



CENTRAL CORRIDOR TRANSIT STUDY

Utah Transit Authority
Utah Department of Transportation

Lehi City
American Fork
Pleasant Grove
Lindon
Orem
Vineyard
Provo
Utah County
and
Mountainland Association of Governments

Final Alternatives Evaluation Report

Prepared for

Utah Department of Transportation,
in collaboration with the Utah Transit Authority



Prepared by

Parametrix

4179 Riverboat Road, Suite 130
Salt Lake City, UT 84123
T. 801.307.3400 F. 1.855.542.6353
www.parametrix.com

Horrocks Engineers

1265 E. Fort Union Boulevard, Suite 200
Cottonwood Heights, UT 84047
T. 801.256.2700
www.horrocks.com



CITATION

Parametrix & Horrocks Engineers. 2021. Final Alternatives Evaluation Report.
Prepared by Parametrix and Horrocks Engineers, Salt Lake City, UT 2021.

□ □ □ □

TABLE OF CONTENTS

A. EXECUTIVE SUMMARY	vii
1. INTRODUCTION	1
1.1 Overview	1
1.2 Study Context	2
1.3 What is High-Capacity Transit?	2
1.4 Study Area	3
2. EXISTING AND PLANNED CONDITIONS	4
2.1 Transportation Conditions	4
2.1.1 Roadway Network	4
2.1.2 Transit Services	4
2.1.3 Non-Motorized Travel	6
2.2 Land Use and Socioeconomic Conditions	6
2.2.1 Land Use and Growth	6
2.2.2 Socioeconomic Analysis	9
2.3 Environmental Considerations	9
3. PUBLIC AND STAKEHOLDER ENGAGEMENT	10
3.1 Public Involvement	10
3.1.1 Phase One	10
3.1.2 Phase Two	11
3.1.3 Phase Three	11
3.2 Stakeholder Engagement	13
4. PURPOSE AND NEED	14
4.1 Project Need	14
4.1.1 Roadway Congestion	14
4.1.2 Limited Locally-Serving High-Capacity Transit Options	14
4.1.3 Rapid Population and Employment Growth	14
4.1.4 Transit-Oriented Land Uses	15
4.1.5 Redevelopment Opportunities	15
4.2 Project Purpose	15

TABLE OF CONTENTS (CONTINUED)

5. DEFINITION OF ALTERNATIVES AND EVALUATION CRITERIA	16
5.1 Initial Range of Alternatives	16
5.2 Evaluation Criteria	16
6. LEVEL 1 SCREENING	19
6.1 Pre-Screening	19
6.2 Level 1 Screening Analysis and Outcomes	19
6.2.1 Corridor Alternatives	19
6.2.2 Modal Alternatives	21
7. LEVEL 2 SCREENING	22
7.1 Level 2 Screening Analysis and Outcomes	22
8. PREFERRED ALTERNATIVE	25
8.1 Overview	25
8.2 Definition and Characteristics	29
8.2.1 Alignment	29
8.2.2 Station Locations	29
8.2.3 Project Elements	30
8.3 Ridership	30
8.4 Costs	31
8.5 Funding	31
8.6 Operations	32
8.6.1 Corridor Operations and Considerations	32
8.6.2 Planning-Level Operations Costs	33
8.7 Land Use and Zoning Recommendations	33

TABLE OF CONTENTS (CONTINUED)

List of Figures

Figure 1-1. Project Development Process	1
Figure 1-2. Project Steps	1
Figure 1-3. Study Area	3
Figure 2-1. 2015 Congestion (left); 2050 Congestion with Planned Projects and Arterial Grid Network (right)	5
Figure 2-2. Planned Land Use	7
Figure 5-1. Initial Range of Alternatives	17
Figure 6-1. Level 1 Alternatives	20
Figure 7-1. Level 2 Alternatives	23
Figure 8-1. Preferred Alternative	26

List of Tables

Table 1-1. High-Capacity Transit Modal Options	2
Table 2-1. Estimated Population and Employment Growth	9
Table 3-1. TAC and Executive Team Meetings Summary	13
Table 5-1. Evaluation Criteria	18
Table 6-1. Level 1 Screening Results Summary	21
Table 7-1. Level 2 Screening Results Summary	24
Table 8-1. Modeling Sensitivity Test Results	30
Table 8-2. Rough Order of Magnitude Operating Cost Estimates	33

Appendix List


- Appendix A – Public Involvement Report
- Appendix B – Level 1 Screening Memo
- Appendix C – Level 2 Screening Memo
- Appendix D – Funding Memo
- Appendix E – TOD Station Area Planning Best Practices

ACRONYMS

BRT	bus rapid transit
BUILD	Better Utilizing Investments to Leverage Development
CIG	Capital Investment Grants
CRA	Community Reinvestment Area
CRT	commuter rail transit
ESA	Endangered Species Act
FTA	Federal Transit Administration
GIS	geographic information systems
LRT	light rail transit
M	million
MAG	Mountainland Association of Governments
NEPA	National Environmental Policy Act
PID	Public Infrastructure Districts
RDA	Redevelopment Agency
RTP	Regional Transportation Plan
SGR	state of good repair
SOV	single occupancy vehicle
SR	State Route
STP	Surface Transportation Program
TAC	Technical Advisory Committee
TIFIA	Transportation Infrastructure Finance and Innovation Act
TOD	transit-oriented development
TRZ	Transportation Reinvestment Zone
UDOT	Utah Department of Transportation
UTA	Utah Transit Authority
UVX	Utah Valley Express
WFRC	Wasatch Front Regional Council

Executive Summary





WHAT IS HIGH-CAPACITY TRANSIT?

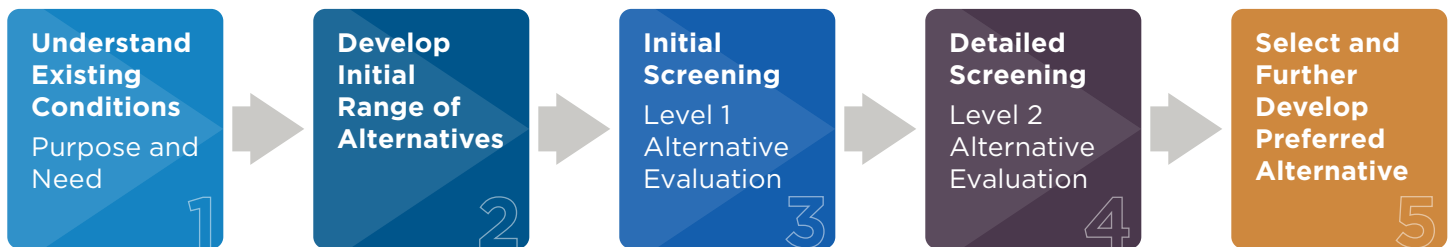
High-capacity transit carries larger numbers of passengers and provides more frequent and reliable service than a standard bus system. Typically, it serves as a “transit backbone,” connecting major destinations within the region, with fewer stops than typical bus systems.

What is the Central Corridor Transit Study?








The Central Corridor Transit Study evaluated options for providing expanded high-capacity transit service in Utah County, from Lehi to Provo. The purpose of the study is to determine a Preferred Alternative, which identifies the transit alignment (corridor and station areas), and the transit mode (type of transit technology, such as bus rapid transit, light rail). The study brought together the cities of Lehi, American Fork, Pleasant Grove, Lindon, Orem, Vineyard, and Provo, and Utah County, in collaboration with Mountainland Association of Governments (MAG), Utah Transit Authority (UTA), and Utah Department of Transportation (UDOT).

The study process consisted of several distinct steps as shown below:



Why is this project needed?



-  Accommodating rapid population and employment growth
-  Increasing roadway congestion and need for reliable transportation options
-  Planning for existing development and expected growth with supportive transit infrastructure
-  Creating economic development and revitalization opportunities for cities
-  Connecting key destinations and employment centers with where people live

What is the Preferred Alternative?

The Preferred Alternative is a new bus rapid transit (BRT) transit route with high-quality service connecting communities and major destinations along a north-south transit spine, generally following State Street from Lehi to Provo, and a branch connecting to Vineyard along 800 North. The Preferred Alternative:


- Provides high-quality transit service to all communities in the study area and connects to key transit-oriented development (TOD) opportunities and transit-supportive land uses, as well as emerging development areas
- Links key destinations and employment centers, including Silicon Slopes, Timpanogos Regional Hospital, and Utah Valley Hospital
- Integrates with the local and regional transit system by providing connections to FrontRunner, UVX, the potential Point of the Mountain transit project, and local bus service



KEY CHARACTERISTICS OF THE PREFERRED ALTERNATIVE



BRT
MODE




25
MILES



CONNECTIONS
TO FRONTRUNNER, UVX,
AND POINT OF THE MOUNTAIN



10 RIDERS PER DAY
(APPROXIMATELY)



84%
EXCLUSIVE
TRANSIT
LANES



10
MINUTE
PEAK
SERVICE



\$32-38M/MILE
CAPITAL COSTS

This planning level estimate maximizes the use of dedicated lanes for a high-quality transit project and will continue to be refined as the project undergoes additional analysis and engineering. This detailed analysis will inform tradeoffs that will refine and potentially reduce total project costs.



\$11-13M/YR
OPERATING COSTS

Operating costs do not include capital, support, overhead, insurance, maintenance, ROW administration, marketing, transit police, customer support, or any other company-wide costs.

What is high-quality BRT?



BRT is often referred to as “light rail on tires.” It offers many features similar to light rail but at a lower cost (light rail is 2-3 times more costly than BRT). BRT is intended to move larger numbers of people efficiently to their destinations.



How was the Preferred Alternative developed and selected?



The study included a multi-step screening process to evaluate alternatives and select a Preferred Alternative. At each step of the process, extensive coordination with project partners and the public helped guide decision making.

LEVEL OF SCREENING	MODE			ALIGNMENT				
	LIGHT RAIL	BRT	COMPUTER RAIL	RAIL CORRIDOR	STATE STREET	GENEVA ROAD	VINEYARD CONNECTOR	I-15
✓ Recommended mode or alignment for subsequent screening ✗ Eliminated mode or alignment								
1 Initial Range of Alternatives	Alternatives: ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓							
2 Pre-Screening: Screen modes and alignments that do not meet project purpose and/or have fatal flaws	Outcome: ✓ ✓ ✗ ✓ ✓ ✓ ✗ ✗							
3 Initial Screening: High-level evaluation of alternatives	Outcome: ✗ ✓ ✓ ✓ ✓ ✓ ✓							
4 Detailed Screening: Detailed evaluation of remaining alternatives	Outcome: ✓ ✓ ✗ ✓ ✓ ✗							
5 Select Preferred Alternative: BRT; combined portions of Rail Corridor and State Street alignments								

How were the public and stakeholders involved?

A robust public and stakeholder engagement program was utilized to provide input and coordination throughout the study. This effort included:

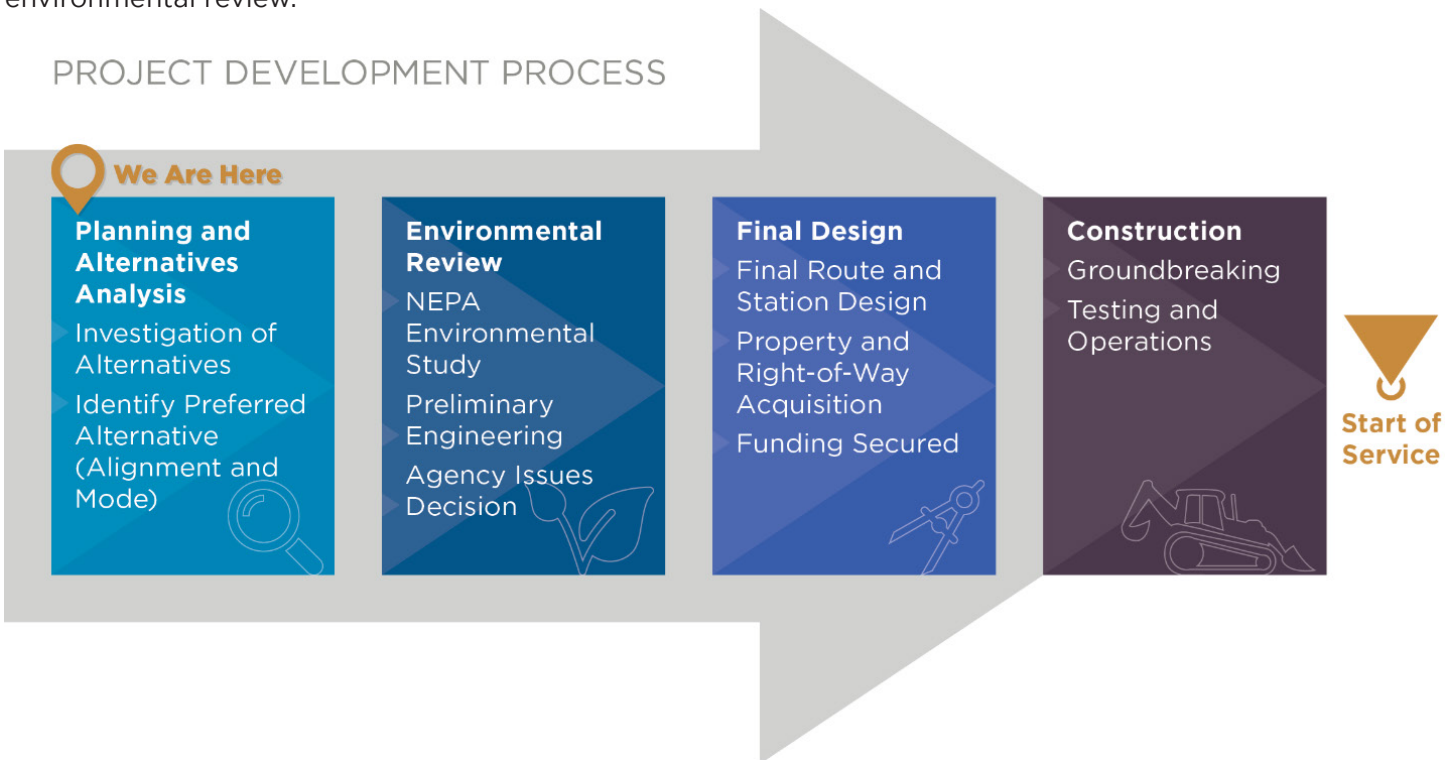
- Ongoing opportunities for education and input through a public website and three targeted public outreach periods to solicit targeted feedback at key milestones
- Coordination with a Technical Advisory Committee (TAC) that provided planning and engineering expertise throughout the process. The TAC was comprised of city and agency staff.
- Coordination with an Executive Committee that provided guidance and decisions at key milestones. The Executive Committee included mayors, city managers, and key agency policy makers

402 comments	11,438 website views
66 social media posts	779 engagements
57 online meeting attendees	10 news articles

What's next?

