DRAFT 2019-2050 Regional Transportation Plan

Wasatch Front Regional Council

Executive Summary

Preface

The Regional Transportation Plan (RTP) is where our Region's future transportation system is born. The 2019-2050 RTP sets forth the 31-year strategy for regional-scale transportation investments for all modes of transportation. The 2019-2050 RTP addresses:

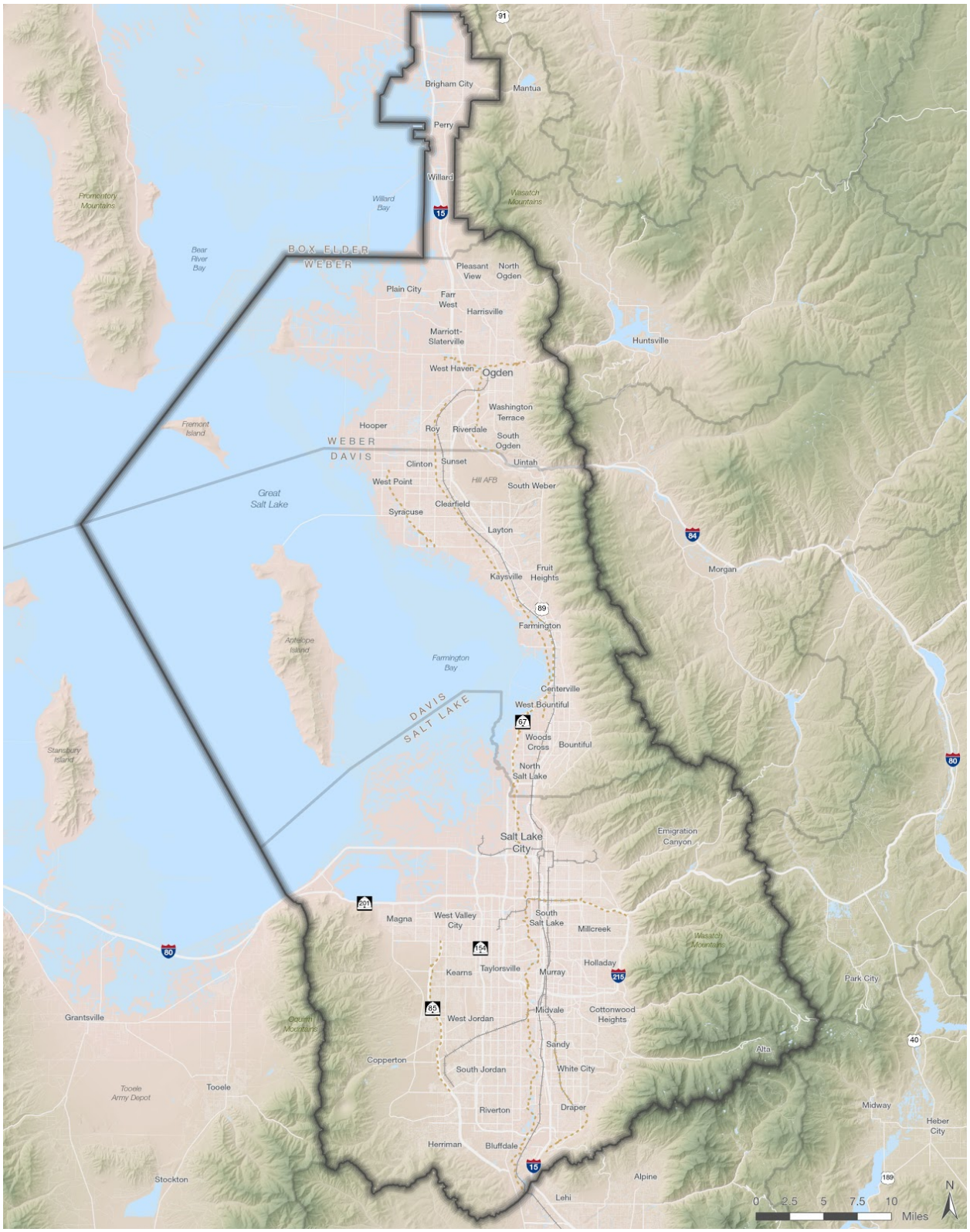
- Desired local growth and infrastructure
- Maintenance of the existing transportation system
- The regional road system
- High-capacity transit opportunities
- Active transportation networks

Updated every four years, the 2019-2050 RTP also lives within an anticipated budget. Against these constraints, particular transportation projects are prioritized, so we build the most important projects first. The 2019-2050 RTP planning process is coordinated with statewide transportation partners to develop common goals, planning time horizons, performance measures, and financial assumptions, which collectively form Utah's Unified Transportation Plan (Unified Plan).

The Wasatch Front Regional Council (WFRC) developed the 2019-2050 RTP with residents, local government stakeholders, and partner agencies. Map 1 shows the planning boundary for WFRC. The 2019-2050 RTP is informed by technical modeling and forecasting to help us understand how it might achieve regional quality of life goals. This includes ensuring that as we invest in transportation, we meet important air quality standards.

A key aspect of the 2019-2050 RTP is it was developed as part of a vision to improve the quality of life in the Wasatch Front known as the Wasatch Choice. This document details the 2019-2050 RTP, which is the transportation planning details of the Wasatch Choice 2050 Vision. The document details planned transportation investments, the process used to collaboratively arrive at the 2019-2050 RTP, the implications for our Region, and mechanisms to implement the 2019-2050 RTP.

Map 1: WFRC Planning Area



Wasatch Choice 2050 Vision: Our Shared Blueprint

The 2019-2050 RTP is the transportation element of the Wasatch Choice 2050 Vision, our region's shared blueprint for regional transportation, local land use, and economic development. This means that the 2019-2050 RTP's planned investments and recommended policies seek to help our Region achieve ten regional goals adopted by WFRC, as listed below in no particular order:

- Livable and healthy communities;
- Access to economic and educational opportunities;
- Manageable, reliable traffic conditions;
- Quality transportation choices;
- Safe and user friendly streets;
- Clean air;
- Housing choices and affordable living expenses;
- Fiscally responsible communities and infrastructure;
- Sustainable environment including water, agricultural, and other natural resources; and
- Ample parks, open spaces, and recreational opportunities.

Therefore, the 2019-2050 RTP is considered within a broad perspective of how transportation infrastructure can work with both land and economic development decisions to maximize overall quality of life. Key quality of life issues, such as mobility, affordability, and air quality, are considered through the lens of not just transportation decisions, but also by how growth patterns should unfold. For example, questions of where and what type of homes and jobs are developed will in turn affect how far people choose to travel, and the modes of transportation they use - driving alone, carpooling, ride hailing or sharing, taking the bus or train, biking, walking, or a combination thereof. In turn, these decisions impact air pollution emissions.

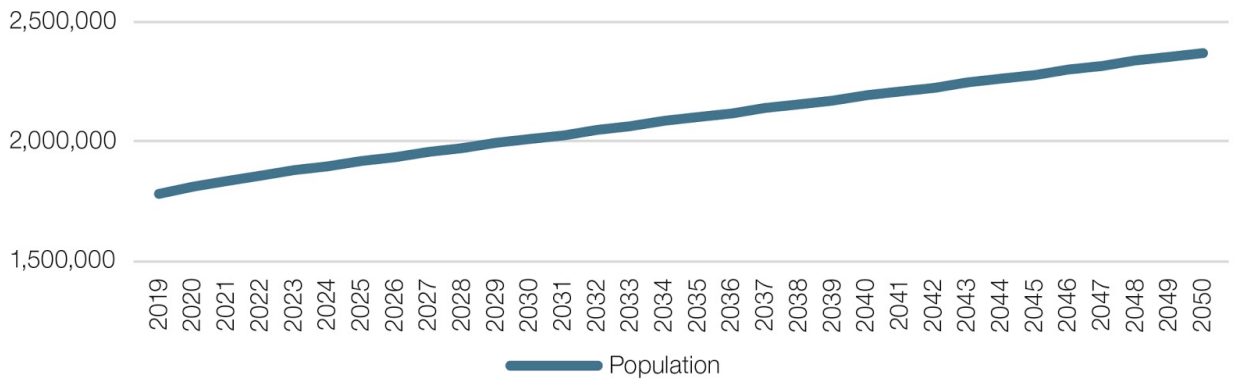
The Wasatch Front's Challenges and Opportunities

Utah is experiencing rapid growth. This amplifies the weight of the decisions we make now and over the next few decades. Here are a few of the key growth-related issues confronting our Region that affect how we develop the 2019-2050 RTP and to which the 2019-2050 RTP seeks to positively impact. All of these issues are affected by growth patterns and how people and goods are transported.

Population and Employment Increase

Utah has one of the fastest growing populations of any state - the state's population is just over three million now[1] and, by 2050, it is expected to grow to roughly five million[2]. From 2010 to 2016, the population of Utah has increased at an annual rate of 1.7 percent, while the number of jobs in the state has increased far more quickly, at an annual rate of 3.4 percent over the same six-year period[3]. Figure 1 and Maps 2 and 3 show how and where our population and employment growth will occur. Utah's growth will largely happen in the greater Wasatch Front, where about 80 percent of our state's population is currently concentrated. Geographically, our area is composed of valleys that are constrained by mountains and lakes, which heightens the challenges associated with growth. How should our transportation and land use systems work together to keep up with growth?

Figure 1: Population Growth along the Wasatch Front, 2019-2050

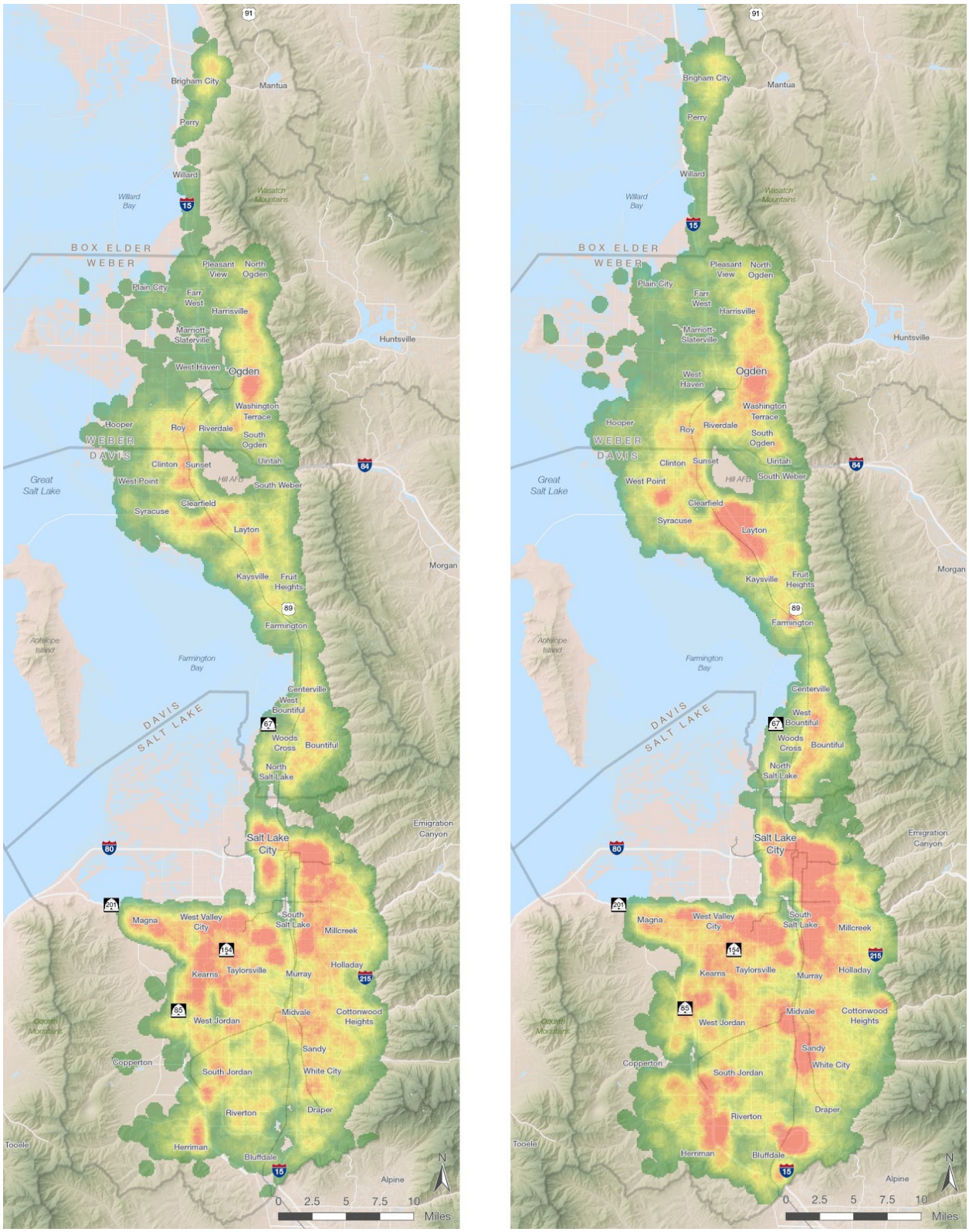


Mobility

Today, the average resident on the Wasatch Front spends about an hour commuting by car or by transit to and from work each day. In 2050, if we absorb the projected population growth but remain on our current path with the existing multi-modal system we have today and stop investing in our transportation system, we project that commutes could grow to over an hour and forty minutes, as shown in Figure 2. This projection suggests the need to build more road capacity in order to lessen delays; however, investments on roadways alone will not be sufficient. New transportation demands grow as a result of the provision of road capacity. Put another way, many will think: "less congestion means I can drive greater distances now." This makes efforts to reduce commuting times a vexing challenge.

Figure 2: Average daily commute times today compared to 2050 with limited new transportation investments

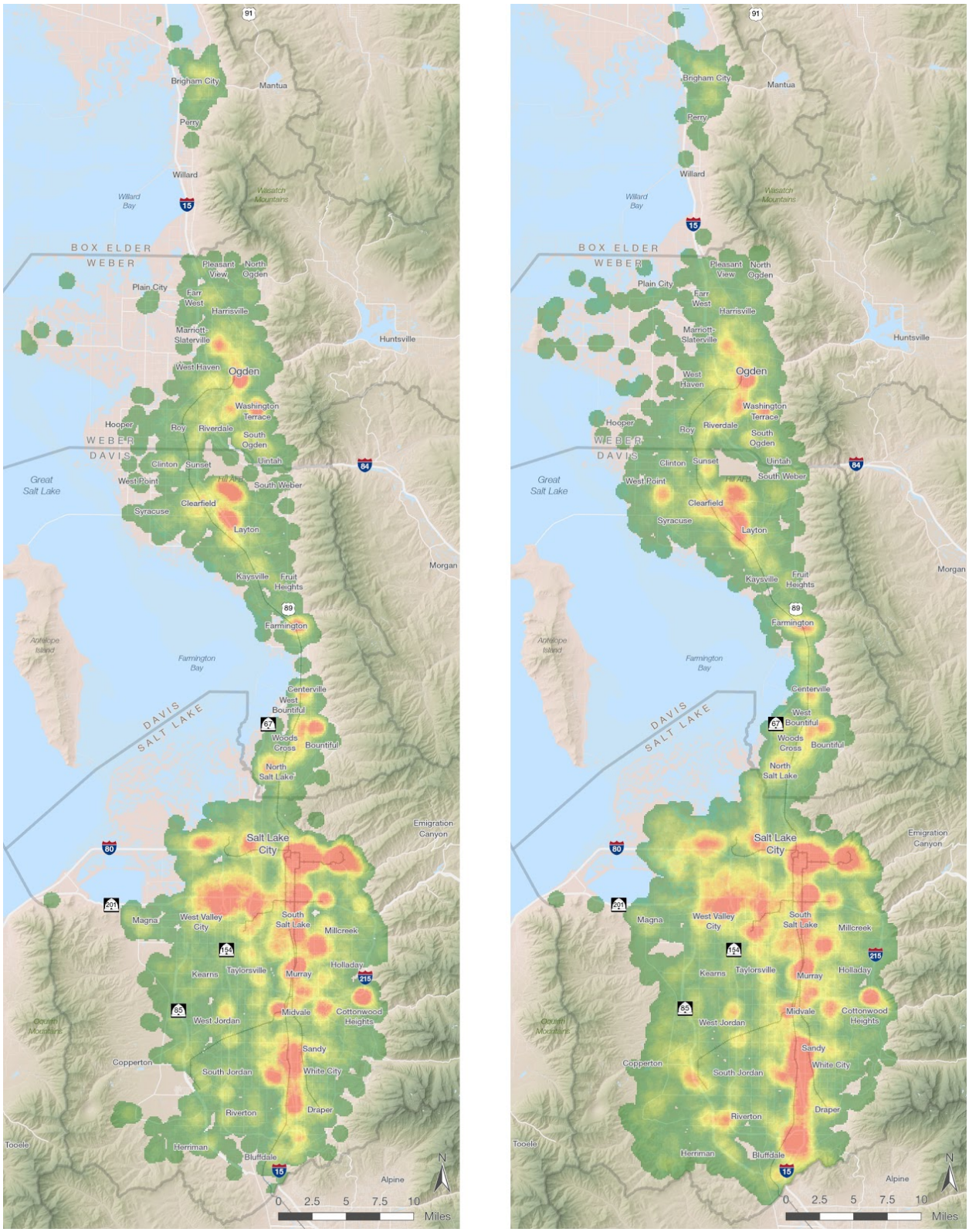
Map 2: Residential Population Change



Existing

2050

Map 3: Employment Population Change

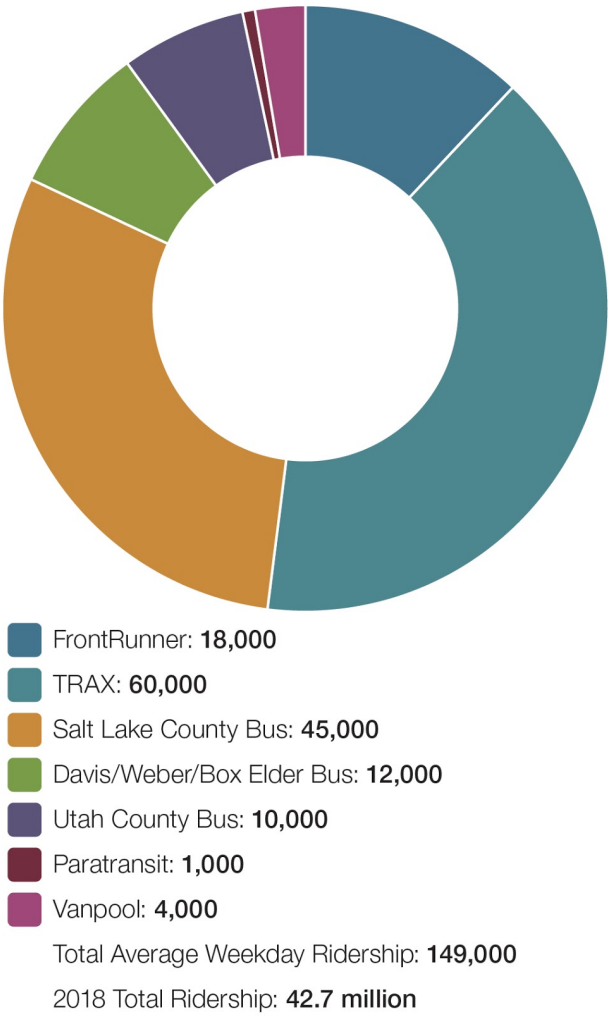


Existing

2050

Transportation demand can also be serviced by our transit system. Our existing commuter rail service currently takes over 3,000 cars per hour off northbound I-15 in the Salt Lake Valley every weekday morning. Without transit, the existing freeway needs to be three lanes wider (1.5 lanes in each direction) to meet 2050 demands. Figure 3 shows the Utah Transit Authorty's (UTA) existing ridership by mode, which demonstrates that the multi-modal transit system supports approximately 149,000 rides on the average weekday, with approximately half being transported by rail and half by bus. It is imperative that we continue investing in our multi-modal transportation system and, as such, the 2019-2050 RTP explores a variety of modes of travel and ways to reduce growth of travel demands.

Figure 3: Transit Ridership by Mode



The spread of connected and autonomous vehicles, and the use of transportation network companies, like Uber and Lyft, have the potential to dramatically affect transportation and urban form decisions. While residents are utilizing these transportation options today, it is difficult to predict how new technologies will shift and shape travel behavior and land use patterns. Transportation agencies in Utah are working together to research the effects of these technologies and to begin to implement them. For instance, the Utah Department of Transportation (UDOT) and UTA are working together to implement a connected transit corridor on Redwood Road in Salt Lake County. UTA and UDOT have also partnered to begin testing autonomous shuttles within the next year.

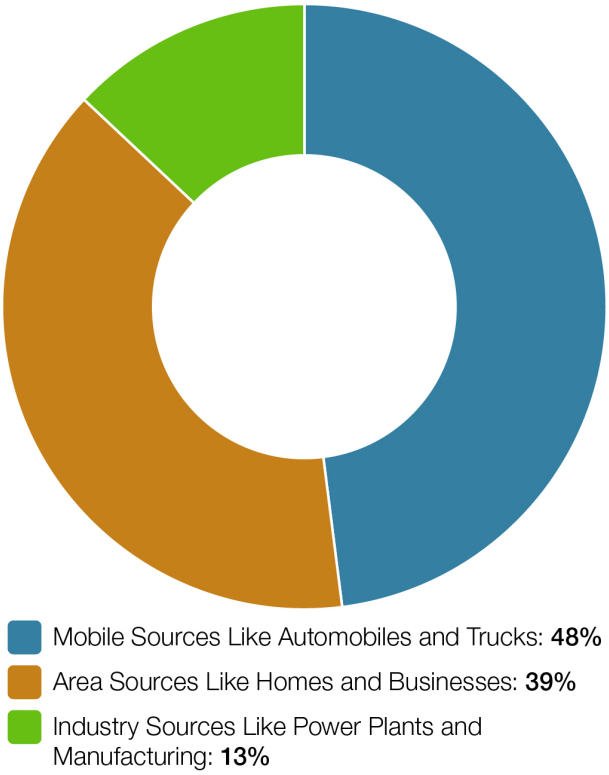
How can our region provide coordinated transportation choices and maximize the cost effectiveness of the investments we make?

Air Quality

Air quality in Utah affects health, business recruitment and retention, and overall quality of life. Utah is making progress in efforts to improve air quality. Over the past decade, we have added 350,000 people along the Wasatch Front while reducing total emissions by 35 percent. But there clearly is a long way to go. In research conducted by the Utah Foundation, air quality was rated a top three issue - along with "traffic" and "affordability of housing" - in answer to "What Could Most Improve Your Area as a Place to Live?"[4] Surveys conducted for the Point of the Mountain Commission by Envision Utah show that air quality was the top reason employees of companies located in the Silicon Slopes and the surrounding area might choose to leave Utah, with 69 percent of survey respondents saying that was

their top issue. Figure 4 shows air pollutants by source and indicates that transportation accounts for almost half of our air pollutants. How should the 2019-2050 RTP address transportation-related air emissions which contribute to approximately 50 percent of overall emissions?

Figure 4: Air Pollutants by Source[5]

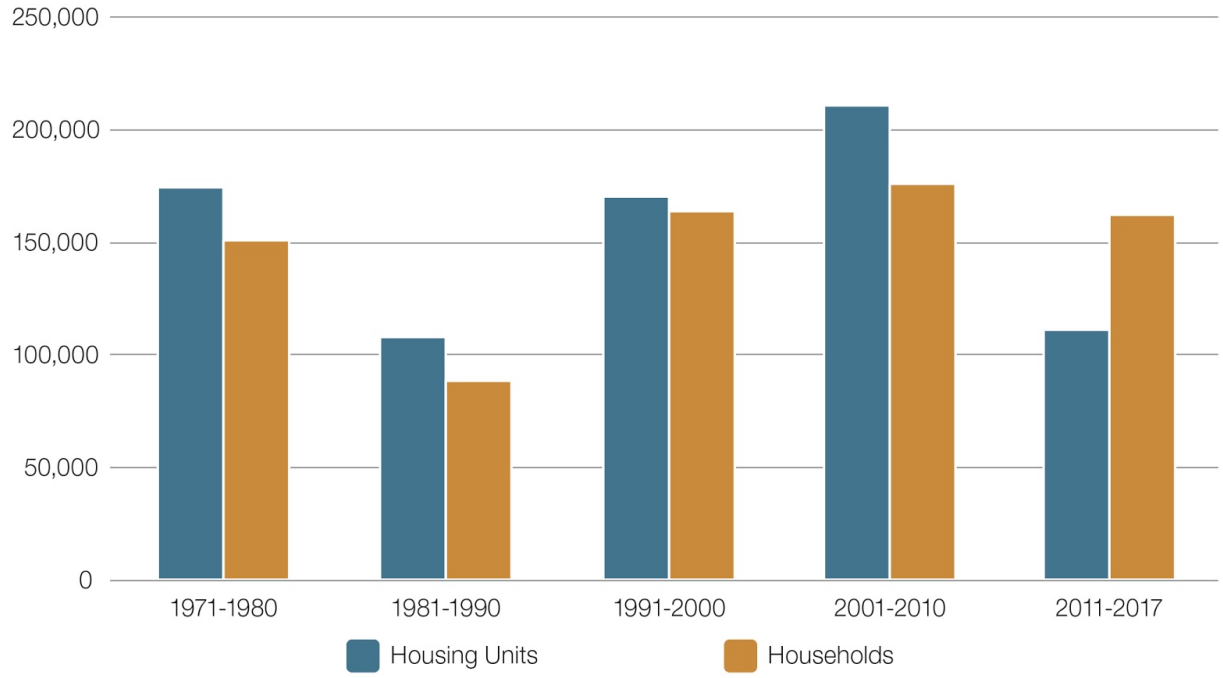


Affordability

Rapid growth has also led to greater expenses for Utahns, and housing is one salient example. The orange bars on Figure 5 show the number of new households being formed in Utah, and the blue bars show the number of housing units being produced[6]. For the first time in decades, household growth has exceeded new housing units; greater demand than supply has caused home prices to rise. This is exacerbated by labor shortages and rising costs of construction materials. Home prices recently have been increasing between seven and eight percent per year, substantially faster than growth in incomes, which has increased by 2.2 to 2.3 percent between 2010 and 2016[7].

Additionally, when we expand the traditional measure of housing affordability to include transportation-related expenses, we get a more complete picture of how much of the average household's budget is left to cover other basic necessities. On average, residents along the Wasatch Front spend 23 percent of their income, or $14,000, on transportation[8]. Transportation expenses are largely a function of housing and employment locations and the characteristics of the neighborhood in which a resident chooses to live. How might the 2019-2050 RTP help improve housing and transportation affordability?

Figure 5: Increase in Households Compared to Increase in Housing Units for Utah



Organization of the 2019-2050 RTP Document

The process to develop the 2019-2050 RTP followed four major stages, integrated with the development of the Wasatch Choice Vision. After the executive summary, the 2019-2050 RTP document begins with the story of these stages.

First, Explore.

Stakeholders explored ideas for how infrastructure might expand to meet changes to their communities, now through the year 2050.

Second, Choose.

Our Region chose a desired future or vision. Ideas explored in the first stage were packaged into three unique land use and transportation scenarios. The scenarios were used to understand the potential implications of different decisions we might start making today, evaluated against the ten regional goals.

Third, Prioritize.

The Vision was refined and decisions were made about the timing and prioritization of both infrastructure improvements and land use changes.

This section details the recommendations of the 2019-2050 RTP.

Lastly, Implement.

An implementation section outlines mechanisms to turn the 2019-2050 RTP into reality.

Afterward, appendices provide more detail on various steps and analyses.

Utah's Unified Transportation Plan

The WFRC 2019-2050 RTP comes together with each unique regional long-range plan in the state to form the Unified Plan.

The Unified Plan is a collaborative effort between transportation agencies across the state of Utah including the Cache Metropolitan Planning Organization (Cache MPO), the Dixie Metropolitan Planning Organization (Dixie MPO), the Mountainland Association of Governments (MAG), UDOT, UTA, and WFRC. The Unified Plan partners have developed a national model for best practices in working together to develop common goals, planning time horizons, performance measures, and financial assumptions so that their long-range plans are consistent across the state while meeting local needs. Then UDOT, UTA, and the MPOs all agree on which projects and needs to include in the Unified Plan, as well as timing, funding, and how to measure their effectiveness in meeting shared objectives. With immense growth projected, particularly in the urbanized areas of Utah, proactive planning amongst transportation agencies is essential, and helps to determine where to prioritize transportation investments that will foster a conducive environment for growth, promote economic vitality, and support local community visions across the state.

Regional Goals

The 2019-2050 RTP seeks to advance ten regional quality of life goals.

On October 27, 2016, WFRC adopted the Wasatch Choice 2050 goals. This milestone represented the culmination of a year and a half of work to gather input from cities, counties, transportation partners, businesses, and community organizations regarding local and regional priorities for the Wasatch Choice 2050 Vision.

The WFRC established these goals to set the direction for our shared regional Vision, and to inform how future transportation investments will be evaluated, selected, prioritized, and coordinated with local community priorities regarding growth, land use, and the pursuit of housing and economic development opportunities.

These goals were utilized in the development of the 2019-2050 RTP in each step: Explore, Choose, and Prioritize.

The ten goals, in no particular order, are:

- Livable and healthy communities;
- Access to economic and educational opportunities;
- Manageable and reliable traffic conditions;
- Quality transportation choices;
- Safe, user friendly streets;
- Clean air;
- Housing choices and affordable living expenses;
- Fiscally responsible communities and infrastructure;
- Sustainable environment including water, agricultural, and other natural resources; and
- Ample parks, open spaces, and recreational opportunities.

The ten regional goals are aligned with the goals of the Unified Plan, as agreed to by the transportation planning agencies within the state of Utah:

- Safety,
- Economic vitality,
- State of good repair;
- Air quality and the environment, and
- Mobility.

In addition, the 2019-2050 RTP seeks to advance national planning factors, part of the federal Moving Ahead for Progress in the 21st Century Act (MAP-21). The factors are:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
- Increase the safety of the transportation system for motorized and non-motorized users;
- Increase security of the transportation system for motorized and non-motorized users;
- Increase the accessibility and mobility of people and freight;
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns;
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- Promote efficient system management and operations;
- Emphasize the preservation of the existing transportation system;
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
- Enhance travel and tourism.

MAP-21 and its successor legislation, the Fixing America's Surface Transportation (FAST) Act, also provided a performance management framework for state departments of transportation, transit agencies, and MPOs to assess and monitor the performance of the transportation system. Outlined were national performance goals for the Federal-aid highway program and transit agencies. The national goals are:

- Safety: to achieve a significant reduction in fatalities, serious injuries, and safety events on all public roads and transit;
- Infrastructure condition/State of Good Repair: to maintain the highway infrastructure asset system and transit rolling stock, facilities, infrastructure, and equipment in a state of good repair;
- Congestion reduction: to achieve a significant reduction in congestion on the National Highway System;
- System reliability: to improve the efficiency of the surface transportation system;
- Freight movement and economic vitality: to improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development; and
- Environmental sustainability: to enhance the performance of the transportation system while protecting and enhancing the natural environment.

The 2019-2050 RTP was developed with a focus on meeting national goals and agency targets. More detail on our use of a performance-based approach can be found in the Present Impacts and Benefits section.

Wasatch Choice 2050 Vision

Together with local, regional, state, and federal partners, WFRC embarked on a shared process to create a vision for how our Region might progress to improve our quality of life and outcomes related to our Region's goals. This visioning process is known as Wasatch Choice 2050.

Wasatch Choice 2050 is a locally driven approach in which cities, counties, community organizations, transportation partners, businesses, the public, and others help to create and implement Wasatch Choice 2050 together, creating local solutions with regional significance. The Wasatch Choice 2050 process explores future scenarios that articulate the trade-offs associated with different approaches to transportation and land use investments. These trade-offs are evaluated in each part of the Region, with stakeholders actively engaged in the process to select the appropriate path forward. Wasatch Choice 2050 identifies specific transportation projects and investments, the use of land near those investments, and associated economic development strategies to achieve desired outcomes for local communities and the Region as a whole. Wasatch Choice 2050 also provides recommendations and resources to help stakeholders achieve those outcomes.

Strategies

The Wasatch Choice 2050 Vision is built upon four key strategies.

- Provide transportation choices: offering better access to transit and bicycle facilities.
- Support housing options: responding to market demands and meeting the needs of a variety of household sizes, types, and budgets.
- Preserve open space: providing unparalleled access to the outdoors, which is key to our quality of life and our state's competitive advantage.
- Link economic development with transportation and housing decisions: thinking about the interplay between them and ultimately the outcomes we want to achieve.

Vision Map

The vision map outlines our collective desired framework for how and where growth, infrastructure, and open space preservation might expand to meet changes to our local communities. It represents the point on the horizon that we are working towards. The 2019-2050 RTP translates the transportation infrastructure component into an actionable plan. The four key strategies are unifying themes exhibited in the Vision Map.

Key Recommendations

The 2019-2050 RTP includes improvements to the transportation system and complementary policies. While the system improvements are limited to regional transportation infrastructure, the policies guide the way WFRC addresses various issues. This includes principles that guide the 2019-2050 RTP, such as a desire to mitigate growth in travel demand. Policies also address new considerations like emerging transportation technologies such as connected and autonomous vehicles and micro-mobility devices. Overall the 2019-2050 RTP seeks to help improve the resilience of the Region in the face of economic, technological, and environmental uncertainties. Policies also suggest implementing actions by other entities that would significantly affect mobility, accessibility, and quality of life along the Wasatch Front.

System Improvements

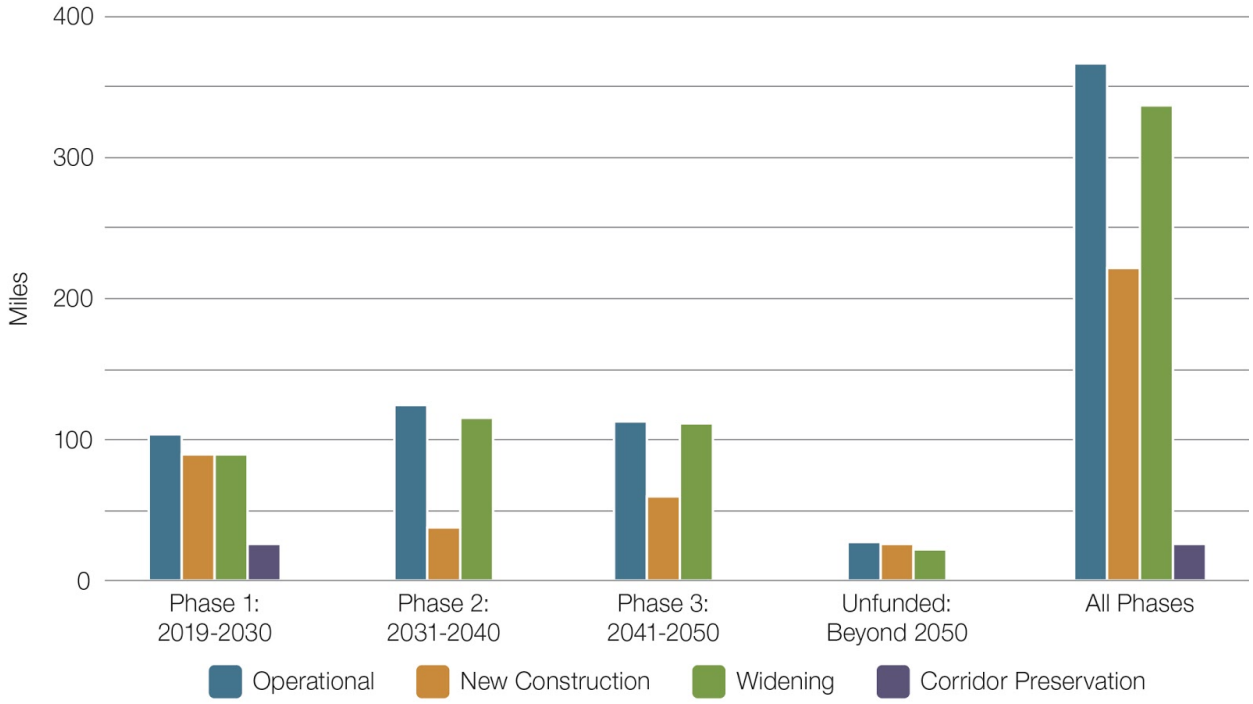
Roadway System Improvements

Programmed roadway improvements in the 2019-2050 RTP include a balance of freeway, highway, arterial, and collector road projects. Freeway and highway projects include widening existing freeways; operational management and ramp metering; two new freeways, the Mountain View Corridor and West Davis Corridor; and two conversions from arterials to freeways, Bangerter Highway and US-89. These large-scale projects will help accommodate the growing travel demand throughout the Region.

The 2019-2050 RTP includes capacity and operational improvements to existing surface roads, such as realigning Midland Drive in Weber County, improving operations on 12600 South and 13400 South in Salt Lake County, and preserving mobility on east-west connectors between West Davis Corridor, I-15, and US-89 in Davis County. The 2019-2050 RTP also identifies 23 grade-separated crossing over railroads and interstates to improve mobility and reduce barriers. Improving connectivity is a key component of the 2019-2050 RTP and included are 99 new construction projects that either complete existing gaps or provide greater localized connectivity, or extend the roadway network. Figure 6 shows miles of planned roadway facilities in the 2019-2050 RTP by phase and project type.

There are approximately 396 roadway projects in the 2019-2050 RTP at an estimated total cost of $18.3 billion, in 2019 dollars. While existing and assumed new funding are projected to be available for the majority of the proposed prioritized projects, there is estimated $2.7 billion, in 2019 dollars, of unfunded needs.

Figure 6: 2019-2050 RTP Miles of Planned Roadway Projects by Type

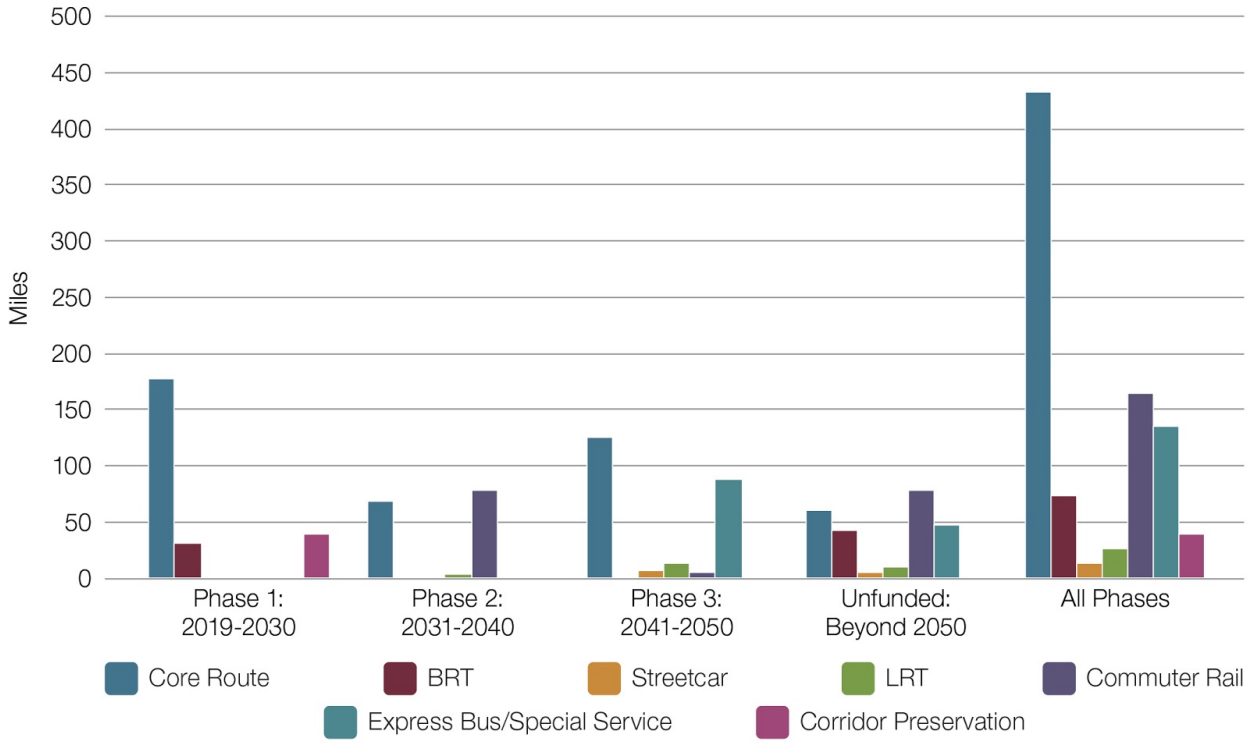


Transit System Improvements

The 2019-2050 RTP plans transit service that fits within the context and scale of individual municipalities, centers, and corridors, while enhancing the regional transportation network through providing accessible and reliable public transportation. As such, there are a variety of planned transit projects throughout the Wasatch Front through the year 2050, including a gridded network of frequent and direct east-west and north-south Core Bus routes, a number of high-capacity transit projects serving urban centers such as the Ogden-Weber State University bus rapid transit (BRT) project and a light rail extension to the rapidly growing Point of the Mountain area, improvements to regional commuter rail (FrontRunner), and express and special service bus routes serving key destinations such as from the Tooele Valley to Salt Lake City and to recreational opportunities in Big and Little Cottonwood Canyons.

