The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the Utah Department of Transportation (UDOT) pursuant to 23 United States Code 327 and a Memorandum of Understanding dated January 17, 2017, and executed by the Federal Highway Administration and UDOT.
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1.0 Introduction

The purpose of this report is to describe the proposed alternatives-development and screening process that will be used for the Parley’s Interchange (I-80/I-215 Eastside Interchange) Environmental Impact Statement (EIS). The Utah Department of Transportation (UDOT) is preparing the EIS to study current and long-term traffic congestion and safety at the Parley’s interchange.

The alternatives-development and screening process will consist of the following four phases:

1. Develop initial project alternatives.
2. Apply first-level (Level 1 – purpose and need) screening criteria, identify alternatives that will move to Level 2 screening, and refine alternatives that pass first-level screening.
3. Apply second-level (Level 2 – Clean Water Act, Section 4(f)/6(f), and environmental impacts) screening criteria related to impacts to the natural and human environment and regulatory requirements and cost.
4. 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 will be designed to a higher level of detail before UDOT performs the detailed impact analyses for the EIS.

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 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.

Clean Water Act. Because the project study area may support federally regulated wetlands and other waters of the United States, UDOT will need to consider the Clean Water Act Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material and Executive Order 11990, Protection of Wetlands, during alternatives development. To achieve compliance with the Section 404(b)(1) Guidelines, UDOT will need to demonstrate through an evaluation of alternatives that the alternative selected is the least environmentally damaging practicable alternative.

Section 4(f). Because the project study area includes Section 4(f) resources (which are publicly owned parks, recreation areas, and waterfowl and wildlife refuges, and publicly or privately owned significant historic properties), UDOT will need to consider the potential uses of the Section 4(f) resources during alternatives development. 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.

Section 6(f). 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 coordinated with the U.S. Department of the Interior. Usually, replacement in kind is required if Section 6(f) properties would be affected by a project.

The criteria used in the screening analyses will be used to generate measures that will let UDOT systematically and objectively identify reasonable and practicable alternatives and screen out alternatives that are unreasonable and not practical. The entire process will take place over several months.

Figure 1 presents an overview of the alternatives-development and screening process. As shown in the figure, the project’s purpose and need are the foundation of the process.

Figure 1. Overview of the Parley’s Interchange Alternatives-Development and Screening Process

The alternatives-development and screening process is designed to be dynamic throughout the EIS process. If a new alternative or refinement of an alternative is developed or arises later in the process, it will be subject to the same screening process as all of the other alternatives, as described in this report.

Figure 2 shows the needs assessment study area, which is the area in which the need for improvements to the Parley’s interchange was assessed earlier in the EIS process (for more information, see the Parley’s Interchange Purpose and Need Statement (UDOT 2018). The alternatives studied in detail in the EIS will be located within this area.
Figure 2. Needs Assessment Study Area for the Parley’s Interchange EIS
2.0 Alternatives-Development and Screening Process

2.1 Alternatives-Development Phase

In the first phase of the alternatives-development and screening process, UDOT will develop an initial list of alternatives to be evaluated. UDOT will gather these alternatives from previous studies, from public and agency input, and from local and regional land-use and transportation plans. UDOT will use the project website and email list to request input on the initial alternatives to be evaluated and the criteria to be used to screen the alternatives. The initial list of alternatives will include different travel modes (for example, transit, automobile, walking, and bicycling) and interchange options.

All of the initial alternatives must be applicable to the needs assessment study area (shown in Figure 2 above) and must present a type of solution that could meet the project’s purpose and transportation need. For example, the alternatives must be compatible with the study area’s topography and must be capable of addressing safety standards and regional mobility challenges, especially during peak travel hours.

Alternatives to improve Parley’s interchange will be focused on the operations and safety of the interchange. Improvements to adjacent interchanges (1300 East and 2300 East on I-80 and 4500 South, 3900 South, and 3300 South on I-215) will be considered only if improvements to these interchanges are necessary to meet UDOT’s goals for the Parley’s interchange (see Table 1 on page 6).

After the initial list of alternatives is developed, the alternatives will be put through the screening phases.

2.2 Alternatives-Screening Phases (Level 1 and Level 2 Screening)

The alternatives-screening phases test each of the initial alternatives using criteria that identify whether the alternative reasonably meets the purpose of and need for the project (Level 1 screening) the alternative’s impacts to the natural and built environment, estimated project costs, logistical considerations, and overall feasibility (Level 2 screening).

