

Draft Purpose and Need April 2022

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 is the project sponsor and lead agency for the project and will be responsible for preparing the I-15 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 Section 327 and a Memorandum of Understanding dated January 17, 2017, extended to April 29, 2022, and executed by FHWA and UDOT.

As part of the environmental review process, the lead agency is required to provide opportunities for the public and participating agencies to be involved in defining the purpose and need statement. To make it easier to review and comment, and to provide the reader with context regarding how the project purpose and need fits into the larger EIS and NEPA process, UDOT has put this public review version of the draft purpose and need statement into the chapter format that will be used in the Draft EIS. The version eventually included in the Draft EIS will reflect input obtained from public and agency comments on this draft during scoping.

1.1.1 UDOT Quality of Life Framework

Utah's Transportation Vision (UVision) is a process for collaborating with partnering agencies 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, Strong Economy, Better Mobility, and Connected Communities (Table 1.1-1). UDOT will use the UVision process as it collaborates and partners with the cooperating and participating agencies, local governments, and the public on the I-15 project.

The purpose of and needs for the I-15 project are consistent with UDOT's Quality of Life Framework and prioritize Good Health, Strong Economy, Better Mobility, and Connected Communities. More information regarding the needs for the project and how these align with the Quality of Life Framework is provided in Section 1.3, *Need for the Project*.

Table 1.1-1. UDOT Quality of Life Framework Outcome Areas

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

Source: UDOT 2021

1.1.2 Description of the Needs Assessment Study Area and Logical Termini

The needs assessment study area is the area that was used to define the transportation issues that help develop the project purpose that is defined in this chapter. The needs assessment study area for the I-15 EIS extends on I-15 from the U.S. 89/Legacy Parkway/Park Lane interchange (I-15 milepost 325) in Farmington to the I-80 West/400 South interchange (I-15 milepost 308) in Salt Lake City (see Figure 1.1-1). The boundaries for the needs assessment study area shown in Figure 1.1-1 extend north of the north terminus and south of the south terminus to include ramps that begin or end at these interchanges.

UDOT developed the termini for the I-15 EIS to include areas that influence the transportation operations of the project. These logical termini are also an adequate distance apart to assess the environmental impacts on a broad scope and are located at rational end points for evaluating proposed transportation improvements. The identified termini for the needs assessment study area are sufficiently broad and do not prevent UDOT from considering a reasonable range of alternatives that could meet the identified needs for the project.

The discussion below provides more information regarding 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. Highway 89 (U.S. 89)/Legacy Parkway/Park Lane interchange and the future West Davis Corridor interchange (planned to be completed in 2024). 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. North of this interchange, traffic disperses and volumes measurably decrease on I-15.
- 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 Interstate 80 (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 was determined to be 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.