The approximately 45 prioritized transit projects in the 2019-2050 RTP are estimated to cost $2.2 billion, in 2019 dollars, to construct with projected available revenues. The 2019-2050 RTP identifies that these projects will be built within one of the three financial phases within the 2019-2050 RTP (Phase 1: 2019-2030, Phase 2: 2031-2040, Phase 3: 2041-2050). It is estimated that there will not be available revenues to construct an additional 15 needed transit projects costing approximately $2.3 billion to construct by the year 2050. These 15 projects are referred to as “unfunded” within the 2019-2050 RTP. Figure 7 shows the miles of planned transit projects by phase and type included in the 2019-2050 RTP.

Figure 7: 2019-2050 RTP Miles of Planned Transit Projects

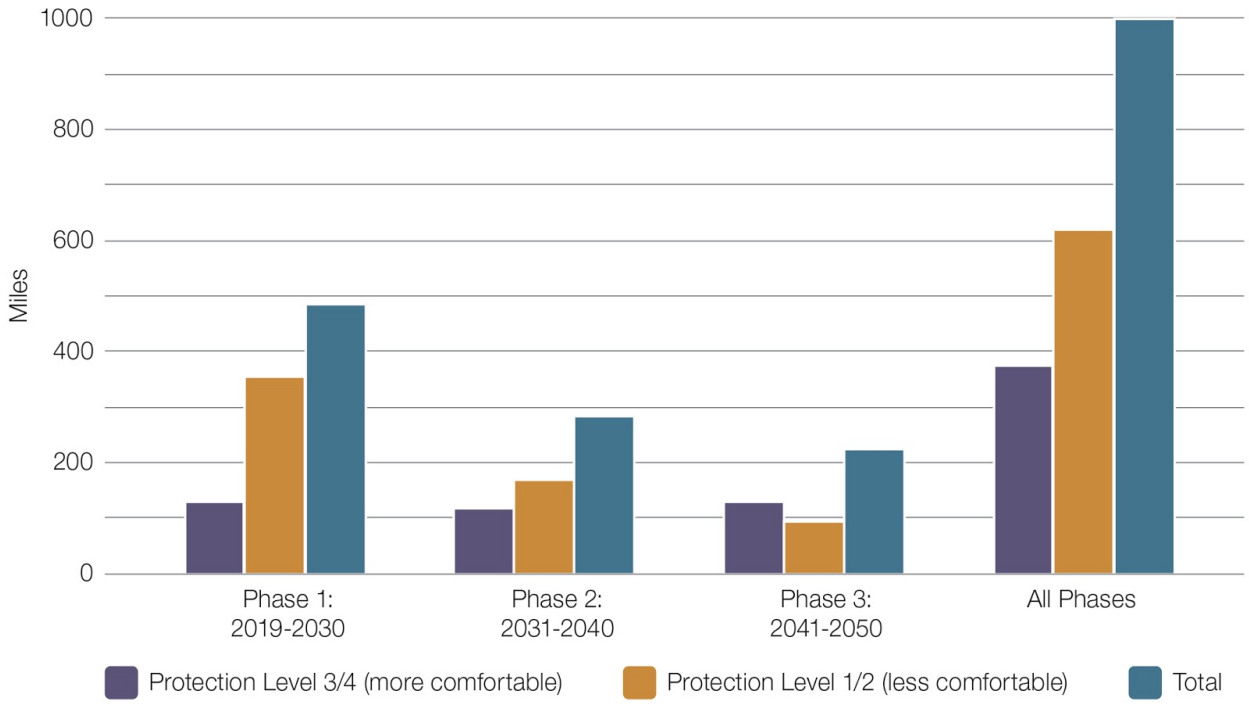


Active Transportation Improvements

In all, 554 active transportation projects, making up over 1,000 miles of linear regional bicycle infrastructure, are planned through 2050 at a cost of about $379 million, in 2019 dollars. New, safe, family-friendly facilities, such as the Historic Orchard Pathway in Box Elder County, Wall Avenue protected bike lane in Weber County, North Fork Kays Creek Path in Davis County, and Porter Rockwell Trail in Salt Lake County, account for 316 miles of the planned network. Such high-comfort facilities are critical to giving people travel options that do not involve a personal vehicle, increasing mobility and access to opportunity and deriving the physical and mental health benefits associated with active transportation. Additionally, the 79 point and intersection projects identified (projects that enable safer bicycle and pedestrian crossings over barriers such as high-speed roadways and unsafe intersections) promote accessibility and user safety. These projects are estimated to cost approximately $82 million, in 2019 dollars. Please note that sidewalk infrastructure projects and costs are not identified in the 2019-2050 RTP.

The 2019-2050 RTP phases active transportation projects in ten year increments according to the same timeline as transit and roadway projects (Phase 1: 2019-2030, Phase 2: 2031-2040, Phase 3: 2041-2050). However, active transportation project phasing is not based on revenue assumptions like the other modes, but rather by need and circumstance. Figure 8 shows the number of miles of planned regional bicycle network by phase and type in the 2019-2050 RTP.

Figure 8: 2019-2050 RTP Miles of Planned Regional Bicycle Network by Protection



Facility type, such as bike lane, shared lane, overhead crossing, etc. is identified project by project on the online interactive map. However, the planned active transportation solution identified in the 2019-2050 RTP may evolve over time. During project development, context sensitive solutions will be considered to build out the preferred solution. Further jurisdiction coordination, deployment of interim designs, or phased implementation may be necessary until complete redesign or reconstruction of the roadway and active transportation facility occurs, and/or additional right-of-way (ROW) can be acquired.

Many studies have made it clear that in order to increase the number of people biking for commuting and utilitarian trips, networks need to provide high comfort facilities that provide real and perceived safety for users from vehicular traffic. Each linear active transportation project in the 2019-2050 RTP is assigned a Protection Level from 1 to 4 with 1 providing the least protection and 4 providing the most protection. To increase the number of people biking, facilities should at least be high-end Protection Level 2 (bike lanes protected by parked cars) or Level 3 (bike lanes protected physically from traffic through curbs or other means). Paved, separated shared use paths provide the most protection and comfort for the user and are classified as Level 4 facilities. Such facilities increase comfort and safety for novice riders of all ages and abilities.

Policies

While the system improvements are limited to regional transportation infrastructure, the policies guide the way WFRC addresses various issues. This includes principles that guided the 2019-2050 RTP, such as a desire to mitigate growth in travel demand. Policies also address new considerations like emerging transportation technologies. Finally, policies suggest implementing actions with other entities that would significantly affect mobility, accessibility, and quality of life in the Wasatch Front (efforts outside of implementing regional transportation infrastructure).

Link planning with project development

The WFRC will explore with UDOT and UTA ways to ensure that the interagency 2019-2050 RTP is connected to project development and environmental review processes for transportation projects. Improving these linkages would mean additional process requirements and documentation for WFRC. The benefits would be reduced project delivery times and potentially significant cost savings for implementing parties.

Mitigate growth of travel demand

The WFRC seeks to reduce the need for transportation capacity even as we plan for transportation capacity improvements.

Transportation infrastructure is generally very expensive. Mitigating growth of travel demand can mean reduced travel distances or increased use of space-efficient modes of travel like carpooling and public transportation. Mitigating growth of travel demand should never come at the expense of the economy, i.e., we should never force people to avoid going to their desired destinations. Effective strategies to mitigate growth or travel demand can do just the opposite: enable the economy to function more effectively. For example, if we work to increase the number of potential workers that can reach firms by transit in a reasonable commute, it would mean better business production and would lower the demand for roadway capacity.

Explore use of pricing to improve mobility

The WFRC explores the use of pricing strategies as a way to improve transportation system and economic outcomes.

Given the physical constraints of existing office buildings and homes, our geographic location between the mountains and lakes, and the costs required to build more infrastructure, WFRC works to maximize the utility of existing infrastructure while keeping people, goods, and services moving. One way to do this is to explore the use of pricing strategies. The purpose of pricing is not to generate revenue, but to improve transportation outcomes. Revenue can be sent back, say, to affected communities.

Perhaps the most important consideration in travel is time -- “how long will it take me to get there?” Congestion increases travel time and harms the economy. Firms and residents must also plan for a “bad traffic day” or face the disruption of missed appointments. It therefore makes sense to see if we can save the traveling public enough time through pricing modifications that the net effect is positive. Time savings of a toll can more than compensate for the direct expenditure. Experience with pricing around the world demonstrates that those positive economic outcomes are predictably achievable. This is especially important to consider given that it is unrealistic to widen roadways in perpetuity.

Pricing strategies to explore include modifications to transit fares and dynamic tolling of limited access roadways.

Improve fit between transportation and adjacent land use

The WFRC supports having the design and function of future transportation facilities be coordinated with the desired design and function of adjacent land use.

This helps ensure that streets balance the needs of businesses and neighborhoods in addition to facilitating movement. If there is a conflict between a current or proposed transportation decision and a

current or proposed land use planning decision, the two decisions should ideally be resolved together to minimize conflict.

Consider long-term needs of other modes of travel when implementing transportation projects

The WFRC supports having the design and function of a transportation facility, such as a street, meet the needs of each modal element in the 2019-2050 RTP.

This includes the needs of cars, transit, bicyclists, and pedestrians as is appropriate. When practical, the timing of construction should consider ways to reduce the aggregate costs of all anticipated improvement of each applicable transportation mode.

Prepare for resiliency in the face of uncertainty

The WFRC seeks to have a transportation plan that helps the Region be resilient in the face of an uncertain future. The WFRC will highlight key vulnerabilities to our member communities and Region.

The Wasatch Front will face a variety of shocks to the economy and possibly ecosystem over the 2019-2050 RTP horizon. Any region that is built to only thrive under average or optimal conditions is vulnerable to unusual or significantly negative conditions.

Resiliency efforts help the Region protect assets and people from natural disasters like earthquakes, floods, landslides, and fires as well as prepare for economic recession. Resiliency underpins the achievement of many other goals in the 2019-2050 RTP, such as affordable living expenses and economic opportunity.

The key uncertainties WFRC considered in the development of this 2019-2050 RTP are:

1. Natural disasters, such as an earthquake;
2. Large scale recession;
3. Significant gas price increase; and
4. Technological changes (addressed in more depth below).

Additional details of ways WFRC is addressing resiliency can be found in Appendix A - System Resiliency.

Maximize the value of emerging technologies

The WFRC develops plans and more detailed policies to maximize the value of emerging technologies.

A number of significant technological shifts are underway or anticipated that will change the way we travel, where we travel, and what and how goods are shipped. Some of these technological shifts will also affect where people choose to live and work. The WFRC has worked to address how we can together maximize the benefits accrued from emerging technologies. Many believe that the changes we will see in the coming decades - take connected and autonomous vehicles, for example - will be the biggest seen since the invention of the automobile. Think back about the introduction of the automobile: It changed life in a myriad number of ways, many positive and some negative. Cities around the world addressed automobile proliferation in different ways which led to dramatically different outcomes to quality of life. Similarly, we must plan now to maximize net impact of emerging technologies.

Here is a list of emerging technologies that WFRC is presently addressing:

1. Aggregation of technologies that encourage telecommuting;
2. Fully or partially automated passenger vehicles;
3. Self-driving buses;
4. On-demand travel services and sharing services (ridesourcing) like Uber, Lyft, car share, bike share,micro-mobility devices, etc;
5. High-tech transit systems: proliferation of real-time arrival information, Wi-Fi on all transit, fare collection advances;
6. Inter-regional high-speed transit that connects the Wasatch Front to other metropolitan areas;
7. Fully or partially automated freight vehicles;
8. Internet shopping;
9. Real-time understanding of travel behavior from cell phone, Wi-Fi, or Bluetooth devices;
10. Managed motorways: aggressive, coordinated ramp metering to maintain vehicular flow on mainline freeways; and
11. Connected vehicles: transit, freight, and personal vehicles that communicate with each other and with fixed sensors and traffic signals.

Additional details of ways WFRC is addressing these technologies can be found in Appendix B - Disruptive Technologies.

Increase street connectivity

It is the policy of WFRC to:

1. Promote greater connectivity in the Region,
2. Encourage local communities to adopt connectivity ordinances, and
3. Provide data and analysis to understand existing and future connectivity.

Street connectivity is vital to our mobility, our safety, and our economy. Public streets provide the function of connecting us to our jobs, neighbors, friends, and the places we visit. Streets are built to link us to one another and our community destinations. Street connectivity is a main component to reducing vehicle miles traveled (VMT) and increasing transit use, walking, and biking. Street connectivity disperses traffic throughout the network, leading to a significant reduction in travel times and delays. A number of projects are included in the 2019-2050 RTP which seek to improve the connectivity of the local street, transit, and active transportation networks. In addition, MAG, UDOT, UTA, and WFRC recently created a guidebook for local communities to implement street connectivity, the Utah Street Connectivity Guide.

Solve the first-/last-mile challenge

The WFRC seeks to reduce first-/last-mile barriers to transit use.

In many cases, a transit rider can get relatively close to their desired destination (e.g., within a mile), but having door to door service is impractical. The ease to which the potential transit rider can navigate the first or last mile is often crucial in helping him or her make the decision to ride transit.

The following are among strategies to reduce first-/last-mile barriers:

1. Bike and pedestrian safety and connectivity improvements,
2. Improve local street connectivity, and
3. Fund ridesourcing including bike share.

Support the state freight plan

The WFRC supports the Utah Freight Plan.

The UDOT has established a Freight Advisory Committee (FAC), which in turn, has developed a set of guiding principles. The mission of the FAC is to support freight projects within the State of Utah that foster economic vitality and competitiveness, promote efficient and safe freight movement across all modes, and ensure they are in alignment with federal standards and UDOT strategic goals. To achieve this mission and support member organizations, the FAC will:

1. Provide input and guidance on the Utah Freight Plan;
2. Provide a venue for information exchange with a broad range of freight stakeholders;
3. Provide educational opportunities and promote freight education and awareness to the broader community;
4. Develop recommendations for projects to be included in the Utah Freight Plan, which then are implemented into the 2019-2050 RTP; and
5. Recommend policy guidance at the state level.

Enhance intelligent transportation systems

The WFRC works with its partners to encourage deployment of Intelligent Transportation Systems (ITS). These systems include technologies which improve transportation safety and mobility by integrating advanced communications technologies into transportation infrastructure and into vehicles. ITS encompasses a broad range of wireless and traditional communications-based information and electronic technologies.

“Non-recurring” congestion, such as that caused by vehicular crashes, highway construction, or weather conditions, has been estimated to account for around 50 percent of traffic congestion in the Wasatch Front Region. ITS are a vital tool to manage the effects of non-recurring congestion. One element of these systems includes dynamic message signs to alert motorists of incidents on the road ahead so that they can take an alternate route. Communications systems to quickly alert emergency management providers, traffic control centers, dispatch, incident management personnel, the media, and others about incidents are also part of ITS. Detectors and cameras further aid in verifying and managing these incidents. The ability to implement pre-packaged signal timing plans to respond to traffic changes resulting from incidents is another aspect of ITS.

ITS can also be used to better manage recurring congestion associated with weekday peak commuting times. This is accomplished through means such as signal timing plans on arterial streets and ramp metering to improve freeway traffic flow. Coordinating signals can reduce delays by 20 to 30 percent. Ramp metering also has significant effects in decreasing delay.

Another way in which ITS addresses both non-recurring and recurring highway congestion is by improving the efficiency and convenience of the transit system, thus increasing ridership and reducing single-occupant vehicle travel. Riders can be notified in “real-time” of bus and rail travel schedules and connecting transit service through electronic signs, the internet, phone systems, and other means. The transit fleet can be better managed in response to changing traffic conditions. Voice annunciators and “smart card” payment systems are also part of transit ITS.

Ensure state of good repair

Proper repair and regular maintenance of active transportation facilities should be a high priority for any authority responsible for such facilities. Well-kept sidewalks, shared-use paths, bike lanes, among other facilities, provide reliability, comfort, and safety to users. This leads to more frequent user trips on such facilities. Repainting lines and symbols; ensuring efficacy of signage; sweeping bike lanes and shoulders to clear them of debris and snow; maintaining good surface conditions through replacement of heaving sidewalks and filling potholes, etc; replacing and repairing truncated dome and crosswalk indicators for people with disabilities; and ensuring the integrity of structures both overhead and underground should all be built in to regular maintenance schedules and budgets. Additionally, programs to obliterate weeds such as puncture vine aid in keeping active transportation facilities in good repair and ensuring a positive user experience.

Potholes and uneven pavement are daily remainders of the importance of the maintenance and preservation of our transportation system. UDOT and local communities invest heavily in the preservation of the roadway system. UDOT's philosophy is that good roads cost less. UDOT includes and prioritizes pavement preservation and structures maintenance projects in its Statewide Transportation Solutions Plan. The Materials and Pavement Management Division identifies proper treatments, prioritizes, and coordinates the pavement management program. The Structures Division administers a Bridge Inspection and Bridge Load Rating Programs and inspects each bridge in the state every two years.

WFRC tries to encourage pavement management and recognizes good pavement management plan. Pavement management is included as a prioritization criteria for Surface Transportation Program (STP) funding. Many local communities work with the Utah Local Technical Assistance Program (LTAP) Center, run by Utah State University, to identify pavement and asset management strategies. To close the preservation funding gap, local communities have begun to identify specific funding streams, such as transportation utility taxes, using the local portion of the 4th quarter local option sales tax, or bonding for street reconstruction.

The UTA recognized early the need to maintain and operate all elements of the transit system in a safe and efficient manner. This early identification provided UTA with a head start in Transit Asset Management (TAM) and as a result, UTA is accepted as a national leader in TAM and is in compliance with the State of Good Repair requirements set forth by MAP-21. To achieve this, UTA has adopted the following philosophy directing their asset management approach:

> "Asset Management is the key to identifying problems before failures occur that can cause unplanned outages and disruptions in service. An effective Asset Management program will maintain a safe, efficient, and reliable transit system for our customers and keep the public investment in a State of Good Repair."

To deliver on this philosophy, UTA must maintain the infrastructure at a level meeting the demands of customers in terms of safety, capacity, capability, reliability, and cost. Successfully meeting this goal ensures the long-term viability and acceptance of a fully functional transit agency for current and future taxpayers.

The UTA has developed a management process to facilitate effective and proactive maintenance of the facilities, systems, vehicles, stations, and guideways. To accomplish this, UTA has defined long-term budget projections showing the future funding needs of the agency. The elements currently contained and tracked within the TAM system can be found in UTA's 2018 Transit Asset Management Plan.

Improve Mobility Management

The WFRC works with its partners to encourage mobility management, or coordination among human service transportation providers. The Human Service Transportation Coordination Presidential Executive Order (13330 - 24 FEB 04) recognized the critical role of transportation in providing access to employment, medical and health care, education, and other community services and amenities. It is noted that the development, implementation, and maintenance of responsive, comprehensive, coordinated community transportation systems is essential for persons with disabilities, persons with low incomes, and older adults who rely on transportation to fully participate in their communities. These populations are collectively referred to as the Transportation Disadvantaged.

The 2017 Wasatch Mobility Plan was prepared principally by UTA with input from members of the Local Coordinating Councils, which include human service transportation providers, WFRC, and other agencies. The full plan in included in Appendix C - 2017 Wasatch Mobility Plan. The Wasatch Mobility Plan identified needs and gaps in transportation services for seniors and people with disabilities in Weber, Davis, Salt Lake, and Utah Counties, and will be used to guide the work of these local councils in increasing the coordination of human services transportation and improving mobility throughout the region, including allocation of the Federal Transit Administration (FTA) 5310 grant funding.

Impacts and Benefits

The Wasatch Front 2019–2050 RTP was evaluated to determine its social, economic, and environmental impacts and how well it would meet the transportation needs of the Region through the year 2050. The goals and objectives for the 2019–2050 RTP, as described earlier, helped form the basis for this evaluation. The 2019–2050 RTP was also analyzed with regard to its conformity with state air quality plans, potential mitigation measures to minimize project impacts, and other factors.

Transportation Modeling and Analysis Tools

The WFRC employs sophisticated transportation and land use modeling tools to provide decision-makers, agency staff, and the public reliable forecasts from which to analyze future scenarios and to make the best plans for our Region. As transportation and land use are mutually dependent, models for both of these systems work together to optimally support the development, selection, and prioritization of future transportation projects. Similarly, integrated modeling tools are critical for exploring local land use policies such as those that promote urban and local centers, and the impact of our urban systems on air quality.

Developing and maintaining travel and land use models is a best practice for regional planning. But it also fulfills requirements and expectations needed to continue to receive our Region's share of federal transportation funding. Accordingly, WFRC's modeling processes comply with federal law (FAST Act, MAP-21, and Clean Air Acts) as well as guidance provided by the US Department of Transportation (USDOT), the Federal Highway Administration (FHWA), FTA, and the Environmental Protection Agency (EPA).

Wasatch Front Travel Demand Model

Since 2000, WFRC has partnered with our neighboring MPO, MAG to develop and support a shared, region-wide travel demand model. Version 8.3 of the Wasatch Front Travel Demand Mode (TDM) was used for the 2019-2050 RTP and will be the version released for official use coinciding with the formal

adoption of the 2019-2050 RTP document. The travel model includes the phased, fiscally-constrained 2019-2050 RTP roadway and transit projects and the official traffic-analysis-zone (TAZ)-level socio-economic forecasts for the Region. The WFRC and MAG have calibrated the model's parameters to local travel behavior patterns (trip rates, trip lengths, time of day of trip, mode of travel, etc.) and validated the model's results with observed travel conditions (transit ridership, roadway volumes, and roadway speed) for the model's base year, 2015. Additional processes are used to validate the reasonableness of future year travel projections.

Real Estate Market Model

The current shared WFRC/MAG Real Estate Market Model (REMM) version is 1.0. The WFRC/MAG REMM relies on best available resources to project future development activity using the UrbanSim modeling platform. Critical inputs to REMM's consideration of available land and profitability of new and redevelopment activity include:

- a region-wide parcel land use and valuation database,
- an inventory of local government general plans,
- the results of a multi-year scenario-based visioning exercises,
- a synthesized household population for the model's base year (2015) based on Census data,
- address geocoded employment totals from the Utah Department of Workforce Services (DWS),
- county-level employment and population control total projections, sourced from the University of Utah's Kem C. Gardner Policy Institute, and
- public and private sector expert advisors.

REMM produces the small area TAZ-level socioeconomic projections that inform the trip generation in the regional travel model. And in turn, REMM factors travel accessibility derived from the travel model, into its predictions of land development activity.

Output from the Models

The Wasatch Front TDM and the REMM are updated every four years in synch with the four-year RTP cycle. These models serve the combined urbanized area of Salt Lake City-West Valley City, Ogden-Layton, and Provo-Orem urbanized areas. Together, the regional travel model and the socioeconomic layers derived from REMM provide planning and operations professionals with a rich set of information from which to gain insights into future needs, opportunities, and solutions. Projected measures produced by the models include:

- future population, household, and employment distributions;
- travel patterns and mode share;
- future vehicle and transit volumes and their relationship to the capacity of existing facilities and services;
- travel times and comparative accessibility to workplaces and other key destinations; and
- key inputs to air quality mobile-source emission forecasts.

Regional Performance Measures

Performance measures were carefully chosen to give decision makers the opportunity to compare how well the 2019–2050 RTP supports their values and goals. Table 1, organized by regional goal, compares today's conditions with two future scenarios: a future supported by existing local zoning policies and no additional transportation funding other than existing revenue sources, and a future in which the Wasatch Choice 2050 is implemented with a focus on centered growth and additional transportation projects found in the 2019-2050 RTP. More detail about regional performance measures can be found in the Present Impacts and Benefits section.

Implementation

Regional transportation planning, to be effective, is a continuous process. Implementation of the 2019-2050 RTP is a cooperative effort of local, state, and federal officials. In addition to working with various agencies and partnerships throughout the Region, WFRC has established a process to continuously monitor the progress of transportation performance and the progress of various transportation improvement projects. The WFRC also works with other agencies to address short-range congestion, pavement preservation, and bridge replacement and rehabilitation needs. Various corridor and environmental studies for major roadway and transit projects help to refine and implement the recommendations of the 2019-2050 RTP.

Overall, implementation of the 2019-2050 RTP comes through funding and development of the planned projects, promoting adoption of policies by implementing agencies, and technical assistance and training to assist the implementers. Tracking or monitoring progress in turn helps inform implementation efforts and future modifications to the 2019-2050 RTP and the underlying Wasatch Choice 2050 Vision.

Finally, the RTP will be updated every four years to consider changing development patterns, new technologies, and evolving goals and vision for the Wasatch Front Region.

Funding and Project Development

The implementation of the roadway, transit, and active transportation projects of the 2019-2050 RTP will rely on the close cooperation of all regional partners and local governments, with funding from federal, state, local, and private sources. Various funding sources for transportation infrastructure have been established and include WFRC-administered Federal Funds like STP, Congestion Mitigation Air Quality (CMAQ), Transportation Alternatives Program (TAP); other Federal funds like grants from FTA and safety and preservation monies for roadways; and general funds from the State of Utah and local communities. The programing and funding of various transportation projects is the responsibility of the WFRC short range planning effort, which develops and utilizes theTransportation Improvement Program (TIP). The TIP is a six-year program of funded roadway, transit, and active transportation projects for the Salt Lake City-West Valley City and the Ogden-Layton Urbanized Areas. Along with numerous other projects, included in the TIP are Phase 1 projects found in the RTP for which funding has been identified. A Metropolitan Planning Organization (MPO) approved TIP is required by federal legislation for a region to receive federal highway, transit, and active transportation funding. Finally, in addition to preparing the regional transportation plan, the WFRC works continuously with UDOT, UTA, and local communities on alternatives analysis, environmental studies, corridor plans, and master plan updates. These efforts help to develop and refine specific projects found in the 2019-2050 RTP.

Table 1. Regional Performance Measures Summary

Metric	Measure		Today	Current Path to 2050	Wasatch Choice Path to 2050
Goal: Livable and healthy communities					
Walkability	The percent of major corridors that are walkable.		7%	18%	26%
Goal: Access to economic and educational opportunities					
Destination Access	The number of jobs accessible to the average Wasatch Front household in a reasonable commute.	Auto *Transit*	180,000 35,000	215,000 48,000	226,000 58,000
Freight	The average truck speed on freight corridors in the evening commute.		56 mph	55mph	57 mph
Goal: Manageable and reliable traffic conditions					
Auto Travel Time	The total time per day that the average person spends in a vehicle.		0:59	1:13	1:10
Goal: Quality transportation choices					
Transportation Choices	The percent of people who are nearby (are within one quarter of a mile) a frequent bus route, transit stop/station, or dedicated bike facility.	Transit Bike	21% 43%	20% 77%	36% 79%
Transit Use	The number of trips per day that residents travel by transit.		118,000	249,000	309,000
Goal: Clean air					
Air Quality	The number of vehicle trips taken in the Region per day.		5.3 M	7.9 M	7.9 M
Goal: Fiscally responsible communities and infrastructure					
Local Infrastructure Costs	The total cost to provide streets and infrastructure to serve new development.		-	$10.2 B	$7.9 B
Goal: Sustainable environment, including water, agricultural, and other natural resources					
Water Use	The number of gallons of water that the average household uses.		519	475	449
Developed Land	The acreage of farmland and open space converted to development.		-	17,800	12,000

Transportation and Land Use Connection Program

Many of the policies the Transportation and Land Use Connection (TLC) supports local governments with technical assistance to integrate land use planning and regional transportation, implementing the Wasatch Choice Vision. These resources have been utilized in the past, and will continue to be used in the future, to fund needed transportation improvements in accordance with their assigned phasing and priority.

Promote 2019-2050 RTP Policies

While the system improvements in the 2019-2050 RTP are limited to regional transportation infrastructure, the 2019-2050 RTP policies guide the way WFRC addresses various issues, like mitigating growth in travel demand, addressing new considerations like emerging transportation technologies, or exploring implementing actions with other entities. The WFRC will work with transportation partners and local governments to further the utilization of shared 2019-2050 RTP policies.

Progress Monitoring

The WFRC is establishing a process to monitor the implementation of the 2019-2050 RTP and the progress in meeting the Wasatch Choice 2050 goals. Roadway, transit, and active transportation projects recommended in the 2019-2050 RTP will need to be refined and evaluated for environmental and social impacts and specific funding sources will have to be assigned and programmed.

End Citations

1. United States Census
2. Kem C. Gardner Policy Institute 2017 Baseline Projections
3. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)
4. Utah Foundation, Quality of Life Index
5. Utah Division of Air Quality, Salt Lake Non-Attainment Area
6. Kem C. Gardner Policy Institute
7. Salt Lake Chamber
8. Center for Neighborhood Technology, Housing + Transportation Affordability Index

Establish Goals

Public Involvement Process

The Wasatch Choice 2050 Vision process was accomplished over a three-year period. It was a new approach for laying down an informational base for the creation of the 2019-2050 Regional Transportation Plan (RTP). It involved many technical planning and public involvement tasks. The collection of regional population, employment, land use, transportation, and socio-economic data and the conduct of specialized studies, data analyses, and public surveys were essential tasks that needed to be accomplished as part of the process. The public outreach process encouraged local governments to serve as partners in identifying stakeholders who would be willing to participate in the workshop process and respond to the following questions: “What is the future we want to create?” and “What will help us create that future?”

The Wasatch Front Regional Council (WFRC) developed a Communications Plan for the Wasatch Choice 2050 Vision and the 2019-2050 RTP. This process included conducting research; developing a strength, weakness, opportunities, and threats analysis; set goals, determine key messages; identify audiences; set objectives; determine strategies; identify tactics; and create a timeline. The Communications Plan can be found in Appendix D - Communications Plan Wasatch Choice 2050 and the 2019-2050 RTP.

Stakeholder and Special Interest Group Outreach

Key stakeholders are integral to achieving the Wasatch Choice 2050 Vision and the 2019-2050 RTP objectives and goals. They are the primary targets for key messages, strategies, and tactics. Key stakeholders are motivated by varying self-interests and persuaded by influential intervening publics and resources.

The success of Wasatch Choice 2050 Vision will depend on delivering messages and important project information to key stakeholders. Intervening publics, and internal audiences or resources help to carry the messages. Table 2 describes the key audiences, intervening audiences, and internal resources.

Table 2. Stakeholder Tiers

Tier 1 Stakeholder	Tier 2 Stakeholder	Tier 3 Stakeholder
Participate directly in Wasatch Choice 2050 creation	Essential role in long-term implementation	Affected by implementation
Decision makers and planners	Related industry and interest groups	The public and media
Elected officials, staff, transportation agencies	Trade associations, developers, community groups, chamber	Residents, commuters, new media

Tier 1 Stakeholders – Decision Makers and Planners

Tier 1 audiences are those individuals and groups who need to participate directly in the creation of Wasatch Choice 2050 Vision. They are the primary decision-makers in local and regional planning. This is the group that sets policy, establishes priorities, and carries out planning. Many groups and individuals in this tier have been engaged with the previous Wasatch Choice 2040 process. Others may have been less engaged, but their future participation is still important for the success of Wasatch Choice 2050. Research shows this is also the group who can serve as trusted spokespeople to their constituencies about Wasatch Choice 2050 Vision or other similar plans.

- Local elected officials - Mayors, city/county council members, city/county planning commissioners
- City/county staff (managers, planners, engineers, technical staff)
- Regional planning organizations (Council of Governments (COGs), Association of Governments (AOGs), other MPOs)
- Partners and other planning agencies/key influencers - the Utah Department of Transportation (UDOT), the Utah Transit Authority (UTA), Salt Lake Chamber, Envision Utah, etc.)
- State elected officials

Tier 2 Stakeholders – Related Industry and Interest Groups

Tier 2 audiences play an essential role in the long-term implementation of the Wasatch Choice 2050 Vision. They are involved in the planning process and potentially in the implementation of planning outcomes. They can have a strong influence on Tier 1 audiences and the public.

- National agencies, industry groups, and associations (Urban Land Institute (ULI), American Planning Association (APA), etc.)
- Business community (Chambers of Commerce, Economic Development Cooperation of Utah (EDCU), and Governor's Office of Economic Development (GOED)
- Community groups, including organizations representing Title VI and Environmental Justice populations
- Federal delegation
- Developers, realtors, and lenders

Tier 3 Stakeholders – The Public and Media

Tier 3 audiences span a spectrum of awareness of the Wasatch Choice 2050 Vision. This is a group that will be affected by the rollout of the Vision in the long-term. The support and participation of Tier 3 audiences is important for the success of the implementation of the Vision.

» Residents of Salt Lake, Davis, Weber, Tooele, Morgan, and Box Elder Counties
» News media

Generalized Public Comment Review

Wasatch Choice 2050 Vision represents the most significant update to the shared regional vision since Wasatch Front communities first established it over a decade ago. Building on community values through an extensive public input process, Wasatch Choice established a blueprint for growth that supports a well-functioning economy, improves air quality, and enhances the overall quality of life for Utahns living across the Wasatch Front.

Through feedback from local communities and transportation partners, Wasatch Choice 2050 will plan for the Region's future through 2050. This locally driven, regionally significant process will produce the next vision and provide a framework to identify, select, and prioritize projects in the 2019-2050 RTP.

Outreach to Title VI and Environmental Justice Populations

The WFRC provided continual and timely engagement through the employment of multiple techniques for education and outreach, such as visualization tools, including Esri Story Maps (in English and Spanish formats when applicable and/or possible), interactive maps, and static maps. The goal of this outreach was to further the understanding of the public, and more specifically that of Title VI and Environmental Justice populations, with regard to transportation needs, potential solutions, and how these are translated into the Wasatch Choice Vision and 2019-2050 RTP, the Transportation Improvement Program (TIP), and other WFRC plans and programs.

More specifically, WFRC, in coordination with UTA and UDOT, invited members from throughout the community to participate in three distinct community organization workshops at key decision-making points over the four-year planning period. Community organization workshop participants represented various agencies within Box Elder, Davis, Salt Lake, and Weber Counties that work with low-income, minority, and elderly populations, as well as those who provide social services.

The meetings allowed attendees to share existing transportation challenges and ideas to improve access to jobs, services, and educational opportunities. Participants were asked to portray barriers that exist for the constituents that they represent, and how transportation and land use strategies can improve the needs of the communities these groups serve. This feedback was incorporated into the development and refinement of the Wasatch Choice 2050 Vision and the 2019-2050 RTP.

Regional Goals

Wasatch Choice 2050 Vision

Because development patterns and transportation improvements affect each other, it makes sense for local governments and regional transportation agencies to closely coordinate planning efforts. The important question is, "How can we work together to produce the outcomes that optimize the long-term quality of life for communities and the overall metropolitan area?" This was the impetus behind the development of our Region's shared vision, the Wasatch Choice 2050 Vision.

The type of growth that is occurring, how the Region is served by the transportation system, and the availability of open space, has a big impact on our quality of life. Together, these factors, along with other related conditions, affect our cost of living, time spent commuting, the air we breathe, how we enjoy our

time with family and friends, and the neighborliness of the communities in which we live. The Wasatch Choice 2050 Vision considers how growth, transportation, and open space can be shaped for the next few decades in such a manner as to have positive impacts on the lives of residents in the greater Wasatch Front area. In short, we need to consider our joint goals for the long term, and then we can each individually consider the choices we want to make in the near term. This is especially important for the Wasatch Front area, where we anticipate growth of well over a million more residents by 2050.

Center-Focused Growth

Growth within centers is one of the key strategies of the Vision. Strategic changes in targeted areas of our Region - places like metropolitan, urban, city, and neighborhood centers - can yield huge benefits. These centers can become the focus of a strong market for accessible jobs and services and moderately priced and/or downsized housing units. These centers should grow where they yield large benefits – in centrally located areas and places with great multi-modal transportation access. Through implementation of these strategies, centers can:

- Help ensure that all people have a selection of homes to meet their needs;
- Reduce the time, distance, and money it takes for people to reach many of their destinations;
- Enable people to reach more of those destinations by foot, bike, and transit in addition to driving;
- Help businesses reach more consumers and support employees to have a greater selection of jobs;
- Help improve air quality;
- Create inclusive, walkable communities;
- Reduce growth pressure on the “Wasatch Back;” and
- Reduce demand for scarce water.

Wasatch Choice 2050 Goals

The WFRC uses Council-adopted regional goals to inform and set a framework for the work of the organization. For example, the regional goals underpin the evaluation criteria that was used to develop the Wasatch Choice 2050 Vision and 2019-2050 RTP, and informed how future transportation investments will be evaluated, selected, and prioritized, and how those projects will be coordinated with local community priorities regarding the use of land and the pursuit of economic development opportunities. Regional goals also inform programming of WFRC-administered funds that are part of the TIP and Transportation Land Use Connection (TLC) funds. The regional goals relate to many aspects of community development and are intended to be useful for any community or organization that wants to be a partner in the Wasatch Choice 2050 Vision.

The goals shown in Figure 9 were developed over a year-and-a-half time frame utilizing local community and Council input. The goals were compared to past Wasatch Choice 2040 Growth Principles, and support federal transportation legislation, Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act, and the goals of partner transportation entities, including UDOT and UTA. During the development of these goals they were discussed and reviewed by the Region Growth Committee and its Technical Advisory Committee, transportation partners, businesses, and stakeholders. On October 27, 2016, WFRC adopted the Wasatch Choice 2050 goals.

Figure 9: Wasatch Choice 2050 Goals

Develop Scenarios

Visioning Process

The WFRC, in close collaboration with local communities and transportation partners, developed three land use and transportation scenarios that articulated the trade-offs associated with different approaches to growth between now and the year 2050.

To kick off the visioning process, WFRC met with groups of cities and counties throughout the Region in the spring of 2016 through a series of Vision Workshops. City and county elected and appointed officials, planners, engineers, economic development staff, and city managers were all invited to attend, in order to obtain a holistic, multi-disciplinary view of the issues that face each unique community. The objective of the workshops was to receive feedback from local communities about their goals and priorities and to understand local critical growth areas and needed transportation investments.

The meetings began with WFRC sharing existing conditions data that was curated to each small area, which provided key indicators of the community such as existing housing stock, amount of vacant or unutilized land, travel behavior, and housing affordability.

Keypad polling was then utilized to prioritize WFRC's ten regional goals from most to least important, as well as to gage the way in which communities envisioned growth. The following questions were asked:

1. With regard to the mix of available housing, this area should support:
    a. a greater percentage of detached, single family homes than today
    b. about the same mix of housing types as today
    c. mostly single-family, but a greater percentage of attached or multi-unit homes than today
    d. a much greater percentage of attached or multi-unit homes than today

2. Growth in this area should occur:
    a. “Vision A” - all growth occurs on vacant land, existing commercial areas stay the same
    b. Mostly like Vision A
    c. Half Vision A, half Vision B
    d. Mostly like Vision B
    e. “Vision B” - little growth occurs on vacant land, most occurs in existing commercial areas
3. The amount of growth in centers:
    a. “Vision A” - a small amount of growth happens in centers, areas like Transit Oriented Development (TOD), downtowns, and main streets
    b. Mostly like Vision A
    c. Half Vision A, half Vision B
    d. Mostly like Vision B
    e. “Vision B” most growth occurs in centers, areas like TODs, downtowns, and main streets

This feedback was captured per small area, and utilized, with the information described below, for the creation of the three regional transportation and land use scenarios.

