

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

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