



2021

# TOOELE TRANSIT

Feasibility Study



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# EXECUTIVE SUMMARY

The Tooele Transit Study's objective is to evaluate and recommend transit service solutions to meet the demands of population growth, continue supporting economic development opportunities, and maintain regional mobility for connections primarily between Tooele Valley and Salt Lake Valley.

## Existing Conditions

Tooele County is located west of Salt Lake County and primarily has one "gateway" to enter and exit the County from the northeast at SR-36/I-80. Along I-80, between developed areas of Salt Lake City and Tooele Valley, there are over 10 miles of undeveloped land, which presents a challenge and an opportunity for transit options for the Tooele Valley.

To evaluate transit options for the Valley, there are two important facts to consider:

1. There is a large jobs-housing imbalance within the County, with most workers commuting to the Salt Lake Valley
2. Many residents frequently travel to Salt Lake Valley for medical, shopping, entertainment, and other services.

In Tooele County, UTA operates five bus lines and a vanpool service. Of those five routes, two are fixed

routes, and three are flex routes. Tooele County also has several Park and Ride locations in Tooele City and Stansbury Park. Transit service in Tooele County recorded over 600 boardings on an average weekday during September 2019, with the two fixed routes as the county's higher-performing routes.

## Community Engagement

In addition to targeted stakeholder outreach, the team delivered a robust public outreach program aimed at reaching diverse audiences throughout the county. The team collected public feedback during the initial phases of the study through both an online survey and face-to-face interactions with members of the public at an in-person open house.

## Alternatives

The development of the transit alternatives to connect Tooele County and Salt Lake County was a collaborative effort between stakeholders, partners, and the team and derived from several sources.

In terms of modes, the alternatives include both rubber-tire (bus) and fixed guideway (rail). Four alternatives were developed to be evaluated, including continuing the existing mixed-flow express bus. In this context, "Mixed flow" means

## 2050 Preliminary Performance

The table below compares the preliminary performance for 2050 of each alternative on several criteria: estimated 2050 average weekday transit ridership, travel time between 2400 North/SR-36 and Salt Lake City, and capital costs.

	Low performance		High performance	
	Existing: Mixed Flow Express Bus	All Day, Mixed Flow Bus with Limited Stops	Shoulder-Running Bus Rapid Transit	Rail
TRAVEL TIME <small>Morning travel time from 2400 N/SR-36 Park &amp; Ride lot to 600 S./State Street in Salt Lake City</small>				
RIDERSHIP				
CAPITAL COST				
OPERATING COST				
ANNUALIZED COST PER RIDER				

Executive Summary Figure 1: Performance Summary of Alternatives

the bus shares travel lanes with other vehicles. New and emerging technologies were also considered, such as microtransit, but considering the long distance between population centers, they were not reasonable as a standalone alternative. However, microtransit can support the alternatives to be evaluated.

- Alternative 1 – Mixed Flow Express Bus (existing)
- Alternative 2 – Mixed Flow Express Bus with Limited Stops
- Alternative 3 – Bus Rapid Transit (BRT) Shoulder Running
- Alternative 4 – Rail

## Evaluation

The following evaluation criteria for the alternatives were established:

- Travel time
- Ridership
- Capital Cost
- Operating Cost
- Annualized Cost per Rider

A rating of the relative performance of the four alternatives is shown in **Figure 1**. Shoulder running BRT performs the best overall in terms of travel time, ridership, and capital cost.

## Implementation

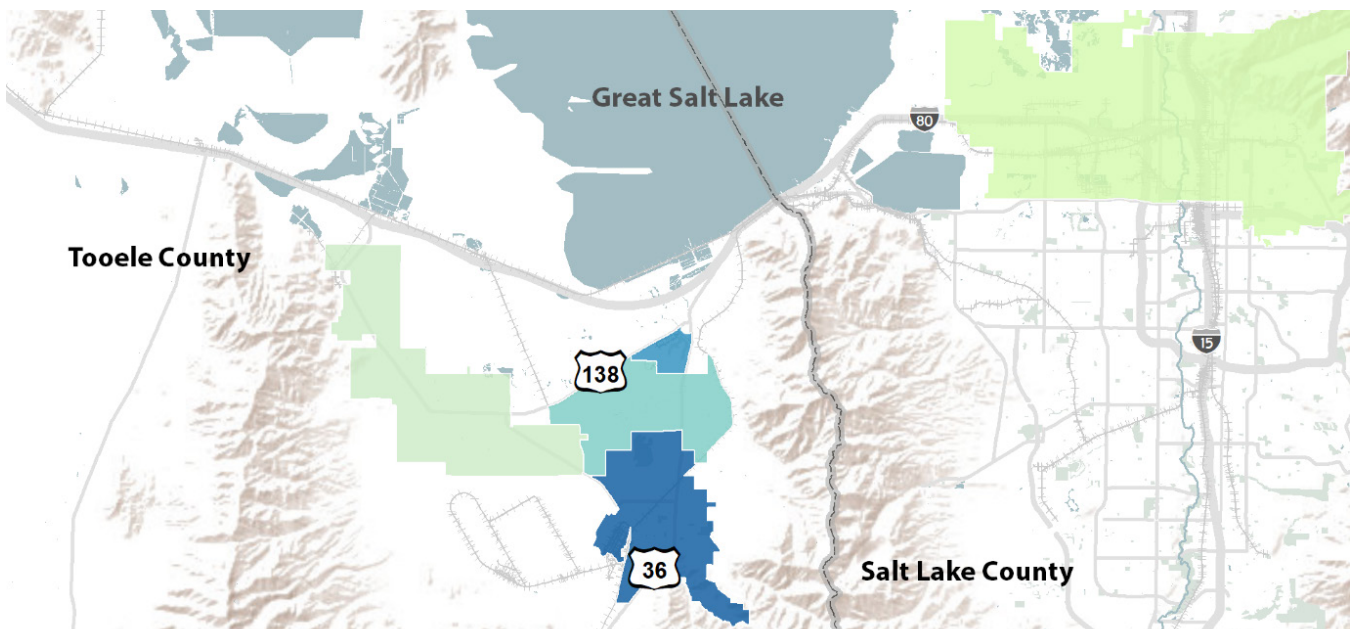
Improving transit access to the Tooele area will take a deliberate and long-term commitment to demonstrate that the area is conducive for further transit investment. Implementation strategies are multifaceted, combining several incremental activities. Key implementation strategies include:

- Corridor preservation
- Continued coordination with UDOT on transit opportunities and operations on SR-36 and I-80
- Development of transit-supportive densities at key development nodes in the Valley
- First- and Last-Mile strategies to improve existing multi-modal connectivity and ensure future development provides these types of connections
- Encouraging the use of existing transit operations through increased marketing

# CHAPTER

# 1

## INTRODUCTION



### Legend

- Erda
- Grantsville
- Salt Lake City
- Stansbury Park
- Tooele



Tooele Valley Transit

Figure 1: Study Area and Major Cities

Tooele Valley has doubled in population between 1990 and 2010 and is projected to continue to grow in the next few decades. With significant growth,

changes to the transportation system are needed to accommodate the growth and maintain or improve the community's mobility options. The Tooele Valley Transit Study was sponsored by Utah Transit

Authority (UTA), in collaboration with Tooele County, Tooele City, Grantsville City, Wasatch Front Regional Council (WFRC), and the Utah Department of Transportation (UDOT) that partnered to evaluate transit alternatives to better serve the Valley. The intent is to analyze current and future transit demands, develop and evaluate a range of alternatives, and make recommendations for the participating agencies.

Tooele County is located west of Salt Lake County and primarily has one “gateway” to enter and exit the County from the northeast at SR-36/I-80. Along I-80, between developed areas of Salt Lake City and Tooele Valley, there are over 10 miles of undeveloped land, which presents a challenge and an opportunity for transit options for the Tooele Valley. **Figure 1** shows the northeast quadrant of Tooele County, Salt Lake County, and the main cities and towns evaluated in this study.

The purpose of this study is to evaluate and recommend transit service solutions to meet the demands of population growth, continue supporting economic development opportunities, and maintain regional mobility for connections primarily between Tooele Valley and Salt Lake Valley. From census data dating back to 1990, it was observed that most of the growth in the county is concentrated in the cities closest to I-80 (i.e., Stansbury Park, Erda, Grantsville, and Tooele City). Given the existing and proposed development patterns, this study evaluates future transit services between the cities near I-80 and Salt Lake County. **Figure 2** shows the historical population growth trends in the county.

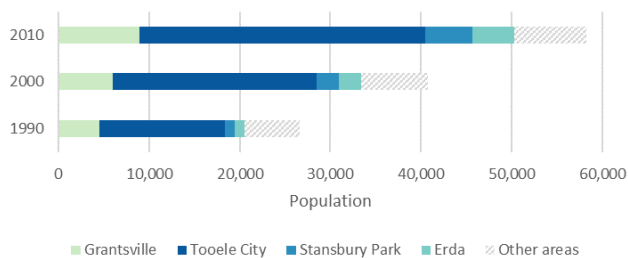


Figure 2: Tooele County Population by Year

Community leaders and agencies know that with the growth that has occurred and the expected growth in the future, transportation solutions need to be evaluated. From a transit perspective, there

is general support to enhance transit service for Tooele Valley residents. However, there has yet to be a unified vision formulated for the future transit needs in Tooele Valley. To evaluate transit options for the Valley, there are two important facts to consider:

1. There is a large jobs-housing imbalance within the County, with most workers commuting to the Salt Lake Valley
2. Many residents frequently travel to Salt Lake Valley for medical, shopping, entertainment, and other services.

Given the travel patterns in Tooele Valley, this study explores various service types based on geography and market to determine which service type would be appropriate for various needs. High-level capital and operation costs are estimated for each service evaluated, along with an evaluation of potential funding streams, including local, federal, and operational revenues, are also addressed. This study aims to:

1. Assess the existing and future transit demands and service levels between Tooele Valley and Salt Lake Valley, as well as service within Tooele Valley.
2. Evaluate feasible transit mode options to serve the study area, including types, spans of service, and frequencies for each proposed transit investment.
3. Recommend an appropriate level of service, which considers physical, demographic, economic, and political constraints, pedestrian accessibility, and implications of potential land-use changes.
4. Provide a blueprint to implement recommended service through 2050 and implement strategies for short, medium, and long-range transit investments throughout the study area.

Concurrent with this transit study, UDOT is conducting the Northeast Tooele County Area Study that evaluates alternatives to alleviate peak traffic congestion around the I-80 “chokepoint” area. There was ongoing collaboration between the two studies to be consistent with data analysis and public messaging.

# CHAPTER



## EXISTING CONDITIONS

### Study Area

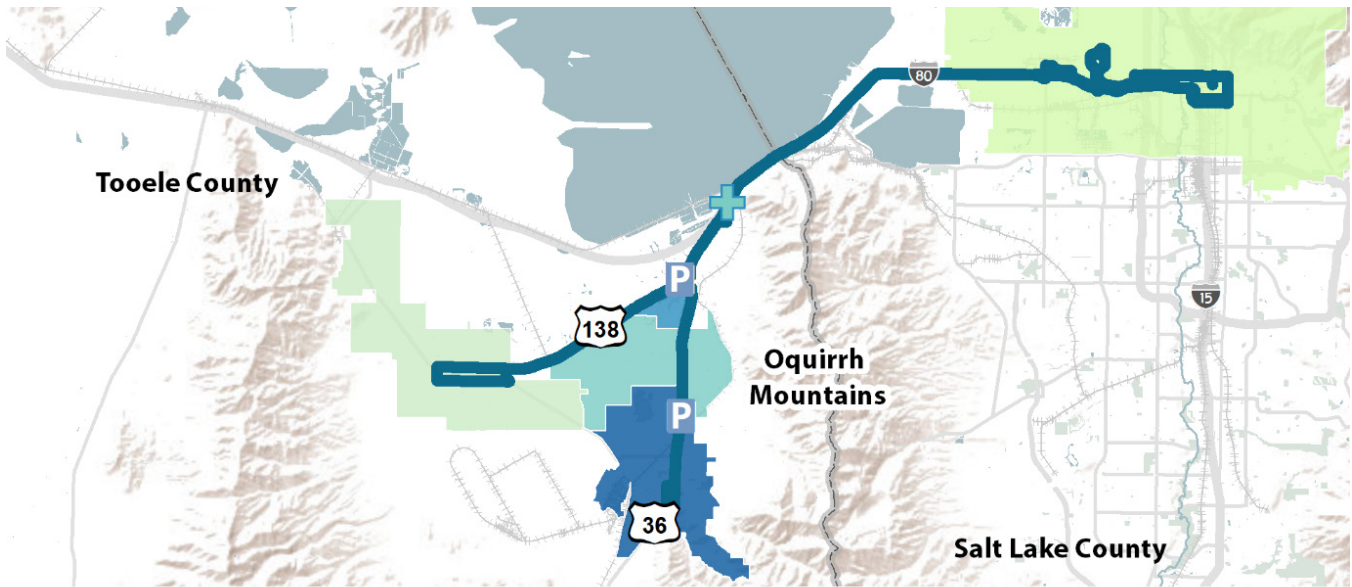
Tooele County, Utah, is located west of Salt Lake County and has experienced and will continue to experience significant growth. As the County grows, providing a range of transportation options for residents and visitors becomes more relevant to meet the County's needs. One of the challenges Tooele Valley faces is the limited transportation access points to enter or exit the County due to the physical constraints of the Oquirrh Mountains and the Great Salt Lake. **Figure 3** shows the geography within and surrounding Tooele, including the following key features and conditions:

- Three major population centers: Stansbury Park/Lake Point, Grantsville, and Tooele City
- A significant portion of the population in Tooele County travels to Salt Lake County for work (approximately 75%, according to the Department of Workforce Services).
- The Oquirrh Mountains to the east, serving as a physical barrier between Salt Lake County and Tooele County

- Two primary state routes: SR-138 and SR-36
- One interstate route: I-80
- One primary interchange: I-80/SR-36
- Five bus transit routes, including three FLEX routes and two fixed routes

The geography of Tooele County, coupled with the understanding that many need to travel to Salt Lake County to meet their needs, poses a unique challenge and opportunity to improve the transportation options for its residents and visitors. Transportation options should not be limited to vehicular improvements but should also include transit options. This study will focus on exploring and evaluating transit alternatives to serve Tooele County residents.





**Legend**

- I-80/SR-36
- Bus Routes
- Erda
- Grantsville
- Salt Lake City
- Stansbury Park
- Tooele



Figure 3: Overview of Tooele Transit Study Area

**Prior Plans and Studies**

Several studies and transit-related analyses have been conducted within the study area over the past decade. The studies analyze existing and future population, economic atmospheres, and land-use layouts. The key transit-related takeaways are summarized below:

**Tooele County General Plan Update – 2016**



The current Tooele County General Plan was first adopted in 1995 and has been updated several times. Tooele

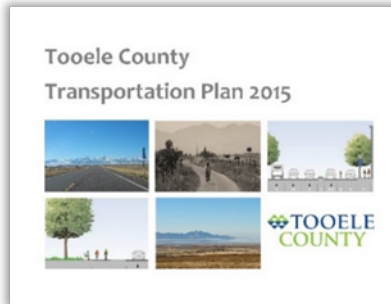
County updated the plan to meet current growth needs and objectives. The Update highlights some transit-specific improvements:

- Transit and multi-modal transportation

- should accompany and enhance density
- Mixed-use centers should support transit and alternative modes, particularly along SR-36
- Transit should be a consideration for the location of affordable housing
- The public made the following comments on transit in Tooele County:
  - Bus service and other forms of transit should be better and easier to use
  - Bus Rapid Transit (BRT) would be useful in Tooele
  - More access points are needed to enter and leave the Valley
  - Good transit will attract desirable employment opportunities
  - Space should be preserved for potential light rail corridors
  - Light rail is preferred to the bus by some due to frequent stops on a long route and the potential of getting caught in vehicular traffic, such as the bottleneck on I-80.

The Tooele County General Plan emphasizes the importance of transit in mixed-use and high-density areas, particularly the oncoming development along SR-36.

## Tooele County Transportation Plan – 2015



The Tooele County Transportation Plan was developed in conjunction with the Tooele County General Plan and

gathered data through Steering Committees and public meetings. The plan aimed to analyze the role of transportation in economics, housing, recreation, and regional sustainability for the next 25 years and beyond. As the region grows, the efficient flow of people and goods is essential with developing land-uses.

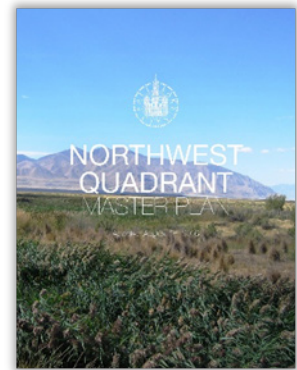
- Vanpool demand will likely increase with incoming large employers
- Develop transit-supportive employment clusters
- Create mixed-use nodes along SR-36 to be served by transit
- Implement a near-term transit hub/park and ride at Erda Way, which could develop into a small activity center in the long-term
- Consider BRT service, likely along SR-36
- Consider a very long-term plan for a rail connection between Tooele and Salt Lake City
- Continue to evaluate bus and vanpool ridership, growth, and cost

As in the Tooele County General Plan Update, the Transportation Plan also notes the need for transit to grow, along with new mixed-use centers along SR-36, and even suggests consideration for a BRT service. The Transportation Plan further highlights specific improvements such as the transit hub at Erda Way and stating the need to review light rail to Salt Lake City.

## Salt Lake City Northwest Quadrant Master Plan – 2016

Salt Lake City developed the Northwest Quadrant Master plan to focus on the northwest area’s unique opportunities and challenges (roughly bounded

by the Great Salt Lake, SR-201, I-215, and I-80 MP 108) of the metro area. The plan aims to outline an area with multi-modal connections to increase accessibility to jobs and other parts of Salt Lake City.



- The Mountain View Corridor EIS is proposed to allow for high-capacity public transit along 5600 West
- Create a transit hub with commuter rail, light rail, and bus connections as a gateway into Salt Lake City
- The Airport light rail should be extended to increase access to future jobs
- The International Center, as well as 7200 West/I-80 Interchange, are potential locations for transit-oriented employment centers
- Transit will be essential to serving the large number of expected employees, in particular, those from low-income households
- Provide transit stop shelters, transit information, and lighting at each stop
- Encourage employers to work with UTA to coordinate potential van, shuttle, or bus services to provide access to rail or other major destinations
- Phase infrastructure construction with development to ensure critical employment levels to enable a successful transit system

Employment opportunities in the Northwest Quadrant are expected to increase substantially in the coming decades. It is worth noting that the Northwest Quadrant Master Plan (and current zoning) does not provide for any residential use of any kind. Transit will be important to connect employees to new jobs as well as maintain the environmentally sensitive landscape. Transit improvements that connect this area to Tooele can make more job opportunities accessible to Tooele residents.

## Land-use

Primarily a rural area, Tooele Valley has seen substantial recent growth across the County. With this growth comes a reevaluation of the transportation options available to those living in the County. Land-use and transportation are intrinsically related, and having well-planned land-use patterns can catalyze roadway and transit improvements to provide an efficient transportation system for residents. Currently, much of the County is utilized for agriculture and military testing with single-family residences surrounding Grantsville, Stansbury Park, and Tooele City. Commercial land-uses are scattered throughout the area but are primarily located around the major transportation corridors such as SR-36 and SR-138. Higher density multi-family residences are few and far between. **Figure 4** shows the existing land-uses in Tooele County.

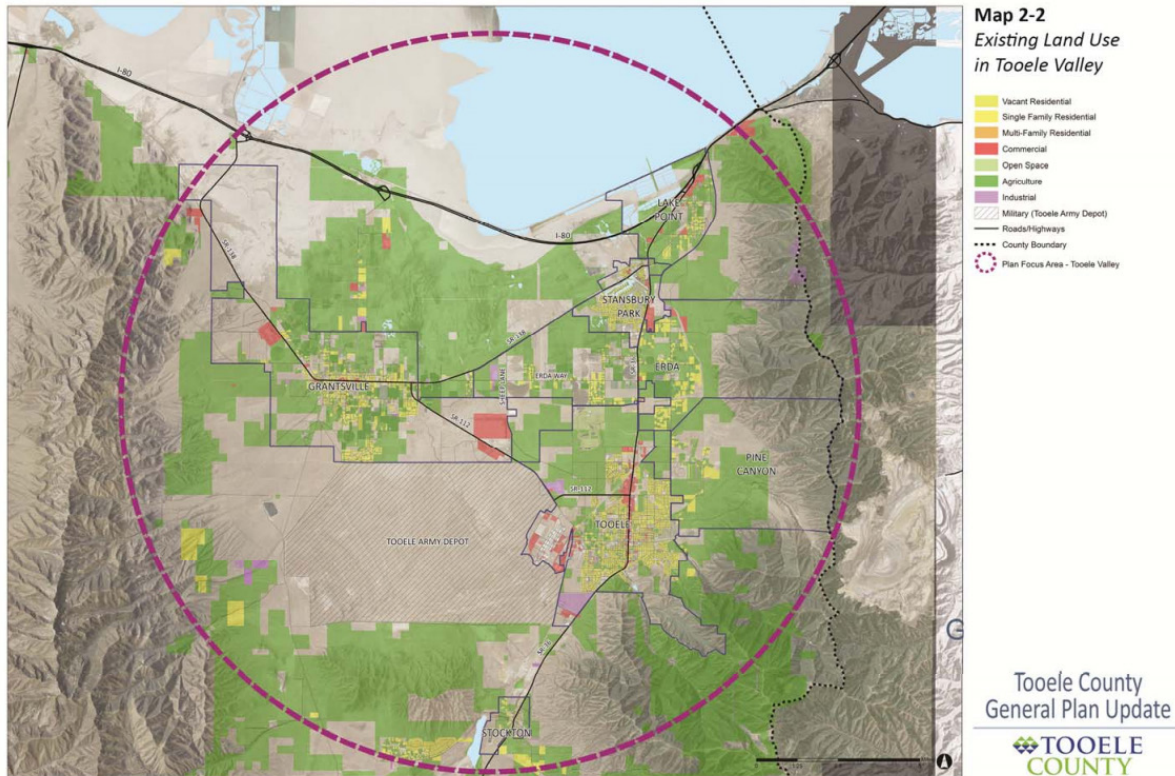


Figure 4: Tooele Valley Existing Land-use Map

Source: Tooele County General Plan Update 2016

## Residential

Residential areas in Tooele County consist primarily of single-family homes and have limited higher-density housing. Several miles east of Tooele County, Salt Lake County has significantly more mixed residential land-uses and higher densities than Tooele County. Although both counties are significantly different, the number of residential land-uses can provide context on transit service differences and levels of investments that can best serve their residents. **Figure 5** shows the 2019 residential patterns for Tooele and Salt Lake Counties aggregated to Traffic Analysis Zones (TAZ), a geographic unit used in regional transportation models. Based on this data, areas within Tooele City have slightly higher densities than other areas in Tooele County. However, comparing these patterns with residential patterns in Salt Lake County shows that Salt Lake County has considerably higher household densities than Tooele County.