The characteristics of the BRT system (exclusive versus mixed flow operations, type of bus vehicle, service frequency, station area amenities, etc.) will be refined in the next phases of project development - environmental review.

PROJECT DEVELOPMENT PROCESS



Visit centraltransitutah.com

1. Introduction

1.1 Overview

The Cities of Lehi, American Fork, Pleasant Grove, Lindon, Orem, Vineyard, Provo; and Utah County in collaboration with Mountainland Association of Governments (MAG), Utah Transit Authority (UTA), and Utah Department of Transportation (UDOT) have completed a transit study that evaluated options for providing expanded high-capacity transit service in Utah County, from Lehi to Provo. The purpose of the study was to determine a Preferred Alternative that can be advanced into the next phase of project development - environmental study and preliminary engineering (Figure 1-1). The Preferred Alternative identifies the transit alignment (corridor and locations to be served) and the transit mode (type of transit technology, e.g. BRT, light rail transit).

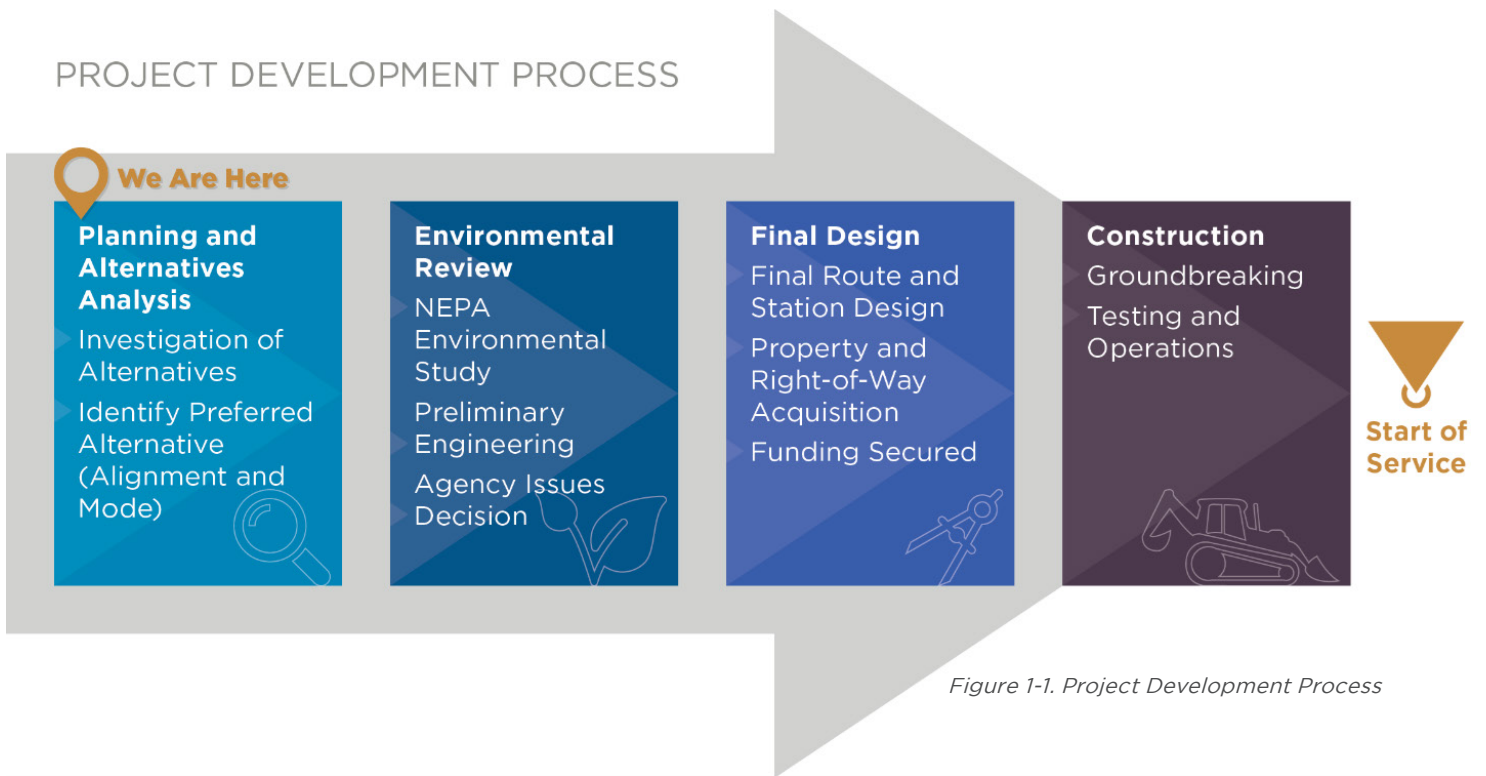


Figure 1-1. Project Development Process

The study process consisted of several distinct steps, including establishing the project context, determining the Purpose and Need for the proposed improvement, identifying and evaluating alternatives, and recommending a Preferred Alternative (Figure 1-2). Coordination and involvement with affected jurisdictions, stakeholders, and the public occurred throughout the process.



Figure 1-2. Project Steps

1.2 Study Context

According to MAG¹, the regional planning agency for Summit, Utah, and Wasatch counties, by 2050 Utah County is expected to double in population - adding over 660,000 more people and surpassing 1.3 million people. This population would be slightly larger than the current day population of Salt Lake County. This equates to 100 percent growth and is more than double any other Wasatch Front county. During this period, Utah County's growth will be larger than the other three Wasatch Front counties combined. By 2065, Utah and Salt Lake counties will nearly be the same size.




Thus, it is important to plan for this growth in a proactive and appropriate manner. Maintaining reliable and efficient mobility, including offering mobility choices, are key to fostering a positive quality of life. This high-capacity transit service is just one potential option to serve the needs of the increased population.

1.3 What is High-Capacity Transit?

High-capacity transit carries larger numbers of passengers and provides more frequent and reliable service than a standard bus system. Typically, it serves as a "backbone", connecting major destinations, within a region. A number of features can be used to help accommodate more passengers and reduce travel times. It can operate in exclusive right-of-way (out of traffic) or on existing streets. High-capacity transit service typically features modern vehicles and enhanced station areas, off vehicle fare collection to allow for faster boarding, and signal priority at intersections.

Table 1-1 compares the three primary types of high-capacity transit considered: BRT, light rail transit (LRT), and commuter rail transit (CRT). For this effort, high-capacity transit is needed that serves both regional and local trips.

Table 1-1. High-Capacity Transit Modal Options

	BUS RAPID TRANSIT	LIGHT RAIL TRANSIT	COMMUTER RAIL TRANSIT
Trip Types	Local and regional	Local and regional	Regional
Operating Environment	Exclusive right-of-way or mixed traffic along arterial streets or highways ^a	Exclusive right-of-way within arterial streets or in dedicated right-of-way separate from streets	Separate right-of-way
Typical Spacing of Stops	1/2 - 1 mile	1 mile	4-5 miles
Typical Peak Frequencies	5-10 minutes	15 minutes	30 minutes
Passenger Capacity per Vehicle	60-90 per bus	180-200 per car ^b	100-200 per car ^b
UTA Example			
	UVX	TRAX	FrontRunner

a - BRT has the greatest flexibility in operating environment. In addition to functioning in a typical street environment, it can also operate along highways, including in high-occupancy vehicle (HOV) lanes.
 b - Multiple LRT and CRT vehicles can be linked to create a longer train, moving a higher capacity of passengers per trip.

¹ Mountainland Association of Governments. TransPlan50, 2019-2050 Regional Transportation Plan

1.4 Study Area

Figure 1-3 illustrates the general study area boundary. It spans from Lehi to Provo in a north-south manner, generally following the I-15 and

FrontRunner corridors. This is a narrow area of study, located between Utah Lake and the Wasatch Mountains, which form a natural area of constraint.

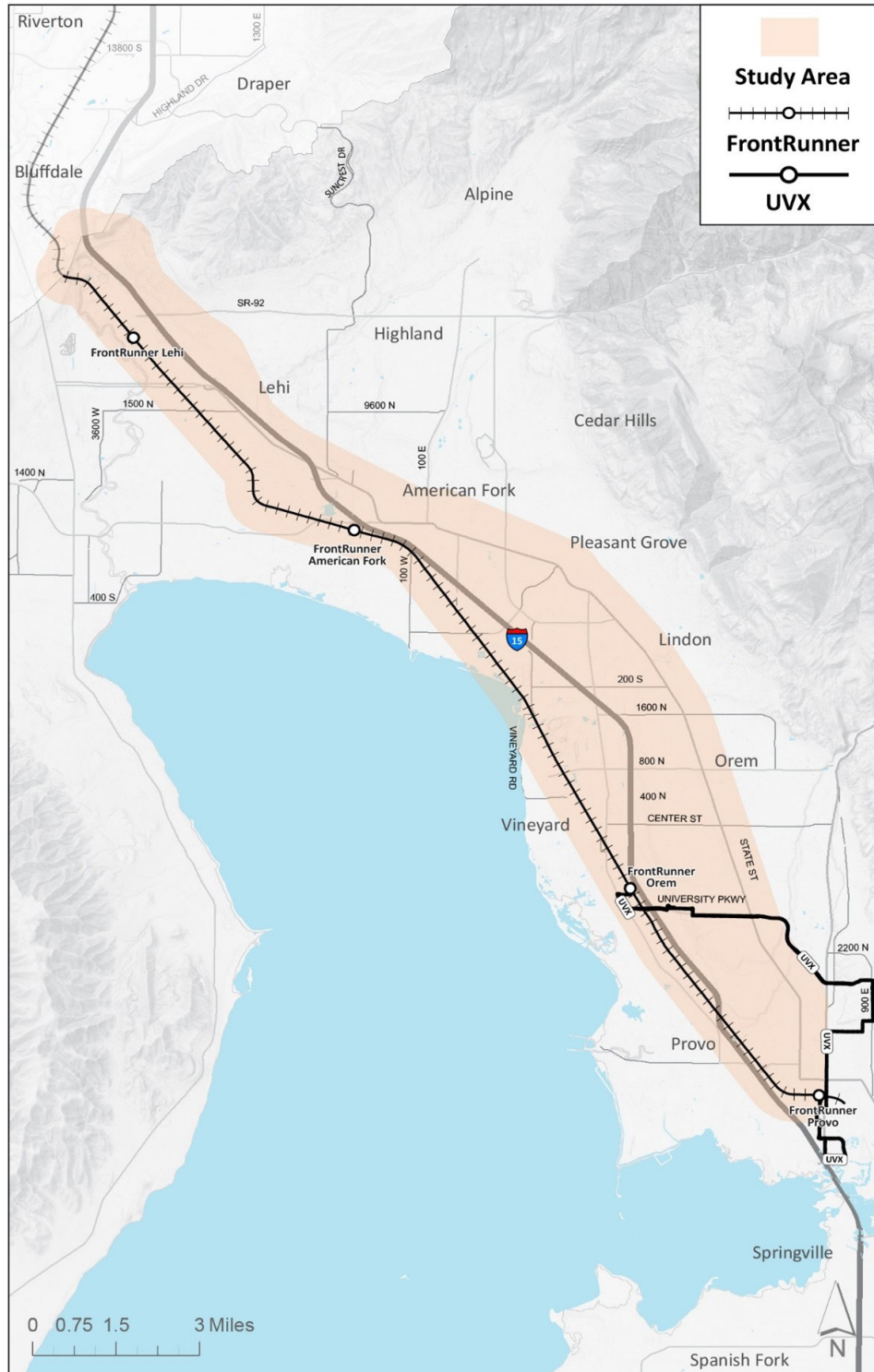


Figure 1-3. Study Area

2. Existing and Planned Conditions

This section includes a discussion of existing and planned conditions in the Central Corridor study area, including major roadway conditions, existing transit services and facilities, other multimodal travel, land use, socioeconomics, and environmental constraints.

