Chapter 1: Purpose and Need

1.1 Introduction

This Environmental Impact Statement (EIS) for the Parley’s Interchange Project has been prepared according to the provisions of the National Environmental Policy Act (NEPA) and other laws, regulations, and guidelines of the Federal Highway Administration (FHWA). This document conforms to the requirements of the Utah Department of Transportation (UDOT), the project sponsor and lead agency.

As the lead agency, UDOT is responsible for preparing the Parley’s Interchange EIS. The environmental review, consultation, and other actions required by applicable federal environmental laws for this action are being, or have been, carried out by UDOT pursuant to 23 United States Code 327 and a Memorandum of Understanding dated January 17, 2017, and executed by FHWA and UDOT.

As part of the environmental review process, the lead agency is required to identify and involve cooperating and participating agencies, develop coordination plans, provide opportunities for the public and participating agencies to be involved in defining the purpose and need statement and determining the range of alternatives, and collaborate with cooperating and participating agencies to determine methodologies and the level of detail for analyzing alternatives. Lead agencies must also provide oversight with regard to managing the NEPA process and resolving issues.

Table 1.1-1 lists the cooperating and participating agencies for the Parley’s Interchange EIS.

1.1.1 Description of the Needs Assessment Study Area

The needs assessment study area for the Parley’s Interchange EIS extends on Interstate 80 (I-80) from 1300 East to the Mt. Aire Canyon Road interchange (exit 132), on Interstate 215 (I-215) from the I-80/I-215 interchange (Parley’s interchange) to 3900 South, on Foothill Drive from the I-80/I-215 interchange to Stringham Avenue, and on Parley’s Way from the Parley’s interchange to Wilshire Drive (see Figure 1.1-1 on page 1-3).

Who is the lead agency for the Parley’s Interchange EIS?
The Utah Department of Transportation is the project sponsor and lead agency.

What are cooperating and participating agencies?
A cooperating agency is any 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 (40 Code of Federal Regulations 1508.5).

A participating agency is a federal, state, tribal, regional, or local government agency that might have an interest in the project.

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1 These steps are required by 23 United States Code 139, which establishes an environmental review process that must be used when preparing an EIS for a highway or transit project.
### Table 1.1-1. Cooperating and Participating Agencies for the Parley’s Interchange EIS

<table>
<thead>
<tr>
<th>Agency or Governmenta</th>
<th>Type of Agency Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Federal Agencies</strong></td>
<td></td>
</tr>
<tr>
<td>National Park Service</td>
<td>Cooperating and participating</td>
</tr>
<tr>
<td>U.S. Environmental Protection Agency</td>
<td>Cooperating and participating</td>
</tr>
<tr>
<td>Advisory Council on Historic Preservation</td>
<td>Participating</td>
</tr>
<tr>
<td>U.S. Army Corps of Engineers</td>
<td>Participating</td>
</tr>
<tr>
<td>U.S. Bureau of Land Management</td>
<td>Participating</td>
</tr>
<tr>
<td>U.S. Fish and Wildlife Service</td>
<td>Participating</td>
</tr>
<tr>
<td><strong>State Agenciesb</strong></td>
<td></td>
</tr>
<tr>
<td>Division of Indian Affairs</td>
<td>Participating</td>
</tr>
<tr>
<td>Division of State Parks and Recreation</td>
<td>Participating</td>
</tr>
<tr>
<td>Division of Water Quality</td>
<td>Participating</td>
</tr>
<tr>
<td><strong>Regional Governments or Agencies</strong></td>
<td></td>
</tr>
<tr>
<td>Metropolitan Water District of Salt Lake and Sandy</td>
<td>Participating</td>
</tr>
<tr>
<td>Utah Transit Authority</td>
<td>Participating</td>
</tr>
<tr>
<td>Wasatch Front Regional Council</td>
<td>Participating</td>
</tr>
<tr>
<td><strong>Local Governments</strong></td>
<td></td>
</tr>
<tr>
<td>Salt Lake City Department of Public Utilities</td>
<td>Cooperating and participating</td>
</tr>
<tr>
<td>Salt Lake County</td>
<td>Participating</td>
</tr>
<tr>
<td>Millcreek</td>
<td>Participating</td>
</tr>
<tr>
<td>Salt Lake City</td>
<td>Participating</td>
</tr>
<tr>
<td>Summit County</td>
<td>Participating</td>
</tr>
</tbody>
</table>

a Several tribes were invited to participate, but none responded. Tribal representatives will also be contacted as part of the Native American consultation process associated with this EIS.

b This is a list of state divisions that accepted the participating agency invitation. All state agency participation will also be coordinated through the Resource Development Coordinating Committee.
Figure 1.1-1. Needs Assessment Study Area for the Parley's Interchange EIS
UDOT developed the termini of the needs assessment study area for the Parley’s Interchange EIS to include an area that would influence the transportation operations of the project. The discussion below provides more information regarding how UDOT made the determination regarding the boundaries of the needs assessment study area for each major road in the area.

- **1300 East Interchange on I-80.** 1300 East is the first full-service interchange west of the Parley’s interchange. Both merge and weave movements and traffic from the 1300 East interchange can influence the operation of the Parley’s interchange. One of the key influences includes I-80 narrowing from four east-bound travel lanes to three travel lanes at the 1300 East interchange. The reduction in the number of travel lanes and the introduction of a steep grade east to the Parley’s interchange limit weave movements and cause traffic congestion. The 1300 East interchange on I-80 is a logical west boundary for the study area.

- **Mt. Aire Canyon Road Interchange (Exit 132) on I-80.** The Mt. Aire Canyon Road interchange is the first full-service interchange east of the Parley’s interchange. This interchange is a logical east boundary for the study area.