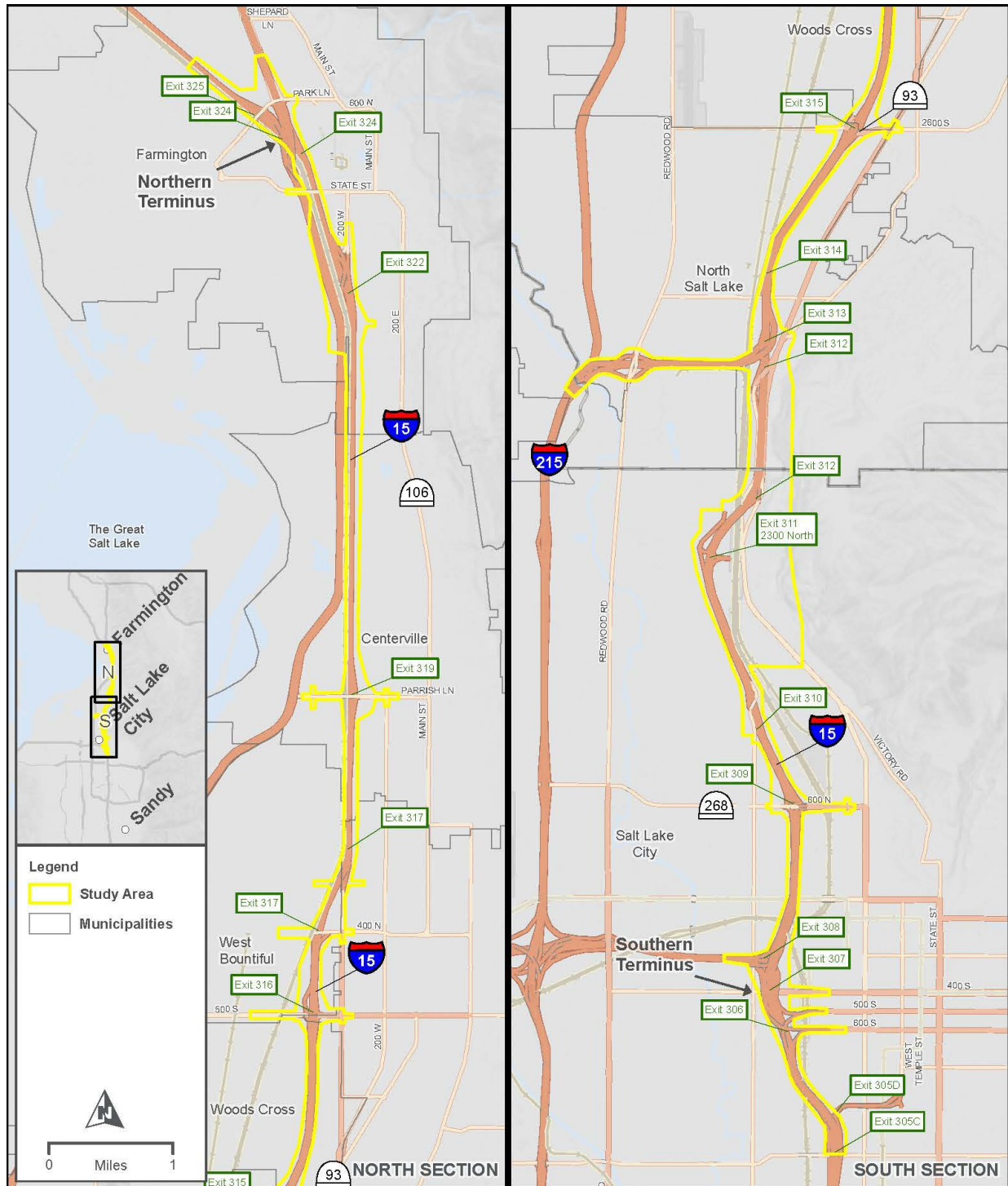
What are logical termini?

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.

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 4-hour period between 6 AM and 10 AM, and the evening peak period is the 4-hour period between 3 PM and 7 PM.

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

Additionally, there is another Phase 1 project in the Wasatch Front Regional Council's (WFRC) 2019–2050 *Wasatch Front Regional Transportation Plan* (RTP) (project R-S-133) to widen I-15 in the northbound direction between 600 South and I-215.

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 and continues north to Alberta, Canada, passing through the states of 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 the 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 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 is the primary north-south interstate highway in Utah. I-15 is a link in most trips that are 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. Existing (2019) average annual daily traffic (AADT) in weekday person-trips on I-15 (northbound and southbound) is 405,000 per day between U.S. 89 and 400 South. By 2050, weekday person-trips are projected to be 495,000 per day, an increase of 22%.

1.2.3.2 Freight Routes

I-15 is a national freight corridor, and 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, trucking is the mode that carries the highest percentage of freight trips by both value and weight. 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).