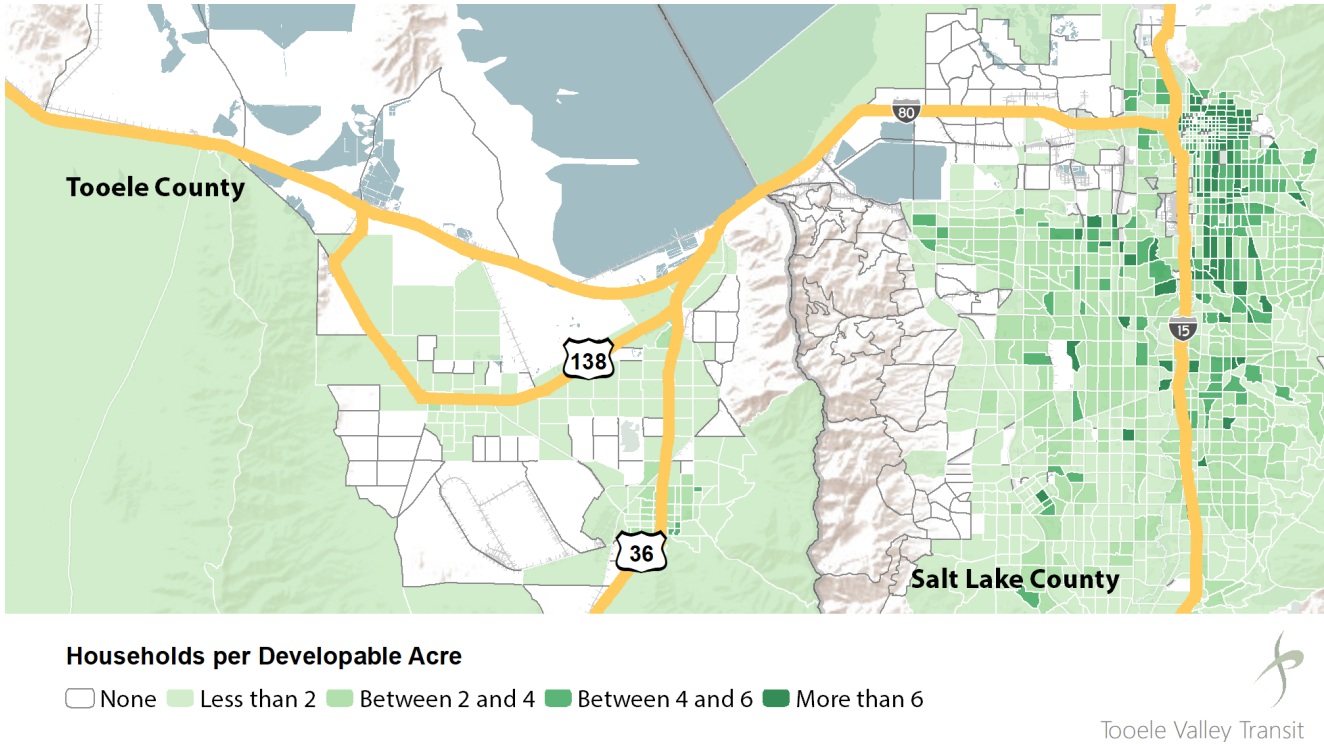


Figure 5: 2019 Households per Developable Acre

Source: Wasatch Front Regional Council

In the future, both Tooele and Salt Lake counties are projected to experience significant residential growth. Future population growth for transportation planning in the state’s non-urbanized areas, such as Tooele County, is distributed by UDOT. These future projections were used as the base to understand what degrees of growth are expected in the future. This exercise found that given developers’ known interest in the area near the junction of SR-36 and SR-138 in Tooele County, the residential growth near that junction was lower than expected. Therefore, households were reallocated to add more households near the SR-36/SR-138 area, as well as other minor modifications were done around the County. **Figure 6** shows the residential densities projected for 2050 after the modifications, and **Figure 7** shows the absolute change between 2019 and 2050.

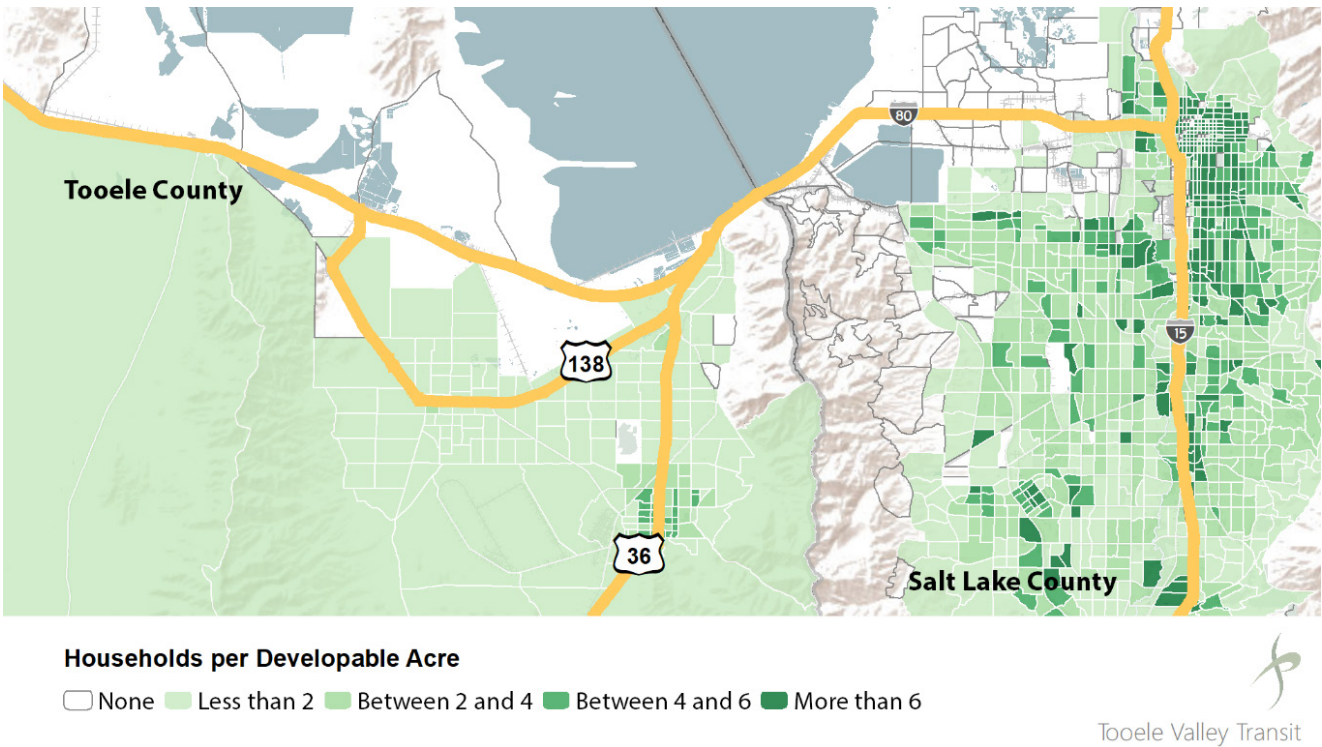


Figure 6: 2050 Households per Developable Acre

Source: Utah Statewide Travel Model (USTM) and Wasatch Front (WF) Travel Model.

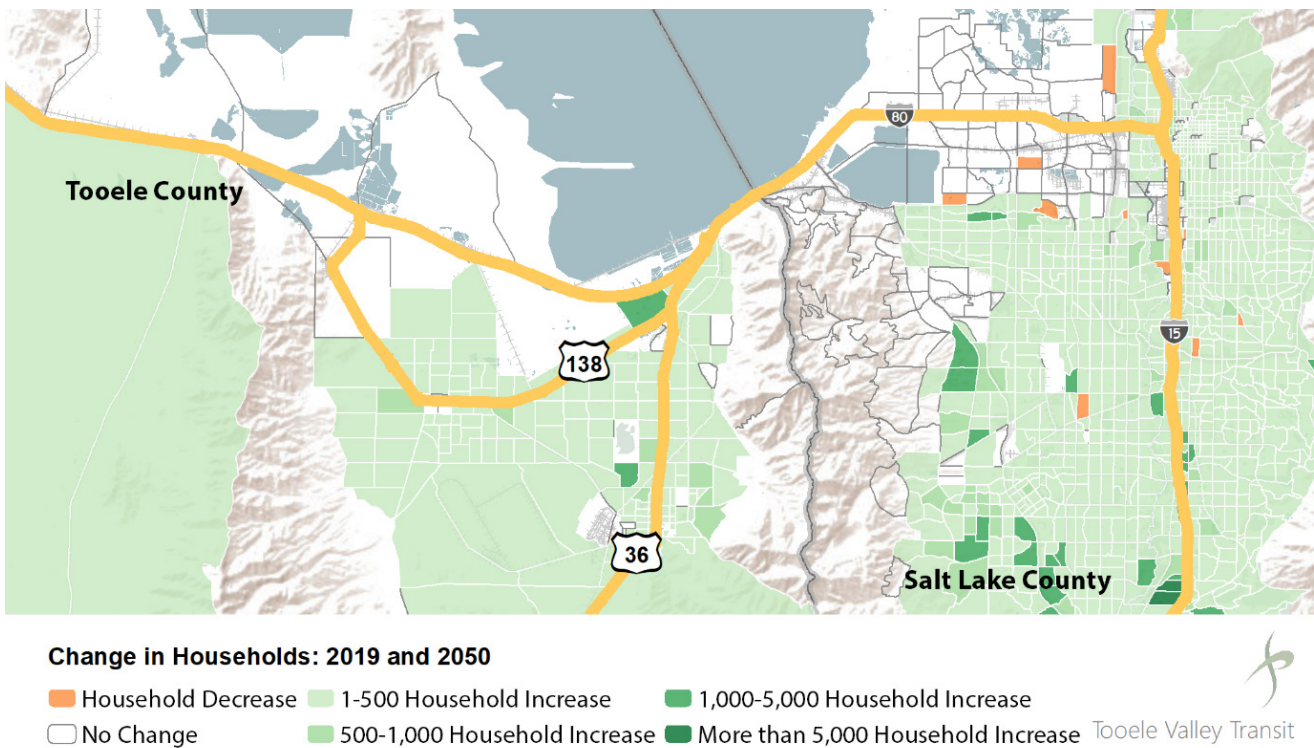


Figure 7: Change in Households between 2019 and 2050

## Employment

In addition to residential land-uses, employment land-uses are also relevant to analyze travel patterns within Tooele County and between Tooele County and Salt Lake County. According to the Department of Workforce Services, most Tooele County workers work outside of Tooele County (approximately 75%), and a smaller share work within the County (approximately 25%). Those that commute outside of Tooele County primarily work in Salt Lake County (approximately 70%). **Figure 8** shows the commuting patterns for Tooele residents and workers.

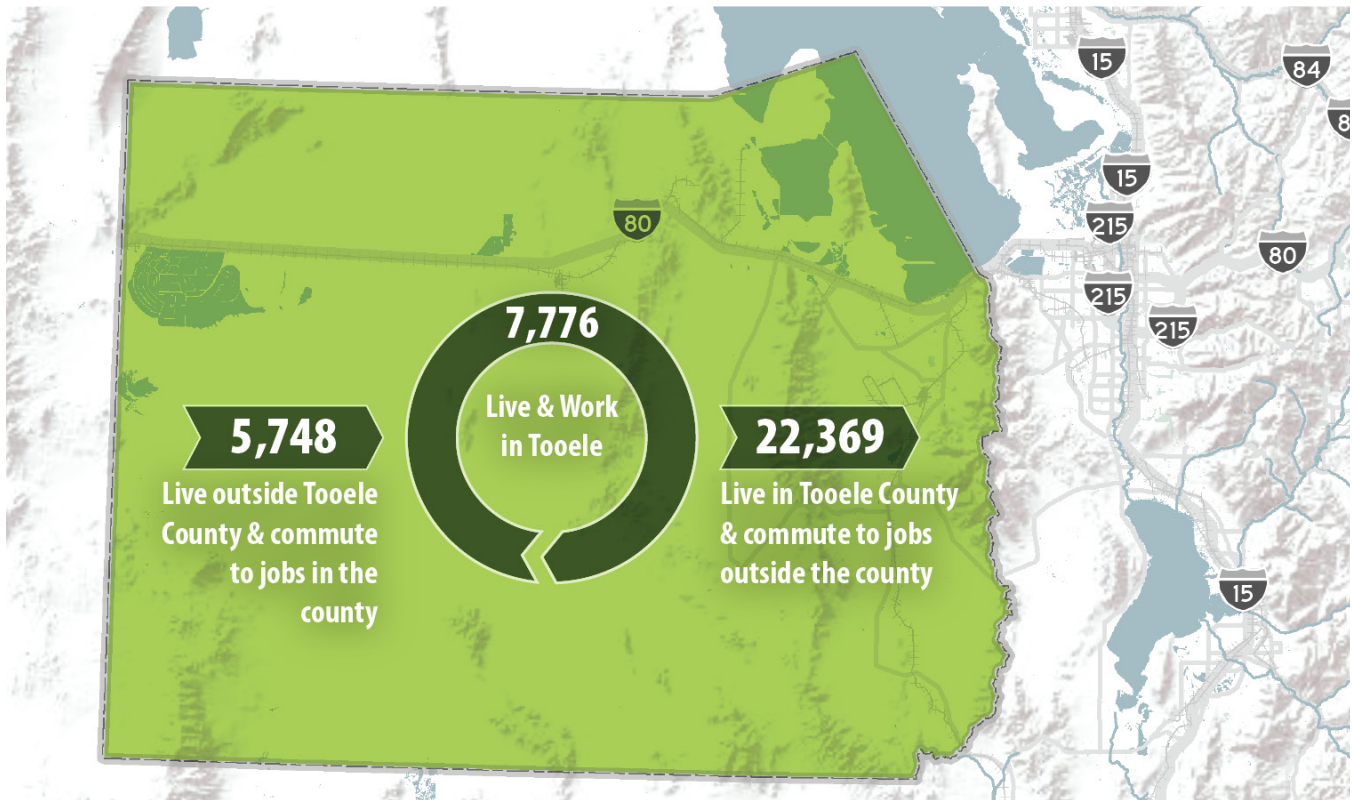


Figure 8: Tooele County Commuting Patterns

Source: Department of Workforce Services (Access 2021)

Within Tooele County, employment is most dense in downtown areas: western Grantsville (Walmart Distribution Center), northern Tooele (Walmart Supercenter), and western Tooele (Peterson Industrial Depot). On the other hand, Salt Lake County has more employment opportunities than Tooele County, as shown in **Figure 9**. This difference in job opportunities can explain the high percentage of Tooele residents leaving the County for work.

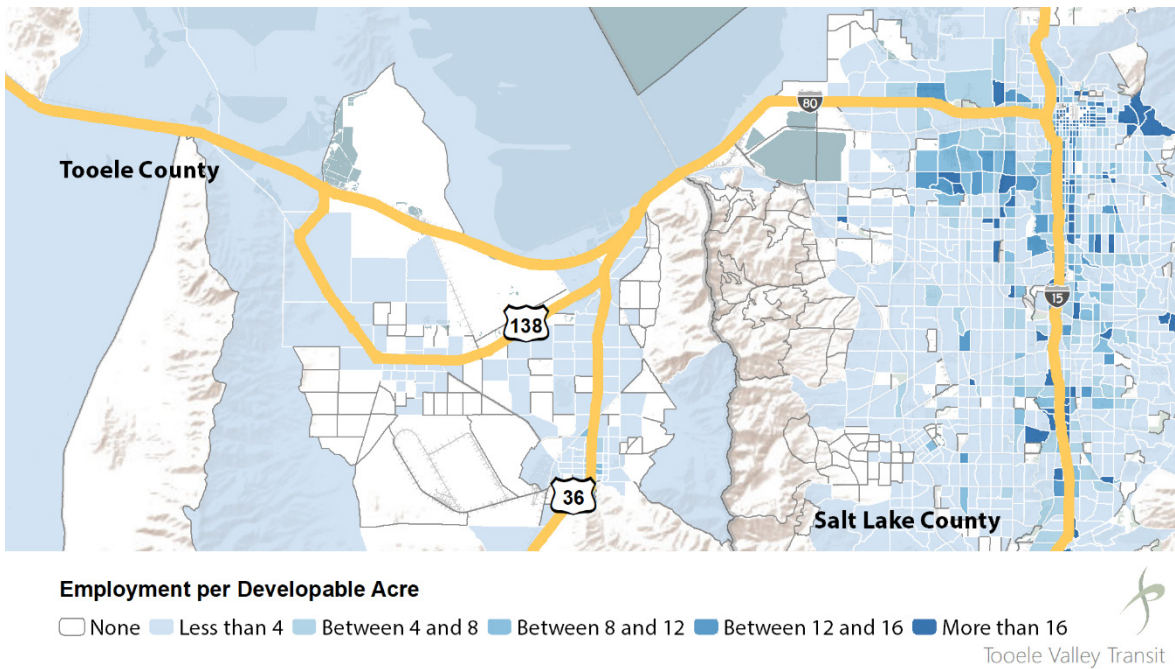


Figure 9: 2019 Jobs per Developable Acre

Source: Wasatch Front Regional Council

In the future, Tooele and Salt Lake Counties are projected to experience employment growth. However, employment growth will be significantly greater in Salt Lake County than in Tooele County. One of the major employment centers that will significantly impact Tooele residents is the Salt Lake City Northwest Quadrant area’s development, as it is closer to Tooele than many other commercial and residential areas. **Figure 10** shows the future employment patterns for both Tooele and Salt Lake Counties, and **Figure 11** shows the employment difference between 2019 and 2050.

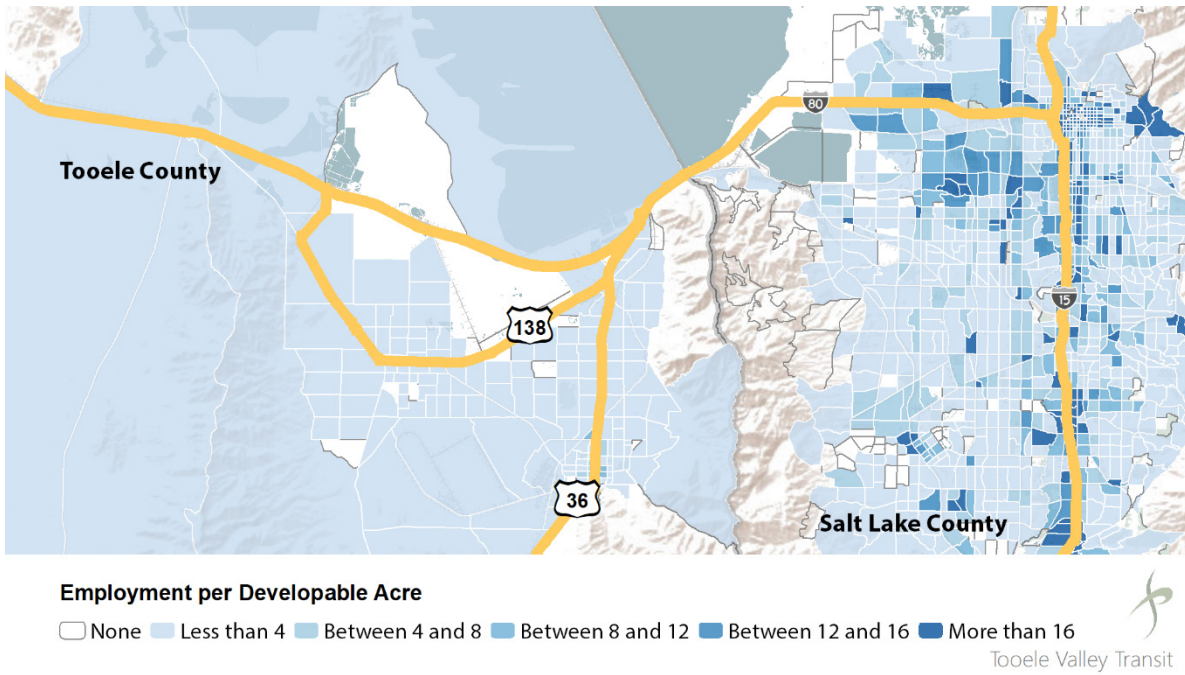


Figure 10: 2050 Jobs per Developable Acre

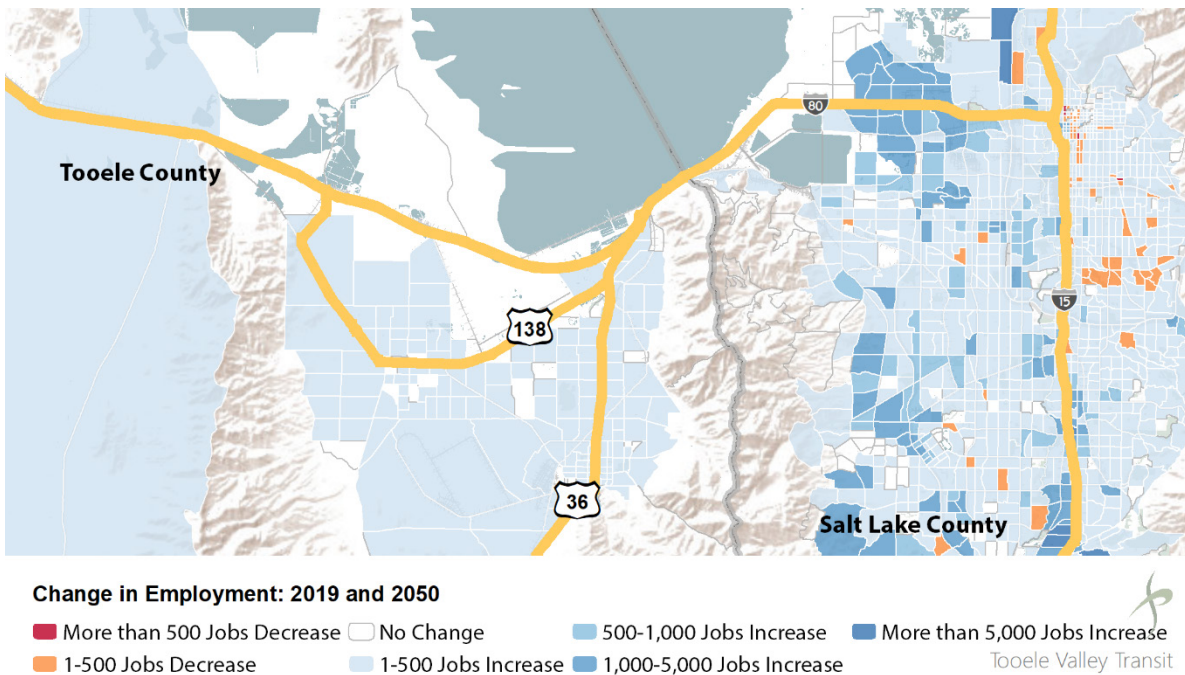


Figure 11: Change in Employment between 2019 and 2050

## Travel Market Analysis

In order to understand potential demand for additional or different transit services to and from Tooele County to various destinations in and beyond Salt Lake County, the study examined existing travel patterns to understand how current trip-making behavior (using all vehicular modes) may inform potential areas for future transit investment.