- **3900 South Interchange on I-215.** 3900 South is the second interchange on I-215 south of the Parley’s interchange; the first interchange is 3300 South. Neither the 3900 South interchange nor 3300 South interchange is a full-service interchange. The two interchanges are designed to operate together to provide all movements to and from I-215. Therefore, these two interchanges, along with Wasatch Boulevard east of I-215, are interconnected in the way they move traffic to and from I-215 and how they influence traffic operations at the Parley’s interchange. The 3900 South interchange on I-215 is a logical south boundary for the study area.

- **Stringham Avenue/Thunderbird Drive Intersection on Foothill Drive.** Stringham Avenue/Thunderbird Drive is the first signalized intersection on Foothill Drive north of the Parley’s interchange. Foothill Drive connects to the Parley’s interchange with direct ramp connections from both I-80 and I-215, and these ramps merge high-speed freeway traffic coming from the south and east onto a principal arterial street\(^2\) (Foothill Drive). The Stringham Avenue/Thunderbird Drive signalized intersection on Foothill Drive slows or stops traffic exiting I-80 and I-215, which can result in backups on both freeways. The Stringham Avenue/Thunderbird Drive signalized intersection on Foothill Drive is a logical north boundary for the Foothill Drive segment of the study area.

- **Wilshire Drive Intersection on Parley’s Way.** Parley’s Way has direct connections to I-80 and I-215, and traffic weaving movements on this arterial affect traffic operations at the Parley’s interchange. The first signalized intersection on Parley’s Way northwest of the Parley’s interchange is Wilshire Drive. The location of the Parley’s Way and Wilshire Drive intersection influences the operation of the Parley’s interchange by constraining traffic weaving operations and causing traffic congestion. Wilshire Drive is also where the roadway classification on Parley’s Way changes from a freeway to minor arterial. The Wilshire Drive intersection on Parley’s Way is a logical north boundary for the Parley’s Way segment of the study area.

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\(^2\) Foothill Drive is classified by UDOT as an “Other Principal Arterial.” These roads serve major centers of metropolitan areas and provide a high degree of mobility. They serve major activity centers and have high traffic volumes and longer trip distances.
1.1.2 Background of the Parley’s Interchange Project

Prior to the initiation of the EIS process, there have been many transportation planning studies on I-80, I-215, and Foothill Drive. The three studies that are most relevant to the Parley’s Interchange EIS are the I-80 Major Investment Study, the Foothill/I-80/I-215 Interchange Area Study, and the Foothill Drive Implementation Study. UDOT considered these three studies, which are summarized below, as it developed the purpose of and need for the Parley’s interchange project.

1.1.2.1 I-80 Major Investment Study

In 1998, UDOT completed a Major Investment Study (MIS) for the I-80 corridor from State Street to the mouth of Parley’s Canyon in Salt Lake City (UDOT 1998). The MIS developed a set of corridor needs and evaluated alternatives that responded to those needs through 2020. The MIS noted that I-80, including portions of the Parley’s interchange, was constructed in the mid-1960s and no longer meets current design standards, has areas of high congestion, and has a higher-than-expected accident rate at many locations.

1.1.2.2 Foothill/I-80/I-215 Interchange Area Study

In 2017, UDOT completed the Foothill/I-80/I-215 Interchange Area Study (UDOT 2017a), which evaluated existing and future travel demand at the Parley’s interchange and identified long-term solutions (through 2050) that could be adopted into the Wasatch Front Regional Council’s (WFRC) Regional Transportation Plan. The study evaluated current conditions and modeled 2050 conditions, and concluded that segments of the interchange are and would be severely congested and would need additional capacity to meet current and future travel demand. Crash data were also evaluated to identify areas of safety concerns within the interchange area of study. Five crash “hot spots” with high crash frequencies were identified. The analysis of the current and future 2050 conditions without any improvements to the interchange found that both capacity and safety improvements are needed.

What is a 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. The travel demand model used for the Parley’s Interchange Project is maintained by WFRC, which is the area’s metropolitan planning organization.

Using travel demand modeling and conceptual design, four concepts were evaluated. The study found that each concept would meet the project goals of improving safety and interchange operations. For each concept, the study identified short-term solutions to address immediate needs and long-term phasing to address future needs. See Chapter 2, Alternatives, for more information about how the alternatives from this study were incorporated into the Parley’s Interchange EIS.

1.1.2.3 Foothill Drive Implementation Study

The Foothill Drive Implementation Study (Parametrix and others 2017) identified short-term and long-term strategies to address traffic congestion, enhance safety, improve connections, and provide transportation options along Foothill Drive, which connects to the Parley’s interchange. The study found that current congestion and pedestrian/bicycling needs don’t meet current and future transportation needs and goals. The preferred scenario identified spot improvements, intersection treatments, and corridor upgrades as well as off-corridor and programmatic improvements to meet the goals. One of the preferred scenario goals was
to improve vehicle and pedestrian safety by providing traffic-calming measures on Foothill Drive to reduce the speeds of northbound vehicles coming from the Parley’s interchange.

1.2 Summary of Purpose and Need

1.2.1 Purpose of the Project

1.2.1.1 Primary Objectives

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

- **Improve the Level of Service at the Parley’s Interchange in 2050.** Improve the level of service (LOS) at the Parley’s interchange in 2050 by meeting UDOT’s goal of LOS D or better on as much of Parley’s interchange as possible (LOS D is considered light congestion). (For more information about level of service, see Section 1.4.3.1, Level of Service Definition)

- **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 I-80 and I-215 as much as possible.

