

Chapter 1: Purpose and Need

1.1 Introduction

In March 2022, the Utah Department of Transportation (UDOT) initiated an Environmental Impact Statement (EIS) for the Interstate 15 (I-15): Farmington to Salt Lake City Project according to the provisions of the National Environmental Policy Act (NEPA) and other laws, regulations, and guidelines of the Federal Highway Administration (FHWA). UDOT, as the project sponsor and lead agency for the project, is responsible for preparing the I-15 EIS. The environmental review, consultation, and other actions required by applicable federal environmental laws for this action have been carried out by UDOT pursuant to 23 United States Code Section 327 and a May 26, 2022, Memorandum of Understanding between FHWA and UDOT.

1.1.1 Cooperating and Participating Agencies

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.¹ The lead agency 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 I-15 Farmington to Salt Lake City EIS.

What are cooperating and participating agencies?

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

1.1.2 UDOT Quality of Life Framework

Utah's Transportation Vision (UVision) is a process for collaborating with partnering agencies and the public to establish a shared vision for transportation statewide. The statewide transportation vision as defined by UDOT is "A Pathway to Quality of Life." To further define the vision, UDOT developed a Quality of Life Framework to serve as the initiatives to implement the vision (UDOT 2020). The Quality of Life Framework includes four outcome areas: Good Health, Connected Communities, Strong Economy, and Better Mobility (Table 1.1-2). The purpose and need statement for the I-15 project is consistent with the Quality of Life Framework and prioritizes the same outcome areas. UDOT used the UVision process as it collaborated and partnered with the cooperating and participating agencies, local governments, and the public on the I-15 project.

More information regarding the project needs and how they align with the Quality of Life Framework is provided in Section 1.3, *Need for the Project*.

¹ These steps are required by 23 United States Code Section 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 I-15 Farmington to Salt Lake City EIS

Agency or Government	Type of Agency Involvement
Federal Agencies	
U.S. Army Corps of Engineers	Cooperating and participating
U.S. Bureau of Reclamation	Cooperating and participating
U.S. Environmental Protection Agency	Cooperating and participating
U.S. Fish and Wildlife Service	Participating
National Park Service (Omaha – Land and Water Conservation Fund)	Participating
Quasigovernmental Agencies	
Utah Transit Authority	Participating
Wasatch Front Regional Council	Participating
Weber Basin Water Conservancy District	Participating
State Agencies	
Utah Division of Outdoor Recreation	Participating
Local Governments	
Davis County	Participating
Salt Lake County	Participating
Bountiful City	Participating
Centerville City	Participating
City of North Salt Lake	Participating
Farmington City	Participating
Salt Lake City	Participating
West Bountiful City	Participating
Woods Cross City	Participating

Table 1.1-2. Outcome Areas in UDOT's Quality of Life Framework

UDOT Quality of Life Framework Initiatives			
Good Health	Connected Communities	Strong Economy	Better Mobility
<ul style="list-style-type: none"> • Safety • Public health and wellness • Natural environment 	<ul style="list-style-type: none"> • Connectivity • Land use and community • Integrated system 	<ul style="list-style-type: none"> • Accessibility • Transport costs • Economic development 	<ul style="list-style-type: none"> • Reliable travel time • Throughput • Risk and resiliency

Source: UDOT 2020

1.1.3 Description of the Needs Assessment Study Area and Logical Termini

The needs assessment study area was used to define the transportation issues that help develop the project purpose described in this chapter.

The needs assessment study area for the I-15 EIS extends from the U.S. Highway 89 (U.S. 89)/Legacy Parkway/Park Lane interchange (I-15 milepost 325) in Farmington to the Interstate 80 (I-80) West/400 South interchange (I-15 milepost 308) in Salt Lake City (see Figure 1.1-1). The study area also includes the ramps that begin or end at these termini.

What are logical termini?

Logical termini are the rational end points for evaluating proposed transportation improvements. Generally, they are the points of major traffic generation such as intersecting roads.

UDOT developed the logical termini for the I-15 EIS at an adequate distance apart to assess the environmental impacts of the project, and the termini are located at rational end points for evaluating proposed transportation improvements. The identified termini for the needs assessment study area were sufficiently broad and allowed UDOT to consider a reasonable range of alternatives that could meet the identified needs for the project.

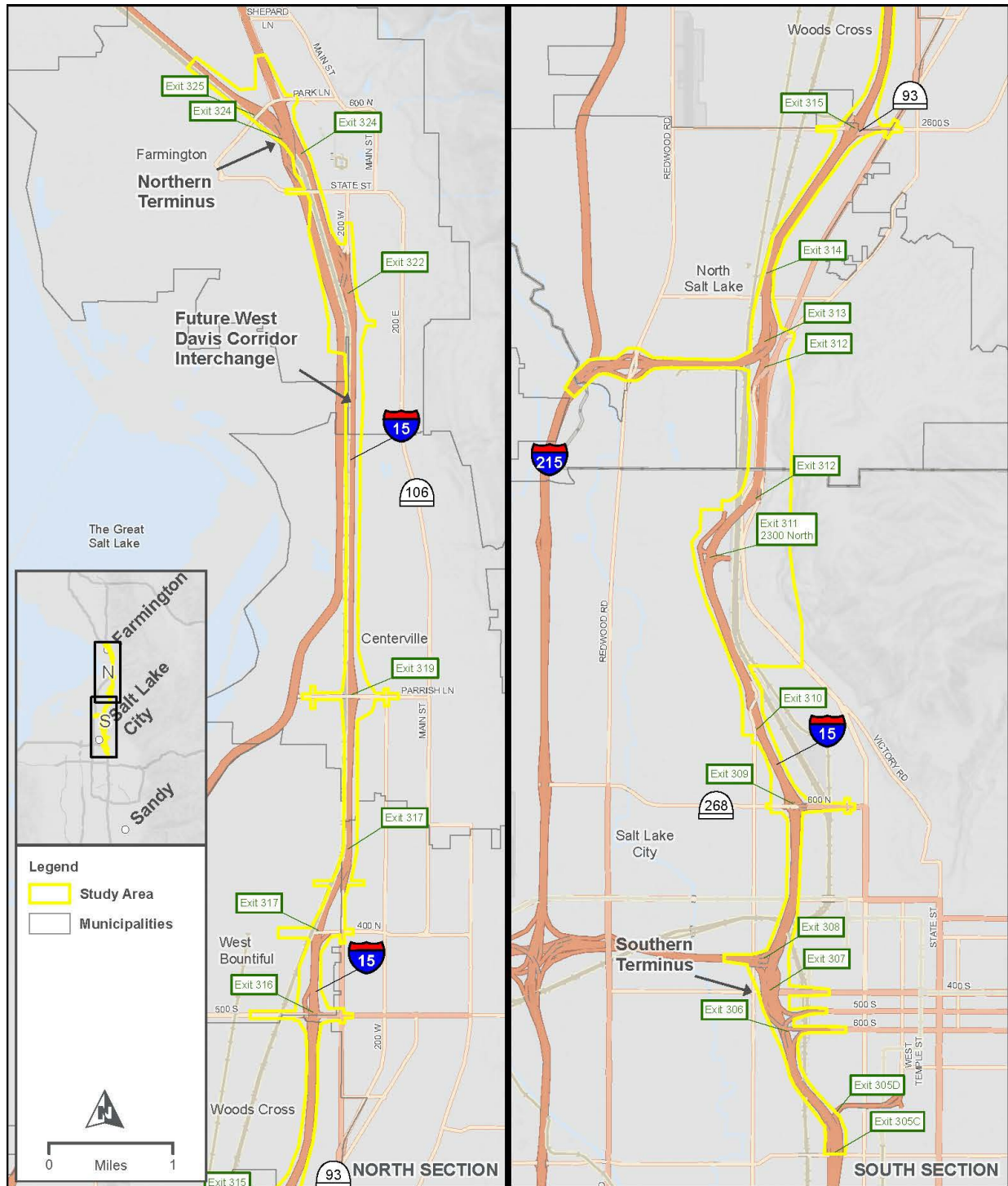
The following discussion explains how UDOT determined the termini of the needs assessment study area with regard to each major road in the area.