Salt Lake City is a major freight hub because the Salt Lake City International Airport is located in the city, and segments of Union Pacific Railroad's trackage, I-80, and I-15 are all located in the city. The 2017 *Utah Freight Plan* (UDOT 2017) emphasizes the importance of I-15 to national and regional freight trips, summarizes the "Interstate 15 Mobility Alliance" and joint planning among California, Nevada, Arizona, and Utah, and summarizes the development of the *I-15 Corridor System Master Plan Update 2017* (CH2M 2017).

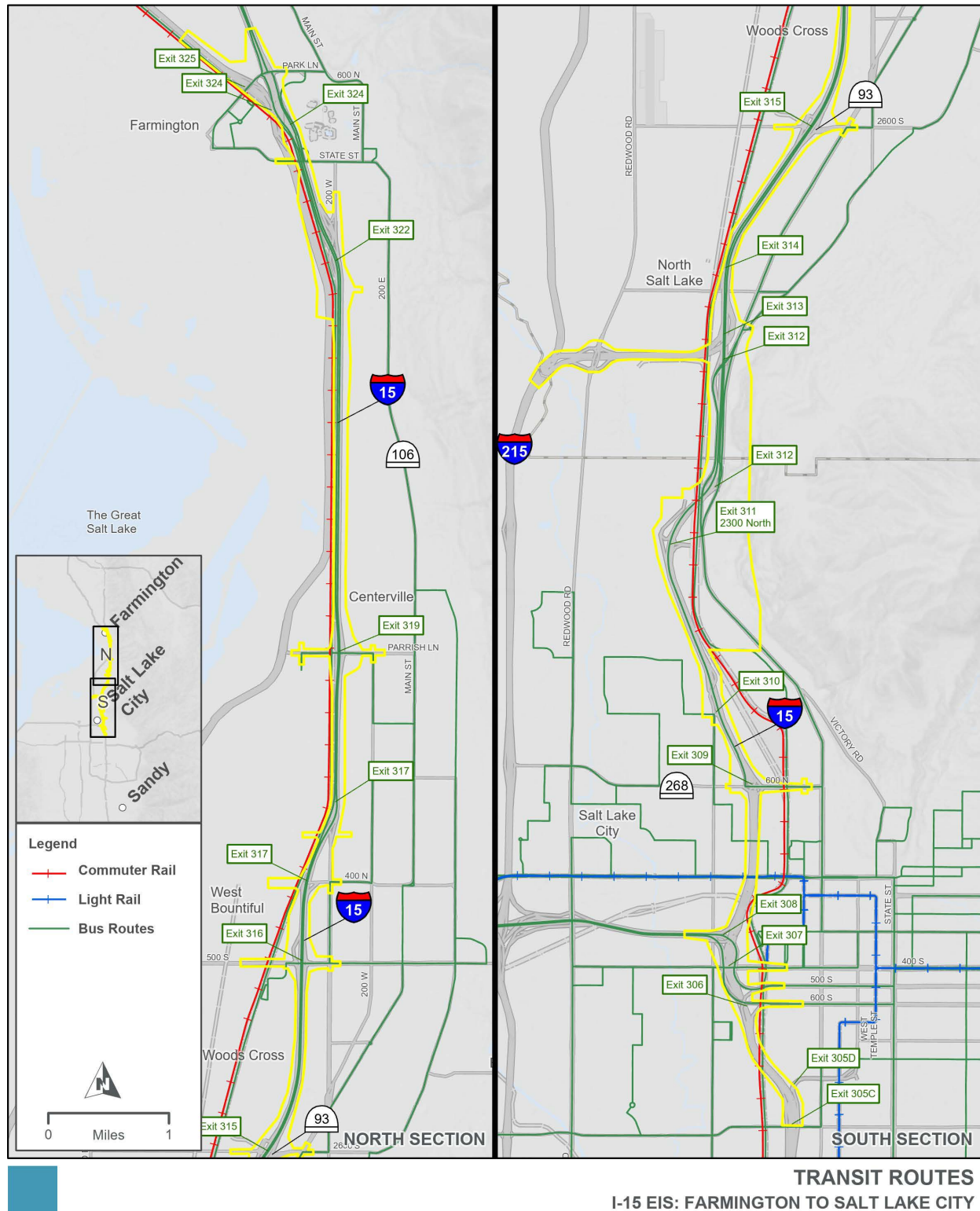
The 2017 *Utah Freight Plan* lists the future improvements on I-15 in the needs assessment study area that are included in the RTP in Table A-3 in Appendix A, *Purpose and Need Chapter Supplemental Information*. These projects include the widening and operational projects in both counties on I-15 and an upgrade to the system interchange at I-215, I-15, and U.S. 89.