2.1 Transportation Conditions

2.1.1 Roadway Network

Existing Roadway Conditions

Currently, I-15 forms the primary north-south connection in the area, supplemented by both State Street - which spans most of the study area - and Geneva Road, which forms a secondary north-south connection in the central and southern portions of the study area. These corridors currently see some of the heaviest traffic volumes in the county. MAG is planning to expand Utah County’s grid network with an additional 1,000 miles of new lanes, which can remove localized trips from I-15, State Street, and Geneva Road, thereby reducing congestion throughout.

Future Roadway Conditions

In the MAG Regional Transportation Plan (RTP), traffic modeling was conducted to understand level of service on roadways in the future both with and without implementation of planned projects. By 2050 with no roadway improvements in place, severe congestion will occur on I-15, along with several connector arterial roadways in the study area (Figure 2-1).

By 2050, with the proposed growth, overall travel delay in Utah County will be 7 times worse than today.

(MAG TransPlan50)

Even with build out of the underlying arterial grid network and planned improvements, congestion still remains on I-15 in the PM peak period as the freeway reaches capacity. Thus, additional travel options are warranted. As part of the long range planning effort, modeling was conducted on various new highway facilities (e.g., west

The study area includes a variety of choices for travel, from local streets and buses to highways and commuter rail (FrontRunner). As population growth increases, however, the demand for these facilities will increase and contribute to congestion, increased travel times, and unreliable transit.



side corridor, Utah Lake crossing, etc.), with the greatest need being for additional north-south travel choices east of the lake. High-capacity transit is one feasible option to fulfill this need. A benefit of building out the underlying grid network is creating more direct paths and options for transit implementation.

Future planned and programmed roadway projects include strengthening the core arterial network in the study area, including several widening and operations improvements. Key new construction projects that will improve connectivity within and to the region include the Point of the Mountain Connector, Vineyard Connector, and capacity improvements to State Street and Geneva Road. Most new construction projects are adding north-south capacity (new facilities, added lanes) through the study area to points north and south, reinforcing the projected north-south travel demand in this area.

2.1.2 Transit Services

Existing Transit Services

The study area is currently served by FrontRunner (commuter rail transit), UVX (BRT), and several local bus routes. The FrontRunner

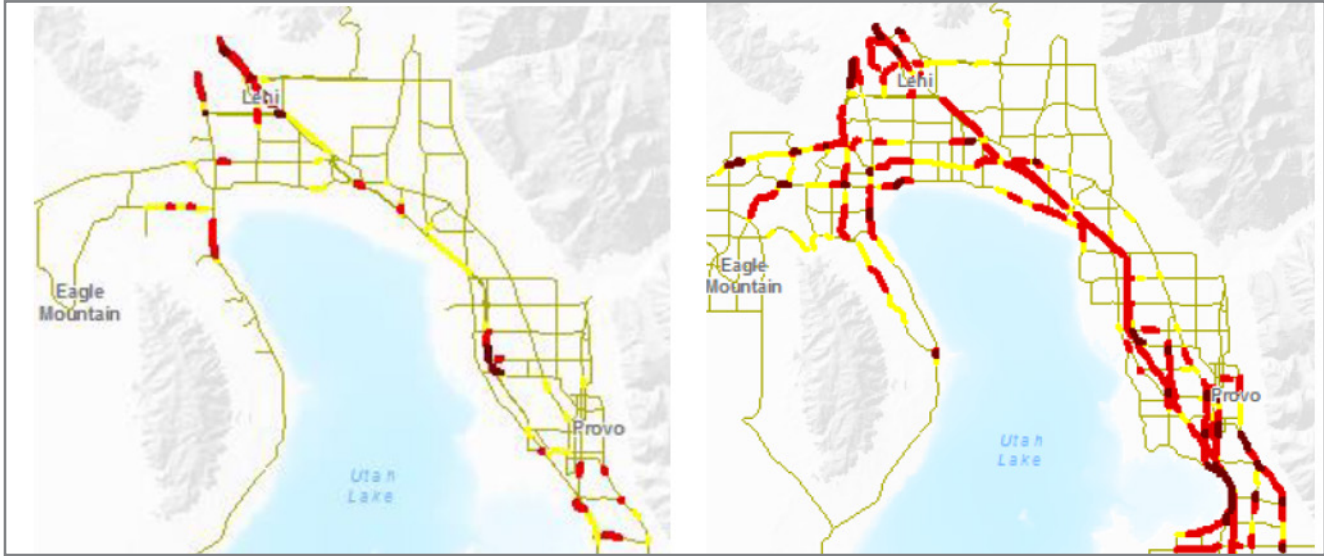


Figure 2-1. 2015 Congestion (left); 2050 Congestion with Planned Projects and Arterial Grid Network (right))Source: MAG TransPlan50)

route generally parallels I-15 and includes four stops within the study area (Lehi, American Fork, Orem, and Provo), with a planned station in Vineyard (service anticipated to start in 2021). The route generally has 30-minute headways (frequencies) during peak travel periods.

UVX is the only BRT route in the study area, connecting Orem and Provo. The route includes 18 stops, with 3 located near the Brigham Young University campus. This route connects to two FrontRunner stations (Orem Central Station and Provo Central Station). The UVX line maintains frequent service throughout most of the day (6-minute headways), with 10- to 30-minute headways in the early morning and late evening.

The most notable local route is Route 850, which traverses State Street throughout the study area (Lehi to Provo), connecting most of the study area community centers. It has 15-minute headways during most of the day, and 164 designated stops. Route 850 has the highest ridership of all local bus routes in the study area.

Future Transit Services

Proposed transit improvements programmed in the MAG TransPlan50 2050 RTP within the study area include an extension of light rail to Lehi and American Fork from Salt Lake County; central light rail from American Fork to Orem; and the State Street BRT corridor connecting the American Fork commuter rail station to UVX.

FrontRunner stops in Orem and Provo are in the top five highest boarding stations system-wide.

Ridership on the UVX bus route rivals ridership on the Green Line TRAX on major event days at Utah Valley University and Brigham Young University.



Implementation of the UVX BRT service increased ridership by five times what the existing bus route 830 was experiencing.
(UTA)

2.1.3 Non-Motorized Travel

Utah County municipalities have embraced non-motorized transportation as integral to improving air quality, reducing congestion, and lowering travel costs. These options are ideal for shorter trips, typically under two miles, which support transit very well as choices for “first/last mile connections” - how a traveler gets to/from their final destination from a high-capacity transit route. Non-motorized travel, also known as active transportation, includes sidewalks, multi-use paths, trails, and on-street bike lanes.

Almost all study area communities have adopted an Active Transportation Plan to further non-motorized travel in their community, with many planned improvements oriented toward connecting to the transit system, including UVX and FrontRunner, which allows a traveler to significantly extend their trips by transferring between modes.

2.2 Land Use and Socioeconomic Conditions

2.2.1 Land Use and Growth

Existing Land Use and Zoning

The existing land use throughout the Central Corridor Study Area varies between each community. Overall, the primary land uses within each community are generally low density, single-family residential development. A large number of schools, churches, and parks are dispersed through each community, with commercial, retail, and industrial land uses focused along major arterial thoroughfares and I-15. This land use pattern follows a typical suburban development pattern.

Zoning categories in each study area community are fairly consistent, allowing for careful

organization and development of land uses in a compatible manner. Planning ahead for potential transit implementation, most communities include a transit-oriented development (TOD) overlay zone, allowing for denser, more compact development around transit corridors and/or stops with the intent to create a cohesive mixture of land uses.

Planned Land Use

Bound by Utah Lake to the west and the mountains to the east, future development in this area of Utah County will be focused on infill and redevelopment opportunities. Figure 2-2 displays generalized planned land uses from each community.

Typically, TOD encourages more pedestrian activity, with a higher emphasis on retail, restaurant, employment, hospitality, entertainment, and high-density residential uses.

Overwhelmingly, much of the study area is expected to develop out into residential development, with small clusters of commercial development at major roadway intersections. The State Street corridor is planned mostly as commercial development, with nodes of mixed use near community centers. The Geneva Road corridor is similar, although with a greater portion of industrial land uses expected to remain. Vineyard is expected to see the greatest amount of new growth and redevelopment. Office and business park development, which typically draw employees from a broader geography, are located mostly along the I-15 corridor, with other pockets throughout the study area communities.



MAG staff conducted a network analysis of all the stations for FrontRunner and for UVX to understand where connections and gaps between active transportation facilities and fixed transit centers existed. Filling those was a significant component of selecting TransPlan50 projects.

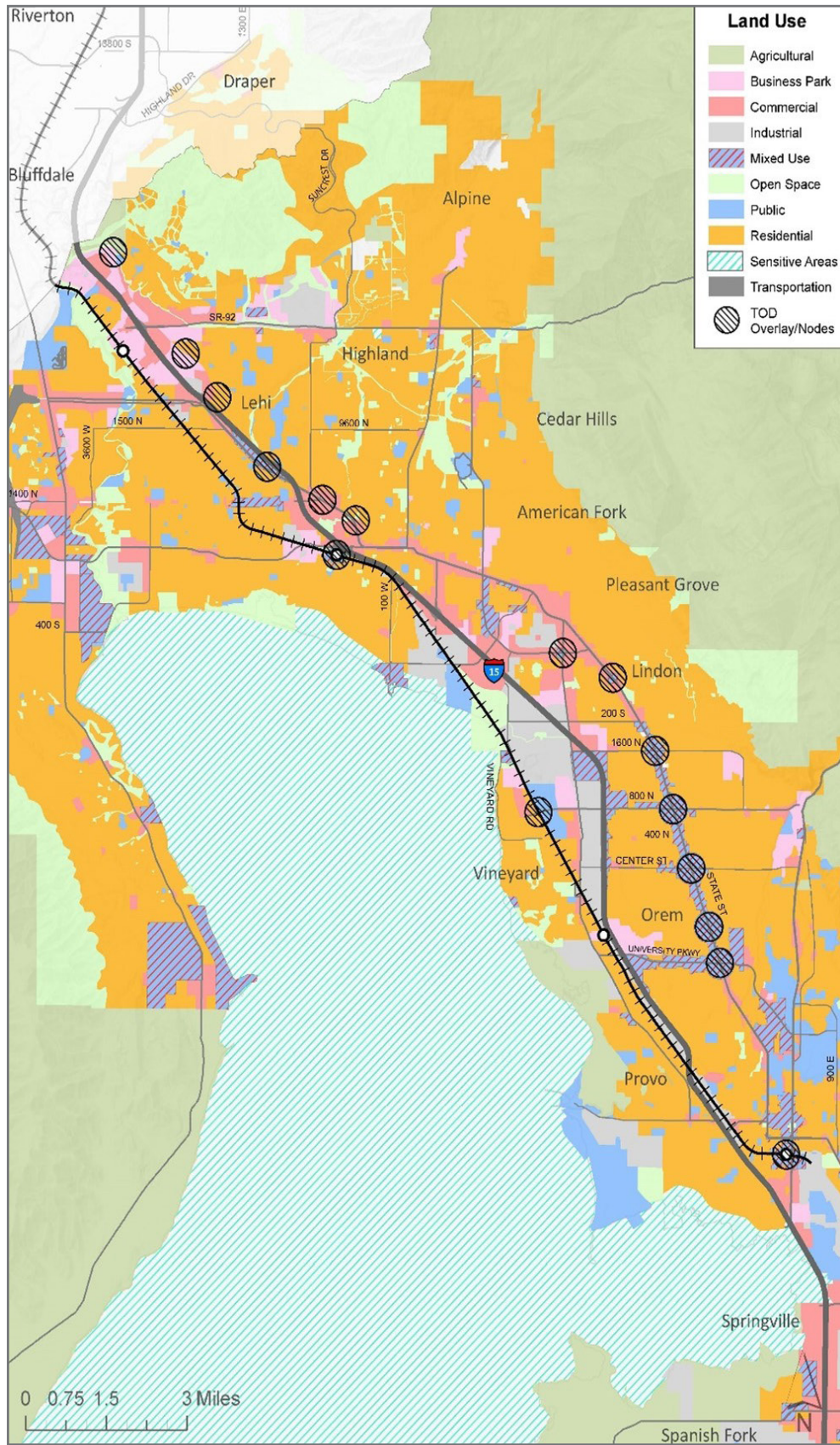


Figure 2-2. Planned Land Use

The I-15 corridor in northern Utah County is planned to become a major employment center, named “Silicon Slopes” for the high-tech industry the region is attracting.



Growth Areas

Wasatch Choice 2050 is a vision shared by regional communities for transportation investments, development patterns, and economic opportunities, including anticipated areas of growth and development. Within the study area, most of the centers are located along the three primary north-south transportation corridors: I-15, State Street, and Geneva Road. The highest density centers (urban centers) are concentrated along State Street in Lehi, Orem, and Provo, with city and neighborhood centers located in Lindon, Pleasant Grove, American Fork and a planned urban center in Vineyard. Three large education centers are located in the southern portion of the study area, with large

An active project in the study area, the Vineyard RDA area (@geneva) encompasses the former Geneva Steel site. Major environmental remediation efforts were undertaken to transform this 1,700 acre site into a regional mixed-use development, anticipated to become the new town center of Vineyard. Utah Valley University will have a presence at @geneva, including relocation of its special events center, a new soccer stadium, administration buildings, classrooms, and a convention center.

“By 2025, @geneva is expected to have over 26,000 residents, contributing significantly to Vineyard’s expected population of 50,000 by 2030. It will also employ about 20,000 people—five times the number that was employed at Geneva Steel during its peak.”

- Stewart Park, project manager for @geneva



tracts of industrial employment along Geneva Road.