Northern Terminus. Farmington is the location of two prominent I-15 interchanges: the U.S. 89/Legacy Parkway/Park Lane interchange and the future West Davis Corridor interchange (planned to be completed in 2024). North of the U.S. 89/Legacy Parkway/Park Lane interchange, traffic volumes measurably decrease on I-15, though congestion issues are present. There is also another, separate planned I-15 project in the Wasatch Front Regional Council's (WFRC) 2019–2050 *Wasatch Front Regional Transportation Plan* (RTP) for the segment of I-15 north of U.S. 89. The U.S. 89/Legacy Parkway/Park Lane interchange in Farmington has high-traffic-volume connections to all of these freeways or major arterials and is the logical northern terminus for this project.

Southern Terminus. Salt Lake City is a primary commuting destination for morning peak-period trips and a primary source of trips during the evening peak period. 400 South, 600 North, and Beck Street/U.S. 89 are the primary interchanges into Salt Lake City when coming from the north on I-15. The exit from northbound I-15 to westbound I-80, a major system-to-system interchange, is also located just south of 400 South. I-80 westbound provides access to the Salt Lake City International Airport, the industrial areas surrounding the airport, and an additional system-to-system connection with Interstate 215 (I-215) and Bangerter Highway. South of 400 South is the end of both northbound and southbound collector-distributor systems and the I-15/I-80 eastbound/State Route (S.R.) 201 “spaghetti bowl” system interchange.

400 South is the logical southern terminus for this project because traffic measurably decreases going to or coming from downtown Salt Lake City at 400 South and because there is a major I-15/I-80/S.R. 201 system-to-system interchange as well as collector-distributor systems south of 400 South. The I-15 interchanges farther south at 1300 South and 2100 South do not tie in as directly to the dense business and residential areas of Salt Lake City. Additionally, south of 400 South there is another Phase 1 project in the 2019–2050 RTP (project R-S-133) to widen I-15 in the northbound direction between 600 South and I-215.

Figure 1.1-1. Needs Assessment Study Area for the I-15 EIS



NEEDS ASSESMENT STUDY AREA
I-15 EIS: FARMINGTON TO SALT LAKE CITY

1.2 Background of the I-15 Project

1.2.1 Project Area Context

I-15 is a major transportation corridor in the western United States that begins near the border of the United States and Mexico in San Diego County, California, and continues north to Alberta, Canada, passing through California, Nevada, Arizona, Utah, Idaho, and Montana. I-15 is a vital link in the economies of the western United States and the entire nation, connecting the ports in California to inland population centers. I-15 is the primary north-south transportation corridor in Utah; most of the population in Utah lives near this corridor.

Within the needs assessment study area, I-15 traverses seven cities (Farmington, Centerville, West Bountiful, Bountiful, Woods Cross, North Salt Lake, and Salt Lake City) and parts of two counties (Davis County and Salt Lake County). The I-15 corridor is an important local and regional transportation artery, facilitating access to commercial centers, industrial developments, residential areas, and community services and amenities.

What is travel demand?

Travel demand is the expected number of transportation trips in an area. Travel demand can be met by various modes of travel, such as automobile, bus, commuter rail, carpooling, and bicycling.

1.2.2 Projected Growth in Population, Employment, and Households

As shown in Table 1.2-1, Davis and Salt Lake Counties are both projected to have large increases in population, employment, and households by 2050. These projected increases are included in the 2019–2050 RTP and are expected to result in continued increased travel demand on I-15 and its interchanges.

Table 1.2-1. Projected Regional Population and Employment Growth

County	Population		Employment		Households	
	2019	2050 Projection (Percent Change from 2019)	2019	2050 Projection (Percent Change from 2019)	2019	2050 Projection (Percent Change from 2019)
Davis	356,000	488,000 (37%)	170,000	252,000 (48%)	112,482	182,148 (49%)
Salt Lake	1,144,000	1,502,000 (31%)	846,000	1,198,000 (42%)	411,472	606,036 (47%)

Sources: Kem C. Gardner Policy Institute 2017; U.S. Census Bureau 2021; WFRC 2019

1.2.3 Importance of I-15 in the Local and Regional Transportation Systems

1.2.3.1 Roadway

I-15, the primary north-south interstate highway in Utah, links most trips going to or from all destinations along the Wasatch Front and within Davis and Salt Lake Counties. I-15 also provides regional connections to Las Vegas, southern California, eastern Idaho, and Montana. On an average weekday in 2019, an estimated 170,000 vehicles crossed the Salt Lake County–Davis County border on I-15. By 2050, this number is projected to be 220,000, an increase of 29% (Horrocks 2022b).

The number of person-trips is the number of vehicle trips multiplied by the number of people per vehicle. The assumed occupancy per vehicle on I-15 in the needs assessment study area is 1.11 to 1.32 people per vehicle for the general-purpose lanes and 1.55 to 2.11 people per vehicle for the express lanes (Horrocks 2022b). The ranges for the assumed occupancy account for differences in occupancy during the morning and evening peak periods for both the northbound and southbound directions on I-15.

The projected increase in person-trips on I-15 between now and 2050 is primarily due to forecasted large population and employment growth in both Salt Lake and Davis Counties and the fact that 40% of workers from Davis County are predicted to commute south to Salt Lake County for work in 2050.

What are peak periods?

A peak period is a 4-hour period during a day in which travel demand is highest. For the I-15 project, the morning peak period is the period between 6 AM and 10 AM, and the evening peak period is the period between 3 PM and 7 PM. The I-15 peak periods were determined by reviewing data from 2019 and 2021. For information regarding why 2019 data are being used for this EIS, see Section 1.3.4.1.2, *Impact of COVID-19 on Traffic Data*.

1.2.3.2 Freight Routes

All segments of I-15 in Davis and Salt Lake Counties carry some of the highest volumes and percentages of freight trips in Utah. In Utah, the highest percentage of freight trips, by both value and weight, is carried by trucks. 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 2017).

I-15 is also a national freight corridor. I-15 and I-80 are National Highway Freight Network routes and provide direct connections to West Coast ports. The *I-15 Corridor System Master Plan Update 2017* (CH2M 2017) describes the Interstate 15 Mobility Alliance and joint planning efforts for I-15 among the states of California, Nevada, Arizona, and Utah.

The 2017 *Utah Freight Plan* (UDOT 2017) emphasizes the importance of I-15 to national and regional freight trips. It lists the same future improvements on I-15 in the needs assessment study area that are included in the 2019–2050 RTP in Table 1A-3 in Appendix 1A, *Purpose and Need Chapter Supplemental Information*. These projects include the widening and operational projects in both counties on I-15 and an upgrade to the I-215/I-15/U.S. 89 system interchange in Farmington.