To understand the diversity of destinations accessed by commuters and other travelers from Tooele County, the project team employed origin-destination data provided by StreetLight Data. This data provider collects samples of trips using mobile phone data (location-based services, or LBS) and aggregates it at the Census Block Group level to provide estimates of travel between origin-destination pairs. In this study, trips to and from populated areas in Tooele County (including Grantsville, Erda, Stansbury Park, Lake Point, and Tooele City) were examined. The data sample used in this study was based on 2019 observed travel patterns.

- The trip ends outside of Tooele County were aggregated to various districts to highlight areas with a high concentration of trips coming from or going to Tooele County. **Figure 12** shows the aggregated trip ends outside of Tooele County. 22% of trips to the Northwest Quad district, including the SR-201 industrial corridor, International District, and Salt Lake City International Airport
- 17% of trips to Eastern Salt Lake City, including the downtown core of Salt Lake City and the University of Utah campus
- 13% of trips to job centers south of the SR-201 corridor, mostly in and around West Valley City

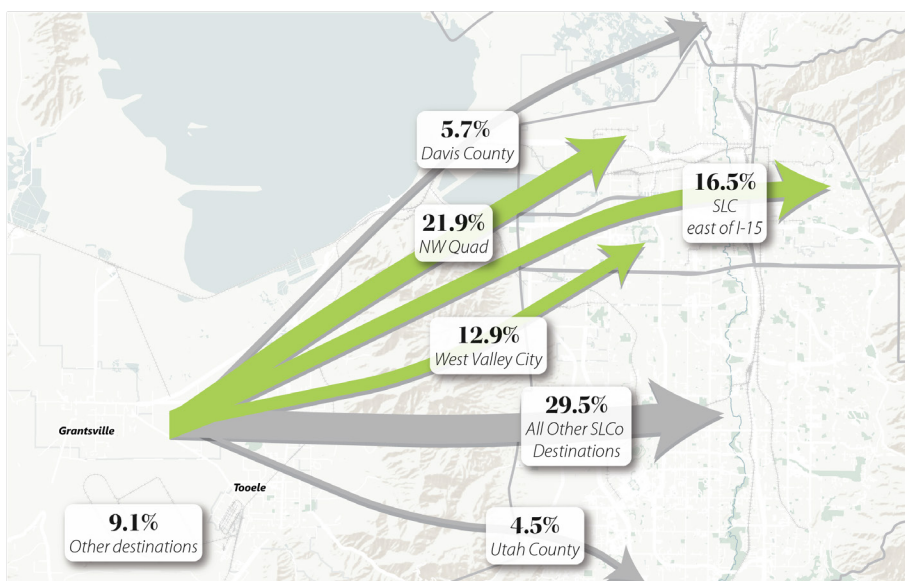


Figure 12: Aggregated trip ends outside of Tooele County

Source: StreetLight Data (2019).

## Traffic Patterns

With a high percentage of Tooele residents commuting outside of the County and knowing there is only one primary way to connect Tooele County with Salt Lake County, congestion and incident delays on the main corridor are expected. As Tooele County experiences significant residential growth and Salt Lake County experiences both employment and residential growth, it is valuable to understand the traffic patterns and issues to prepare and accommodate the increasing demand for the transportation system. Currently, most Tooele County residents travel through at least one of these corridors to access employment and other relevant destinations:

- SR-36
- SR-138
- I-80

To understand the traffic patterns and identify key traffic issues that Tooele County residents experience, three

indicators are presented:

- Annual Average Daily Traffic (AADT)
- Travel Time

### AADT

The 2017 AADT reported by the Utah Department of Transportation (UDOT) indicates that 31,000 vehicles and 44,000 vehicles travel on SR-36 near I-80 and I-80 near SR-36, respectively, on an average day, as shown in **Figure 13**. SR-36 carries many vehicles and is the main roadway connecting Tooele City, Stansbury Park, and Grantsville to Salt Lake County.



Figure 13: 2017 AADT for major roads in Tooele  
 Source: UDOT AADT Dataset (UDOT Data Portal).

### Travel Times

As more vehicles travel through SR-36 onto I-80, travel times are expected to increase. Using data collected by HERE, a third-party vendor that provides travel time and other metrics for UDOT, it was found that a typical trip takes between 34 and 41 minutes to travel from 2400 N / SR-36 in Tooele County to 600 South / State Street in Salt Lake County during the morning peak period. This data was obtained for Tuesdays through Thursdays of September 2019. **Figure 14** shows the travel times reported

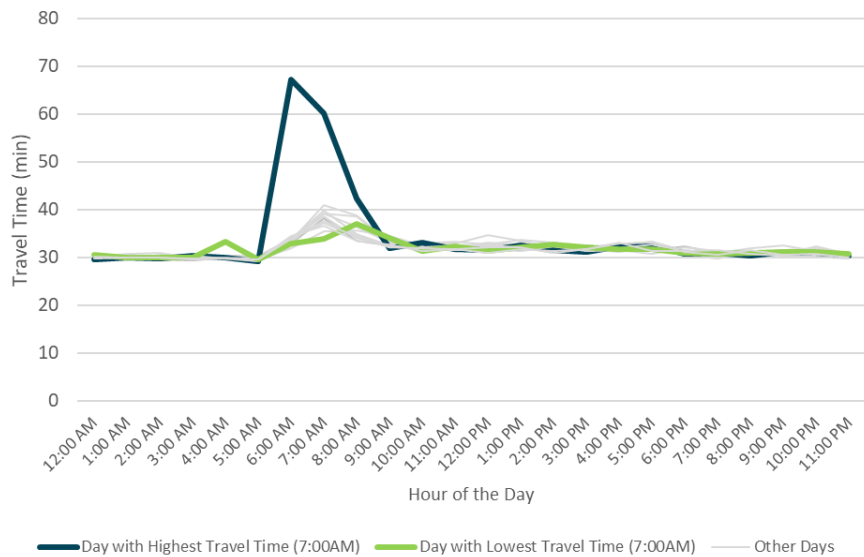


Figure 14: Travel time from 2400 N / SR-36 in Tooele to 600 S. / State St. in Salt Lake (Sept. 2019)

Source: ClearGuide (UDOT).

for September 2019 by hours of the day. The abnormally high travel time on one of the days could result from an incident along the route, which shows a travel time of 67 minutes.

## Transit Service

UTA operates a variety of transit services across the Wasatch Front, with connections to Tooele and Summit Counties. These services range from various types of bus services, vanpools, and rail. In Tooele County, UTA operates five bus lines and a vanpool service. Of those five routes, two are fixed routes, and three are flex routes. Fixed routes are the standard bus service with a fixed alignment and schedule; whereas, flex routes can deviate from their fixed routes, upon request from passengers, up to a three-quarter-mile radius from the regular route. The County also provides transit services such as a medical shuttle, senior transportation, and on-demand service for its residents. The routes serving Tooele County provide service both within the County and between Tooele County and Salt Lake County. Tooele County also has several Park and Ride locations in Tooele City and Stansbury Park. Most Park and Ride locations are surface parking lots for The Church of Jesus Christ of Latter-Day Saints; however, two locations are dedicated UTA Park and Rides built exclusively to serve transit routes. **Figure 15** shows the five routes serving Tooele County with the two dedicated UTA Park and Ride locations, and **Table 1** shows general information of each route.

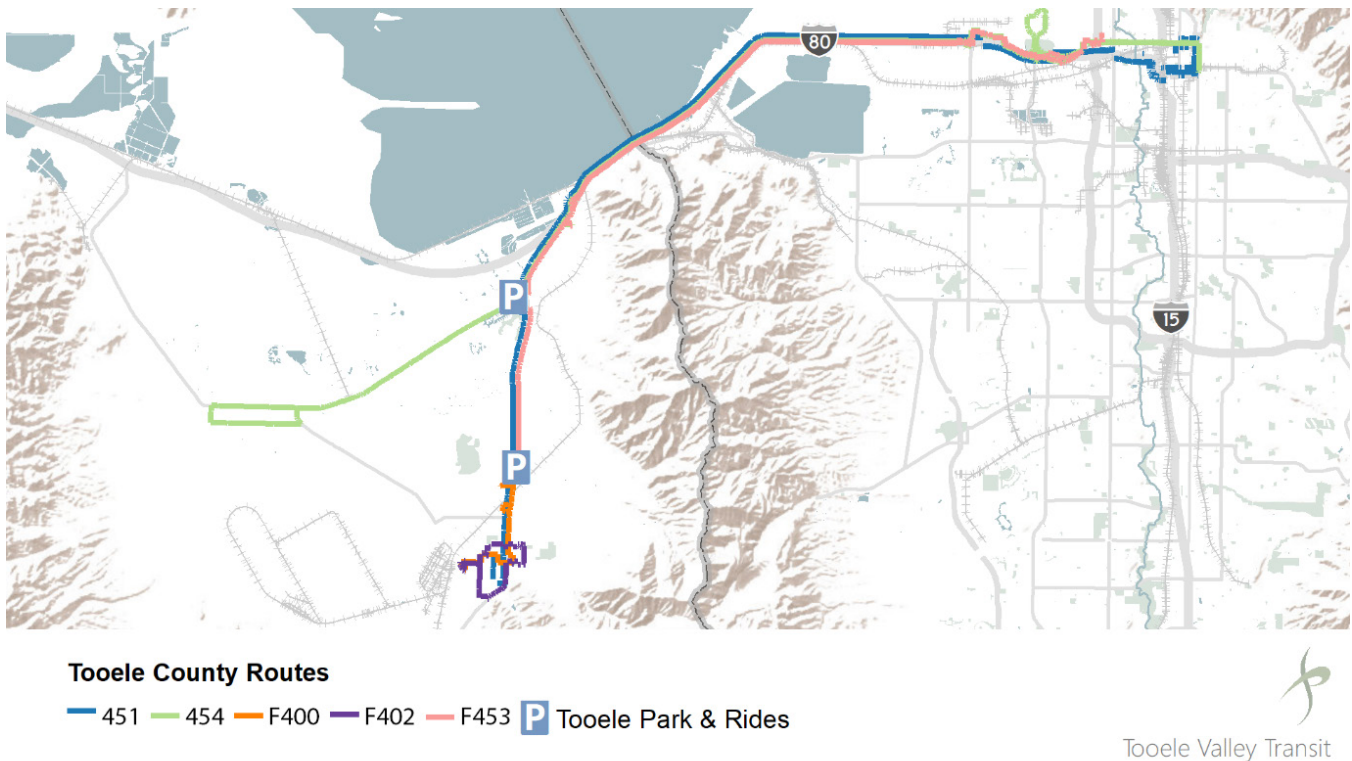


Figure 15: Tooele Transit Service

**Table 1: Transit Overview**

	<b>451</b> Tooele Fast Bus	<b>F453</b> Tooele-SLC Flex	<b>454</b> Grantsville-Salt Lake	<b>F400</b> Tooele Flex	<b>F402</b> Tooele City Circulator
<b>Route Type</b>	Fixed	Flexible	Fixed	Flexible	Flexible
<b>Route</b>	Downtown Tooele City to/from Downtown SLC	Tooele to/from 1940 W. North Temple Station	Grantsville via SLC Airport	2400 N Park and Ride to/from TATC/USU	Circulates counter-clockwise TTC/USU Campus
<b>Approx. Travel Time*</b> <i>(end to end)</i>	1 hour 20 minutes	45 minutes	1 hour 35 minutes	18 minutes	23 minutes
<b>Frequency</b>	30 minutes	60 minutes	30 minutes	30/60 minutes	30/60 minutes
<b>Roundtrip/One Way</b>	Five trips to Salt Lake in AM Five trips to Tooele in PM only	All Day	Five trips to Salt Lake in AM only Five trips to Tooele in PM only	All Day	All Day

\*September 2019

### History of Transit in Tooele County

UTA approved the inclusion of Tooele County in 1990 into its service area, and service began once a vote on the Transit Annexation Proposition passed. In November of 1990, the UTA annexation (inclusion) proposition was approved by a three to one margin in both Tooele City and Grantsville. Bus service to Tooele County began in 1991.

### Bus Service

Transit service in Tooele County recorded over 600 boardings on an average weekday during September 2019, with the two fixed routes as the county’s higher-performing routes. **Table 2** shows the average weekday ridership of the routes serving Tooele County for September 2019.

**Table 2: Daily Route-level Ridership**

	<b>451</b> Tooele Fast Bus	<b>F453</b> Tooele-SLC Flex	<b>454</b> Grantsville-Salt Lake	<b>F400</b> Tooele Flex	<b>F402</b> Tooele City Circulator
<b>Route Type</b>	Fixed	Flexible	Fixed	Flexible	Flexible
<b>Average weekday boardings*</b>	<b>388</b>	<b>56</b>	<b>115</b>	<b>59</b>	<b>19</b>

\*September 2019

As shown in **Table 2**, routes 451 and 454 have the highest ridership per day. Both routes are fixed routes and connect Tooele County with Salt Lake County. **Figure 16** shows the ridership at each stop for these two routes. This figure indicates most of the boardings in Tooele County occur at the two main Park and Ride locations, one at the Benson Grist Mill and the other north of Tooele City (2450 North/ SR-36).

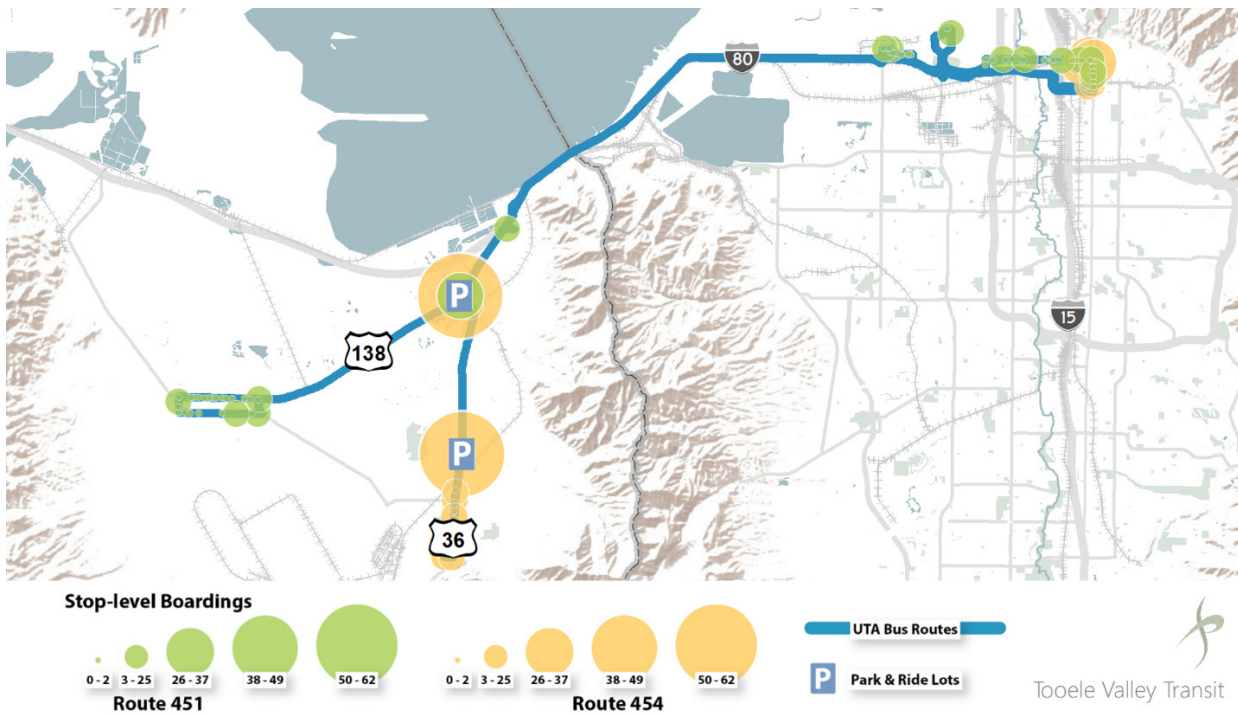


Figure 16: Ridership at each stop for routes 451 and 454  
 Source: UTA Stop-Level Bus Ridership.

### Vanpool Service

In addition to the bus service, Tooele County is served by UTA vanpools. Employees at registered companies create a vanpool account and join others on their commute in vans ranging from six- to fifteen-passenger vans. The vanpool service currently services 27 companies with a total of 458 commuters. **Table 3** shows the top 5 destinations.



**Table 3: Top Five Vanpool Stops**

	GOODYEAR & STARK ROAD, TOOELE COUNTY (MILITARY)	DUGWAY PROVING GROUND (MILITARY)	TOOELE MILITARY BASE (MILITARY)	GOODYEAR ROAD (MILITARY)	UNIVERSITY OF UTAH MEDICAL CAMPUS
# of Daily Commuters	193	79	57	25	21

# CHAPTER

# 3

## COMMUNITY ENGAGEMENT

### Goals and Target Audience

The overarching goal of the public engagement process is to strive for a broad range of meaningful public participation during the study’s planning process. Members of the public should feel ownership over the process and be informed about the study’s findings.

The target audiences of the public engagement were the following groups:

- Residents and commuters in Tooele Valley
- Large employers
- Higher education institutions
- Large landowners/developers in Tooele Valley

### Previous Engagement Efforts





To create a successful engagement strategy that results in the public feedback and information gathering needed for the evaluation without creating outreach fatigue and burnout among residents, the strategies used in recent planning efforts were assessed. This was an important step to understand

what questions and methods people have been asked about transportation and transit in the recent past. The strategies utilized for this planning effort are complementary without being redundant. **Table 4** below outlines the previous planning projects and their associated engagement strategies.

Previous planning efforts have utilized many forms of public engagement related to transportation. The [Tooele County Human Services Coordinated Plan](#) had the most types of engagement efforts, including pop-up events, open houses, questionnaires, and advertisements on UTA buses. Many of the previous plans utilized a website, and often an online or in-person survey was given.

As in previous planning efforts, this study also created an engagement plan for outreach efforts. While there is some overlap with the methods used in previous plans, there were also unique engagement methods such as a Facebook Live broadcast. The team was mindful of refreshing any information used in public engagement materials that may have been used in previous efforts to prevent participants from feeling like they answered the same question a few years ago.

**Table 4: Previous Plan Engagement Strategies**

PLANS	YEAR	IN- PERSON PUBLIC MTGS	ONLINE MTGS	SURVEY FORMAT	WEBSITE	NOTES
Stansbury Park Community Master Plan	2019	2				<i>Informal Internet Survey. Responses in the Appendix (responses illegible)</i>
Tooele County Active Transportation Plan	2018	2	✓		✓	<i>Only one public open house is listed. Appendix missing from the document</i>
Wendover Land- use Map	2017	-	-	-	-	
Tooele City Land- use Map	2017	-	-	-	-	
Tooele County Human Services Coordinated Plan	2016					<i>Focus groups, public hearings, booths set up at community events/expos, and questionnaires. Newspaper articles, meetings with potential user groups, advertisements on vehicles, booths at special events, and disseminating informational brochures. Group presentations and travel training were also provided.</i>
Tooele County General Plan Update	2015	3	-		✓	<i>The plan was developed in conjunction with the Tooele County Transportation Plan. Visual preferences survey.</i>
Tooele County Transportation Plan	2015	3	-	✗	✓	<i>The plan was developed in conjunction with the Tooele County General Plan.</i>
Grantsville Current and Future Land- use Maps	2015	-	-	-	-	
Wendover Land- use Regulations	2015	-	-	-	-	
Dugway Proving Grounds Strategic Plan	2014	-	-	-	-	
Tooele County General Plan (public version, ch 5-9,12,14,16,18-20)	2006	-	-		-	
Original Tooele General Plan (archived version)	2006	-	-	-	-	
Town of Stockton General Plan	2002	-	-	-	-	

## Public Engagement

In addition to targeted stakeholder outreach, the team delivered a robust public outreach program aimed at reaching diverse audiences throughout the county. The team collected public feedback during the initial phases of the study through both an online survey and face-to-face interactions with members of the public at an in-person open house. For this planning effort, the team sought public input through several major outlets, outlined in **Table 5**.

