Little Cottonwood Canyon ENVIRONMENTAL IMPACT STATEMENT
Wasatch Boulevard to Alta

Draft Alternatives Development and Screening Methodology and Preliminary Concept Report

Little Cottonwood Canyon Environmental Impact Statement Wasatch Boulevard to Alta

Lead agency:
Utah Department of Transportation

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Contents

Tables

Figures

Appendixes

Appendix A. Preliminary Evaluation of Alternatives/Concepts

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1.0 Introduction

The purpose of this report is to describe the alternatives development and screening process that will be used for the Little Cottonwood Canyon Environmental Impact Statement (EIS). The Utah Department of Transportation (UDOT) is preparing the 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.

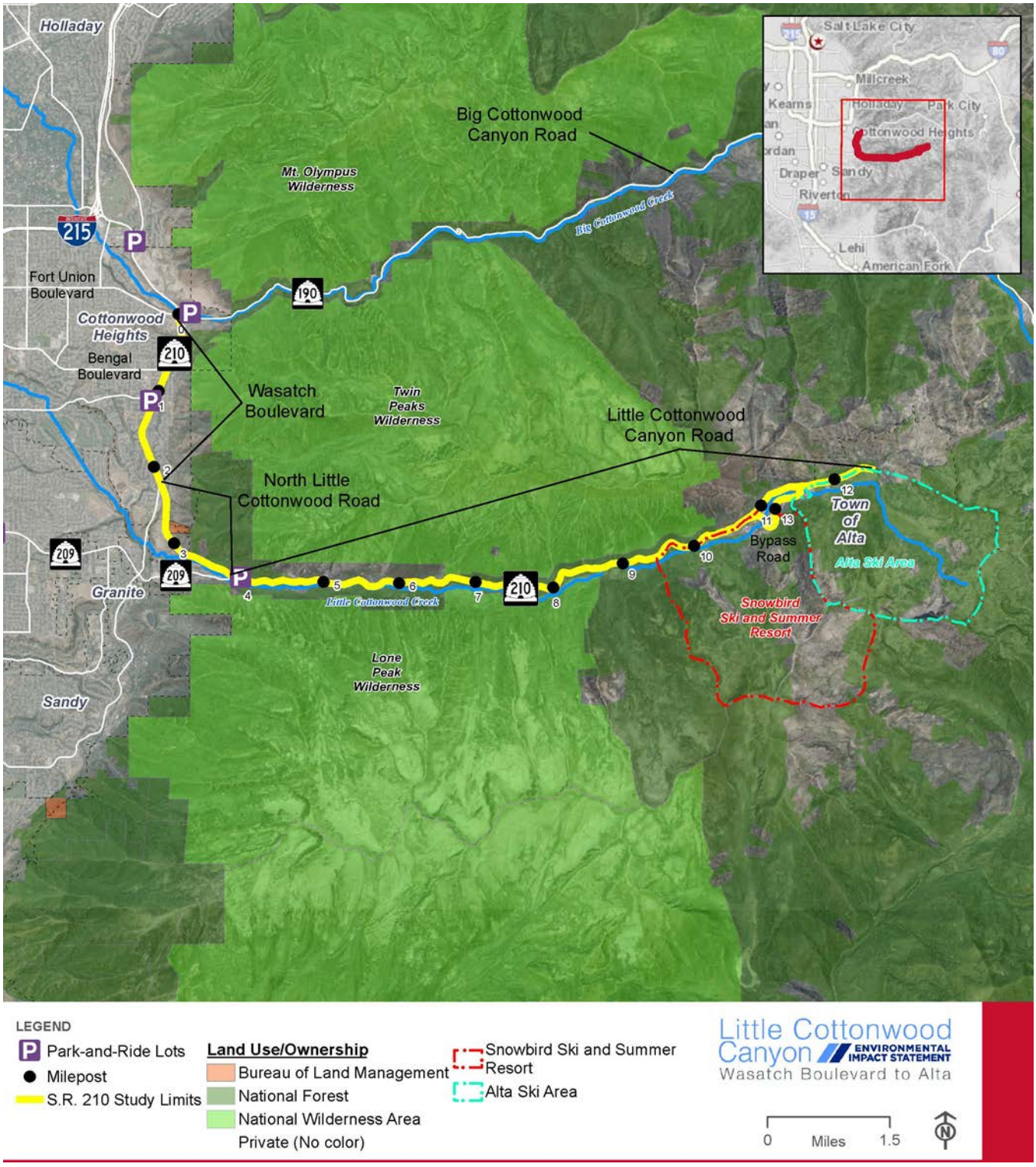
What is the purpose of this report?

The purpose of this report is to describe the alternatives development and screening process that will be used for the Little Cottonwood Canyon EIS.

The study area, as shown in Figure 1, extends along the S.R. 210 corridor and includes the following segments:

- **Wasatch Boulevard** – S.R. 210 from Fort Union Boulevard to North Little Cottonwood Road
- **North Little Cottonwood Road** – S.R. 210 from Wasatch Boulevard to the intersection with S.R. 209
- **Little Cottonwood Canyon Road** – S.R. 210 from the intersection of North Little Cottonwood Road and S.R. 209 through the town of Alta, including the Bypass Road, up to but not including Albion Basin Road