Finally, through the lens of identifying solutions that will address the issues that stakeholders are facing, workshop participants were asked to identify land use “centers,” or areas within their communities where walkable, higher-intensity growth might occur in the future, and to contemplate the scale and type of development that the community could support in these centers. Participants also developed a variety of multi-modal transportation ideas that would serve these various development patterns. This feedback was obtained by rolling out maps of each community, and asking participants to use markers, tape, and stickers to identify the aforementioned areas of focus within their communities. The information gathered from this visioning process was used to develop three unique land use and transportation scenarios.

Scenario planning is an important tool used to explore different stories about how the future might unfold. Evaluating growth scenarios allows one to understand the interplay between transportation and land use decisions, and enables decision makers to consider how best to accommodate mobility needs over the coming decades. By analyzing the impacts and benefits of those alternatives, scenario planning allows communities to test how well various future growth patterns meet their goals.

Center-Focused Growth: Wasatch Choice Centers

Wasatch Choice Centers are historic and emerging regional destinations of economic activity and housing.

A variety of centers will develop in the future that are similar to places in our Region today – places like downtown Salt Lake City, Provo, Ogden, emerging downtowns like Sandy City, and TODs like Station Park in Farmington or the Fireclay District in Murray. These are examples of concentrated developments that are growing with market demands for living and working in accessible locations throughout the Wasatch Front. Growth that takes place as infill and redevelopment in these historic and emerging centers is generally able to make better use of existing infrastructure when compared to growth that occurs in greenfield areas. Frequently, the transportation system in these locations is sufficient to handle additional growth, especially in locations where the historical street grid pattern is still in existence, frequent transit service exists and is shown to be viable, and considerable roadway and active transportation investments have been made.

The concept of Wasatch Choice Centers emphasizes that these designated areas should be a) walkable and b) more dense than their surrounding area. By supporting compact development, centers reduce the footprint of urban development and, by bringing some destinations closer together, lend themselves to walking and bicycling. Strategically located centers enable more people to easily use transit, and tend to reduce travel distances in general. Centers should provide a variety of mobility options such as sidewalks, bicycle and trail connections, transit facilities, and strong street connectivity in order to serve pedestrians, bicyclists, and transit riders, as well as drivers. This transportation infrastructure equips the area to both support and attract higher-density, mixed-use developments. The Wasatch Choice 2050 Vision suggests that these centers should absorb some of the expected growth and expand to provide ever-broadening choices to residents.

The Wasatch Choice 2050 Vision identifies four different types and intensities of centers, as described below.

Metropolitan Center

Downtown Salt Lake City is the metropolitan center, serving as the hub of business and cultural activity in the Region. Metropolitan Center has the most intensive form of growth and expansion for both employment and housing, with high-rise development common in the central business district. Similar to today, Salt Lake City will continue to draw people from the entire metro area and serve as the finance, commerce, government, educational, retail, tourism, arts, and entertainment center for the Region. Buildings range from four to 25 stories tall, with the number of housing units ranging from 20 to 200 per

acre. A variety of roadways and major freeways serve the metropolitan center, and the area acts as the Region's primary transit hub.

Urban Center

Urban centers are the focus of commerce and local government services benefiting a market area of a few hundred thousand people. Urban centers should be served by high-capacity and high-frequency transit and major roads and freeways. They are characterized by four- to ten-story employment and housing options. The number of housing units range from 20 to 100 per acre.

City Center

City centers provide localized services to tens of thousands of people within a two- to three-mile radius. One- to three-story buildings for employment and housing are typical. The number of housing units range from ten to 50 per acre.

Neighborhood Center

A neighborhood center is usually one to four city blocks in size and draws people living within close proximity. The typical building within a neighborhood center may be one to three stories tall with housing types that range between small apartments, townhouses, and small-lot single unit homes. This area typically contains retail destinations located on walkable streets. A neighborhood center is served by major roads and frequent bus service.

Additional Land Use Designations: Employment, Industrial, and Special Districts

The following land use distinctions are significant hubs of employment, economic, and/or educational activity. As such, these areas draw people from throughout the Region and are significant trip generators, including employment and/or freight travel. These areas are distinct from Wasatch Choice centers in that they typically do not have a strong mix of uses or concentrated housing opportunities.

Employment Districts

An employment district is classified not by size but instead by the number of employees. This area is primarily made up of offices or light industrial space. An employment district attracts a large number of workers from across the Region and is served by major roads, highways, and often with high-frequency bus or high-capacity transit.

Industrial Districts

An industrial district can vary in size and is typically focused around both light and heavy industry and warehousing, with some office and retail. This area is not residential and is primarily freight-oriented. An industrial district could be served by bus, shuttle, vanpool, or transportation network companies (TNCs).

Special Districts

A special district is a regionally significant area that serves a specific purpose apart from more common land uses such as residential, retail, office, and industrial. Examples of "special districts" are airports,

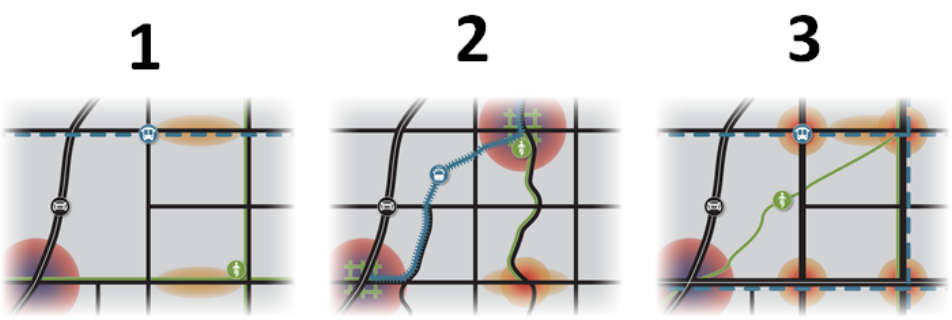
educational campuses, and research centers - places that are distinctive and that may attract people from the entire region. The special district is served by a variety of roadway types and transit modes.

Overview of Wasatch Choice 2050 Scenarios

This visioning process explored how growth and transportation might work together to in order to achieve regional goals and support a high quality of life. A key ingredient of the Wasatch Choice 2050 Vision is to encourage robust growth centered in areas such as central business districts, main streets, and major employment areas, and to coordinate centered growth with high-capacity transit, major roadways, and regional bicycle facilities.

The Wasatch Choice 2050 scenarios, as shown in Figure 10, represent a range of land use and transportation combinations. It is important to note that each scenario was developed using equal population and employment projections, and a comparable amount of revenue spent on regional transportation. Transportation funding was divided differently between roadways, transit, and active transportation depending on the scenario. In general terms, the scenarios can be described as follows:

Figure 10: Land Use and Transportation Scenarios



	1	2	3
Land Use	General plans, extrapolated trends	Regional centers	Dispersed village/town centers
Transit	2015-2040 RTP projects	Capital-intensive projects	Service-intensive projects
Roadway	2015-2040 RTP projects	Connectivity and management	Capacity-focused investments
Active Transportation	Priority bicycle routes	Centers-based, Local bicycle connectivity	Separated regional bicycle facilities

Scenario 1: The future based on current plans and trends.

This scenario included all projects within the 2015-2040 RTP and incorporates all currently adopted city and county general plans. Land use was extrapolated from local general plans and zoning out to 2050. Roadway improvements had an emphasis on east-west road widenings and connections. Two new freeways and additional capacity on existing freeways were planned. Transit included a mix of capacity and service projects. All transit routes ran every 15 minutes, except FrontRunner, which ran every 30

minutes during peak times and 60 minutes throughout the day. Active transportation included the build out of the Regional Priority Bicycle network of connected active transportation facilities.

Major Future Travel Corridors

Road System

Scenario 1 included all regional roadway projects that are included in the 2015-2040 RTP but have not yet been constructed. It placed emphasis on east-west road widening and connections. In additional to surface street improvements, additional freeway capacity is added to carry increased regional travel. Existing freeways such as I-15, SR-201, and I-80 have proposed capacity and operational improvements. In addition, US-89 in Davis County and Bangerter Highway in Salt Lake County are converted to limited-access roadways. Two new freeways are also planned - the Mountain View Corridor on Salt Lake County's western edge and the West Davis Corridor, which provides an alternative route to I-15 through Davis County.

Transit System

Scenario 1 included all major regional transit projects that have been envisioned through the 2015-2040 RTP planning process. This scenario was comprised of several fixed guideway transit routes, including various north-south Bus Rapid Transit (BRT) projects in Salt Lake County, and a continuous BRT line through Weber and Davis Counties adjacent to FrontRunner. Scenario 1 also contemplated extensions of both the Blue and Red TRAX lines into Utah County and the City of Herriman, respectively, as well as a FrontRunner extension into Box Elder County. Transit lines in Scenario 1 are designed as a "hub and spoke" system, with routes traveling from the periphery and channeling into a few major destinations. Most routes therefore terminate at a hub in downtown Salt Lake City.

Active Transportation System

A key component of Scenario 1 was the distribution of a consistent network of connected active transportation facilities. Proposed bicycle infrastructure was spread evenly throughout the Region, but does not include project phasing or identification of bicycle route types.

Projects to highlight in Scenario 1 include a separated bicycle facility on Mountain View Corridor and West Davis Highway, and improved on-street connections between Salt Lake and Davis Counties and between Weber and Box Elder Counties.

Land Use and Centers

Land use assumptions in Scenario 1 were based mainly on the currently adopted General Plans from each city and county. There were some liberties taken in areas where major growth centers are emerging, but have yet to be incorporated into an official plan. These areas would include the site of the existing Utah State Prison in Draper, as well as the Falcon Hill development in Davis County.

Scenario 2: Focuses growth in large regional centers and expands local streets and regional rail.

This scenario concentrated future population and employment growth in regional centers strategically placed throughout the Region. Because the centers are larger, the transit system improvements are more focused on high-capacity rail and fixed bus lines. All transit routes ran every 15 minutes (including FrontRunner) during peak times and then 30 minutes throughout the remainder of the day. The roadway improvements are focused on linking communities by connecting roadways and improving access over

barriers with additional operational improvements. Active transportation focused on bicycle network improvements located within one and a half miles from regional centers and transit stations.

Major Future Travel Corridors

Road System

Additional connectivity improvements in Scenario 2 linked communities by connecting roadways and improving access over barriers, such as freeways and railroads, while operational improvements will improve the flow of traffic. For example, Scenario 2 included nine additional crossings over I-15 in Salt Lake County south of I-215 and increased connectivity west of I-15 along the I-15 corridor. In Weber County, a backbone street network in the western part of the county is proposed. Major roads such as Pioneer Road, Antelope Drive, and Hill Field Road have operational improvements. Existing freeways such as I-15, I-80, and Legacy Parkway have proposed capacity and operational improvements. Similar to Scenario 1, US-89 in Davis County and Bangerter Highway in Salt Lake County are converted to limited-access roadways. Two new freeways are also planned - the Mountain View Corridor on Salt Lake County's western edge and the West Davis Corridor, which provides an alternative route to I-15 through Davis County.

Transit System

Scenario 2 envisioned several high capacity, fixed guideway projects in order to support the higher density growth that is focused in large regional centers. A Red Line light rail extension south from Daybreak to Herriman connects east to the Blue Line in Draper, created a complete light rail loop around southern Salt Lake County; a spur from the Red Line extends north via the historic Garfield Spur right-of-way (ROW) at 9000 South to 5600 West, connected to the Green Line at the Salt Lake International Airport. The Blue Line also extended to Utah County, supporting large growth in the Point of the Mountain area. BRT routes are planned through Davis and Weber Counties and connected to FrontRunner stations. FrontRunner extended to Box Elder County and double-tracking and electrification of the rail line supported 15-minute commuter rail service. New infill stations along FrontRunner provided rail access to several communities in Salt Lake, Davis, and Weber Counties.

Active Transportation System

Projects to highlight in Scenario 2 include a variety of point projects identified as first-/last-mile improvements. These projects are specific improvements for biking and walking that facilitate improved access to fixed guideway transit, and are implemented in conjunction with an expanded high-capacity transit system. Bicycle network improvements are all located within a one-, two-, or three-mile diameter from the center of the regional centers.

Land Use and Centers

Scenario 2 focused new growth into large centers. The metropolitan center in downtown Salt Lake City; large urban centers in Ogden, Layton, West Valley City, and Sandy; and development at the site of the existing Utah State Prison were included in Scenario 2. Scattered smaller centers at transit stations and major interchanges were also included.

Scenario 3: Creates small village and town centers while expanding regional roads and local buses.

This scenario had a focused land use with well-dispersed town and village centers. Roadway improvements included capacity improvements on existing roads both east-west and north-south to reduce travel times and improve traffic flow. Because the centers are more dispersed, the transit system

improvements are more focused on bus service, including additional routes, increased frequency, and expanded service throughout the day. All transit routes ran every ten minutes, except FrontRunner, which ran every 15 minutes. Active transportation focused on trails and protected bike lanes to increase separation from vehicles for bikes and pedestrians and to enhance user safety.

Major Future Travel Corridors

Road System

Scenario 3 focused on providing capacity improvements on existing roads both east-west and north-south to reduce travel times and improve traffic flow. Scenario 3 also had a focus on freight improvements with new roads and grade-separation in the Northwest Quadrant. Roads such as Midland Drive and 5600 South in Weber County; SR-193 and University Park Boulevard in Davis County; and 3900 South, 4500 South, 7200 South, 7800 South, and 10600 South in Salt Lake County are all proposed to be widened. Similar to Scenario 2, existing freeways such as I-15, Legacy Parkway, and I-80 have proposed capacity and operational improvements. In addition, US-89 in Davis County and 9000 South and Bangerter Highway in Salt Lake County are converted to limited-access roadways. Two new freeways are also planned - the Mountain View Corridor on Salt Lake County's western edge and the West Davis Corridor, which provides an alternative route to I-15 through Davis County.

Transit System

Scenario 3 focused on creating a gridded high-frequency, reliable bus network. Transit lines in this bus network are referred to as "core routes," and, as possible, are located on blocks spaced one mile apart and utilized the east-west and north-south street pattern throughout the Wasatch Front. Capital improvements provided enhanced stations and stops, and operational efficiencies are gained through queue jumping and/or transit signal priority. Previously proposed light rail extensions are envisioned as core route bus service. Bus routes run on 15-minute headways or less and provide early and late night service, seven days a week.

Active Transportation System

Scenario 3 included fewer active transportation facilities, and those facilities are more separated and may include grade-separated crossings to make travel by bike faster between dispersed centers.

Projects to highlight in Scenario 3 include point projects to create grade-separated crossings on the existing backbone trail network of Denver and Rio Grande Rail Trail and the Jordan River Trail. Trail projects included a robust network of canal trails in Salt Lake County, along with a separated trail connecting Weber and Box Elder Counties.

Land Use and Centers

Land use assumptions in Scenario 3 spread growth into a series of well-spaced town and village centers, as well as some strategic large centers. Growth was still allowed in the metropolitan center in Salt Lake City and the urban centers discussed in Scenario 2, but a network of smaller town and village centers were also allowed to grow. These centers were sited in key locations, including every TRAX and FrontRunner station, as well as neighborhood nodes, such as 2700 North in Plain City, Bountiful Main Street, the Glendale area in Salt Lake City, and 12600 South in Riverton.

Additional Public Involvement

The WFRC hosted and participated in the National Association of Regional Council (NARC) annual conference, as well as the Wasatch Choice 2050 and Active Transportation and Health Summit on July 29, 2016. Both events were well-attended by transportation partners and city and county staff and were opportunities to discuss, explore, and refine the three land use and transportation scenarios.

Evaluate Scenarios

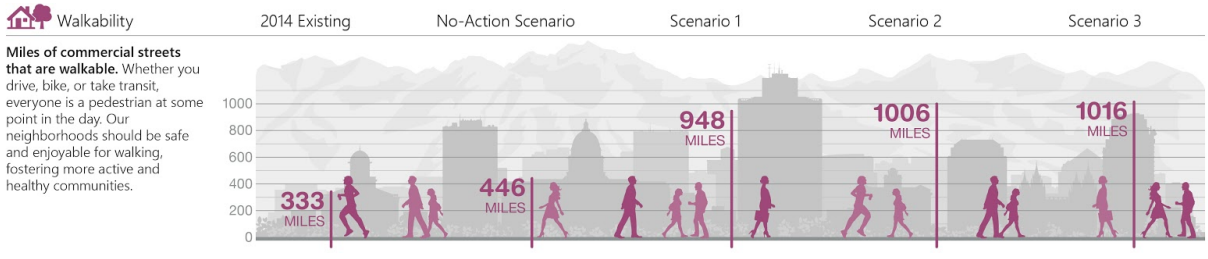
In close collaboration with our local communities and transportation partners, WFRC developed formulated, specific performance measures to quantify outputs to measure success for most of the adopted regional goals, and analyzed modeling results that assisted in evaluating and comparing each scenario. Three scenarios were developed to show the trade-offs associated with different transportation and land use investments, as described in the 'Develop Scenarios' section. Project selection criteria was used to evaluate each scenario and, in conjunction with feedback received from the public involvement process, move towards a preferred scenario.

Performance Measures

Each performance measure was compared against five scenarios:

1. **2014 Existing:** this scenario represents how our current transportation system and land use are performing today.
2. **No-Action Scenario**: this scenario demonstrates how our transportation system and land use will perform together in 2050, if we build currently funded transportation projects and then make no additional transportation investment or shift in land use policy through the year 2050.
3. **Scenario 1:** Wasatch Choice 2050 Scenario 1, as described 'Develop Scenarios' section.
4. **Scenario 2**: Wasatch Choice 2050 Scenario 2, as described 'Develop Scenarios' section.
5. **Scenario 3:** Wasatch Choice 2050 Scenario 3, as described 'Develop Scenarios' section.

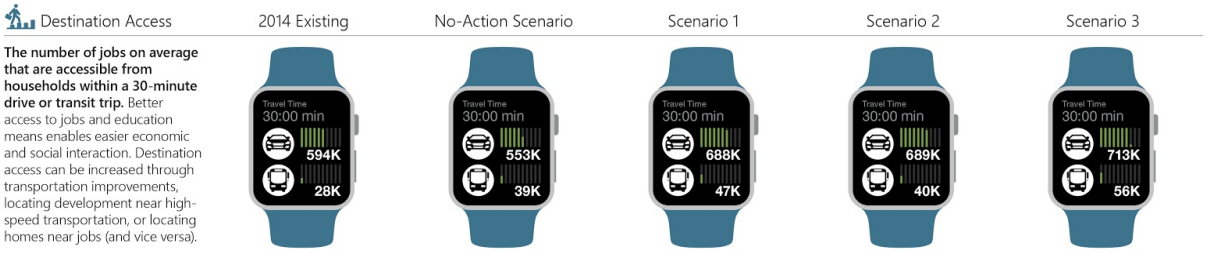
Livable and healthy communities



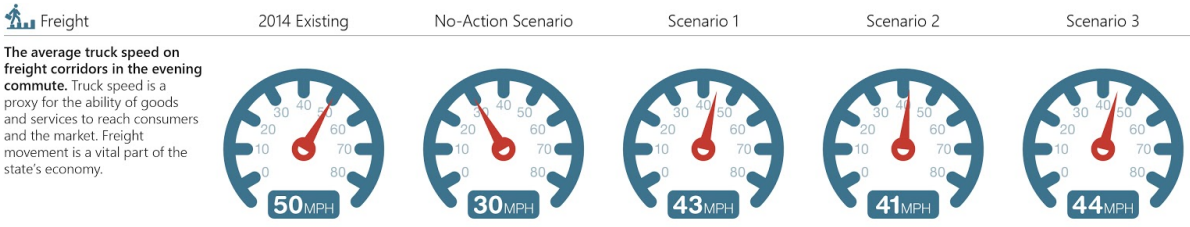
Walkable streets were defined by vehicle speed, land use mix, population and employment densities, proximity to transit, and access to key destinations. By increasing the number of streets that are walkable, people may be more likely to walk to a bus stop, place of employment, or a service where they otherwise might drive. This not only contributes to personal health, but can improve the Region's air quality and congestion. All three future scenarios significantly increase the walkability of the Region.

However, linking transportation and land use, as done in Scenarios 2 and 3, can provide greater increases to our Region's walkability.

Access to economic and educational opportunities



The factors influencing destination accessibility are the proximity of households and employment or educational opportunities in relationship to each other, the speed of movement through transportation facilities, and the placement of these facilities to serve the job and higher education commutes. While all future scenarios perform better than a no-action scenario, Scenario 3 provides the best improvement for both auto and transit access. While Scenario 3 provided a small reduction in auto travel time, the significant increase in accessibility by auto and by transit is most likely due to better aligning employment and housing with transportation.

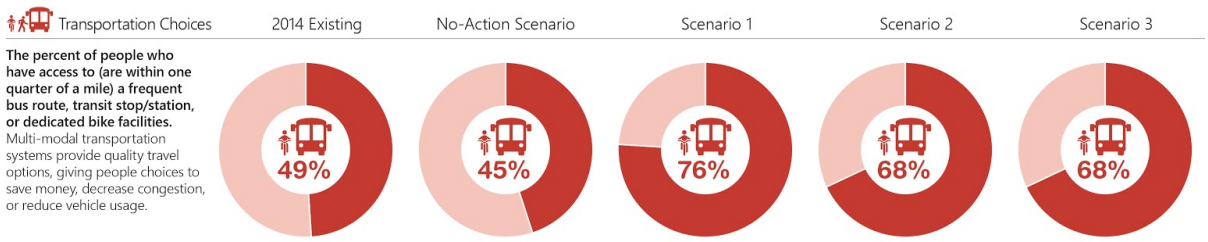


One of the most direct measures of economic vitality is truck freight travel times. Freight speed on major corridors can be an indicator of overall freight travel times. Freight mobility is also one of the Federal performance measures that UDOT and WFRC are mandated to monitor. All three scenarios significantly decrease the average truck speed in the evening commute because these routes were specifically targeted for both operational and capacity improvements when warranted by delay. Comparatively, the no-action scenario severely limits the mobility of freight in the Region and points to the need to continue to invest in our roadway system.

Manageable and reliable traffic conditions

Average travel time by household is the total amount of time a household spends driving - including work and non-work commute trips. Average travel time by car improves in each of the three Wasatch Choice scenarios over the no-action scenario. In addition, the three Wasatch Choice scenarios do not result in significantly increased average travel times for autos as compared with the current year. However, these travel times are the result of a financially unconstrained system and, therefore, may be less realistic than the final Wasatch Choice 2050 Vision.

Quality transportation choices

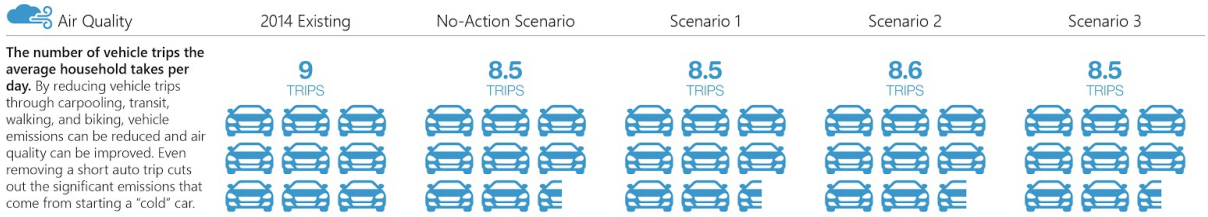


The quality transportation choices measure represents the percentage of the regional population that has access to frequent transit service (routes with a minimum of 15-minute headways) and/or an active transportation facility. This scenario is impacted heavily by the design of the active transportation system. Scenario 1 performs best in this measure for both bicycle and transit routes, as the scenario represents the full build out of a regional bicycle system and a blend of transit projects that are distributed throughout the Region. Scenario 2 contains highly localized active transportation projects and high-capacity transit projects that are focused primarily in large centers. These projects, therefore, do not reach a large percentage of the population that are living in existing neighborhoods and suburban areas. Scenario 3 focuses on connecting smaller centers through commuter-oriented bicycle highways and a system of high-frequency bus routes. This scenario spreads coverage throughout the Region, but spreads it thin, resulting in fewer people having multi-modal access.

The transit use measure reflects the length of trip the average household takes via transit. This performance measure result reflects the different transit system design approaches between future scenarios. Scenario 1 is designed as a hub-and-spoke, commuter-oriented transit system with all routes terminating in one central location (downtown Salt Lake City), and therefore transit riders must ride the entire length of the route to reach a hub, major transfer point, or destination. This results in transit trips that are lengthier than the other scenarios. Conversely, Scenarios 2 and 3 assume that with growth in dispersed centers throughout the Region, all riders are not traveling to the same central destination. These scenarios therefore create a gridded transit network where users may transfer east and west or north and south in order to reach any center or point of interest throughout the network. One tradeoff between these two approaches is riders may be deterred from the gridded network due to forced transfers, but will find that they are able to access more destinations within an equivalent time spent in

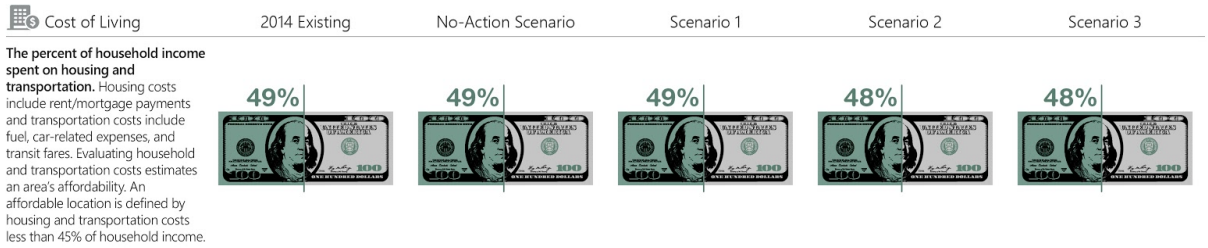
the hub-and-spoke transit commute (see Access to economic and educational opportunities measure above).

Clean air



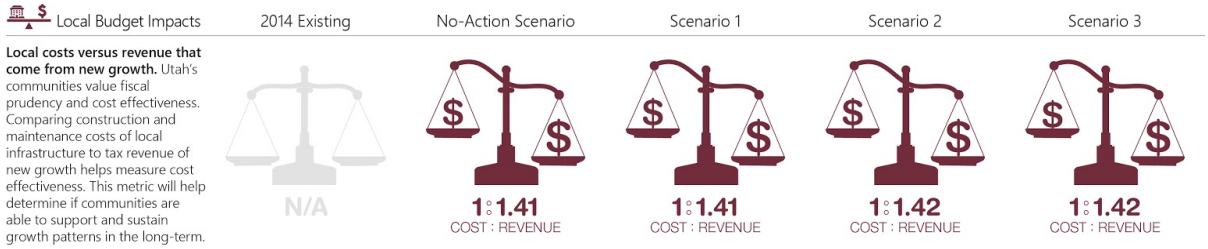
Foremost among causes of auto emissions in the Region is the number of auto trips taken regardless of length traveled. The beginning of a trip, when a car's catalytic converter is not warmed up and functioning, is called a cold start. As much as 80 percent of a trip's emissions can take place in the first few miles after a cold start. Other causes of travel emissions include idling, the number of vehicle miles traveled, travel speed, and stop-and-go driving. As shown above, there is a slight decrease in the number of vehicle trips in the Region between the current year and all future year scenarios. Future year scenarios are forecasted to experience a comparatively consistent number of daily vehicle trips between them, most likely due to each scenario containing similar major freeway investments, a still relatively limited transit network, and other policy-driven factors such as free, abundant parking at destinations and no tolls or congestion pricing on roadways.

Housing choices and affordable living expenses



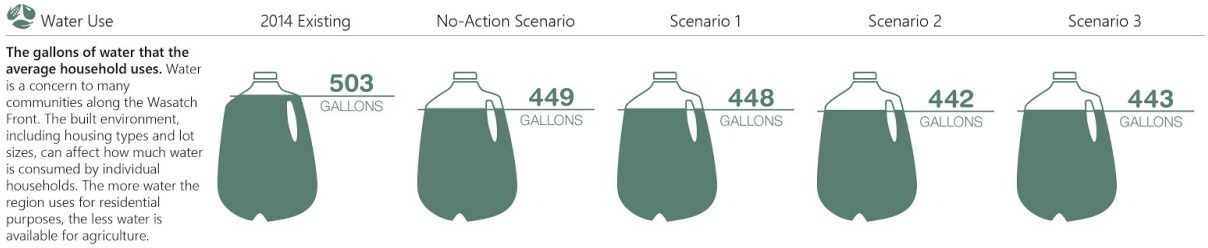
Housing typically takes the biggest portion of our income and, when prices soar, quality of life can suffer. Higher monthly rent or mortgage payments leave less money for food, transportation, and health care, and restricts housing options for households with fixed or low-to-moderate incomes. Additionally, cost can often be a barrier to private vehicle ownership among low-income households, making access to public transit important to maintain affordability. Evaluating housing and transportation costs together makes the benefits of multi-modal transportation and housing near transit and destinations more apparent, and provides opportunities to examine relevant strategies to make transportation more affordable for low-income households. An affordable location is defined as one that residents pay housing and transportation costs that are less than 45 percent of household incomes. Scenarios 2 and 3 provide a slight decrease in the total housing and transportation costs, partially due to an increased mix of housing types and locating more jobs and housing near transit. For instance, only 50 percent of housing and 66 percent of jobs are near transit in Scenario 1, whereas 63 percent of housing and 71 percent of jobs are near transit in Scenario 3.

Fiscally efficient communities and infrastructure

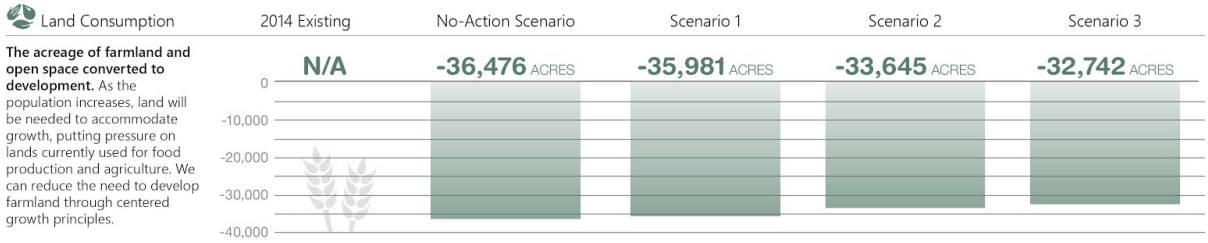


New development can increase a community's tax-generated revenue and improve economic opportunities for new businesses and jobs. However, not all new development has the same construction and maintenance costs. Developing closer to existing development and in more efficient ways can reduce the amount of new infrastructure needed and, in turn, lessen the cost of long-term maintenance to a community. Scenarios 2 and 3, which focus on centered growth, have a higher return on investment for local communities.

Sustainable environment, including water, agricultural, and other natural resources



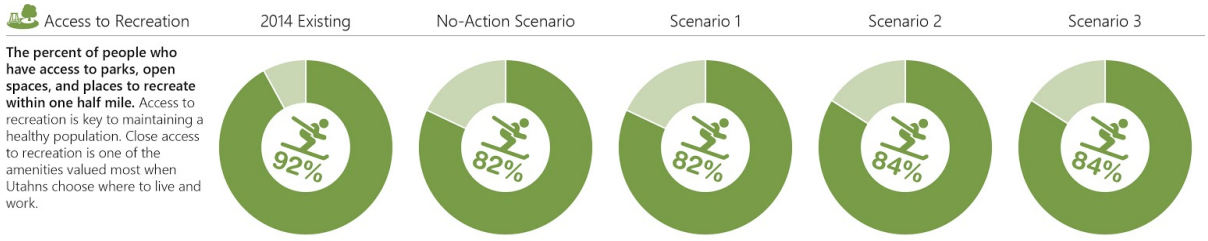
Water availability continues to be a major concern to our local communities. Our land use patterns have a direct affect on our water consumption. Due to the Region's geography, our development patterns, such as household lot size, will change to accommodate an increasing population, and will result in a reduction in daily household water usage between now and the future. However, scenario modeling indicates that by concentrating growth in planned centers, as done in Scenarios 2 and 3, the Region can be even more efficient in its water usage and provide for a more sustainable environment.



The Wasatch Front continues to be a highly desirable place to live, due in part to our access to the outdoors and our economic vitality. This desirability puts pressure on our undeveloped land, such as farmland and open space, to convert to housing and commercial buildings to provide for a growing population. By striving to reduce land consumption for development we can protect scenic vistas, reduce water consumption, reduce travel times, and provide space for future generations beyond the life of this

plan. Similarly to fiscal efficiency and water consumption, Scenarios 2 and 3, which focus on centered growth, provide the greatest benefit to preserving the Region's undeveloped land.

Ample parks, open spaces, and recreational opportunities



Access to recreation and the outdoors is a key contributor to the Region's quality of life. In the future, that access will change unless our Region and communities work to preserve existing open space and identify new parks and recreation opportunities. Scenarios 2 and 3, which concentrate activity in nodes and centers, provide better recreational access compared to other future scenarios because more people are able to locate near existing recreation opportunities and these scenarios preserve a larger amount of land for open space and new recreation opportunities.

Public Involvement Process

During February and March of 2017, WFRC along with UDOT, UTA, and key stakeholders met with local communities to refine the three land use and transportation scenarios into a single, shared preferred vision, which would form the foundation of both the Wasatch Choice 2050 Vision and the 2019-2050 RTP. These workshops focused on gathering input about each scenario's future land use patterns along with specific roadway, transit, and active transportation projects. Each of the scenarios identified potential growth centers, supporting transportation facilities, network connectivity, and critical open space to be preserved. In addition to designing three transportation and land use scenarios, WFRC communicated specific performance measures to determine success for most of the adopted regional goals, and analyzed modeling results that assisted in evaluating and comparing each scenario. All comments received throughout the process were responded to by WFRC, UDOT, UTA, and local communities. Comments and their corresponding responses are included in Appendix E - Public Comment.

Following the small area (or sub-region) meetings with local communities, WFRC performed significant partner and stakeholder outreach to gather input on these scenarios from over 50 unique organizations, ranging from transportation advocacy groups, community organizations including those representing Title VI and Environmental Justice populations, community advisory committees, special interest groups, and a number of individual cities who requested additional information or opportunity to comment. The WFRC held two in-person open houses and created an-online visualization tool to present the three scenarios and performance measures to the public and to obtain feedback on general scenarios, individual projects, and the vision for the future. Additionally, WFRC offered a 45-minute webinar to inform attendees about the three different scenarios, as well as an opportunity to provide feedback.

The collected feedback and information were used to develop the preferred scenario.

Small Area Workshop Summary

The workshops focused on gathering input about each scenario's future land use patterns along with specific roadway, transit, and active transportation projects. Each of the scenarios identified potential growth centers, transportation facilities, network connectivity, and critical open space to be preserved. Maps of each scenario by mode and land use were presented and participants could provide feedback about alignment, project type, and timing. Participants were also engaged in a series of survey questions. Map-based feedback is detailed in Appendix E - Public Comment.

Based on keypad polling results, participants preferred the roadway and transit components of Scenario 2 and the active transportation and growth components of Scenario 3. Overall, Scenario 2 was preferred by just under half of participants, with Scenario 3 preferred by almost 40 percent of participants, and Scenario 1 preferred by less than 20 percent.

Scenario workshop participants reviewing Wasatch Choice scenarios.

Participants also engaged in a survey of active transportation, transit service, and roadway preferences. For active transportation, participants were asked to rank the following improvements:

1. Multi-use paths or trails separated from traffic,
2. On-street bicycle routes with greater separation from traffic,
3. On-street bicycle lanes adjacent to traffic,
4. Bicycle connections to transit stops and stations,
5. Wider multi-use sidewalks and
6. Complete missing sidewalk connections.

Multi-use trails, separated on-street facilities and complete missing sidewalks were the top preferences throughout the Region pointing to the need to improve safety for the most vulnerable users. Meanwhile, wider, multi-use sidewalks ranked last as many communities saw the need to complete their sidewalk networks before replacing existing sidewalks with wider sidewalks since they were more expensive to maintain.

For transit, participants were asked to rank the following improvements:

1. Additional bus routes,
2. More frequent bus service on existing routes,
3. Additional fixed-guideway transit routes (TRAX, BRT),
4. More frequent service on existing fixed-guideways (TRAX, BRT), and
5. Transit amenities, such as shelters, kiosks, and route information.

Participants preferred additional fixed-guideway transit routes and more frequent bus service on existing routes. Amenities were the least preferred choice among all small areas besides Northwest Salt Lake County and East Weber County. Discussions at the small area workshop indicated that communities wanted to strengthen service before investing in amenities, especially if the routes were subject to change alignments.

For roads, attendees were asked to rank the following improvements:

1. Widen many roads,
2. Add lanes on the freeway,
3. Widen a few roads,
4. Improve network connectivity, and
5. Reduce necessary travel distances (mixing homes and jobs).

Reduce necessary travel distances and improve road network connectivity were the preferred roadway strategies. Linking transportation and land use is a key strategy of the Wasatch Choice 2050 Vision. Improvements to connectivity specifically focus on local connectivity within subdivisions and across larger, regional barriers. Attendees least preferred to widen many roads and, although some road widening was needed, the overall discussion pointed to numerous roads were wide enough and wide streets were difficult to cross as a pedestrian.

Stakeholder and Special Interest Group Outreach Summary

Title VI and Environmental Justice Outreach: Community Organization Workshop

On April 18 and 27, 2017, WFRC held two Community Organization Workshops in Salt Lake and Weber Counties. The purpose of these meetings was to receive input on the three draft land use and transportation scenarios from diverse advocates representing low-income, minority, and elderly populations, as well as those who need social services.

The goal of the discussion was to learn how these scenarios might increase the quality of life and opportunities for people who live in the Region. The meetings allowed attendees to share existing transportation challenges and ideas to improve access to jobs, services, and educational opportunities. Participants were asked to discuss barriers that exist for the constituents that they represent, and how transportation and land use strategies can improve the needs of the communities these groups serve. Similar to the Small Area Workshops with local communities, keypad polling was used to gauge participants' feelings about the effectiveness of the current transportation system in helping people get to goods, services, and employment and educational opportunities, and how future resources should be used to improve mobility.

Feedback indicated that the greatest barrier felt by these groups is that transit service does not serve areas that residents need to reach and/or transit does not run at times needed in order to get to work and school. The primary outcome these groups would like to see from the Wasatch Choice 2050 Vision is to

increase job opportunities within a reasonable commute and to increase transportation choices for getting around.

A total of 30 community members were in attendance in the two workshops, representing 22 organizations throughout the Wasatch Front Region (see Appendix F - Community Organization Workshop Summary for additional details and a complete list of workshop participants).

Key Stakeholder Outreach

The WFRC met with a number of important landholding corporations and special interest groups, including Rio Tinto (Kennecott); The Church of Jesus Christ of Latter-day Saints Property Reserve, Inc, (PRI), Suburban Land Reserve (SLR), and Farmland Reserve, Inc. (FRI); Utahns for Better Transportation (UBET); and urban planners and professors at the University of Utah College of Architecture + Planning. Representatives and officials for each of these groups were provided the opportunity to give feedback on regional transportation needs and the three land use and transportation scenarios, which provided input for the Preferred Scenario. The input provided by these stakeholders proves invaluable in determining if the transportation needs of the Wasatch Front Region were successfully met. These stakeholders were identified and utilized throughout the four year planning process due to being key land holding groups, land use and transportation experts, and/or engaged and organized groups interested in land use and transportation. Each group was provided a hands-on opportunity to listen to a short presentation, review various maps, and provide comments on both land use centers and transportation networks.

In-Person Public Outreach Summary

On July 18 and 20, 2017, public open houses were held at the Ogden Intermodal Station and the Salt Lake Central Station, respectively. These open houses were a joint effort by WFRC, UDOT, and UTA for the 2018-2023 Statewide Transportation Improvement Program (STIP), 2015-2040 RTP Amendment #4, and the Wasatch Choice 2050/2019-2050 RTP scenarios. Participants were provided the opportunity to review the Wasatch Choice 2050 scenarios and offer comments on which of the three would best address the growing transportation demand along the Wasatch Front.