The alternatives-screening phases will be supported by technical analyses to help UDOT refine the alternatives and identify those alternatives that meet the purpose of and need for the project. This report explains how the process will occur and the criteria that will be applied. The results of the screening process will be documented in a separate screening report.

2.2.1 Level 1 Screening

The purpose of Level 1 screening is to identify alternatives that meet the purpose of and need for the project. Alternatives that are determined by UDOT to not meet the purpose of the project will be considered unreasonable for NEPA purposes, not practicable for Clean Water Act Section 404(b)(1) purposes, and not prudent or feasible for Section 4(f) purposes and will not be carried forward for further analysis. For more information, see Section 2.5.1, CEQ Regulations and Guidance; Section 2.5.2, Clean Water Act Requirements; and Section 2.5.3, Section 4(f)/Section 6(f) Requirements.
Purpose of the Project

The primary purpose of the Parley’s Interchange project consists of the following objectives:

- **Improve the Level of Service at Parley’s Interchange in 2050.** Improve the level of service (LOS) at Parley’s interchange in 2050 by meeting UDOT’s goal of LOS D on as much of Parley’s interchange as possible (LOS D is considered light congestion).

- **Improve Regional Mobility in 2050.** Improve regional mobility through a key link in the local, state, and national transportation network for automobile, transit, and freight trips by substantially reducing travel delay through the interchange compared to the no-action conditions.

- **Improve Safety.** Improve the operational characteristics and safety of the Parley’s interchange by addressing obsolete design elements. Prevent traffic on the Parley’s interchange exit ramps from backing onto the main and auxiliary travel lanes of Interstate 80 (I-80) and Interstate 215 (I-215) as much as possible.

In addition to the primary objectives, UDOT will also evaluate the following secondary objectives:

- The project should be consistent with local land use and transportation plans.
- The project should be compatible with other planned projects on Foothill Drive and I-80.

Need for the Project

The major transportation needs in the needs assessment study area (see Figure 2, Needs Assessment Study Area for the Parley’s Interchange EIS, above) are a result of growing population, high current and future travel demand, highway infrastructure that was designed to accommodate traffic conditions over 50 years ago, and numerous locations in the Parley’s interchange that have safety and operational issues. These conditions result in the following deficiencies in the needs assessment study area:

- Decreased mobility and increased traffic congestion in the AM and PM peak-period travel periods (inadequate roadway capacity)

- Roadway elements (shoulders, ramps, horizontal and vertical curves, seismic standards for structures, and merging and weaving distances) that are obsolete and do not meet current design standards for all potential users and accommodate the high traffic volumes safely

- Above-average accident rates in multiple locations

UDOT identified these principal deficiencies by comparing present and future levels of congestion, crash data, and roadway design elements. The deficiencies would occur even with all other anticipated transportation improvements (except for improvements to the Parley’s interchange) in the needs assessment study area that are identified in the Wasatch Front Regional Council’s *Regional Transportation Plan* for 2015 to 2040 (WFRC 2015) as being implemented by 2040.
In addition, the need for transportation improvements is recognized in the *Utah Freight Plan* (UDOT 2017), which documents the need for improvements at the Parley’s interchange in the needs assessment study area.

**Level 1 Screening Criteria**

Level 1 screening is the first major decision point at which alternatives can be eliminated based on specific screening criteria. During Level 1 screening, UDOT will screen the initial alternatives 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 travel demand model (see Section 2.6.1, Travel Demand Model) to forecast the future traffic volumes on any roadway alternatives.

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

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve the level of service at the Parley’s interchange in 2050</td>
<td>• Meet a level of service of LOS D on as much of the Parley’s interchange and entrance and exit ramps as possible.</td>
</tr>
<tr>
<td>Improve regional mobility in 2050</td>
<td>• Substantially reduce travel time and delay through the Parley’s interchange.</td>
</tr>
<tr>
<td></td>
<td>• Substantially improve travel speeds through the Parley’s interchange.</td>
</tr>
<tr>
<td>Improve safety</td>
<td>• Eliminate queuing on interstate mainline through lanes.</td>
</tr>
<tr>
<td></td>
<td>• Reduce queuing lengths on the interchange ramps</td>
</tr>
<tr>
<td></td>
<td>• Meet UDOT’s safety standards (such as lane and shoulder widths, access, and sight distance) for all roadway users including passenger and freight vehicles.</td>
</tr>
</tbody>
</table>

These criteria will be used to screen potential Parley’s interchange alternatives and will be focused on the operations and safety of the interchange. Improvements to adjacent interchanges (1300 East and 2300 East on I-80 and 4500 South, 3900 South, and 3300 South on I-215) will be considered only if the improvements to these interchanges are necessary to meet UDOT’s goals for the Parley’s interchange.