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). 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 A-3 in Appendix A, *Purpose and Need Chapter Supplemental Information*, several transit projects are planned in the needs assessment study area. The planned projects are building a new FrontRunner station in Centerville, doubletracking FrontRunner through Salt Lake and Davis Counties, electrifying FrontRunner, implementing an enhanced bus project, and making some bus service upgrades. Some of these planned projects will be completed after 2050 and are listed as unfunded projects in the RTP. Figure 1.2-1 shows the locations of the existing UTA bus routes in the needs assessment study area.

Figure 1.2-1. Existing Transit Routes



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 Appendix A, *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.

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 Appendix A, *Purpose and Need Chapter Supplemental Information*. UDOT considered these 15 studies as it developed the purpose of and need for the I-15 project. The relevant prior studies included the identification of 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.

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

WFRC is the metropolitan planning organization for the project region and develops the *Wasatch Front Regional Transportation Plan* (WFRC 2019) for the region. 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:

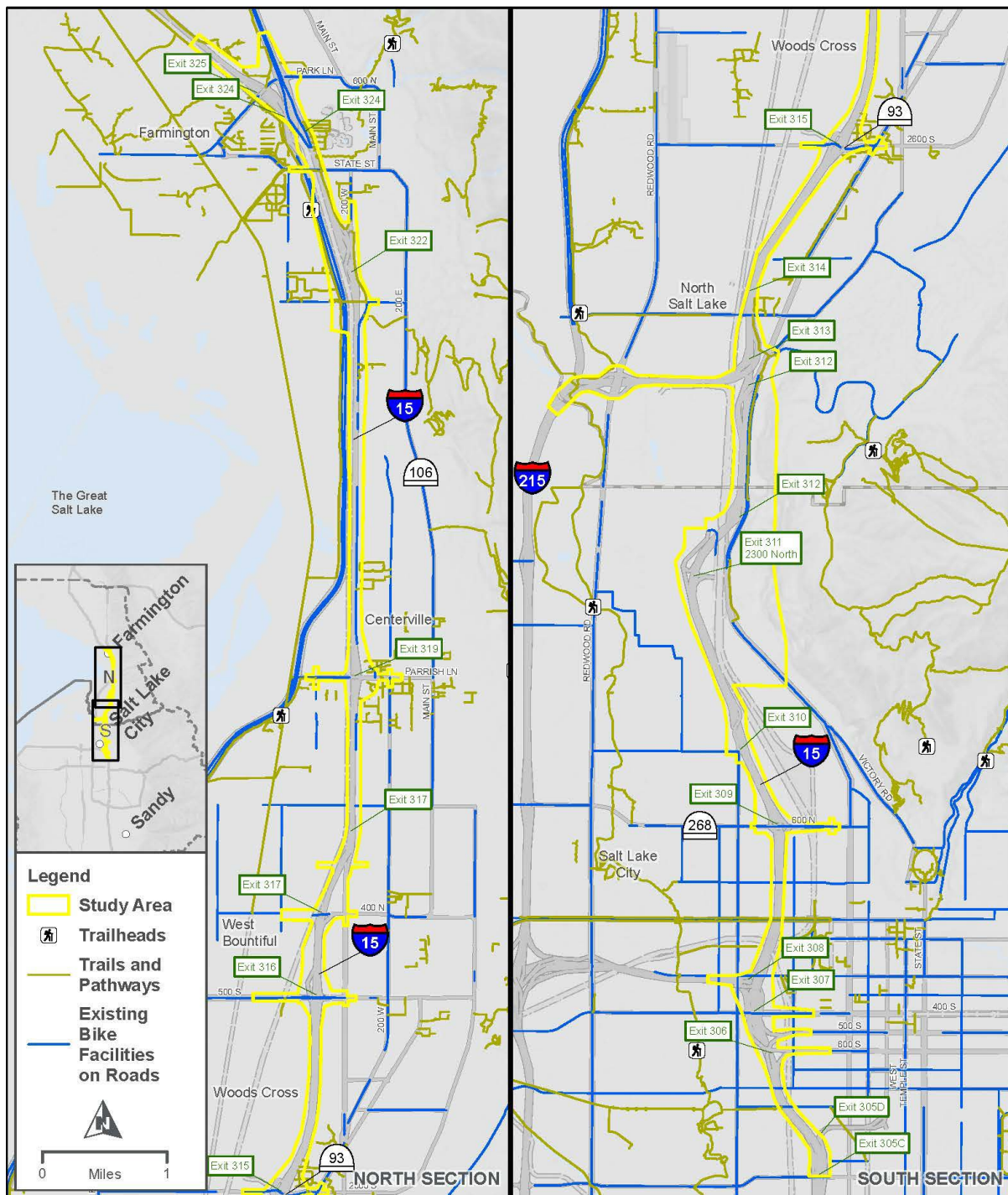
- I-15 widening (from 5 lanes to 6 lanes in each direction) from Farmington to Salt Lake County line (RTP project: R-D-53)
- I-15 widening (from 4 and 5 lanes to 6 lanes in each direction) in Davis County to 600 North (RTP project: R-S-137)