1.2.1.2 Secondary Objectives

The project will also evaluate the following secondary objectives:

- The project should be consistent with local land use and transportation plans.

- The project will be compatible with other planned projects on Foothill Drive, I-80, I-215, and Wasatch Boulevard.

1.2.1.3 Use of the Primary and Secondary Objectives

UDOT used the primary objectives as criteria to screen or eliminate alternatives that weren’t reasonable or practicable. In other words, if an alternative wouldn’t achieve the project’s primary objectives, it was eliminated from further consideration. UDOT used the secondary objectives to further consider the consistency of the project with local land use and transportation plans, other planned projects, and to compare among the alternatives that were carried forward, but the secondary objectives weren’t used to determine whether a roadway alternative was reasonable or practicable.
Chapter 2, Alternatives, lists the elements of the project’s purpose and objectives and the measures that were used to help develop and screen the project alternatives. For more information about the need for the Parley’s Interchange Project, see Section 1.4, Needs Assessment, and Section 1.2.2, Need for the Project.

1.2.2 Need for the Project

The major transportation needs in the needs assessment study area (see Figure 1.1-1 above, Needs Assessment Study Area for the Parley’s Interchange EIS) are a result of growing population, high current and future traffic 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, and merging and weaving distances) that are obsolete and don’t 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 (see Section 1.3, Regional Transportation Planning).

In addition, the need for transportation improvements is recognized in the Utah Freight Plan (UDOT 2017b), which documents the need for improvements at the Parley’s interchange in the needs assessment study area (see Section 1.4.2, Importance of the Parley’s Interchange in the Local and Regional Transportation Systems).

Sections 1.3 and 1.4 present data that document the need for improvements to the Parley’s interchange. UDOT determined the need for the project by reviewing the current roadway design, crash data, freight truck use, and the safety and operational issues identified in previous studies and by quantifying the change in anticipated travel demand between existing (2017) and forecasted (2050) conditions.

What are peak periods?

Peak periods are the periods of the day with the greatest amounts of traffic. The AM (morning) peak period is from 6 AM to 9 AM, and the PM (afternoon) peak period is from 3 PM to 6 PM. Peak periods are looked at by transportation officials when examining the need for a project.
1.3 Regional Transportation Planning

WFRC is the metropolitan planning organization for the project region and develops the Regional Transportation Plan (RTP) for the region. WFRC’s area of responsibility is Davis, Salt Lake, and Weber Counties and the southern portion of Box Elder County. WFRC’s most recent RTP, the 2015 to 2040 RTP, was adopted in 2015 and includes improvements to the Parley’s interchange in Salt Lake County (WFRC 2015).

The 2015 to 2040 RTP is a fiscally constrained, 20-to-30-year plan of the anticipated highway and transit projects that would be needed to meet travel demand in the WFRC planning area. Transportation needs are based on projected and planned socioeconomic factors and land use within a region. Under federal law, WFRC must update its RTP every 4 years. In general terms, fiscally constrained means that a metropolitan planning organization can approve a plan only if the state department of transportation or other transportation agency determines (and FHWA concurs) that enough funding is reasonably anticipated to be available to carry out the projects in the plan.

The 2015 to 2040 RTP identifies three timeframes, or phases, for construction:

- Phase 1: 2015 to 2024
- Phase 2: 2025 to 2034
- Phase 3: 2035 to 2040

The 2015 to 2040 RTP includes the Parley’s interchange as a Phase 1 need and a Phase 2 funded project. Table 1.3-1 lists the Parley’s Interchange Project and other planned highway and transit projects in the 2015 to 2040 RTP in the needs assessment study area.

What is a fiscally constrained RTP?

Fiscally constrained means that an RTP demonstrates that the listed projects can be implemented using committed, available, or reasonably available revenue sources, with reasonable assurance that the federally supported transportation system is being adequately operated and maintained.
Table 1.3-1. Planned Transportation Improvements in the 2015 to 2040 RTP in the Needs Assessment Study Area

<table>
<thead>
<tr>
<th>Facility</th>
<th>RTP Identification Number</th>
<th>Limits</th>
<th>Existing Number of Lanes</th>
<th>Future Number of Lanes</th>
<th>Project Type</th>
<th>Phasea</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highway Projects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-80 Interchange at I-215/Foothill Drive</td>
<td>S-161</td>
<td>Interchange</td>
<td>N/A</td>
<td>N/A</td>
<td>Upgrade</td>
<td>1 (funded in Phase 2)</td>
</tr>
<tr>
<td>I-80</td>
<td>S-4</td>
<td>1300 East to I-215 (East)</td>
<td>6</td>
<td>8</td>
<td>Widening</td>
<td>2</td>
</tr>
<tr>
<td>I-80</td>
<td>S-5</td>
<td>I-215 (East) to Lambs Canyon</td>
<td>6</td>
<td>7 (add one eastbound travel lane)</td>
<td>Widening</td>
<td>1</td>
</tr>
<tr>
<td>Foothill Drive</td>
<td>S-122</td>
<td>2300 East to I-80</td>
<td>4</td>
<td>6</td>
<td>Widening</td>
<td>1</td>
</tr>
<tr>
<td>Foothill Drive</td>
<td>S-121</td>
<td>1300 East to 2300 East</td>
<td>6</td>
<td>6</td>
<td>Operational</td>
<td>1</td>
</tr>
<tr>
<td><strong>Transit Projects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLC–Foothill Drive–Wasatch Drive Corridor</td>
<td>27 Segment 8</td>
<td>2100 East/Foothill Drive to I-80/Foothill Interchange</td>
<td>N/A</td>
<td>N/A</td>
<td>Bus rapid transit</td>
<td>1</td>
</tr>
<tr>
<td>SLC–Foothill Drive–Wasatch Drive Corridor</td>
<td>27 Segments 9 and 10</td>
<td>I-80/Foothill Interchange to 3900 South</td>
<td>N/A</td>
<td>N/A</td>
<td>Enhanced bus</td>
<td>1</td>
</tr>
<tr>
<td>3300 South–3500 South Corridor</td>
<td>42 Segment 1</td>
<td>3900 South Wasatch Blvd. to 3300 South 2300 East</td>
<td>N/A</td>
<td>N/A</td>
<td>Enhanced bus</td>
<td>1 (funded in Phase 2)</td>
</tr>
</tbody>
</table>

Source: WFRC 2015
N/A = not applicable; SLC = Salt Lake City
a Unless otherwise noted, the phase includes both the needs phase and the funded phase.