**Table 5: Major Public Input Events**

TYPE	NUMBER OF TIMES THROUGHOUT THE PROJECT AND WHEN	DATES	PURPOSE
<b>Traditional in-person open house</b>	At the beginning of the project <sup>1</sup>	January 30, 2020	<i>Engage directly with the public at an event dedicated to the study, with staff present to answer questions.</i>
<b>Virtual open houses</b>	Once <sup>1</sup>	December 3 to 20, 2020	<i>Engage directly with the public at an event dedicated to the study while keeping all parties safe during the COVID-19 pandemic</i>
<b>Online surveys</b>	Twice. In the beginning, to gather information and during the second open house to gather feedback on alternatives.	January 19 and February 7, 2020 December 3 to 20, 2020	<i>For those not able or willing to attend an in-person meeting, an online survey was available. The content was similar to the information available at the public open house.</i>
<b>A study website</b> ( <a href="http://www.tooeletransit.org">www.tooeletransit.org</a> )	Updated until March 2020		<i>The website was geared towards providing technical information related to the study and updated on a need-be basis.</i>
<b>Facebook Live Broadcast</b>	Once <sup>1</sup>	January 30, 2020	<i>The open house that took place in January 2020 was broadcast onto the UTA Facebook page. Study staff assisted with answering the questions as they arise.</i>

<sup>1</sup> Originally, all open houses were planned as traditional, in-person open houses that would also be broadcast via Facebook Live. The impacts of the global pandemic on public health and the safety of the community necessitated that future open houses be virtual.

There have been two online surveys for public comment and two open houses. The first online survey was available to the public between January 19 and February 7, 2020, and was shared via the study's website, <http://www.tooeletransit.org>, and social media posts from UTA. This survey had over 188 responses during the time it was open to the public. The second online survey was available to the public while the virtual open house took place between December 3 to December 20, 2020. It was shared via a press release, social media posts from UTA. The survey had 1,252 responses during the time it was open to the public.

### Open Houses

Open houses provide an opportunity for interested members of the public to learn about and engage with the study. There were two public open houses for this study: the first one occurred on January 30, 2020, at the Tooele Technical College, and the second one was a virtual event from December 3 to December 20, 2020. All the information gathered from the open houses are incorporated into the final report with results in the [Appendix](#).

UTA and the team advertised each of these events and the online surveys through existing social media channels. **Figure 17** shows the social media advertising graphic used on the various social media sites for the open house events.



Open House #1



Open House #2



Figure 17: Social media advertising graphics for both open houses

## Open House #1

The first open house was an in-person event on the evening of January 30, 2020, at the Tooele Technical College North Multi-Purpose Room, with over 30 people in attendance. This open house was also streamed via Facebook Live, a Facebook social network feature to broadcast real-time video, and moderated by UTA and project team staff. Residents, participants, and viewers were able to submit questions and receive real-time responses. At its high, the streamed open house had over 2,000 participants. UTA advertised the public open house on the “[Active Projects](#)” page on its website and hosted the Facebook event page for the open house. **Figure 18** shows the open house set-up at the Tooele Technology Applied College.



Figure 18: The first open house at the Tooele Applied Technology College, January 30, 2020

The first open house’s focus aimed to **identify the public’s thoughts on transit issues, concerns, gaps, and successes in the Tooele Valley**. All engagement materials were focused on listening to what the public considers are the existing transit system’s strengths and weaknesses, including first-last-mile connections and internal transit circulation.

In preparation for the open house, the project team prepared engaging boards to present relevant project information and request feedback on the study’s vision, goals, and other pertinent items, such as trip origins and destinations and barriers to transit service. Prior to the event, a project team member performed a limited survey of bus riders to learn about rider’s experiences and recommendations for improvements. During the open house, the materials were being streamed via Facebook Live to present and request information in real-time from Tooele residents not in attendance.

## Open House #1 Engagement Boards

A series of engagement boards were prepared for the open house to convey information. An image of each board is included below, with the primary community feedback to the right. Larger versions of these boards and feedback are located in the Appendix.

# VISION & GOALS

WHAT DOES THE FUTURE LOOK LIKE?



## TELL US WHAT YOU THINK OF THE VISION STATEMENT:

The tooele valley transit study will use input from the community along with technical analysis to provide **clear, milestone-driven strategies** to achieve an integrated transportation system. As tooele valley grows, well-planned, funded, and sustainable transit options should be phased ahead of development to create an overall system **that helps reduce travel times and provides transportation choices** for residents and visitors alike.

## Vision and Goals

- Provide improved service for commuters for jobs in SLC (versus internal Tooele Valley service)

# BARRIERS TO TRANSIT

WHAT MAKES IT DIFFICULT TO USE TRANSIT?

RATE HOW MUCH YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS:	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE
Transit doesn't go where I need to go				
Traveling by transit takes too long				
It's too hard to get to the stop (i.e. there are missing sidewalks on the route to the stop)				
There isn't enough parking at stations / stops				
Riding transit feels unsafe / uncomfortable				
Transit is too expensive for me				
Service is too unreliable				
Riding transit doesn't allow me to be flexible or spontaneous with my schedule				
There are too many stops to reach my destination or I must transfer too many times				
No transit service near where I work or live				
Transit does not run at the dates or times I need				
I am not interested or unwilling to use transit				
Other comment? Or, wish to elaborate on your responses above? Please use the comment card:				

## Barriers

- Traveling by transit takes too long
- Riding transit doesn't allow me to be flexible with my schedule
- No direct connection to any job center – everyone must transfer

# WHAT DO YOU WANT TRANSIT IN TOOELE VALLEY TO LOOK LIKE?

**We can prioritize service a few different ways:**

(PICK ONE)

We can focus on **more localized service** that connects destinations within Tooele Valley.

We can provide **service for commuters** to areas of high job concentration in Salt Lake.

## Feedback

- Confusing downtown
- Getting from TRAX to the final destination

## Open House #1 Facebook Live Broadcast

The project study team worked with UTA's Community Engagement and Communication departments to broadcast a Facebook Live event during the open house and gather comments and survey responses in real-time. The broadcast was hosted from the UTA Facebook site, and UTA staff members were present to MC the event to the "Live" online audience. Key stakeholders were assigned to host and answer "Live" participants' questions that came through in the Facebook Live chat. While nearly 40 people attended the open house in person, over 2,100 people watched the livestream both during and after the event. The record of these events is kept on UTA's Facebook page and will remain so, as long as UTA deems it appropriate.

## Open House #1 Survey

The first online survey materials and responses were published on UTA's site after all the first open house information was processed. The survey consisted of three questions and had 188 responses. These questions were identical to the ones asked at the in-person open house. Online survey participants had similar feedback to that of in-person respondents – traveling by transit takes too long, transit doesn't allow flexibility in their schedules, there are too many stops to reach their destinations, and one must transfer too many times. Online respondents also indicated a strong perception that TRAX or FrontRunner would be coming to Tooele Valley.

## Open House #2

Due to public health and safety concerns stemming from the COVID-19 pandemic, the second Tooele transit open house took place online. The open house was advertised and promoted by UTA social media outlets and via a press release written by the project team and released by UTA communication staff. The virtual open house consisted of a website containing all pertinent study information and six questions relating to the transit alternatives and soliciting input and comments. The alternatives consisted of mixed flow express bus, mixed flow bus with limited stops, shoulder running Bus Rapid Transit (BRT), and commuter rail (FrontRunner). Handouts of each alternative were provided on the website and are included in this document. The open house was digitally accessible to the public for two and a half weeks, from December 3 to December 20, 2020. The open house received over 1,200 unique respondents. On December 3, the first day of the virtual open house, KSL News media picked up the press release and published it on their website, [www.ksl.com](http://www.ksl.com), above the scroll - as a top story. There was a high volume of respondents in the beginning as a result of this article. Nearly 65% of total responses occurred on the first day of the virtual open house. It is unknown how many people accessed the open house information from KSL or other sources.

This virtual open house gathered valuable responses from the public on the potential future transit alternatives. Many respondents view the current transit service in Tooele as a problem that needs to be addressed. Alternative 4, heavy rail, was the most liked. Many also suggested a light rail (TRAX) line extension. Alternative 1, Mixed Flow Bus, comparable to the existing service offered in September 2019, was the least liked.

All comments and results from the virtual open house were compiled and processed by the project team and transferred to UTA.

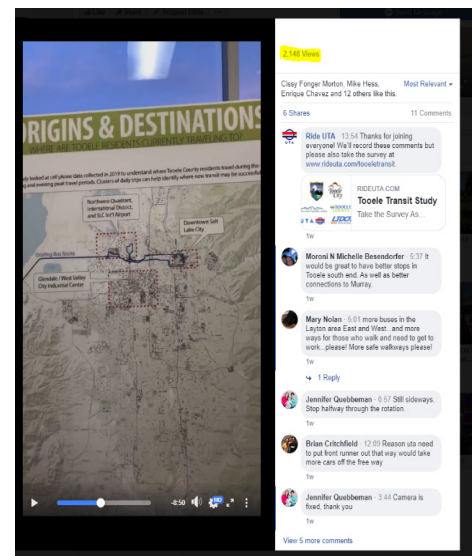


Figure 19: A screenshot of the Facebook Live event with public comments

## Open House #2 Engagement Boards

A series of boards were prepared for the virtual open house to convey information engagingly. An image of each is included below, with the primary community feedback to the right. Larger versions of these boards and feedback are located in the Appendix.

## Open House #2 Online Survey

The second online survey materials were published when the second open house was opened. The survey consisted of six questions and had 1,252 responses. The participants common themes include the aforementioned TRAX line extension, a combination of the proposed alternatives, and connections to Grantsville, Stansbury Park, and Wendover. Many comments related to alternate paths through Butterfield/Middle Canyon. Other feedback that was received included extending night and weekend service and increasing the frequency of service. Summaries of results are included below.

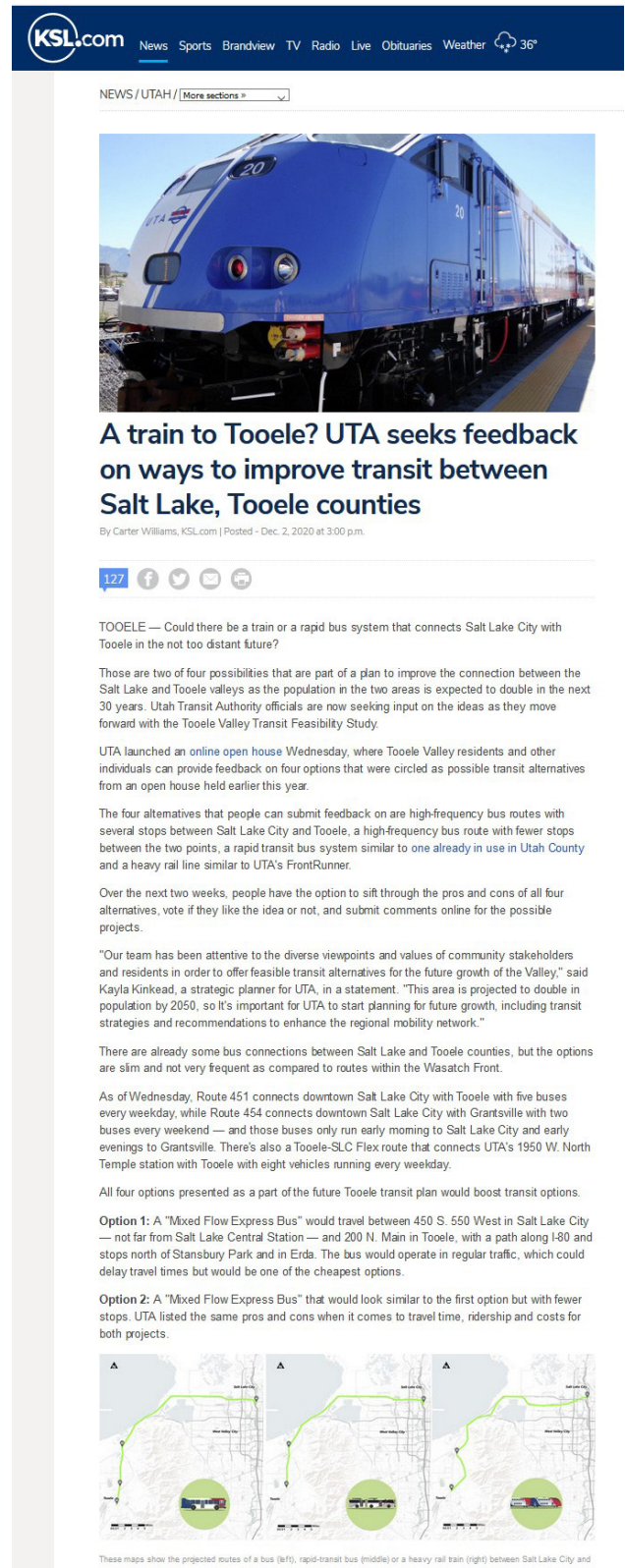


Figure 20: Screenshot of KSL Media article, www.ksl.com

# TOOELE VALLEY TRANSIT

# WELCOME! VIRTUAL OPEN HOUSE

## PURPOSE OF THIS VIRTUAL MEETING:

- UPDATE ON PROJECT PROGRESS
- INTRODUCE THE DRAFT TRANSIT ALTERNATIVES
- HEAR FROM YOU ABOUT THE ALTERNATIVES



## THE STORY SO FAR

### Project Progress

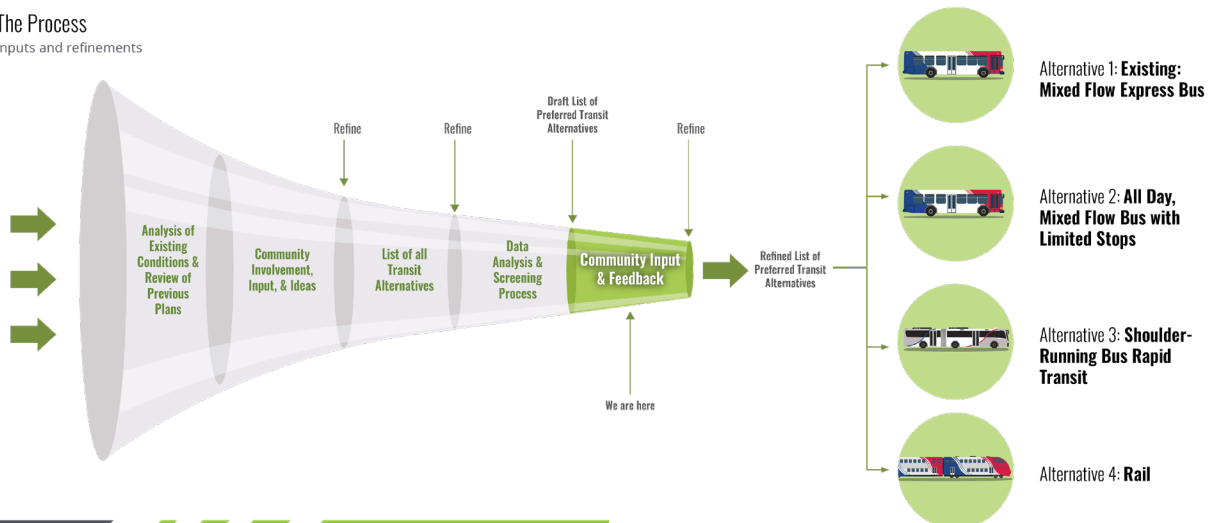
Since our last public open house in January, we took the community's wealth of ideas, analyzed existing conditions, and created a list of all possible transit options or alternatives. We took this list and refined it through a technical screening process. There are now four alternatives that UTA is

considering. We are interested in hearing from you. **What do you think about each of these alternatives? Would you use any of them?** On the following pages, each alternative is presented with the fact sheet that can be downloaded and reviewed. These contain a description of the alternative and

its significant features, advantages, and disadvantages, and the preliminary performance of each alternative, including approximate travel time between 2400 N Park & Ride and Salt Lake City, ridership for the overall route, and cost.

### The Process

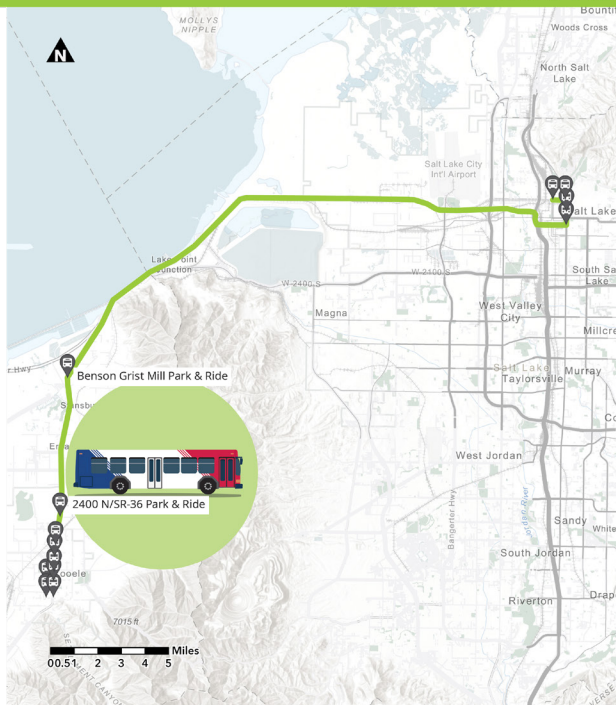
Inputs and refinements



## At a Glance

	General Route	Stops	Exclusive Lanes/Alignment	Service
<b>ALTERNATIVE 1: EXISTING: MIXED FLOW EXPRESS BUS</b>	I-80 and SR-36	<ul style="list-style-type: none"> <li>» Tooele City (multiple stops)</li> <li>» 2400 N/SR-36 Park &amp; Ride lot</li> <li>» Benson Grist Mill Park &amp; Ride lot</li> <li>» Salt Lake City (multiple stops)</li> </ul>	<ul style="list-style-type: none"> <li>» Mixed flow with automobile traffic</li> </ul>	<ul style="list-style-type: none"> <li>» Weekday service only during typical commute times (30 min frequency)</li> </ul>
<b>ALTERNATIVE 2: ALL DAY, MIXED FLOW BUS WITH LIMITED STOPS</b>	I-80 and SR-36	<ul style="list-style-type: none"> <li>» 2400 N/SR-36 Park &amp; Ride lot</li> <li>» Benson Grist Mill Park &amp; Ride lot</li> <li>» Salt Lake City (multiple stops)</li> </ul>	<ul style="list-style-type: none"> <li>» Mixed flow with automobile traffic</li> </ul>	<ul style="list-style-type: none"> <li>» All day weekday service with more frequent service during typical commute times (30 min frequency)</li> </ul>
<b>ALTERNATIVE 3: SHOULDER-RUNNING BUS RAPID TRANSIT</b>	I-80 and SR-36	<ul style="list-style-type: none"> <li>» 2400 N/SR-36 Park &amp; Ride lot</li> <li>» Benson Grist Mill Park &amp; Ride lot</li> <li>» Salt Lake City (multiple stops)</li> </ul>	<ul style="list-style-type: none"> <li>» Use of shoulders on SR-36 and I-80</li> </ul>	<ul style="list-style-type: none"> <li>» All day weekday service with more frequent service during typical commute times (15 min frequency)</li> </ul>
<b>ALTERNATIVE 4: RAIL</b>	Adjacent to existing Union Pacific line	<ul style="list-style-type: none"> <li>» Tooele City North</li> <li>» Benson Grist Mill area</li> <li>» Salt Lake City</li> </ul>	<ul style="list-style-type: none"> <li>» Dedicated rail corridor</li> </ul>	<ul style="list-style-type: none"> <li>» All day weekday service (30 min frequency)</li> </ul>

## EXISTING: MIXED FLOW EXPRESS BUS ALTERNATIVE



### At a Glance

General Route	Stops	Exclusive Lanes/Alignment	Service
I-80 and SR-36	<ul style="list-style-type: none"> <li>» Tooele City (multiple stops)</li> <li>» 2400 N/SR-36 Park &amp; Ride lot</li> <li>» Benson Grist Mill Park &amp; Ride lot</li> <li>» Multiple stops in Salt Lake City</li> </ul>	<ul style="list-style-type: none"> <li>» Mixed flow with automobile traffic</li> </ul>	<ul style="list-style-type: none"> <li>» Weekday service during typical commute times (30 min frequency)</li> </ul>

### Advantages

- » This alternative provides express bus service to employment centers and housing in Tooele City and Salt Lake City.
- » This alternative has one of the lowest estimated costs per rider.
- » Buses are flexible and service can be added or reduced depending on needs.

### Disadvantages

- » This alternative is subject to the same traffic conditions as other automobiles, limiting overall efficiency.
- » Service would only run to Salt Lake City in the morning and to Tooele in the afternoon.