Additional outreach presentations and input gathering meetings were held during 2017 and the first half of 2018 with APA; American Public Works Association (APWA); Association of General Contractors; Breath Utah; Coalition De La Raza; Davis Health Services Directors Meeting; Disability Law Center; Disability Rights Action Coalition; Intermountain Credit Union League; Jordan River Commission; Interim Transportation Committee of the Utah State Legislature; League of Women Voters; National Association for the Advancement of Colored People (NAACP); Neighborhood Works; Ogden-Weber Chamber of Commerce; Salt Lake Chamber of Commerce; Salt Lake County Community Organization Workshop; Senior Policy Advisory for the Salt Lake County Council; State Area Authority on Aging; State of Utah School and Institutional Trust Lands Administration (SITLA); Union Pacific Railroad; ULI; Utah Association of Counties (UAC); Utah Community Action Program; Utah Division of Indian Affairs; Utah League of Cities and Towns (ULCT); Utah State Department of Natural Resources Coordinating Committee; Utah State Tourism Department; Utah Trucking Association; UTA Committee on Accessibility; UTA Community Transit Advisory Committee; UTA Transit Riders Association; Wasatch Front Economic Development District (WFEDD) Committee; Weber, Davis, and Box Elder Community Organization Workshop; Weber Association of Human Service; and Women's Transportation Seminar (WTS).

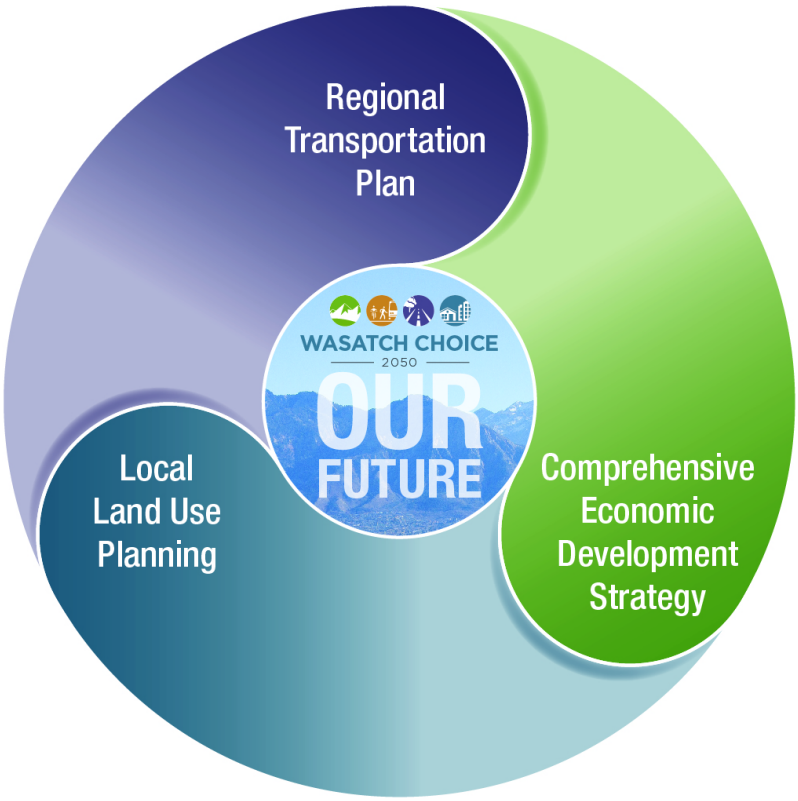
Online and Webinar Public Comment Summary

An online visualization tool provided another opportunity to gather public feedback on the Wasatch Choice scenarios. This visualization tool provided a detailed map and explanation of key differences in each scenario, performance measures to gauge each scenario's effectiveness, and compared those scenarios to current conditions and a hypothetical future in which no transportation investments occurred. The tool gave stakeholders and the public the opportunity to comment directly on the various elements identified on the scenario maps and a way for them to have their voices heard through a survey with a series of questions deliberately tailored to garner specific and usable feedback. The visualization tool received more than 2,000 page views and over 150 comments from across the Region. See Appendix E - Public Comment for comments received via the interactive map.

The WFRC held a free, online webinar on May 2, 2017 to explore the three scenarios and receive comments from viewers. The webinar was 45 minutes followed by a question and answer session.

Choose Preferred Scenario

The purpose of the 2019-2050 RTP is to address the transportation needs for the Wasatch Front Region and help make the Wasatch Choice 2050 Vision a reality. The 2019-2050 RTP planning process produces a list of planned improvements to regional roadway, transit, and active transportation systems designed to meet the travel needs of the Wasatch Front Region for the next 31 years. The 2019-2050 RTP process also reviewed the work done in previous Wasatch Choice Vision efforts, including the Preferred Scenario of the Wasatch 2040 Vision and the Wasatch Choice 2040 Vision. The planning process evaluated long-range capacity needs while examining changes in land use, economic activities, and anticipated new growth areas. The 2019-2050 RTP, along with comprehensive economic development strategies and local land use planning, formed the basis of the Wasatch Choice 2050 Vision, and directly supports the Wasatch Choice 2050 Vision. Wasatch Choice 2050 aims to represent a pattern of growth and transportation solutions that reflect the ten adopted goals of WFRC.



Following a series of sub-regional meetings, held in February and March of 2017, WFRC gathered and evaluated comments from planners, engineers, city officials, and transportation partners. The information was used to distill three land use and transportation scenarios into a single, preferred regional vision. Local government, transportation agency, stakeholder, and public comments were compiled, and WFRC examined specific geographic areas for consensus. The WFRC worked closely with individual city planners and engineers, UDOT, and UTA in resolving specific comments.

Project Selection Criteria

The WFRC created project selection criteria for roadway, transit, and active transportation projects, in close collaboration with transportation partners and local communities, to refine the three scenarios to a preferred scenario. These methods used the adopted goals, as well as a variety of performance factors, to evaluate which improvements should be included as part of the Wasatch Choice Vision.

On June 21, 2017, WFRC, along with UDOT and UTA, met with local planners and engineers during a Wasatch Choice 2050 Vision and 2019-2050 RTP special working session for the Regional Growth Committee Technical Advisory Committees (RGC TAC). The purpose of the meeting was not to make any specific decisions, but rather to ask local planners and engineers to weigh in on the draft preferred scenario and provide comments to help WFRC refine land use, green infrastructure, and transportation mode alignments, focusing on how land use and transportation fit together. The WFRC provided information and asked for any feedback regarding the project selection criteria and process.

Roadway

To develop the preferred scenario, there was a three-step roadway project selection process, conducted in close collaboration with UDOT.

1. **Stakeholder feedback** was reviewed. Feedback considered included information from the scenario workshops, including map comments and keypad polling results; survey results and map comments from the online visualization tool; and feedback gathered from stakeholder meetings. This feedback informed WFRC on which projects support livable and healthy community, transportation choices, and fiscally efficient communities and infrastructure goals, as well as those projects that are not needed or desired within the year 2050.
2. **Technical evaluation** using measures based on the Wasatch Choice 2050 goals, and influenced by federal goals and performance measures, was conducted. This technical evaluation used a two-tiered screening process followed by an evaluation of potential impacts to communities, the environment, transit and active transportation, and open space. The technical evaluation first utilized screening criteria to include projects that a) mitigate safety issues; b) meet volume thresholds for additional lanes (see Appendix G - Preferred Scenario Project Selection Criteria), increases connectivity, or is identified as a Congestion Management Program project; and/or c) are on the TIP, are part of an environmental study, or have preserved ROW. Projects that did not meet this first screening were evaluated to determine whether the project improved access to opportunity or enhanced freight mobility.
3. **Consideration and incorporation of relevant efforts** such as the Wasatch Front Central Corridor Study, Point of the Mountain Study, Transportation Investment Fund (TIF), environmental reviews, multi-modal reviews, and other planning analyses.

See Appendix G - Preferred Scenario Project Selection Criteria for further details on project selection.

Transit

The transit analysis followed a similar process as the roadway project selection. The three-step transit project selection process occurred as follows:

1. **Stakeholder feedback** as provided by small area meetings held throughout the Region. This feedback informed staff on which projects support community mobility goals and those that are not needed or desired within the year 2050.
2. **Technical evaluation** first utilized screening criteria to include projects that a) are considered in municipal planning documents, are part of an environmental study, or have preserved ROW and/or b) yield established ridership thresholds (see Appendix G - Preferred Scenario Project Selection Criteria for these thresholds). Projects that did not meet this first screening were evaluated through a set of goal-based performance measures, in order to include transit projects that help achieve regional planning objectives such as improving access to opportunity, serving Vulnerable Communities, and connecting to Wasatch Choice 2050 Centers. Projects were also screened to remove any projects with potential significant environmental impacts.
3. **Incorporation of relevant efforts** such as the Wasatch Front Central Corridor Study, environmental reviews, and other planning analyses.

See Appendix G - Preferred Scenario Project Selection Criteria for further details on project selection.

Active Transportation

The active transportation analysis followed a three-step process to determine which projects should be included in the Plan.

1. **Stakeholder Feedback** as provided by small area meetings held throughout the Region. This information was received from keypad polling results, map comments from Scenario Workshops, and survey & map comments from the online visualization tool.
2. **Develop Active Transportation Preferred Scenario Deliverables** consisted of creating (1) a GIS Bicycle Map updated with local and UDOT input, (2) a GIS Regional Point Projects Map, and (3) a GIS Regional Sidewalk Map update. Each deliverable used criteria based on Wasatch Choice 2050 Goals and Project Evaluation Criteria.
3. **Incorporation of relevant efforts** such as the Westside Bicycle Connectivity Study, First and Last Mile Study, and locally adopted or in progress active transportation plans.

See Appendix G - Preferred Scenario Project Selection Criteria for further details on project selection.

Transportation System Improvements

Based on the input received and detailed analysis of costs, mobility, transit use, and many other factors, WFRC prepared a new growth and transportation scenario known as the draft preferred scenario. The preferred scenario formed the basis for the recommended transportation improvements found in the 2019–2050 RTP.

Roadway Improvements

The preferred roadway scenario in the 2019-2050 RTP include a balance of freeway, highway, arterial, and collector road projects. These projects add needed connectivity, capacity, and operational improvements throughout the Wasatch Front. Not all of the projects recommended for construction by 2050 can be met by the 2019-2050 RTP. More information about financial constraints is contained with the Prioritize section of the document. Project types, functional classification, and ROW needs are described below.

Roadway Project Types

Corridor preservation projects preserve a corridor for future roadway construction through purchasing property before major development occurs and/or as property becomes available.

Grade-separated crossings physically separate the roadway from a railroad or highway either through an overpass or through an underpass.

Interchange improvements redesign an interchange to improve traffic operations. The redesign could include realignment of ramps, additional ramps, or redesign of the at-grade intersection.

New construction projects are new roadways or interchanges where a roadway or interchange does not currently exist.

Operational projects are enhancements to improve the operations of a roadway without adding physical capacity. These projects may include signal timing optimization, access management, or ramp metering.

Re-stripe projects add lanes to a roadway without adding new pavement or ROW by re-striping the existing pavement.

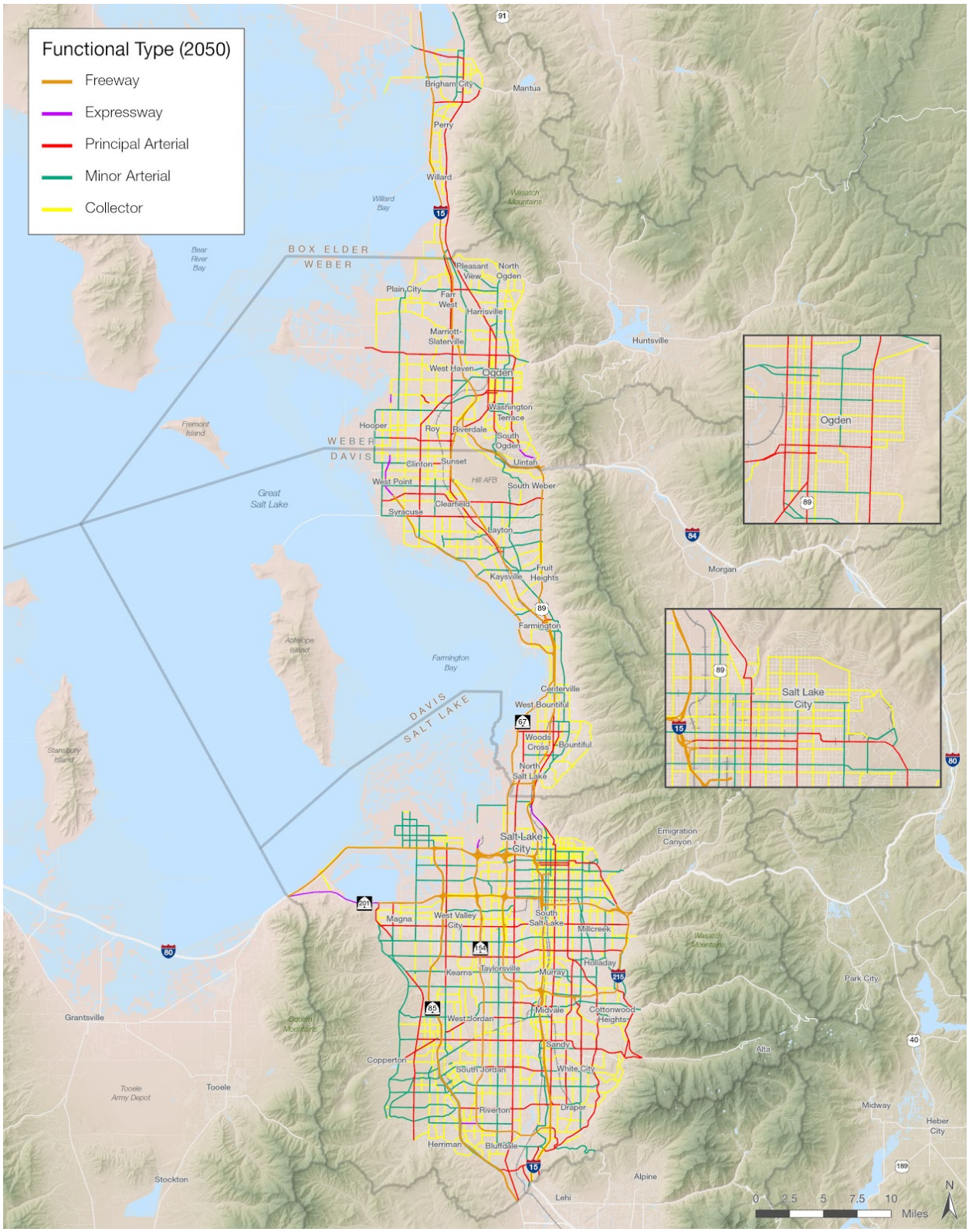
Widening projects increase the number of lanes of an existing roadway. Sometimes this widening can occur in existing ROW, while other times additional ROW may be needed to accommodate the widening project.

Roadway Functional Classification

The roadway system is composed of a variety of roads that serve different purposes and balance speed and access. Map 4 shows the Region's functional classification.

Freeways are the largest traffic facility. They are built with complete control of access and high design speeds and provide the greatest mobility for regional traffic. Existing freeways with planned improvements in the 2019-2050 RTP are I-15 widening and operational improvements through Salt Lake, Davis, and Weber Counties; I-80 widening and operational improvements in Salt Lake County; I-215 operational improvements in Salt Lake County; Legacy Parkway widening in Davis County; and SR-201 widening in Salt Lake County. There are also new freeways planned, specifically the Mountain View Corridor in Salt Lake County, the West Davis Corridor in Davis County, and the West Weber Corridor in Weber County. Bangerter Highway in Salt Lake County and US-89 in Davis County are also planned to be converted, or finished being converted, to freeways. In addition, collectors and distributors are planned along I-15 and Bangerter Highway and frontage roads are planned along I-15 and I-215. In all, 413 miles of capacity and operational improvements along existing and planned freeways is identified.

Map 4: Roadway Functional Classification



Principal arterials serve the major centers of activity of a metropolitan area. There are 262 miles of principal arterials planned to be constructed or improved. Principal arterials that have operational or widening improvements planned in the 2019-2050 RTP include US-89 in Box Elder County, Harrison Boulevard in Weber County, Antelope Drive in Davis County, and 9000 South in Salt Lake County. The extension of SR-193 west of the West Davis Corridor in Davis County and Oquirrh Boulevard in Salt Lake County are two of the new principal arterials planned.

Minor arterials interconnect with and augment the urban principal arterial system and provide for trips of moderate length at a somewhat lower level of travel mobility than principal arterials. These facilities place more emphasis on land access to adjoining or nearby land use than freeway or major arterials, and offer movement within communities. Roadway facilities that will be constructed or improved include approximately 216 miles of minor arterials. There are a number of new or extensions of minor arterials included in the 2019-2050 RTP such as South Bench Drive in Davis County, 1200 West in Box Elder County, 7200 West in Salt Lake County, and Monroe Boulevard in Weber County. Existing minor arterials with planned improvements include Hill Field Road in Davis County, Fort Union Boulevard in Salt Lake County, and 24th Street in Weber County.

Collector streets provide for both land access and movement for local traffic within residential, commercial, and industrial areas. Collectors can penetrate neighborhoods distributing trips from arterial streets through developed areas to ultimate destinations. Conversely, collector roads can also be expected to collect traffic from local streets and channel it onto the arterial system. Most improvements to collector streets in the 2019-2050 RTP are new construction or operational improvements. There are 153 miles of collectors planned to be constructed or improved. Examples include extending Perry Street in Box Elder County, Gentile Street in Davis County, 900 East in Salt Lake County, and constructing Skyline Drive in Weber County.

Transit Improvements

A variety of transit system improvements and accompanying types of modes and technologies are included in the 2019-2050 RTP. A description of these transit modes and examples of these projects found in the 2019-2050 RTP are found below.

Transit Service Types

Core routes are high-frequency bus routes (15 minutes or less), that run early in the morning until late in the evening, seven days a week. These routes utilize the street grid by operating in end-to-end, north-south and east-west service and stop frequently (about ¼ mile stop spacing), which enhances the familiarity of the route and eases wayfinding. Buses run in mixed traffic and have enhanced stations including shelters, street furniture, and, possibly, off-board fare collection. These routes could have operational improvements such as transit signal prioritization.

Examples of corridors supporting this service found in the 2019-2050 RTP include Salt Lake County's State Street, Redwood Road, 3300/3500 South, 12300/12600 South, Davis County Main and State Streets, and Weber County's Washington Street and Riverdale Road.

Bus Rapid Transit (BRT) service is a high frequency bus line that runs in dedicated median or curb running transit only lanes for a majority if its route. BRT service has a minimum of ten minute headways and buses stop along the route less frequently than core routes (about ½ mile stop spacing). Amenities

could include enhanced stations, off-board fare collection, prominent brands or identity, and operational improvements such as intersection treatments and signal prioritization.

Examples of BRT projects found in the 2019-2050 RTP include the Ogden-Weber State University BRT in Ogden, the Davis-Salt Lake City Connector BRT in Bountiful, Woods Cross, and North Salt Lake, and the Midvalley Connector in Murray, Taylorsville, and West Valley City.

Streetcar provides local train service at slow speeds (about 15 miles per hour (mph)). Streetcars have smaller, single-car vehicles and run on tracks embedded in the street that are powered by an electric overhead catenary system. Streetcars typically share the automobile travel lane and provide neighborhood access by stopping frequently and operating in the outermost travel lane adjacent the sidewalk.

There is one streetcar project contemplated in the financially constrained 2019-2050 RTP, which would extend and loop the existing Sugarhouse S-Line through downtown Salt Lake City and onto 100 South and South Temple streets.

Light rail provides high-capacity electric train service, typically operating within a compact urban center or utilized to connect centers in a metro region. Light rail systems often link multiple train cars and operate in its own median or curb-running ROW, and stop less frequently than buses (1+ mile station spacing).

A light rail extension is planned through the Point of the Mountain area to connect the Draper Prison Site to the TRAX Blue Line, the Draper FrontRunner Station, and points north and south. Transportation partners are currently evaluating potential alignments for the light rail investment that will best catalyze economic development opportunities in the area, as well as provide regional connectivity and mobility. The alignments shown for this project in the 2015-2050 RTP are illustrative at this point in the process.

Capacity improvements to the existing Salt Lake City TRAX system are contemplated, including an additional TRAX line from Salt Lake Central Station to the University of Utah, and a north-south line configuration. These improvements would require small construction but would mostly utilize existing light rail tracks and stops.

Commuter Rail is high-capacity train service that operates from a central city to outlying cities and suburban areas. This service is busiest during peak travel times and typically serves workers, or people who travel the same route every day. Commuter rail links multiple train cars and station spacing is the longest of all types of transit service (five or more miles), with vehicle parking at most stations.

The 2019-2050RTP plans for double-tracking FrontRunner, the Region's commuter rail line, which is the first critical step needed in order to improve service frequencies on the line. Electrification of the rail is unfunded in the 2019-2050 RTP, but is a needed operational improvement that would allow for increased frequencies and would increase the speed of rail travel.

Express bus service is tailored toward commuters traveling from outer cities and suburban areas to major employment areas during peak periods. Express routes operate faster than local bus routes by stopping less frequently (five or more miles) and by traveling on major roadways rather than arterials and neighborhood streets. Riders often access this service by driving, and stations are typically located near park-and-ride lots.

Express bus service is planned from Tooele County to downtown Salt Lake City, and from Box Elder County to the commuter rail and employment opportunities in Ogden.

Special bus service can be seasonal or reliant upon a specific activity, such as ski or recreational access. Station stops are limited to park-and-ride areas or other transit hubs and the final destination. Special bus service is planned (but unfunded) up Little and Big Cottonwood Canyons.

Intelligent Transportation Systems (ITS) refers to electronic applications that aid in the management of transit facilities, such as vehicles and parking garages, and that provide traveler information in real time with which their behavior can be influenced or their trip can be more pleasant. Potential benefits include better preventative maintenance, more rapid response to vehicle breakdowns, direction to available parking spaces, or real time vehicle arrival information. These types of improvements are planned to be implemented with relevant transit modes in the 2019–2050 RTP.

Innovative mobility solutions is a broad term referring to emerging trends and technologies that impact transportation patterns and behavior. Examples of these could be TNCs (i.e. ride-hailing services such as Uber and Lyft), bike and scooter share programs, and autonomous vehicles. The WFRC supports cities, counties, UTA, and UDOT as they work to support and further these efforts. One such effort underway is a "Mobility as a Service" program that would combine access to multiple transportation options on one mobile application, allowing for seamless trip planning and payment options all in one place. Users would be able to access the application on their smartphone, which will show the various transportation options (transit, bikeshare, ride hailing, etc.) available to them. The 2019-2050 RTP does not allocate assumed funding to these programs, but considers their use in the planning process.

Programmatic line items are any other transportation investments included in the 2019-2050 RTP that are not associated with a specific project. An example of a programmatic line item is an increase in local bus service broadly across a service area. The planned investment does not identify a specific corridor or city, but allocates assumed funding for local bus service enhancements county-wide.

Transit Point Projects

Point projects in the 2019–2050 RTP include park-and-ride lots, transit hubs, maintenance facilities, and light rail and commuter rail infill stations.

Park-and-ride lots are lots located in peripheral areas and are utilized by commuters to leave their vehicles and transfer to a bus, commuter rail, or other transit service.

Transit hubs are points for passengers to transfer between transit services, and should be located in central nodes of activity to maximize efficiency. Hubs should have restroom facilities and shelters.

Maintenance facilities are storage and maintenance facilities for bus fleets. Facilities are used by transit operators and technicians to keep transit vehicles in a state of good repair.

Infill stations are new light rail or commuter rail stations that are located within existing rail lines.

Transit Mode Selection Process

As the 2019-2050 RTP took a fresh look at needed regional transportation projects, an iterative process was developed to determine appropriate transit service and capital investments within regional corridors. The primary objective of this process was to determine thresholds for levels of transit investments ranging from core routes to light rail. It should be noted that the 2019-2050 RTP process establishes a rough vision for transit corridors but assumes that transit modes and alignments can and will change over time, depending on the land use mix, building patterns and densities, community objectives, and funding availability. Please see below for a summary of the transit mode selection process.

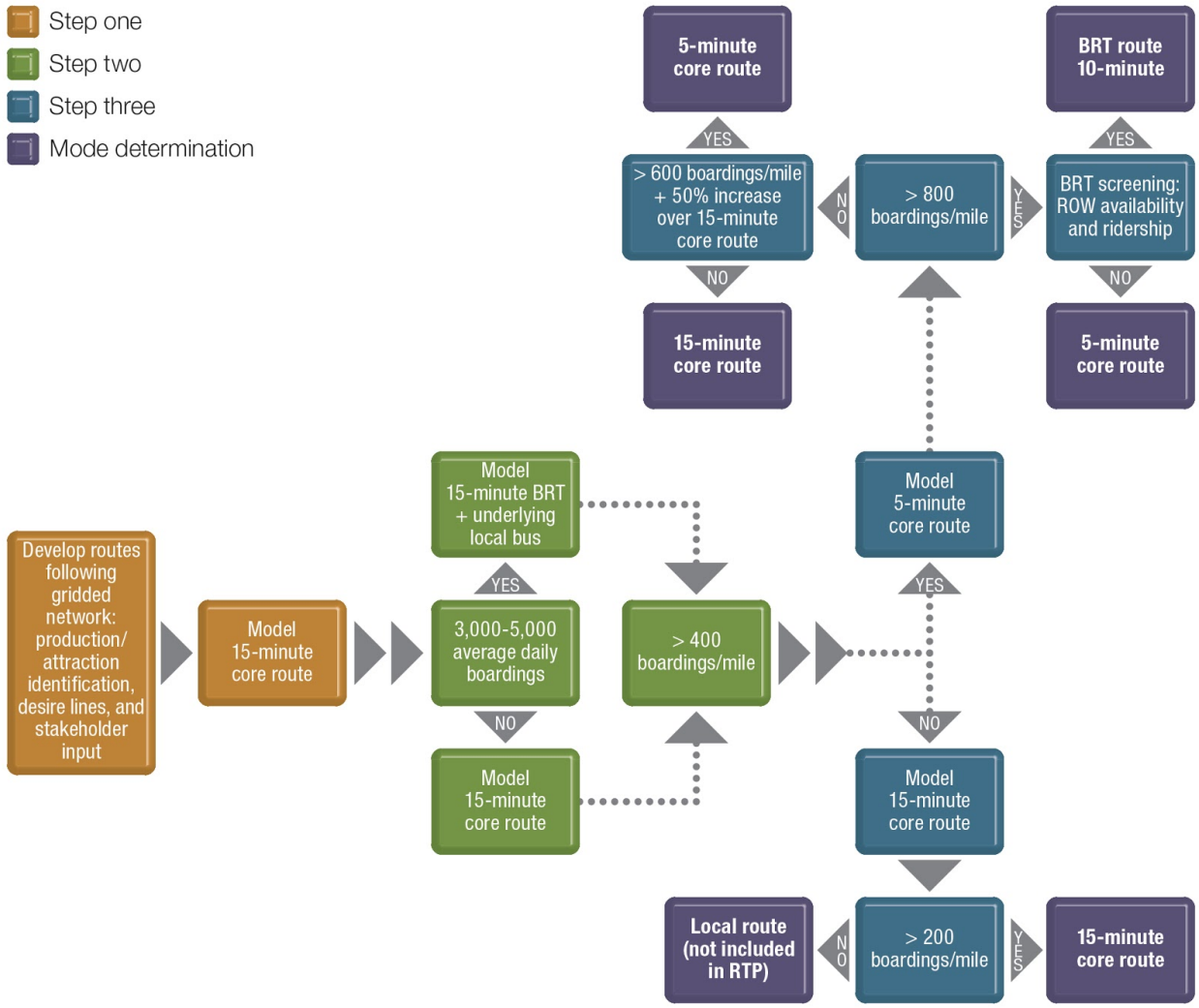
1. Utilize chosen transit corridors as developed through Project Selection process.
2. Test all routes "mode-neutrally" (baseline core route 15-minute service) on all transit corridors using the Travel Demand Model. Focus on gridded service and tie to fixed-guideway stations and major destinations when possible. (This process did not re-evaluate transit projects that are currently being studied for implementation, i.e. Ogden-Weber State University BRT, Midvalley Connector, and Davis-Salt Lake City Connector BRT.)
3. Evaluate route-level ridership. For routes with ridership greater than 3,000-5,000 passengers, increase service to 15-minute BRT service (transit-only lanes, increased speed, ½-mile station spacing). Routes that did not meet this threshold were left at 15-minute core route service.
4. For BRT routes tested in step 3 that have ridership greater than 400 riders per mile, test five-minute core route service (mixed traffic, ½-mile station spacing).
5. Evaluate route-level ridership impacts from dedicated lanes (step 3) versus increased five-minute frequencies (step 4) to determine the ridership difference between increased frequencies and dedicated transit lanes. When identifying a route for BRT-level investments, consider if a dedicated lane might improve route speeds, total corridor throughput, and/or facilitate greater interaction with land use. Also look at ROW constraints (can the project utilize shoulder, narrow median, etc.).
6. Develop thresholds for determining mode, based on the previous model runs.

Table 3 describes the 2050 ridership forecasts (total daily boardings) that have been utilized for mode assignments per project. Figure 11 summarizes this methodology.

Table 3. Transit mode ridership thresholds

Transit Mode	Weekday Riders, 2050 forecasts
Core Route 15-Minute Service	200-600 riders per mile
Core Route Five-Minute Service	600-800 riders per mile and 50 percent increase in ridership over 15-minute service
Bus Rapid Transit	800-1000 riders per mile
Streetcar	1000 or more riders per mile
Light Rail	1000 or more riders per mile

Figure 11: Transit Mode Determination Process



Active Transportation Improvements

The preferred active transportation scenario was arrived at through coordination with local municipalities through RGC TACs for the Salt Lake City-West Valley City and Ogden-Layton urbanized areas and the small area workshops. Transportation partners at UTA and UDOT Regions 1 and 2 have collaborated throughout the process, as well as WFRC Active Transportation Committee, Weber County Active Transportation Committee, and Davis County Active Transportation Committee. General public outreach was conducted via an online interactive map where comments could be made on individual projects.

The preferred active transportation scenario focuses on regional connectivity, including connections to transit, supported by underlying local active transportation networks. This means overcoming first-/last-mile barriers to transit and filling gaps in the regional network. Identification of appropriate facility type (described below) based on vehicular speeds, volumes, and local land use context is also a major component of the preferred scenario. User safety and comfort is largely tied to the level of physical separation from vehicles. Such separation is identified on facilities through protection levels 1 to 4 with protection level 1 being less separated (shared roadway) and protection level 4 being totally separated

(shared use path). As shown in Table 4, not quite one-third of all planned regional bicycle network miles are more comfortable for a novice user. Point projects are intersections or other major obstacle crossings that facilitate safe, convenient travel by foot or bicycle.

It should be noted that the 2019-2050 RTP does not show the local bicycle networks that support the regional network nor are future sidewalks identified. However, a regional sidewalk inventory was completed in 2018 and can be found in Appendix H - Regional Sidewalk Inventory.

Table 4. Regional Bicycle Plan Project Summary

Total Miles	1,003
Protection Level 3 and 4 Miles (more comfortable for users)	299
Protection Level 1 and 2 Miles (less comfortable for users)	704
Point Projects Total	79

Facility Types

Bike lanes are designated space on the roadway for the use of cyclists distinguished through pavement markings and signage, typically adjacent to vehicular travel lanes. Bicycle travel usually follows the directional flow of adjacent vehicle traffic.

Buffered bike lanes are bike lanes with increased distance between the vehicular travel lane and bike lane but is still located on the roadway. The increased distance, or "buffer," is typically designated through pavement markings indicating a "no-use zone" or something similar.

Bike boulevards, or neighborhood byways, are where vehicular volumes and speeds are low enough and speed control measures are in place so that cyclists feel comfortable riding in the roadway, without the need for a specific area in which to operate. Bike boulevards may have pavement markings and upright signage to identify them.

Protected bike lanes, also known as a cycle tracks, denote a level of physical protection and separation beyond painted markings between the bike lane and vehicle travel lanes. This separation can be raised curbs, bollards, or even parked vehicles, and offers greater comfort and safety for users.

Shared lanes are facilities where bikes and vehicles share the same space on the roadway shown by pavement markings and signage, but differ from bike boulevards in that vehicular speeds and volumes may not be low.

Shared-use paths are paved, off-roadway, separated facilities that allow bicycle, pedestrian, and other non-vehicular uses. User comfort levels are typically high due to the absence of vehicular friction.

Shoulder bikeways are paved roadway shoulders that can be used by cyclists, but not set aside exclusively for bicycle use.

Sidepaths are shared-use paths immediately adjacent to a roadway.

Trails are soft surface paths typically used for recreational cycling purposes.

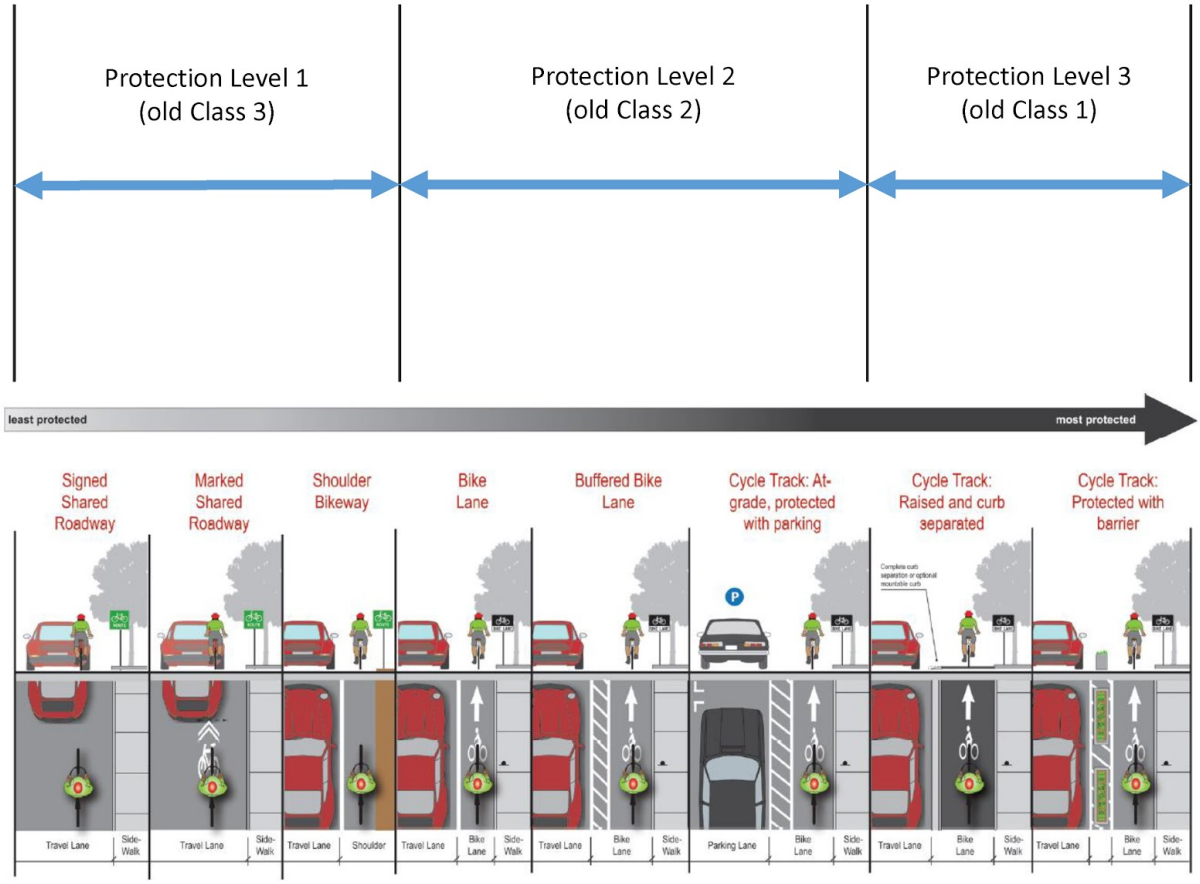
At-grade crossings are intersections of a bicycle/pedestrian facility with a roadway, railroad track, etc. at the same grade where potential user conflicts between vehicles and bicyclists/pedestrians must be negotiated.

Overhead crossings are intersections of a bicycle/pedestrian facility with a roadway, railroad track, etc, where the bicycle/pedestrian facility crosses above the grade of the roadway, railroad track, etc. and avoids potential conflicts between vehicles and bicyclists/pedestrians.

Underground crossings are intersections of a bicycle/pedestrian facility with a roadway, railroad track, etc. where the bicycle/pedestrian facility crosses under the grade of the roadway, railroad track, etc. and avoids potential conflicts between vehicles and bicyclists/pedestrians.

Facility types are identified project by project on the online interactive map. However, the planned active transportation solution on a given roadway may evolve over time. During project development, context sensitive solutions will be considered to build out the preferred solution. Further jurisdiction coordination, deployment of interim designs, or phased implementation may be necessary until complete redesign or reconstruction of the roadway and active transportation facility occurs, and/or additional ROW can be acquired. Figure 12 defines protection levels of bicycle infrastructure.

Figure 12. Bicycle Infrastructure Protection Levels



Source: Salt Lake County Best Bicycle Practices

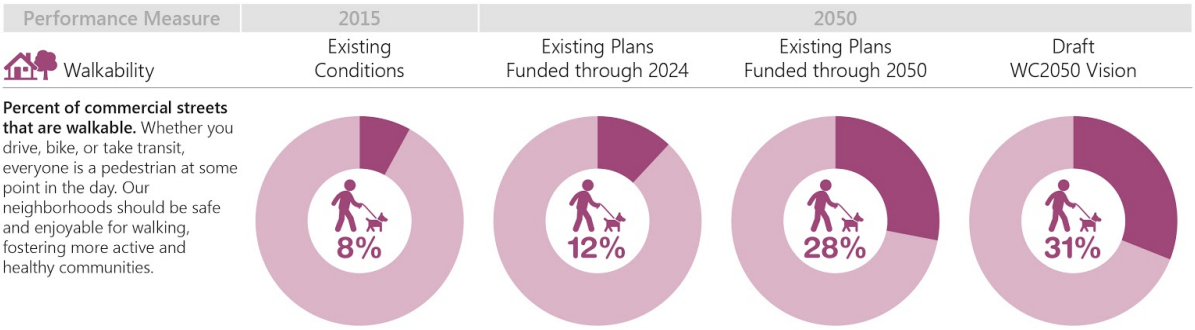
Performance Measures

The performance measures used to assess the three Wasatch Choice scenarios were also used to determine the performance of the Preferred Scenario. **Some criteria, methodologies, models, and project lists were further refined, when needed, and therefore may not be directly comparable to the performance measures as shown in other chapters.**

Each measure below compares existing conditions to three future scenarios:

1. **Existing plans funded through 2024:** this scenario demonstrates how our transportation system and land use will perform together in 2050, if we build currently funded transportation projects and then make no additional transportation investment or shifts in land use policy through the year 2050.
2. **Existing plans funded through 2050:** this scenario demonstrates how our transportation system and land use will perform together in 2050, if we fund and build all phases of the 2015-2040 RTP and continue existing land use policies through 2050.
3. **Draft Wasatch Choice 2050 Vision:** this scenario demonstrates how our transportation system and land use will perform together in 2050, if we fund and build transportation projects through 2050 that are responsive to an updated approach to land use policy.

Livable and healthy communities



Walkable streets were defined by vehicle speed, land use mix, population and employment densities, proximity to transit, and access to key destinations. Only eight percent of major corridors are considered walkable today, and not much improves without key investments in our active transportation and transit infrastructure. An additional increase in walkability is realized through the Wasatch Choice 2050 Vision, as greater emphasis is placed on land use.

Access to economic and educational opportunities

Performance Measure	2015	2050		
Destination Access	Existing Conditions	Existing Plans Funded through 2024	Existing Plans Funded through 2050	Draft WC2050 Vision
The number of jobs on average that are accessible from households within a 30-minute drive or transit trip. Better access to jobs and education means enables easier economic and social interaction. Destination access can be increased through transportation improvements, locating development near high-speed transportation, or locating homes near jobs (and vice versa).	160K auto 38K transit	90K auto 28K transit	129K auto 35K transit	141K auto 47K transit

Today, the average household can reach more than four times as many jobs by auto than by transit. In the future, auto access is likely to decline due to increased congestion on major roads. However, if the Region continues to strategically invest in our transit system, access to jobs by transit, and in turn improved economic opportunities for all, is projected to increase 20 percent between now and the draft Wasatch Choice 2050 Vision. If we do not continue to invest in our transit system, the Region would see an eight percent decline in transit access between now and 2050.