2.2.2 Socioeconomic Analysis

Population and Employment Growth

Population growth in Utah County has been steadily increasing, rising by 40 percent each of the last two decades, and is the fastest growing county in the state (MAG TransPlan 2050). More recently, the Provo/Orem area was the fourth fastest growing metro area in the country with the population now exceeding 630,000. By 2050, Utah County will double in population, rivaling the population of Salt Lake County. Current and projected population and employment are presented in Table 2-1 for the state, Salt Lake and Utah counties, and within the study area.

In 2050, population densities in the study area are highest along the State Street corridor, particularly, in Pleasant Grove, Orem, and Provo, along with clustered growth in Vineyard. Employment is more focused along the I-15 corridor.

In response to projected growth, the state and county have invested nearly \$4 billion in highway and rail projects to ease congestion and create better connectivity within the region.
(MAG TransPlan50)

2.3 Environmental Considerations

A high-level environmental review using readily available data was completed to build awareness of major constraints or fatal flaws that may impact the feasibility of broad corridor alternatives. A more detailed and exhaustive inventory of potential environmental resource impacts will be undertaken during National Environmental Policy Act (NEPA) studies.

Utah Lake is a large constraining water feature to the west and south, and to the north and east are large-scale mountain ranges – creating a narrow strip of developable land in northern and central Utah County. Because of this, major drainage patterns form in a southwest nature, and many stream and wetland flows are funneled to crossings beneath I-15 to manage drainage conditions on the freeway.

The study area has a high concentration of community facilities, including educational facilities, civic operations, medical facilities, and cultural/recreational facilities. In general, these features are dispersed throughout the area, however there is a likelihood for historic features being located along State Street, which serves as the “main street” for many study area communities.

Air quality in particular pollutants that exceed National Ambient Air Quality Standards, are of concern along much of the Wasatch Front. The project area lies within non-attainment areas for PM10 and PM2.5, with the very southern area of the corridor in a maintenance area for carbon monoxide. Major sources of carbon monoxide and PM10/PM2.5 include vehicular emissions, service stations, and resuspension of dust.

Table 2-1. Estimated Population and Employment Growth^a

	POPULATION			EMPLOYMENT		
	2019	2050	% Change	2019	2050	% Change
State of Utah	3,260,765	5,017,232	54%	2,113,031	3,214,743	54%
Salt Lake County	1,164,057	1,531,282	32%	948,858	1,341,790	41%
Utah County	661,286	1,297,515	96%	365,174	689,992	89%
Study Area	256,268	395,522	54%	204,984	310,356	51%

a - University of Utah's Kem C Gardner Policy Institute. July 1, 2017. Long-term Demographic and Economic Projections.

3. Public and Stakeholder Engagement



A robust public and stakeholder engagement program was established to provide input and coordination with project partners throughout the study. This section summarizes public outreach efforts as well as coordination with stakeholders. A full list of all project activities and comments can be found in Appendix A Public Involvement Report.

3.1 Public Involvement

Public outreach was organized into three phases throughout the study, to solicit targeted feedback at key milestones. Various outreach methods and tools were used to reach a wide audience, including social media, a public-friendly website, news media articles, a telephone hotline, various commenting methods, including interactive maps and two online public meetings.

3.1.1 Phase One

Phase One of the Central Corridor Transit Study public outreach component focused on gathering input related to the purpose and need of the study. The first comment period began in February 2020 and ran through May 2020.

The study website received 3,361 pageviews visits through social media, traditional media, and city newsletter content that pushed readers to the site for more information about the study. An additional comment form requesting input on the purpose and need for the transit study was located on the study website.

Social media content was developed and distributed to the partnering cities and agencies, resulting in 15 posts from six of the seven cities as well as from UTA and UDOT. In addition, two news outlets and two city newsletters published online stories about the study, garnering more comments and views.

From February 20, 2020, through May 22, 2020, the study team received 123 comments through the interactive web map, email, and phone hotline. Comment themes from this comment period included:

Purpose and Need (3 Comments)

Comments received highlighted the benefits of transit on reduced air pollutants and an

improved overall quality of life; future economic growth and social function within Utah Valley; and increased mobility, specifically for local university students and professors.

State Street Alignment (15 comments)

Comments received expressed support of the State Street alignment option because it would enhance access and mobility to popular destinations such as the Utah Valley Convention Center, Utah Valley Hospital and University Place Mall. Additionally, commenters stated this alignment would alleviate traffic that tends to build up on State Street through Thanksgiving Point. Several supporters stated that a BRT line was their preferred mode because it would enhance safety, mobility and connectivity.

Other comments regarding the State Street alignment included concern for property values along the route and increased taxes to pay for the transit improvement.

Geneva Road Alignment (2 comments)

Supporters of the Geneva Road alignment option felt that this transit route would significantly cut down on the use of their personal vehicles. Others were concerned about the increased traffic and noise near their homes on Geneva Road as well as tax increases to support the study.

Vineyard Alignment (3 comments)

Feedback on the Vineyard alignment included the sentiment that it would attract the most riders due to the high level of businesses on the west side of the interstate and a growing population. Other comments highlighted the direct connection from Pioneer Crossing to Geneva Road as being a significant benefit.

Rail Corridor Alignment (4 comments)

Many of the comments in support of the Rail Corridor alignment also suggested implementing a shuttle system for added mobility, stating a need for high-frequency transit with runtimes every five to 15 minutes for increased convenience. Some comments suggested altering the Rail Corridor alignment to shift north of State Street or east of State Street where the majority of residents are located. Comments also expressed concern about the amount of improvements that would need to be made to the Union Pacific Railroad to make the alignment a viable and safe option.

Other Comments (64 Comments)

Some feedback did not fall within the categories above. Those topics include:

- Current traffic congestion
- Increased active transportation
- General approval/disapproval of transit

Out-of-Scope (32 Comments)

Several comments did not fall within the current study initiative, including protected bike lanes, city street improvements and traffic signal timing.

3.1.2 Phase Two

The Phase Two public outreach period focused on gathering public input related to the three alternative routes under consideration. The second phase began in June 2020 and ran through September 2020.

The study website received 2,906 pageviews visits through social media, traditional media, and city newsletter content that pushed readers to the site for more information about the study. An additional comment form providing a project update and requesting feedback on three alternatives was provided on the study website.

Social media content was developed and distributed to the partnering cities and agencies, resulting in 11 posts from six of the seven cities, as well as from UTA and UDOT.

From June 1, 2020, to September 30, 2020, the study team received another 125 public comments through the interactive web map, email, and phone hotline. A breakdown of the comments by topic is provided below.

State Street Alignment (50 comments)

Public comments in this phase showed strong support for a State Street alignment. Additionally, many of the comments addressed the diversion of the route along State Street to connect North County Boulevard in Pleasant Grove to the State Street route. Many comments in this category mentioned support of BRT as the mode proposed in the study. Finally, several comments advocated for including a Lindon connection.

Other Alignment (29 comments)

A common theme was the need for more east-west connections. Specifically, comments referenced a connection between Bulldog (Cougar Boulevard) and 100 North, Pioneer Crossing, 850 East and Vineyard. Other comments mentioned additional FrontRunner stations and connectivity. Several comments requested a FrontRunner North Orem Station

and a tie into the FrontRunner Lehi Station. Within this category, there were comments in opposition to the BRT mode. Many felt that the current UVX route had disturbed traffic flow and the current demand on the UVX line did not justify the extension of BRT proposed by this project.

Rail Corridor Alignment (15 comments)

Comments in support of the Rail Corridor Alignment mentioned that this route would be preferable due to its proximity to dense residential areas. With close proximity to residences, many felt this would be the best option for commuters. Comments commonly requested a tie-in to Pioneer Crossing. Comments mentioned the importance of a FrontRunner tie-ins, which was a repeating theme from other comment categories. Lastly, those who favored this route expressed concern about overcrowding and heavy traffic on State Street.

Geneva Road Alignment (16 comments)

Comments under this category referenced the importance of including east-west transit options in Utah County, especially prevalent in this category was the request for a Vineyard tie-in. Comments specifically called out the 800 North corridor and the connection it brought to Vineyard and west Orem.

Stop Recommendations (9 comments)

Recommendations for stops included:

- NuSkin
- Utah Valley Hospital
- Cougar Boulevard
- Utah Valley University Convention Center
- Silicon Slopes
- Bulldog Boulevard
- Freedom Boulevard
- 500 West

Out-of-Scope (6 comments)

Several comments did not fall within the current study initiative, including UTA route timing and frequency and improvements outside of the study area.

3.1.3 Phase Three

The Phase 3 outreach period focused on gathering input related to the Preferred Alternative and publicizing the upcoming online public meetings. The second phase began in October 2020 and ran through November 2020.

The study website received 5,171 pageviews visits through social media, traditional media, and city newsletter content that pushed readers to the site for more information about the study. An additional comment form providing a project update and requesting feedback on Preferred Alternative was provided on the study website. Additionally, updates were made to the FAQ page to provide additional study data to the public.

Social media campaigns were developed and distributed to partnering cities and agencies to notify the public of the release of the Preferred Alternative route, the promotion of the online public meetings and a final push for public comments before the end of the study. In total, 40 posts were shared via Facebook and Twitter from all seven participating cities, as well as from UTA and UDOT. In addition, three news outlets and two city newsletters published online stories about the study, garnering more comments and views.

Two online public meetings were held via Zoom on Monday, October 26, from 6-7 p.m. and Thursday, October 29 from 7-8 p.m. The purpose of these online public meetings was to provide an overview of the study and allow for the public to ask questions and receive answers from the project team in “real-time.” 57 people attended the online public meetings.

There were 157 public comments received between October 1 and November 13, 2020. Comments were collected using the interactive GIS comment map, email and hotline. Key themes heard during this public comment period included:

Preferred Alternative (53 comments)

The majority of comments supported the preferred alignment along State Street and felt that a BRT line from Lehi to Provo was a net benefit. Comments mentioned that an expanded BRT route would increase rider utilization and be beneficial to a broader transit audience. Concerns were raised regarding road construction and the impacts to residents and drivers and overcrowding on State Street.

Other Alignments (26 comments)

Comments advocating for previously presented alternatives were included in this category. The previous alignment that received the most comments was the Geneva route. Comments recommend a direct route through Pleasant Grove and Vineyard. This category captured overall support for the State Street route emphasizing that State Street is most central to population and business dense areas.

Additional Connections to FrontRunner (24 comments)

Comments questioned the exclusion of connections of the Preferred Alternative to the Lehi and American Fork FrontRunner stations. Comments were concerned that excluding these connections would decrease and disincentivize ridership were raised. Lastly, future tie-ins at 800 North and State Street, Draper FrontRunner, and Mountain View Corridor were suggested.

Out-of-Scope (14 comments)

Several comments did not fall within the current study and comment period initiative, including improvements outside of the study area, population densities required to support transit, route frequency and timing, street parking,



Executive Committee 850-UVX Bus Tour

flyover bridges at major intersections, and traffic constraints attributed to the UVX line.

Stop Locations (12 comments)

Recommendations for stops included:

- 800 North
- Utah Valley Hospital
- Riverside Avenue
- Cougar Boulevard
- Freedom Boulevard
- Pioneer Crossing
- Main Street, Vineyard
- 500 West

In this category there were also suggestions to connect FrontRunner stations to the Preferred Alternative throughout the corridor.

Other (22 comments)

The other category captured comments related to increased traffic on State Street with the extension of a BRT route, future connections to the Point of the Mountain and other FrontRunner stations, alternative solutions to current transit issues, and clarification on the proposed mode.

Active Transportation (4 comments)

Active transportation users advocated for prioritizing space for bike lanes and landscaping in the final design. Comments emphasized that State Street is hazardous for bicyclists currently,

and asked that any plans account for increased bike accessibility along State Street.

Funding (2 comments)

Two comments expressed concern over taxpayer dollars being allocated to the project. Both comments compared the study to the current UVX line and included criticism regarding usage of the UVX line and the feeling that it has increased traffic on State Street.

3.2 Stakeholder Engagement

To keep project partners and constituent cities engaged throughout the study process, a Technical Advisory Committee (TAC) and Executive Committee were established to coordinate with jurisdictions and agencies throughout the planning process. The TAC was comprised of technical planning and engineering staff from UDOT, UTA, MAG, and all participating cities (Lehi, American Fork, Pleasant Grove, Lindon, Orem, Vineyard, and Provo) and provided technical feedback and recommendations on decision making to the Executive Committee at key milestones. The Executive Committee was comprised of Mayors, City Managers, and key agency policy makers that provided guidance throughout the process and made decisions at key milestones. The meeting schedule of both the TAC and Executive Team is summarized in Table 3 1.

Table 3-1. TAC and Executive Team Meetings Summary

Date	Meeting Purpose
Technical Advisory Committee	
December 4, 2019	Project kickoff
January 27, 2020	Purpose and Need, Level 1 evaluation criteria
March 5, 2020	Level 1 alternatives evaluation and recommendation
July 28, 2020	Level 2 alternatives evaluation review and Preferred Alternative recommendation
Executive Committee	
November 8, 2019	Project kickoff and 850/UVX tour
February 10, 2020	Purpose and Need, Level 1 evaluation criteria
May 21, 2020	Level 1 alternatives evaluation review and recommendation
September 24, 2020	Level 2 alternatives evaluation review and Preferred Alternatives recommendation
November 9, 2020	Preferred Alternative recommendation
January 13, 2021	Finalized Preferred Alternative, project wrap-up

In addition to TAC and Executive Committee meetings, the study team also met with cities individually at three distinct points (project kickoff, prior to Preferred Alternative Recommendations, after detailed analysis of Preferred Alternative).