### 2050 Preliminary Performance

#### RIDERSHIP PER DAY



#### FUTURE TRAVEL TIME

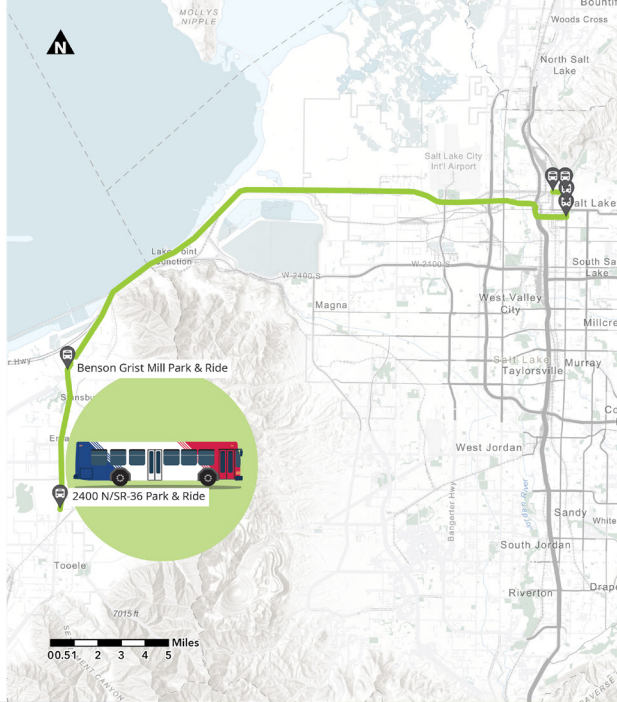
Morning travel time from 2400 N/SR-36 Park & Ride lot to 600 S./State Street in Salt Lake City



#### CAPITAL COST



# ALL DAY, MIXED FLOW BUS WITH LIMITED STOPS ALTERNATIVE



## At a Glance

General Route	Stops	Exclusive Lanes/Alignment	Service
I-80 and SR-36	<ul style="list-style-type: none"> <li>2400 N/SR-36 Park &amp; Ride lot</li> <li>Benson Grist Mill Park &amp; Ride lot</li> <li>Salt Lake City (multiple stops)</li> </ul>	Mixed flow with automobile traffic	All day weekday service with more frequent service during typical commute times (30 min frequency)

## Advantages

- Buses are flexible and service can be added or reduced depending on needs.
- This alternative would have all day service with more frequent service during typical commute times.
- The total route travel time of this alternative would be shorter than the Existing Mixed Flow Express Bus because it doesn't go through Tooele City.

## Disadvantages

- This alternative has fewer stops than the Existing Mixed Flow Express Bus alternative. People living in Tooele City will need to drive to and from the 2400 N/SR-36 Park & Ride lot.
- This alternative is subject to the same traffic conditions as other automobiles, limiting overall efficiency.

## 2050 Preliminary Performance

### RIDERSHIP PER DAY

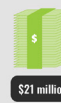


### FUTURE TRAVEL TIME

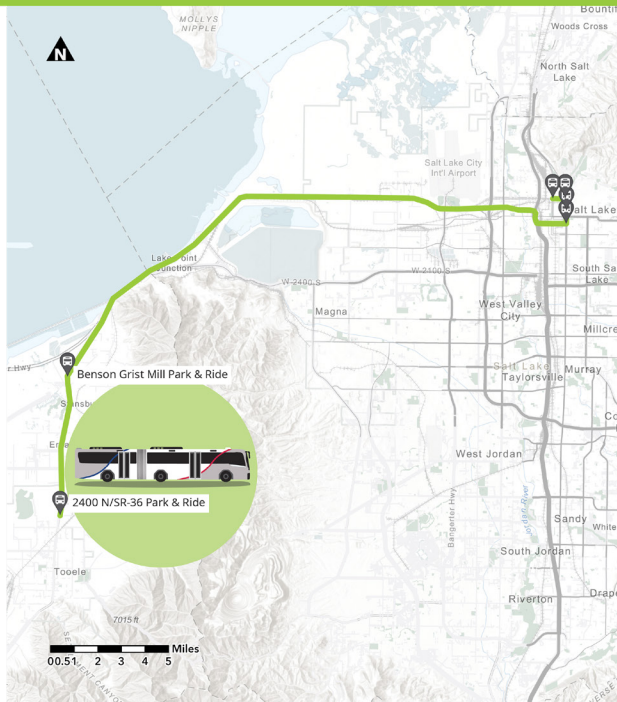
Morning travel time from 2400 N/SR-36 Park & Ride lot to 600 S./State Street in Salt Lake City



### CAPITAL COST



# SHOULDER-RUNNING BUS RAPID TRANSIT ALTERNATIVE



## At a Glance

General Route	Stops	Exclusive Lanes/Alignment	Service
I-80 and SR-36	<ul style="list-style-type: none"> <li>2400 N/SR-36 Park &amp; Ride lot</li> <li>Benson Grist Mill Park &amp; Ride lot</li> <li>Salt Lake City (multiple stops)</li> </ul>	Use of shoulders on SR-36 and I-80	All day weekday service with more frequent service during typical commute times (15 min frequency)

## Advantages

- This alternative provides high-frequency bus service to employment centers and high-density opportunities in Tooele City and Salt Lake City.
- This alternative is the fastest of all the bus alternatives.
- This alternative avoids most of the congestion that other alternatives pass through.
- This alternative has the highest forecasted ridership.

## Disadvantages

- Lane enforcement can be a challenge.
- Requires partnership and compliance with UDOT.

## 2050 Preliminary Performance

### RIDERSHIP PER DAY



### FUTURE TRAVEL TIME

Morning travel time from 2400 N/SR-36 Park & Ride lot to 600 S./State Street in Salt Lake City

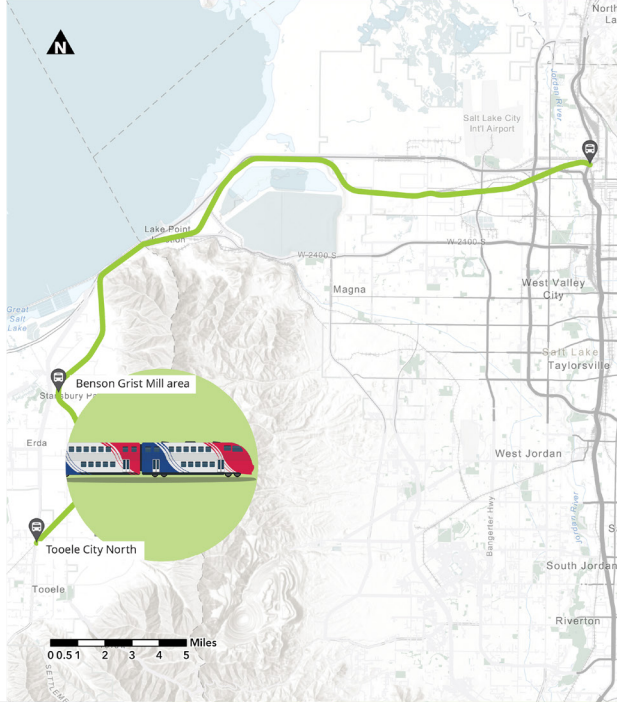


### CAPITAL COST





# RAIL ALTERNATIVE



## At a Glance

General Route	Stops	Exclusive Lanes/Alignment	Service
Adjacent to existing Union Pacific line	<ul style="list-style-type: none"> <li>Tooele City North</li> <li>Benson Grist Mill area</li> <li>Salt Lake City</li> </ul>	<ul style="list-style-type: none"> <li>Dedicated rail corridor</li> </ul>	<ul style="list-style-type: none"> <li>All day weekday service (30 min frequency)</li> </ul>

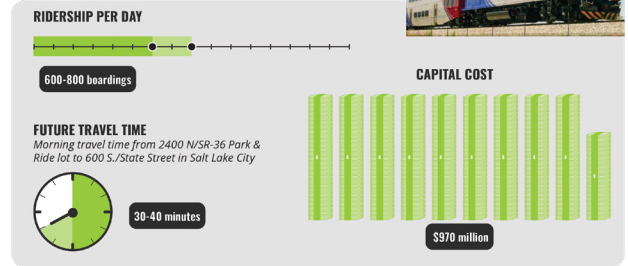
## Advantages

- » This alternative provides rail service to the existing commuter rail system on the Wasatch Front.
- » This alternative avoids the congested areas that other alternatives pass through.
- » Commuter rail has a high seating capacity per trip.

## Disadvantages

- » This alternative requires extensive coordination with Union Pacific.
- » This alternative requires purchase of Union Pacific Right-of-Way.
- » This alternative has the highest estimated cost.
- » This alternative is not as flexible as the other alternatives (alignment and stops are not easy to modify).

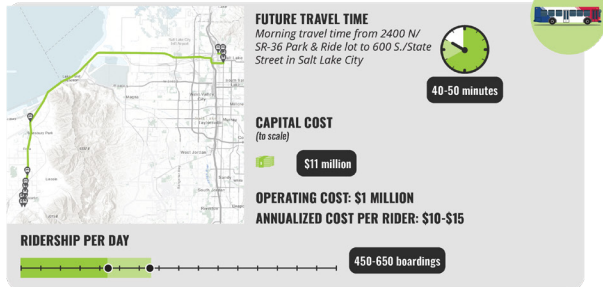
## 2050 Preliminary Performance



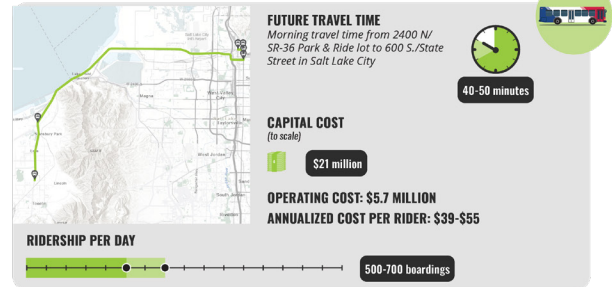
# ALTERNATIVES AT-A-GLANCE

## Preliminary 2050 Performance

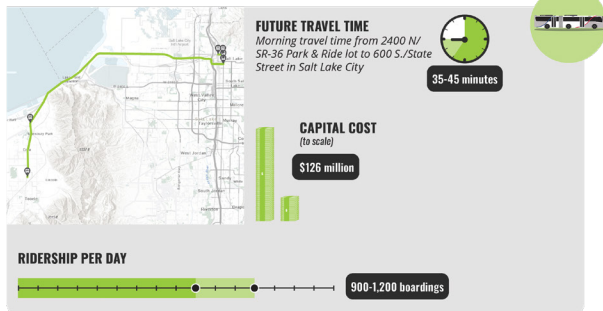
### Alternative 1: Existing: Mixed Flow Express Bus



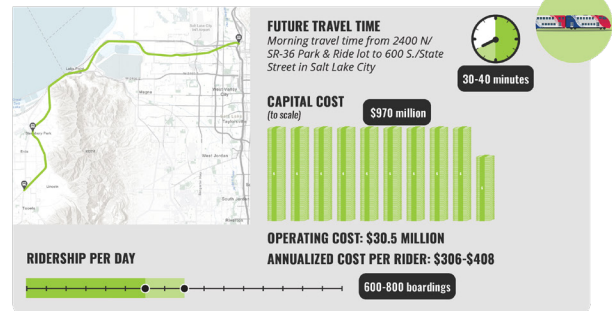
### Alternative 2: All Day, Mixed Flow Bus with Limited Stops



### Alternative 3: Shoulder-Running Bus Rapid Transit



### Alternative 4: Rail



## 2050 Preliminary Performance

The table below compares the preliminary performance for 2050 of each alternative on several criteria: estimated 2050 average weekday transit ridership, travel time between 2400 North/SR-36 and Salt Lake City, and capital costs.

	Existing: Mixed Flow Express Bus	All Day, Mixed Flow Bus with Limited Stops	Shoulder-Running Bus Rapid Transit	Rail
<b>TRAVEL TIME</b> <i>Morning travel time from 2400 N/SR-36 Park &amp; Ride lot to 600 S./State Street in Salt Lake City</i>	40-50 minutes	40-50 minutes	35-45 minutes	30-40 minutes
<b>RIDERSHIP PER DAY</b>	450-650	500-700	900-1,200	600-800
<b>CAPITAL COST</b>	\$11 million	\$21 million	\$126 million	\$970 million

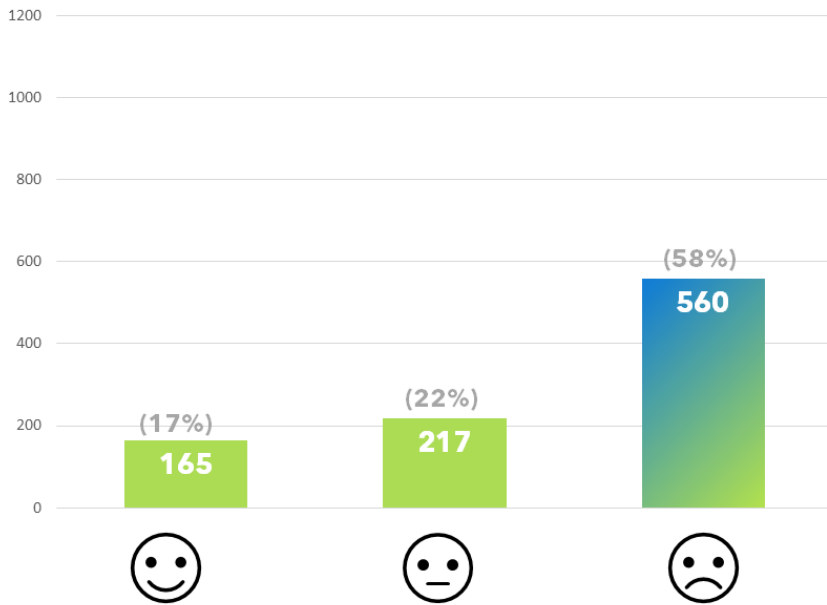
## 2050 Preliminary Performance

The table below compares the preliminary performance for 2050 of each alternative on several criteria: estimated 2050 average weekday transit ridership, travel time between 2400 North/SR-36 and Salt Lake City, and capital costs.



	Existing: Mixed Flow Express Bus	All Day, Mixed Flow Bus with Limited Stops	Shoulder-Running Bus Rapid Transit	Rail
<b>TRAVEL TIME</b> <i>Morning travel time from 2400 N/SR-36 Park &amp; Ride lot to 600 S./State Street in Salt Lake City</i>				
<b>RIDERSHIP</b>				
<b>CAPITAL COST</b>				
<b>OPERATING COST</b>				
<b>ANNUALIZED COST PER RIDER</b>				

### Alternative 1: What do you think about a Mixed Flow Express Bus?



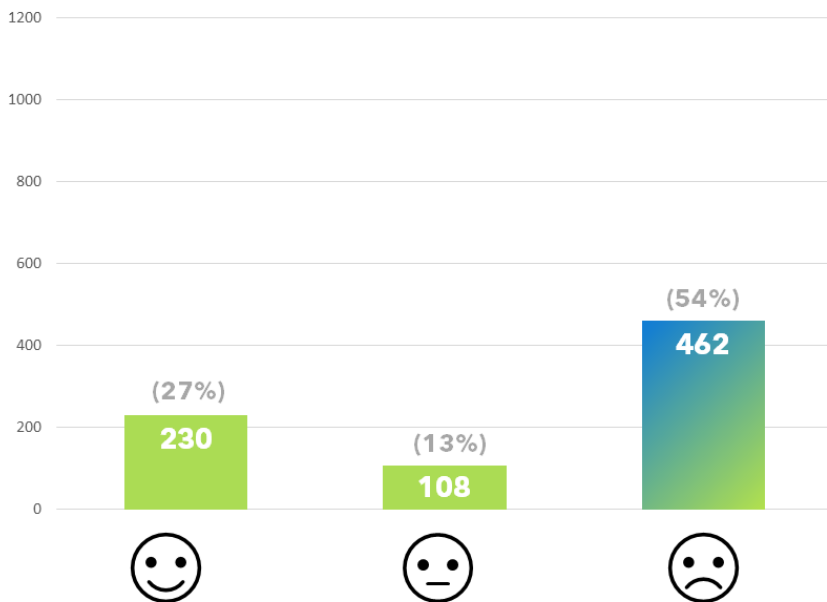
**942**  
Responded

75% respondents out of all 1,252 answered this question.

**184**  
Additional Comments

25% of respondents to this question had additional comments

### Alternative 2: What do you think about an all-day, Mixed Flow Bus with Limited Stops?



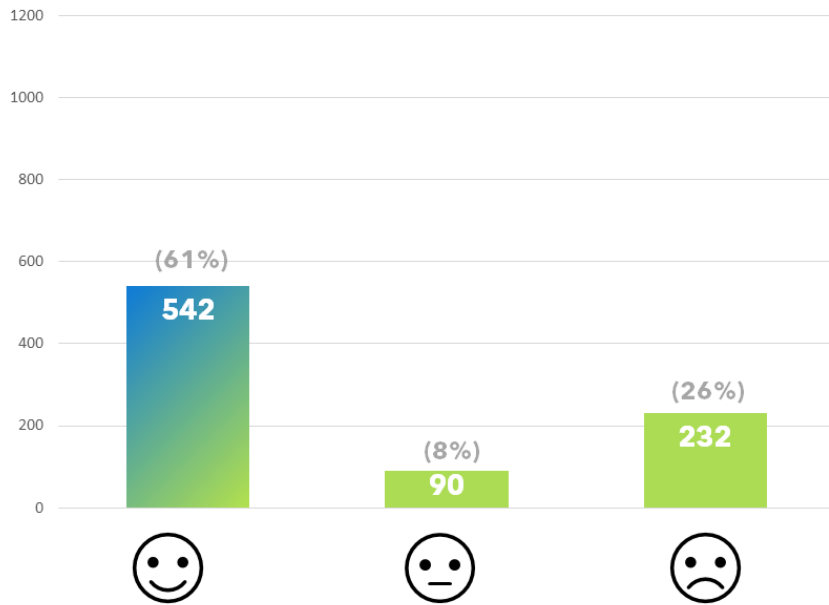
**800**  
Responded

64% respondents out of all 1,252 answered this question.

**176**  
Additional Comments

22% of respondents to this question had additional comments

### Alignment #3: What do you think about Shoulder-Running Bus Rapid Transit (BRT)?



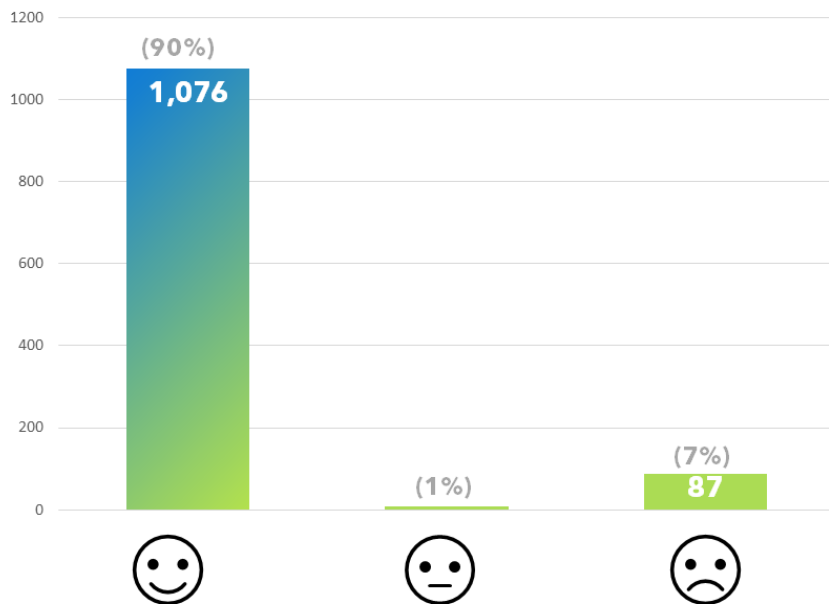
**844**  
Responded

867% respondents out of all 1,252 answered this question.

**203**  
Additional Comments

24% of respondents to this question had additional comments

### Alignment #4: What do you think about a heavy rail option, like FrontRunner?



**1,173**  
Responded

94% respondents out of all 1,252 answered this question.

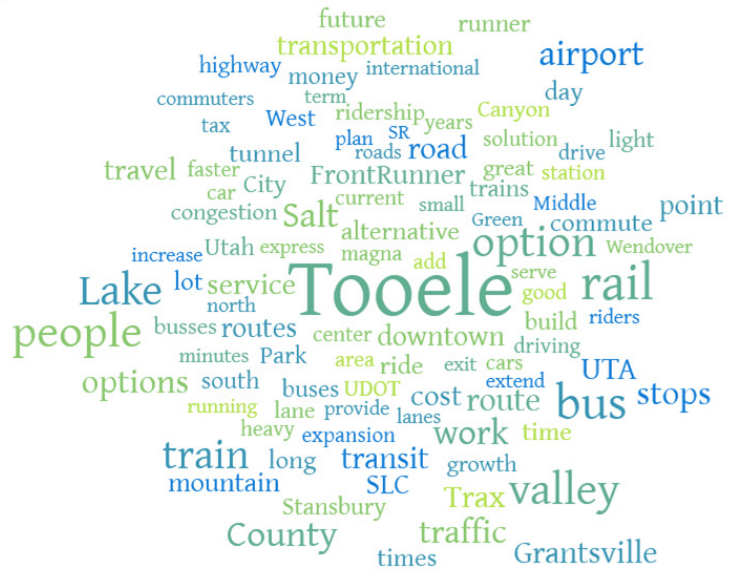
**362**  
Additional Comments

31% of respondents to this question had additional comments

### Q5: Are we missing anything?

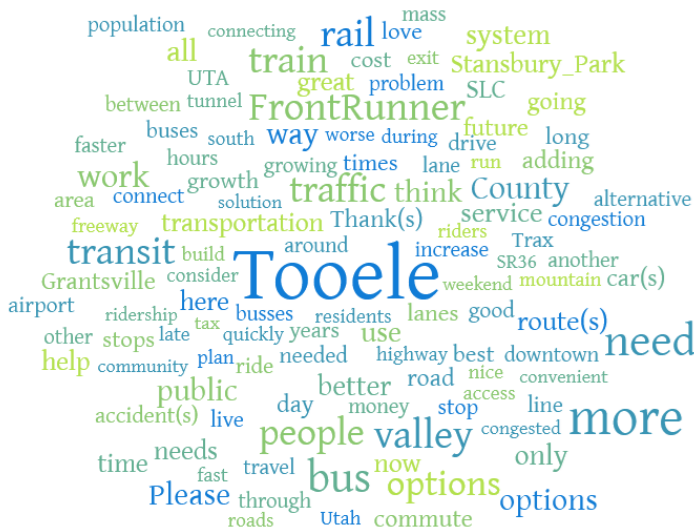
**1,164** 93% respondents out of all 1,252 answered this question.  
**Responded**

22% of respondents to this question had additional comments despite only 236 respondents indicating "Yes" to this question.  
**259**  
**Additional Comments**



### Q6: Do you have any other comments or feedback related to public transit in the Tooele Valley?

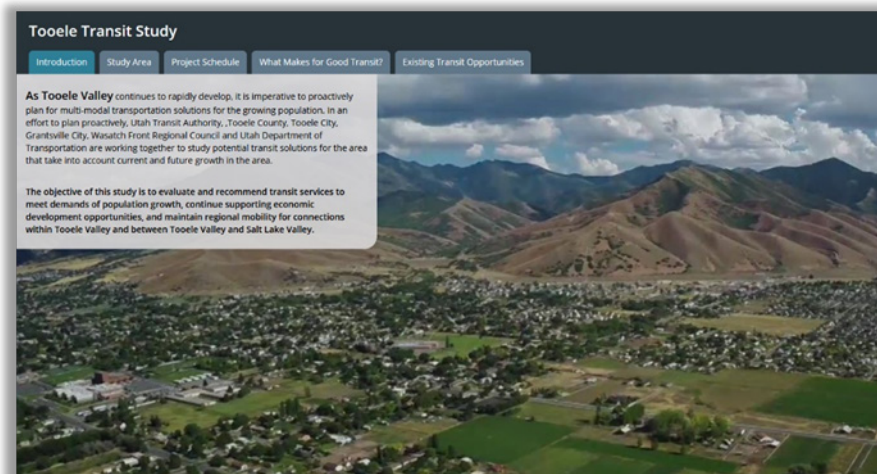
All pertinent words or phrases with text sizes varied by frequency



**37%** 464 respondents out of all 1,252 had additional comments.  
**Answered**

## Study Website

The study website, <http://www.tooeletransit.org/>, served as an information announcement for the project until March 2020. UTA linked to the study website on their hosted project page.