Performance Measure	2015	2050		
Freight	Existing Conditions	Existing Plans Funded through 2024	Existing Plans Funded through 2050	Draft WC2050 Vision
The average truck speed on freight corridors in the evening commute. Truck speed is a proxy for the ability of goods and services to reach consumers and the market. Freight movement is a vital part of the state's economy.				

Freight mobility is one of the Federal performance measures that UDOT and WFRC are mandated to monitor and freight mobility affects an area's economy. By making key investments to our freight corridors, we can almost maintain today's trucking speeds despite growth in population. The draft Wasatch Choice 2050 Vision performs much better than the three draft scenarios by combining operational and capacity improvements.

Manageable and reliable traffic conditions

Performance Measure	2015	2050		
Auto Travel Time	Existing Conditions	Existing Plans Funded through 2024	Existing Plans Funded through 2050	Draft WC2050 Vision

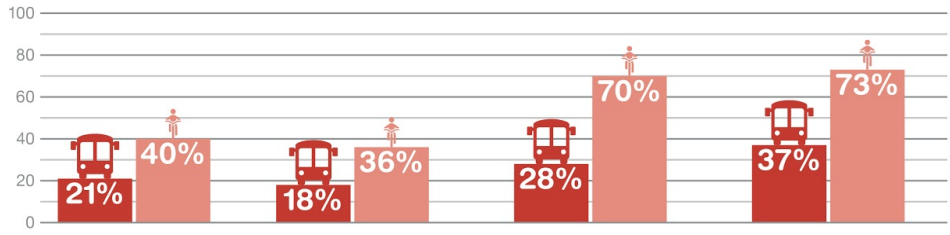
The total time per day that the average person spends in a vehicle. Auto travel time increases with added congestion and delay. Shorter travel times mean we spend less time driving and have more time for leisure and recreation.

Travel time will inevitably increase as our population grows and more people use our transportation system. However, by continuing to invest in our mobility - through strategic widenings, operational improvements, new roadways, expanded transit, and shorter distances between destinations - we can reduce the increase in travel time, from about 40 minutes to only 20 minutes.

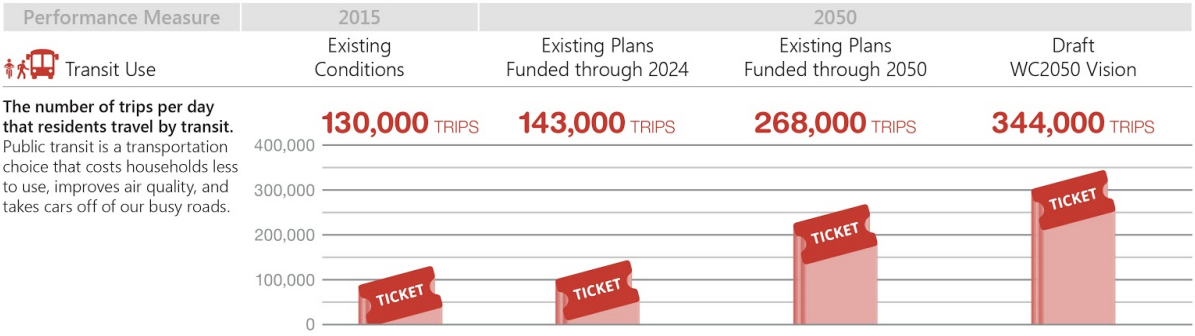
Quality transportation choices

Performance Measure	2015	2050		
Transportation Choices	Existing Conditions	Existing Plans Funded through 2024	Existing Plans Funded through 2050	Draft WC2050 Vision

The percent of people who have access to (are within one quarter of a mile) a frequent bus route, transit stop/station, or dedicated bike facility. Multi-modal transportation systems provide quality travel options, giving people choices to save money, decrease congestion, or reduce vehicle usage.

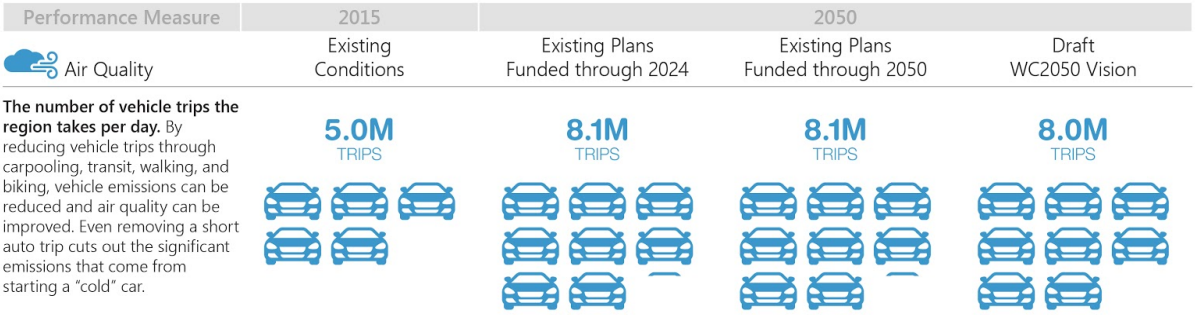


Improving access to transportation choices requires a two-pronged approach: expanding the active transportation and transit networks and developing more housing and destinations near transit stations and bicycle facilities. Without funding to increase transit, trails, and bicycle lanes, a smaller percentage of our Region will be able to access frequent transit service (routes with a minimum of 15-minute headways) and/or an active transportation facility. The draft Wasatch Choice 2050 Vision represents the full build out of a regional bicycle system, a blend of transit projects that are distributed throughout the Region and densification around transit stations. The Vision results in significant increases to people having multi-modal access.



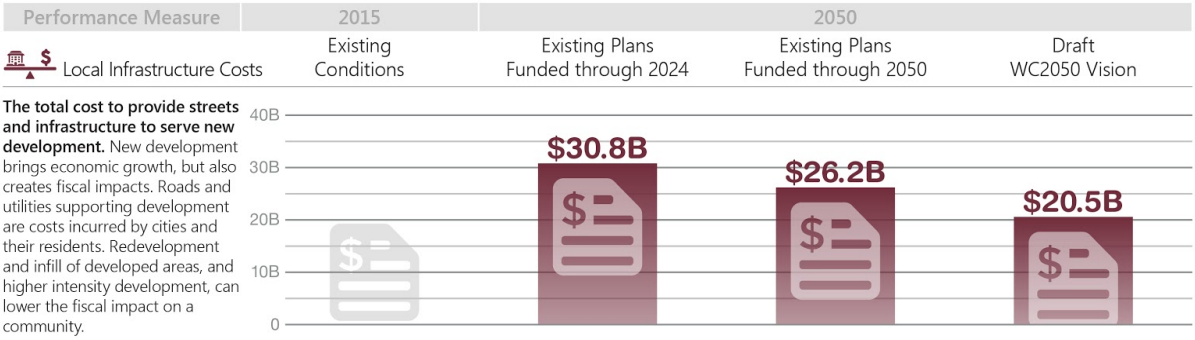
The transit use measure reflects the number of transit trips the Region takes per day. As more people have access to a frequent bus route or transit stop/station, ridership throughout the Region increases. Funding our transit network and expanding service leads to a major increase in ridership, in this comparison, almost a 90 percent increase in ridership. However, our existing plans include a hub-and-spoke, commuter-oriented transit system with all routes terminating in one central location (downtown Salt Lake City). By redesigning this system to create a gridded transit network and strategically developing along transit corridors, people can access more destinations in a shorter time and will ride transit more frequently, almost 30 percent more than our existing plans.

Clean air



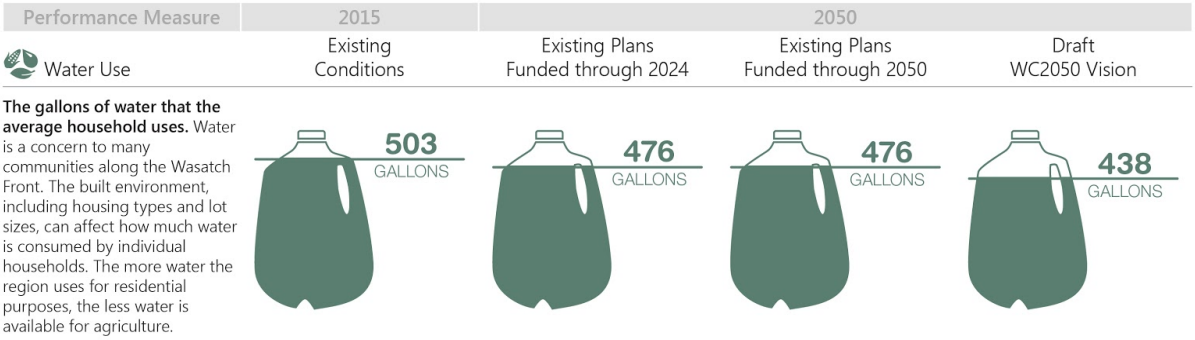
Foremost among causes of auto emissions in the Region is the number of auto trips taken, regardless of length traveled. As shown above, the Region will take more vehicle trips in the future, despite investment or how we grow, simply because there are more people living in the Region. However, the lower number of vehicle trips the Region takes in the draft Wasatch Choice 2050 Vision illustrates that if the Region succeeds in planning transportation and land use in a coordinated effort, change can be made improving our air quality.

Fiscally responsible communities and infrastructure

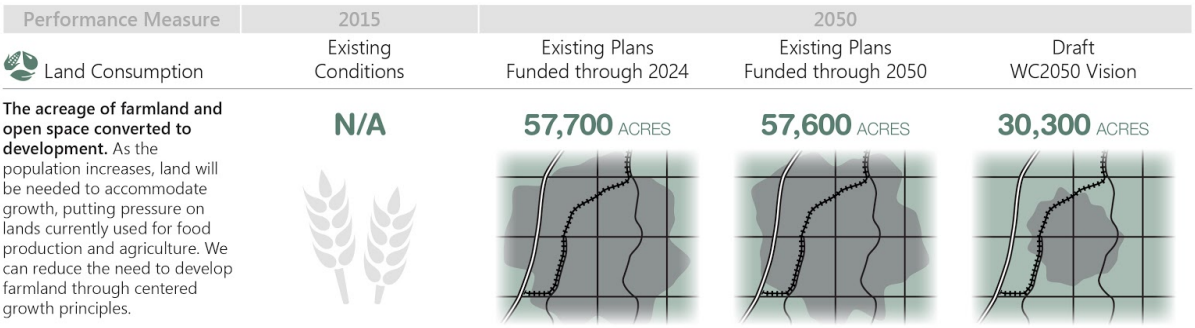


Local infrastructure costs shown above include infrastructure such as roads, sewer, and water, and services, such as police and fire. Infrastructure and services to support new development can be significant. The draft Wasatch Choice 2050 Vision provides a 33 percent reduction in costs compared to Existing Plan Funded through 2024. These cost savings are realized through locating development closer to existing infrastructure, such as greater infill development, more centered development, and locating future developments closer to transportation.

Sustainable environment, including water, agricultural, and other natural resources

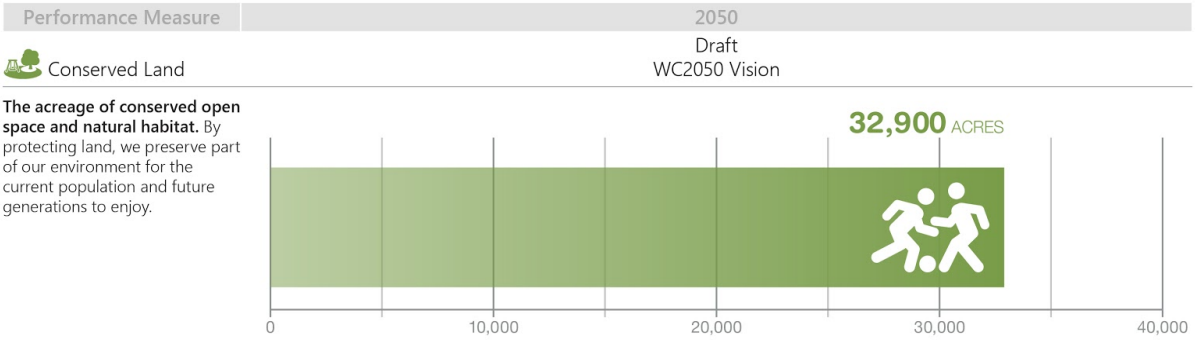


As mentioned before, the Region's development patterns, such household lot size, will change to accommodate an increasing population, and will result in a reduction in daily household water usage in the future. However, scenario modeling indicates that by concentrating growth in planned centers, as done in the preferred scenario, the Region can further reduce household water use by approximately eight percent.



As we grow, many acres of farmland and undeveloped open space will be converted to housing and commercial uses. By adhering to the growth principals and the blueprint of the Wasatch Choice 2050 Vision, the Region can reduce the conversation of farmland and undeveloped open space to development by about 90 percent compared to futures where land use and transportation are not linked.

Ample parks, open spaces, and recreational opportunities



Utah is renowned for its open space and natural wonder. One of the goals of Wasatch Choice 2050 is to provide ample parks, open spaces, and recreational opportunities. Through concentrating development in nodes of activity and by intentionally working to preserve land and create parks, local communities can work together to maintain the Wasatch Front's access to the outdoors and conserve about 32,900 acres.

System Management Review

Demand Management

Transportation demand management (TDM) strategies include approaches such as transit service in all its forms, ridesharing, flextime, telecommuting, pedestrian and bicycle accommodations, growth management, and congestion pricing. Most of these strategies are currently utilized in the existing transportation network. Increased implementation of these strategies is needed to provide a full range of options to the traveling public, as well as to improve access and mobility.

Congestion Management Systems

As part of the Congestion Management Process (CMP), WFRC reviewed projected highway congestion conditions and identified a number of locations where congestion mitigation is or will be needed. The CMP involves an evaluation of Transportation System Management (TSM) strategies, such as signal coordination, intersection widening, and access management, and TDM strategies, include ridesharing, high occupancy vehicle (HOV) lanes, and telecommuting, as potential solutions to regional congestion rather than increasing highway capacity. Locations have been identified where TSM and TDM strategies can delay or eliminate the need for new capacity. Where these strategies cannot meet the projected travel demand, the need for new capacity is noted. Whenever additional capacity is added, TDM efforts to reduce demand should be employed, and the transportation system made as efficient as possible in order to maximize the effectiveness of the new capacity and minimize the need for future capital investments in highways. More information on the CMP can be found in Appendix I - Congestion Management.

Freight Needs

The efficient movement of freight is a critical component of a health economy and a key indicator of a well-planned transportation system. As the "Crossroads of the West" for several transportation modes, the Wasatch Front Region plays a major role in the movement of freight across the United States. Each year, approximately 57.4 million tons of freight valued at $80.1 billion is shipped from Utah via all modes of transportation. Conversely, a a total of 47.6 million tons of freight arrives in Utah with a value of $93 billion. This makes for a yearly total of 105 billion tons of freight shipped to and from Utah valued at $173.1 billion. Annually, approximately 65.1 million tons of freight, at a value of $44.8 billion, is shipped and remains in Utah. Trucks haul 47 percent of the Region's freight tonnage and 69 percent of its value. Railroad hauls approximately 11 percent of the tonnage and five percent of value. Pipelines move about 38 percent of the tonnage, but only seven percent of the total value of goods. Multi-modal freight, including mail, account for five percent of the tonnage and 18 percent of the value. Meanwhile, air cargo accounts for less than one percent of the total freight tonnage moved to, from, and within Utah, but seven percent of its value.

The Wasatch Front Regional Council worked in close cooperation with UDOT in developing the "Utah Freight Plan (UFP)," which was adopted in December 2017. The UFP was funded by UDOT and subject to approval by the United State Department of Transportation (USDOT) through the Federal Highway Administration (FHWA). A specific list of roadway projects for the Wasatch Front Region can be found in Table 9.2 (Phase 1 projects), Table 9.3 (Phase 2 projects), and Table 9.4 (Phase 3 projects) of the UFP.

The agency developed a freight plan that is complaint with the requirements enacted the FAST Act. USDOT provided a list of ten required elements below for the development of freight plans with the addition of other elements as needed based on the variation of needs.

- An identification of significant freight system trends, needs, and issues;
- A description of freight policies, strategies, and performance measures;
- Critical urban and rural freight facilities and corridors;
- A description of how the UFP will meet national multimodal freight goals;
- A description of how innovative technologies and operational strategies were considered;
- A description of facility improvements that may be required to reduce or impede the deterioration of roadways used by heavy vehicles;
- An inventory of facilities with freight mobility issues, such as bottlenecks, and a description of strategies to be employed to address these issues;

- » Consideration of any significant congestion or delay caused by freight movement;
- » A freight investment plan that includes a list of priority projects and a description of how funding would be matched and invested; and
- » The formation and utilization of a freight advisory committee to the Utah State Transportation Commission.

The railroad industry continues to play a vital role in the movement of freight to and through Utah. Currently, local and national railroads are the number two freight carrier in Utah, behind trucking and ahead of pipelines. The Wasatch Front is a hub for six railroad routes, all of which are owned and operated by the Union Pacific Railroad. Utah sits astride both Union Pacific Railroad central corridor routes linking northern California and the Midwest, with other routes radiating out from northern Utah rail terminals to Pocatello, Idaho and the Pacific Northwest, as well as Southern California. Two additional railroad companies, the Burlington Northern Santa Fe and the Utah Railway, a Genesse & Wyoming short line railroad, also operate in Utah. Finally, there are two passenger rail services that operate in Wasatch Front Region - Amtrak, for cross country travel, and UTA's FrontRunner, a regional commuter service that operates from Ogden to Provo City. Finally, the Salt Lake City Intermodal Terminal (SLCIT), built in 2006, receives about 500 trailer and container lifts per day, mostly from the Ports of Los Angeles, Long Beach, and Oakland. The SLCIT is located directly adjacent to the City's westside warehousing and distribution center and in close proximity to three of Utah's primary freight network highways and the Salt Lake International Airport. UDOT adopted the Utah State Rail Plan in April 2015.

Safety Issues and Concerns

The UDOT collected data on roadway crashes from 2013-2015 and reported this in the form of a "safety index," which incorporates the severity of the crash and highlights those areas that have a higher rate of crashes into a single numeric value. The Safety Index provides a starting point for identifying where safety improvements are needed. The Safety Index for the Wasatch Front area is shown in Map 5. The needs analysis emphasizes roadway segments with a safety index ranging from 7.0-10.0 shown in black.

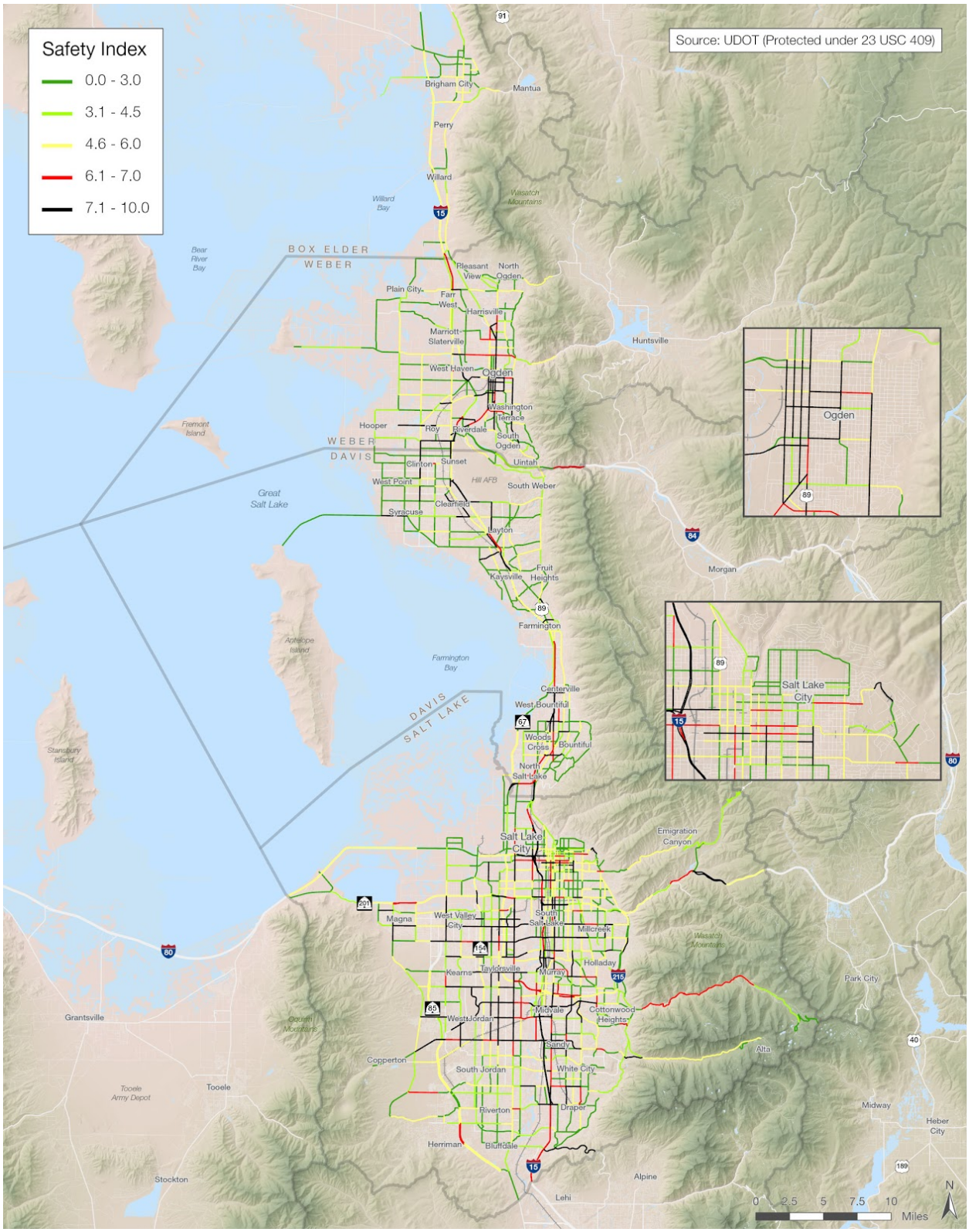
The Safety Index is a useful tool to track where the most serious and most frequent crashes are occurring. However, since the overwhelming majority of crashes can be attributed to driver error, a map of crash locations begins to indicate traffic volume (or crash opportunities) more than it indicates safety needs in the system.

The UDOT is pursuing a new approach to identifying safety needs in the roadway system, called the United States Roadway Assessment Program (usRAP). The usRAP model makes a thorough inventory of roadway assets by video inspection. The state and local road inventory for the Wasatch Front was scheduled to be completed in 2018. Based on the roadway assets, traffic volumes, and historical crashes, the usRAP program can evaluate the benefit/cost of various crash mitigation strategies and even estimate the number of lives that can be saved.

This asset-based approach to safety improvements is a much better fit with the transportation planning process. The usRAP program will facilitate the identification of safety improvement needs in the roadway system rather than unwittingly assigning priority to projects with the highest volumes or the most intersections.

For the 2019-2050 RTP, the usRAP model was not yet available, so safety needs relied on the Safety Index to identify locations with the greatest need of safety improvement.

Map 5: Safety Index



A visual inspection focusing on the black segments (safety index 7.1 – 10.0) of the Safety Index map shown in Map 5 reveals some interesting patterns about roadway safety. In general, higher volume arterial facilities with unrestricted access tend to have the highest Safety Index. This is to be expected because these facilities have the most conflict points with at-grade intersections and unrestricted commercial and residential access along the route. I-80 and SR-201 are the only east-west oriented freeways, so all other east-west traffic must use arterial roads with their inherent safety issues. An inspection of Map 5 reveals that several of the east-west arterials in the Salt Lake County area have the highest safety index. A few high-volume, north-south arterials such as State Street and Redwood Road in Salt Lake County also have a high safety index.

Conflict points increase even more where arterials intersect with a freeway. As can be expected, the arterial segments at freeway interchanges tend to have a higher safety index than other portions of the arterial.

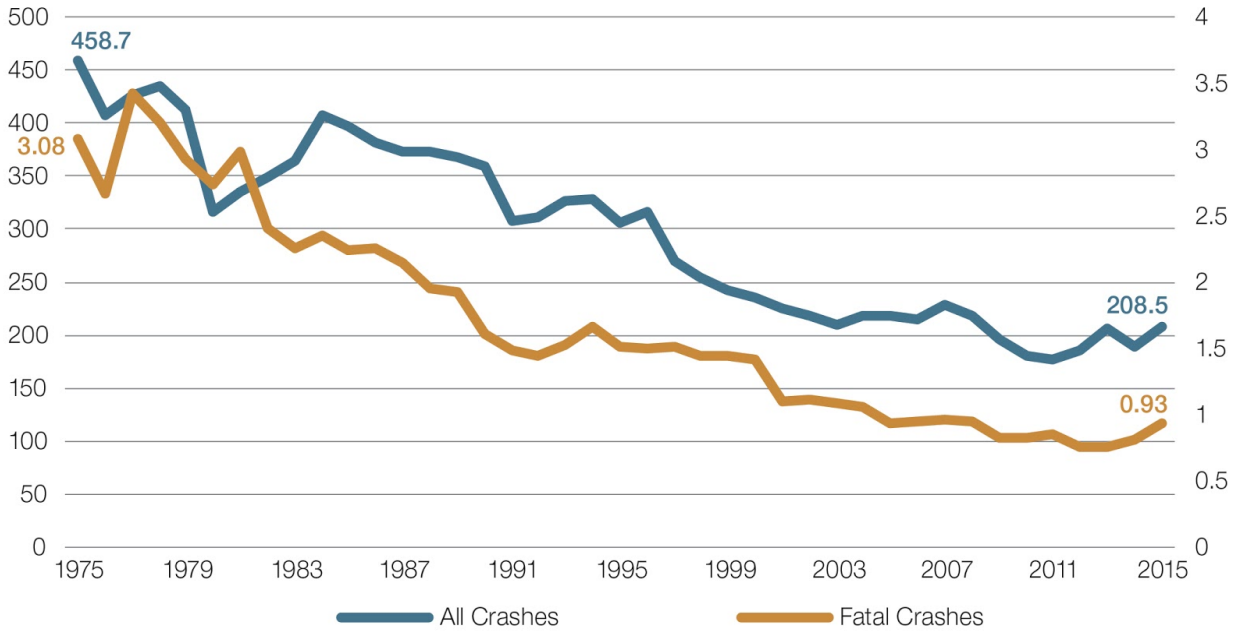
Canyon roads also show up on the Safety Index map. Parley's Canyon (I-80) and Big Cottonwood Canyon in particular have elevated safety index scores. Narrow, winding canyon roads make these facilities more dangerous to drive during winter weather conditions. On I-80 in Parley's Canyon, UDOT has recently installed variable speed limit signs linked to weather conditions. Initial indications are that this measure is helping to improve safety.

The I-15 freeway, which carries the greatest traffic volumes, shows a safety index in black or red throughout much of the Region. The crash rate is lower in general on freeways, but the heavy volume of traffic and the congestion patterns on I-15 result in a net high number of crashes.

In addition to project selection and prioritization, WFRC also addresses safety concerns at the project implementation phase. The TIP also evaluates crash history among other factors in the process for selecting projects to be funded for construction in the next five years. When these projects are ready to be implemented, WFRC invites UDOT traffic and safety engineers to the project orientation meeting to recommend and coordinate crash mitigation strategies to be included in the project.

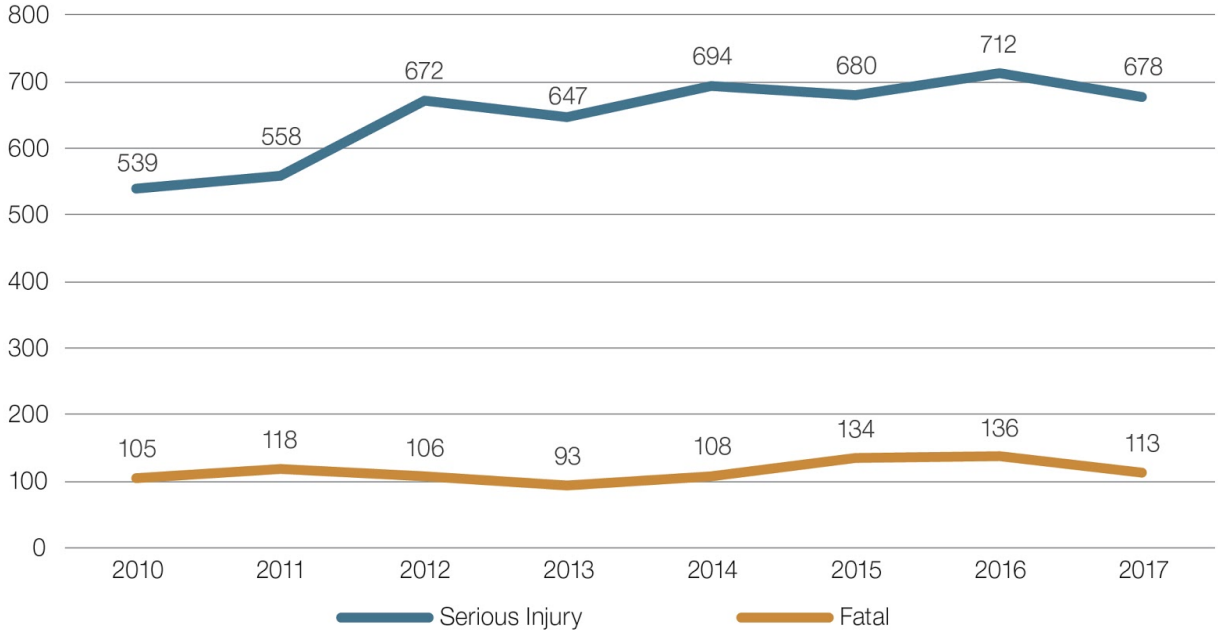
Figure 13 below shows the trend of roadway crashes per million vehicle miles (or crash rate) for the State of Utah. This is encouraging that the crash rate is on a declining trend. Fatal and serious injury crashes for the State of Utah is also on a declining trend for the last ten years as shown in Figure 14. These improvements are a result of a combination of efforts including safer roads, safer vehicles, and improved driver performance.

Figure 13. Roadway Crashes per Million Vehicle Miles



Source: UDOT, January 1, 2010 to July 31, 2018.

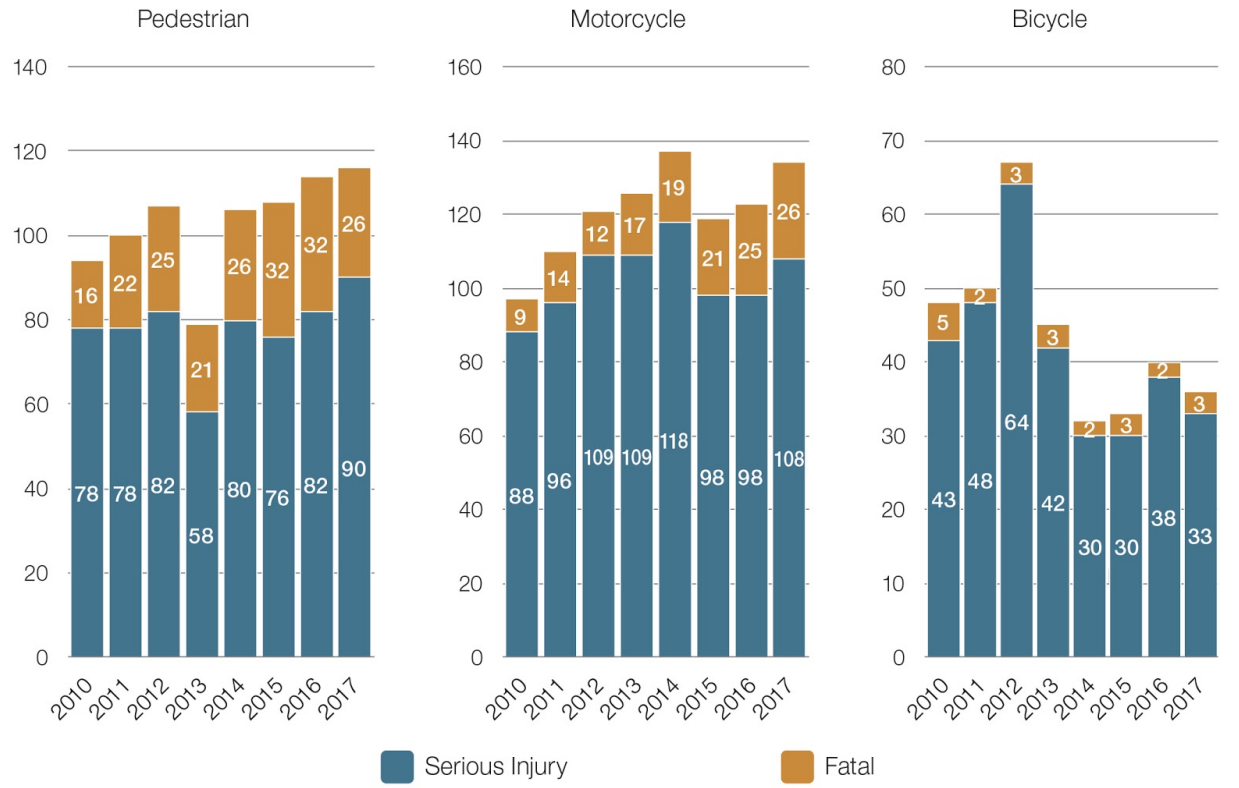
Figure 14: Fatal and Serious Injury Crashes



Source: UDOT, January 1, 2010 to July 31, 2018.

Pedestrians, bicycles, and motorcycles are the most vulnerable modes of transportation. Increased investments and emphasis on transit use and non-motorized travel has produced more pedestrian and bicycle travel. Coupled with an ever growing volume of traffic, there is increased exposure to these vulnerable travel modes. Figure 15 shows fatal and serious injury crashes by mode. Safer facilities to accommodate non-motorized travel will need greater emphasis throughout the implementation of the 2019-2050 RTP.

Figure 15. Fatal and Serious Injury Crashes by Mode, 2000-2015



Source: UDOT, January 1, 2010 to July 31, 2018.

Homeland Security Needs

The Wasatch Front Region is often times referred to as the "Crossroads of the West." Because the Rocky Mountains bisect the entire western portion of the United States (north-south), there are only five interstate facilities that allow east-west travel across this portion of the country. Of those facilities, I-80 is the most centrally located, running through Salt Lake City and connecting New York, Chicago, Omaha, Salt Lake City, and San Francisco. Similarly, I-15 is one of only three north-south interstate facilities west of the Mississippi River that extend to the northern and southern borders of the United States. Designated the Canadian-Mexican (CanaMex) Transportation Corridor, I-15's regional impacts along the Wasatch Front are ever increasing. Paralleling the Rocky Mountains, it too passes through the Wasatch Front Region intersecting I-80 in the Salt Lake Valley and I-84 in Weber County.

In developing an RTP, the distinctive topography of the Region must be taken into account. I-15, I-80, and I-84 all enter and exit the Region through narrow corridors constrained by the natural topography. These constrained corridors, both north-south and east-west, include one freeway (I-15, I-80, or I-84),

railroad lines (freight and passenger), a power corridor, frontage road(s), and one or two parallel arterials. The east-west corridors are similarly constrained by high mountain passes and the Great Salt Lake.

The air corridors are also severely restricted as access to the Salt Lake International Airport is limited to north-south approaches. These approaches are further impacted by the confined air space bounded by mountains on the east and west. The restrictive natural topography, or "pinch points," affecting surface transportation in all cardinal directions from Salt Lake City and the availability of limited air space are the basis of the need for more redundancy within the transportation system throughout the Region.

In considering the convergence of two interstate highways, the Transcontinental Railroad, and an international airport along the Wasatch Front, it becomes very evident that the regional transportation facilities have national significance. This importance is further increased when consideration is given to the physical constraints of the topography and potential for natural disasters. These conditions quickly raise awareness and concerns about the possible impact disruptions in the Region's transportation systems could have not only on local and regional populations but the national transportation industry and security interests as well.

The national significance of this "Crossroads of the West," coupled with restrictive topography and potential for natural disasters, demonstrate a need for additional regional transportation facilities to serve increasing regional travel demands. It bolsters the rationale for long-range transportation planning, adding new capacity and improvement of current facilities, and elimination of choke points in transportation corridors. In order to effectively address regional security needs, a concerted effort must continue at all levels of government and industry within the Wasatch Front Region to develop an awareness of the potential dangers that exist to transportation systems. A consensus must be reached on what elements of security incident prevention and mitigation, including consideration and implementation of specific projects, strategies, and services will best address the security needs of the transportation system for motorized and non-motorized users. Well-defined and agreed-upon strategies should be incorporated into the state and metropolitan area's transportation planning processes.

Regional security goals at the metropolitan planning level are based, in-part, on improved communication and coordination between the increasing number of agencies involved with security and emergency preparedness. As a component of the coordination effort, several plans should be considered for review and update. These plans include but are not limited to a public transit emergency management operations and recovery plan; a fuel shortage plan; emergency operations plans at local, regional, and state levels; and communications plans. Conducting simulations and exercising these plans is needed to determine their operational benefits and shortfalls.

System Resiliency

Resiliency is the ability to anticipate, prepare for, adapt to, withstand, and recover from disruptions and changing conditions. At its core, the resiliency of the transportation infrastructure system allows the Region to maintain essential services in the event of a human-caused or natural disaster, such as an earthquake. But a resilient system can also withstand not only a single event, but also a series of events or a permanent change in the environment.

The distinctive regional topography constraining the transportation network has a conspicuous impact on the entire Wasatch Front Region in the form of natural hazards. The steep slopes of the Wasatch Mountain Range were created by the Wasatch Fault, which runs the entire length of the Urbanized Area. The Wasatch Fault and other nearby faults highlight the potential for earthquakes in the area and the need to consider their possible impact on transportation facilities. These same mountains provide a

winter wonderland for outdoor enthusiasts, but snowfall can also impact the area in more harmful ways. A winter of heavy snowfall followed by a spring of quick melting can overwhelm the area's creeks, streams, and rivers and cause widespread flooding. Lack of snowfall and rain can also provide the perfect conditions for destructive wildfires, resulting in losses to life and property. Dam failures and landslides can also impact development and transportation in the Region.

Resiliency expands beyond natural disasters and includes one-time events and permanent changes in the environment. For example, conferences, sporting events, or other large events where many people who do not normally congregate, come together all at once. The Region can accommodate these issues through managed motorway projects, better street connectivity, a gridded transit network, and safe bicycling facilities. These are some of the projects planned for the future that can provide resiliency and redundancy in the system and allow the Region's communities to handle anomalies of higher travel demand. At the operational level, ITS has been implemented, and will continue to expand, to facilitate the reliability, robustness, and resiliency of the transportation infrastructure system and to maintain essential services needed to preserve confidence in the transportation system during large events or in the event of a man-caused or natural disaster.

With a prominent geological fault paralleling the foothills of the Wasatch Mountains throughout the Region, the effects of an earthquake or other natural disasters, including severe weather conditions, on the resiliency of the transportation system must also be taken into consideration. Many in the Region are aware of these potential hazards and have worked to develop plans and approaches to keep our transportation system safe and operational.

See Appendix A - Resiliency for more information about how the Region's transportation system is prepared for resiliency.

Public Involvement

Small Area Workshop Summary

The WFRC organized and held the third in a series of regional workshops from January 30 through March 6, 2018. As with previous small area workshops, invited participants included elected and appointed community officials, planners, engineers, and representatives from UTA, UDOT, and Envision Utah. The focus of this particular work was to highlight the key challenges that the Wasatch Front Region faces, the purpose of the Wasatch Choice 2050 Vision, and a tabletop activity. Participants were invited to examine roadway, transit, and active transportation projects, and the Region's supporting land use for the preferred scenario transportation networks. The tabletop activity involved modifying the shape, location, and type of regionally significant land uses and identified centers, provide a score for each center according to the level of local interest to implement such, consider the fit of land use with transportation, and to determine the proper transportation mode, type, and alignment for each mode. All ten of these workshops were well attended, providing 64 maps that contained invaluable feedback that helped further refine both the Wasatch Choice 2050 Vision and the preferred 2019-2050 RTP scenario.