Figure 1. Study Area for the Little Cottonwood Canyon EIS

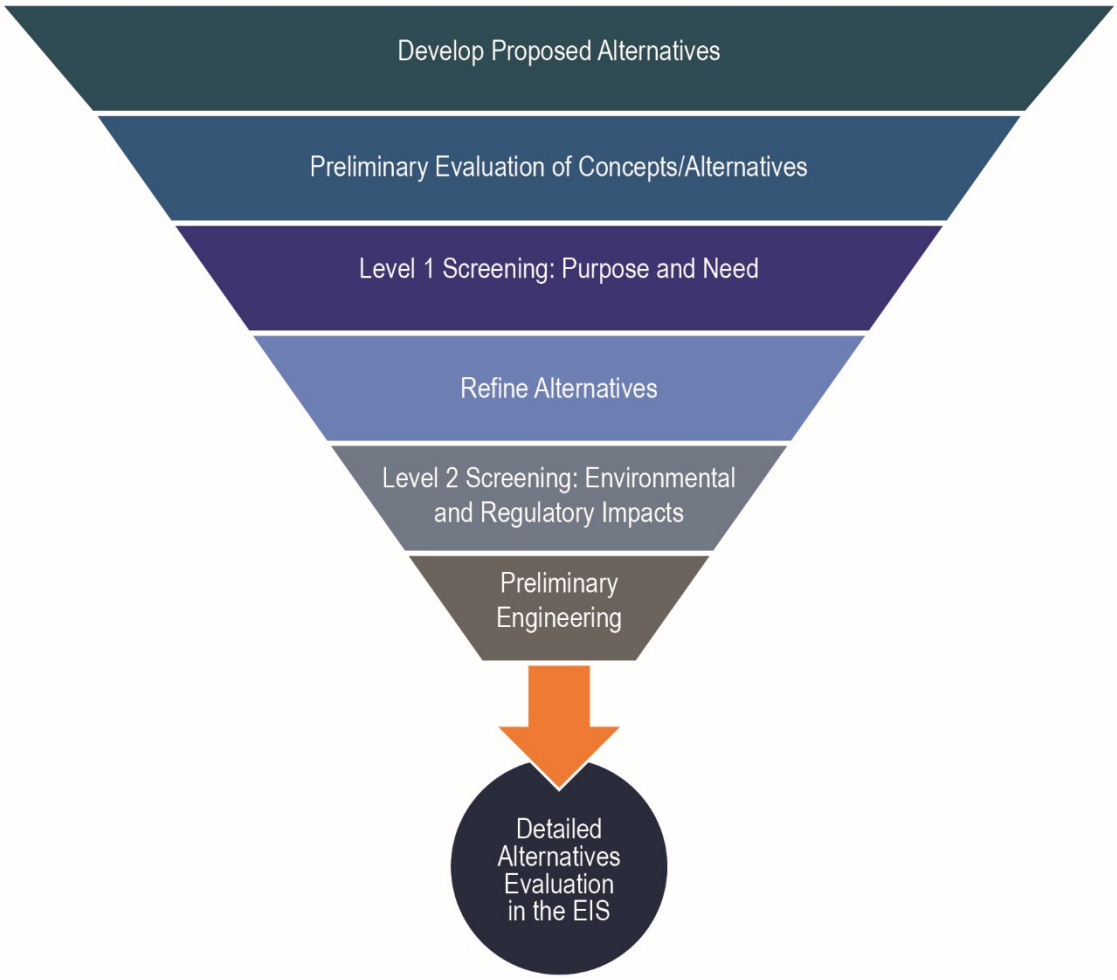


UDOT is developing, with public and agency input, a Purpose and Need Statement for the project that will guide the development of project alternatives. The alternatives development and screening process will consist of the following phases (Figure 2):

1. Develop proposed alternatives that respond to the Purpose and Need Statement based on previous studies, public and agency input during the scoping process, and local and regional land use and transportation plans.
2. Conduct a preliminary evaluation of concepts and/or alternatives received during the EIS scoping process to determine which concepts and/or alternatives could generally meet the project purpose, are within the scope of the EIS and EIS study area, and are technically feasible (for more information, see Section 7.0, Alternatives to Be Considered in the Screening Process). The alternatives that were not eliminated during the preliminary evaluation were carried forward into Level 1 screening.
3. Apply initial (Level 1) screening criteria to eliminate alternatives that do not meet the purpose of and need for the project.
4. Refine alternatives that pass the Level 1 screening process.
5. Apply secondary (Level 2) screening criteria to eliminate alternatives that might meet the purpose of and need for the project but would be unreasonable alternatives for other reasons—for example, an alternative would have unreasonable impacts to the natural and human environments, would not meet regulatory requirements, or could be replaced by a less costly alternative.
6. Conduct preliminary engineering. The alternatives that pass Level 1 and Level 2 screening will be further developed to avoid and minimize impacts to the natural and human environment and designed to a higher level of detail before UDOT performs the detailed impact analyses for the EIS.

FHWA has assigned its responsibilities under NEPA and other federal environmental laws to UDOT for highway projects in Utah, pursuant to 23 United States Code Section 327, in a Memorandum of Understanding (MOU) dated January 17, 2017. In accordance with the assignment MOU, UDOT is carrying out the environmental review process for the Little Cottonwood Canyon Project in lieu of FHWA and serves as the lead agency in the NEPA process. The assignment MOU does not change the roles and responsibilities of any other federal agency whose review or approval is required for the project.

Figure 2. Overview of the Little Cottonwood Canyon EIS Alternatives Development and Screening Process



The alternatives development and screening process described in this report will provide critical information about how well an alternative satisfies the project's purpose and meets the transportation needs, and whether it is reasonable under the National Environmental Policy Act (NEPA), practicable under the Clean Water Act, and prudent and feasible under Section 4(f) of the Department of Transportation Act of 1966. For more information regarding regulations considered in this screening process, see Section 5.0, Reasons Why Alternatives Might Be Eliminated. The results of the screening process will be presented in a memorandum and summarized in the EIS.

The alternatives development and screening process is designed to be dynamic throughout the EIS process. If a new alternative is developed later in the process, it will be subject to the same screening process as all of the other alternatives, as described in this report. The No-Action Alternative is not subject to the screening process because evaluation of the No-Action Alternative is a requirement of NEPA; the No-Action Alternative will be fully evaluated in the EIS.

2.0 Alternatives Development and Screening Process

2.1 Develop Proposed Alternatives

In the first phase of the alternatives development and screening process, UDOT will develop proposed alternatives to address the project's objectives for S.R. 210. These proposed alternatives will be based on previous studies, public and agency input during the scoping process, and local and regional land use and transportation plans.

