience
Utah Department of Transportation (UDOT)			
Josh Van Jura, PE, Project Manager	Project Manager	BS, Civil Engineering	20
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Carissa Watanabe, Environmental Performance Manager	NEPA Oversight	BS, Environmental Science, Chemistry	14
Brandon Weston, Environmental Services Director	Environmental Oversight	BS, Landscape Architect	19
U.S. Department of Agriculture, Forest Service (USDA Forest Service)			
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Name and Title	Project Role	Education	Years of Experience
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Name and Title	Project Role	Education	Years of Experience
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Megan Daniels, Architectural Historian	Cultural Resources	MPS, Preservation Studies BA, Art History	7
Jeremy Eyre	Land Use	JD, Law, environmental and natural resources law emphasis	16
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Brianna Binnebose, Account Manager	Public Involvement Lead	MPP, Public Policy BA, Political Science	6
SE Group			
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Dynamic Avalanche Consulting, Ltd.			
Jordy Hendrikx, Associate Professor	Avalanche Analyst	Ph.D, Geography BSc, Physical Geography BS, Geology	15
Alan Jones, Snow Avalanche Specialist	Avalanche Lead	MSC, Civil Engineering BASc, Geology Engineering	23
Gerhart Cole, Inc.			
Ryan Cole, Principal	Geotechnical	PhD, Geology BS, Geology	20

Chapter 30: Distribution

The following agencies and organizations were notified that the Draft EIS were available on the project website and that an electronic copy could be provided on request.

Federal Agencies

U.S. Army Corps of Engineers
U.S. Department of Agricultural Forest Service
U.S. Environmental Protection Agency

Native American Tribes

Cedar Band of Paiutes
Confederated Tribes of the Goshute Reservation
Eastern Shoshone Tribe of the Wind River Reservation
Northwestern Band of the Shoshone Nation
Shivwits Band of the Paiute Indian Tribe of Utah
Shoshone-Bannock Tribes of the Fort Hall Reservation
Skull Valley Band of Goshutes
Ute Indian Tribe of the Uintah and Ouray Reservation

State Agencies

Governor's Office:

- Resource Development Coordinating Committee

Department of Community and Culture:

- Division of State History – Deputy State Historic Preservation Office
- Division of State History – State Archaeologist

Department of Environmental Quality:

- Division of Air Quality
- Division of Water Quality

Department of Heritage and Arts:

- Division of Indian Affairs

Department of Natural Resources:

- Division of Forestry, Fire and State Lands

Local and Regional Agencies

Salt Lake County
Cottonwood Heights City
Murray City
Salt Lake City
Sandy City
Town of Alta
Metropolitan Water District of Salt Lake City and Sandy
Utah Transit Authority
Wasatch Front Regional Council

Other Entities

Central Wasatch Commission
Salt Lake City Public Library, Anderson-Foothill Branch
Salt Lake County Library, Whitmore Branch
Utah Office of Tourism

Elected Officials

Senator Kathleen Riebe – Utah Senate, District 8
Senator Kirk Cullimore – Utah Senate, District 9
Representative Steven Eliason – Utah House of Representatives, District 45
Representative Gay Lynn Bennion – Utah House of Representatives, District 46
Representative Robert Spendlove – Utah House of Representatives, District 49
Jenny Wilson, Salt Lake County Mayor
Michael Peterson, Cottonwood Heights City Mayor
Blair Camp, Murray City Mayor
Erin Mendenhall, Salt Lake City Mayor
Kurt Bradburn, Sandy City Mayor
Harris Sondak, Town of Alta Mayor

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