4. Purpose and Need

A project’s purpose statement defines the objectives to be achieved. A project’s need describes the underlying problems or conditions that the project should address. If a major transit project seeks potential federal or state funding, a Purpose and Need statement is required under federal environmental regulations. The statement is used to help guide decisions about alternatives that should be considered and helps measure their performance.

The Central Corridor Transit Study Purpose and Need was developed through an iterative and collaborative process and informed by an understanding of the study area context, as presented in the inventory of existing and future conditions.

4.1 Project Need

4.1.1 Roadway Congestion

Need: Roadway congestion is increasing on I-15 and major arterials in Utah County, affecting reliability (i.e., increased travel times and delay) for transit and vehicles.

Transit investments are one solution in the toolbox. Not everyone needs to ride transit to see overall success; diverting some trips to transit reduces congestion on the roads, benefiting everyone. Shifting more trips from single-occupancy vehicles to transit increases the capacity of the transportation system to serve travel demand.

By 2050, with planned roadway improvements in place, including build-out of the underlying arterial grid network, severe congestion will still occur on I-15, along with several connector arterial roadways in the study area. Arterial-to-arterial intersections will be extremely constrained. Thus, additional alternatives to vehicle travel are warranted in the study area.

4.1.2 Limited Locally-Serving High-Capacity Transit Options

Need: Limited locally-serving north-south high-capacity transit options exist to meet existing and future transportation demands in northern and central Utah County.

High-capacity transit carries a larger volume of passengers, using larger vehicles and/or more frequent service than standard fixed route bus service. It provides local service, stopping every one-half to one mile, with a goal to provide faster, more convenient, and more reliable service. High-capacity transit is one solution to address growth in travel demand.

While existing study area transit services provide several options for transportation choices to residents, only FrontRunner and local Route 850 provide north-south service through the study area - but at vastly different service options. FrontRunner serves long-distance trips, only stopping every 5+ miles and at limited frequencies. Route 850 serves local trips, stopping very frequently and therefore experiences slower travel times. UVX mostly serves east-west trips. Thus, a high-capacity transit facility, with service options between commuter rail and local bus, that serves north-south trips is missing.

4.1.3 Rapid Population and Employment Growth

Need: Long-term population and employment growth in the study area is forecasted to be substantial and as a result will require additional and robust transit options to meet the forecasted demand.

Population and employment are forecast to grow significantly in Utah County over the next few decades, which will create additional

transportation demand in the geographically constrained area. This growth will arrive incrementally - not all at once - and therefore the changes incurred will build on another and not necessarily be noticeable until they pose a problem. Appropriately planning and preparing for growth allows communities to accommodate growth when/if it comes in a context-sensitive manner, helping cities maintain community cohesion and compatibility.

By 2050, Utah County will nearly double in population, rivaling the population of Salt Lake County. Population densities in the study area are expected to be highest along the State Street corridor, particularly, in Pleasant Grove, Orem, and Provo. The Vineyard town center is also expected to see high concentration of residential development. Employment is more focused along the I-15 corridor; however, dense clusters of employment growth will also encompass both the Geneva Road and State Street corridors in 2050.

4.1.4 Transit-Oriented Land Uses

Need: Local and regional plans call for increased residential, commercial, and employment center development located in areas served by high-capacity transit and multi-modal transportation systems. Local and regional future land use plans would not be adequately served by the existing transit network.

Density plays a key role in driving ridership: the more people located close to a transit stop, the more potential for increased transit ridership. As population grows, residents need a robust transportation network to access their homes and workspaces. Focusing opportunities for residential and employment growth around transit benefits residents, the community.

Currently, the existing primary land uses within each community are generally low density, single-family residential development with commercial, retail, and industrial land uses focused along major arterial thoroughfares and I-15. The mix and density of existing uses is not always advantageous to high-capacity transit.

However, nearly each community has some plans for TOD, from established TOD overlay zones and zoning, or general plan goals to adopt future TOD policies.

4.1.5 Redevelopment Opportunities

Need: Local plans call for transit investments to catalyze economic development and redevelopment opportunities.

Development surrounding transit can create dense, walkable communities that greatly reduce the need for driving. By promoting development opportunities that create economic and pedestrian activity around transit stations, communities can capitalize on enhanced transit service as an opportunity to catalyze development and redevelopment.

This has already been seen in study area communities like Orem and Provo, and is a goal for other communities, like Lehi, American Fork, Pleasant Grove, and Vineyard, whose long-range planning documents include goals and strategies to revitalize/redevelop city center areas in tandem with creating more walkable communities and including more transit service options.

4.2 Project Purpose

Based on the identification of needs in the study area, the following purpose statements describe the objectives to be achieved by this project.

The **project purpose** is to:

- Provide a context-sensitive high-quality, reliable, efficient, and frequent high-capacity transit service to communities in northern and central Utah County that improve mobility and provide an alternative to driving for both local and regional trips
- Create a north-south transit spine in northern and central Utah County that connects to the existing and planned multimodal transportation network (including FrontRunner, local bus, UVX, bicycle, and pedestrian)

- Appropriately support the long-range transportation demands of planned growth in population and employment in northern and central Utah County
- Support adopted land use and economic development plans and policies of the Central Corridor communities and region
- Improve access and mobility between existing and planned centers and development areas

In addition, and while not fundamental to the purpose, there are several other desirable outcomes of this investment. Project partners seek a project that:

- Is a fiscally-responsible capital and operations investment
- Has flexibility to be phased to accommodate existing and future transportation needs
- Supports local and regional efforts to improve air quality
- Minimizes adverse impacts to the natural and built environment and community character

- **State Street:** beginning west of I-15 at FrontRunner Lehi station, generally following State Street throughout the study area, with a diversion on North County Boulevard in Pleasant Grove.
- **Geneva Road:** same as State Street alternative through Pleasant Grove, uses Geneva Road to connect to 800 North in Orem and connect back to State Street.
- **Vineyard Connector:** similar to the Geneva Road alternative, but uses the proposed Vineyard Connector route south of Lehi to connect into Vineyard.
- **I-15:** co-located on I-15 throughout study area.

Additionally, and independent of corridor alignments, the Purpose and Need identified three high-capacity transit modes as possible options to implement within this corridor:

- BRT
- LRT
- Commuter Rail

5. Definition of Alternatives and Evaluation Criteria

5.1 Initial Range of Alternatives

A series of meetings were held with project stakeholders to generate the broad range of corridor alternatives to be assessed during this study, including the TAC, Executive Committee, and individual cities. In addition, the study team referenced previous plans and recommendations to understand what has been proposed in the past based on existing and future land uses and the planned transportation network. Figure 5-1 illustrates the five corridor alternatives developed, all beginning in Lehi, and ending at the Provo FrontRunner station:

- **Rail Corridor:** beginning east of I-15 in Lehi, generally following a UTA rail corridor through Lehi, American Fork, Pleasant Grove, Lindon, Vineyard, Orem, and Provo. Note that while this alternative follows an actual railroad track, right-of-way exists to consider all modal options, including both LRT and BRT.

5.2 Evaluation Criteria

This study process included a two-tiered evaluation screening, with both the Level 1 and 2 screening including multiple quantitative and qualitative measures that correspond with the Purpose and Need, as well as additional planning-related factors such as potential impacts to sensitive environmental resources. The intent is that the Level 2 screening will provide more detailed outputs than Level 1. The evaluation criteria is presented in Table 5-1.



Figure 5-1. Initial Range of Alternatives

Table 5-1. Evaluation Criteria

Transportation Challenge/Need	Purpose Statement(s)	Evaluation Criteria	Level 1 Measures	Level 2 Measures
GOAL: Improve Transportation Mobility and Access with Anticipated Growth				
<ul style="list-style-type: none"> Northern and central Utah County is growing rapidly, and the street/highway network will not be able to serve increased traffic; robust transit options will be required to meet the forecasted demand Roadways are becoming more congested and travel times are unreliable 	<ul style="list-style-type: none"> Appropriately support the long-range transportation demands of planned growth in population and employment in northern and central Utah County that improve mobility and provide an alternative to driving for both local and regional trips Create a transit spine in northern and central Utah County that connects to the existing and planned multimodal transportation network 	Transit Ridership Potential	<ul style="list-style-type: none"> Current and future population and employment in proximity to transit (0.5 mile buffer) 	<ul style="list-style-type: none"> Daily and annual projected ridership (2019 and 2050) and station boardings
		Transit Network Integrity and Reliability	<ul style="list-style-type: none"> Ability to accommodate transit operations within the street 	<ul style="list-style-type: none"> Potential effects on existing planned traffic operations, including freight (truck and rail) Transit reliability Travel time
		Active Transportation Accessibility	<ul style="list-style-type: none"> Accessibility of station area to major existing/ planned bicycle and pedestrian facilities 	<ul style="list-style-type: none"> Station area accessibility (walking or biking)
GOAL: Support Land Use and Economic Development Planning				
<ul style="list-style-type: none"> Local plans call for transit investments to catalyze economic development opportunities and desire for planned growth to occur in areas served by high-capacity transit 	<ul style="list-style-type: none"> Support adopted land use and economic development plans and policies of the Central Corridor communities and region Improve access and mobility between existing and planned centers and development areas 	Community Compatibility	<ul style="list-style-type: none"> Compatibility of alignments with adjacent existing land use 	<ul style="list-style-type: none"> Zoning policies that allow for mixed-use development, transit overlay zones, development oriented toward the street, and/or incentives for development supportive of transit
		Station Area/TOD Development Potential	<ul style="list-style-type: none"> Presence of factors that drive TOD development 	<ul style="list-style-type: none"> Development potential/ redevelopment susceptibility (vacant or underutilized areas)
Supporting Objectives				
	<ul style="list-style-type: none"> Is a fiscally-responsible capital and operations investment 	Cost Considerations	<ul style="list-style-type: none"> Order of magnitude costs 	<ul style="list-style-type: none"> Capital cost estimate Operating cost estimate State of good repair considerations
	<ul style="list-style-type: none"> Has flexibility to be phased to accommodate existing and future transportation needs 	Constructibility Considerations	<ul style="list-style-type: none"> Consideration of potential constructibility risks (major utilities, transportation infrastructure) and flexibility to accommodate phased construction 	<ul style="list-style-type: none"> Potential conflicts with major utilities, structures, or other transportation infrastructure; unique construction challenges
	<ul style="list-style-type: none"> Minimizes adverse impacts to the natural and built environment and community character 	Environmental Effects	<ul style="list-style-type: none"> Potential impacts on environmental resources 	<ul style="list-style-type: none"> Assessment of environmental risk to key resources (water, ESA, Section 4(f), historic resources, hazardous resources) Estimated levels of property impacts
	<ul style="list-style-type: none"> Supports local and regional efforts to improve air quality 	Potential for Air Quality Improvements	<ul style="list-style-type: none"> Potential for reduction in single occupancy vehicle (SOV) trips, increase in transit trips 	<ul style="list-style-type: none"> Reduction in vehicle miles traveled

6. Level 1 Screening

6.1 Pre-Screening

Pre-screening is used to ensure alternatives meet the project’s Purpose and Need, and to eliminate alternatives that clearly do not address it, or that are addressing other problems. Input was solicited from stakeholders to refine corridor alignments, assign station locations correctly, and confirm if the alternative (corridor and modal options) satisfies the project’s purpose. *Feedback received screened out one modal option and two corridor options.*

- **Commuter rail was eliminated from further modal consideration** because it does not meet the Purpose and Need elements of providing local connectivity and fostering community goals related to land use and economic development. Additionally, commuter rail service exists through the study area and this would be duplicating services and ridership capture.
- **The I-15 corridor alternative was eliminated from further consideration**, as it would not easily serve local trips (similar to FrontRunner service), does not serve local land use/economic development planning, is not conducive to connecting to the local multimodal network (pedestrian/bicyclists), and could actually take away capacity from I-15. An I-15 alternative would require a transfer to access destinations within the local communities, adding actual/perceived time and effort, which can be a detriment to ridership.
- **The Vineyard Connector corridor alternative was also screened out** because there is not enough assurance that the new roadway corridor would be constructed in the future and that there would be adequate right-of-way and transit supportive land-use. Without this transportation connection, this corridor is not a viable option. In addition, the alignment on the west side of I-15 did not satisfy the local land use and economic development interests of the communities along this alignment.

6.2 Level 1 Screening Analysis and Outcomes

6.2.1 Corridor Alternatives

Three corridor alternatives (Rail Corridor, State Street, and Geneva Road) and two modal options (BRT and LRT) were advanced from the pre-screening into the Level 1 screening for more thorough analysis against the project goal areas (Figure 6-1).

Table 6-1 provides a summary overview of the Level 1 screening results. A more detailed description of the results can be found in Appendix B Level 1 Screening Memo. Relative performance of each corridor alternative was assessed using a three-scale rating to assess how well each alternative meets the criteria (high/moderate/low – ranging from best meets to least meets criteria).

This screening process constitutes a high-level evaluation of the corridor options, with the intent that alternatives advanced into a Level 2 screening meet the Purpose and Need and avoid major environmental and engineering constraints to the extent possible at this stage. More detailed impacts analysis will occur in both Level 2 screening, as well as subsequent project development phases, including detailed resource area topics such as property impacts, biological resources, water resources, Section 4(f) properties, etc.