1.2.3.3 Transit Routes

One Utah Transit Authority (UTA) bus route, route 473 Ogden–Salt Lake Express, currently uses I-15 as part of its service route. This route connects Ogden with downtown Salt Lake City. Numerous bus routes operate on cross streets in the needs assessment study area. Information regarding these bus routes is available on the UTA website (UTA 2022). The track for FrontRunner, UTA's commuter rail system, is west of I-15 in Davis County and east of I-15 in the Salt Lake County part of the study area. FrontRunner connects Ogden to Provo, Utah.

As shown in Table 1A-3 in Appendix 1A, *Purpose and Need Chapter Supplemental Information*, several funded and unfunded transit projects are planned in the needs assessment study area. The funded planned transit projects are double-tracking FrontRunner in strategic locations through Davis and Salt Lake Counties, implementing a bus rapid transit project from Farmington to the University of Utah Research Park, and making some bus service upgrades. The 2019–2050 RTP and UTA's long-range transit plan list additional unfunded transit projects that will be completed after 2050 (see Table 1A-3 in Appendix 1A). As described in Section 1.3.1, *Planning Horizon and No-action Conditions*, only funded projects are considered part of the no-action conditions in 2050 for the I-15 project. Figure 1.2-1 shows the locations of the existing UTA bus routes in the needs assessment study area.

What are the no-action conditions?

The no-action conditions are the expected conditions in the needs assessment study area in 2050 if no I-15 improvements are made. For more information, see Section 1.3.1, *Planning Horizon and No-action Conditions*.

1.2.3.4 Bicycle and Pedestrian Facilities

Numerous bicycle and pedestrian facilities cross over, cross under, or are parallel to I-15 between Salt Lake City and Farmington (Figure 1.2-2). There are 25 existing locations where bicyclists and pedestrians can cross I-15, with or without dedicated bicycle or pedestrian facilities. See Table 1A-1 in Appendix 1A, *Purpose and Need Chapter Supplemental Information*, for the locations of existing bicycle and pedestrian facilities and routes in the needs assessment study area. Many of these locations are within school district boundaries and connect residents who live on the other side of I-15 and must cross I-15 to get to a school in their district. Additionally, the supporting document *Mobility Memorandum for the I-15 Environmental Impact Statement from Farmington to Salt Lake City* on the project website (<https://i15eis.udot.utah.gov>) includes more detailed information regarding bicycle and pedestrian mobility and facility characteristics at each location (Horrocks 2022b).

Figure 1.2-1. Existing Transit Routes

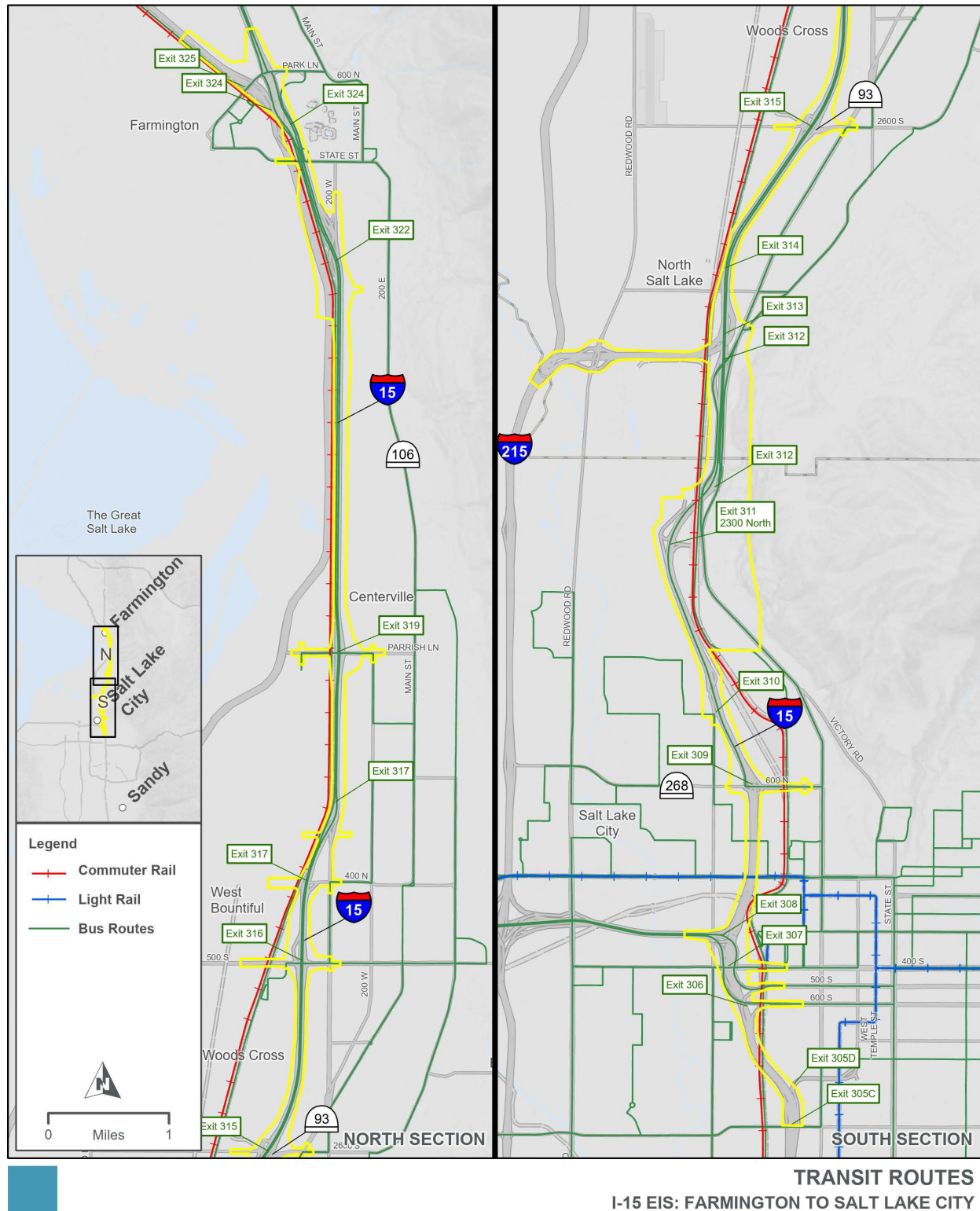
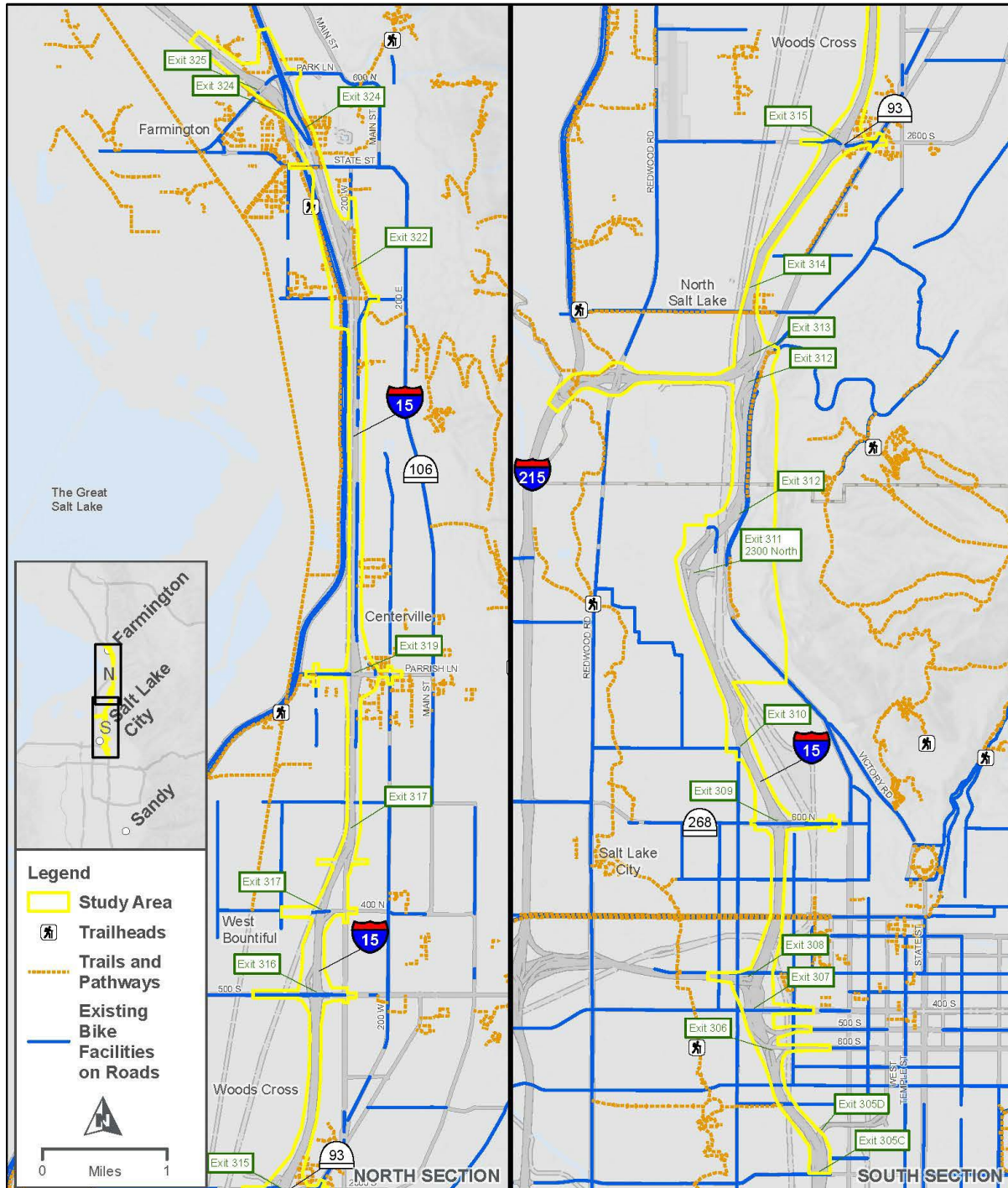