1.4 Needs Assessment

The regional plans in Section 1.3, Regional Transportation Planning, have identified a need for improvements to the Parley’s interchange in the needs assessment study area. This section evaluates that need based on growth projections, travel demand data, and identified safety and operational issues in the study area.

Planning Horizon. The initial planning process for the Parley’s Interchange EIS started in December 2017. The planning horizon in WFRC’s current RTP is 2015 to 2040. However, UDOT anticipates that WFRC will release a 2019 to 2050 RTP in May 2019. The release would occur about when the Parley’s Interchange Draft EIS is released. Therefore, the project team decided to align the EIS’s planning horizon to match the 2019 to 2050 RTP’s planning horizon of 2050.

To ensure the accuracy of travel demand modeling for the 2050 planning horizon, the project team coordinated with WFRC and obtained WFRC’s 2050 travel demand model for use in developing the EIS. The model includes the socioeconomic forecast for 2050 but the proposed road network for 2040. The 2040
Road network was used because the proposed road network for 2050 is unknown and won't be available until the 2019 to 2050 RTP is finalized in May 2019. Through coordination with WFRC, the project team determined that the 2050 model will provide accurate forecasting for the planning horizon. After the release of the 2019 to 2050 RTP, the project team will conduct a sensitivity analysis to verify the results of the travel demand modeling that was conducted for the Draft EIS.

Therefore, UDOT decided to use 2050 as the planning horizon for the development of the needs assessment study area, the project's purpose and need, and the project alternatives.

**2050 No-Action Conditions.** This needs assessment is based on the no-action conditions for the road and transit system in the needs assessment study area in 2050 if no Parley’s interchange improvements are made. The no-action travel demand conditions used in this EIS are based on version 8.2 of WFRC’s regional travel demand model, as described in the 2015 to 2040 RTP (WFRC 2015), and include the socioeconomic forecast for 2050. WFRC’s travel demand model is a state-of-the-practice tool that allows transportation analysts to input various land use and growth scenarios to test road and transit networks with the expected traffic for each scenario. The travel demand model includes all roadway and transit projects identified in the RTP to 2040.

For the 2050 no-action conditions, the project team assumed the socioeconomic forecast for 2050 and that all funded transit and roadway projects in the 2015 to 2040 RTP would be in place (see Table 1.3-1 above), with the only exception being improvements to the Parley’s interchange (identified in the RTP as I-80 Interchange @ I-215/Foothill Drive, Project S-161). Figure 1.4-1 shows the planned 2050 no-action roadway and transit network in the study area.
Figure 1.4-1. Future (2050) No-Action Transportation Network

Legend

Study Area - No Action 2050

- **Widen to 8 Lanes (4 Lanes Each Direction)**
- **Widen Eastbound I-80 to 4 Lanes**
- **Widen to 6 Lanes (3 Lanes Each Direction)**
1.4.1 Projected Growth in Population, Employment, and Households

As shown in Table 1.4-1, Salt Lake and Summit Counties are both projected to have large increases in population, employment, and households by 2050. These projected increases are included in the 2015 to 2050 RTP and are expected to result in continued increased travel demand on I-80, I-215, and Foothill Drive.

Table 1.4-1. Regional Population and Employment Growth

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Salt Lake</td>
<td>1,112,000</td>
<td>1,508,200 (36%)</td>
<td>899,800</td>
<td>1,131,800 (49%)</td>
<td>394,700</td>
<td>606,000 (54%)</td>
</tr>
<tr>
<td>Summit</td>
<td>40,600</td>
<td>63,000 (55%)</td>
<td>42,600</td>
<td>67,300 (58%)</td>
<td>15,900</td>
<td>27,300 (72%)</td>
</tr>
</tbody>
</table>

Source: Kem C. Gardner Policy Institute, 2017

1.4.2 Importance of the Parley’s Interchange in the Local and Regional Transportation Systems

1.4.2.1 Roadway

The Parley’s interchange is a key system link for I-80, I-215, and Foothill Drive in Salt Lake County. The Parley’s interchange is a link in trips that are going to or from the University of Utah, Research Park, Salt Lake City, Millcreek, Holladay, Sandy, Cottonwood Heights, Big and Little Cottonwood Canyons, Salt Lake City International Airport, Park City, and Summit County.

I-80 is the major east-west interstate highway that goes through Utah. It carries a high volume of national, regional, and local trips.

I-215 is an interstate highway loop that connects I-80 to the central Salt Lake Valley, West Valley City, and the Salt Lake City International Airport. I-215 is also the major interstate highway link that provides recreational access to Millcreek Canyon and Big and Little Cottonwood Canyons.

Foothill Drive is a major arterial that’s used for regional and local trips that are going to or from the University of Utah, Research Park, and downtown Salt Lake City.