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.

When developing alternatives, UDOT will consider the goals put forward by the City of Cottonwood Heights in its draft *Wasatch Boulevard Master Plan*,[1] goals such as a connected network of paths and trails for transportation and recreation and balancing livability, roadway capacity, and sustainable canyon access. These goals are consistent with UDOT's need to provide safe and reliable access for travelers on S.R. 210. UDOT will also consider safety improvements related to avalanche mitigation and trailhead parking in Little Cottonwood Canyon that affect safety, reliability, and mobility for all users of S.R. 210.

All proposed alternatives will be developed to an equal level of detail to allow for objective screening. Although the proposed alternatives will not be fully developed during this phase, they will meet UDOT's safety standards and design criteria. To accommodate Level 1 screening, UDOT will develop the proposed alternatives in enough detail to allow UDOT to use travel demand modeling (see Section 6.1, Travel Demand Model) for the roadway alternatives to compare to other modes.

2.2 Preliminary Evaluation of Concepts and Alternatives Received during the Scoping Process

During the EIS scoping process in 2018 and 2019, UDOT received more than 1,500 comments, about 100 of which suggested concepts and alternatives for UDOT to evaluate in the EIS. As part of the preliminary evaluation of concepts and alternatives, UDOT considered these suggested concepts and alternatives to determine whether they would meet project objectives, would meet NEPA requirements, are within the project study area, are technically feasible, and whether they are state operational improvements that are in process and are considered independent safety improvements or are improvements considered within a larger alternative. If UDOT determines that a suggested concept or alternative is practical and reasonable, meets the project goals, is located within the project study area, and would be subject to analysis under NEPA, then the suggested concept or alternative will be included in the proposed alternatives to be evaluated in Level 1 screening. Section 7.0, Alternatives to Be Considered in the Screening Process, provides more details regarding UDOT's process for reviewing alternatives suggested during the scoping process.

[1] City of Cottonwood Heights, *Wasatch Boulevard Master Plan (Draft)*, June 2019.

2.3 Alternatives Screening Level 1: Purpose and Need

During the Level 1 alternatives screening phase, each of the proposed alternatives will be evaluated using criteria that identify whether the alternative reasonably meets the purpose of and need for the project.

The purpose of Level 1 screening is to eliminate alternatives that do not meet the project's purpose and need. Alternatives that are determined by UDOT to not meet the purpose of and need for the project will be considered unreasonable for NEPA purposes and not practicable for Clean Water Act Section 404(b)(1) purposes. Such alternatives will not be carried forward for further analysis. The basis for that determination will be documented in the screening results memorandum. For more information, see Section 5.1, NEPA Regulations and Council on Environmental Quality Guidance, and Section 5.2, Clean Water Act Requirements. Initial alternatives that are not eliminated during Level 1 screening will be refined and advanced to Level 2 screening.

What is the purpose of Level 1 screening?

The purpose of Level 1 screening is to eliminate alternatives that do not meet the purpose of and need for the project.

2.3.1 Purpose of the Project

UDOT's purpose is reflected in one primary objective for S.R. 210: to substantially improve safety, reliability, and mobility on S.R. 210 from Fort Union Boulevard through the town of Alta for all users on S.R. 210.

A secondary objective for UDOT is to consider the City of Cottonwood Heights's goals in its draft *Wasatch Boulevard Master Plan*, which goals include provisions for all users of the transportation network: pedestrians, bicyclists, commuters, residents, and visitors. Another secondary objective for UDOT is to recognize the importance of the Little Cottonwood Canyon watershed to Salt Lake City's water supply and mitigate short-term impacts and minimize potential long-term transportation system impacts to water quality.

These secondary objectives were used to refine project alternatives, not used to eliminate alternatives in the screening process.

2.3.2 Need for the Project

The transportation needs in the study area are related primarily to traffic during peak periods, avalanche risk and avalanche control 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 in the study area:

- 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 control program in Little Cottonwood Canyon. Periodic road closures for avalanche control 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.
- Roadway elements that do not meet current design standards; for example, shoulders that are narrow, and horizontal and vertical curves that are steep and/or sharp.
- Limited parking at trailheads and ski areas that leads to on-road parking. The consequences of on-road 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, and loss of native vegetation in the canyon
  - Damage to the pavement along the roadway edge, which causes increased soil erosion and runoff into nearby streams

What are peak periods?

Peak periods are the periods of the day with the greatest amounts of traffic. For Little Cottonwood Canyon, the winter daily peak periods are tied to the ski areas opening and closing, whereas peak summer traffic occurs in the early afternoon. Peak periods are looked at by transportation analysts when examining the need for a project.

2.3.3 Level 1 Screening Criteria

UDOT developed Level 1 screening criteria based on the need to improve safety, reliability, and mobility for all users of S.R. 210. The proposed alternatives will be screened against criteria pertaining to travel demand and capacity, safety, and pedestrian and bicycle access (Table 1). To accommodate Level 1 screening, UDOT will develop the initial alternatives in enough detail to allow UDOT to use the Wasatch Front Regional Council's (WFRC) travel demand model to forecast the future traffic volumes and associated congestion for Wasatch Boulevard and a separate travel demand model developed by UDOT for North Little Cottonwood Road and Little Cottonwood Canyon Road. (For more information about the travel demand model, see Section 6.1, Travel Demand Model.)

Table 1. Level 1 Screening Criteria (Purpose and Need)

Criterion	Measure
Improve reliability and safety in 2050	• Substantially reduce number of hours and/or days during which avalanches delay users. • Substantially reduce the avalanche hazard for roadway users. • Improve roadway safety at existing trailhead locations. • Reduce or eliminate traffic conflicts between motorized and nonmotorized transportation modes at existing trailhead locations. • Reduce or eliminate on-road parking to improve the safety and operational characteristics of S.R. 210.
Improve mobility in 2050	• Substantially improve peak-hour (defined as the 30th-busiest hour) travel times in Little Cottonwood Canyon for uphill and downhill users in 2050 compared to travel times with the No-Action Alternative. • Meet peak-hour average total person demand on busy ski days in Little Cottonwood Canyon. • Substantially reduce vehicle backups on S.R. 210 and S.R. 209 through residential areas on busy ski days. • By 2050, meet UDOT's goal of LOS D in the weekday AM and PM peak periods on Wasatch Blvd.