Title VI and Environmental Justice Outreach: Community Organization Workshop

The goal of the 2018 Community Organization Workshop was to reflect on the input received the previous year, and to continue dialogue on the ongoing growth challenges we face as a Region. The WFRC and partners provided maps to show the Draft Wasatch Choice 2050 Vision that was developed

from integrating feedback from these groups and other stakeholders, and through distilling the three land use and transportation scenarios into a preferred vision. The WFRC described the strategies the Draft Vision contemplates to address regional challenges in housing, mobility, economic development and open space protection. The meetings allowed representatives to provide specific input on transportation projects, and to describe how and if the Draft Vision will improve access to jobs, services, and educational opportunities for the communities they serve.

Through dialogue and feedback on transportation and land use maps, participants expressed a need to create strategies to increase the share of non-automobile trips throughout the Region, and underscored that poor air quality continues to be a public health and economic development issue residents and businesses face throughout the Wasatch Front. Specific map comments portrayed that community members on the outskirts of cities have a difficult time reaching jobs and services within centers and business districts, yet there is a tradeoff as these areas lack the critical mass needed to employ effective and reliable transit service. The group discussed the possibility of innovative mobility solutions that may be utilized to help these populations reach necessary destinations.

A total of 25 community members were in attendance at this workshop, representing 23 organizations along the Wasatch Front.

Please see Appendix E - Public Comment for a full report capturing the feedback received through these meetings.

Generalized Public Comment Review

The WFRC in partnership with Salt Lake County, the University of Utah City and Metropolitan Planning Department, the Mountainlands Association of Governments (MAG), and Envision Utah held a Wasatch Choice 2050 and Mayor's Metro Solution Event on January 23, 2018. The combined Wasatch Choice 2050 and Mayor's Metro Solutions event brings together stakeholders from across the Region to discuss how to increase access to jobs and educational opportunities (Access to Opportunity) through the development of the Wasatch Choice 2050 Preferred Scenario.

An online visualization tool provided another opportunity to gather public feedback on the draft preferred Wasatch Choice 2050 Vision. This visualization tool provided a detailed map of projects and land uses and performance measures. The tool gave stakeholders and the public the opportunity to comment directly on the various elements identified in the preferred scenario and a way for them to have their voices heard. See Appendix E - Public Comment for comments received via the interactive map.

Endorse Vision

In early 2018, communities refined the draft Vision Map through sub-region meetings and consultation with local city planners. All told, the Wasatch Choice 2050 Vision has been built through extensive engagement with local governments, stakeholders, and the public.

In May of 2018, WFRC endorsed the Wasatch Choice 2050 Vision. Below are the elements of the Wasatch Choice 2050 Vision that were considered for endorsement.

ABCs of the Vision

A. The regional goals were adopted by WFRC in 2016 and are the desired outcomes to be achieved. The goals inform future transportation investment decisions, as well as local community considerations regarding the use of land and the pursuit of economic development opportunities.

B. The Wasatch Choice 2050 Vision Map is a blueprint for regional transportation, land use, and open space, and explicitly considers how these elements should work together geographically. Overall, the Vision Map represents the long-term vision of the communities along the Wasatch Front and Back. Communities have expressed the desire to implement the Wasatch Choice 2050 Vision within their local plans and ordinances in conversations with residents and business owners.

C. The key strategies represent the overarching themes in the Wasatch Choice 2050 Vision and help achieve the Regional Goals. The key strategies are as follows.

Provide Transportation Choices

Help us have real options in how we choose to get around and increase the number of easily reached destinations.

Support Housing Options

Support housing types and locations that we can both afford and that work best for our lives.

Preserve Open Space

Preserve sufficient and easily accessible open lands that provide recreational opportunities.

Link Economic Development with Transportation and Housing Decisions

Create a synergy between these three key building blocks. Enable shorter and less expensive travel to afford us more time and money. Efficiently utilize infrastructure to save taxpayer dollars. Provide housing options and increase housing affordability. Improve the air we breathe by reducing auto emissions.

The ABCs of the Vision are the foundation for the 2019-2050 RTP, 2019 Comprehensive Economic Development Strategy (CEDS), and will be considered for local land use and economic development implementation.

Emphasis on Growth Centers

On average, 40 percent of all new residential development in the Wasatch Choice 2050 Vision is in the form of a mixed-land uses, such as a village, town center, or city centers. The Wasatch Choice 2050 Vision also endorses a desire to have a series of employment centers in each part of the Region; a desire to have a focal point, or "heart" for each community; and/or an interest in a walkable form of development that mixes jobs, shopping, and housing.

Desire for Land Recycling

In addition to having more centers in the communities, the Vision has these centers located in existing commercial areas adjacent to major transportation facilities. Approximately 50 percent of proposed new housing and 45 percent of proposed new employment would take place on land that is currently occupied. This signifies an interest in the gradual evolution of some commercial areas.

Preference for a Variety of Housing

The Wasatch Choice 2050 Vision advocates that neighborhoods maintain much of their current ambience, but with a notable increase in the variety of housing options. Residential chips placed on workshop maps averaged 60 percent detached, stand-alone homes; 25 percent townhouses; and 15 percent apartments or condominiums (urbanized portion of the Region currently consists of 67 percent single-family dwellings). Individuals throughout the Wasatch Front Region expressed an interest in a greater variety of housing, although they still desired detached, single-family residences to predominate in future communities.

Emphasis on Bike and Pedestrian Routes

Thirty percent of all transportation routes placed on workshop maps represented bike and pedestrian routes, indicating the popularity of these options. The Wasatch Choice 2050 Vision includes an extensive system of bike and pedestrian routes should be encouraged to promote flexibility in transportation choices and to encourage healthy recreational activities.

Assess Financial Considerations

Federal regulations require long-range transportation plans developed by metropolitan planning organizations (MPOs) include a financial plan to demonstrate how recommended roadway and transit facility improvements would be funded. Long-range plans must also be "fiscally constrained," meaning that only those new facilities and recommended improvements which could be funded using existing and reasonably anticipated revenue streams could be included in MPO long-range transportation plans. The purpose of these requirements is to ensure that planned improvements included in the 2019-2050 Regional Transportation Plan (RTP) can reasonably be assumed to be funded and that air quality benefits assumed with the implementation of the plan are realistic.

Projects that are needed but are not able to be funded with existing or reasonably anticipated revenue streams can be included as part of a regional long-range transportation plan as "unfunded." The Wasatch Front's 2019–2050 RTP includes a number of unfunded projects that are not covered by current funding sources identified in this financial plan. However, if prospective regional funding sources can be identified to pay for these projects in the future, they will then be included as part of future regional transportation plans.

Potential funding sources for the 2019-2050 RTP are summarized in this section, with more detailed information about these sources and expenditures contained within Appendix J - Revenue and Cost Assumptions. Cost estimates not only include the amount of funding that will be required to pay for each improvement project, but also the operation, maintenance, and preservation of the existing transportation network.

Overview of Revenue Sources and Assumptions

Revenue sources and assumptions for the 2019-2050 RTP are based on coordination between the Utah MPOs (Cache MPO, Dixie MPO, the Mountainland Association of Governments (MAG), the Wasatch Front Regional Council (WFRC)), the Utah Department of Transportation (UDOT), and the Utah Transit Authority (UTA). This coordination leads to a joint Utah's Unified Transportation Plan (Unified Plan) financial model that includes estimates of potential revenues based on projected sources for transportation improvements through the year 2050 and is used by each agency when financially constraining their respective plans. A more detailed description of potential federal, state, and local revenue sources for the 2019-2050 RTP has been provided in Appendix K - Potential Federal, State, and Local Revenue Sources.

Roadway Revenue Sources

The WFRC assumed that federal, state, and local government revenues will be available for the recommended roadway improvements in the 2019-2050 RTP. Separate estimates have been made for funds available for state roadways and local government roadways.

Revenue sources were estimated using available data such as tax revenues, federal grants, registration fees, and current expenditures and then grown based on historic trends. More information about these assumptions and growth rates can be found in Appendix J - Revenue and Cost Assumptions.

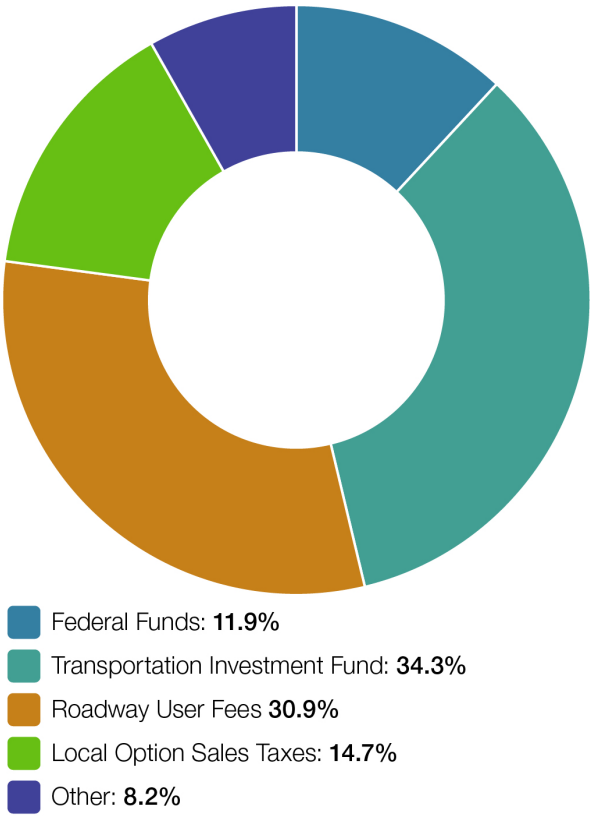
Revenue sources for state road estimates include both federal and state funds, such as motor fuel taxes, special fuel taxes, vehicle registration, and the Transportation Investment Fund (TIF). The TIF is the main source of funding for state-owned, capacity-increasing roadway projects and is mostly funded using a portion of auto-related Utah State sales tax (up to 17 percent of Utah State sales tax).

For local roads of regional significance, the main sources of revenue available for projects are:

- Federal funds allocated for the Ogden–Layton and Salt Lake City–West Valley City Urbanized Areas Surface Transportation Program (STP) and the Congestion Mitigation Air Quality Program (CMAQ);
- Class B and C funds from Utah State roadway user revenues designated for counties and municipalities;
- Local entity general funds;
- Local vehicle registration fee; and
- Local option taxes.

Figure 16 shows the breakdown of existing and assumed new roadway revenue assumptions for both the state and local systems.

Figure 16. Roadway Revenue Sources



State Roadway Revenues

The Unified Plan Financial Model was developed with estimates of projected revenues that will be available to UDOT between 2019 and 2050. These existing and assumed new revenues come from federal and state transportation funds, as presented below and shown in Table 5.

Federal Revenue

A number of federal transportation acts outlined written guidelines for the use of federal funds for roadway improvements sponsored by UDOT. These programs include the National Highway Performance, Surface Transportation Block Grant, Highway Safety Improvement, and Bridge Replacement programs. The WFRC's urbanized area is expected to receive approximately $1.467 billion in current dollars for UDOT federal expenditures related to preservation and other non-capacity programs and $1.15 billion in capacity programs.

State Revenue

Revenues provided by the State of Utah for transportation are primarily generated through roadway user fees, such as fuel taxes, registrations, and permits, but also includes additional funding such as federal contracts and grants, department collections, and investment income. In the past, the Utah State Legislature has also programmed state general funds to support UDOT projects. Revenue was projected from each of the various sources listed above based on historical growth rates. From these sources, the State will generate approximately $4.586 billion in current dollars, between 2019 and 2050 for use in WFRC urbanized areas. It should be noted that these funds will be used for preservation, capacity, operations, and a variety of other uses.

The major source of funding for UDOT capacity projects is the TIF. This fund receives 17 percent of the total state general funds, which is equivalent to the amount of transportation-related sales tax collected. Although TIF is distributed through a prioritization process, for the purposes of the long-range planning process, MPOs assume TIF is distributed based on population and historic distribution. It is expected TIF will generate approximately $10.71 billion for use in WFRC urbanized areas, in current dollars, from 2019 to 2050 for future transportation projects, not including current TIF allocations.

State revenue projections also assume future increases in State of Utah motor fuel and special fuel tax. In 2015, the State of Utah passed legislation that reformed the fuel tax from 24.5 cents per gallon to a 12 percent tax on motor and special (diesel) fuels. The conversion to a percentage tax went into effect January 1, 2016 and equates to an immediate 4.9 cents per gallon increase in the state fuel tax, with potential growth overtime as the price of fuel rises. To limit price volatility the rate the tax is calculated has a floor set at $2.45 and a ceiling set at $3.33 on the wholesale price of fuel. This rate is recalculated annually based on the three-year average of the wholesale price of fuel. During the development of the 2019–2050 RTP, current trends indicate that it is reasonable to expect the Utah State Legislature to continue to raise revenues for roadways every five to ten years. The 2019–2050 RTP assumes the ceiling for fuel tax will raise at the equivalent of ten cents per gallon of gasoline and special fuel in the years 2030 and 2040. An increase in vehicle registration fees is assumed in 2021, 2031, and 2041. These new revenues are estimated to generate approximately $928 million statewide in current dollars for WFRC urbanized areas.

Over the last several decades, motor and special fuel taxes have decreased in purchasing power due to construction cost inflation and increasing fuel efficiency. To help close this gap, the State of Utah will begin to implement a road usage charge (RUC) program in 2020. When implemented, RUC will only apply to gas hybrid, electric, and plug-in hybrid electric vehicles, but may be expanded to more vehicle types as the program matures. The RUC program will allow users to either pay a flat yearly rate or pay a fee based on vehicle miles traveled. While the increases in motor and special fuel taxes and vehicle registration fees are assumed to occur for the purposes of revenue estimation, sometimes an equivalent funding stream, such as RUC, may actually be implemented.

Table 5. Projected UDOT Roadway Revenue for the WFRC Urbanized Area, 2019-2050

Source	Amount (in current dollars)
Federal Revenue	
UDOT federal expenditures related to preservation and other non-capacity projects	$1,467,000,000
UDOT federal expenditures related to capacity projects	$1,150,000,000
State Revenue	
Roadway user funds	$4,586,000,000
Transportation Investment Fund (TIF)	$10,710,000,000
New Revenue	$928,000,000
Total Statewide Revenue Available	**$18,841,000,000**

Local Roadway Revenues

The main sources of local revenues for transportation projects are:

- Federal funds allocated for the Ogden–Layton and Salt Lake City–West Valley City Urbanized Areas STP and CMAQ;
- Existing and future Class B and C funds from Utah State roadway user revenues designated for counties and municipalities or its equivalent;
- Existing and future (2020, 2023, 2030, 2040) local option sales taxes or its equivalent;
- Existing and future (2026, 2036, 2046) local option vehicle registration fees for corridor preservation or its equivalent;
- Allocations from the general funds of local governments; and
- Funding from private developers.

The following section describes the various funds that are available to local municipalities within the Wasatch Front Region.

Federal Revenue

The WFRC administers federal spending programs to fund roadway improvements in urban areas. These programs are the Ogden–Layton and Salt Lake City–West Valley City Urbanized Areas STP and CMAQ. These funds can be used for projects on the state highway system and on local streets. Based on past trends, the 2019–2050 RTP assumes that approximately 60 percent of STP and CMAQ funds will be used for state facilities and the other 40 percent will be used for locally owned facilities of regional significance. The STP funds, based on historical trends, assumed 43 percent will be used for capacity improvements, 28 percent for preservation costs, and the remaining 29 percent for operations and miscellaneous projects. The CMAQ funding, based on historical trends, assumes all the funding will be used for operations and other types of projects. Approximately $717 million is projected to be available for STP and approximately $227 million is projected to be available for CMAQ between 2019 and 2050 for the WFRC urban area, in current dollars. In addition, there are other miscellaneous federal revenues

that are used for operations and other types of projects and account for $160 million between 2019 and 2050.

Class B and C Revenue

Class B and C road funds are allocated from the State's roadway user fees revenue. Currently, 70 percent of the roadway user fees are directed to UDOT and 30 percent are diverted to the Class B and C funds. These monies are then divided between counties and municipalities based on a formula that uses population and road miles for calculations. The distribution of existing Class B and C funds assumed 85 percent for system preservation and 15 percent for operations and other types of projects, with no funds used towards capacity improvements. Although the allocation formula may change in the future, the current percentage was used for the projection of funding from this category for the implementation of the 2019–2050 RTP. Approximately $2.69 billion, in current dollars, is projected to be generated between 2019 and 2050 for the WFRC urban area. Increases in motor and special fuel taxes and state-imposed vehicle registration fees are projected to generate an additional $685 million for local communities between 2019 and 2050.

General Fund Revenue

Counties and municipalities along the Wasatch Front program a significant amount of their general funds for local road maintenance and improvements. Many of these roads are part of the Region's roadway system. Current and past general fund spending on regionally significant roadways was examined to project future revenues. Local governments in the Wasatch Front urbanized area are projected to spend about $2.301 billion on roadway improvements between 2019-2050.

Local Option Sales Tax and Vehicle Registration Revenue

At the local level, there are two additional funding sources that locals have the option to enact - sales taxes and vehicle registration fees.

The State Legislature has authorized the use of local option sales taxes for both roadways and transit. Currently, counties have the option to adopt four quarter-cent sales tax, with a fifth quarter-cent authorized if a county already has adopted the first four quarter-cent sales tax. Local officials have not designated an amount or percentage that will be spent on roadway or transit projects, but the majority is currently spent on local and state roadways. Table 6 provides information regarding allocation and assumptions of the local option sales tax. Local option sales taxes are expected to generate approximately $4.581 billion, in current dollars, between 2019 and 2050 for the WFRC urban area.

Table 6: Local Sales Tax Allocation Assumptions

Quarters	Year Assumed	Planning-level Percentage of the Quarter		Rate	
		Roadway	Transit	Roadway	Transit
Box Elder County					
1st & 2nd	Existing	0%	100%	0.00%	0.55%
3rd	2023	80%	20%	0.20%	0.05%
4th	2030	60%	40%	0.15%	0.10%

5th	2040	0%	100%	0.00%	0.20%
			Total	**0.35%**	**0.90%**
Davis County					
1st & 2nd	Existing	0%	100%	0.00%	0.55%
3rd	Existing	80%	20%	0.20%	0.05%
4th	Existing	60%	40%	0.15%	0.10%
5th	2023	0%	100%	0.00%	0.20%
6th	2030	60%	40%	0.15%	0.10%
7th	2040	60%	40%	0.15%	0.10%
			Total	**0.65%**	**1.10%**
Salt Lake County					
1st	Existing	0%	100%	0.00%	0.30%
2nd	Existing	25%	75%	0.0625%	0.1875%
3rd	Existing	20%	80%	0.05%	0.20%
4th	Existing	60%	40%	0.15%	0.10%
5th	2023	0%	100%	0.00%	0.20%
6th	2030	60%	40%	0.15%	0.10%
7th	2040	60%	40%	0.15%	0.10%
			Total	**0.5625%**	**1.1875%**
Weber County					
1st & 2nd	Existing	0%	100%	0.00%	0.55%
3rd	Existing	80%	20%	0.20%	0.05%
4th	Existing	60%	40%	0.15%	0.10%
5th	2023	0%	100%	0.00%	0.20%
6th	2030	60%	40%	0.15%	0.10%
7th	2040	60%	40%	0.15%	0.10%
			Total	**0.65%**	**1.10%**

Additionally, counties can impose a $10 vehicle registration fee for corridor preservation for Utah state and local roadways and transit facilities. Existing local option vehicle registrations will generate approximately $280 million in Salt Lake County; $82 million in Davis County; $64 million in Weber County; and $18 million in Box Elder County, all in current dollars. The local option vehicle registration fee is assumed to be increased by $5 per vehicle in 2026, 2036, and 2046. The increase in local option vehicle registration fees could generate approximately $185 million in Salt Lake County; $54 million in Davis County; $42 million in Weber County; and $12 million in Box Elder County in current dollars.

Private Developer Funding

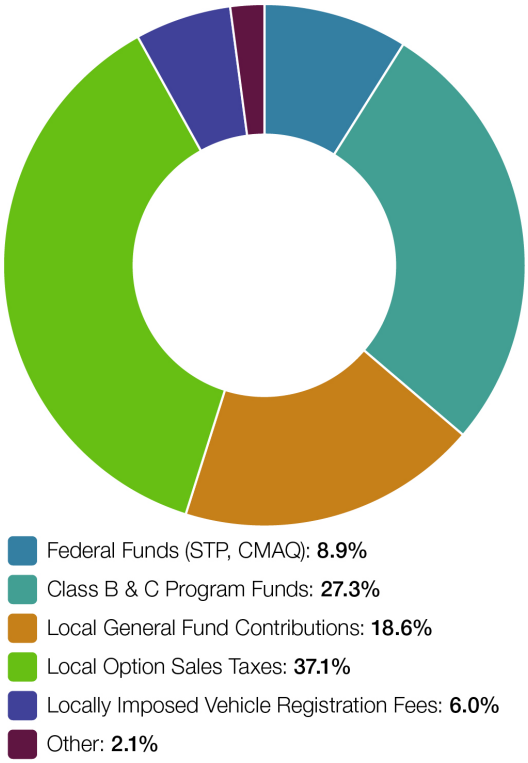
The 2019-2050 RTP assumes that private developer funding will fund some new local road construction as part of new developments. Roads that will be constructed with private developer funding were identified by local communities. It is estimated that private developer funding will generate approximately $259 million over the next 31 years for local roadway construction.

Table 7 shows the projected local roadway revenues between 2019 and 2050 in current dollars, while Figure 17 shows the percent each of the revenue sources contributes to the total local roadway revenue.

Table 7. Projected Local Roadway Revenue for the WFRC Urbanized Area, 2019-2050

Source	Amount (in current dollars)
Regional and Local Revenue	
Federal Funds (STP, CMAQ)	$1,104,000,000
Existing Class B & C Program Funds	$2,690,000,000
New Class B & C Program Funds	$685,000,000
Local General Fund Contributions	$2,301,000,000
Existing Local Option Sales Taxes	$3,000,000,000
New Local Option Sales Taxes	$1,581,000,000
Existing Locally Imposed Vehicle Registration Fees	$443,000,000
New Locally Imposed Vehicle Registration Fees	$293,000,000
New Private Developer Funding	$259,000,000
Total Statewide Revenue Available	**$12,356,000,000**

Figure 17. Projected Local Roadway Revenue



Transit Revenue Sources

The WFRC assumes that federal, state, and local government revenues will be available for the recommended transit improvements in the 2019-2050 RTP. Revenue sources were estimated using available data such as tax revenues, federal grants, and current expenditures and then grown based on historic trends. More information about these assumptions and growth rates can be found in Appendix J - Revenue and Cost Assumptions.

It is important to note that revenues sourced from existing funding mechanisms are anticipated only to cover the costs of operating, maintaining, and administering the system as it exists today. The proposed 2019–2050 RTP projects cannot be funded with existing revenue streams and will require new sources of revenue, such as the following:

- Transit Transportation Investment Fund (TTIF);
- Local option sales taxes or its equivalent in Box Elder, Davis, Salt Lake, and Weber Counties;
- Future increases in local option sales taxes or its equivalent for transportation projects in Box Elder, Davis, Salt Lake, and Weber Counties in 2020, 2023, 2030, and 2040;
- Fares forecasted from the increased transit ridership tied to transit investments proposed in the 2019-2050 RTP;
- Competitive federal grants awarded to noteworthy projects; and
- Increases in federal formula grants that are tied in part to the proposed service increases.

Funding for new transit projects over the life of the 2019-2050 RTP totals $5.473 billion. These funds are in addition to the $12.721 billion budget that is currently forecasted in UTA's Transit Financial Plan for operating and maintaining the existing transit system within the WFRC planning area during the same time frame. Table 8 shows the projected new transit revenues from major sources between 2019 and 2050 in current dollars.

With the exception of federal formula grants, each source will be discussed below. All values are shown in current dollars unless otherwise stated.

Transit Transportation Investment Fund

The TTIF, is provided by the State of Utah for transit capital projects statewide and prioritized by the state transportation commission. These funds are subject to legislative appropriation yearly and require a 40 percent local match.

Revenue amounts provided to the TTIF are determined based on 35 percent of the increase in the amount of tax revenue that is collected in the fiscal year on motor and special fuels that exceeds 29.4 centers per gallon. The State will begin transferring approximately $5 million to the TTIF for statewide use beginning July 1, 2019 and annual contributions to the fund are expected to grow over time due to indexing of the motor and special fuel taxes to the Consumer Price Index (CPI) per House Bill 362. This is assumed to occur in 2021, with the tax per gallon increasing to 30.3 cents per gallon, thus generating a $0.09 cent increment. The 2019-2050 RTP financial analysis assumes that motor fuel prices will grow by four percent annually, and that motor fuel gallons sold is assumed to grow by 2.4 percent annually from the years 2019 to 2022, and then reduce to a 1.48 percent growth rate through the year 2050. Special fuel gallons sold are assumed to grow by 3.2 percent annually through 2050. More information about these assumptions and growth rates can be found in Appendix J - Revenue and Cost Assumptions. The TTIF will generate approximately $634 million (in current dollars), or 11.2 percent of assumed transit revenues, between 2019 and 2050 for use in WFRC urbanized areas.

Local Option Sales Tax Revenue

Future receipts from the increased local sales tax or equivalent for this period are projected to be $3.603 billion, representing 65.7 percent of anticipated new transit funding for the 2019–2050 RTP. In the recent past, support for additional transit funding by local governments, the business community, citizens, and the Utah State legislators have resulted in significant new local option sales tax being approved for transit expansion. As of January 2019, Davis, Salt Lake, and Weber Counties have enacted all four local option transportation sales tax "quarters." By enacting of all four transportation "quarters," these counties are now eligible to impose a fifth "quarter" that would provide a 0.20 percent sales tax increase for the use of transit projects, as authorized by SB136. The 2019-2050 RTP assumes that Salt Lake, Weber, and Davis Counties will impose this fifth "quarter" by the year 2023, as well as a sixth and seventh "quarter" in years 2030 and 2040, respectively. See Table 6 for sales tax assumptions by county split by mode. These revenues are assumed to grow in line with UTA forecasts for current sales tax revenues. Overall, an average annual growth rate of 3.81 percent is anticipated. See Table 8 summarizes the total transit revenue amounts derived from local option sales tax funds for the period between 2019 and 2050.

Fare Revenue

The WFRC anticipates that 10.5 percent of the new revenues, or $577 million, will be generated from passenger fares which patrons will pay to use new transit services over the life of the 2019-2050 RTP.

Fare revenues are estimated using ridership projections from the WFRC travel demand model and the historic trend of the average revenue per ride collected by the agency.

Since 2013, UTA's base fare has been $2.50, but fares range from $1.25 for senior citizens to $5.50 for premium express service; the average revenue per ride collected by the agency has ranged between $1.12 and $1.16 between 2013 and 2018. UTA's most recent passenger revenue accounting reported the agency collected $52 million from 45,000,000 passenger trips in 2017.

UTA's ridership is anticipated to increase as transit projects proposed in the 2019–2050 RTP are implemented. Total ridership is projected to be about 309,000 linked trips starting in the WFRC area each weekday in 2050.

Federal Competitive Grants

Federal competitive grants are applied for on a nationwide basis and have traditionally paid between 50 and 80 percent of the capital costs of awarded light rail, heavy rail, commuter rail, streetcar, and bus rapid transit projects. The award selection process is guided by a rigorous planning process and a set of selection criteria. As of 2018, the United States Congress appropriates roughly $2.3 billion each budget year for the New Starts, Small Starts, Core Capacity, and Program of Interrelated Projects programs.

WFRC anticipates that 10.6 percent of new revenues (or $581 million) for the 2019 – 2050 RTP could come from federal grants awarded to the following noteworthy projects within the plan horizon:

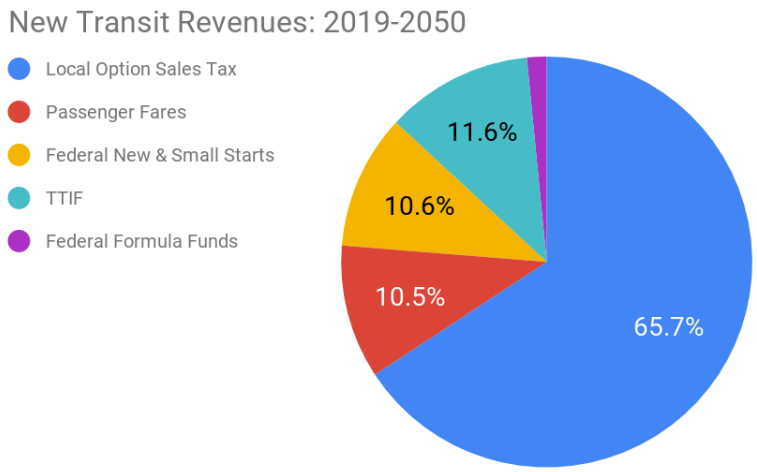
- Ogden-Weber State University Bus Rapid Transit (BRT),
- Davis-Salt Lake City Community Connector BRT,
- TRAX Green Line reconfiguration and Salt Lake Central to University of Utah new TRAX Line,
- Salt Lake City Streetcar Loop, and
- Doubletracking FrontRunner.

Table 8 shows the projected transit revenues between 2019 and 2050 in current dollars, while Figure 18 shows the percent each revenue source contributes to the total projected transit revenue.

Table 8. Projected Transit Revenue for the WFRC Urbanized Area, 2019-2050

Source	Amount (in current dollars)
Transit Revenue	
Local Option Sales Tax (or equivalent)	$3,604,000,000
Passenger Fares	$577,000,000
Federal New & Small Starts	$581,000,000
Bond Revenue	$0
TTIF	$634,000,000
Federal Formula Funds	$85,000,000
Total Transit Revenue Available	$5,481,000,000

Figure 18: Projected Transit Revenue for the WFRC Urbanized Area, 2019-2050



Active Transportation Revenue Sources

Although increasing in recent years, revenue for active transportation within the MPO area has limited dedicated funding sources. There are several funding sources that can fund active transportation but which are not dedicated to it.

Dedicated active transportation revenue sources include UDOT Region Transportation Alternatives Program (TAP) fund which is approximately $500,000 annually in Region 1 and $500,000 annually in Region 2 (monies can be spent outside of Urbanized Areas); Salt Lake County Active Transportation Fund which is approximately $1 million annually; Federal TAP funding which is approximately $500,000 annually in the Ogden-Layton Urbanized Area and approximately $900,000 in the Salt Lake City-West Valley City Urbanized Area; and the Utah Safe Routes to School (SRTS) Program which is approximately $1.36 million annually distributed statewide.

Other revenue sources include Federal funds from the Ogden-Layton Urbanized and Salt Lake City-West Valley City Urbanized Area Surface Transportation Program (STP) and Congestion Mitigation and Air Quality Program (CMAQ); one-time Federal assistance grants such as Transportation Investment Generating Economic Recovery (TIGER) and Better Utilizing Investments to Leverage Development (BUILD); local-option 3rd Quarter sales tax available in Weber County, Davis County, and Salt Lake County; local-option 4th Quarter sales tax available in Weber County, Davis County, and Salt Lake County; Utah Outdoor Recreation Grant; State Transportation Improvement Fund; State Transit Transportation Improvement Fund; State Highway Safety Fund; and local entity general funds.

Other Potential Funding Sources

There are other potential funding sources that are available to local communities for funding projects, but that have not been included in revenue projections for the 2019-2050 RTP. Other potential funding sources include private-public partnerships, private funding, and tax increment financing/transportation

reinvestment zones. If these sources become available, they could advance projects by providing funding not yet available and/or replacing public revenues.

Project Cost Estimates

The RTP must be cost constrained. With the exception of active transportation, only projects tied to reasonable funding assumptions can be included in the 2019-2050 RTP. Costs were estimated for roadway and transit new construction, operations, and maintenance in order to determine which projects could be included in each of the 2019-2050 RTP's three funded phases. The costs for making needed improvements for roadways, transit, and active transportation, as identified by the 2019 – 2050 RTP, were analyzed by WFRC, UDOT, UTA and the other local MPOs. Costs include those required to meet the specific system needs identified in the 2019–2050 RTP, as well as cost estimates for general administration, operations, maintenance, and preservation of the existing transportation system. Projected costs for roadway improvements have been adjusted at an annual four percent inflation rate, while the projected costs for transit construction, operations, and maintenance have been adjusted at an annual four, two, and 0.75 percent inflation rate, respectively.

Roadway

This section outlines costs for capacity and operational improvements as estimated for individual projects contained within the 2019-2050 RTP, as well as roadway operations, maintenance, and preservation costs needed for both the existing and future systems.

Project Costs: Capacity and Operational Improvements

For the purpose of the 2019-2050 RTP, UDOT has estimated the current costs to purchase right-of-way (ROW), construct new roads and bridges, restripe, improve interchanges, and make operational improvements. Table 9 shows roadway unit costs per project type. Roadway costs were initially estimated in 2019 dollars and then inflated to year of expenditure dollars using a four percent annual growth rate. This rate of inflation was derived from the national Consumer Price Index and agreed to by the state's four MPOs, UDOT, and UTA. All project costs are in current dollars unless otherwise noted. The project list, Appendix L, provides planning-level total costs for each project.

Statewide Roadway Cost Estimates: Operations, Maintenance, Preservation, and Other

For purposes of the 2019–2050 RTP, UDOT has estimated the current costs to operate, maintain and preserve, and administer the Utah State roadway system. In addition, through its asset management program, UDOT has estimated the future level of funding needed to maintain UDOT's system. For planning purposes the Unified Plan assumes that future construction projects will include system maintenance and preservation.

Table 9. Roadway Unit Costs

Type	Unit	2019 Cost
Right-of-Way Costs		
Right-of-Way	per SF	$9.28
Bridge Costs		
Simple Bridge	per	$12,000,000
Complex Bridge	per	$22,000,000
Spot Improvement Costs		
System Interchange	per	$126,000,000
Simple Interchange	per	$40,000,000
Complex Interchange	per	$60,000,000
Interchange Upgrade	per	$18,000,000
Overpass	per	$22,000,000
Operational Costs		
Operational	per mile	$3,000,000
Restriping Costs		
Restripe	per mile	$15,000
New Construction/Widening Costs		
Collector	per mile	$7,000,000
Arterial - Urban	per mile	$15,000,000
Arterial - Rural	per mile	$7,000,000
Expressway - Urban	per mile	$35,000,000
Expressway - Rural	per mile	$11,000,000
Freeway - Complex	per mile	$70,000,000
Freeway - Simple	per mile	$40,000,000
Freeway - Add a lane urban	per mile	$9,000,000
Freeway - Add a lane rural	per mile	$2,500,000

Though UDOT's asset management program, interstate rehab, interstate preservation, National Highway System (NHS) Rehab, NHS Preservation, Surface Transportation Program Rehab, and STP Preservation costs were identified using the current condition of the roadway, maintenance and preservation requirements, and other factors. Costs were based on conditions of individual facilities and then summarized by planning area. UDOT has identified various "other costs" categories including pipe culvert replacement, traffic signal maintenance, traffic management replacement, barrier replacement, lighting, sign modification, safety spot improvement, traffic signals replacement, and maintenance spot improvement. It is projected that $1.968 billion is needed for all UDOT pavement needs, bridge maintenance and replacement, and other expenditures related to preservation in the WFRC urbanized areas between 2019 and 2050.

For operations, UDOT's expenditures include support services, engineering services, maintenance management (operations), construction management, Region management, equipment management, aeronautics, share-the-road, B and C distribution, safe sidewalks, mineral lease, corridor preservation, toll way, counties of the 1st and 2nd class, highway projects within counties, and non-appropriated. Transfers and diversions of UDOT funds include sales of capital assets, transfers to and from the TIF, and other transfers. These operations and other expenses total $4.612 billion over the next 31 years, in current dollars for the WFRC urbanized area. For the planning purposes of the 2019–2050 RTP, some of these expenditures and transfers were not specifically allocated to WFRC, but were kept at a statewide level. The majority of these funds are simply passed through to other state agencies or is not specific to Wasatch Front Region. Thus, they are more suited to be kept at a statewide level.

Capacity needs and the selection process for projects in the 2019–2050 RTP will be explained in more detail in the Phase Projects chapter, but total approximately $14.699 billion for UDOT projects in the WFRC area.

Table 10 summarizes the amount of statewide roadway expenditures projected from 2019 to 2050. The total UDOT projected needs for the Wasatch Front Region totals $21.279 billion.

Table 10. Projected Statewide Roadway Costs, 2019-2050

UDOT Expenditures	Amount (in current dollars)
Roadway, bridge, and other preservation needs	$1,968,000,000
Operations and various needs	$4,612,000,000
Capacity needs	$14,699,000,000
Total UDOT costs	**$21,279,000,000**

Local Roadway Cost Estimates: Operations, Maintenance, Preservation, and Other

Estimates were made for municipalities and counties with assistance from the Utah League of Cities and Towns (ULCT), the Utah Association of Counties (UAC), the Utah Foundation, and the Utah Local Technical Assistance Program (Utah LTAP). These assumptions are based on a survey of local agency roadway expenses, various studies, and available data. Growth and inflation assumptions were applied to these cost totals for the period 2019 through 2050.

Local roadway maintenance activities include activities such as snow removal, sweeping, weed control, crack sealing, and pothole repair. Pavement preservation actions are surface treatments for streets and highways, which are more extensive than routine maintenance. These treatments range from chip seal work to full reconstruction and major resurfacing. It is estimated that during the period 2019 – 2050, local governments maintenance and preservation needs will be approximately $5.609 billion on maintenance and preservation activities.

Administration costs are expenditures associated with managing transportation agencies and the transportation divisions of larger local public works departments. These costs include expenditures for staff, planning activities, preliminary engineering, etc. Traffic operations activity includes signing, marking, and signal installation and maintenance. Safety improvements include hazard elimination, intersection upgrades, railroad crossing improvements, and similar projects. It is estimated that these items will cost about $1.325 billion between 2019 and 2050, in current dollars.

Capacity needs and the selection process for projects in the 2019–2050 RTP will be explained in more detail in the Phase Projects chapter, but total approximately $3.728 billion for capacity projects on local roads of regional significance in the WFRC area. Locally classified road capacity needs will be approximately $870 million by 2050. These total $4.598 billion of local capacity needs.

Table 11 summarizes the amount of local roadway expenditures projected from 2019 to 2050. The total local projected needs for the Wasatch Front Region totals $11.532 billion.

Table 11. Projected Local Roadway Costs, 2019-2050

Local Expenditures	Amount (in current dollars)
Maintenance and preservation needs	$5,609,000,000
Administration/traffic operations and safety/other needs	$1,325,000,000
Capacity needs	$4,598,000,000
Total local roadway costs	**$11,532,000,000**

The total local projected needs for the Wasatch Front Region totals $32.637 billion.

Transit

For purposes of the 2019–2050 RTP, UTA has estimated the current costs to operate, maintain, and preserve the UTA transit system based on the agency's experience building and operating the existing transit system; cost estimates are updated with every RTP cycle and include the latest studies and/or construction experience when possible. Transit costs in the 2019–2050 RTP were initially estimated in 2019 dollars and then inflated to year of expenditure dollars using a four percent annual rate for capital costs and a 2.85 percent annual rate for operating costs. This rate of inflation was derived from the national Consumer Price Index and is consistent with UTA's Transit Financial Plan that accounts for the existing transit system. All project costs are represented in current dollars unless otherwise stated.

This section will outline the total transit capital, operating, and preservation needs, and then detail transit cost assumptions on a per mile basis. Further discussion of the difference between transit needs and available revenues can be found in Phase Projects - Financial Constraint Phasing. The project list, located

in Appendix L - 2019-2050 Phased Project Lists by Mode, provides planning-level capital and operating cost estimates for each project. A more detailed breakdown of the unit costs is provided in Appendix J - Revenue and Cost Assumptions.

Project Costs: Capital, Operations, and State of Good Repair

Capital Costs

Capital cost estimates include the construction of stations, ROW, track or rail (when applicable), parking lots, vehicles, vehicle maintenance facilities, and operational investments associated with building new transit lines. Also included in these costs are needed point projects that have been identified to enhance existing and planned new service, such as transit hubs, maintenance facilities, and park and ride lots. There is an estimated $6.66 billion in capital cost needs in the financially unconstrained 2019-2050 RTP, in current dollars.