1.4.2.2 Freight Routes

I-80 is a national freight corridor, and all segments of I-80 in Utah carry some of the highest volumes and percentages of freight trips in Utah. In Utah, trucking is the mode that carries the highest percentage of freight trips by both value and weight (UDOT 2017b). UDOT anticipates that the amount of freight moved by trucks will increase by 73% by value and 37% by weight by 2045 compared to 2015 (UDOT 2017b).

Salt Lake City is a major freight hub due to the Salt Lake City International Airport, and segments of the Union Pacific Railroad’s trackage, I-80, and I-15 are all located in the city. The 2015 Utah Freight Plan emphasizes the importance of I-80 to national and regional freight trips and lists the Parley’s interchange...
improvements as a Phase 2 freight project (constructed between 2025 and 2034) (UDOT 2017b). In 2013, UDOT estimated that truck traffic on I-80 between 1300 East and the Mt. Aire Canyon Road exit was between 31% and 33% of the total traffic in this segment (UDOT 2013). The estimated truck traffic on I-215 between the Parley’s interchange and 3300 South was between 25% to 31% of the total traffic in this segment (UDOT 2013). The Parley’s interchange needs to be able to accommodate current and anticipated freight traffic on I-80.

1.4.2.3 Transit Routes

Four Utah Transit Authority (UTA) bus routes (Routes 228, 313, 354, and 902) currently use the Parley’s interchange as part of their service routes. These existing bus routes generally connect destinations in the southeast part of the Salt Lake Valley to downtown Salt Lake City or the University of Utah and Research Park. There are currently no stops in the needs assessment study area on I-80, I-215, or Foothill Drive, but the Parley’s interchange is an important link in the regional transit network.

As shown above in Table 1.3-1 in Section 1.3, there are planned transit projects in the study area. The planned projects include a bus rapid transit project on Foothill Drive and enhanced bus projects on Wasatch Drive and 3300 South.

Figure 1.4-2 shows the locations of the UTA bus routes in the study area.

1.4.2.4 Bicycle and Pedestrian Facilities

There are two major regional bicycle and pedestrian facilities, the Parley’s Trail and the Bonneville Shoreline Trail, in the needs assessment study area.

The Parley’s Trail currently runs from the Bonneville Shoreline Trailhead on Wasatch Drive to Sugarhouse Park. The Parley’s Trail is the only east-west, paved, dedicated pedestrian and bicyclist facility in the Salt Lake Valley and is a major link in the local trail network.

In the study area, the Parley’s Trail is paved and includes two grade-separated structures that connect the trail from Wasatch Drive to Tanner Park. One of these structures crosses the I-215 northbound to I-80 eastbound ramp, and the other crosses I-80 westbound to I-215 southbound ramp and I-215. Another paved trail segment is located east of I-215 and connects the Parley’s Trail to Foothill Drive north of I-80. This segment includes a grade-separated pedestrian and bicyclist bridge over I-80. Once completed, the Parley’s Trail will connect to the Jordan River Parkway Trail.

The Bonneville Shoreline Trail is a regional north-south trail that’s planned to connect from the Utah–Idaho border to Nephi, Utah, for a total distance of about 280 miles. Currently, the Bonneville Shoreline Trail is a mix of unpaved and paved surfaces. Some sections have a separate trail, and other sections share a roadway. Many sections of the trail currently don’t exist. The Bonneville Shoreline Trail currently crosses the study area on a separate paved trail that uses grade-separated structures to cross I-80 and the ramps between I-215 and I-80. South of the Parley’s interchange, the Bonneville Shoreline Trail continues on an unpaved trail for about 0.5 mile along the base of Grandeur Peak. North of the Parley’s interchange, the Bonneville Shoreline Trail is paved and is located on the east side of Foothill Drive until it reaches the Stringham Avenue intersection.

Figure 1.4-3 shows the locations of bicycle and pedestrian facilities and routes in the needs assessment study area.
Figure 1.4-2. Transit Routes

[Map showing transit routes in Salt Lake City and Millcreek, Utah]
Figure 1.4-3. Bicycle and Pedestrian Facilities
1.4.3 Current and Future Roadway Congestion

This section provides an overview of level of service, the level of service planning goals for the Parley’s interchange, and the existing and future capacity and level of service in the needs assessment study area. Traffic volumes on the roadway facilities are compared with traffic capacities to determine the current level of service on each roadway segment in the study area.

1.4.3.1 Level of Service Definition

Level of service (LOS) is measurement of the vehicle-carrying capacity and performance of a street, freeway, or intersection. When the capacity of a road is exceeded, the result is congestion, delay, and a poor level of service. Level of service is represented by a letter “grade” ranging from A for excellent conditions (free-flowing traffic and little delay) to F for failure conditions (extremely congested, stop-and-go traffic, and excessive delay). LOS B through LOS E describe progressively worse traffic conditions (see Figure 1.4-4).

Figure 1.4-4. Level of Service

<table>
<thead>
<tr>
<th>Levels of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FREE FLOW</strong></td>
</tr>
<tr>
<td>Low volumes and no delays.</td>
</tr>
<tr>
<td>LOS A</td>
</tr>
<tr>
<td><strong>STABLE FLOW</strong></td>
</tr>
<tr>
<td>Speeds restricted by travel conditions, minor delays.</td>
</tr>
<tr>
<td>LOS B</td>
</tr>
<tr>
<td><strong>STABLE FLOW</strong></td>
</tr>
<tr>
<td>Speeds and maneuverability closely controlled because of higher volumes.</td>
</tr>
<tr>
<td>LOS C</td>
</tr>
<tr>
<td><strong>STABLE FLOW</strong></td>
</tr>
<tr>
<td>Speeds considerably affected by change in operation conditions; high density traffic restricts maneuverability; volume near capacity.</td>
</tr>
<tr>
<td>LOS D</td>
</tr>
<tr>
<td><strong>UNSTABLE FLOW</strong></td>
</tr>
<tr>
<td>Low speeds; considerable delay; volume at or slightly over capacity.</td>
</tr>
<tr>
<td>LOS E</td>
</tr>
<tr>
<td><strong>FORCED FLOW</strong></td>
</tr>
<tr>
<td>Very low speeds; volumes exceed capacity; long delays with stop-and-go traffic.</td>
</tr>
<tr>
<td>LOS F</td>
</tr>
</tbody>
</table>
1.4.3.2  Level of Service Planning Goals