Figure 1.2-2. Existing Bicycle and Pedestrian Facilities



BICYCLE AND PEDESTRIAN FACILITIES
I-15 EIS: FARMINGTON TO SALT LAKE CITY

1.2.4 Prior Studies and Recommendations

Before the I-15 EIS process was initiated, many transportation planning studies had been conducted for I-15 or adjacent transportation facilities. The 15 studies that are most relevant to this EIS are summarized in Section 1A.2 of Appendix 1A, *Purpose and Need Chapter Supplemental Information*.

UDOT considered these studies as it developed the purpose of and need for the I-15 project. The relevant prior studies identified needs and potential solutions for the I-15 mainline, the I-15 interchanges, the arterial streets that access or cross I-15, the bicycle and pedestrian network, FrontRunner, and system-to-system connections for the West Davis Corridor and for I-215. These studies document existing and future travel demand between Davis and Salt Lake Counties and the need for a multifaceted solution to support future travel demand. The supporting document *Mobility Memorandum for the I-15 Environmental Impact Statement from Farmington to Salt Lake City* on the project website (<https://i15eis.udot.utah.gov>) includes detailed information about the bicycle and pedestrian mobility and facility characteristics at each location (Horrocks 2022b).

What is a system-to-system interchange?

A system-to-system interchange is an interchange that connects freeway facilities with direct-connect ramps.

What is a mainline?

A mainline is the primary travel-way of an interstate or freeway.

1.2.5 Regional Transportation Planning

The Wasatch Front Regional Council is the metropolitan planning organization for the project region and develops the *Wasatch Front Regional Transportation Plan* (WFRC 2019). WFRC's area of responsibility includes Davis, Salt Lake, and Weber Counties and the southern portion of Box Elder County. WFRC's most recent RTP, the 2019–2050 RTP, was adopted in 2019 and has had a total of four amendments in 2020 and 2021. The amended 2019–2050 RTP includes two projects that identify improvements to I-15 in Davis and Salt Lake Counties:

- I-15 widening (from five lanes to six lanes in each direction) from Farmington to Salt Lake County line (2019 RTP project: R-D-53)
- I-15 widening (from four and five lanes to six lanes in each direction) in Davis County to 600 North (2019 RTP project: R-S-137)

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 forecasted or expected revenue sources, with reasonable assurance that the federally supported transportation system is being adequately operated and maintained.

These two projects for I-15 were identified during the EIS process. The purpose of this EIS process is to conduct a thorough analysis of I-15 and identify a preferred solution. The 2019–2050 RTP is a fiscally constrained, 20-to-30-year plan of the anticipated highway, transit, and active transportation projects that would be needed to meet travel demand for all modes in WFRC's planning area. Transportation needs are based on projected and planned socioeconomic factors and land use in a region. Under federal law, WFRC must update its RTP every 4 years. An updated RTP is expected in 2023. WFRC and UDOT will coordinate on revisions and updates to project phasing. See Section 1A.3 of Appendix 1A, *Purpose and Need Chapter Supplemental Information*, for a list of upcoming 2019–2050 RTP projects in the needs assessment study area.

1.3 Need for the Project

Previous studies and the regional plans described in Sections 1A.2 and 1A.3 of Appendix 1A, *Purpose and Need Chapter Supplemental Information*, established a need for improvements to I-15 in the needs assessment study area. This section discusses the basis for those conclusions based on growth projections, travel demand data, and identified safety and operational issues. Section 1.3.1 describes the planning horizon and no-action conditions used for the needs assessment. Sections 1.3.3 through 1.3.5 describe the specific needs for the project using UDOT's Quality of Life Framework.

1.3.1 Planning Horizon and No-action Conditions

Planning Horizon. The planning horizon in WFRC's current RTP is 2019 to 2050. This EIS's planning horizon is designed to match the 2019–2050 RTP's planning horizon of 2050. To ensure the accuracy of travel demand modeling for the 2050 planning horizon, UDOT coordinated with WFRC and obtained WFRC's 2050 travel demand model for use in developing this EIS.

2050 No-action Conditions. This needs assessment is based on the no-action conditions in the needs assessment study area in 2050 if no I-15 improvements are made. The no-action travel demand conditions used in this EIS are based on version 8.3.2 of WFRC's regional travel demand model 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.