When UDOT reviews the Level 1 screening results, the initial alternatives will be eliminated if they fail to meet the Level 1 screening criteria. Initial alternatives that are not eliminated during Level 1 screening will be advanced to Level 2 screening.

**2.2.2 Level 2 Screening**

The purpose of Level 2 screening is to determine which alternatives are practicable and reasonable and therefore will 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 how well each alternative meets the purpose of the project (this might require refined travel demand modeling), the alternative’s impacts to the natural and built environment, estimated project costs, logistical considerations, and overall feasibility.

In preparation for Level 2 screening, UDOT will use geographic information systems (GIS) software to 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, and community facilities (such as schools, senior centers, fire stations, and community gathering places). The amount of impacts will be determined by estimating the right-of-way needed for each alternative. UDOT will also identify the potential number of
impacts to homes and businesses, potential property acquisitions, potential utility impacts, and potential community impacts. Table 2 lists the Level 2 screening criteria.

### Table 2. Level 2 Screening Criteria (Impacts)

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility with local plans</td>
<td>• Alternative’s consistency with local and regional land-use and transportation plans(^a)</td>
</tr>
<tr>
<td></td>
<td>• Alternative’s compatibility with other planned projects on Foothill Drive and I-80 as identified in current planning studies for those roadways and in the Regional Transportation Plan(^b)</td>
</tr>
<tr>
<td>Cost, technology, and logistics</td>
<td>• Estimated project cost (general)</td>
</tr>
<tr>
<td></td>
<td>• Constructability given available technology</td>
</tr>
<tr>
<td></td>
<td>• Logistical considerations(^c)</td>
</tr>
<tr>
<td>Impacts to natural resources</td>
<td>• Acres and types of wetlands and other waters of the United States affected(^c)</td>
</tr>
<tr>
<td></td>
<td>• Acres of floodplain affected</td>
</tr>
<tr>
<td>Impacts to the built environment</td>
<td>• Number and area of parks and trails affected</td>
</tr>
<tr>
<td></td>
<td>• Number of linear feet of canal or pipelines affected</td>
</tr>
<tr>
<td></td>
<td>• Number of water infrastructure facilities affected</td>
</tr>
<tr>
<td></td>
<td>• Number of community facilities affected</td>
</tr>
<tr>
<td></td>
<td>• Number of potential property acquisitions including residential, business, and utility acquisitions</td>
</tr>
<tr>
<td></td>
<td>• Number of Section 4(f)/Section 6(f) uses(^d)</td>
</tr>
<tr>
<td></td>
<td>• Number of cultural resources (for example, historic and archaeological resources) affected</td>
</tr>
</tbody>
</table>

\(^a\) This criterion will not be used to determine whether an alternative is reasonable or practicable but will be used to make minor shifts to alternatives’ alignments.

\(^b\) Logistical considerations will be defined by the U.S. Army Corps of Engineers.

\(^c\) 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. For more information, see Section 2.5.2, Clean Water Act Requirements.

\(^d\) Based on the requirements of Section 4(f) of the Department of Transportation Act of 1966 requirements and Section 6(f) of the Land and Water Conservation Fund Act of 1965, an alternative with a substantially greater number of Section 4(f) or Section 6(f) impacts could be eliminated from detailed study in the EIS. For more information, see Section 2.5.3, Section 4(f)/Section 6(f) Requirements.

UDOT will collectively evaluate the alternatives that passed Level 1 screening for how well they meet the purpose of the project as well as their impacts, costs, logistical considerations, and so on. If UDOT determines that an alternative would have substantially higher impacts or costs without having substantially higher benefits, it will be considered unreasonable for NEPA purposes. However, the alternative first will be evaluated independently for costs, logistics constraints, and technological feasibility to determine whether an alternative is practicable for Clean Water Act Section 404 (b)(1) purposes. If an alternative is found to be practicable and has less adverse impacts to the aquatic environment, it will be retained for detailed analysis in the EIS. For more information, see Section 2.5, Reasons Why Alternatives Might Be Eliminated.