2.4 Refine Alternatives

The alternatives that pass Level 1 screening will be developed in enough detail to estimate their preliminary impacts and cost. This development will consist of conducting preliminary engineering so that UDOT can determine the right-of-way requirements for estimating impacts to the natural and human environment. In addition, through the engineering process, UDOT will develop high-level cost estimates for each alternative.

2.5 Level 2 Screening

The purpose of Level 2 screening is to identify alternatives that are practicable and reasonable and should be evaluated in detail in the EIS. During Level 2 screening, UDOT will collectively evaluate the alternatives that passed Level 1 screening against criteria that focus on the alternative's impacts to the natural and built environment, estimated project costs, logistical considerations, and technological feasibility. Table 2 lists the Level 2 screening criteria.

What is the purpose of Level 2 screening?

The purpose of Level 2 screening is to identify alternatives that are practicable and reasonable and should be evaluated in detail in the EIS.

Table 2. Level 2 Screening Criteria (Impacts)

Criterion	Measure
Cost	• Alternative's cost compared to other alternatives that pass Level 1 screening
Consistency and compatibility with local and regional plans	• Alternative's consistency with local and regional land use and transportation plans[a] • Alternative's compliance with the Wilderness Act of 1964 and consistency with the 2003 *Revised Wasatch-Cache Forest Plan*
Compatibility with permitting requirements	• Permit requirements
Impacts related to Clean Water Act	• Acres and types of wetlands and other waters of the United States[b]
Impacts to natural resources	• Acres and types of sensitive habitat • Acres of floodplain • Acres of critical habitat
Impacts to the built environment	• Number and area of parks • Number of community facilities • Number of potential property acquisitions including residential, business, and utility acquisitions • Number of Section 4(f)/Section 6(f) uses[c] • Number of cultural resources (for example, historic and archaeological resources) affected

[a] This criterion is a secondary objective that will be used to meet local community desires after environmental impacts are considered and to make minor shifts to alternatives' alignments. It will not be used to determine whether an alternative is reasonable or practicable.

[b] Based on Clean Water Act requirements, an alternative with a substantially greater number of wetland impacts could be eliminated from detailed study in the EIS. UDOT will not use the criteria listed in this table to eliminate alternatives from detailed study in the EIS before considering whether the alternatives would comply with the Clean Water Act Section 401(b)(1) Guidelines. For more information, see Section 5.2, Clean Water Act Requirements.

[c] Based on 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, an alternative with substantially greater Section 4(f) or Section 6(f) impacts could be eliminated from detailed study in the EIS. For more information, see Section 5.3, Section 4(f)/Section 6(f) Requirements.

The overall process for Level 2 screening will be:

- Estimate the impacts of each alternative that passed Level 1 screening on various resources.
- Evaluate the alternatives for costs, logistical considerations, and technological feasibility.
- Determine whether any of the alternatives would have substantially greater impacts or costs without having substantially greater benefits.

Using the information gathered from Level 2 screening, UDOT will determine which alternatives to study in detail in the EIS. More information about each of these steps is provided below.

Compare Impacts and Costs to Benefits. UDOT will use the screening results to determine whether any of the alternatives would have substantially greater impacts or costs without having substantially greater benefits. Alternatives that have the same or similar benefits to other alternatives but have substantially greater impacts or costs will be eliminated and considered unreasonable for NEPA purposes.

Although public and agency involvement is critical throughout the entire alternatives development and screening process, the comments received from the public during the public scoping period will be particularly relevant during Level 2 screening. Several of the Level 2 screening criteria focus on local and community elements, so the public scoping comments that pertain to these elements will be critical to this phase of screening. These comments include input received from the public at the open houses, comments received at stakeholder meetings, and comments received from agencies that identified specific resources of concern that should be considered during the alternatives development and screening process.

Comments received outside the scoping periods are equally valuable to the process and will be considered and incorporated into alternatives development and screening as they are received.

Evaluate Alternatives for Consistency with Permitting Requirements. UDOT will evaluate the alternatives independently for their consistency with applicable permitting requirements, including consideration of whether an alternative is practicable for Clean Water Act Section 404(b)(1) purposes. If an alternative is found by UDOT to be practicable and to have less adverse impacts to the aquatic environment, it will be retained for detailed analysis in the EIS. For more information, see Section 5.0, Reasons Why Alternatives Might Be Eliminated.

Estimate Impacts on Resources. Using geographic information systems (GIS) software, UDOT will estimate how each alternative that passed Level 1 screening might affect resources such as wetlands and other waters of the United States, Section 4(f) and Section 6(f) resources, wildlife habitat, existing and planned parks and trail systems, cultural resources, camping areas, wilderness areas, and community facilities such as schools, senior centers, fire stations, and community gathering places. The amount of impacts will be determined by overlaying the estimated right-of-way for each alternative on the GIS datasets for these resources. UDOT will use the same approach to identify the potential number of impacts to homes and businesses, potential property acquisitions, potential utility impacts, and potential community impacts.

What are Sections 4(f) and 6(f)?

For more information about Sections 4(f) and 6(f), see Section 5.3, Section 4(f)/ Section 6(f) Requirements.

3.0 Preliminary Engineering Phase

The alternatives that pass the screening process will be further developed through preliminary engineering to support detailed analysis in the EIS. The preliminary engineering phase will include design work to provide details such as horizontal and vertical alignments, right-of-way needs, intersection design, parking lot and bicycle lane configurations, access design, and potential drainage designs. All alternatives will be designed to a similar level of detail.