Operating Costs

Operating costs include the price to employ transit service and is reflective of the length of the project and the frequency and span of service (hours per day and days per week) that is assumed. Frequencies and service hours are generally assumed on a per mode basis. Vehicle replacement is also accounted for in the operating costs. It is estimated that it would cost approximately $3.23 billion to operate the proposed transit system between 2019 and 2050, in current dollars.

State of Good Repair

State of good repair (SOGR) refers to the maintenance, overhaul, and replacement of assets such as rail, bus, and vanshare vehicles, train control software and hardware, railroad track and BRT lanes, railroad crossings and bridges, bus shelters, and station platforms. In order to receive federal transit funds, transit agencies are required to develop an asset management plan that accounts for the upkeep and maintenance of the transit system's assets. As such, SOGR is accounted for in the 2019–2050 RTP for the management of future planned assets, and is a substantial portion of total future transit costs.

It should be noted that SOGR for the existing transit systems is not included in the 2019-2050 RTP, but is planned and accounted for by UTA's Budget and Financial Department, and recorded annually in the agency's Comprehensive Annual Financial Report.

Administration, Safety, and Other Costs

Administration costs are expenditures associated with managing transportation agencies and the transportation divisions of larger local public works departments. These costs include expenditures for staff, planning activities, preliminary engineering, etc. It is estimated that these items associated with planned new transit projects will cost about $150 million between 2019 and 2050, in current dollars.

Table 12 summarizes the needed expenses associated with transit capital, operation, and SOGR costs projected from the financially unconstrained 2019 to 2050 RTP, which total $12.2 billion.

Table 12. Projected Transit Costs, 2019-2050

Transit Expenditures	Amount (in current dollars)
Capital project needs	$6,660,000,000
Operating costs/administration/safety needs	$3,232,000,000
State of good repair needs	$2,275,000,000
Total transit needs	**$12,167,000,000**

With $5.472 billion of available projected revenues, the process for how the above transit needs were prioritized against financial constraints will be explained in the Phase Projects chapter.

Project Costs by Mode

Transit capital and operating costs are estimated on a per mile basis, and include the cost of the transit vehicles, ROW preservation, track or rail, stops and stations, maintenance facilities, fuel, operator costs, and the number of hours per day and days per week that the transit service is assumed to run. Transit capital and operating costs per mile are represented in Table 13 in current dollars, and are utilized to estimate total project costs based on the length of the project. Project costs are then inflated to the year of construction by an annual rate of four percent for capital costs and 2.85 percent for operating costs when financially constraining the 2019-2050 RTP.

Table 13. Estimated Planning-Level Transit Costs per Mile, 2019

Transit Mode	Capital Cost Amount (per mile, in current dollars)	Operating Cost Amount (per mile per year, in current dollars)
Core Route Service	$1,660,000-3,000,000*	$130,000-330,000*
Bus Rapid Transit	$16,190,000	$390,000
Streetcar	$48,450,000	$500,000
Light Rail	$68,890,000	$1,180,000
Commuter Rail	$12,000,000-32,000,000**	$750,000
Express Bus / Special Service	$510,000	$130,000

*cost varies depending on frequency of service

**commuter rail capital costs vary depending on the type of investment. Cost estimates could include line upgrades such as electrification or construction of new rail. For more information regarding needed commuter rail investments, see the Future of FrontRunner study.

Transit Point Projects

Transit point projects in the 2019–2050 RTP include park-and-ride lots, transit hubs, and vehicle maintenance facilities or garages. The total cost of 2019–2050 RTP point project construction is $200 million. Table 14 depicts planning-level point project costs for the 2019-2050 RTP. As with transit line projects, it is assumed that these costs will become further refined as they are studied and engineering work is complete prior to implementation.

Table 14. Estimated Planning-Level Transit Point Project Costs

Point Project Type	Cost per Project (in current dollars)	Total Costs for Planned Point Projects (in current dollars))
Transit Hub	$14,000,000	$196,000,000*
Park & Ride Lot (structured)	$1,800,000-4,500,000	$36,000,000
Maintenance Facility (Bus)	$5,000,000-7,500,000	$10,000,000
Commuter Rail Station	$2,500,000-4,000,000	$10,000,000 (unfunded)
Light Rail Station	$2,000,000	$4,000,000 (unfunded)

Active Transportation

Linear active transportation projects were based on cost per mile while point projects were based on a lump sum per project for at-grade projects, square footage for overhead projects, and linear footage for underground projects. Costs per unit were determined in consultation with local transportation planning firms (Alta Planning & Design, Fehr & Peers) along with the UTA first-/last-mile funding cost estimates developed for the received TIGER grant. Cost for the 1,003 miles of planned linear projects is estimated at $461 million, in 2019 dollars. Table 15 shows active transportation unit costs.

Point projects (crossings) were estimated based on UDOT-provided costs for overhead and underground crossings. Overhead crossings cost $250 per square foot based on a 14-foot wide bridge. Underground crossings cost $6,000 a linear foot based on a 10’x16’ concrete culvert. Cost for the 79 planned point projects is estimated at $82 million, in 2019 dollars.

Table 15. Active Transportation Unit Costs

Type	Unit	2019 Cost
Bike boulevard	Mile	$18,000
Bike lane	Mile	$100,000
Buffered bike lane	Mile	$150,000
Protected bike lane	Mile	$1,000,000
Shared lane	Mile	$18,000
Shared use path	Mile	$1,000,000
Shoulder bikeway	Mile	$50,000
Sidepath	Mile	$528,000
Trail	Mile	$205,300
Neighborhood byway	Mile	$50,000
Phased implementation	Mile	$100,000
At-grade crossing	Each	$100,000
Overhead crossing	Square foot	$250
Underground crossing	Lineal foot	$6,000

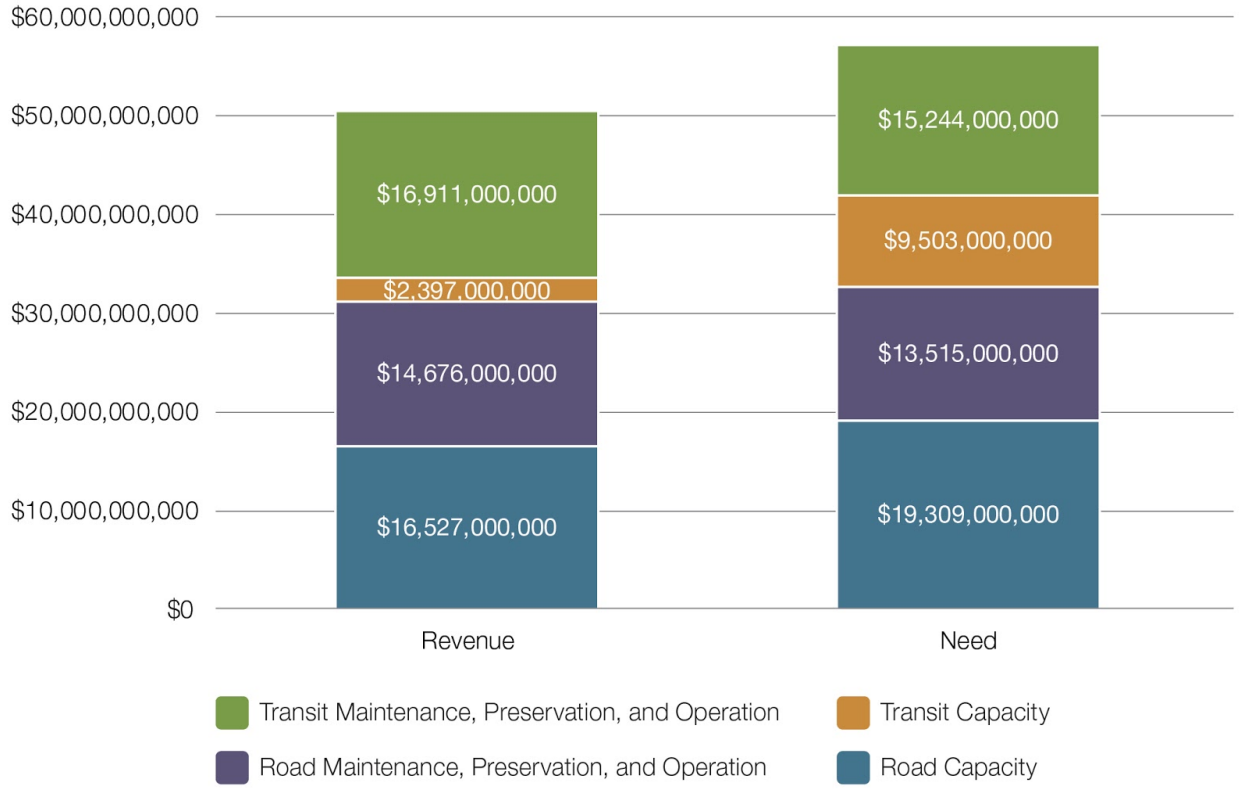
Comparison of Revenue and Cost Estimates

Total new transit and roadway needs, including capacity, operations, and preservation, for the WFRC planning area total $57.1 billion between 2019 and 2050. There is an estimated $50.5 billion assumed new revenues to pay for these needed projects, creating a funding shortfall of approximately $6.6 billion, as seen in Figure 19 below.

Roadway

Of the approximate $19.309 billion of capacity project needs, there will only be about $16.527 billion of funding, in current dollars. It is projected that approximately $15.625 billion, resulting from existing funding sources, is available for capacity improvements to roadways within the WFRC planning area and about $902 million of funding will come from new revenue sources, in current dollars. This results in $2.782 billion of unfunded roadway capacity projects that are needed between 2019 and 2050.

Figure 19. Roadway and Transit Capacity, Operations, and Preservation Needs vs. Available Revenue, 2019-2050



Preservation and maintenance funds for the state roadways are estimated to be approximately $6.651 billion through existing revenues and $2.088 billion from new revenues for the Wasatch Front Region. It is projected that there is about $7.576 billion of preservation needs, leaving about $1.162 of unfunded preservation and maintenance projects in the Wasatch Front between 2019 and 2050.

Funding available for operations for UDOT and the local communities is approximately $5.43 billion from existing revenues, with $507 million assumed from new revenue sources. Existing and assumed new funding sources are projected to meet all operational needs between 2019 and 2050.

Transit

Approximately $12.721 billion in current dollars is projected to be available for transit services with existing funding sources between 2019 and 2050, which is to be spent on operating and maintaining the existing transit system in a state of good repair. There is approximately $5.472 billion projected to be available for new transit projects within the RTP through the identified new funding sources, which will be balanced between capital, operations, and preservation expenses. With $12.2 billion in identified needs by the year 2050, this leaves approximately $6.73 billion in unfunded capital, operations, and preservation expenses in the Wasatch Front Region between 2019 and 2050.

Phase Projects

Overview of Phasing Process

The WFRC developed a two-tiered phasing process in which WFRC, in consultation with UDOT, UTA, and local communities, first identified the phase a project is needed, and then assessed financial constraints for the three phases.

A project is considered to be in a certain "phase" when its construction start date is placed into a funded time horizon or an unfunded list of projects. The three phases of the 2019-2050 RTP are:

- Phase 1: 2019 to 2030
- Phase 2: 2031 to 2040
- Phase 3: 2041 to 2050

Funding is not projected to be available for all projects and a few projects will end up being placed in the unfunded portion of the plan – although they are still considered needed by 2050.

Needs-Based Phasing

The needs-based phasing of the 2019-2050 RTP roadway, transit, and active transportation projects was guided by the Wasatch Choice 2050 regional goals. These goals informed the criteria, weighting, and methodology used to phase projects, and differ slightly by transportation mode.

The WFRC uses a variety of tools to forecast the timing and impact of anticipated growth, such as the regional Travel Demand Model (TDM) and the Real Estate Market Model (REMM). Socioeconomic and travel-related forecasts from these models are used to assign points to each transportation project in the near- and long-term time horizon. Projects are phased using technical data and input from WFRC's partners, including UDOT, UTA, and local communities. Phasing was further refined through coordination with UDOT,UTA, local technical advisory committees, and the local area workshops held for community elected officials and staff.

The specific, goal-centered criteria used by WFRC for phasing differ by mode. Each criterion listed a specific measure, methodology, and data requirement. The 2019-2050 RTP's project selection and phasing criteria by mode are as follows:

Roadway

- Safe, user-friendly streets
- Manageable and reliable traffic conditions
- Access to economic and educational opportunities
- Fiscally efficient communities and infrastructure
- Livable and healthy communities
- Quality transportation choices
- Housing choices and affordable living

See Appendix M - Needs-Based Phasing Criteria for additional information regarding roadway phasing.

Transit

- Safe, user-friendly streets
- Access to economic and educational opportunities
- Fiscally efficient communities and infrastructure
- Livable and healthy communities
- Quality transportation choices
- Housing choices and affordable living
- Clean air

See Appendix M for additional information regarding transit phasing.

Active Transportation

As the first ever effort to divide all of the needed active transportation projects into three phases, the initial phasing used a spreadsheet formula based upon the scores each project received from the evaluation criteria. Evaluation criteria was based on the Wasatch Choice 2050 goals of:

- Manageable and reliable traffic conditions
- Safe, user-friendly streets
- Access to economic and educational opportunities
- Livable and healthy communities
- Quality transportation choices
- Housing choices and affordable living

Using the scoring, a spreadsheet formula was used to place an even number of projects in each phase. Phasing was further refined through coordination with UDOT, local technical advisory committees, and the local area workshops held for community elected officials and staff.

Active Transportation is not required to be financially constrained and therefore, phasing was not further refined following the above exercises.

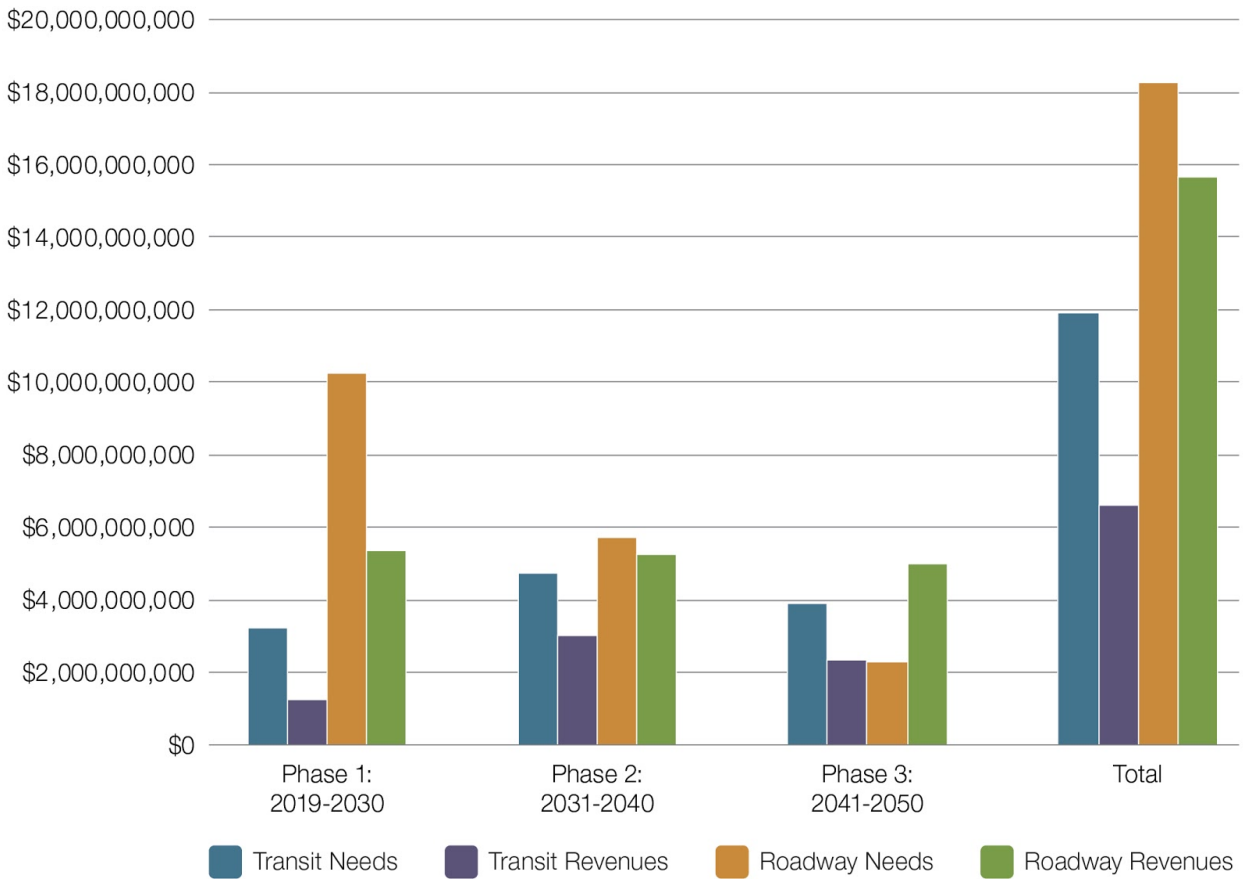
See Appendix M for additional information regarding active transportation phasing.

Financial Constraint Phasing

After roadway and transit projects were prioritized by need, they were then assigned phases based upon these priorities and the amount of funding that is forecasted to be available within each phase. The roadway and transit financial plans, including revenue and costs assumptions within 2019 to 2050, can

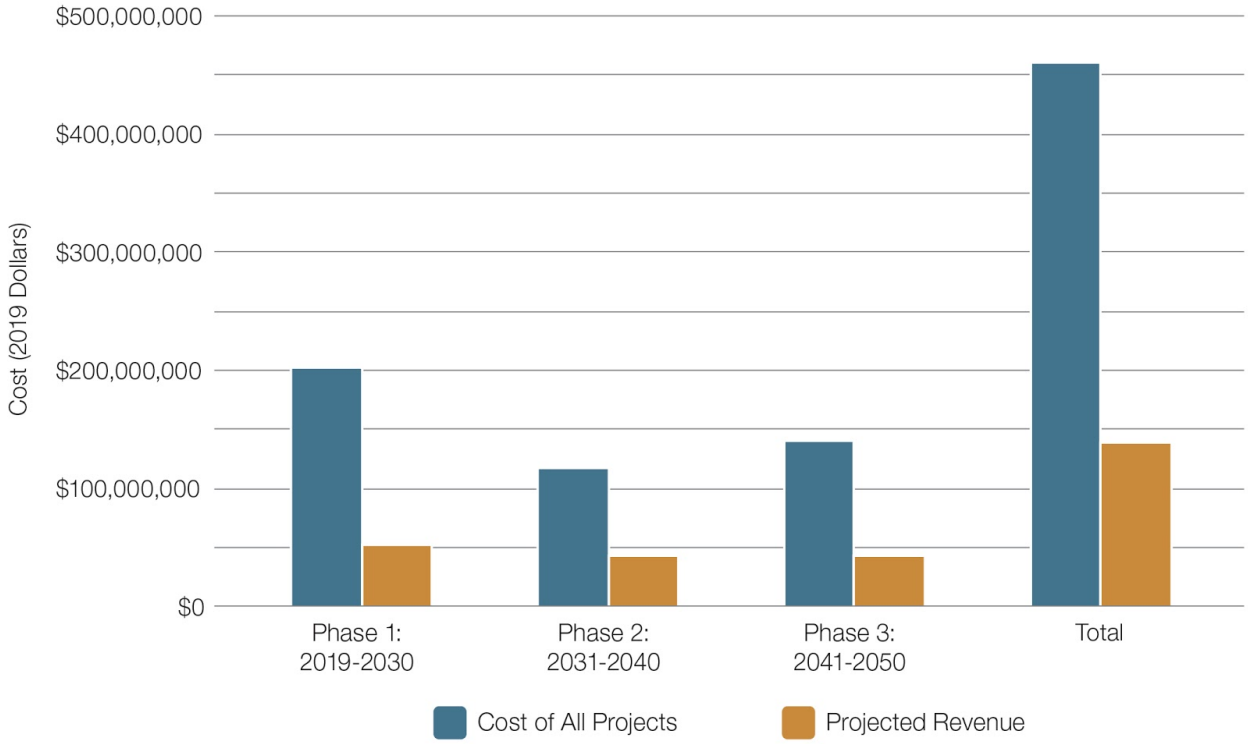
be reviewed in the chapter titled Assess Financial Considerations. There were more needed projects than anticipated revenues could fund. Therefore, some projects were moved to future phases or placed into the "unfunded" category. Figure 20 shows the needs and available revenue by phase for road and transit projects.

Figure 20. Roadway and Transit Capacity Needs vs. Available Revenue, 2019-2050



Active transportation facilities were ranked and phased based on need, but were not financially constrained as a dedicated funding source for these projects has yet to be identified. Estimated costs for new active transportation facilities total $461 million. Figure 21 shows a comparison between project bicycle network needs and available revenue.

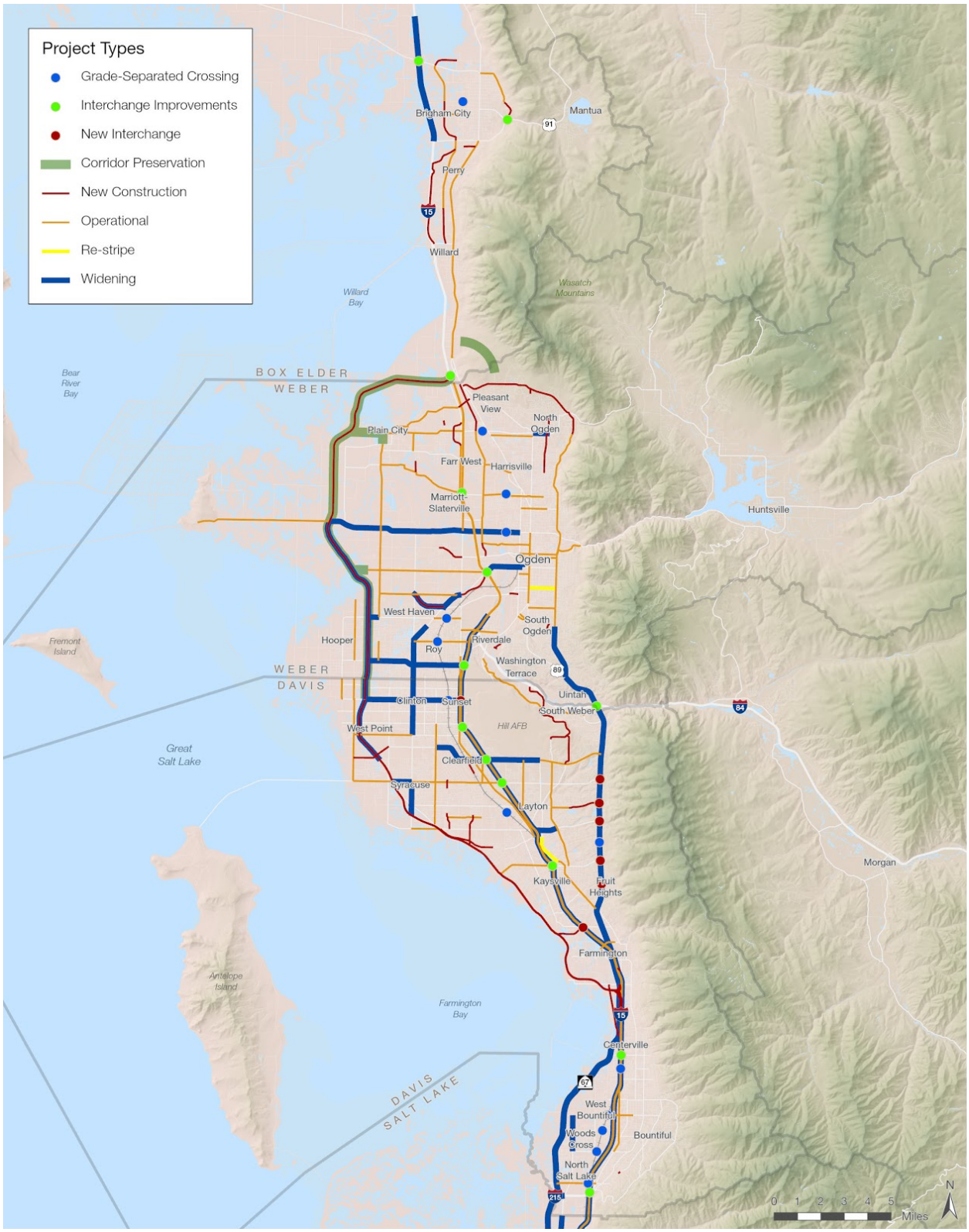
Figure 21. Regional Bicycle Network Needs vs. Available Revenue, 2019-2050



Roadway Projects and Phasing

The 2019-2050 RTP roadway projects are identified segments of corridors or point locations that will require new construction, widening or upgrades, or operational improvements. Maps 6 and 7 shows the location and type of each roadway project. Table 16 provides a summary by phase of the number of projects, miles of projects, and costs of projects by type. A complete list of each project, including project number, project name, project length, type of improvement, number of lanes, proposed 2050 right-of-way width, functional classification, length of improvement, facility owner, when the project is needed, financially constrained phase, current cost, and phased cost, is located in Appendix L - 2019-2050 RTP Phased Project Lists by Mode. The 2019-2050 RTP roadway projects list can also be accessed via the interactive map by clicking on the project, and viewing the information in the pop up box.

Map 6. Roadway Projects by Type - Ogden-Layton Urbanized Area



Map 7. Roadway Projects by Type -Salt Lake City-West Valley City Urbanized Area

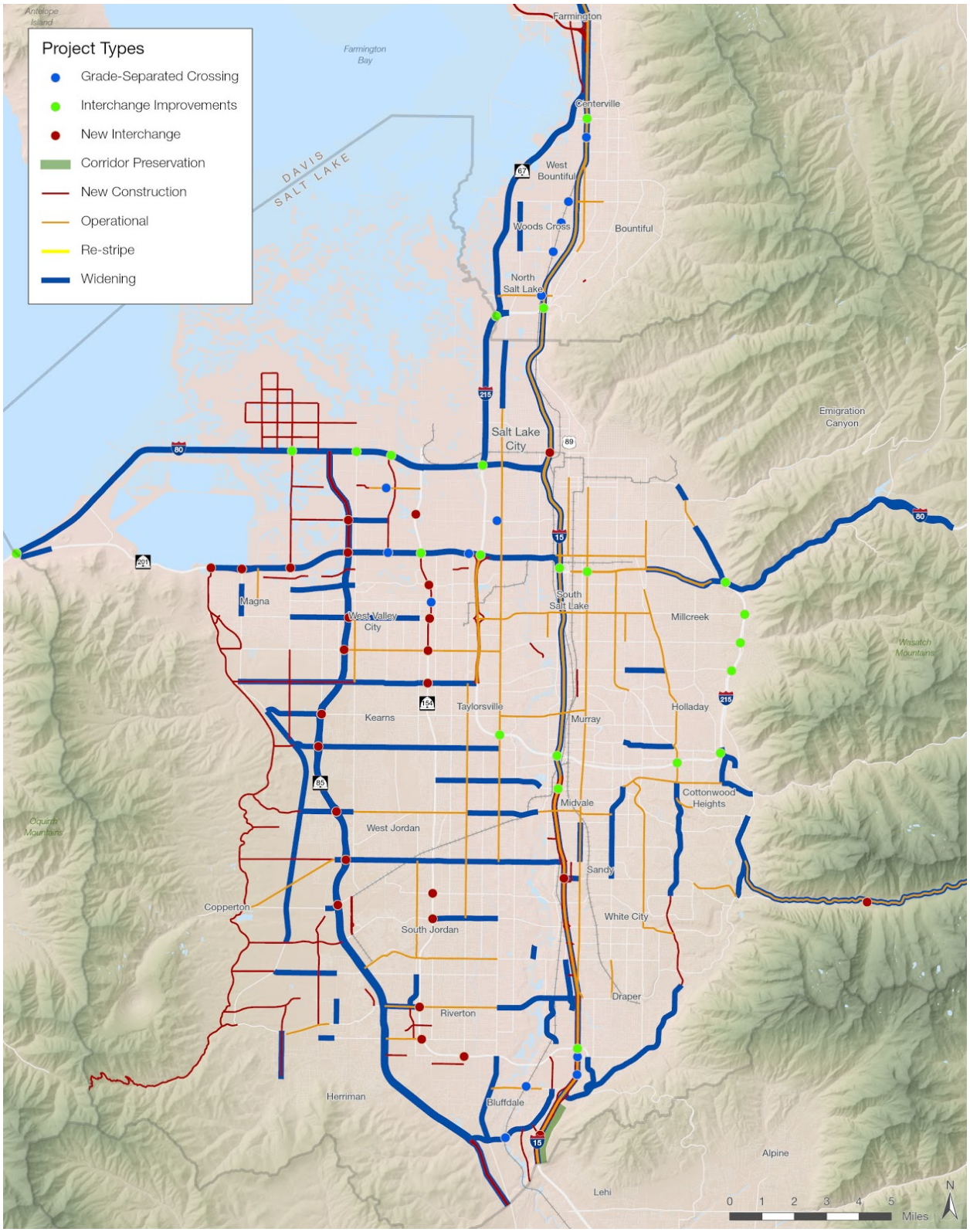


Table 16. Roadway Project Summary

Type	Number of Projects	Number of Miles	2019 Cost
Phase 1			
New Construction	45	89	$1,653,000,000
Widening	34	89	$1,485,000,000
Operational	29	103	$317,000,000
Restripe	1	1	$21,000
Corridor Preservation	8	26	$24,000,000
Interchange Improvements	11	-	$708,000,000
New Interchanges	17	-	$677,000,000
Grade-Separated Crossing	9	-	$198,000,000
Total	**154**	**308**	**$5,061,021,000**
Phase 2			
New Construction	18	40	$1,030,000,000
Widening	37	115	$2,672,000,000
Operational	29	124	$412,000,000
Restripe	1	1	$18,000
Corridor Preservation	0	0	$0
Interchange Improvements	7	-	$724,000,000
New Interchanges	10	-	$486,000,000
Grade-Separated Crossing	7	-	$154,000,000
Total	**109**	**280**	**$5,478,018,000**
Phase 3			
New Construction	33	65	$956,000,000
Widening	24	111	$3,036,000,000
Operational	39	113	$351,000,000
Restripe	1	2	$28,000,000
Corridor Preservation	0	0	$0
Interchange Improvements	13	-	$472,000,000
New Interchanges	4	-	$162,000,000
Grade-Separated Crossing	7	-	$154,000,000
Total	**121**	**291**	**$5,159,000,000**
Unfunded			
New Construction	3	26	$464,000,000
Widening	3	22	$1,415,000,000
Operational	1	27	$80,000,000

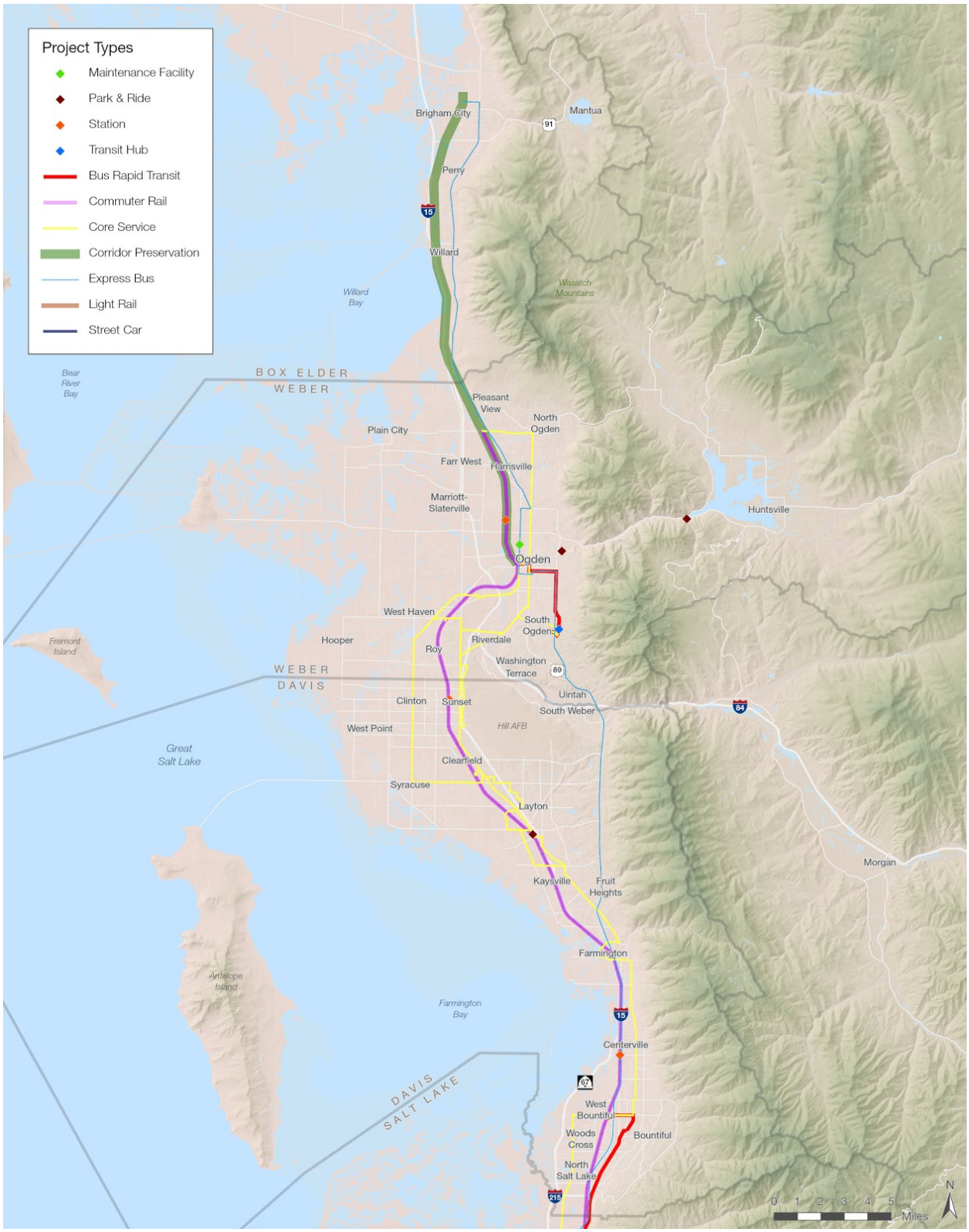
Restripe	0	0	$0
Corridor Preservation	0	0	$0
Interchange Improvements	3	-	$652,000,000
New Interchanges	2	-	$120,000,000
Grade-Separated Crossing	0	-	$ 0
Total	**12**	**75**	**$2,731,000,000**
All Phases			
New Construction	100	221	$4,103,000,000
Widening	98	337	$8,606,000,000
Operational	98	367	$1,160,000,000
Restripe	3	4	$28,039,000
Corridor Preservation	8	26	$24,000,000
Interchange Improvements	34	-	$2,556,000,000
New Interchanges	33	-	$1,445,000,000
Grade-Separated Crossing	23	-	$506,000,000
Total	**396**	**955**	**$18,427,039,000**

Transit Projects and Phasing

The 2019-2050 RTP transit projects are identified corridors with planned transit routes, as shown in Maps 8 and 9. Each project is identified by mode and is designated as core route, BRT, streetcar, light rail, commuter rail, express bus/special service, corridor preservation, park and ride, infill station, maintenance facility, or transit hub,. Table 17 provides a summary of these investments by mode and phase, including the number and miles of planned investments and capital and operating costs in current dollars. A complete list of each project including the project name, project length, transit mode, when the project is needed, the financially constrained phase, current cost, and phased cost can be found in Appendix L - the 2019-2050 RTP Phased Project Lists by Mode. The 2019-2050 RTP transit project list can also be accessed via the interactive map by clicking on the project, and viewing the information in the pop up box.

Figures 22 and 23 summarize the proportion of transit expenditures that are projected to be spent on operating and capital project costs by mode for the financially constrained RTP from 2019 to 2050.