For the 2050 no-action conditions, UDOT assumed the socioeconomic forecast for 2050 and that all funded transit and roadway projects in the 2019–2050 RTP would be in place (see Section 1A.3 of Appendix 1A, *Purpose and Need Chapter Supplemental Information*, for a list of projects), with the only exception being the two widening projects on I-15 (identified in the 2019–2050 RTP as I-15 widening from Farmington to Salt Lake County line [R-D-53] and I-15 widening in Davis County to 600 North [R-S-137]). These two projects are not included in the 2050 no-action conditions because they are the potential components of this project.

The traffic analysis in this chapter is based on future land use, planned projects, and modeling assumptions. If some of these assumptions change as the study progresses, the results in this EIS might be updated based on more-current information.

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. This prediction is based on the expected population, employment, household, and land-use conditions in the area. The travel demand model used for the I-15 project is maintained by WFRC.

1.3.2 Health and Safety Needs

The Good Health outcome area of UDOT's Quality of Life Framework encompasses the health of people and communities. UDOT recognizes the role of active transportation in mental and physical health as well as environmental conditions contributing to health such as air quality and water quality. This section describes the safety and public health needs that will be addressed during the development of the I-15 EIS. Natural environment considerations were addressed through alternatives screening and are discussed in Chapter 3, *Affected Environment, Environmental Consequences, and Mitigation Measures*.

1.3.2.1 Safety Issues

The crash analysis conducted for the needs assessment study area shows that the crash rate and characteristics in the study area are comparable with those in the I-15 corridor throughout the urban Wasatch Front (that is Salt Lake, Davis, and Weber Counties). Within the study area, the crash analysis identified 15 “hot spot” locations where there were crashes with a severity level of 4 or greater (serious injury or fatality) between 2018 and 2020.

In general, more crashes occur in Salt Lake County, where there is greater traffic and congestion. The crashes also have a directional and temporal pattern: southbound travel has more crashes during the morning hours (6 AM to 9 AM), and northbound travel has more crashes during the afternoon hours (3 PM to 6 PM). This pattern follows rush-hour and commuter-traffic characteristics between Davis and Salt Lake Counties. The majority of crashes in either travel direction are front-to-rear and sideswipe crashes. A high number of front-to-rear and sideswipe crashes is often associated with congestion. See Section 1A.5.1 of Appendix 1A, *Purpose and Need Chapter Supplemental Information*, for more crash data.

1.3.2.2 Operational Safety Issues

Several locations in the needs assessment study area have worsening operational issues. These issues include locations where traffic congestion exceeds capacity of the interchange and traffic can back onto I-15 mainline, which is a safety concern because of the high travel speeds on the I-15 mainline. In 2050, under the no-action conditions, 95th-percentile vehicle queue lengths are expected to extend back into the I-15 mainline at the 600 North, 2600 South, 500 South, 400 North, and Parrish Lane interchanges during peak travel periods (Horrocks 2022b). The supporting document *Mobility Memorandum for the I-15 Environmental Impact Statement from Farmington to Salt Lake City* on the project website (<https://i15eis.udot.utah.gov>) includes detailed figures showing the projected 95th-percentile vehicle queue lengths in 2050 at each location (Horrocks 2022b).

What are 95th-percentile vehicle queue lengths?

The 95th-percentile vehicle queue lengths is the vehicle queue length in feet (how many cars are backed up at a signal) that should not be exceeded in 95% of the operational periods based on predicted traffic volumes. In 5% of the operational periods, the vehicle queues will extend longer than this distance. The queue length distance varies at each location based on the amount of projected traffic demand.

1.3.2.3 Outdated Roadway Features

The definition of standard roadway geometry is based on the highway design standards established by the American Association of State Highway and Transportation Officials (AASHTO 2018). Design standards have been updated over time. Although I-15 met design standards when it was originally constructed, many elements of I-15 are now outdated and do not meet current design standards. UDOT analyzed the horizontal and vertical alignments of I-15 and identified several roadway geometric features that do not meet current design standards and contribute to congestion and safety issues. These roadway features include barriers, shoulder widths, interchange ramps, horizontal curves, lane buffers, vertical clearance, and vertical sight distances. See Section 1A.5.2 in Appendix 1A, *Purpose and Need Chapter Supplemental Information*, for the locations of these outdated roadway features and more details about the design standards and criteria for these roadway features.

1.3.2.4 Bicyclist and Pedestrian Issues

The Good Health outcome area of UDOT's Quality of Life Framework includes safety considerations and accommodations for bicyclists and pedestrians. At some locations, such as 500 South in Bountiful or Parrish Lane in Centerville, the existing pedestrian and bicycle accommodations cross uncontrolled roads (that is, roads without traffic signals) and are uncomfortable for many bicyclists and pedestrians. There is a need throughout the needs assessment area to better transition vehicle traffic from the interstate to neighborhood streets through visual and design cues to reduce speeds and increase line of sight for vehicles to see pedestrians and bicyclists.

What are comfortable bicycle and pedestrian facilities?

Comfortable bicycle and pedestrian facilities are facilities that provide a sense of perceived safety and protection for bicyclists and pedestrians and have an absence of "uncomfortable" interactions with motor vehicles.

During the Smart Growth America (SGA 2021) workshops, the I-15 corridor was identified by many participants as being a barrier to east-west connectivity for residents. In addition to these workshops, the *Salt Lake City Pedestrian and Bicycle Master Plan* (Salt Lake City 2015), the *South Davis County Active Transportation Plan* (APD and TR 2020), and the 2019–2050 RTP have also identified a need for safe and comfortable pedestrian and bicycle facilities that run parallel to I-15 and those that cross I-15.

Additionally, UDOT analyzed StreetLight Data to better understand the travel behavior of people walking, riding bicycles, and accessing transit in the needs assessment study area. The data were used to determine trip mode, origins and destinations of nonmotorized travel, demographics such as the race or income level of users, trip directness, short vehicle trips to FrontRunner stations, and frequency of use at each I-15 crossing. Each crossing of I-15 has unique bicycle and pedestrian travel patterns and traffic characteristics. See Section 1A.5.3 of Appendix 1A, *Purpose and Need Chapter Supplemental Information*, for the characteristics and needs of each crossing in the study area.

1.3.3 Connected Community Needs

The Connected Community outcome area of UDOT's Quality of Life Framework reviews the intersection of transportation and land use as well as the need for intermodal connections between walking, biking, transit, and vehicle travel. The Quality of Life Framework emphasizes that transportation ties communities together. This section describes the connected community needs that are addressed in this EIS.

1.3.3.1 Local Land Use and Transportation Plans

As described in Section 1.2.5, *Regional Transportation Planning*, and in Sections 1A.3 and 1A.4 of Appendix 1A, *Purpose and Need Chapter Supplemental Information*, many multimodal transportation projects are planned adjacent to and intersecting with the I-15 needs assessment study area in the 2019–2050 RTP. The I-15 project considers these other planned multimodal projects.

Local land use plans informed the travel demand model used to describe the conditions in 2050 in the study area. UDOT has considered land use plans and future updates to plans to the extent that these plans change travel demand or travel patterns. See Section 1A.4 of Appendix 1A for a list of land use plans that apply to the study area.

1.3.3.2 Network Gaps and Lack of Multimodal Connectivity

Bicyclist and Pedestrian Network Needs. Bicyclist and pedestrian network needs for both recreation users and those using bicycles or walking as their means of transportation have been previously identified in the *South Davis County Active Transportation Plan*, the *Salt Lake City Pedestrian and Bicycle Master Plan*, and the 2019–2050 RTP. All of these plans have projects to improve multimodal networks in or near the needs assessment study area. UDOT worked with project sponsors and considered these other planned projects that would cross or be close to I-15. The I-15 project is intended to maintain and improve multimodal access across I-15 and support these planned future multimodal projects.