Once the preliminary engineering phase is complete, the expected effects of the alternatives will be characterized and compared to the No-Action Alternative in the EIS, as required by NEPA.

4.0 Agency and Public Involvement

As part of the NEPA process, UDOT sought input on the range of alternatives during the agency and public scoping periods from March 9 to May 4, 2018, and March 5 to June 14, 2019. At the public scoping meetings on April 10, 2018, and April 9, 2019, UDOT showed some alternative concepts and asked agencies and the public for input on alternatives that should be evaluated. Additionally, UDOT posted requests for input on the alternative concepts on the project website during the scoping process.

UDOT has made this *Alternatives Development and Screening Methodology Report* available to, and is requesting input from, the public, agencies, and tribal representatives on the alternatives development and screening process for the Little Cottonwood Canyon EIS. During the alternatives development process, UDOT will apply the screening criteria to identify the range of alternatives to be considered and fully evaluated in the EIS.

What are cooperating and participating agencies?

A cooperating agency is any federal, state, or local 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.

A participating agency is a federal or non-federal agency that might have an interest in the project.

Following the screening process, UDOT will present the alternatives to the public for review and comment. This may include a public open house as well as information posted on the project website.

UDOT is currently consulting with Native American tribes under NEPA, Section 106 of the National Historic Preservation Act, and the coordinated environmental review process under 23 United States Code (USC) Section 139.

After the alternatives development and screening process is completed, UDOT will prepare a screening results memorandum to document the input UDOT received and how UDOT considered the input during the screening process. This information will also be presented in the EIS.

5.0 Reasons Why Alternatives Might Be Eliminated

5.1 NEPA Regulations and Council on Environmental Quality Guidance

According to NEPA regulations and guidance issued by the Council on Environmental Quality, there are three primary reasons why an alternative might be determined to be not reasonable and eliminated from further consideration.

1. The alternative does not satisfy the purpose of the project (evaluated in the Level 1 screening for the Little Cottonwood Canyon Project).
2. The alternative meets the purpose of and need for the project but is unreasonable based on a combination of other factors such as costs, environmental impacts, or its inability to meet permitting or other regulatory requirements (evaluated in the Level 2 screening for the Little Cottonwood Canyon Project).
3. The alternative substantially duplicates another alternative; that is, it is otherwise reasonable but offers little or no advantage for satisfying the project's purpose, and it has impacts and/or costs that are similar to or greater than those of other, similar alternatives (evaluated in the Level 2 screening for the Little Cottonwood Canyon Project).

5.2 Clean Water Act Requirements

Because the area of analysis for the project might support federally regulated wetlands or other waters of the United States, UDOT will also consider the Clean Water Act *Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material* (40 Code of Federal Regulations 230) and Executive Order 11990, *Protection of Wetlands*, during the alternatives development phase. The U.S. Army Corps of Engineers is responsible for determining compliance with the Section 404(b)(1) Guidelines and may permit only the least environmentally damaging practicable alternative.

The Section 404(b)(1) Guidelines state that "no discharge of dredged or fill material [to Section 404–regulated waters] shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences" [Section 230.10(a)]. This section of the guidelines further states that:

1. For the purpose of this requirement, practicable alternatives include but are not limited to:
    a. Activities which do not involve a discharge of dredged or fill material into the waters of the United States or ocean waters;
    b. Discharges of dredged or fill material at other locations in waters of the United States or ocean waters;
2. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity may be considered.
3. Where the activity associated with a discharge which is proposed for a special aquatic site (as defined in Subpart E of the guidelines) does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not water dependent), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise.

To achieve compliance with the Section 404(b)(1) Guidelines, UDOT will need to demonstrate through an evaluation of alternatives in the EIS that the alternative selected in the project's Record of Decision is the least environmentally damaging practicable alternative.

5.3 Section 4(f)/Section 6(f) Requirements

Section 4(f) of the Department of Transportation Act of 1966 (49 USC Section 303) applies to publicly owned parks, recreation areas, and wildlife and waterfowl refuges and publicly or privately owned significant historic properties. The requirements of Section 4(f) apply only to agencies within the U.S. Department of Transportation (USDOT)—for example, the Federal Highway Administration (FHWA). Pursuant to 23 USC Section 327 and the NEPA Assignment Memorandum of Understanding between FHWA and UDOT dated January 17, 2017, UDOT is responsible for meeting Section 4(f) and Section 6(f) requirements.

Section 4(f) prohibits USDOT agencies from approving the use of any Section 4(f) land for a transportation project, except as follows:

- First, the USDOT agency can approve the use of Section 4(f) land by making a determination that (1) there is no prudent and feasible alternative that would avoid the use of the Section 4(f) resource *and* (2) the project includes all possible planning to minimize harm to that property.
- Second, the USDOT agency can approve the use of Section 4(f) property by making a finding of *de minimis* impact for that property.

Section 6(f) of the Land and Water Conservation Act requires that the conversion of lands or facilities acquired with Land and Water Conservation Act funds be approved by the U.S. Department of Interior. Approval requires "substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location."

What is a *de minimis* impact?

For publicly owned public 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 the property.

For historic sites, a finding of *de minimis* impact means FHWA has determined that either the project would not affect the historic property or the project would have "no adverse effect" on the historic property.

An alternative that would not be available because of the severity of Section 4(f) or Section 6(f) impacts could be eliminated during Level 2 screening. To achieve compliance with the Section 4(f) regulations, UDOT will need to demonstrate through an evaluation of alternatives that either (1) the alternative selected would have a *de minimis* use of Section 4(f) resources or (2) there is no feasible and prudent alternative that would avoid the use of Section 4(f) resources, and the project includes all possible planning to minimize harm to Section 4(f) resources.