Although public and agency involvement is critical throughout the entire alternatives-development and screening process, the comments received from the public will be particularly relevant during Level 2 screening. Several of the Level 2 screening criteria focus on local and community elements, so input received from the public at open houses, the Stakeholder Working Group, and agencies that are part of the EIS process through the provisions of SAFETEA-LU (the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users; Public Law 109-59) will be critical to this phase of screening.
The alternatives that pass Level 2 screening will be further refined and carried forward for detailed study in the EIS. The results of the screening process will be presented in a memorandum and summarized in the EIS.

2.3 Preliminary Engineering Phase

The alternatives that are not eliminated through Level 1 or Level 2 screening will be further refined through preliminary engineering before they are analyzed in detail for the EIS. This preliminary engineering will include details such as horizontal and vertical alignments, interchange design, trail and bicycle lane configurations, access design, and potential drainage designs. Each alternative will be designed to a similar level of detail.

Once the preliminary design work is complete, the expected effects of the alternatives will be identified and compared at an equal level of detail as required by NEPA.

2.4 Agency and Public Involvement

As part of the NEPA process, UDOT will seek input from the public and agencies during the scoping and alternatives-development processes. At the public scoping meeting, boards requesting input on initial alternatives and screening criteria will be displayed, and UDOT members will ask for input on initial alternatives that should be evaluated. Additionally, requests for input on initial alternatives and screening criteria will be posted on the project website. Other input will be sought during stakeholder interviews and at Stakeholder Working Group meetings.

UDOT will seek input from agencies at cooperating and participating agency meetings and at meetings with resource agencies to request input on alternatives that should be considered and criteria that should be used to screen the alternatives. During the alternatives-development phase, UDOT will request concurrence from agencies on the screening criteria to be used to evaluate alternatives and on the range of alternatives to be considered.

Finally, UDOT will consult with tribal representatives regarding Native American concerns about initial alternatives and the screening process. UDOT is currently consulting with Native American tribes under Section 106 of the National Historic Preservation Act, so consultation regarding alternatives will take place as part of that process as well as through the NEPA and SAFETEA-LU processes.

After the alternatives-development and screening process is completed, UDOT will prepare a screening results report to document the input that was received and how it was considered during the screening process.

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.
2.5 Reasons Why Alternatives Might Be Eliminated

2.5.1 CEQ Regulations and Guidance

According to NEPA regulations and the Council on Environmental Quality (CEQ), 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 (Level 1 screening).
2. The alternative is determined to be not practical or feasible from a technical and/or economic standpoint (Level 2 screening).
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 (Level 2 screening).

2.5.2 Clean Water Act Requirements

Because the area of analysis for the project may 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 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.

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

Section 4(f) of the Department of Transportation Act of 1966 (49 United States Code, 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.

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 coordinated with the U.S. Department of the Interior. Usually, replacement in kind is required.

An alternative that would not be available to the USDOT agency because of the severity of Section 4(f) or Section 6(f) impacts could be eliminated during Level 2 screening.

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.
2.6 Tools Used

2.6.1 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.

The Wasatch Front Regional Council maintains a travel demand model for Salt Lake County. UDOT will use the output from this travel demand model to determine whether an alternative meets the purpose of improvements to the Parley’s interchange.

2.6.2 Microsimulation Model

Microsimulation will also be used for the traffic modeling analysis because of its ability to analyze complex interchange configurations. Specifically, PTV’s VISSIM software will be used to report measures of effectiveness for all scenarios. Densities, speeds, and travel times will be analyzed at the mainline, merge segments, and diverge segments for the action and no-action conditions.

2.6.3 GIS Data

Geographic information systems (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, 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 needs assessment 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.

2.7 Public and Agency Review of This Report

This draft version of this report was provided to the cooperating and participating agencies and the public for a 30-day review period ending on May 25, 2018. UDOT received comments from several agencies on the draft version of this report. The comments included suggestions about what to include in Level 1 or Level 2 screening, editorial suggestions, edits on the figures, and information about resources in the needs assessment study area that could be affected by project alternatives. UDOT has reviewed and responded to all comments received and has revised this report based on the public and agency input.
3.0 References

[UDOT] Utah Department of Transportation
2018 Parley’s Interchange Purpose and Need Statement. April.

[WFRC] Wasatch Front Regional Council