The evaluation results from this Level 1 screening will not be carried forward into Level 2. All corridors recommended for advancement will be on equal footing with a new set of evaluation criteria that provides a deeper dive into the performance and potential impacts of each alternative.

Summary Findings

Based on the relative similarities in alternative alignments, all alternatives performed comparably in Level 1 evaluation. No alternatives performed poorly enough to warrant eliminating from further consideration. Additional alignment modifications/design options should be explored in Level 2 evaluation, including the connection between rail corridor alignment and State Street/ Geneva Road alignment in Lehi to provide service between FrontRunner Lehi Station and the east side of I-15; an option to provide continuous service down State Street instead of deviating

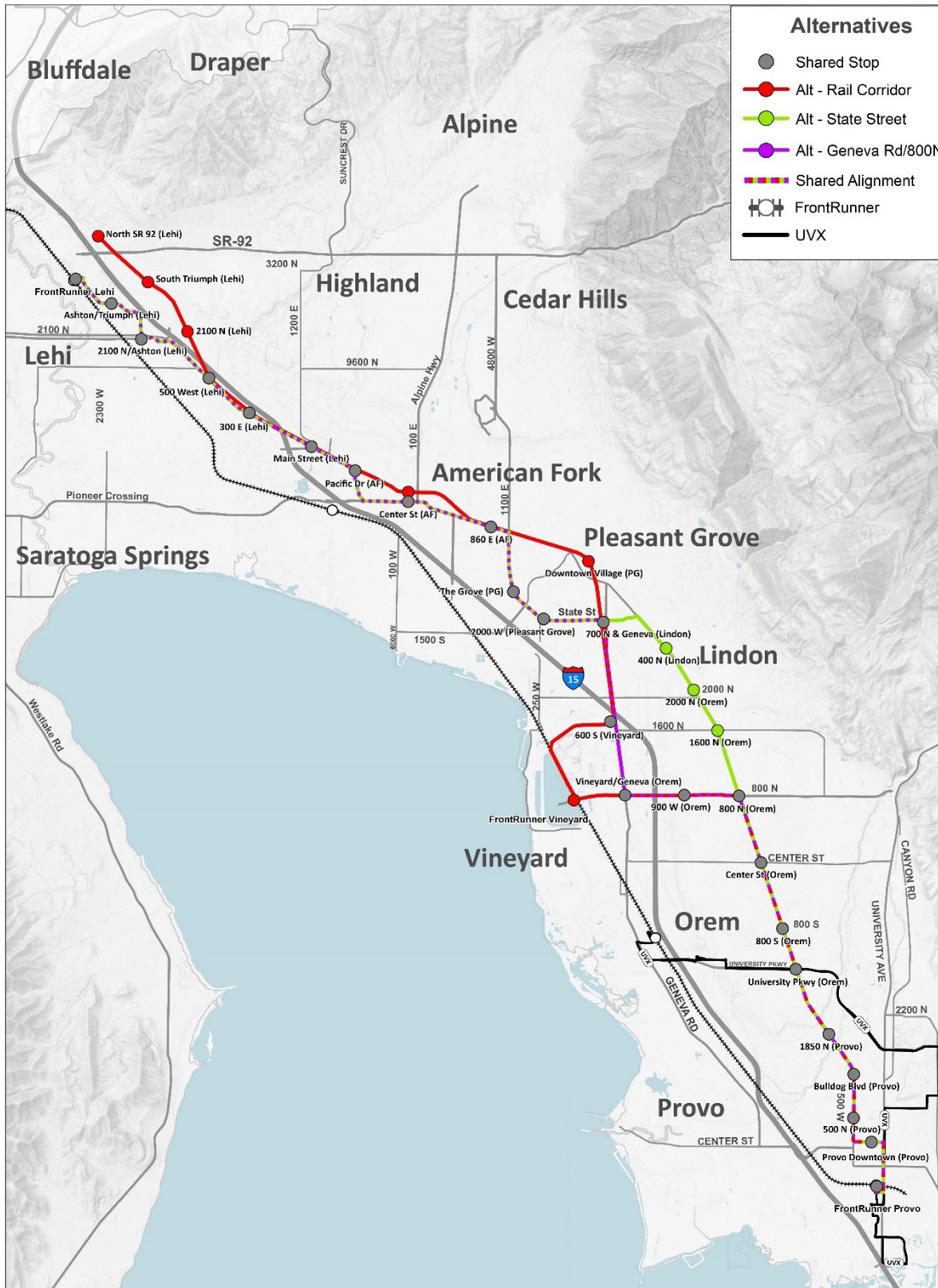


Figure 6-1. Level 1 Alternatives

onto North County Boulevard; and, an alignment between downtown Provo and Provo FrontRunner to minimize overlap with UVX.

6.2.2 Modal Alternatives

Both LRT and BRT provide alternative mode technology options to meet the project Purpose. However, an additional review was performed after the Level 1 screening to evaluate the performance of LRT and BRT in the study area, which assumed that both LRT and BRT would operate in exclusive right-of-way, with enhancements such as signal priority at intersections. The purpose of this effort was to assess whether it is prudent and reasonable to carry forward both or one mode into the more detailed Level 2 screening process.

Summary Findings

The Central Corridor study area is characterized by a wide range of existing and future land use densities and a variety of both transit-

supportive and less-transit supportive development patterns. Although both LRT and BRT generally meet Purpose elements; LRT was not recommended for further evaluation based on the following findings:

- A primary goal of project partners is to allow for flexibility of service and implementation. Implementation of BRT may allow for greater flexibility for phased implementation to match the varied local conditions in the study area. In addition, given the wide range of “readiness” for a large capital investment along the length of the corridor, a modal solution such as BRT may offer greater flexibility for implementing sooner and scaling up transit service as transportation demands warrant the investment
- The varied land uses and population and employment densities along the corridor that may not be as supportive or generate the ridership necessary to justify a higher capital transit investment, such as LRT

Table 6-1. Level 1 Screening Results Summary

Evaluation Criteria	Rail Corridor	State Street	Geneva Road/800 N
	23.6 miles	21.8 miles	22.5 miles
	24	24	24
Transportation Growth Factors			
Transit Ridership Potential	High Performance	Medium Performance	Medium Performance
Transit Network Integrity/Reliability	Medium Performance	Medium Performance	Medium Performance
Transit Connections	High Performance	High Performance	High Performance
Active Transportation Accessibility	High Performance	High Performance	High Performance
Land Use/Economic Development Factors			
Community Compatibility	Medium Performance	Medium Performance	Medium Performance
Station Area/TOD Development Potential	High Performance	High Performance	High Performance
Access to Centers/Development Areas	High Performance	High Performance	High Performance
Supporting Considerations			
Cost Considerations	High Performance	High Performance	High Performance
Constructibility Considerations	High Performance	High Performance	High Performance
Environmental Effects	Medium Performance	Medium Performance	Medium Performance
Potential for Air Quality Improvements	Medium Performance	Medium Performance	Medium Performance

Rating Key:

Low Performance	Medium Performance	High Performance
-----------------	--------------------	------------------

- Implementation of BRT is not reliant on actions occurring outside of study area and can operate independently of other regional transit investments
- Funding for LRT could be secured with significant effort; however, funding may not be available in the short-term to support an LRT investment
- Support for high-capacity bus-based technologies has been expressed by partner agencies and jurisdictions

7. Level 2 Screening



The Level 2 alternatives evaluation was performed for three BRT alternatives: Rail Corridor, State Street, and Geneva Road. The purpose of the Level 2 alternatives evaluation was to obtain more quantitative data to compare alternatives and make an informed decision on the best option to recommend as the Preferred Alternative. Because of the near proximity and shared alignment of some alternatives, this evaluation took a different approach from Level 1 in reviewing data on a segment-by-segment basis, as well as looking at individual station locations. The purpose of this approach was to better understand the factors contributing to the comparison among the alternatives that might be less obvious when end-to-end corridor data is aggregated.

Figure 7-1 illustrates the Level 2 alternatives that were evaluated. This map reflects a series of minor alignment changes from Level 1 that were conducted to respond to stakeholder requests and concerns, including:

- Moved the Rail Corridor Alternative off State Street to North County Boulevard through Pleasant Grove
- Adjusted the Rail Corridor Alternative through Vineyard to better match development plans
- Adjusted route and added new stations near downtown Provo

7.1 Level 2 Screening Analysis and Outcomes

Findings presented for the Level 2 screening are based on representative alignments which provide initial conceptual engineering and general assumptions about how the transit service would operate. Ratings of high - medium - low performance are assigned at the segment and station area level. The screening results are comparative to each other, ranging from those that best meet the criteria (high), to those least meeting the criteria (low). Those with the highest performance or most competitive outcome are ranked high.

Because the analysis is comparative, high-medium-low are not indicators of peak performance or impacts, but rather how well an option performs relative to the other options under consideration.

Table 7-1 includes a summary of the overall evaluation. A more in-depth discussion of the screening methodology and results, including detailed outcomes for each alternative, can be found in Appendix C - Level 2 Screening Memo.

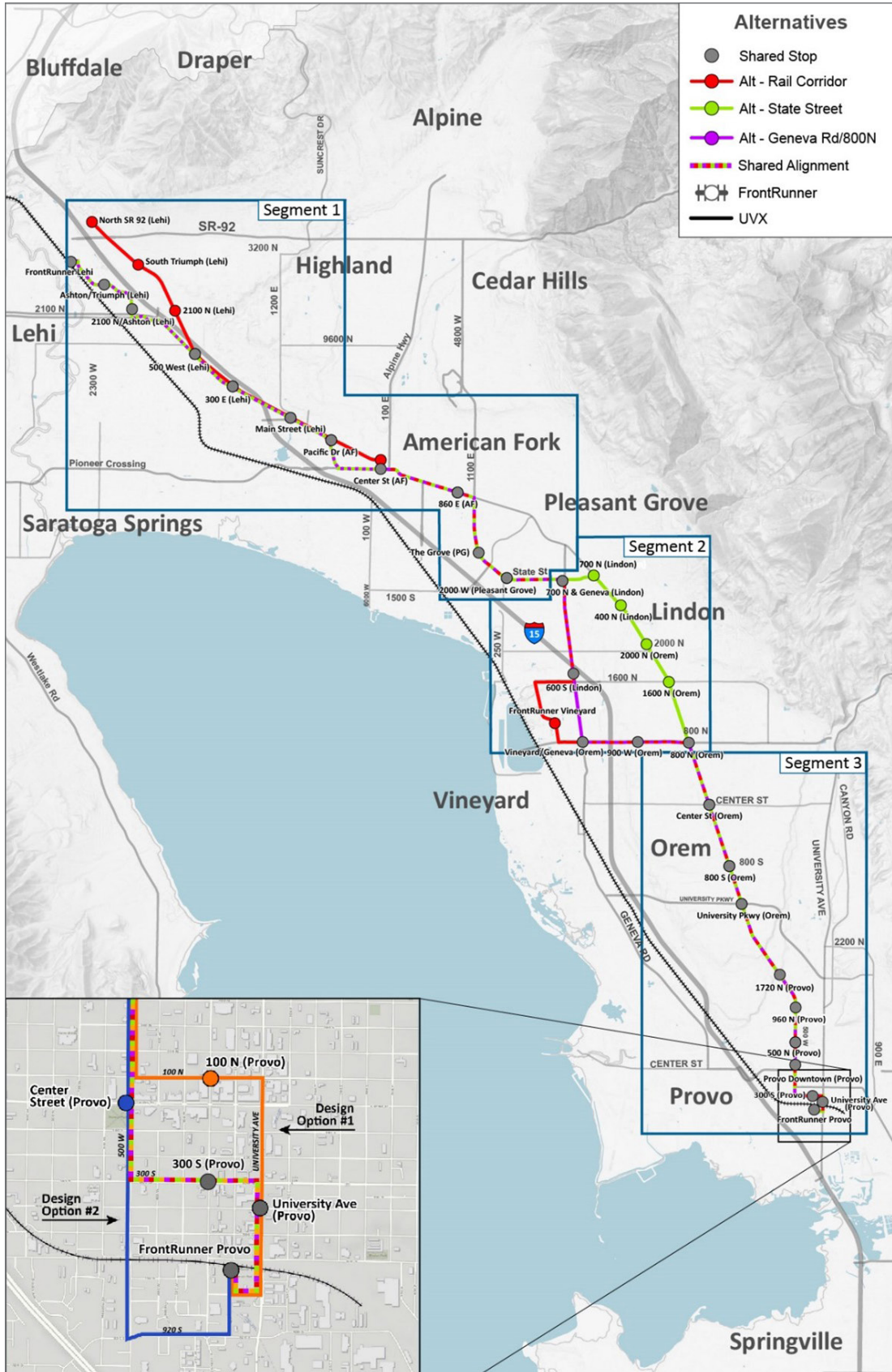


Figure 7-1. Level 2 Alternatives

Table 7-1. Level 2 Screening Results Summary

Evaluation Criteria	Alternative Snapshot		
	RAIL CORRIDOR <i>23.4 miles / 26 stations</i>	STATE STREET <i>21.9 miles / 25 stations</i>	GENEVA ROAD/800 N <i>22.6 miles / 25 stations</i>
Ridership	2019: 4,150 riders 2050: 8,250 riders 2050 SE data change: 8,400 riders	2019: 4,100 riders 2050: 7,650 riders 2050 SE data change: 7,700 riders	2019: 4, 250 riders 2050: 7,250 riders 2050 SE data change: 7,300 riders
Transit Reliability	71 signals, 84% exclusive lanes	61 signals, 88% exclusive lanes	64 signals, 73% exclusive lanes
Travel Time¹	73-90 minutes	70 minutes	71 minutes
Corridor Transit Trips	2019: +1,800 new transit riders 2050: +3,000 new transit riders	2019: +1,650 new transit riders 2050: +2,750 new transit riders	2019: +1,700 new transit riders 2050: +2,300 new transit riders
Capital Costs²	Lowest level of investment	10% more than lowest level of investment	Lowest level of investment
Operating Costs³	Due to longer travel times with this alternative, operating costs are estimated to be slightly more expensive than the State Street and Geneva Road alternatives	Due to similar estimated travel times between State Street and Geneva Road alternatives, operating costs end up being about the same and are slightly lower than the Rail Corridor alternative.	
State of Good Repair	State of good repair (SGR) takes into account costs associated with replacement of facilities over a 50-year lifespan. For this project, major SGR costs would include replacement of bus fleet (12-15-year replacement cycle), guideway improvements (20-year for flexible pavement, 40-year for rigid pavement), and station improvements (estimated 30-year lifespan). Due to similarities in corridor length and number of stations, it is assumed these costs would be similar for all alternatives.		
Air Quality Improvement	All alternatives show a slight decrease in vehicle miles traveled and a slight increase in transit mode share; however, in the context of the broader region these decreases/increases are negligible.		