5.4 Wilderness Act of 1964 (Public Law 88-577; 16 USC Sections 1131–1136)

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 Little Cottonwood Canyon Road and Lone Peak Wilderness to the south. The Wilderness Act was established by Congress to secure for the American people of present and future generations the benefit of an enduring resource of wilderness. The Wilderness Act states there shall be no commercial enterprise and no permanent road within any Wilderness Area designated by the Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of the Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

An alternative could be determined not reasonable under NEPA if, during Level 2 screening, UDOT determines that the alternative requires activities in a designated wilderness area prohibited under the Wilderness Act and would require federal legislative approval to be built.

5.5 Appropriation of Lands Owned by the United States for Highway Purposes

In Little Cottonwood Canyon, S.R. 210 crosses National Forest System (NFS) land; however, UDOT does not currently have a perfected easement for the entire length of the corridor on those lands. If proposed improvements would occur on NFS land not already appropriated by FHWA, this action 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.

6.0 Tools Used

6.1 Travel Demand Model

A travel demand model is a computer model that predicts the number of transportation trips (travel demand) in an area at a given time. This prediction is based on projections of land use, socioeconomic patterns, and transportation system characteristics in the area.

UDOT will use the output from travel demand modeling to determine whether an alternative meets the purpose of improvements to S.R. 210. For the Wasatch Boulevard segment of S.R. 210, UDOT will use WFRC's travel demand model. Because WFRC's model does not capture the unique nature of recreational demand in Little Cottonwood Canyon, UDOT will develop a separate travel demand model for the North Little Cottonwood Road and Little Cottonwood Canyon Road segments of S.R. 210.

6.2 GIS Data

GIS-based data will be used during the screening phases to help UDOT understand the locations and extents of a number of resources. Some GIS data are managed by the State of Utah, the federal government, Cities, or Counties and are readily available to UDOT. The data that will be checked regularly include data layers that show streets, parcels, land ownership, parks, and land use designations. UDOT will also use other data layers available from the State that provide information such as the locations of rivers, streams, and water bodies; jurisdictional boundaries (such as city and county boundaries); wildlife habitats; and geology.

UDOT is also developing GIS databases through reconnaissance-level field surveys in the Little Cottonwood Canyon EIS study area. The specific data layers that UDOT is creating and that will be used during Level 2 screening include wetland locations and types, wildlife habitat types by location, and cultural (prehistoric and historic) resources.

6.3 Public and Agency Review of This Report

This report will be provided to the cooperating and participating agencies and the public for at least a 30-day review period. After comments are received, UDOT will revise the report as necessary based on the public and agency input.

7.0 Alternatives to Be Considered in the Screening Process

This section lists the proposed alternatives that will be evaluated in the Level 1 screening process: Wasatch Boulevard improvements, avalanche mitigation, parking, and mobility improvements. UDOT developed this list from previous studies, public and agency input during the scoping process, and local and regional land use and transportation plans.

During the scoping processes in 2018 and 2019, UDOT received about 100 comments that suggested alternatives for UDOT to consider. Appendix A, Preliminary Evaluation of Alternatives/Concepts, summarizes those comments and UDOT's review of their applicability to the Little Cottonwood Canyon Project EIS. Table 3 lists the proposed alternatives that will be considered further in the Level 1 screening process.

Table 3. Proposed Alternatives To Be Considered in the Level 1 Screening Process [a]

Safety	Mobility	Reliability
Avalanche Mitigation • Snow sheds • Snow-supporting structure • Road realignment and/or bridges • Berms • Stopping walls • Reduce traffic flow by implementing transit Parking • Reduce on-road user conflict • Reduce or eliminate on-road parking at ski resorts • Expand trailhead parking with elimination of on-road parking within 0.25 mile of each trailhead • Expand trailhead parking with elimination of on-road parking from S.R. 209/S.R. 210 intersection to Snowbird entry 1 • No trailhead parking expansion with elimination of on-road parking from S.R. 209/S.R. 210 intersection to Snowbird entry 1	Wasatch Boulevard • Transit • Roundabouts • Reversible lanes • Four lanes • Five lanes • Signalized intersection at Kings Hill Drive Little Cottonwood Canyon • Transit[b] o Gondola from Salt Lake Valley o Gondola from Park City o Train and/or light rail o Bus o SkyTran o Monorail • Additional road lanes[c] o Reversible o Peak-hour shoulders • One direction travel on existing road during the AM and PM peak periods • Roundabout at S.R. 210/S.R. 209 • Tolling • Eliminate or reduce on-road parking at ski resorts	• Increase transit service • Avalanche mitigation

[a] Alternatives that were suggested during scoping but are not shown in this table were reviewed and eliminated because they are outside the scope of the EIS, are state operational improvements that are in process and are considered independent safety improvements, or are improvements considered within a larger alternative (see Appendix A of this report).

[b] Some transit alternatives assume that the roadway capacity of S.R. 210 in Little Cottonwood Canyon would not be expanded.

[c] A dedicated bus and/or high-occupancy vehicle lane will be considered with alternatives that add lanes.

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Appendix A. Preliminary Evaluation of Alternatives/Concepts

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Table A-1. Preliminary Evaluation of Alternatives/Concepts Suggested during EIS Scoping Periods