To achieve UDOT’s goal of optimizing mobility, proposed roadway projects are evaluated in terms of the road’s modeled level of service. UDOT has set a goal of maintaining roads in urban parts of the state at LOS D or better. Typically, in urban areas, LOS E and F are considered unacceptable operating conditions and LOS D and above are considered acceptable operating conditions Therefore, UDOT chose LOS D as the threshold for determining whether capacity improvements are needed on the roads in the needs assessment study area.

1.4.3.3  Existing 2017 and Future (2050) Levels of Service

This section summarizes a level of service analysis that was conducted for the Parley’s interchange (UDOT 2018a). The analysis looked at both highway segments, ramp segments, and key intersections during the AM and PM peak hours for the existing conditions in 2017 and for the no-action conditions in 2050.

Existing 2017 Levels of Service

Table 1.4-2 lists the road segments that operate at an unacceptable level of service (LOS E or F) in 2017. As shown in Figure 1.4-5 and Figure 1.4-6, I-80 and I-215 currently operate at an acceptable level of service (LOS D or better).

Several ramp and merge areas in the Parley’s interchange area are operating at LOS E or F in 2017 (see Table 1.4-2, Figure 1.4-5, and Figure 1.4-6).

Table 1.4-2. Segments of the Parley’s Interchange with Unacceptable Levels of Service in the AM and PM Peak Hours under Existing Conditions (2017)

<table>
<thead>
<tr>
<th>Interchange Movement</th>
<th>AM or PM Peak</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastbound I-80 ramp to northbound Foothill Drive</td>
<td>AM</td>
<td>E</td>
</tr>
<tr>
<td>Southbound Foothill Drive ramp to westbound I-215</td>
<td>AM</td>
<td>F</td>
</tr>
<tr>
<td>Northbound Foothill Drive between I-80 and Stringham Drive</td>
<td>AM</td>
<td>F</td>
</tr>
<tr>
<td>I-215 southbound weave north of 3300 South (where I-80 westbound to I-215 southbound on ramp merges and 3300 South exits on southbound I-215)</td>
<td>PM</td>
<td>E</td>
</tr>
<tr>
<td>Southbound Foothill Drive merge with southbound I-215</td>
<td>PM</td>
<td>E</td>
</tr>
</tbody>
</table>

Source: UDOT 2018a
Figure 1.4-5. Levels of Service in the AM Peak Period (2017)
Figure 1.4-6. Levels of Service in the PM Peak Period (2017)
Future No-Action Levels of Service

For future conditions, the analysis used 2050 as the planning horizon because 2050 is the planning horizon for both the 2019 to 2050 RTP and UDOT’s 2019 to 2050 Long-Range Transportation Plan. The analysis of level of service with the no-action conditions in 2050 assumed that all projects in the 2019 to 2050 RTP and in UDOT’s 2015 to 2050 Long-Range Transportation Plan would be built, except for the Parley’s Interchange Project.

Table 1.4-3 lists the road segments that are projected to operate at an unacceptable level of service (LOS E or F) in 2050. Many mainline and ramp segments of the Parley’s interchange are projected to function at LOS E or F in 2050 (see Table 1.4-3, Figure 1.4-7, and Figure 1.4-8). As shown in Figure 1.4-8, failing (LOS E or F) interchange movements are projected to result in congestion on eastbound I-80 west of the Parley’s interchange and on westbound I-80 east of the Parley’s interchange in The PM peak period.

Table 1.4-3. Segments of the Parley’s Interchange with Unacceptable Levels of Service in the AM and PM Peak Hours under the Future No-Action Conditions (2050)

<table>
<thead>
<tr>
<th>Interchange Movement</th>
<th>AM or PM Peak</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northbound I-215 ramp to eastbound I-80</td>
<td>AM</td>
<td>E</td>
</tr>
<tr>
<td>Southbound Foothill Drive ramp to I-80 (eastbound and westbound)</td>
<td>AM and PM</td>
<td>E and F</td>
</tr>
<tr>
<td>Northbound Foothill Drive north of eastbound I-80 ramp</td>
<td>AM</td>
<td>E and F</td>
</tr>
<tr>
<td>Southbound Foothill Drive ramp to westbound I-215</td>
<td>AM</td>
<td>F</td>
</tr>
<tr>
<td>I-215 northbound between 3900 South and Foothill Drive exit</td>
<td>AM</td>
<td>E and F</td>
</tr>
<tr>
<td>Parley’s Way southbound ramp to southbound Foothill Drive and I-80</td>
<td>AM</td>
<td>F</td>
</tr>
<tr>
<td>I-80 and northbound Foothill Drive ramps to northbound Parley’s Way</td>
<td>AM</td>
<td>E</td>
</tr>
<tr>
<td>I-80 westbound to I-215 southbound movement and I-215 southbound merge and weave area (north of 3300 South exit)</td>
<td>PM</td>
<td>F</td>
</tr>
<tr>
<td>Westbound I-80 east of the Parley’s Interchange</td>
<td>PM</td>
<td>E and F</td>
</tr>
<tr>
<td>Eastbound I-80 west of the Parley’s interchange</td>
<td>PM</td>
<td>F</td>
</tr>
<tr>
<td>Southbound I-215 merge between I-80 and Foothill Drive and merge with southbound Foothill Drive</td>
<td>PM</td>
<td>F</td>
</tr>
</tbody>
</table>