¹ Initial travel times are estimated from posted roadway speeds (where applicable) and high-level assumptions of transit service operating characteristics and signal delay along the length of the corridor. Travel times will be refined as the project progresses through future phases of project development.

² Rough order of magnitude capital cost range based on representative alignment (length of BRT construction, number of stations, intersection/roadway reconstruction, crossing structures, as applicable) which includes an allowance for real estate and soft costs, but does not include vehicle costs, maintenance facilities, operations and SGR costs, or station programming elements (park and rides, operator facilities, etc.).

³ As a Preferred Alternative is selected, assumptions to determine high-level operating costs will be refined and presented as part of the project operating plan.

8. Preferred Alternative



8.1 Overview

Findings from Level 2 alternative evaluation informed the development of a Preferred Alternative. The Preferred Alternative includes the following components of Level 2 alternatives, as part of one project (Figure 8-1):

- **Segment 1** – Rail Corridor Alternative
- **Segment 2** – State Street Alternative
- **Segment 2** – Vineyard “branch” connection from FrontRunner Vineyard to State Street along 800 North
- **Segment 3** – Shared alignment

The preferred mode is BRT. It has been expressed by project partners that a high-quality BRT that operates in exclusive right-of-way is desired. The characteristics of the BRT system (exclusive versus mixed flow operations, type of bus vehicle, service frequency, station area amenities, etc.) and potential project phasing will be refined in the next phases of project development (i.e. environmental study through final design).

Several overarching factors were considered in the development of the proposed Preferred Alternative:

- **Rail Corridor performance in Segment 1** – The Rail Corridor Alternative performed better than the other alternatives in Segment 1 and should be the preferred corridor in this Segment.
- **Maximizing ridership and connecting communities in Segment 2** – Notably, the three alternatives explored in Level 2 showed minimal ridership differentiation in Segment 2. However, leveraging a north-south transit spine with a branch to Vineyard substantively increases ridership over the three alternatives considered and better connects all communities.
- **Connecting key land uses and destinations** – This alternative serves all communities in the study area. In addition, the proposed Preferred Alternative provides connections to many of the Wasatch Choice 2050 centers and TOD opportunities identified by communities in the study area. Key destinations served include Silicon Slopes, Timpanogos Regional Hospital, and Utah Valley Hospital.

Key Features of the Preferred Alternative:

- Creates a robust north-south high-capacity transit spine in Utah County with connections to key rapidly developing areas
- Connects to key Wasatch Choice 2050 centers and TOD opportunities
- Provides connections to regional transit system - FrontRunner, UVX, proposed Point of the Mountain transit
- Serves all communities in the study area
- Preliminary modeling indicates that this alternative maximizes ridership potential compared to the State Street, Rail Corridor, and Geneva Road alternatives on their own
- **Leveraging regional transit investments** – The Preferred Alternative includes a direct connection to Vineyard and Provo FrontRunner stations, with potential connections to be explored in Lehi and American Fork. The project connects with UVX in numerous locations (University Place and Provo FrontRunner) and connects to the proposed Point of the Mountain project at the northern terminus. The Preferred Alternative also supports future expansion of UVX that envisions a potential connection from the FrontRunner Orem Station to the FrontRunner Vineyard Station. Additional analysis is needed to understand the feasibility of this connection.
- **Optimizing funding success** – Due to the corridor length, number of stations, and large proportion of exclusive guideway, this project will be a major capital investment. However, this project is strongly desired and supported by all communities and would likely require both federal and local funding to construct and operate. Support from all communities in the study area is critical.
- **Maintaining eligibility for federal funding** – A project that includes the north-south spine with an east-west branch to Vineyard could be eligible for funding under the FTA Capital Improvement Grant program.





Figure 8-1. Preferred Alternative

Key Characteristics of the Preferred Alternative:

Primary Mode: Bus Rapid Transit

Length: 25 miles

Percent Exclusive: 84%

Projected Ridership: Approximately 10,000 riders/day

Travel Time: 83-102 minutes

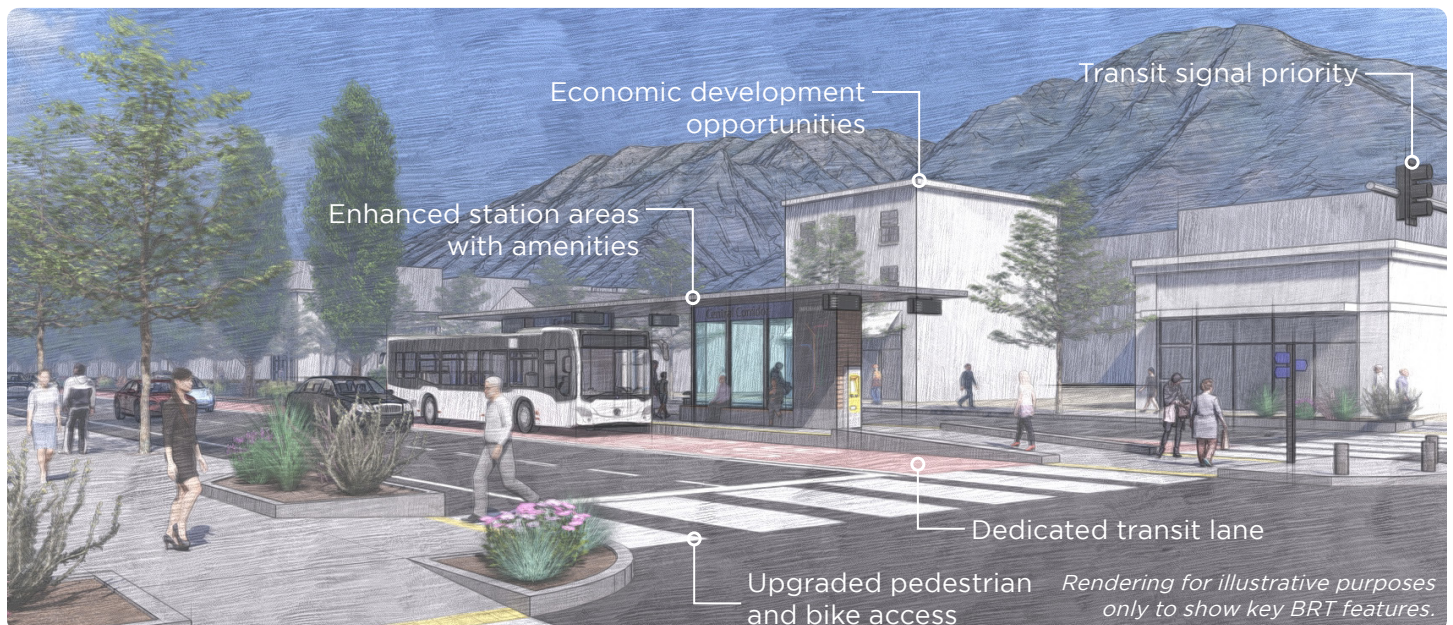
Capital Costs: \$800M - 1.2B. Note: Capital costs include major infrastructure for the representative project, including but not limited to; roadway reconstruction and widening and associated right-of-way acquisition, BRT stations, vehicles, maintenance base and station access funds. Capital costs are based on a representative alignment based on UDOT and UTA standard cross-sections and could change as the scope of the project is further refined in future phases of work. This planning level estimate maximizes the use of dedicated lanes for a high-quality transit project and will continue to be refined as the project undergoes additional analysis and engineering. This detailed analysis will inform trade offs that will refine and potentially reduce total project costs.

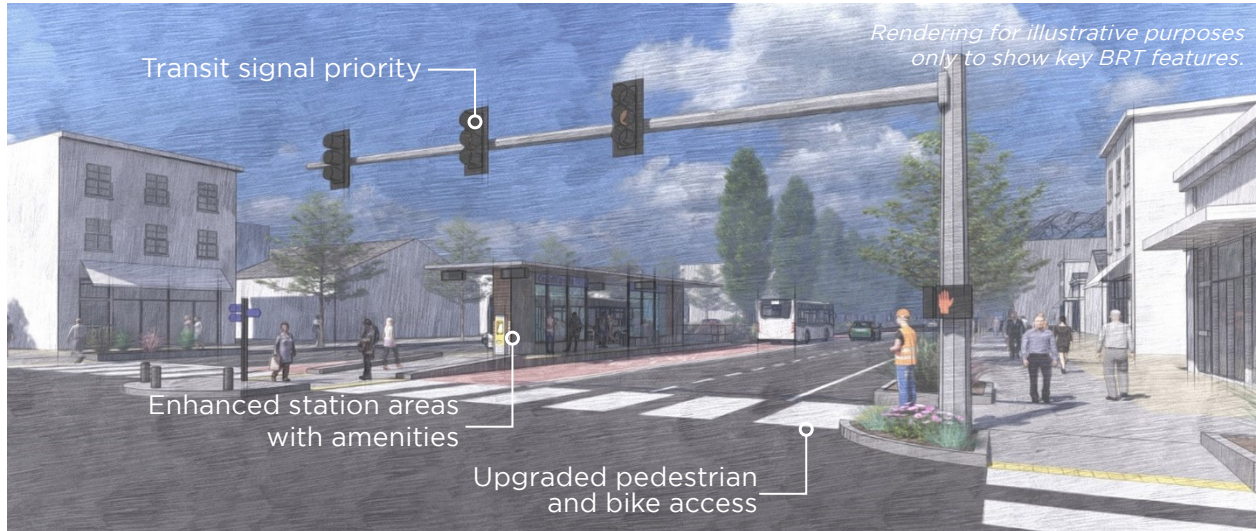
Operating Costs: Approximately \$11-13M/year. Note: Operating cost estimates do not include capital, support, overhead, insurance, maintenance, right-of-way, administration, marketing, transit police, customer support, or any other company-wide costs.

Headways: 10-minute peak service

The following renderings show potential BRT features and amenities, including:

- Dedicated transit lane that operates outside of general purpose traffic
- Station areas with enhanced shelter and seating, off-board payment, wayfinding, real time arrival information
- Transit signal priority
- Enhanced pedestrian and bicycle access
- Landscaping, urban design features, and other corridor branding





8.2 Definition and Characteristics

This 25-mile BRT project would design and implement BRT along the existing UTA owned rail corridor and State Street from Lehi to Provo and provides a branch connection to Vineyard along 800 North. The representative alignment and proposed station locations are described below and depicted on Figure 8-1. Definition and characteristics are based on the project partner's desire for maximizing exclusive transit facilities and a high level of station area amenities where possible. Additional refinements to the alignment and station area locations, including exploration of design options at the northern terminus and in American Fork and Provo, will be explored in future phases of project development.

8.2.1 Alignment

The alignment begins north of SR-92 in Lehi, connecting to the proposed Point of the Mountain transit project and terminates at the Provo Intermodal Hub. From the northern terminus, the project would operate in exclusive BRT guideway along the existing UTA owned rail corridor beginning north of SR-92 and east of I-15 and would run south, with a grade separated crossing at SR-92. It would continue south, operating in existing UTA owned rail corridor, under I-15, where the UTA owned rail corridor transitions to the north and east side of State Street in Lehi. The alignment would continue to operate in exclusive BRT guideway along the UTA owned rail corridor as it parallels State Street to approximately the intersection with Pacific Drive in American Fork. Along Pacific Drive, the alignment transitions to center running, exclusive BRT operations before turning south on 100 West where it operates in joint use. The alignment then turns east on Main Street, operating in center running exclusive BRT lanes as Main Street transitions to State Street in American Fork. The alignment continues in center running exclusive BRT lanes along State Street until North County Boulevard, where it continues south onto North County Boulevard in Pleasant Grove and then 700 North in Lindon. The alignment turns south at State Street and operates in center running, exclusive BRT lanes along State Street through Lindon, Orem, and into Provo. In Provo the alignment runs along 500 West south of Cougar Boulevard and turns east at 300 South where it operates in joint use.

The alignment then turns south on University Avenue where it utilizes the UVX center running exclusive lanes until just south of 400 South where it becomes joint use to the southern terminus located at the Provo Intermodal Hub.