## Stakeholder Engagement

The team also engaged with select development and agency stakeholders in the Tooele area during the first half of the study:

- **Kennecott Corporation** – to learn more about their proposed, large-scale development, including timing, land use types, access, and location;
- **Salt Lake City Transportation Division** – to learn about any plans for greater connectivity and transit-supportive land use concepts in the greater northwest quad of the City;
- **Tooele County Planning** – this was a series of meetings related to growth assumptions and projects in the County, a key factor in the study. Also involved were UTA, UDOT, and WFRC

## Committee Structure

At the onset of the study, the team worked with local staff to create a Project Management group and a Stakeholder Committee. The Project Management Group met every two weeks throughout the planning process to coordinate and discuss the study progress, set and coordinate stakeholder and public meetings, and discuss the next steps. Members are shown in **Table 6**.

**Table 6: Project Group Members**

	Title	Affiliation
<b>James Walz</b>	Public Works Director	Grantsville City
<b>Andrew Aagard</b>	City Planner/Zoning Administrator	Tooele City
<b>Jim Bolser</b>	Community Development Director	Tooele City
<b>Paul Hansen</b>	City Contract Engineer	Tooele City
<b>Jeff Miller</b>	Planner	Tooele County
<b>Kim Clausing</b>	Health Educator	Tooele Health Department
<b>Cissy Morton</b>	Transportation Mobility Manager	Tooele Health Department
<b>Grant Farnsworth</b>	Region 2 Planning Manager	UDOT
<b>Oanh Le-Spradlin</b>	Project Manager	UDOT
<b>Eric Callison</b>	Manager, Service Planning	UTA
<b>Kerry Doane</b>	Manager, Long Range Strategic Planning	UTA
<b>Laura Hanson</b>	Director of Planning	UTA
<b>Kayla Kinkead</b>	Strategic Planner	UTA
<b>Levi Roberts</b>	Strategic Planner	UTA

The stakeholder committee met four times throughout the planning process. They were involved in setting the study's tone and direction through feedback on analysis and recommendations on engagement strategies. Due to the pandemic, the majority of meetings were held remotely. **Table 7** outlines the stakeholder committee members involved in the study.

## Coordination with UDOT

In parallel to the Tooele Transit Study, the Northeast Tooele County Study is also being completed by UDOT. This study focuses on the traffic challenges between Mills Junction (Tooele County) and SR-201 (Salt Lake County). Although both studies come from different agencies, there is close coordination between them to work with similar data in the area. UDOT is part of the Project Management group of the Tooele Transit Study, and technical members from both studies met various times to coordinate on the data and tools used.

**Table 7: Stakeholder Committee Members**

	Title	Affiliation
<b>Brent Marshall</b>	Mayor	Grantsville City
<b>James Walz</b>	Public Works Director	Grantsville City
<b>Andrew Aagard</b>	City Planner/Zoning Administrator	Tooele City
<b>Jim Bolser</b>	Community Development Director	Tooele City
<b>Paul Hansen</b>	City Contract Engineer	Tooele City
<b>Debbie Winn</b>	Mayor	Tooele City
<b>Rachelle Custer</b>	Community Development Director	Tooele County
<b>Jeff Miller</b>	Planner	Tooele County
<b>Shawn Milne</b>	County Commissioner	Tooele County
<b>Kendall Thomas</b>	County Commissioner	Tooele County
<b>Tom Tripp</b>	County Commissioner	Tooele County
<b>Kim Clausing</b>	Health Educator	Tooele Health Department
<b>Cissy Morton</b>	Transportation Mobility Manager	Tooele Health Department
<b>Grant Farnsworth</b>	Region 2 Planning Manager	UDOT
<b>Oanh Le-Spradlin</b>	Project Manager	UDOT
<b>Eric Callison</b>	Manager, Service Planning	UTA
<b>Kerry Doane</b>	Manager, Long Range Strategic Planning	UTA
<b>Laura Hanson</b>	Director of Planning	UTA
<b>Kayla Kinkead</b>	Strategic Planner	UTA
<b>Levi Roberts</b>	Strategic Planner	UTA
<b>Lorin Simpson</b>	Regional General Manager for Salt Lake Business	UTA
<b>Ryan Taylor</b>	Coordinated Mobility Manager	UTA
<b>Wayne Bennion</b>	Director of Short-Range Planning and Programming	WFRC
<b>Kip Billings</b>	Senior Transportation Engineer	WFRC
<b>Lauren Victor</b>	Transportation Planner	WFRC

# CHAPTER

# 4

## ALTERNATIVES DEVELOPMENT

### Overview

The development of the transit alternatives to connect Tooele County and Salt Lake County was a collaborative effort between stakeholders, partners, and the team and derived from several sources. First, the 2019-2050 Wasatch Front Regional Transportation Plan currently has an Express Bus project, the “Tooele Corridor,” in Phase 3 (2050 timeline) that is proposed to run from Vine and Main in Tooele City to downtown Salt Lake City. Another source for the alternatives development is based on community input and stakeholder dialogue. Over many years, the community has provided feedback to UTA service planners that informed and gathered concepts for the alternatives evaluated in this study. Lastly, given the Tooele Valley and greater Wasatch Front’s geography, the range of alternatives is fairly limited due to physical constraints of the Oquirrh Mountains and Great Salt Lake blocking reasonable connectivity except at the north end where all the transportation infrastructure exists (I-80, UPRR, etc.).

In terms of modes, the alternatives include both rubber-tire (bus) and fixed guideway (rail). Four

alternatives were developed to be evaluated, including continuing the existing mixed-flow express bus, route 451 – Tooele Express. In this context, “Mixed flow” means the bus shares travel lanes with other vehicles. New and emerging technologies were also considered, such as microtransit, but considering the long distance between population centers, they were not reasonable as a standalone alternative. However, microtransit services can improve access and support connections to the alternatives to be evaluated.

- Alternative 1 – Mixed Flow Express Bus (existing)
- Alternative 2 – Mixed Flow Express Bus with Limited Stops
- Alternative 3 – Bus Rapid Transit (BRT) Shoulder Running
- Alternative 4 – Commuter Rail

In terms of locations served by transit alternatives, key areas in Tooele County and Salt Lake County were considered, including Grantsville, Tooele City, Stansbury Park, Northwest Quad (Salt Lake



City), Downtown Salt Lake City, West Valley City, and the University of Utah. The pre-screening of alternatives removed several of these locations as direct connections from Tooele County for the following reasons:

- **Grantsville:** today, a bus service (route 454) connects Grantsville with several locations in Salt Lake City. As part of this study, a stop-level analysis was done for route 454, and it was found that a small portion of the boardings on this route come from downtown Grantsville and a much larger portion comes from the Benson Grist Mill Park and Ride. Therefore, Grantsville was not evaluated as part of the alternatives. However, local services within Tooele County, such as local bus or microtransit services, can provide connections to the alternatives being evaluated.
- **Northwest Quad (Salt Lake City):** while the employment projections in this large geographic area show lots of change and development, the majority will be industrial, and warehouse land uses. Certain types of transit can best serve this type of development, such as employee shuttles, microtransit service, and vanpool programs. They are not well-suited to fixed guideway since there isn't a central point of the development. There will be no residences, which translates to an absence of typical transit supporting land uses such as housing, schools, and retail.
- **West Valley City:** similar to the Northwest Quad area, West Valley City consists of industrial and warehouse land uses that are not conducive to fixed-guideway transit service. The team considered alternatives using SR-201 to connect to various industrial areas and end at the West Valley Central TRAX station. However, the types of land uses, the distance a bus would require to travel, and the desire to use I-80 to connect to Salt Lake City resulted in this alternative not being further evaluated in this study.
- **University of Utah:** although the University of Utah is a large employment center that today attracts many Tooele workers, the distance from Tooele City to the University can be a large deterrent for a direct transit connection. Instead, the alternatives being evaluated have multiple stops in downtown Salt Lake City that can provide connections for those seeking access University of Utah via existing rail or bus services.

## Alternative 1 – Mixed Flow Express Bus



The baseline condition is based on the existing mixed-flow express bus that operates today between Tooele Valley and downtown Salt Lake City, as shown in **Figure 21**. This is the existing route 451 that operates with five morning commute trips from Tooele to Salt Lake City and the five afternoon commuter trips from Salt Lake City to Tooele.

### Characteristics

The existing mixed-flow express bus has the following characteristics shown in **Table 8**. It represents a typical commuter express bus that provides longer distance connectivity between a more distant rural area to an urban employment center. This express bus, as does today, has multiple stops both within Tooele City and Salt Lake City.

Figure 21: Alternative 1 – Existing Mixed Flow Express Bus Route

**Table 8: Characteristics of Alternative 1**

GENERAL ROUTE	STOPS	EXCLUSIVE LANES/ ALIGNMENT	SERVICE
I-80 and SR-36	<ul style="list-style-type: none"> <li>» Tooele City (multiple stops)</li> <li>» 2400 N/SR-36 Park and Ride lot</li> <li>» Benson Grist Mill Park and Ride lot</li> <li>» Multiple stops in Salt Lake City</li> </ul>	Mixed flow with automobile traffic	Weekday service during typical commute times  (30 min frequency only during commute times)

Source: Fehr & Peers, 2020.

### Considerations

An analysis of this existing baseline alternative yields the following advantages and disadvantages.

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> <li>• This alternative provides express bus service to housing in Tooele City and employment centers in Salt Lake City.</li> <li>• Buses are flexible, and service can be added or reduced depending on needs.</li> </ul>	<ul style="list-style-type: none"> <li>• This alternative is subject to the same traffic conditions as other automobiles, limiting overall efficiency.</li> <li>• Service only runs to Salt Lake City in the morning and Tooele in the afternoon.</li> </ul>

## Alternative 2 – Mixed Flow Express Bus with Limited Stops



Alternative 2 was developed as an incremental improvement from the existing express bus by creating a shorter, faster route with fewer stops, as shown in **Figure 22**. This alternative is similar to the existing UTA route F451 but with a higher level of overall service that would include connectivity throughout the day.

### Characteristics

The characteristics of Alternative 2 are shown in **Table 9** and represent an incremental improvement of the existing 451 and F453 routes by providing 30-minute headways during the commuter hours and then a base level of 60-minute headways throughout the day and possibly into the early evening hours. The route characteristics would be a combination of the existing 451 and F453 routes but with more daily trips due to the addition of implementing all-day service. Under this alternative, the two existing routes would

be combined into one and coordinated with local Tooele City service.

Figure 22: Alternative 2 – Mixed Flow Express Bus Route with Limited Stops

**Table 9: Characteristics of Alternative 2**

GENERAL ROUTE	STOPS	EXCLUSIVE LANES/ ALIGNMENT	SERVICE
I-80 and SR-36	<ul style="list-style-type: none"> <li>» 2400 N/SR-36 Park and Ride lot</li> <li>» Benson Grist Mill Park and Ride lot</li> <li>» Multiple stops in Salt Lake City</li> </ul>	Mixed flow with automobile traffic	All-day weekday service with more frequent service during typical commute times (30 min frequency)

Source: Fehr & Peers, 2020.

### Considerations

An analysis of this mixed flow bus with limited stops yields the following advantages and disadvantages.

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> <li>• Buses are flexible, and service can be added or reduced depending on needs.</li> <li>• This alternative would have all-day service with more frequent service during typical commute times.</li> <li>• This alternative's total route travel time would be shorter than the Existing Mixed Flow Express Bus because it does not go through Tooele City.</li> </ul>	<ul style="list-style-type: none"> <li>• This alternative has fewer stops than the Existing Mixed Flow Express Bus alternative. People living in Tooele City will need to access the 2400 N/SR-36 Park and Ride lot or transfer from the local F402 route (Tooele circulator).</li> <li>• This alternative is subject to the same traffic conditions as other automobiles, limiting overall efficiency.</li> </ul>

Alternative 2 is an incremental improvement, in terms of service (number of daily trips) and directness of the route, relative to the existing baseline conditions of Alternative 1, but it may involve a transfer or alternative access to the 2400 N/SR-36 Park and Ride lot; thus, might not result in travel time savings.

## Alternative 3 – Bus Rapid Transit (BRT) Shoulder Running



To facilitate consistently faster travel times between Tooele Valley and downtown Salt Lake City with more frequent buses, a shoulder-running BRT alternative was developed, as shown in **Figure 23**. This service would operate primarily on the shoulders of SR-36 and I-80 and bypass traffic during times of vehicle congestion. It would also likely incorporate BRT technologies such as transit signal prioritization and queue jumping.

### Characteristics

The characteristics of shoulder running BRT are shown in **Table 10** and represent a higher level of service than Alternatives 1 or 2 with 15-minute peak headways and consistent 30-minute off-peak service throughout the day.

Figure 23: Alternative 3 – Shoulder Running BRT Route

**Table 10: Characteristics of Alternative 3**

GENERAL ROUTE	STOPS	EXCLUSIVE LANES/ ALIGNMENT	SERVICE
I-80 and SR-36	<ul style="list-style-type: none"> <li>» 2400 N/SR-36 Park and Ride lot</li> <li>» Benson Grist Mill Park and Ride lot</li> <li>» Multiple stops in Salt Lake City</li> </ul>	Use of shoulders on SR-36 and I-80	All-day weekday service with more frequent service during typical commute times (15-min frequency)

Source: Fehr & Peers, 2020.

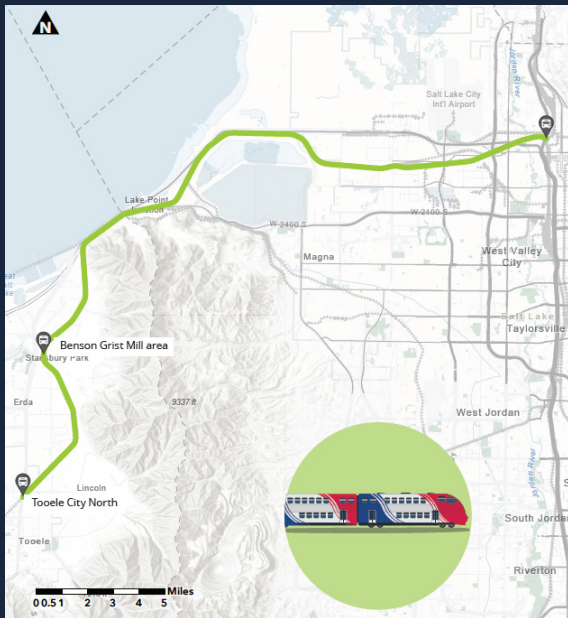
### Considerations

An analysis of this alternative for shoulder running BRT yields the following advantages and disadvantages.

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> <li>• This alternative provides high-frequency bus service to employment centers and high-density opportunities in both counties.</li> <li>• This alternative is the fastest of all the bus alternatives because it avoids most of the congestion that other alternatives cannot bypass.</li> </ul>	<ul style="list-style-type: none"> <li>• Lane enforcement can be a challenge.</li> <li>• Requires partnership and compliance with UDOT.</li> </ul>

Generally, BRT provides a much higher level of overall service with improved frequency and travel time, leading to the potential to increase ridership. Although this option would require planning for construction and funding for implementation, it utilizes existing pavement and right-of-way. It provides the most frequent service of all alternatives considered in this study.

## Alternative 4 – Rail Service



An alternative for passenger rail between Tooele Valley and Salt Lake City was developed, as shown in **Figure 24**. Rail service (FrontRunner) would operate on dedicated right-of-way and would require significant planning, funding, and implementation coordination. Alternative 4 is the most challenging and expensive service to develop and would likely require decades of planning, coordination and right-of-way preservation ahead of service start.

### Characteristics

The characteristics of rail service are shown in **Table 11**. This alternative would require a new rail line, including property acquisition and associated environmental approvals in both Tooele and Salt Lake Counties. The service level is envisioned to be 30-minute peak headway.

Figure 24: Alternative 4 – Rail Service Route

**Table 11: Characteristics of Alternative 4**

GENERAL ROUTE	STOPS	EXCLUSIVE LANES/ ALIGNMENT	SERVICE
Adjacent to existing Union Pacific line	<ul style="list-style-type: none"> <li>» Tooele City North</li> <li>» Benson Grist Mill area</li> <li>» Salt Lake City</li> </ul>	Dedicated rail corridor	All-day weekday service (30 min frequency)


Source: Fehr & Peers, 2020.

### Considerations

An analysis of this alternative for rail service yields the following advantages and disadvantages.

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> <li>• This alternative provides rail service to the existing commuter rail system on the Wasatch Front.</li> <li>• This alternative avoids the congested areas that other alternatives pass through.</li> <li>• Commuter rail has a high seating capacity per trip.</li> </ul>	<ul style="list-style-type: none"> <li>• This alternative requires extensive coordination with Union Pacific and UTA.</li> <li>• This alternative requires the purchase of Union Pacific Right-of-Way.</li> <li>• This alternative is not as flexible as the other alternatives (alignment and stops are not easy to modify).</li> </ul>

This alternative is the most challenging option to implement. Rail infrastructure and operations come with significant disadvantages that will take years, potentially decades, of planning to overcome. However, it does provide the most consistent travel time (since it will operate on its own track) and high capacity to accommodate for potential ridership growth.



# CHAPTER 5

## ALTERNATIVES EVALUATION

### Evaluation Criteria

The following evaluation criteria for the alternatives were established:

- Travel time
- Ridership
- Capital Cost
- Operating Cost
- Annualized Cost per Rider

### Travel Time

Travel time estimates for the alternatives were derived from the current travel time of UTA Route 451 for bus alternatives and average commuter rail speeds for the rail alternative. Most alternatives have similar start and end points; however, there are some differences, such as Alternative One going through Tooele City, whereas Alternatives Two, Three, and Four starting at or near the 2400 N/ SR-36 Park and Ride. To evaluate and compare all four alternatives, the travel time is measured between the 2400 N/SR-36 Park and Ride and Salt Lake City near 600 South/State Street.

### Bus Alternatives

UTA travel time data for September 2019 shows that, on average, Route 451 has a travel time of 80 minutes in the morning. From those 80 minutes, the approximate travel time between key sections is:

- 20 minutes through Tooele City to 2400 N/ SR-36 Park and Ride
- 50 minutes from the 2400 N/SR-36 Park and Ride and 600 South/State Street
- 10 minutes to the end terminal in Salt Lake City.

This study is evaluating alternatives for the future. Therefore, travel times need to be adjusted to account for the projected growth and future roadway improvements. Utah Statewide Travel Model (USTM) and Wasatch Front Travel Demand Model (WF TDM) were used to estimate the change in travel time between 2019 and 2050. The 2050 networks reflect the fiscally constrained capacity improvement projects from the 2019 WFRC and UDOT long-range plans. UDOT's Northeast Tooele County Area Study team provided results from the 2019 and 2050 highway networks that this study

uses to estimate changes in travel time within Tooele County. The official WF TDM 2020-08-17 highway network was used to estimate changes in travel time in Salt Lake City. **Table 12** shows weekday AM automobile travel times estimated using the models and the travel time changes between 2019 and 2050.