Suggested Alternative	Part of No-Action/ Baseline	Reason for Not Including in the Proposed Alternatives				Evaluated Further in Level 1 Screening	Considered as Part of Alternative Design, Environmental Analysis, and/or Potential Mitigation	Additional Information
		Does Not Meet Project Objectives	Outside the EIS Study Area	Outside the Scope of the EIS	Technically and/or Feasibly Prohibitive			
Wasatch Boulevard								
Consider pedestrian overpasses or tunnels.							✓	Will be part of road improvements alternatives.
Add pedestrian warning lights at crosswalks.							✓	UDOT will look at pedestrian and bicycle safety as part of road improvements.
Reduce speed limits.				✓				Speed limits are a UDOT operational issue considered in accordance with state code outside NEPA. Reduced speed limits would not change the results of the roadway capacity analysis.
Don't widen Wasatch Boulevard.	✓							
Add bus-only lane.						✓		Transit-only alternatives will be considered.
Consider safety and neighborhood access. Improve intersections.							✓	Will be part of road improvements alternatives.
Add traffic signal at Kings Hill Drive.						✓		
Improve sight distance at Kings Hill Drive.							✓	Will be part of road improvements alternatives.
Add separate bicycle/pedestrian trail.							✓	Will be part of road improvements alternatives.
Improve Highland Drive to provide alternate route.	✓							Included in Phase 2 of the 2019–2050 WFRC RTP to widen Highland Drive to five lanes from 9800 South to the Draper city limits. Travel demand modeling showed that, even with Highland Drive improvements, there would be a need to improve Wasatch Boulevard.
Add bicycle lanes and improve bicycle safety.							✓	Will be part of road improvements alternatives.
Widen Wasatch Boulevard.						✓		
Provide roundabouts.						✓		
Put through traffic in a tunnel to I-215.					✓			Alternative eliminated. Cost of 3-mile tunnel would be about $2.5 billion[a]. In addition, it would require extensively reworking the existing road network to accommodate entrance and exit points.
Avalanche Mitigation								
Current system is sufficient.	✓							
Install more remote-activation systems.		✓						More remote-activation active systems would not reduce the number closure days or hours of closure since the road would still need to be closed during activation.
Add snow sheds.						✓		
Use bridges to go over avalanche paths.						✓		
Reduce the number of vehicles (provide more transit).						✓		Transit alternatives would reduce vehicle use.
Avalanche control should start early.		✓		✓				This is a UDOT operational consideration. UDOT currently conducts avalanche control at the earliest possible time. This alternative would not reduce the amount of road closure.

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		Does Not Meet Project Objectives	Outside the EIS Study Area	Outside the Scope of the EIS	Technically and/or Feasibly Prohibitive			
Mobility/Capacity								
Build transit hubs at gravel pit and 9400 South.						✓		
Provide parking for cars waiting to enter Little Cottonwood Canyon.						✓		Considered as part of the transit alternative to reduce vehicle use and avalanche mitigation to reduce closure and eliminate backup both of which reduce the number of vehicles waiting to enter Little Cottonwood Canyon.
Eliminate on-road parking at ski resorts.						✓		
Increase road capacity (three and four lanes).						✓		
Don't expand road capacity.	✓							
Consider reversible lanes.						✓		
Add a dedicated travel lane for Alta.						✓		Considered in reversible lane and widen road alternatives. If alternatives provide enough roadway capacity, there would be no need for a dedicated lane.
Add more pullouts for slow vehicles.		✓					✓	Concept will be included as part of adding capacity. Slow vehicle pull outs for buses would substantially increase travel time making buses less feasible. Does not meet project objective of improving mobility for all users (including transit users)
Build a longer merge lane at S.R. 209/S.R. 210.						✓		
Don't build a merge lane at S.R. 209/S.R. 210, and reduce speed limits.	✓			✓				Reducing speed limits is a UDOT operational consideration. Reducing speed limits would not change the need for mobility improvements.
Add a traffic signal at S.R. 209/S.R. 210.				✓				UDOT is currently making safety improvements to this intersection outside the EIS process for immediate implementation.
Restrict larger vehicles during peak periods.						✓		Transit and tolling options are being considered to reduce overall vehicle use.
Allow buses only.						✓		
Add bicycle lanes.							✓	Will be considered as part of road improvement alternatives.
Limit the number of vehicles.						✓		
Eliminate single-occupant vehicles.						✓		Will be considered as part of transit and tolling alternatives.
Provide transit priority.							✓	Will be considered as part of road improvement alternatives.
No vehicle waiting at base of canyon.						✓		Part of screening criteria to reduce vehicle waiting at base of canyon. Considered under all alternatives.
Road should be one way during AM and PM peak periods.						✓		
Provide police escorts for traffic.				✓				Operational consideration that can be implemented outside the EIS process. Would still need to have large wait areas for cars to be platooned up canyon.
Provide more smaller shuttles and fewer big buses.						✓		Feasibility of transit alternatives will be considered. Size of buses to accommodate demand will be managed by UTA outside the EIS process.

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Free or discounted transit.				✓				Managed by UTA outside the EIS process.
Consider ride-share programs.	✓			✓				Rider-share companies currently exist along with ride-share apps. UDOT can accommodate ride-share areas but would not provide a system under which ride-sharing would operate.
Direct bus service to ski resorts (no stops).						✓		
Train and/or light rail.						✓		
Gondola from the Salt Lake Valley.						✓		
Gondola from Park City.						✓		
Give buses priority when leaving parking areas and on the road.							✓	Will be considered as part of transit alternatives.
Bus priority at signalized intersections.							✓	Will be considered as part of Wasatch Boulevard alternatives.
Bus-only reversible lane in Little Cottonwood Canyon.						✓		
Add bicycle trail by paving Temple Quarry/Little Cottonwood Creek Trail.				✓				The trail is managed and maintained by USDA Forest Service and would require a separate NEPA action.
Provide tunnels at strategic locations to ease traffic flow, mainly at ski resorts.							✓	
Open Emma Mine Tunnel between Little Cottonwood Canyon and Big Cottonwood Canyon to disperse traffic.		✓		✓				Tunnels between Little Cottonwood Canyon and Big Cottonwood Canyon are not necessary to meet the objectives of improving mobility in Little Cottonwood Canyon.
Trailhead Parking								
No additional parking at trailheads.						✓		
Charge fee for parking at trailheads.		✓		✓				UDOT does not have ability to charge for parking at trailheads. USDA Forest Service would be responsible for implementing a recreational fee program.
Expand trailhead parking with restrooms.						✓		
Allow roadside parking in Little Cottonwood Canyon near trailheads.						✓		
Add parking at Grit Mill.				✓				Project is partially funded, and USDA Forest Service has conducted the NEPA process.
Improve parking at Gate Buttress.						✓		
No parking at Lisa Falls.	✓							
Tolling								
No tolls.	✓							
Toll single-occupant vehicles only.						✓		