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.

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 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. See Appendix A, *Purpose and Need Chapter Supplemental Information*, for a list of upcoming RTP projects in the needs assessment study area.

Figure 1.2-2. Existing Bicycle and Pedestrian Facilities



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

1.3 Need for the Project

Previous studies and the regional plans described in Appendix A, Purpose and Need Chapter Supplemental Information, have identified a need for improvements to I-15 in the needs assessment study area. This section discusses that need based on growth projections, travel demand data, and identified safety and operational issues in the needs assessment study area. Section 1.3.1 describes the planning horizon and no-action conditions used for the needs assessment. Section 1.3.3 through Section 1.3.5 detail 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. Therefore, this EIS's planning horizon is 2050 to match the 2019–2050 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 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 in the needs assessment area. 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, the project team assumed the socioeconomic forecast for 2050 and that all funded transit and roadway projects in the 2019–2050 RTP would be in place (see Appendix A, *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 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 because they are the potential components of this project.

The traffic analysis in this purpose and need statement 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 report may 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 individuals and communities, recognizing 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. For the I-15 EIS, UDOT has identified the following safety and public health needs that will be addressed with the project. Natural

environment considerations will be addressed through alternatives screening and design refinements later in the EIS process.

1.3.2.1 Safety Issues

The crash analysis conducted for the needs assessment study area identified 15 “hot spot” locations. These are locations in the needs assessment study area where there were crashes with severe injuries and/or fatalities between 2018 and 2020. The crash data and associated analysis in this EIS are protected under 23 United States Code Section 409.

In general, more crashes occur in Salt Lake County, where there is higher AADT. There is also a directional and temporal pattern to crashes: southbound travel has more crashes during the morning hours (6 AM to 9 AM), and northbound travel has more crashes during the evening 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 Appendix A, *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 an 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, vehicle queues 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 2022).