**Table 12: Morning Travel Time Changes between 2019 and 2050**

SEGMENTS	AM TIME		
	2019	2050	Change
USTM			
Tooele City and 2400 N/SR-36	8.7	8.9	2%
2400 N/SR-36 and SR-138/SR-36	7.8	8.9	13%
SR-36/SR-138 and External	9.8	8.5	-14%
WFRC			
External* and 600 S/State St.	16.3	16.7	3%
600 S/State St and 200 S/300 W	5.8	5.9	1%

*\*Boundary of the two model areas used in the study (WF TDM and USTM)*

The estimated changes in travel time between 2019 and 2050 show that overall, the travel time along the route in 2050 will be similar to the travel time today. Two segments could experience abrupt changes:

- 2400 N/SR-36 and SR-138/SR-36: increases travel time by approximately 15%
- SR-36/SR-138 and External: decreases travel time by approximately 15%

As was shown in the Existing Conditions, Tooele is expected to significantly grow in the future, and therefore, it is expected that the travel times will increase in Tooele County. However, the segment between 2400 N/SR-36 and SR-138/SR-36 shows a decrease in travel time rather than an increase. The following roadway improvements can explain this future decrease:

- Midvalley Highway: a new highway west of SR-36 that will connect to I-80, providing an alternative route primarily for Grantsville
- Widening of SR-36: the Utah Unified Transportation Plan has a planned project to widen SR-36 to three lanes per direction

Using the UTA travel time data for September 2019 and both USTM and WF TDM to estimate the future travel time between 2400 N/SR-36 Park and Ride and 600 South/State Street, the estimated travel

time is 40-50 minutes for both mixed flow buses.

The BRT alternative, which would have the option to use the shoulder on both SR-36 and I-80, could bypass congestion. Using observed probe data from UDOT iPeMS, it was found that typical congestion between 2400 N/SR-36 Park and Ride and 600 South/State Street can range between 3-10 minutes (travel time difference between 7:00 am and 12:00 pm). If the BRT can bypass this congestion, the BRT's travel time can range between 35-45 minutes.

### Rail Alternative

The rail alternative assumes a parallel track to the Union Pacific alignment between 2400 N/SR-36 Park and Ride and North Temple Front FrontRunner station (Salt Lake City). In theory, a commuter rail similar to the FrontRunner along the Wasatch Front can travel up to 79 mph; however, the Union Pacific alignment proposed for the Tooele rail alternative has a significant number of curves that would slow down the train. Therefore, it was estimated that this alternative's train speed could average approximately 70 mph for 35 miles on this corridor. This alternative's estimated travel time can range between 30-40 minutes, similar to the free-flow auto travel time for similar start and end points.

### Ridership

Traditionally, travel demand models with a transit component are used to forecast future ridership. However, Tooele County and Salt Lake County are part of two different travel demand models: Tooele County is part of the USTM, and Salt Lake County is part of the WF TDM. Furthermore, USTM does not have a transit component. Therefore, transit alternatives cannot be evaluated using any of these regional models directly. The team developed a simple Direct Ridership Model (DRM) to evaluate alternatives between Tooele Valley and Salt Lake Valley. A DRM is an alternative tool that uses existing ridership and other sources to develop coefficients that estimate the ridership of a route. The DRM evaluates alternatives between Tooele Valley and Salt Lake Valley only using existing ridership and socioeconomic data.

The DRM was developed using existing UTA routes across the Wasatch Front with similar service

characteristics and/or that serve areas similar to Tooele. In coordination with UTA, the following routes were used to develop this tool:

- 472: Riverdale - Salt Lake Express
- 473: Ogden-Salt Lake Express
- 630: Brigham City-Ogden Commuter
- 805: Santaquin - Payson-Spanish Fork-Provo Station - UVU
- 806: Eagle Mountain-Saratoga Springs - Lehi Station - UVU

The resulting DRM used the following variables to estimate ridership:

- **Households within 0.5 miles of a stop:** households around stops in residential-oriented locations such as Spanish Fork, Eagle Mountain, Saratoga Springs, Brigham City, Layton, Farmington, etc.
- **Employment within 0.25 miles of a stop:** jobs around stops in employment-oriented locations such as UVU, downtown Ogden, downtown Salt Lake City, University of Utah, etc.
- **Households within a 3-mile radius of a standard Park and Ride:** households around locations with well-used Park and Rides.
- **Households within a 3-mile radius of the last Park and Ride prior to the long-distance segment:** households around the last location with well-used Park and Rides before the long-distance trip. Farmington and Kaysville are the only stops in this category.
- **Commuter Rail ridership:** ridership at the bus stops that connect to commuter rail.

The alternatives evaluated in this study are variations of Route 451, and therefore, the DRM was calibrated to Route 451, currently connecting Tooele Valley to Salt Lake County.

The final DRM was used to estimate the base future ridership of the alternatives evaluated in this study, assuming the same service characteristics that the current Route 451 service (peak period only, peak direction only, 30-minute headways). To capture service changes included in the various alternatives, elasticities included in the *Transit Capacity and*

*Quality of Service Manual, Third Edition (TCQSM)* were used. If an increase in a variable increases ridership, the elasticity will be a positive number, as in the case of more service. Conversely, if a decrease in a variable will increase ridership, the elasticity will be negative, as in the case of travel time. Since this DRM was developed using bus data, this tool was used to estimate ridership for Alternatives 1, 2, and 3. Thus, it cannot be used to estimate ridership for Alternative 4, commuter rail.

### *Alternative 1: Existing Mixed Flow Express Bus*

The *Existing Mixed Flow Express Bus* Alternative is the current Route 451 bus service. The DRM was applied to estimate future (year 2050) ridership of this route, which considers the expected growth around the transit stops. The future estimated ridership for alternative 1 using the DRM ranges from 450-650 daily boardings. While the direct ridership model provides a specific number, it is best practice to use a range when describing future ridership.

### *Alternative 2: Mixed Flow Express Bus with Limited Stops*

The *Mixed Flow Express Bus with Limited Stops* alternative is similar to the existing Route 451 bus service; however, it starts at the 2400 N/SR-36 Park and Ride instead of going through Tooele City, as well as operating all day. The DRM was applied to estimate the base ridership, and a transit expansion elasticity was applied to account for the off-peak service. The TCQSM report provides an elasticity range between 0.6-1; however, this range seems overly optimistic given the Tooele context of low-density land uses and undeveloped areas between stops. A 0.3-0.4 range was selected as more appropriate for the area. The future estimated ridership for Alternative 2 using the DRM and the transit expansion elasticity ranges from 500-700 daily boardings.

### *Alternative 3: Bus Rapid Transit (BRT) Shoulder Running*

The *BRT Shoulder Running* alternative has the same stops as the *Mixed Flow Express Bus with Limited Stops* but is more frequent (15-minutes peak headways and 30-minutes off-peak headways), can use the



roadway shoulders to avoid congestion (about a 20% decrease in travel time), and has enhanced characteristics inherent to a BRT service (i.e., branded buses, real-time arrival information, enhanced stations, etc.). The base future ridership estimated for the Mixed Flow Express Bus with Limited Stops was used for this alternative, and transit expansion, travel time, and BRT elasticities were applied.

The TCQSM report provides ranges of elasticities for transit expansion (as previously discussed), travel time, and BRT. The report provides a range of -0.3 and -0.5 for travel time changes (typical is -0.4) and explains that studies have found a ridership increase of up to 25% beyond the travel time and frequency improvements for BRT.

The USTM results provided by the Northeast Tooele County Area Study and the 2012 Utah Household Travel Survey (HTS) were also used to estimate a maximum ridership potential for the future Tooele route. The USTM results show a total of 40,000 home-based work daily vehicles on I-80, and by applying a vehicle occupancy factor of 1.5, approximately 60,000 people will be on I-80 daily for work in the future. Additionally, the 2012 Utah HTS shows a transit mode share of 1.1% and 2.1% for the UDOT region (rural) and Cache region, respectively. Given that the UDOT region includes areas of the state that do not have transit service, it was determined that the Cache region was the most similar to Tooele. Therefore the 2.1% was used. Applying this transit mode share to the home-based work results, a maximum ridership potential of 1,200 boardings a day was estimated. Using the DRM, elasticities, and maximum ridership potential analysis, the future estimated ridership for Alternative 3 ranges from 900-1,200 daily boardings.

### Alternative 4: Rail Service

The DRM used to evaluate the bus alternatives could not be used to evaluate the rail alternative because the tool was developed using comparative bus service. Due to this limitation and not having another readily available tool to evaluate rail, the relationship between future commuter rail ridership along the Wasatch Front and the land uses around those commuter rail stations was used to estimate ridership.

The project team created the chart in **Figure 25** to understand future ridership patterns forecasted by the WF TDM in relation to land use for existing and potential commuter rail stations. The land use information presented in Chapter 2 was used for this analysis. The land use displayed in **Figure 25** corresponds to the households and employment within a three-mile radius of the station. If the three-mile radius of two stations overlaps, the areas closer to each station are accounted for (there is no double-counting).

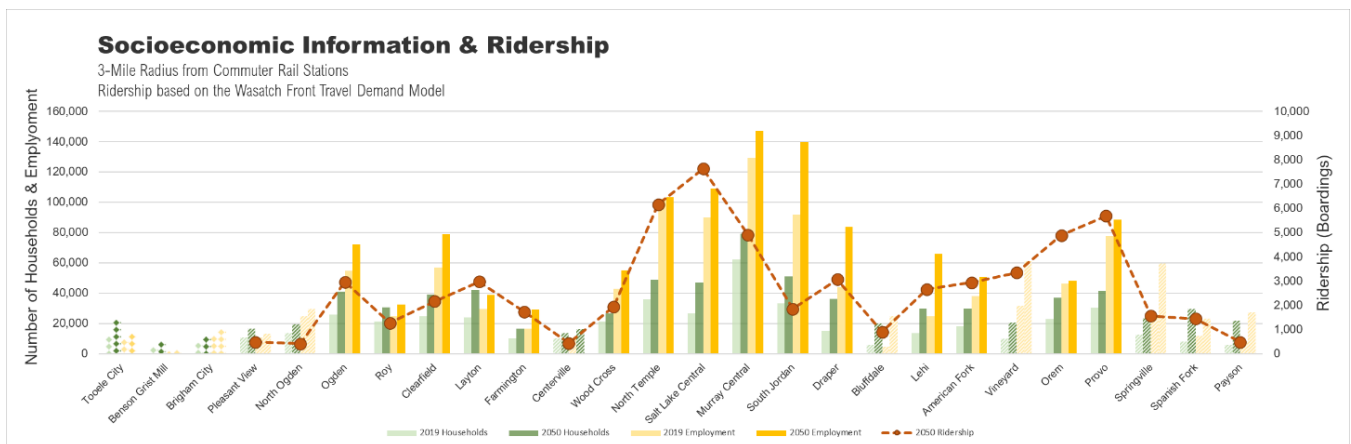


Figure 25: Socioeconomic Information and Ridership Projections

The ridership patterns shown in the figure indicate that areas with greater numbers of household and employment such as Salt Lake City, Murray, Ogden, and Provo have higher ridership projections. In contrast, lower density household and employment areas such as Pleasant View, Payson, and Centerville have ridership

projections in the 400-900 boardings range – these stations (represented by hatched bars) do not exist but have been studied; and therefore, are available in the WF TDM, along with having an advantage of being contiguous with the existing line. Comparing the future land use projections near Tooele City and Benson Grist Mill (dotted bars) to the other commuter rail stations, the most similar stations seem to be the stations in smaller communities with fewer households and job opportunities. Other factors considered in this analysis were travel time, frequency, and the terminal in Salt Lake City. The rail has an estimated travel time of 30-40 minutes (slightly faster than the BRT alternative), an assumed frequency of 30 minutes (less frequent than the BRT alternative), and a connection to the North Temple FrontRunner station (farther removed from downtown Salt Lake City, where many people from Tooele go). Since the BRT alternative has a more direct connection to downtown Salt Lake City than the rail alternative and considering the future ridership/land use patterns displayed in the figure, it is estimated that the rail ridership will be lower than the BRT alternative, ranging from 600-800 daily boardings.

## Capital Cost

Capital cost estimates for each alternative were developed using planning level per-mile cost estimates by mode. These costs include construction costs as well as the costs associated with vehicle purchases and right-of-way.

**Table 13: Capital Costs**

ALIGNMENT	CAPITAL COST (2020 \$\$)
Alternative 1: Existing: Mixed Flow Express Bus	\$11,000,000
Alternative 2: All Day, Mixed Flow Bus with Limited Stops	\$21,000,000
Alternative 3: Shoulder-Running Bus Rapid Transit	\$126,000,000
Alternative 4: Rail	\$970,000,000

## Operating Cost

Capital construction is just one of the costs to consider when understanding and evaluating the alternatives. Once the project is completed, funding is also needed to operate and maintain the project on an ongoing basis. Operating and maintenance costs were developed using cost per vehicle revenue mile by mode, the assumed level of service, and then annualized.

**Table 14: Operating Costs**

ALIGNMENT	ANNUAL OPERATING COST (2020 \$\$)
Alternative 1: Existing: Mixed Flow Express Bus	\$1,050,000
Alternative 2: All Day, Mixed Flow Bus with Limited Stops	\$5,687,500
Alternative 3: Shoulder-Running Bus Rapid Transit	\$8,837,500
Alternative 4: Rail	\$30,457,000

## Annualized Cost per Rider

To provide a comprehensive overview of the capital costs plus the ongoing operating costs, capital costs were annualized, assuming an average asset life of 15 years for buses and 30 years for rail. This total cost was then divided by annualized ridership to provide an annualized cost per rider. It was assumed 260 days of operation to annualize ridership.

**Table 15: Annualized Cost per Rider**

ALIGNMENT	COST PER RIDER RANGE (2020 \$\$)
Alternative 1: Existing: Mixed Flow Express Bus	\$10 - \$15
Alternative 2: All Day, Mixed Flow Bus with Limited Stops	\$39 - \$55
Alternative 3: Shoulder-Running Bus Rapid Transit	\$55 - \$74
Alternative 4: Rail	\$306 - \$408

Alternative 1 has the lowest range of costs per rider, while Alternative 4 has the highest range, almost six times higher than Alternatives 2 and 3, driven by its much higher capital and operating costs.

# Evaluation of Alternative 1: Mixed Flow Express Bus with Limited Stops

The evaluation of Alternative 1 against the criteria is shown in **Figure 26**.

## Alternative 1: Existing: Mixed Flow Express Bus

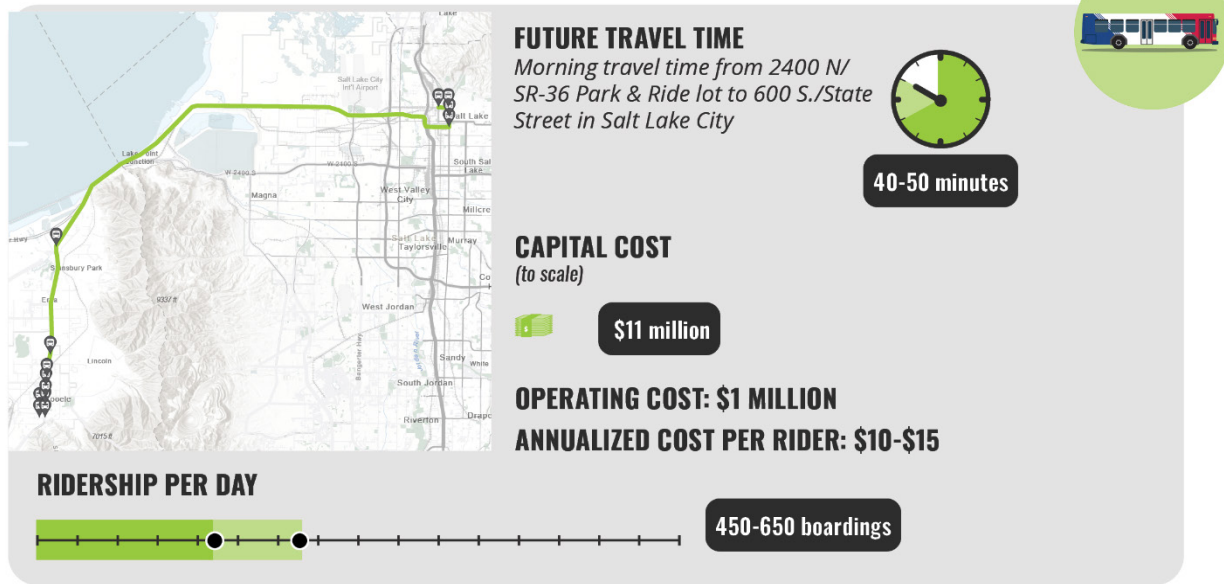


Figure 26: Evaluation of Alternative 1

# Evaluation of Alternative 2: Mixed Flow Express Bus with Limited Stops

The evaluation of Alternative 2 against the criteria is shown in **Figure 27**.

## Alternative 2: All Day, Mixed Flow Bus with Limited Stops

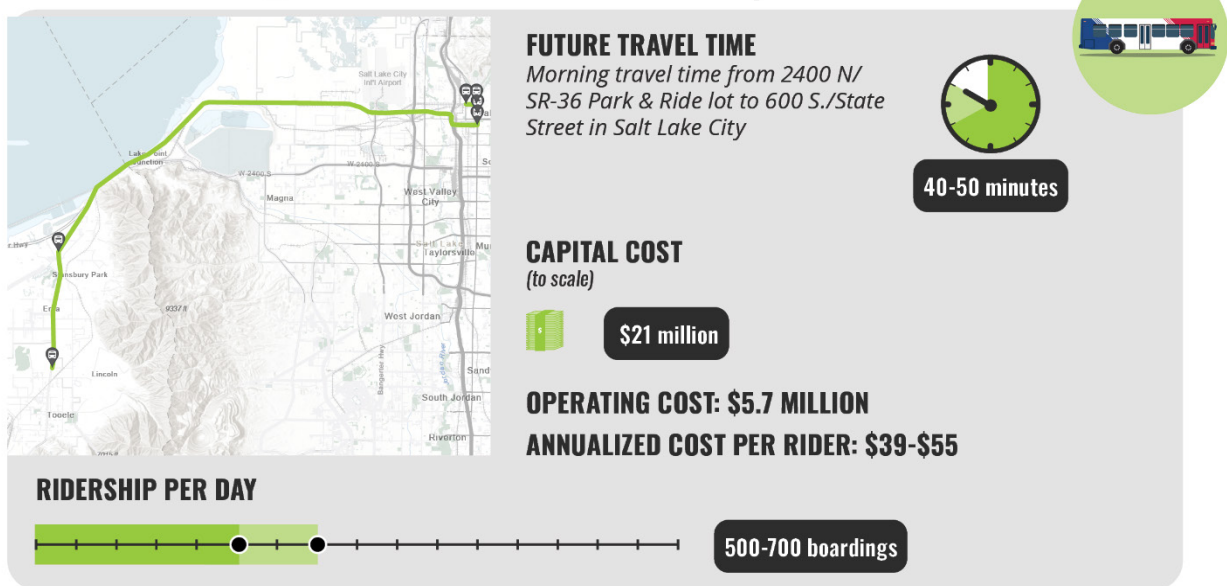


Figure 27: Evaluation of Alternative 2

## Evaluation of Alternative 3: Bus Rapid Transit (BRT) Shoulder Running

The evaluation of Alternative 3 against the criteria is shown in **Figure 28**.

### Alternative 3: **Shoulder-Running Bus Rapid Transit**

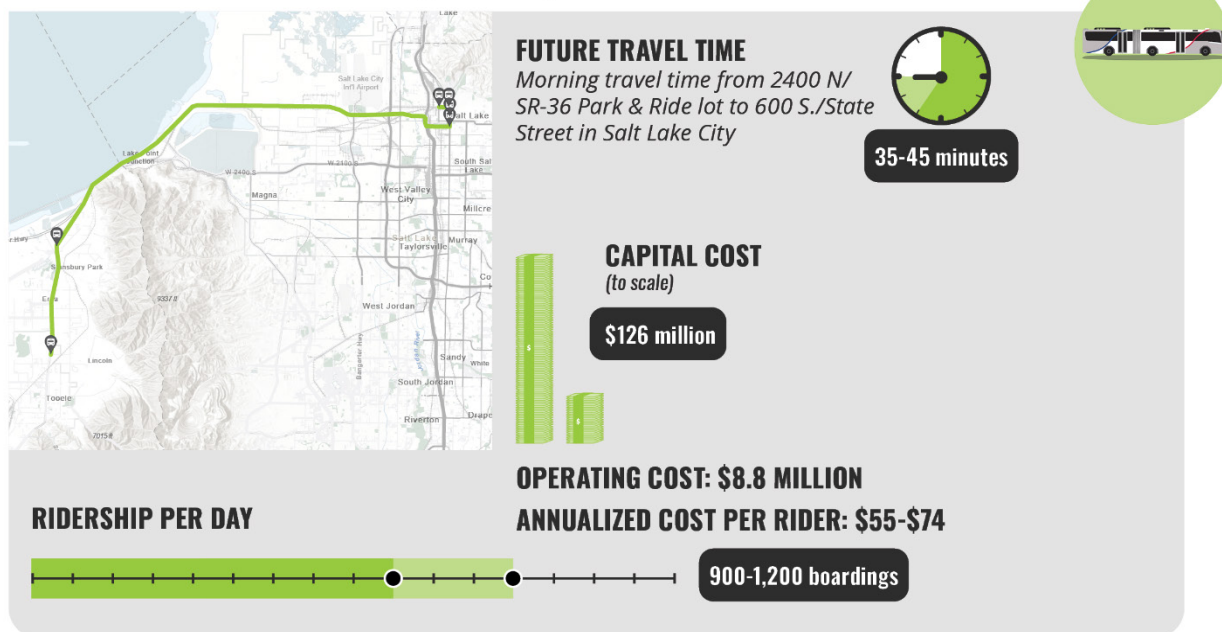


Figure 28: Evaluation of Alternative 3

## Evaluation of Alternative 4: Rail Service

Evaluating commuter rail passenger service from the existing UTA network to Tooele is a major part of the study effort. Tooele County has some challenges to successfully implementing a passenger rail service, including lack of existing, available rail right-of-way, the distance between residential and employment opportunities, insufficient population density, and no preserved corridors or future planned preservation.