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Toll all nontransit vehicles.						✓		
Toll based on number of occupants.						✓		
Reduce toll for low-income populations.							✓	Environmental justice and equity will be evaluated in the EIS.
Dynamic tolling based on time of day and occupants.						✓		
Tolling revenue should go back into canyon.				✓				The state legislature and the Utah Transportation Commission would decide how tolling revenue would be spent.
Other								
Fire suppression in snow sheds should be nontoxic with no release into Little Cottonwood Creek.							✓	
Snow sheds should provide room for a train.							✓	Will be considered as part of snow shed alternatives design.
Provide avalanche protection for Tanner Flats.		✓						UDOT has analyzed the avalanche paths that have the greatest effect on road closure. The Tanner Flats avalanche path was determined not to warrant protection.
Charge fee for resort parking and/or reserved parking.				✓				UDOT does not have the authority to require private businesses to charge fees for parking.
Add parking at base of canyon.						✓		Will be considered as part of transit alternatives.
Open parking at 3900 South/Wasatch Boulevard.						✓		Transit alternatives evaluated in the EIS will be evaluated to determine the capacity of parking. UTA can determine routes and park-and-ride locations without the need for a NEPA analysis.
Allow parking at Reams strip mall at 7200 South.						✓		Transit alternatives evaluated in the EIS will be evaluated to determine the capacity of parking. UTA can determine routes and park-and-ride locations without the need for a NEPA analysis.
Ski areas should build parking structures.						✓		
Build parking structure at the tree farm.						✓		
Don't expand parking at Little Cottonwood Canyon park-and-ride lot.						✓		The transit and road alternatives will look at options that could include additional parking.
Expand parking at the swamp lot.						✓		The transit and road alternatives will look at options that could include additional parking.
Use school and church parking lots for bus park-and-ride lots.						✓		UDOT and UTA will develop alternatives to meet the project's purpose and will consider parking as part of the alternative design that best promotes efficient bus use.
Parking should be underground or limited to two levels.							✓	
Include rumble strips and box dots to protect cyclists.							✓	Road alternatives will consider meeting cyclist safety standards.
Improve high-tee intersections at Alta and Snowbird.				✓				UDOT is currently looking at improving these intersections as part of safety improvements.
Eliminate "right on red" at S.R. 209 and Old Wasatch Boulevard.	✓		✓					S.R. 209 is not part of the scope of the EIS.
Add guard rail in Little Cottonwood Canyon.							✓	UDOT will meet safety design standards for the alternatives considered.
Reduce travel on Albion Basin Road.				✓				Albion Basin Road is not part of S.R. 210.

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Preregister vehicles for winter use and provide a fast pass.				✓				This is an operational program that would require state legislative approval. It would not require a NEPA analysis.
Provide electric buses.							✓	Operational requirement that can be determined by UTA based on technical feasibility. Does not need to be part of the NEPA decision.
To encourage transit use provide ski lockers and improved stops bus stop locations. Include amenities at bus stops such as lift ticket purchasing and heating.							✓	Will be considered part of transit alternatives.
Increase fines for ill-equipped vehicles or improve monitoring.		✓		✓				This is a state enforcement consideration and does not require a NEPA analysis.
Improve traffic condition communications.	✓			✓				UDOT is currently improving canyon communications to address safety and mobility.
Work with car rental companies regarding the types of vehicles allowed in the canyon.				✓				UDOT does not have the authority to change how car rental companies operate.
Plow trailhead parking.		✓						Plowing trailheads does not meet the project purpose of improving mobility.
Provide e-bicycle rentals in summer.		✓		✓				Summer mobility is not part of the project purpose.
Provide black ice warning system.							✓	Safety improvements will be considered as part of roadway alternatives.
Restrict development in Little Cottonwood Canyon.				✓				UDOT does not have the authority to limit development. Local government agencies are responsible to implement zoning.
Allow access to Snowbird from American Fork Canyon.				✓				This alternative is being considered by Snowbird Ski Resort across its private land and is an economic decision by a private company.
No IKON pass use at ski resorts.				✓				UDOT does not have the authority to limit IKON passes.
Ski resorts should incentivize people to stay longer and stagger skiers exiting parking lots.				✓				UDOT does not have the authority to implement how a private business operates.
No bicycles on the road.		✓						Eliminating bicycles is not required to meet the project's objectives.
Add more snow plows.							✓	
Replace bridge at Wasatch Resort.		✓		✓				Wasatch Resort is a private development and road outside the authority of UDOT.
Address summer use.						✓		Summer trailhead parking is being considered in the EIS. Mobility improvements during the summer are not needed to meet project's objectives.
Use technology to reduce vehicle use.							✓	UDOT will consider the latest available technology when developing alternatives.
Add parking at Temple Quarry Trail.		✓						UDOT and UTA will develop alternatives to meet the project's purpose and will consider parking as part of the alternative design that best promotes efficient bus use.

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Add parking at S.R. 210/Wasatch Boulevard.							✓	UDOT and UTA will develop alternatives to meet the project's purpose and will consider parking as part of the alternative design that best promotes efficient bus use.
Provide electric charging stations at park-and-ride lots.							✓	

AM = morning; EIS = Environmental Impact Statement; I-215 = Interstate 215; NEPA = National Environmental Policy Act; PM = afternoon; RTP = *Wasatch Front Regional Transportation Plan*; S.R. = State Route; UDOT = Utah Department of Transportation; USDA = United States Department of Agriculture; UTA = Utah Transit Authority; WFRC = Wasatch Front Regional Council

[a] In 2012, the cost estimate for the Alaskan Way Viaduct tunnel in the state of Washington was $1.35 billion for the 9,100-foot tunnel, or about $148,352 per linear foot. This cost includes all elements to construct the Alaskan Way Viaduct tunnel. The LCC team used cost index inflation rates from the *Engineering News-Record* to escalate the 2012 construction cost estimate to 2018 values. Based on this cost escalation, the 2018 cost would be about $165,000 per linear foot.