The project also provides a branch connection from the north-south alignment described above. The branch alignment runs west from the State Street and 800 North intersection in Orem, along 800 North in center running exclusive BRT lanes to approximately 900 West. The alignment continues west in joint use from 900 West to the Vineyard Town Center/future FrontRunner station.

8.2.2 Station Locations

The following station locations were defined for this exercise, offering appropriate spacing to ensure convenient access as well as streamlined service:

- North SR 92 (Lehi)
- South Triumph (Lehi)
- 2100 North (Lehi)
- 500 West (Lehi), 300 E (Lehi)
- Main Street (Lehi)
- Pacific Drive (American Fork)
- Center Street (American Fork)
- 860 E (American Fork)
- Center Street (Pleasant Grove)
- The Grove (Pleasant Grove)
- 2000 West (Pleasant Grove/Lindon)
- Anderson Boulevard (Lindon)
- 700 North and State Street (Lindon)
- 400 North (Lindon)
- 2000 North (Orem)
- 1600 North (Orem)
- 800 North (Orem)
- Center Street (Orem)
- 800 South (Orem)
- University Parkway (Orem)
- 1700 South (Orem)
- 900 West (Orem)
- Vineyard/Geneva (Orem/Vineyard)
- FrontRunner Vineyard (Vineyard)
- 1720 North (Provo)
- 960 North (Provo)
- 500 North (Provo)

- Provo Downtown (Provo)
- 300 S (Provo)
- University Ave (Provo)
- FrontRunner Provo (Provo)

8.2.3 Project Elements

- Up to 32 stations with BRT branding
- 84% exclusive right-of-way, where the buses operate in an exclusive lane outside of vehicle traffic
- Enhanced stations with weather protection, passenger seating and lighting
- Real-time next bus arrival information and possible off-board payment options
- Level boarding and alighting platforms
- Transit connections to FrontRunner at Vineyard and Provo and connections to UVX at University Parkway, University Avenue, and Provo Intermodal Hub. Additional FrontRunner and UVX connections to be explored in future planning efforts.
- Connects seven cities to transit through the northern and central Utah valley: Lehi, American Fork, Pleasant Grove, Lindon, Orem, Vineyard, and Provo
- Maintenance base expansion for additional fleet
- Purchase of vehicles

8.3 Ridership

Ridership forecasts for the Preferred Alternative were completed using the Wasatch Front Regional Council (WFRC)/MAG regional travel demand model. The Preferred Alternative resulted in 10,200 average weekday boardings in forecast year 2050. Similar to results completed on alternatives in Level 2 screening, segment level boardings for the Preferred Alternative were highest in Segment 3 with 4,850 total boardings, followed by Segment 1 with 3,100 boardings and then Segment 2 with 2,300 boardings.

To understand the potential impact of changes to variables that would impact ridership on the Preferred Alternative, a series of sensitivity tests were completed using full WFRC/MAG model runs that included coding of variations on top of the Preferred Alternative. Table 8-1 below provides information on the magnitude of the impact on 2050 ridership as compared to the Preferred Alternative for each of the sensitivity tests performed.

As shown in Table 8-1, the sensitivity test that impacted boardings the most was a change in service assumptions that reflected BRT operating in mixed traffic in Segments 2 and 3 and assumed to be a lower level BRT in the model with nearly a 39% drop in boardings. On the positive side, the implementation of a free fare on the project resulted in a 20% increase in boardings. Each of the other sensitivity tests performed showed impacts of less than 5% difference in ridership on the project. Additional ways to optimize ridership will be explored in future phases of project development.

Table 8-1. Modeling Sensitivity Test Results

Sensitivity Test Description	Daily Boarding Percentage Change
Vineyard Branch Coded as Lower BRT (Mode 5)	-1.3%
Double Frequency of FrontRunner (15 Peak/30 Off-Peak)	-4.6%
Hospital TOD Terminus	-4.3%
Free Fare on Project	20.0%
Project in Mixed Traffic and Coded as Lower BRT (Mode 5)	-38.8%
Interlined with Point of the Mountain Transit	-1.9%
Addition of Lehi Connector Route to FrontRunner (Mode 9)	4.8%
Addition of Lehi Connector Route to FrontRunner (Mode 5)	4.4%

8.4 Costs

Rough order of magnitude cost estimates were prepared using previous UTA estimates from the Point of the Mountain Study that was developed in conjunction with Krebs Corporation. Proposed project scope (length of corridor, portion of exclusive guideway, number of stations, etc.) was based on the information from the Level 2 development of alternatives. The estimate approach utilizes past and 60% design cost information from the UVX, Ogden, and Mid Valley BRT projects and past roadway projects to develop unit costs using a route per foot basis.

The quantities were based on the envisioned scope of work for the project. It should also be noted that at this early stage of project development, the estimate was very high-level which can lead to wide variations in estimated costs. To capture the variety of treatments along the corridor, the estimate was broken down by type of BRT facility, elevated structure, roadway widening, grind and overlay, etc. Typical cross sections along the corridor were used to determine potential widening and right-of-way acquisition based on maintaining the typical UDOT roadway standards. A design allowance of 30% was added to account for design unknowns at this stage of project development.

Right-of-way costs were developed based on GIS parcel information. To account for variability of right-of-way costs along the corridor, a unit price for “over the fence” values of properties from the Utah County Assessor’s office was developed using GIS to assess an average cost per square foot of right-of-way. This was applied to a right-of-way estimate based on areas requiring right-of-way from the design, including stations and intersections where widening is assumed due to the existing roadway configuration with left/right turning movements. The unit price was doubled to help account for right-of-way contingency as well as relocation and acquisitions fees and real estate market adjustments.

The estimate also includes vehicle costs (based on frequency and route length, including spares), a contribution to a new or expanded operations and maintenance base (to accommodate the expanded vehicle fleet), and station programming. Station programming is an allowance for potential costs related to pedestrian/bike access, kiss-and-ride areas, park-and-ride lots, or operator facilities that have

yet to be identified. Lastly, professional services/soft costs of 30% were applied based on UTA guidance. The professional service/soft costs account for UTA administration of the project, environmental, engineering, construction management and construction change order contingency. A range of magnitude low and high cost range was created by adding an additional 40% to the total program low cost to produce a range to capture the variability of scope on planning level project.

The rough order of magnitude cost estimate for the Preferred Alternative is \$800M to 1.2 billion. This cost estimate will continue to be refined in future phases of work.

8.5 Funding

Given the scope of the Preferred Alternative, a multitude of funding options are available and should be considered as the project moves forward (Appendix D Funding Memorandum). Potential funding sources include:

- Federal funds and grants, including: Transportation Infrastructure Finance and Innovation Act (TIFIA) program, Surface Transportation Program (STP), Better Utilizing Investments to Leverage Development (BUILD) grants, and the FTA Capital Investments Grants (CIG) program.
- Local funds including existing and/or new tax revenues (e.g. local and county sales and use taxes, mass transit sales taxes, and others)
- Economic development tools such as Community Reinvestment Area (CRA), Public Infrastructure Districts (PIDs), and transportation reinvestment zones (TRZs).

The available funding tools listed above may be combined in a variety of viable options to arrive at the desired funding level. The following options are illustrated as examples of combining various components to potentially accelerate funding:

- Traditional Funding Mechanisms
- Non-Traditional Funding Mechanisms
- Hybrid Options

The Hybrid Option, which utilizes a combination of traditional and non-traditional funding mechanisms, pulling from existing and new revenue streams is recommended as the most

viable option. Some key components of this option are as follows:

- State of Utah General Obligation Bonds
- Utah Transit Authority Sales Tax Revenue Bonds
- Tax Increment Bonds from CRAs or TRZs (or potential new, enhanced tax increment financing tools)
- Federal Grant Money

Detailed description of funding sources can be found in Appendix D.

8.6 Operations

8.6.1 Corridor Operations and Considerations

The Central Corridor Preferred Alternative is proposed to operate differently throughout the length of the corridor, including operating in mixed traffic in some portions and in exclusive lanes for others. As demand for transit increases, operations may change to see more exclusive lane development. However, for planning purposes, initial operating assumptions were made to begin estimating costs and other operational needs. The following bullets articulate six locations where additional design and operational logistics will need to be considered as more detailed environmental planning and design occurs.

- **Connection to Point of the Mountain Transit:** The Point of the Mountain transit study has recently selected a Preferred Alternative that provides BRT service between Draper and Lehi, with a connection to Central Corridor in Lehi. Additional analysis will occur in future phases of work to determine an operating plan for these two BRT projects, including consideration of potential connections to FrontRunner Lehi.
- **Vineyard Branch Operations:** The Vineyard branch connection (running along 800 North) is expected to operate as a separate line, traveling to and from the station at State Street/800 North to the planned FrontRunner Vineyard Station, with a transfer required to travel the main alignment. Without this transfer, the frequency on the main alignment would be reduced to accommodate the two southern route options.

Additional attention is required to understand where/how the bus turns around both at State Street and at the FrontRunner station. A future study will evaluate the feasibility of extending UVX to the planned FrontRunner Vineyard Station. From a transit systems perspective, it will be important to understand how the UVX extension and Central Corridor branch line interface.

- **Station Spacing in Orem:** Between 1600 North and 1700 South, stations are spaced slightly farther apart than other corridor segments. These stations have primarily been identified and planned in the State Street Corridor Master Plan, however from UTA’s experience with other BRT routes, additional station locations, resulting in closer station proximity, should be considered in future phases of project development.
- **University Parkway/UVX Connection (Orem):** The Central Corridor alignment intersects with UVX at University Parkway. Based on current routing logistics, the Central Corridor route would not stop at the existing UVX station. However, a shared station - or easily accessible stations in near proximity - would be preferred. In an effort to keep both routes as straight and rapid as possible, further design is required to understand how these two stops could operate more effectively in one location.
- **Routing through Downtown Provo:** The southern terminus of the Central Corridor line is the Provo FrontRunner station. Navigating the dense street network of downtown Provo and crossing the east-west rail corridor comes with several options. Further phases will determine (1) the best manner to interline with UVX on University Avenue to avoid user confusion; (2) the best connection across the railroad tracks to the FrontRunner station (e.g., 100 North, 500 West, Center Street, Freedom Boulevard); and (3) where this route stops within the FrontRunner station.

8.6.2 Planning-Level Operations Costs

Operating costs were estimated based on several key variables, such as corridor frequencies, travel times (based on length and number of stations), layovers, and recovery times. This route is anticipated to operate daily, with 10-minute frequencies during most of the day (6:00 am to 8:00 pm). Reduced operating hours and longer frequencies can be expected on Sundays and holidays.

An hourly operating cost estimate was provided by UTA based on costs incurred per hour, such as labor; and costs per mile, such as fuel and tires. Paired with the above mentioned operating assumptions, total operating costs were estimated for both the main corridor and Vineyard branch line, with a high and low cost range based on the span of variables which could impact length and travel times (e.g., connecting to the POM corridor, syncing schedules with UVX, branch transfers, etc.).

This summary is presented in Table 8-2, showing an estimated full project annual operating cost range of \$11 million to \$13 million. It is important to note that these estimates do not include capital (buses), support, overhead, insurance, maintenance, right-of-way, administration, marketing, transit police, customer support, or any other company-wide costs.

Vehicle fleet assumptions have not yet been made. It is expected that a high-quality BRT

vehicle will be purchased, but costs per vehicle have not been factored into these assumptions. Additionally, with an expanded fleet of 24 to 27 buses, either a new or expanded maintenance facility will be required. The determination on maintenance facility needs will occur in later phases as regional transit system expansion needs and implementation time frames are understood.

8.7 Land Use and Zoning Recommendations

High-quality transit investments are one major step in creating vibrant connected communities. Planning for the immediate station area, for the walkable transit-served district, and for the transit corridor are equally important to capitalizing on high-capacity transit. TODs typically includes a mix of commercial, residential, office and entertainment adjacent to the transit station. Dense, walkable, mixed-use places near transit attract people and catalyze additional investments. TOD is most successful when regional and local governments encourage it through land use planning, zoning laws, and changes to building codes, among other proactive steps.

Many of the communities in the Central Corridor study area already have TOD zoning policies in place to encourage a more dense transit-supportive development pattern. However, the Federal Transit Administration requires a baseline

Table 8-2. Rough Order of Magnitude of Cost Estimates

Scenario	Peak Vehicle Requirement	Annual Operating Hours	Annual Cost*
High Range			
Main Corridor	22	115,00	\$10,500,000
Vineyard Branch	5	30,00	\$2,500,000
Full Project (Sum)	27	145,00	\$13,000,000
Low Range			
Main Corridor	19	96,000	\$9,000,000
Vineyard Branch	5	27,000	\$2,000,000
Full Project (Sum)	24	123,000	\$11,000,000

* This estimate does not include capital (buses), support, overhead, insurance, maintenance, right-of-way, administration, marketing, transit police, customer support, or any other company-wide costs.

threshold of densities and policies to be in place to successfully award funding for major transit investments. Appendix E includes a review of TOD Station Area Planning Best Practices that communities can begin to reference now, as more detailed planning and design occurs on the Central Corridor BRT route. By beginning to strengthen and codify TOD plans and policies, these measures can be in place by the time a federal funding award may be sought.



Public Involvement Report

APPENDIX A



Level 1 Screening Memo

APPENDIX B



Level 2 Screening Memo

APPENDIX C



Funding Memo

APPENDIX D



TOD Station Area Planning Best Practices

APPENDIX E