### Challenges

A fundamental need to justify a major public investment such as heavy rail (FrontRunner) is that it has a large and consistent pool of riders. Successful ridership has been the key metric in transit project planning for decades across the U.S. and in Utah. Predicting ridership for various time periods such as “opening day” and a twenty-year horizon is also a typical industry standard. No agency wants to fund and build an under-utilized, very expensive transit option. While Tooele County is indeed growing, there simply isn’t the mass nor the density of population and employment to generate ridership on a consistent basis. This issue is compounded by the long stretch between population centers of very limited development. In other words, the long stretch between Benson Grist Mill and the nearest employment area in Salt Lake County (the International Center) doesn’t generate any riders, so there is a cost for that distance but no “return” in ridership.

On the Wasatch Front, one of the many reasons for the successful implementation of both TRAX light rail and FrontRunner commuter rail was the extensive and redundant rail right-of-way network due to a merger of national freight rail companies. This provided the “in place” corridors and made planning for fixed rail guideways easier. That fact, coupled with a concerted negotiation effort to partner with the freight companies,

enabled freight rail corridors for passenger rail service. Prior to, nor in the course of, this study, there has not been any communication with the freight rail carriers about partnering to provide passenger rail service in Tooele County. Until such conversations happen and there is some likelihood that a preserved rail corridor would become available, it is difficult and risky to assume rail service is possible on the existing freight corridors.

Another challenge for Tooele County is the distance between destinations in the study area. Many Tooele County residents travel at least 30 miles by automobile to reach their job locations. The typical spacing between commuter rail stations ranges from approximately one mile to ten miles, depending on residential and employment cluster densities, service type desired, and other factors. The benefit and necessity of multiple stations along a line are that they provide access to employment, attract ridership, and offer potential economic development (i.e., transit-oriented development). Ridership and transit-oriented development are two very important factors necessary for successful rail service. While the train travel speed could be sustained over the long distance between the Tooele Valley and the urban core of Salt Lake City, the lack of development creates a 25-mile gap where no passengers can enhance ridership and improve the service's cost.

The last major challenge to implement passenger rail service between Tooele County and Salt Lake County is not having a preserved nor a planned rail corridor. Sometimes communities will use their land-use authority to preserve a corridor ahead of or concurrent with development, making transit planning much easier, time-efficient, and more cost-effective. The City of Herriman and Box Elder County have done that successfully. Box Elder County is working to preserve a corridor for potential passenger rail service in the future. Unfortunately, at the time of this study, no such corridor exists in the Tooele Valley. There is no planned corridor preservation in the County, any of the cities, or with any large-scale developers, such as Kennecott Land.

## Options

Despite these challenges, a series of options exists for future rail service that includes (from simple to complex): share track rights with Union Pacific, build a new parallel rail line within the UPRR right-of-way, and build a new rail corridor. Below is an outline of those options, going from simplest to complex.

1. **Share track rights with the Union Pacific rail line:** UPRR has an existing rail line that starts in Salt Lake City and goes to Tooele County, and continues south to other regions. The upside to this line is that the track is already in place. However, obstacles to this are issues with Positive Train Control. The limits track-sharing would place on consistent and reliable scheduling of passenger service (since UPRR freight traffic would get priority, and that schedule would likely be variable and inconsistent), and negotiating with UPRR for track rights. UTA operated on a shared track with Union Pacific to provide service to Pleasant View until 2018, which required a very limited schedule. Ultimately, this service was discontinued.
2. **Build a parallel rail line next to the existing UPRR (within the same right-of-way):** UTA used this option to implement the FrontRunner service on the Wasatch Front. UPRR would then have to agree with the project and allow for adjacent track construction and passenger service operation.
3. **Build a new rail corridor:** This assumes a new corridor not just in Tooele County but also in western Salt Lake County. As previously noted, the best place to begin this effort is to identify a logical corridor alignment and pursue corridor preservation efforts. New corridors can be acquired and preserved using land-use planning resources at the local level. But first, there must be a plan with a corridor identified in place so that government agencies can work with developers and landowners to preserve the desired corridor. Depending on the ability to get some or most of the corridor from development, this approach will still be very expensive and time extensive as land in Salt Lake County can be more difficult to preserve as well as all the construction costs associated with a new track.
4. The last option is to **integrate service with the possibility of a multi-state High-Speed rail**

**project.** This is highly speculative and very much a long-term option. In 2014, UTA was part of a large consortium that looked at the possibility of High-Speed Rail in the West (*Southwest Multi-State Rail Planning Study*). This was a high-level study that included six states in the southwest that, among other things, looked at “candidate corridors” for eventual High-Speed rail. A corridor that could connect Salt Lake and Las Vegas is a route through the Tooele Valley. This route did not score particularly high considering all the other connections in the study, including numerous connections to California’s major metropolitan areas. But, if it were to go forward, it would likely require a new corridor “footprint.” This footprint could theoretically also include either width for local passenger service, or perhaps the technology is such that a station could be considered in Tooele.

Unfortunately, none of these options are low-cost scenarios, nor is the quantity of existing and future development likely sufficient to produce enough ridership by 2050 to overcome the long stretch devoid of station opportunities. For the purpose of this study, the Rail Alternative reflects a parallel rail line next to the existing UPRR within the same right-of-way (Option 2 above).

### Rail Evaluation

The evaluation of Alternative four against the criteria is shown in **Figure 29**.

#### Alternative 4: Rail

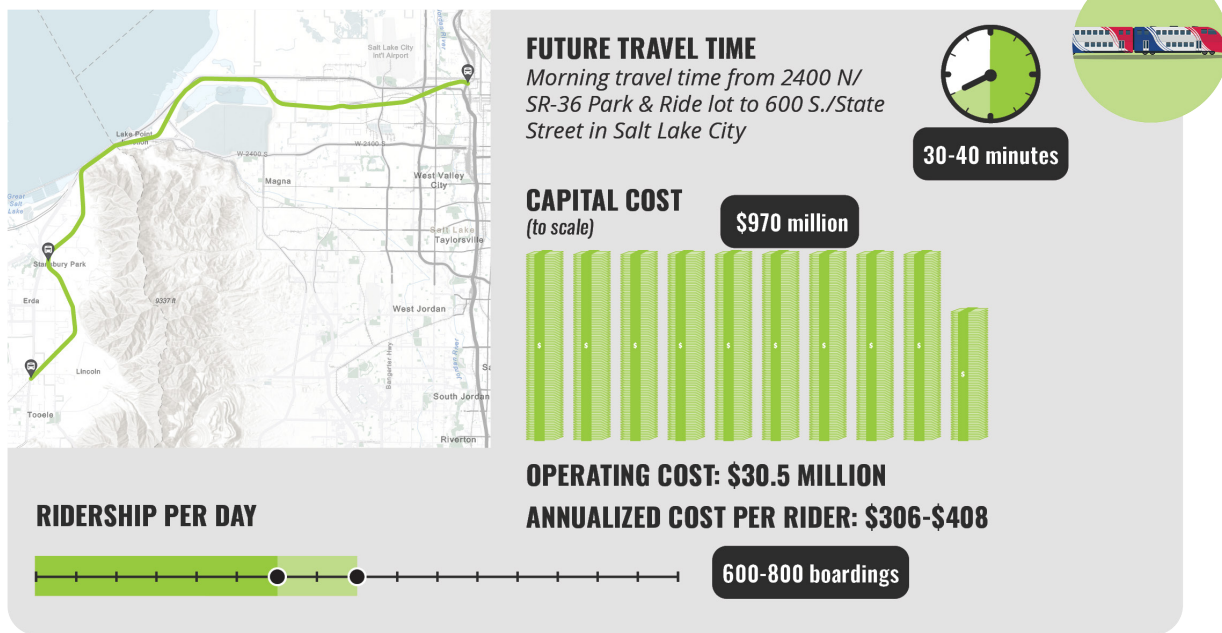


Figure 29: Evaluation of Alternative 4

## Performance Summary

A rating of the relative performance of the four alternatives is shown in **Figure 30**. The shoulder-running BRT alternative performs better in travel time and ridership, while the Express Bus alternative is the most affordable option. However, the Express Bus is not an improvement in transit service for the Tooele Valley and does not meet the stated needs of the community. Therefore, a future bus service that operates all day and can pass congestion on the freeway is an attractive option for investment by the Tooele Valley communities and UTA.

### 2050 Preliminary Performance

The table below compares the preliminary performance for 2050 of each alternative on several criteria: estimated 2050 average weekday transit ridership, travel time between 2400 North/SR-36 and Salt Lake City, and capital costs.

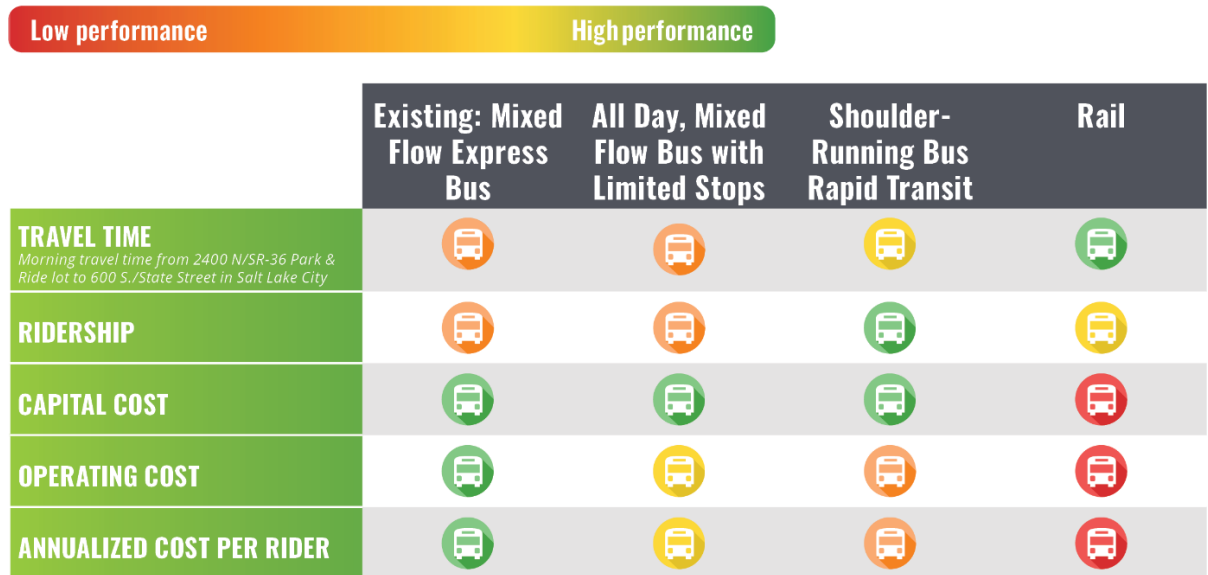


Figure 30: Performance Summary of Alternatives



# CHAPTER

# 6

## IMPLEMENTATION

This chapter discusses methods to implement transit improvements.

Improving transit access to the Tooele area will take a deliberate and long-term commitment to demonstrate that the area is conducive for further transit investment. Implementation strategies are multifaceted, combining several incremental activities. These include strategies to preserve corridors for future transit use, embracing transit-supportive densities at key nodes, and encouraging additional utilization of the existing transit options to help make a case for higher service levels and investments.

### Corridor Preservation

Any future fixed-guideway transit project will require exclusive right-of-way. This can be a very costly and time-consuming effort, particularly as additional development occurs and land values rise over time. Investments in preserving the corridor now and over the next several years are essentially investing in a future transit project, reducing the overall cost of the project.

Corridor preservation also provides the public and the development community with a clear expectation of where anticipated transit investment will occur as well as tangible evidence that something proactive is being done to bring fixed guideway transit service to the area. This is a critical component for local governments within Tooele Valley, given the overwhelming desire for fixed guideway service demonstrated in the public survey responses.

While a fixed guideway transit project may be years away, there are many possible interim uses for this kind of right-of-way, including developing a greenbelt or community trail, which could provide an amenity to the area well before any transit elements are constructed. This planning process is currently occurring in both Herriman and Box Elder County.

Further study will be needed to help answer the following key questions about corridor preservation:

- What corridor should be preserved?
- How much right-of-way should be preserved to allow for future transit investment as well as future active

transportation investment?

- What funding mechanisms and strategies should be used to fund corridor preservation
- What agency should manage this preservation effort?

## Coordination with UDOT

One possible future transit improvement to the area that could improve transit travel time and reliability, but would not require exclusive right-of-way, is shoulder running bus service. Allowing buses to use the shoulder part-time during heavily congested periods allows the service to bypass auto congestion. SR-36 is a good candidate for allowing this type of strategy, but continued coordination with UDOT is vital. SR-224 in Summit County serves as an example of this type of strategy. Park City and UDOT partnered to implement shoulder-running buses on the corridor, initially only during peak events such as the Sundance Film Festival but now allowing buses to use the shoulders as travel lanes during all peak times.

While this coordination should consider how this could be accomplished with the current roadway cross-section, there are two widening projects on the corridor identified in the Unified Transportation Plan. These future projects offer an opportunity to further design the shoulder for bus operations and potentially provide enhanced transit stations with first- and last-mile amenities.

## Transit Supportive Land Use Densities

Transit needs density to work cost-effectively. Ridership is largely driven by the number of people that can access transit service within a short distance. But higher density development does not necessarily need to be ubiquitous across a route for good high-quality transit to succeed. Rather, focusing density at key nodes can also lead to increased transit demand and utilization. There are opportunities in the area for the development of transit-supportive densities. For example, the Benson Grist Mill is one area that could potentially support higher density development. Further

focused study is needed to identify other areas where transit-supportive densities make the most sense. It will also be critical for the county and the municipalities to work with UTA to time development and transit service improvements so that if higher densities are developed, they are accompanied by improved transit service levels.

## First- and Last-Mile Strategies

Improving and enhancing multi-modal connectivity to existing transit stations is a low-cost method to foster higher ridership. Providing safe and convenient active transportation facilities with direct connections to transit stops should be a primary strategic focus. This applies to both retrofitting existing conditions but also when considering approving new developments. Any new development in the area should provide a robust multi-modal network to improve connectivity and access to existing and planned transit stops.

Active transportation investment is just one first- and last-mile strategy. Others should also be considered to help improve access to transit. Recently, UTA partnered with a transit provider firm named Via to launch a microtransit pilot service in southern Salt Lake County with much success. UTA has already begun to look at where this type of service could be deployed in the future. The Tooele Valley area is already slated as a potential location for on-demand microtransit service, with UTA proposing implementation within the next five years. Encouraging this deployment could improve access to the existing transit service but may also allow resources used on the existing FLEX routes to be reallocated to additional transit service connecting Tooele Valley commuters with Salt Lake County.

## Encourage Use of Existing Transit Options

Encouraging the utilization of existing transit options in the area can also help build a case for further transit investment. Increased marketing of the existing commuter bus services and vanpool services could introduce more users to these options and generate additional interest in these services.

## Funding Sources

To continue to move forward with the implementation steps outlined above, funding will need to be a key consideration. This includes funding sources for continued planning activities as well as funding sources for capital and operational investments. To help coordinate and drive this effort, it is recommended that Tooele County work closely with the Tooele Valley Rural Planning Organization (RPO) to leverage the knowledge and funding resources from the Wasatch Front Regional Council (WFRC).

### State and Regional Options

- UDOT Technical Planning Assistance Program (TPA)**  
 This program provides funding for planning assistance across the state, especially for areas experiencing rapid growth or lack sufficient resources to carry out planning projects on their own. These funds are awarded on a competitive basis. They can fund a variety of planning activities, including corridor plans/solutions development processes, active transportation/multi-modal plans, and zoning code updates.
- WFRC Transportation Land Use Connections Program (TLC)**  
 The TLC program provides technical assistance to local communities to plan growth and implement changes to the built environment that reduce traffic on roads and enable more people to easily walk, bike, and use transit. Funds are awarded on a competitive basis and can fund numerous planning activities, similar to the UDOT TPA program.
- Transit Transportation Investment Fund (TTIF)**  
 The Utah Legislature recently created the TTIF funding source. It can provide capital funding for transit projects, as well as first- and last-mile projects that improve connections to transit stations. Funding cannot be used for corridor preservation

but can be used for bus purchases or other capital development projects (i.e., rail or BRT construction). The funds require a 40% non-state match, and recipients must demonstrate the ability to operate and maintain projects or first- and last-mile facilities. The Utah Transportation Commission makes funding decisions while UDOT administers the program.

### Federal Programs

- Access and Mobility Partnership Grants**  
 This FTA program provides competitive funding to improve access to public transportation by building partnerships among health, transportation, and other service providers. The program provides competitive funding to support innovative capital projects for the transportation disadvantaged that will improve the coordination of transportation services and non-emergency medical transportation services.
- Better Utilizing Investments to Leverage Development (BUILD) Transportation Grants Program (formerly TIGER)**  
 This program funds investments in transportation and transit infrastructure, along with first- and last-mile facilities.
- Capital Investment Grants (CIG) - 5309**  
 Provides funding through a multi-year competitive process for transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit. Federal transit law requires transit agencies seeking CIG funding to complete a series of steps over several years to be eligible for funding.
- Enhanced Mobility of Seniors and Individuals with Disabilities - Section 5310**  
 Formula funding available to states to assist private nonprofit groups in meeting transportation needs of the elderly and persons with disabilities. Funds can potentially be used for transit services that

transport people either into or out of the urbanized area.

- **Flexible Funding Programs - Congestion Mitigation and Air Quality Program (CMAQ) - 23 USC 149**  
CMAQ provides funding to areas in nonattainment or maintenance for ozone, carbon monoxide, and/or particulate matter. States with no nonattainment or maintenance areas still receive a minimum apportionment of CMAQ funding for either air quality projects or other elements of flexible spending. Funds may be used for any transit capital expenditures and otherwise eligible for FTA funding as long as they have an air quality benefit.
- **Flexible Funding Programs - Surface Transportation Block Grant Program - 23 USC 133**  
Provides funding that states and localities may use for a wide range of projects to preserve and improve surface transportation conditions and performance, including highway, transit, intercity bus, bicycle, and pedestrian projects.
- **Formula Grants for Rural Areas - 5311**  
Provides capital, planning, and operating assistance to states to support public transportation in rural areas with populations less than 50,000, where many residents often rely on public transit to reach their destinations.
- **Grants for Buses and Bus Facilities Formula Program - 5339(a)**  
Provides funding to states and transit agencies through a statutory formula to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities. In addition to the formula allocation, this program includes two discretionary components: The Bus and Bus Facilities Discretionary Program and the Low or No Emissions Bus Discretionary Program.
- **Integrated Mobility Innovation (IMI)**  
The Federal Transit Administration (FTA) IMI Program funds projects that demonstrate innovative and effective practices, partnerships, and technologies to enhance public transportation effectiveness, increase efficiency, expand quality, promote safety, and improve the traveler experience.
- **Low or No Emission Vehicle Program - 5339(c)**  
Provides funding through a competitive process to states and transit agencies for purchasing or leasing low or no emission transit buses and related equipment; or to lease, construct, or rehabilitate facilities to support low or no emission transit buses. Ultimately, this program provides funding to support the wider deployment of advanced propulsion technologies within the nation's transit fleet.
- **Metropolitan and Statewide Planning and Nonmetropolitan Transportation Planning - 5303, 5304, 5305**  
Provides funding and procedural requirements for multi-modal transportation planning in metropolitan areas and states. Planning needs to be cooperative, continuous, and comprehensive, resulting in long-range plans and short-range programs reflecting transportation investment priorities.
- **Mobility for All Pilot Program Grants**  
This funding opportunity seeks to improve mobility options through employing innovative coordination of transportation strategies and building partnerships to enhance mobility and access to vital community services for older adults, individuals with disabilities, and people of low income.
- **Mobility on Demand (MOD) Sandbox Demonstration Program - 5312**  
Funds projects that promote innovative

business models to deliver high-quality, seamless and equitable mobility options for all travelers.

- **Pilot Program for Expedited Project Delivery - 3005(b)**  
The Pilot Program for Expedited Project Delivery allows FTA to select up to eight capital transit projects for expedited grant awards.
- **Pilot Program for Transit-Oriented Development Planning – Section 20005(b)**  
Provides funding to local communities to integrate land use and transportation planning with a transit capital investment that will seek funding through the Capital Investment Grant (CIG) Program.
- **Public Transportation Innovation - 5312**  
Provides funding to develop innovative products and services assisting transit agencies in better meeting the needs of their customers.
- **Rural Transportation Assistance Program - 5311(b)(3)**  
Provides funding to states for developing training, technical assistance, research, and related support services in rural areas. The program also includes a national program that provides information and materials for local operators and state administering agencies and supports research and technical assistance projects of national interest.
- **Safety Research and Demonstration (SRD) Program**  
The SRD Program is part of a larger safety research effort at the U.S. Department of Transportation that provides technical and financial support for transit agencies to pursue innovative approaches to eliminate or mitigate safety hazards. The SRD program focuses on the demonstration of technologies and safer designs.
- **State of Good Repair Grants (SGR) - 5337**  
Provides capital assistance for maintenance, replacement, and rehabilitation projects of existing high-intensity fixed guideway and high-intensity motorbus systems to maintain a state of good repair. Additionally, SGR grants are eligible for developing and implementing Transit Asset Management plans.
- **Technical Assistance and Standards Development - 5314(a)**  
Provides funding for technical assistance programs and activities that improve the management and delivery of public transportation and development of the transit industry workforce.
- **Transportation Infrastructure Finance and Innovation Act (TIFIA)**  
The TIFIA program provides credit assistance for qualified projects of regional and national significance. Many large-scale, surface transportation projects - highway, transit, railroad, intermodal freight, and port access - are eligible for assistance. Eligible applicants include state and local governments, transit agencies, railroad companies, special authorities, special districts, and private entities. The TIFIA credit program is designed to fill market gaps and leverage substantial private co-investment by providing supplemental and subordinate capital.
- **Urbanized Area Formula Grants - 5307**  
Provides funding to public transit systems in Urbanized Areas (UZA) for public transportation capital, planning, job access, and reverse commute projects, as well as operating expenses in certain circumstances. This funding source would be focused on the Salt Lake County side of any future transit improvement.

Integrated mobility solutions to service  
life's connections,  
improve public health and  
enhance quality of life.



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