Transit Network Needs. As described in the 2019–2050 RTP, several regional UTA projects are planned adjacent to and intersecting with the I-15 needs assessment study area, including the Davis–SLC Community Connector bus rapid transit (BRT) project and the FrontRunner double-track and unfunded electrification projects. In many locations in the I-15 study area, FrontRunner is directly adjacent or parallel to I-15, and the Davis–SLC Community Connector BRT project is parallel to and on the east side of I-15. UDOT has considered these planned FrontRunner and BRT projects where they are adjacent to I-15 or would cross I-15 to make sure that the I-15 project supports these planned projects.

Multimodal Connections to FrontRunner Station Needs. The existing road, bicyclist, and pedestrian connections to the FrontRunner stations in Farmington and Woods Cross would benefit from more direct, comfortable multimodal access. Farmington residents on the east side of I-15 cannot directly access the FrontRunner Farmington Station. A project is planned to build a new pedestrian crossing near Park Lane that will improve access for residents near Park Lane. Residents located near Park Lane must travel to State Street and then north to the station, resulting in out-of-direction travel. State Street has the highest use by bicyclists in the needs assessment study area for accessing a FrontRunner station.

The FrontRunner Woods Cross Station is closest to 500 South for residents on the east side of I-15. The 500 South diverging diamond interchange at I-15 has high bicycle and pedestrian use compared to the rest of the study area, but it is difficult to navigate. Additionally, no formal or maintained pedestrian or bicyclist facilities access the FrontRunner Woods Cross Station from 500 South. The Union Pacific Railroad and UTA FrontRunner rail lines in Woods Cross are barriers for residents arriving by foot or bicycle from the west because the cross streets have at-grade crossings that can have long delays when trains travel through. Increasing multimodal network connectivity (east-west and north-south) across I-15 near the FrontRunner stations and the future Davis–SLC Community Connector BRT stations will help support these planned transit projects.

1.3.3.3 Coordination with UTA FrontRunner

Coordination with UTA and the UTA FrontRunner Double Track project has been considered in this EIS. In 2021, in anticipation of the preparation of this EIS, UTA prepared a technical memorandum describing the current strategic UTA investments that are underway for the FrontRunner Double Track project. The full memorandum is included in Section 1A.6 in Appendix 1A, *Purpose and Need Chapter Supplement Information*. UTA notified UDOT that it has begun planning and engineering for the following FrontRunner Double Track improvements:

- Beck Yard double track
- Centerville to Woods Cross double track
- Potential double track embankment as part of the ongoing West Davis Corridor project

UTA's technical memorandum summarized many of the agreements from the 2009 *I-15 North and Commuter Rail Collaborative Design Planning Study* (see Section 1A.2.2 in Appendix 1A) as well as the locations where coordination will be required between UDOT and UTA as they work on these two projects that are parallel in location to ensure that there will be adequate space for the planned FrontRunner Double Track projects with the I-15 alternatives.

1.3.4 Economic Needs

The Strong Economy outcome area of UDOT's Quality of Life Framework recognizes the vital role of transportation in business and commerce. This outcome area is not solely focused on the intra-state and inter-state traffic levels but also considers how transportation can help inter-city and intra-city economies. The transportation system provides access to jobs, education, services, and many other essential needs and supports economic development to improve quality of life. The following economic needs are addressed in this EIS.

1.3.4.1 Delay and Congestion

1.3.4.1.1 Network Delay

Delay and congestion on I-15 adds time to regional and local trips on I-15 and local side streets near interchanges. UDOT analyzed network delay in the needs assessment study area. The I-15 EIS *Existing and No-action Traffic Operations Analysis Technical Memorandum* (Horrocks 2022a) shows that daily hours of network delay during both the morning and afternoon peak periods is projected to increase more than 1,300% under the no-action conditions in 2050 compared to 2019 (Table 1.3-1).

What is network delay?

Network delay is the delay on I-15, interchanges, cross streets, and other nearby roads.

Table 1.3-1. Existing (2019) and 2050 No-action Network Daily Delay

AM			PM		
2019 Delay (hours)	2050 Delay (hours)	Percent Increase	2019 Delay (hours)	2050 Delay (hours)	Percent Increase
2,409	36,782	1,427%	2,910	42,500	1,360%

Source: Horrocks 2022a

As discussed in Section 1.3, *Need for the Project*, for the 2050 no-action conditions, UDOT assumed that all funded transit and roadway projects in the 2019–2050 RTP would be in place except for the two widening projects on I-15 (R-D-53 and R-S-137). The list of projects included in the 2050 no-action conditions is in Table 1A-3 in Appendix 1A, *Purpose and Need Chapter Supplemental Information*. This projected increased delay will result in lost productivity and wages and increased transport costs, all of which negatively affect the local and regional economy through inefficient movement of goods and people. The large increase in delay on I-15 is primarily the result of large forecasted population and employment growth in both Salt Lake and Davis Counties and the fact that 40% of workers from Davis County are predicted to commute south to Salt Lake County for work in 2050.

1.3.4.1.2 Impact of COVID-19 on Traffic Data

In 2020, traffic volumes were disrupted by the COVID-19 pandemic. For many sectors of the state economy, normal business services were interrupted, and many employees began working from home. This led to unpredictable traffic volumes in 2020. Using traffic volumes from 2020 and 2021 for this study would have led to an inaccurate assessment of current and future traffic conditions due to the change in travel patterns with the COVID-19 pandemic. In this EIS, the analysis of the existing conditions uses traffic volumes from 2019 to characterize traffic during the AM and PM peak periods. UDOT selected 2019 over 2021 as the base year for this study for the following reasons:

- Although 2021 traffic volumes approached or surpassed pre-COVID levels, congestion on I-15 was less volatile and more predictable in 2019. Simulation models can be calibrated better when there is existing congestion to match the causes of congestion.
- Transit ridership in 2021 did not recover to pre-COVID levels.
- The regional travel demand model 8.3.2 is calibrated to 2019 and uses transit ridership from 2019.

For more information, see the I-15 EIS *Existing and No-action Traffic Operations Analysis Technical Memorandum* (Horrocks 2022a).

1.3.4.2 Aging Infrastructure

Quality infrastructure is important to Utah's freight network and the traveling public. Quality infrastructure reduces transport costs and reduces delay by providing reliable, safe, and efficient transportation and reducing repair costs for vehicles traveling on I-15 and maintenance costs of the roadway itself. This section provides an overview of existing infrastructure on I-15 that needs to be replaced.

1.3.4.2.1 Pavement

The existing pavement in the needs assessment study area has sections of asphalt and sections of concrete. UDOT's maintenance strategy for asphalt is to mill and overlay it every 7 to 10 years and completely replace it every 20 years. 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-15 between Farmington and West Bountiful has been in service about 50 years, and UDOT has identified the need for a pavement reconstruction project on I-15 between Park Lane in Farmington to Pages Lane in West Bountiful.