Source: UDOT 2018a
Figure 1.4-7. Levels of Service in AM Peak Period (2050)
Figure 1.4-8. Levels of Service in PM Peak Period (2050)
1.4.4 Safety and Operational Issues

In addition to the insufficient capacity documented in Section 1.4.3.3, the Parley’s interchange also has numerous safety and operational deficiencies. The Foothill/I-80/I-215 Interchange Area Study documented these deficiencies. This study identified five “hot spots” where there were higher-than-predicted crash rates and identified seven priority issues and areas with safety and operational issues that needed to be addressed. Note that the five crash “hot spots” and seven priority issues and areas from the Foothill/I-80/I-215 Interchange Area Study had some overlap.

The crash data and associated analysis in this document are protected under 23 United States Code 409.

1.4.4.1 Safety Issues

The crash analysis conducted for the Foothill/I-80/I-215 Interchange Area Study identified five “hot spot” locations where there were higher-than-predicted crash rates and accidents with a severity level of 3 or greater (minor injury or greater). The five “hot spot” locations are the following areas:

1. **Eastbound I-80 to northbound Foothill Drive loop ramp (Foothill Drive, Milepost [MP] 0.00 to 0.39)**
   - This location had 237 accidents between 2010 and 2015.
   - Accidents at this location are the result of inadequate merge and weave distances, yield control, curves posted at 20 or 25 miles per hour (mph) on the loop ramps, and speed differentials between the mainline I-80 (speed limit 65 mph) and Foothill Drive (speed limit 45 mph) traffic and the traffic on the loop ramps (speed limit 20 or 25 mph).

2. **Southbound I-215 merge and weave area between the southbound Foothill Drive on ramp to the 3300 South off ramp (I-215, MP 1.50 to MP 1.83)**
   - This location had 37 accidents between 2010 and 2015.
   - Accidents at this location are due to inadequate capacity, merge and weave distances, and horizontal curve geometry to accommodate the merge and weave movements for traffic entering I-215 from Foothill Drive and westbound I-80 and for traffic exiting at 3300 South.

3. **Eastbound I-80 west of the Foothill Drive interchange (I-80, MP 128.46 to 128.75)**
   - This location had 21 accidents between 2010 and 2015.
   - Accidents at this location are due to speed differentials, inadequate horizontal and vertical curves, and insufficient capacity.

4. **Eastbound diverge area where southbound I-215 exits I-80 (I-80, MP 127.19 to 127.62)**
   - This location had 28 accidents between 2010 and 2015.
   - Accidents at this location are due to speed differentials, weave movements for traffic before the I-215 exit from I-80, and inadequate horizontal and vertical curves.
5. Eastbound I-215 merge and weave with southbound Foothill Drive (I-215, MP 0.84 to 1.26)
   - This location had 18 accidents between 2010 and 2015.
   - Accidents in this location are due to inadequate capacity at the I-215 merge before southbound
     Foothill Drive enters I-215.

The locations of the five safety “hot spot” areas are shown in Figure 1.4-9.
Figure 1.4-9. Safety “Hot Spot” Areas

The crash data and associated analysis in this document are protected under 23 USC 409.
1.4.4.2 Seven Priority Issues and Areas

The Foothill/I-80/I-215 Interchange Area Study identified seven priority issues and areas that had operational deficiencies. These seven priority locations and their operational issues are listed below.

1. **Eastbound I-80 to northbound Foothill Drive interchange**
   - The eastbound I-80 to northbound Foothill Drive clover-leaf loop ramp has slow speeds and a yield-controlled uphill ramp with inadequate acceleration and merge distances with the northbound I-215 to northbound Foothill Drive ramp. These speed differentials are the cause of many accidents in this location.
   - The southbound Foothill Drive to eastbound I-80 ramp has a slow speed and has inadequate acceleration distance and merging distances with eastbound I-80. This ramp enters I-80 in the weave area where the eastbound I-80 to northbound Foothill Drive traffic is exiting I-80.

2. **Southbound I-215 merge with southbound Foothill Drive**
   - In this location, the two lanes of eastbound I-215 merge into one lane before joining the two-lane southbound Foothill Drive on ramp. Issues at this location include inadequate capacity and merging distances for these movements.

3. **Southbound I-215 merge and weave section between the westbound I-80 on ramp and the 3300 South off ramp**
   - In this location, there is inadequate capacity and horizontal spacing to accommodate the westbound I-80 to southbound I-215 movements and the southbound I-215 to the 3300 South exit movements, which both occur in the same location that’s only about 0.2 mile long. This merge and weave distance is inadequate to handle the traffic volumes for these movements.

4. **Northbound Foothill Drive congestion in the AM peak period**
   - Inadequate capacity and congestion on northbound Foothill Drive in the AM peak period can result in traffic backing from the northbound Foothill Drive exit to northbound mainline I-215.