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. The project team 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 Appendix A, *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 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. Additionally, the Smart Growth America 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 WFRC's 2019–2050 RTP have identified a need for safe and comfortable pedestrian and bicycle facilities that cross I-15. Additionally, StreetLight Data were analyzed to better understand travel behavior of people walking, riding bicycles, and accessing transit in the 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. See Appendix A, *Purpose and Need Chapter Supplemental Information*, for the characteristics and needs of each crossing in the needs assessment 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. For the I-15 EIS, UDOT has identified the following connected community needs that will be addressed with the project.

1.3.3.1 Local Land Use and Transportation Plans

As described above in Section 1.2.5, *Regional Transportation Planning*, and in Appendix A, *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 WFRC's 2019–2050 RTP. The I-15 project needs to consider these other planned multimodal projects.

Local land use plans informed the travel demand model used to describe the conditions in 2050 in the needs assessment study area. The I-15 project will consider land use plans and future updates to plans to the extent that these plans change travel demand or travel patterns. A list of land use plans in the needs assessment study area is included in in Appendix A, *Purpose and Need Chapter Supplemental Information*.

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 WFRC's 2019–2050 RTP. All of these plans have projects to improve multimodal networks in or near the needs assessment study area. The I-15 project needs to work with project sponsors and consider these other planned projects that would cross or be close to I-15. The I-15 project needs to maintain and improve multimodal access across I-15 and support these planned future multimodal projects.

Transit Network Needs. As described in WFRC's 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 doubletrack and electrification projects. In many locations in the I-15 needs assessment 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. The I-15 project needs to consider 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 would support these planned projects.

Multimodal Connections to FrontRunner Station Needs. Additionally, the existing road, bicyclist, and pedestrian connections to the FrontRunner stations in Farmington and Woods Cross need more direct, comfortable multimodal access. Farmington residents on the east side of I-15 cannot directly access the Farmington FrontRunner station. A project is planned to build a new pedestrian crossing near Park Lane that will improve access for residents near Park Lane. For residents located near Park Lane, they 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 study area for accessing a FrontRunner station.

The Woods Cross FrontRunner station is closest to 500 South for residents on the east side of I-15. 500 South has a diverging diamond interchange at I-15 that has high bicycle and pedestrian use compared to the rest of the study area; however, it is difficult to navigate. Additionally, no formal or maintained pedestrian or bicyclist facilities access the Woods Cross FrontRunner station from 500 South. The Union Pacific 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

In 2021, in anticipation of the preparation of this EIS, the Utah Transit Authority (UTA) prepared a technical memorandum describing the current strategic UTA investments that are underway for the FrontRunner Double Track project. 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 A.2.2 in Appendix A, *Purpose and Need Chapter Supplemental Information*) 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.

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 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. For the I-15 EIS, UDOT has identified the following economic needs that will be addressed with the project.

1.3.4.1 Delay and Congestion

Delay and congestion on I-15 adds time to regional and local trips on I-15 and local side streets near interchanges. The project team analyzed network delay in the needs assessment study area. The I-15 EIS *Existing and No-Action Traffic Operations Analysis Technical Memorandum* (Horrocks 2022) shows that daily hours of network delay in both the morning and afternoon peak periods is projected to increase over 1,300% under no-action conditions in 2050 compared to 2019 (Table 1.3-1). As previously discussed in Section 1.3, *Need for the Project*, for the 2050 no-action conditions, the project team assumed that all funded transit and roadway projects in the 2019–2050 RTP would be in place with the only exception being the two widening projects on I-15. Unfunded projects in the RTP were not included in the 2050 no-action conditions. 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.

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 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 2022

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. 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 periodically (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, 9 are recommended for replacement, 1 is recommended for a deck replacement, and 19 are recommended for preservation work by the UDOT Structures Group. 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 Appendix A, *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. For the I-15 EIS, UDOT has identified the following mobility needs that will be addressed with the project.