1.3.4.2.2 Structures

Of the 35 existing structures in the I-15 needs assessment study area, the UDOT Structures Group recommends 9 for replacement, 1 for a deck replacement, and 19 for preservation work. Preservation work includes replacing and/or placing overlay, painting superstructures, sealing columns and parapets, replacing joints, making minor substructure repairs, and repairing and/or replacing fences. The other 6 are not identified as needing any condition-based work. Most existing structures (26 of the 35) do not have enough vertical clearance or width to accommodate any additional widening of I-15 in areas if needed. See Section 1A.5.4 of Appendix 1A, *Purpose and Need Chapter Supplemental Information*, for a list of structures and the identified needs for each structure.

What are structures?

Structures are bridges and culverts that cross under or over I-15 and carry vehicles, bicycles, pedestrians, creeks, or drainages.

1.3.5 Mobility Needs

The Better Mobility outcome area of UDOT's Quality of Life Framework focuses on moving people, not just vehicles, and includes public transit, walking, and biking needs as part of better mobility. The following mobility needs are addressed in this EIS.

1.3.5.1 Failing Operations

This section provides an overview of existing and projected traffic volumes in 2050 on I-15 and its interchanges, and the existing and future traffic volumes in the needs assessment study area. In this section, traffic volumes on roads are compared with existing and future no-action capacities to determine future operations and mobility on each road segment in the study area.

1.3.5.1.1 Increasing Regional Travel Demand

UDOT analyzed regional travel patterns among Weber, Davis, and Salt Lake Counties. Although Weber County is not in the needs assessment study area, traffic from Weber County is a component of the regional commuter traffic coming from the northern Wasatch Front on I-15 and is a component of traffic volumes on I-15 in Davis and Salt Lake Counties.

The I-15 EIS *Existing and No-action Traffic Operations Analysis Technical Memorandum* (Horrocks 2022a) shows that, in 2019, more than half of the jobs along the Wasatch Front were located in Salt Lake County, and more than 40% of Davis and Weber County workers commuted south. In 2050, even with strong job growth in Davis and Weber Counties, a majority of jobs are still projected to be in Salt Lake County, and a similar percentage of Davis and Weber County workers is projected to commute south. These factors lead to heavy north-south traffic between Davis and Salt Lake Counties and much higher traffic during peak commuting times.

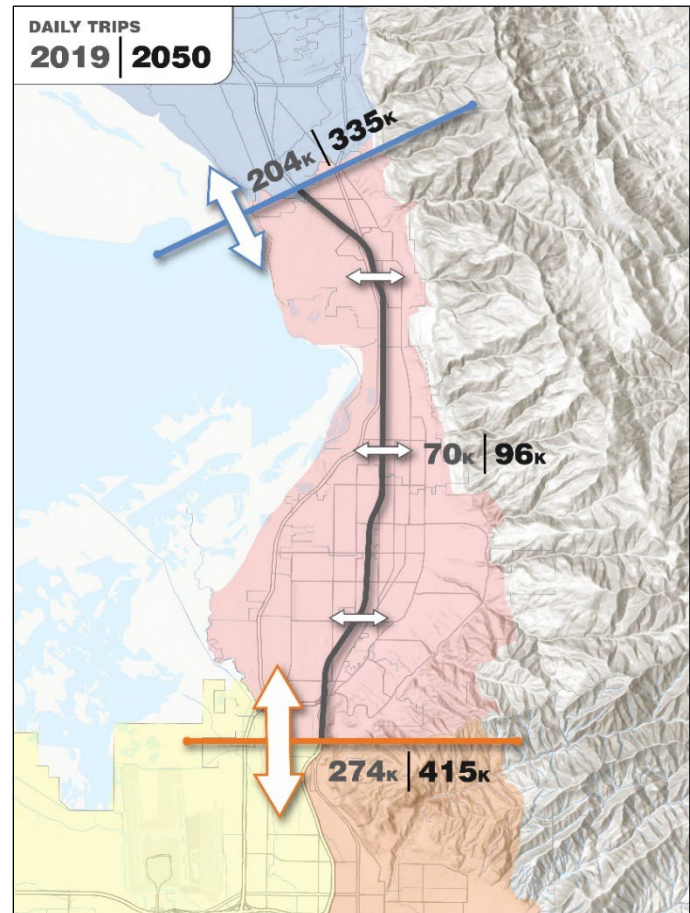
UDOT performed a screen-line analysis to quantify the travel demand across northern Davis County on the north end near Park Lane and across southern Davis County at the Davis and Salt Lake County boundary on the south end. A similar screen line was established on I-15 in southern Davis County to estimate east-west travel across I-15. Figure 1.3-1 shows the results of the screen-line analysis.

A screen line is an imaginary line on a map that crosses several links in a travel demand model. Screen lines are an accepted tool for evaluating a transportation network that serves a large geographic area. In a screen-line analysis, the sum of observed link trip counts (person-trips for all travel modes) that are crossed by the screen line are compared with model-estimated volumes for the same links and travel directions.

The screen-line analysis shows travel (in terms of person-trips) across northern-southern Davis County increasing from 204,000 in 2019 to 335,000 in 2050, an increase of over 64%. The screen-line analysis shows travel across Davis and Salt Lake Counties increasing from 274,000 in 2019 to 415,000 in 2050, an increase of over 51%. East-west travel across I-15 in the needs assessment study area is expected to increase from 70,000 in 2019 to 96,000 in 2050, an increase of 37%. See the I-15 EIS *Existing and No-action Traffic Operations Analysis Technical Memorandum* for more information (Horrocks 2022a).

This increase in north-south and east-west travel will put increased pressure on I-15, its interchanges, and crossing arterial streets.

Figure 1.3-1. Existing (2019) and 2050 No-action Screen-line Analysis



1.3.5.1.2 Increasing Travel Times

UDOT modeled the existing (2019) and 2050 no-action conditions for peak AM and PM travel times on I-15. Travel times in 2050 are expected to increase between 30% and 432% during the AM peak period for I-15 southbound travel, resulting in failing operations on I-15 for morning commuters. Travel times in 2050 are projected to increase between 129% and 407% during the PM peak period for I-15 northbound travel (Table 1.3-2). Additionally, travel times on the arterial streets that serve I-15 interchanges and local traffic in the needs assessment study area are projected to more than double. See the I-15 EIS *Existing and No-action Traffic Operations Analysis Technical Memorandum* (Horrocks 2022a) for more information.

What are failing operations?

Failing operations refers to traffic volumes that exceed roadway capacity, resulting in increased travel times, congestion and delay.

Table 1.3-2. Comparison of I-15 Mainline Travel Time between Farmington and Salt Lake City (2019 and 2050)

I-15 Travel Direction	Existing (2019) Travel Time (minutes)	2050 No-action Travel Time (minutes)	Percent Change
Southbound			
6:00 AM	15.9	20.6	30%
7:00 AM	19.2	41.6	117%
8:00 AM	19.1	69.1	262%
9:00 AM	16.7	88.9	432%
Northbound			
3:00 PM	16.5	37.8	129%
4:00 PM	20.6	64.5	213%
5:00 PM	23.6	78.1	231%
6:00 PM	16.6	84.2	407%

Source: Horrocks 2022a

1.3.5.1.3 Decreasing Average Speed

UDOT calculated average travel speeds on I-15 using the VISSIM model during the morning (6:00–10:00 AM) and evening (3:00–7:00 PM) peak periods for the existing (2019) and 2050 no-action conditions. Under the existing conditions (in 2019), I-15 southbound operates with limited congestion during the AM peak period, and average travel speeds are 59 to 71 miles per hour (mph). I-15 northbound experiences congestion during the PM peak period, and average travel speeds are 45 to 64 mph.