5. **I-215 and I-80 merge/diverge area**
   - There are inadequate merging distances in this location to accommodate all traffic coming from southbound Parley’s Way and southbound Foothill Drive to westbound I-215.
   - About 0.2 mile after the southbound Parley’s Way and southbound Foothill Drive traffic merges with westbound I-215, westbound I-215 enters westbound I-80. Immediately before westbound I-215 enters westbound I-80, westbound I-80 goes from two lanes to one lane in a location with inadequate merging distance and inadequate horizontal curves.
   - Eastbound I-215 exits from eastbound I-80 in this location, but there are often operational issues from traffic making late lane changes to go on either I-215 or I-80. Most of the heavy truck traffic is going east on I-80, but if a truck is in the right lane, it must move to the center lane prior to the eastbound I-215 exit in order to remain on eastbound I-80.
6. **Eastbound I-80 east of the Foothill Drive interchange**

   - Issues at this location include slower traffic merging onto eastbound I-80 from southbound Foothill Drive and northbound I-215. Additionally, the steep vertical grade and slow horizontal curves on eastbound I-80 in this location cause speed differentials between trucks and passenger vehicles.

7. **Westbound I-80 to southbound I-215 and northbound I-215 to eastbound I-80 ramp**

   - Issues at this location include inadequate horizontal curves and inadequate capacity to accommodate traffic during peak periods. The curve speeds on the ramps for both movements are 40 to 45 miles per hour, which causes larger vehicles to slow down and limits the capacity of the ramp movements.

   - The acceleration distance for westbound I-80 to southbound I-215 traffic is also inadequate.

   - There is no separation or barrier between the two opposing ramp movements.

The locations of the seven priority issues and areas are shown in Figure 1.4-10.
Figure 1.4-10. Operational Priority Areas
1.4.5 Aging Infrastructure

Structures

The six bridges in the needs assessment study area were constructed in the mid-1960s with an anticipated design life of 50 years. Provisions for seismic analysis and detailing of bridges were first introduced into the American Association of State Highway and Transportation Officials (AASHTO) design codes in 1981, and the codes have been updated several times since then. The Parley’s interchange bridges aren’t designed to current seismic criteria and would perform poorly in a major seismic event. Given the importance of access to medical facilities and of maintaining regional traffic movements, the seismic risk associated with this interchange is substantial.

The 2016 National Bridge Inspection Standards (NBIS) condition inspection identified all six bridges as being functionally obsolete. A functionally obsolete bridge is one that was built to standards that aren’t used today, meaning it doesn’t have adequate lane widths, shoulder widths, or vertical clearances to serve the current traffic demand. Additionally, three of the bridges were rated as structurally deficient. Bridges are considered structurally deficient if they require rehabilitation or if elements of the bridge need to be monitored and/or repaired. These ratings don’t imply that a bridge is unsafe. UDOT completed a bridge rehabilitation project for these bridges in 2017, including replacing the decks of two of them. A goal of this deck-replacement project was to increase the service life of these bridges by 10 to 15 years.

There are additional bridges in the study area. To the west, eastbound and westbound I-80 cross 2300 East on bridges that were replaced in 2010 and are rated as having no deficiencies. The I-80 bridges that cross over 2000 East were constructed in 1964 and are rated as functionally obsolete. The 1700 East and 1300 East bridges that cross I-80 were constructed in 1964 and are planned to be replaced in 2021. To the east, bridges cross I-80 at the Quarry and Mt. Aire Canyon Road interchanges. Both carry small traffic volumes, were constructed in 1973, and were rated as having no deficiencies in the latest NBIS condition inspections. To the south, the 3300 South bridge crossing I-215 was replaced in 2008, and the I-215 bridges crossing Upland Drive were replaced in 2004 and are rated as having no deficiencies. The I-215 bridge crossing 3900 South was constructed in 1971, was widened in the 1980s, and received a deck replacement in 2004. The latest NBIS inspection rated it as having no deficiencies.

Pavement

The existing pavement in the needs assessment study area is a mix of asphalt and concrete. UDOT’s maintenance strategy for asphalt is to mill and overlay it periodically (every 7 to 10 years) while causing minimal impacts to traffic. UDOT has used this strategy in the study area, and the asphalt pavement remains in good condition. Concrete pavement requires minimal routine maintenance during its lifecycle but needs major rehabilitation or replacement after 40 to 50 years. The concrete pavement on I-80 and adjacent I-215 ramps has been in service about 50 years, and UDOT has identified the need for a pavement reconstruction project between the Parley’s interchange and 1300 East by 2021. The concrete pavement on I-215 has been in service for about 40 years, and UDOT has identified the need for a pavement reconstruction project on I-215 from the Parley’s interchange to 4500 South by 2020.
1.5 Public and Agency Involvement in Developing Purpose and Need

This draft version of the purpose and need chapter 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 the purpose and need chapter. The comments included suggestions about what to include in the purpose of the project, editorial suggestions, edits on the figures, and information about resources in the needs assessment study area that could be affected by project alternatives.

UDOT also received comments from the public, including many comments suggesting that the need for the project should include reducing noise levels in the surrounding neighborhoods. Other comments suggested that the purpose of the project should include protecting watersheds and water-related infrastructure and noise mitigation. UDOT considered these comments, but they aren’t related to the reason why the project was initiated, which is primarily to address safety and congestion. Therefore, the purpose of the project wasn’t revised. However, these resources will be evaluated as part of the EIS analysis.

UDOT reviewed and responded to comments not related to revisions of the project purpose and revised the purpose and need chapter as appropriate based on the public and agency input.

1.6 References

Kem C. Gardner Policy Institute
  2017 Utah’s Long-Term Demographic and Economic Projections, July 1.

Parametrix, V-I-A Consulting, and Alta Planning + Design

[UDOT] Utah Department of Transportation
  2013 Truck Traffic on Utah Highways 2013. Prepared by the UDOT Program Development Division, Traffic Analysis Section, in cooperation with the Federal Highway Administration.
  2017b Utah Freight Plan.

[WFRC] Wasatch Front Regional Council