1.3.5.1 Failing Operations

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

1.3.5.1.1 Increasing Regional Travel Demand

The project team analyzed regional travel patterns in the needs assessment study area. The I-15 EIS *Existing and No-Action Traffic Operations Analysis Technical Memorandum* (Horrocks 2022) shows that, in 2019, more than half of the jobs along the Wasatch Front are located in Salt Lake County, and, more than 40% of Davis and Weber County workers commute 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 with much higher traffic during peak commuting times.

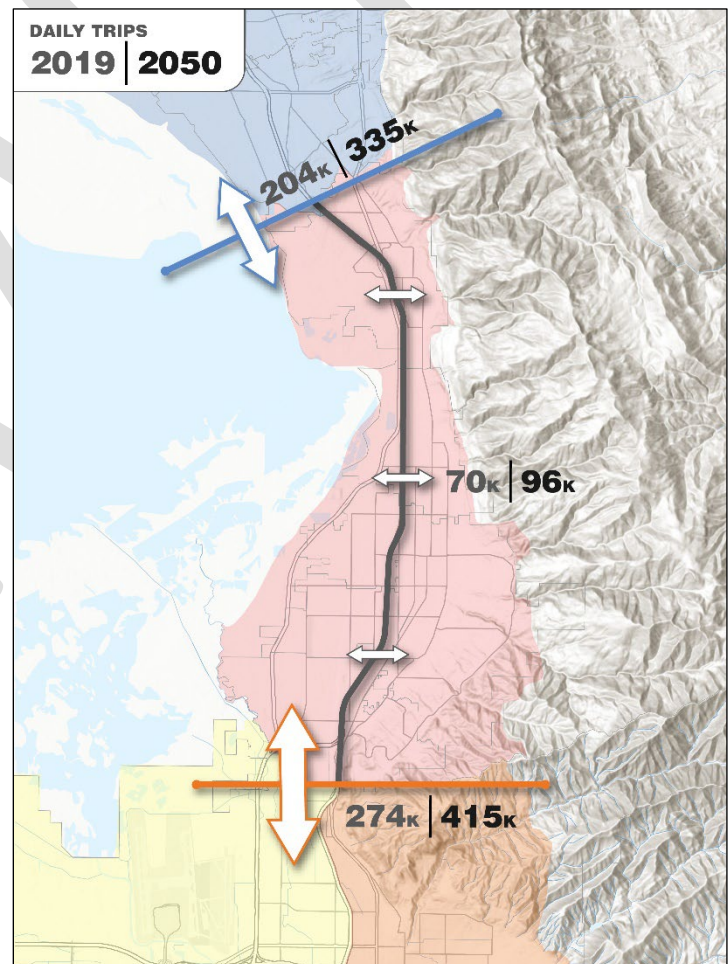
The project team performed a screen-line analysis to quantify the travel demand across northern Davis County on the north end near Park Lane and across southern Davis County at the Davis and Salt Lake County boundary on the south end. A similar screen line was established on I-15 in southern Davis County 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 (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 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 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.

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

The project team 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 2022) for more information.

What are failing operations?

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

Table 1.3-2. I-15 Mainline Travel Time Comparison between Farmington and Salt Lake City

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 2022

1.3.5.1.3 Decreasing Average Speed

The project team 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 existing conditions and will negatively impact throughput, operations, and safety on I-15. Table 1.3-3 details the deteriorating average speeds on I-15 northbound and southbound under the projected no-action conditions in 2050.

Table 1.3-3. I-15 Mainline Average Speed Comparison between Farmington and Salt Lake City

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 2022

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, vehicle queues 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 ^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 2022

^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. A range of congestion levels is presented when there are a number of intersections and congestion levels associated with the interchange.

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 current 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 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 the supporting roadway network.

1.4.2.2 Better Connect Communities

- Be consistent with planned land use, growth objectives, and transportation plans.
- 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, the supporting roadway network, transit connections, and bicyclist and pedestrian facilities to help accommodate projected travel demand in 2050.

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