Under the no-action conditions in 2050, heavy congestion is projected to occur on I-15 in the northbound and southbound directions during both the AM and PM peak periods. Congested conditions are projected to spread to encompass the full 4-hour peak period during both the morning and evening. Southbound AM peak-period travel speeds are projected to be 13 to 55 mph, and northbound PM peak-period travel speeds are projected to be 13 to 28 mph. These projected average speeds are much slower than the existing conditions and will negatively impact throughput, operations, and safety on I-15. Table 1.3-3 shows the deteriorating average speeds on I-15 northbound and southbound under the projected no-action conditions in 2050.

Table 1.3-3. Comparison of I-15 Mainline Average Speed between Farmington and Salt Lake City (2019 and 2050)

I-15 Travel Direction	Existing (2019) Average Speed (mph)	2050 No-action Average Speed (mph)	Percent Change
Southbound			
6:00 AM	71.0	54.8	-23%
7:00 AM	58.8	27.1	-54%
8:00 AM	59.1	16.3	-72%
9:00 AM	67.6	12.7	-81%
Northbound			
3:00 PM	64.3	28.0	-56%
4:00 PM	51.5	16.4	-68%
5:00 PM	44.9	13.6	-70%
6:00 PM	63.9	12.6	-80%

Source: Horrocks 2022a

1.3.5.1.4 Interchange Operation Needs

By 2050, all I-15 interchanges between Park Lane and 600 North are projected to experience much higher levels of congestion than current levels because the interchanges will not have enough capacity to support the projected traffic volumes exiting and entering I-15.

As stated in Section 1.3.2.2, *Operational Safety Issues*, in 2050 under the no-action conditions, the 95th-percentile vehicle queue lengths are expected to extend back into the I-15 mainline at the 600 North, 2600 South, 500 South, 400 North, and Parrish Lane interchanges. See Table 1.3-4 for the I-15 interchanges that are expected to experience heavy congestion during the PM peak period in 2050.

Table 1.3-4. Interchanges Modeled in the Davis County I-15 Study and Future Congestion

I-15 Interchange	City	Existing Conditions ^a	Future Conditions ^a
Park Lane	Farmington	Minimal congestion	Moderate to heavy congestion
Parrish Lane	Centerville	Minimal to moderate congestion	Heavy congestion
400 North	West Bountiful	Minimal to moderate congestion	Heavy congestion
500 South	West Bountiful	Minimal to moderate congestion	Heavy congestion
1100 North/2600 South	North Salt Lake	Minimal to moderate congestion	Heavy congestion
600 North	Salt Lake City	Minimal congestion	Heavy congestion

Source: Horrocks 2022a

^a Minimal congestion is delays less than 35 seconds, moderate congestion is delays of 35 or 55 seconds, and heavy congestion is delays of more than 55 seconds at an intersection related to the interchange. This table presents a range of congestion levels when several intersections and congestion levels are associated with the interchange. Thresholds obtained from the sixth edition of the *Highway Capacity Manual* (TRB 2016) were used to assign a congestion level similar to what a driver would experience.

1.4 Summary of Purpose and Need

1.4.1 Need for the Project

As described in Section 1.3, *Need for the Project*, between Farmington and Salt Lake City, I-15 has aging infrastructure and worsening operational characteristics for 2019 and projected (2050) travel demand, both of which contribute to decreased safety, increased congestion, lost productivity, and longer travel times. East-west streets that access or cross I-15 are important to connect communities and support other travel modes such as biking, walking, and transit. When I-15 and its interchanges do not support travel demand, traffic is added to the local streets, which affects both the regional and local transportation system as well as safe, comfortable, and efficient travel by other travel modes.

1.4.2 Purpose of the Project

The purpose of the I-15 project is to improve safety, replace aging infrastructure, provide better mobility for all travel modes, strengthen the state and local economy, and better connect communities along I-15 from Farmington to Salt Lake City. The project purpose consists of the following objectives, which are organized by UDOT's Quality of Life Framework categories of Good Health, Connected Communities, Strong Economy, and Better Mobility.

1.4.2.1 Improve Safety

- Improve the safety and operations of the I-15 mainline, I-15 interchanges, bicyclist and pedestrian crossings, and connected roadway network.

1.4.2.2 Better Connect Communities

- Be consistent with planned land use, growth objectives, and transportation plans.
- Support the planned FrontRunner Double Track projects and enhance access and connectivity to FrontRunner, to regional transit and trails, and across I-15.

1.4.2.3 Strengthen the Economy

- Replace aging infrastructure on I-15.
- Enhance the economy by reducing travel delay on I-15.

1.4.2.4 Improve Mobility for All Modes

- Improve mobility and operations on the I-15 mainline, I-15 interchanges, connected roadway network, transit connections, and bicyclist and pedestrian facilities to help accommodate projected travel demand in 2050.

1.5 Public and Agency Involvement in Developing the Purpose and Need

The Council on Environmental Quality (CEQ) oversees federal agencies' implementation of NEPA. In 2020, CEQ announced a final rule amending the NEPA regulations in 40 Code of Federal Regulations Parts 1500–1508. The new regulations require agencies to provide more information and solicit input from the public earlier in the process to ensure and facilitate informed decision-making. The new regulations allow agencies to develop a draft purpose and need statement before publishing the Notice of Intent to prepare an EIS in the Federal Register.

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.

The Federal Register notice for this EIS was posted on March 28, 2022.

A draft version of this purpose and need chapter was provided to the cooperating and participating agencies and the public for a 30-day review period ending on May 13, 2022. This review period occurred at the same time as the formal scoping process. During the public comment period for the scoping process and the draft purpose and need, the study team gave presentations at 24 city council, community council, advisory group, and planning commission meetings. UDOT held two equity working group meetings, on February 28 and March 28, 2022. UDOT held a virtual agency scoping meeting on April 7, 2022, via Webex.

In all, 900 comments were received during the scoping and draft purpose and need comment period. Comments were submitted by the agencies and the public through the study email address, the study website, an online mapping tool (a geographic information systems [GIS] tool), and the regulations.gov website. The majority of the comments were related to access to Glovers Lane from I-15 or the West Davis Corridor, bicycle and pedestrian accommodations across I-15, new interchanges or interchange modifications, pavement quality, noise impacts, grade-separating railroad tracks and local streets, and other alternative ideas relating to transit, transportation system management, travel demand management, tolling, and lane restrictions. Copies of the comments received during the scoping and draft purpose and need comment period are included in the *Scoping Summary Report* (UDOT 2022).

During the scoping and draft purpose and need comment period, UDOT received very few unique comments related to the project purpose and need. UDOT reviewed comments related to the project purpose and need and revised this purpose and need chapter as appropriate based on the public and agency input. The following list summarizes the main comments UDOT received on the draft purpose and need chapter specifically and UDOT's responses to those comments.

- **The I-15 project is not needed.** Traffic operations on I-15 are expected to fail by 2050 if no action is taken, and the infrastructure on I-15 is nearing its useful life. See Section 1.3, *Need for the Project*.
- **The I-15 project should accommodate UTA's plans for FrontRunner.** The I-15 project will accommodate UTA's plans for FrontRunner. See Section 1.4.2, *Purpose of the Project*.

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