Map 8. Transit Projects by Type - Ogden-Layton Urbanized Area



Map 9. Transit Projects by Type - Salt Lake City-West Valley City Urbanized Area

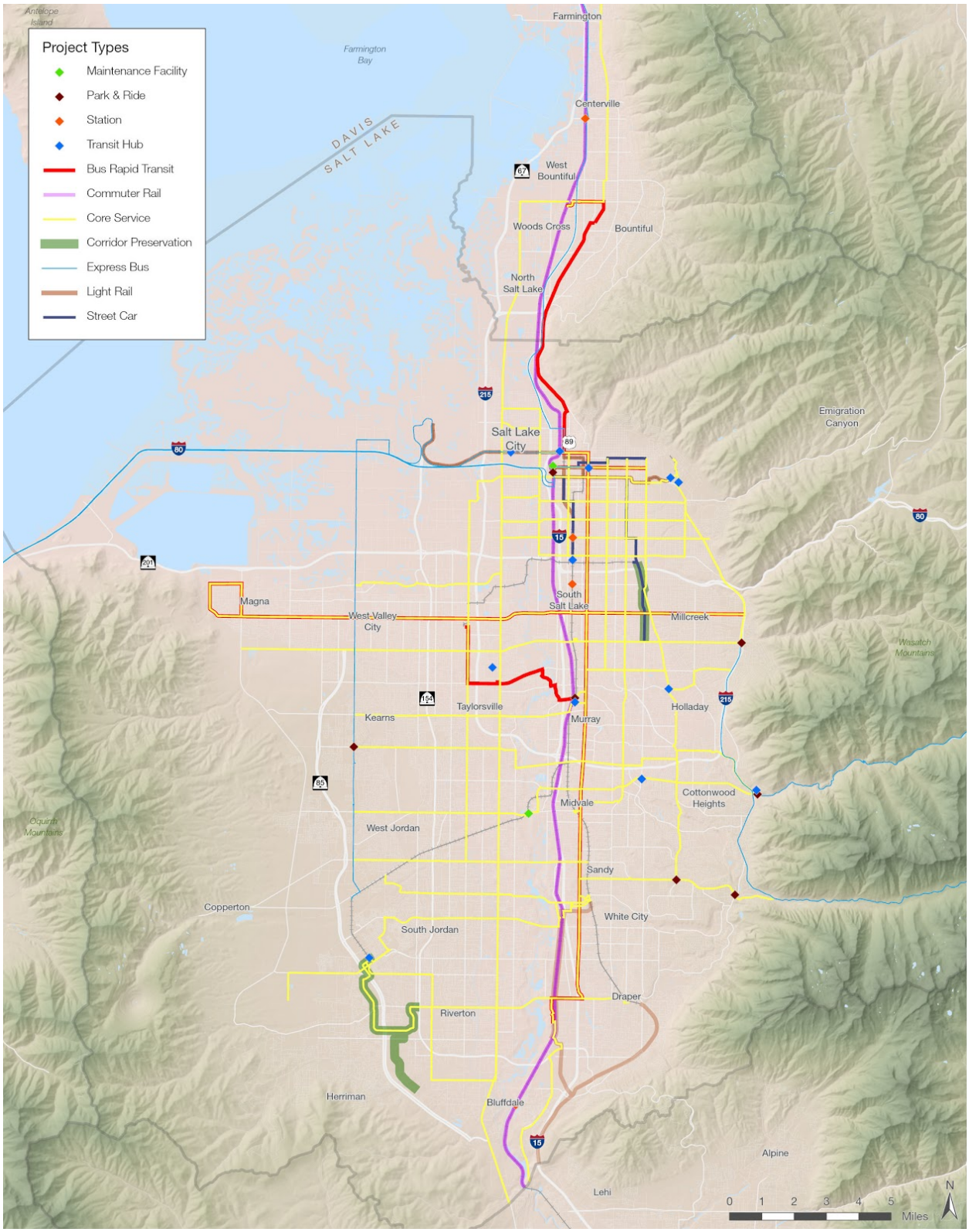


Table 17. Transit Project Summary

Mode	Number of Projects	Number of Miles	2019 Capital Cost	2019 Annual Operating Cost
Phase 1				
Core Route	15	153	$312,541,000	$28,670,000
BRT	4	23	$378,037,000	$9,109,000
Streetcar	0	0	$0	$0
Light Rail	0	0	$0	$0
Commuter Rail	0	0	$0	$0
Express Bus / Special Service	0	0	$0	$0
Corridor Preservation	5	40	$19,725,000	$0
Transit Hub	9	-	$126,000,000	$0
Maintenance Facility	2	-	$10,000,000	$0
Park & Ride	2	-	$7,200,000	$0
Infill Station	0	-	$0	$0
Total	**37**	**216**	**$853,503,000**	**$37,779,000**
Phase 2				
Core Route	6	70	$115,519,000	$9,054,000
BRT	0	0	$0	$0
Streetcar	0	0	$0	$0
Light Rail	2	3	$163,618,000	$3,304,000
Commuter Rail (double-track)	3	66	$199,461,000	$0
Express Bus / Special Service	0	0	$0	$0
Corridor Preservation	0	0	$0	$0
Transit Hub	1	-	$14,000,000	$0
Maintenance Facility	0	-	$0	$0
Park & Ride	5	-	$18,000,000	$0
Infill Station	0	-	$0	$0
Total	**15**	**139**	**$510,598,000**	**$12,358,000**
Phase 3				
Core Route	14	125	$207,882,000	$16,292,000
BRT	0	0	$0	$0
Streetcar	1	7	$317,251,000	$3,274,$0000
Light Rail	1	14	$964,460,000	$16,520,000
Commuter Rail (new construction)	1	6	$163,918,000	$4,620,000
Express Bus / Special Service	4	88	$44,640,000	$11,379,000
Corridor Preservation	0	0	$0	$0
Transit Hub	3	-	$42,000,000	$0

Maintenance Facility	1	-	$5,000,000	$0
Park & Ride	3	-	$10,800,000	$0
Infill Station	0	-	$0	$0
Total	**28**	**240**	**$1,755,951,000**	**$52,085,000**
Unfunded				
Core Route	8	60	$99,600,000	$7,806,000
BRT	3	42	$673,342,000	$16,224,000
Streetcar	2	6	$276,166,000	$2,850,000
Light Rail	1	10	$515,718,000	$11,778,000
Commuter Rail (electrification)	3	66	$1,632,970,000	$45,750,000
Express Bus / Special Service	5	59	$29,993,000	$7,645,000
Corridor Preservation	0	0	$0	$0
Transit Hub	0	-	$0	$0
Maintenance Facility	0	-	$0	$0
Park & Ride	0	-	$0	$0
Infill Station	7	-	$14,000,000	$0
Total	**29**	**243**	**$3,241,789,000**	**$92,053,000**
All Phases				
Core Route	43	408	$735,542,000	$61,822,000
BRT	7	65	$1,051,379,000	$25,333,000
Streetcar	3	13	$593,417,000	$6,124,000
Light Rail	4	27	$1,643,796,000	$31,602,000
Commuter Rail	7	138	$1,996,349,000	$50,370,000
Express Bus / Special Service	9	147	$74,633,000	$19,024,000
Corridor Preservation	5	40	$19,725,000	$0
Transit Hub	13	-	$182,000,000	$0
Maintenance Facility	3	-	$15,000,000	$0
Park & Ride	10	-	$36,000,000	$0
Infill Station	7	-	$14,000,000	$0
Total	**111**	**838**	**$6,361,841,000**	**$194,275,000**

Figure 22. Projected WFRC Total Transit Operating Costs by Mode, Financially Constrained Projects, 2019-2050

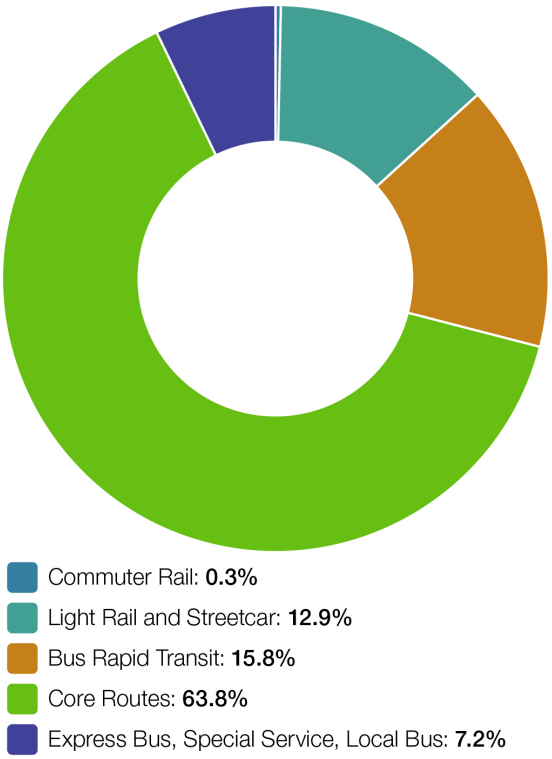
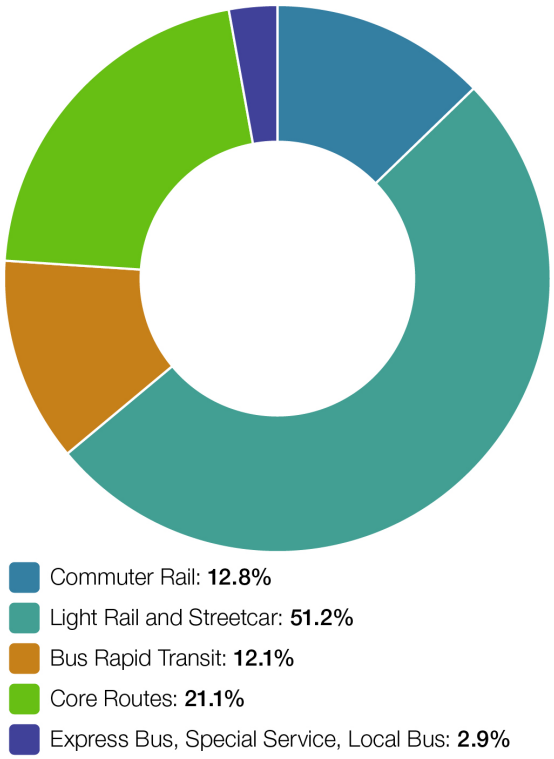


Figure 23. Projected WFRC Total Transit Capital Costs by Mode, Financially Constrained Projects, 2019-2050



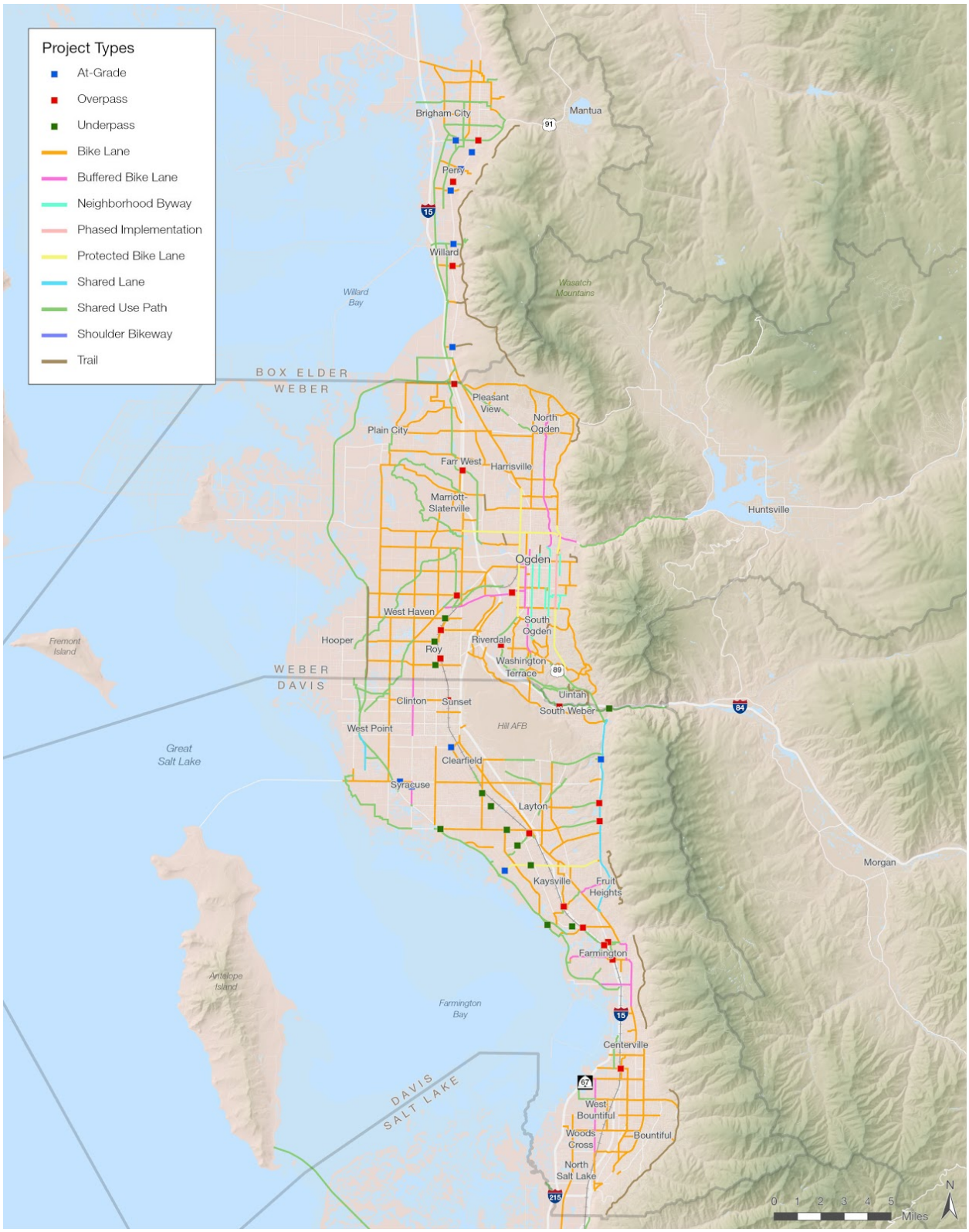
Active Transportation Projects and Phasing

The 2019-2050 RTP active transportation projects list identifies planned active transportation routes and point projects. Each project description includes the project name, project length, facility type, when the project is needed, current cost, and phased cost. The 2019-2050 RTP active transportation project list can also be accessed via the interactive map by clicking on the project, and viewing the information in the pop up box. Maps 10 and 11 show the locations and Table 18 provides a summary of active transportation projects included in the 2019-2050 RTP.

Phased Project Maps

Roadway, transit, and active transportation projects work together to create a comprehensive, multimodal system. Maps 12-19 show 2019-2050 RTP roadway, transit, and active transportation projects by phase. For more detail, these maps have been split by Urbanized Area.

Map 10. Active Transportation Projects by Type - Ogden-Layton Urbanized Area



Map 11. Active Transportation Projects by Type - Salt Lake City-West Valley City Urbanized Area

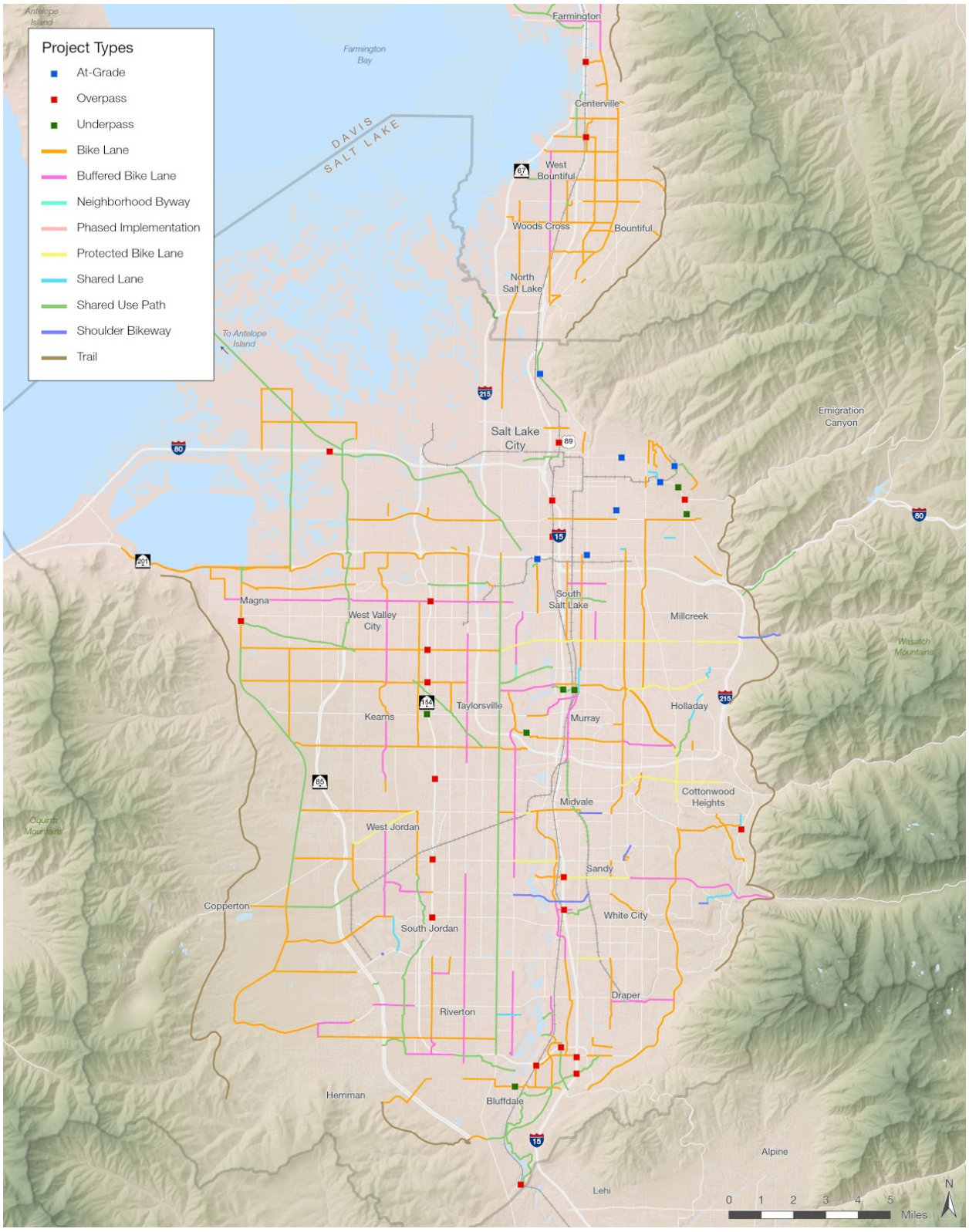
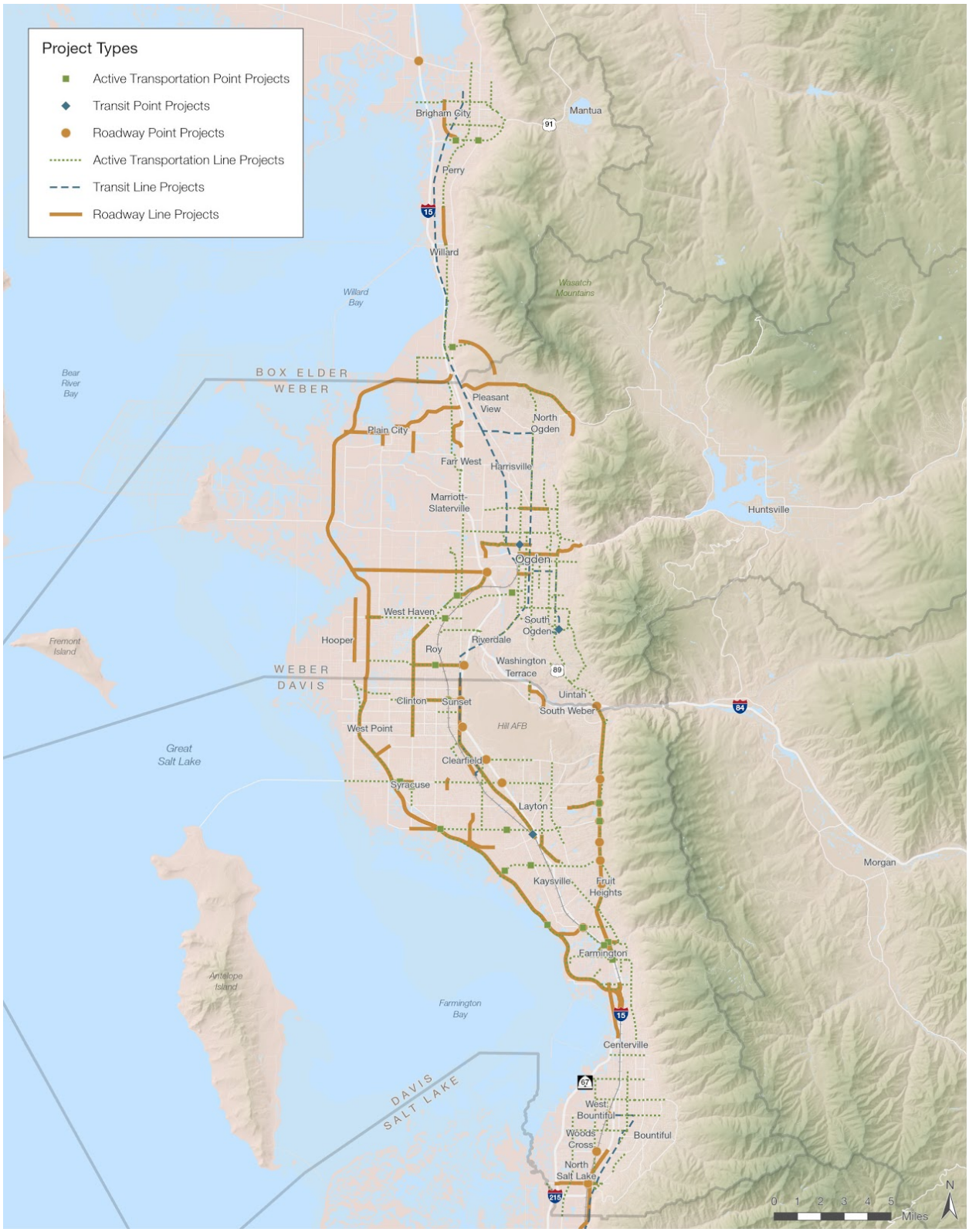


Table 18: Active Transportation Project Summary

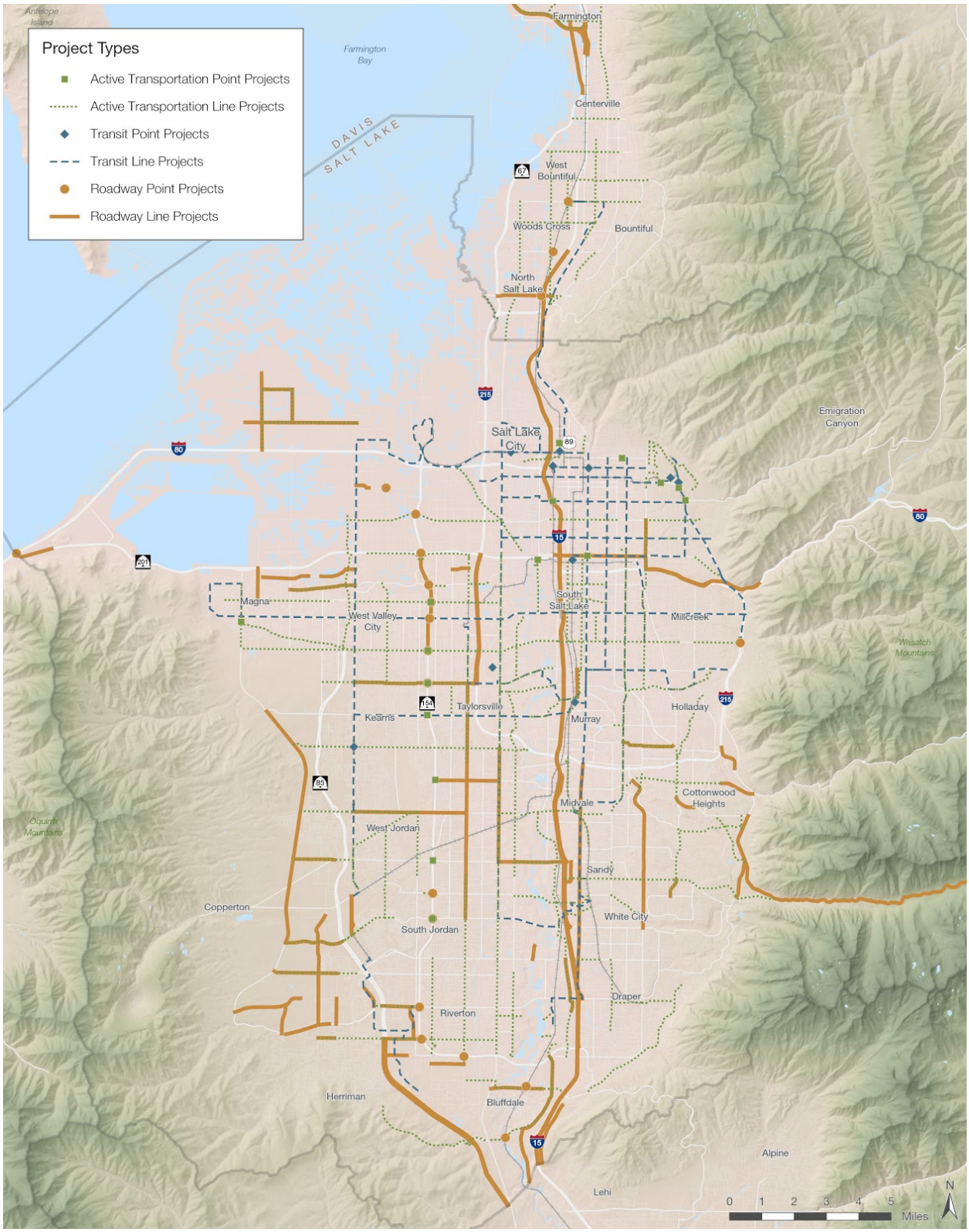
Mode	Number of Projects	Number of Miles	2019 Capital Cost
Phase 1			
Bike Boulevard	2	1.5	$30,000
Bike Lane	120	209.3	$20,930,000
Buffered Bike Lane	34	61.7	$9,280,000
Neighborhood Byway	0	0	$0
Phased Implementation	0	0	$0
Protected Bike Lane	8	17.5	$17,540,000
Shared Lane	7	12.6	$233,000
Shared Use Path	69	132.9	$132,850,000
Shoulder Bikeway	1	0.7	$30,000
Sidepath	0	0	$0
Trail	9	18.6	$3,830,000
At-Grade Crossing	8	-	$1,400,000
Underground Crossing	7	-	$6,060,000
Overhead Crossing	18	-	$29,350,000
Total	**283**	**454.9**	**$221,533,000**
Phase 2			
Bike Boulevard	4	8.7	$160,000
Bike Lane	93	158.3	$15,810,000
Buffered Bike Lane	11	17.6	$2,660,000
Neighborhood Byway	1	0.4	$20,000
Phased Implementation	0	0	$0
Protected Bike Lane	4	10.6	$10,570,000
Shared Lane	5	3.3	$60,000
Shared Use Path	36	71.1	$71,110,000
Shoulder Bikeway	6	4.7	$240,000
Sidepath	1	0.4	$210,000
Trail	16	50.6	$10,370,000
At-Grade Crossing	6	-	$600,000
Underground Crossing	7	-	$7,710,000
Overhead Crossing	10	-	$10,500,000
Total	**200**	**325.7**	**$130,020,000**
Phase 3			

Bike Boulevard	2	0.8	$10,000
Bike Lane	85	129.8	$12,970,000
Buffered Bike Lane	8	10.4	$1,570,000
Neighborhood Byway	0	0	$0
Phased Implementation	1	2.4	$240,000
Protected Bike Lane	4	9.5	$9,460,000
Shared Lane	1	0.6	$10,000
Shared Use Path	20	56.5	$56,550,000
Shoulder Bikeway	0	0	$0
Sidepath	0	0	$0
Trail	6	11.9	$2,440,000
At-Grade Crossing	4	-	$400,000
Underground Crossing	5	-	$5,250,000
Overhead Crossing	14	-	$20,810,000
Total	**150**	**221.9**	**$109,710,000**
All Phases			
Bike Boulevard	8	11	$200,000
Bike Lane	298	497.4	$49,710,000
Buffered Bike Lane	53	89.8	$13,510,000
Neighborhood Byway	1	0.4	$20,000
Phased Implementation	1	2.4	$240,000
Protected Bike Lane	16	37.6	$37,570,000
Shared Lane	13	16.6	$303,000
Shared Use Path	125	260.5	$260,510,000
Shoulder Bikeway	7	5.3	$270,000
Sidepath	1	0.4	$210,000
Trail	31	81.1	$16,640,000
At-Grade Crossing	18	-	$2,400,000
Underground Crossing	19	-	$19,020,000
Overhead Crossing	42	-	$60,660,000
Total	**633**	**1002.6**	**$461,263,000**

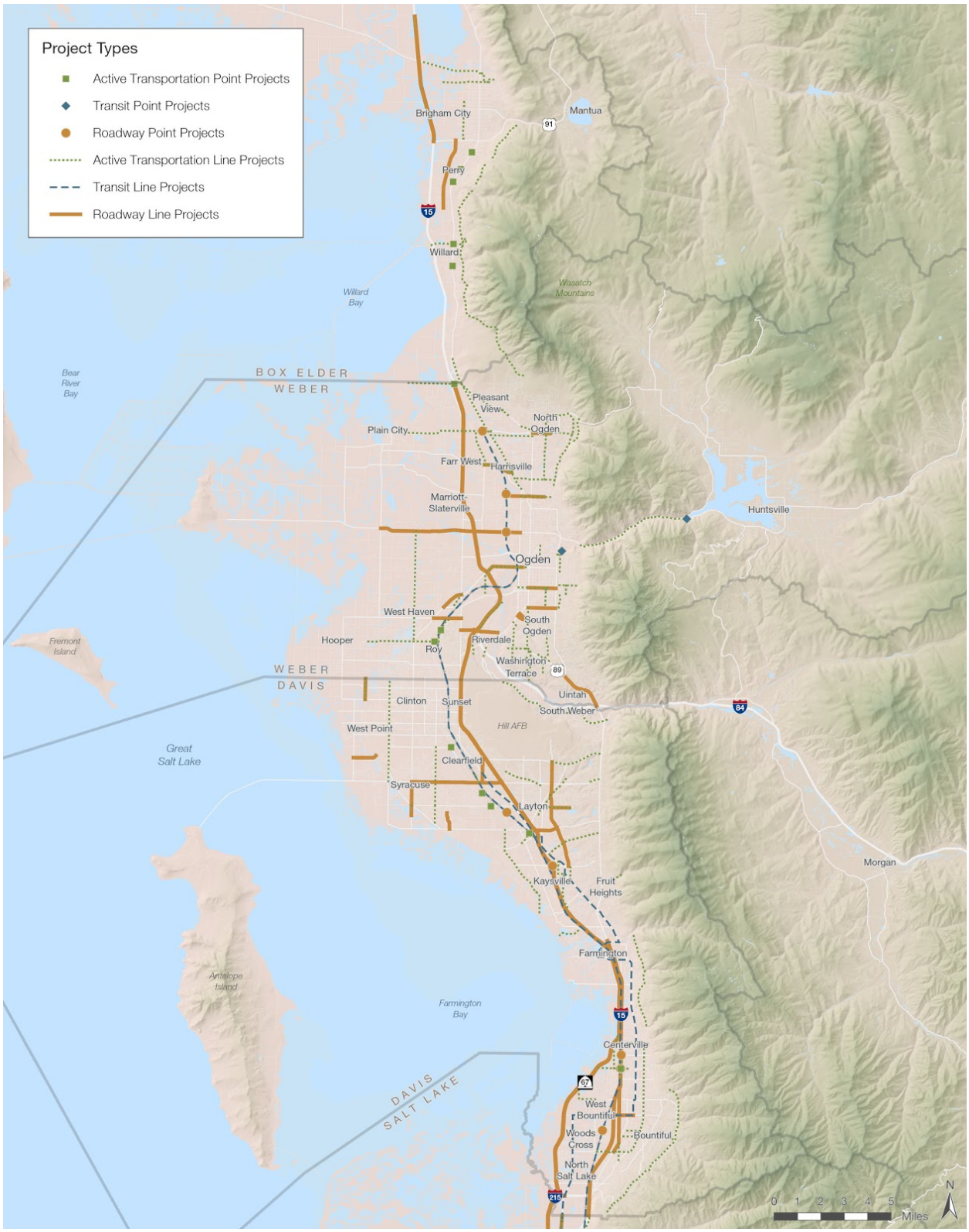
Map 12. Phase 1 Projects (2019-2030) Roadway, Transit, and Active Transportation - Ogden-Layton Urbanized Area



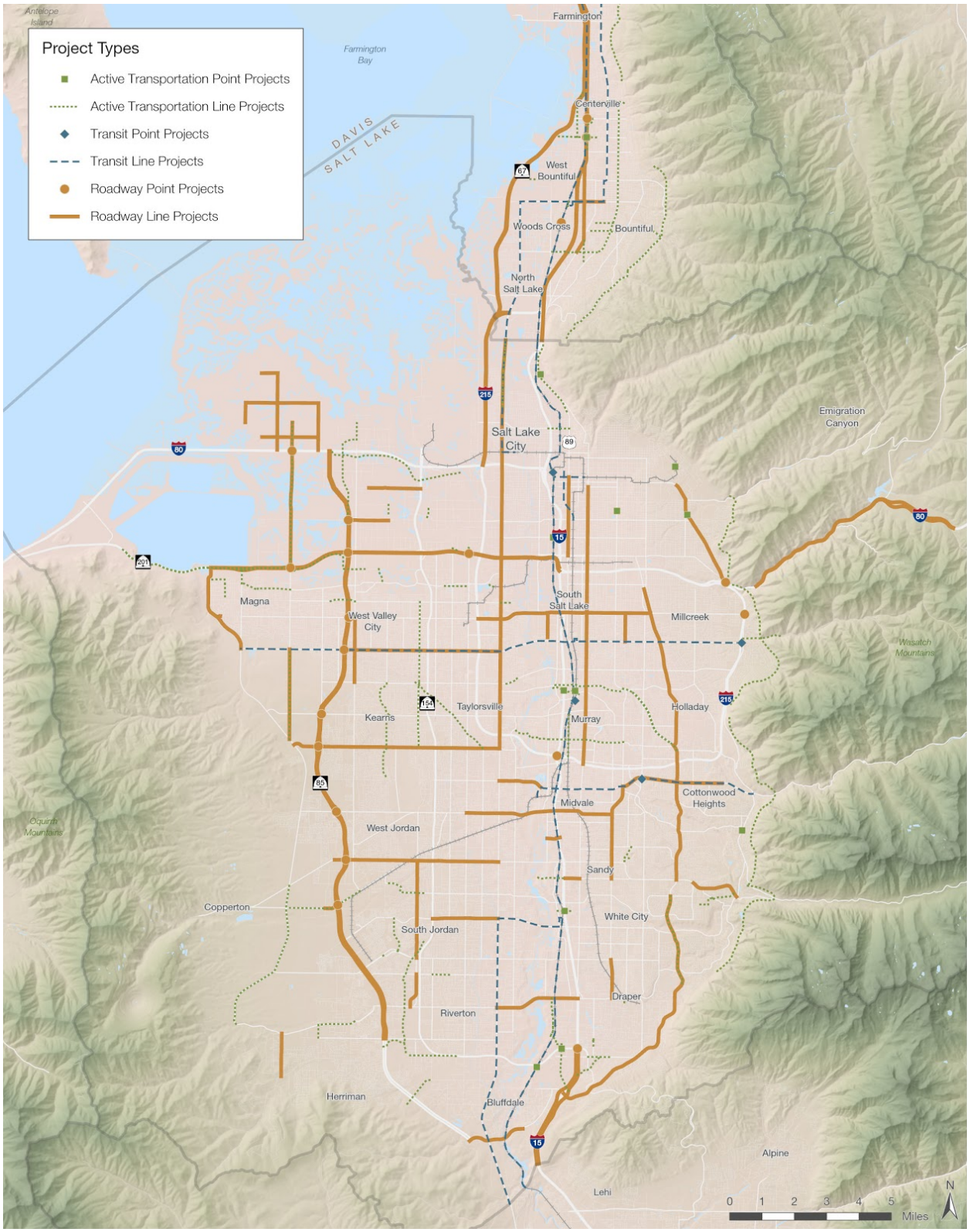
Map 13. Phase 1 Projects (2019-2030) Roadway, Transit, and Active Transportation -Salt Lake City-West Valley City Urbanized Area



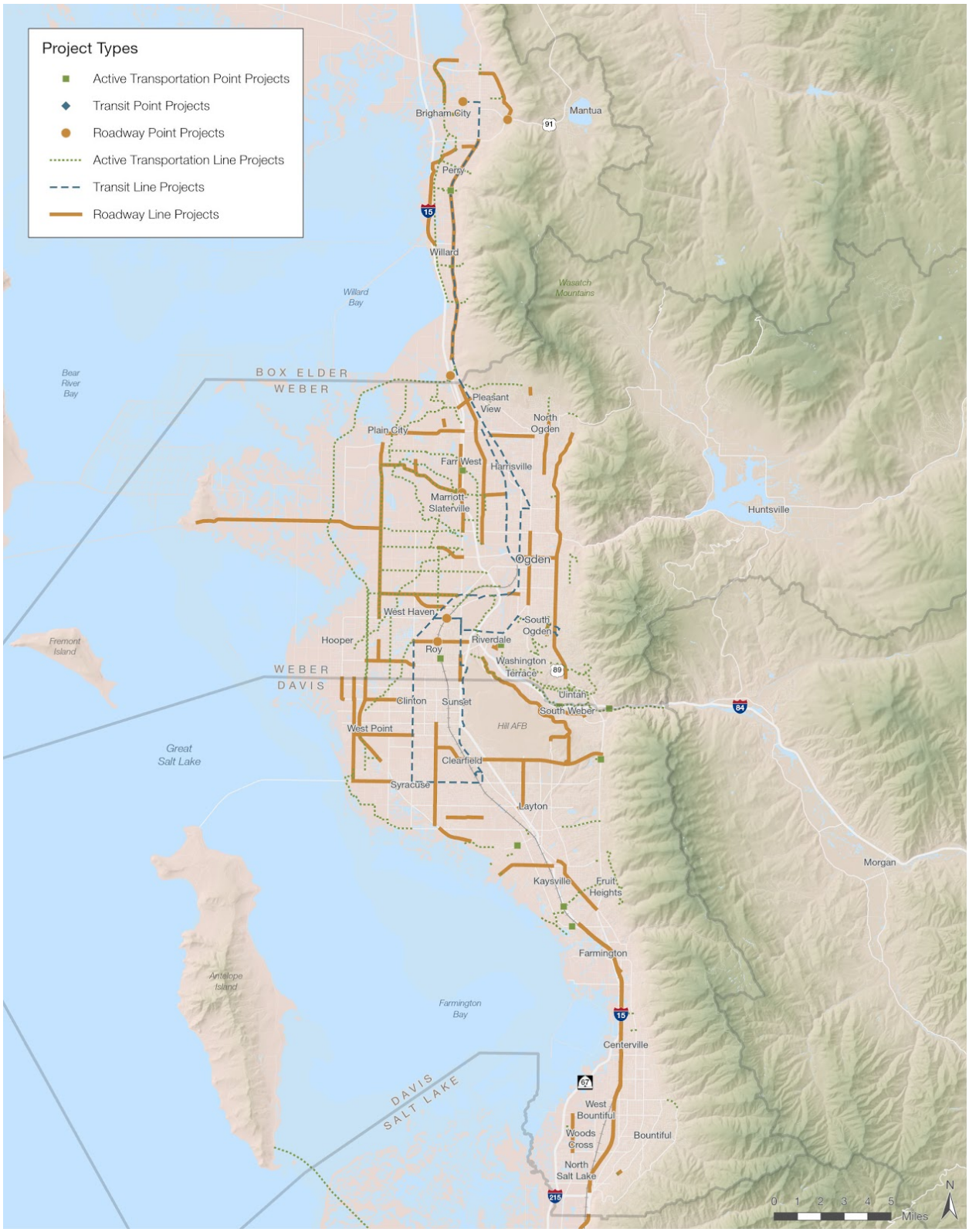
Map 14. Phase 2 Projects (2031-2040) Roadway, Transit, and Active Transportation - Ogden-Layton Urbanized Area



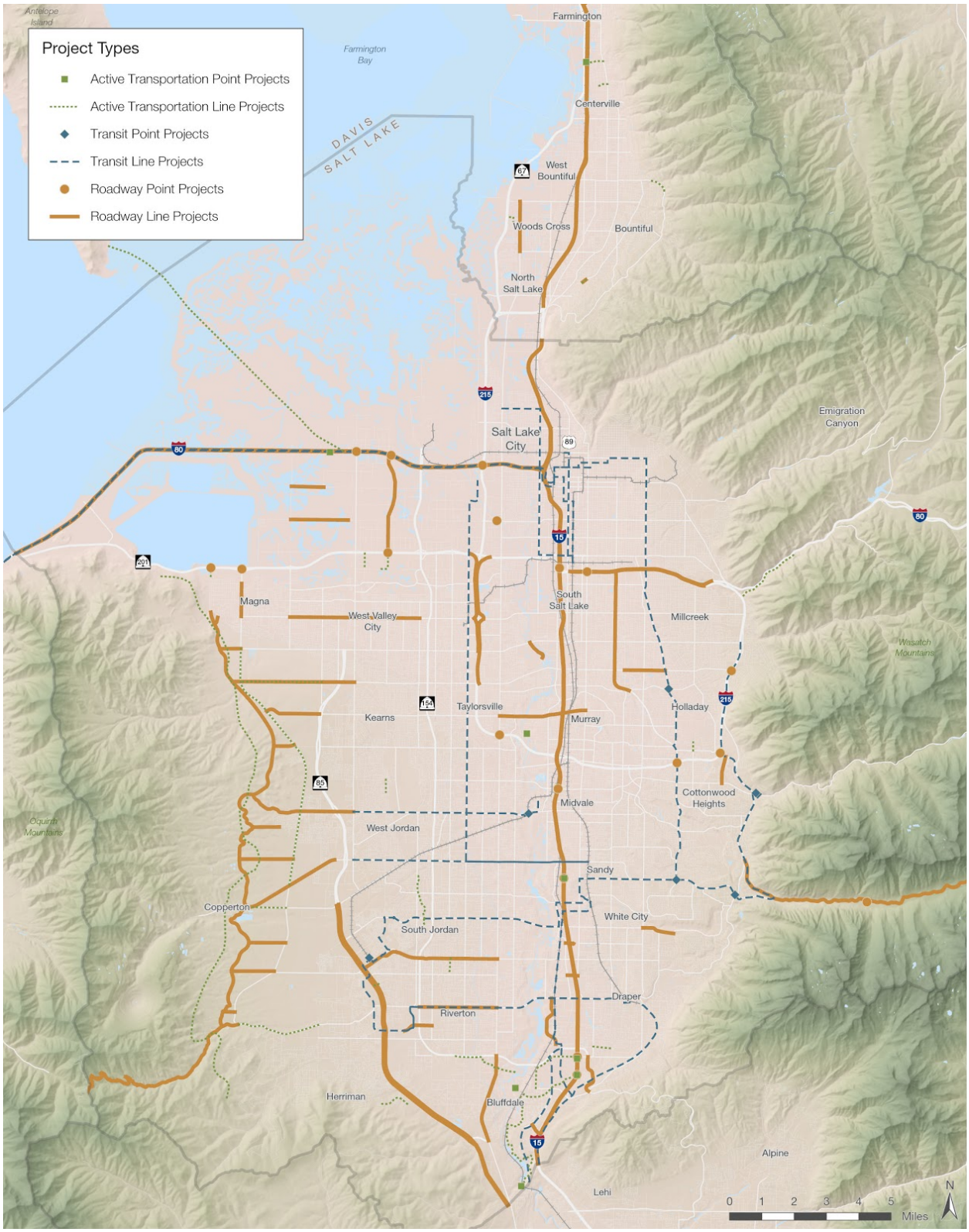
Map 15. Phase 2 Projects (2031-2040) Roadway, Transit, and Active Transportation -Salt Lake City-West Valley City Urbanized Area



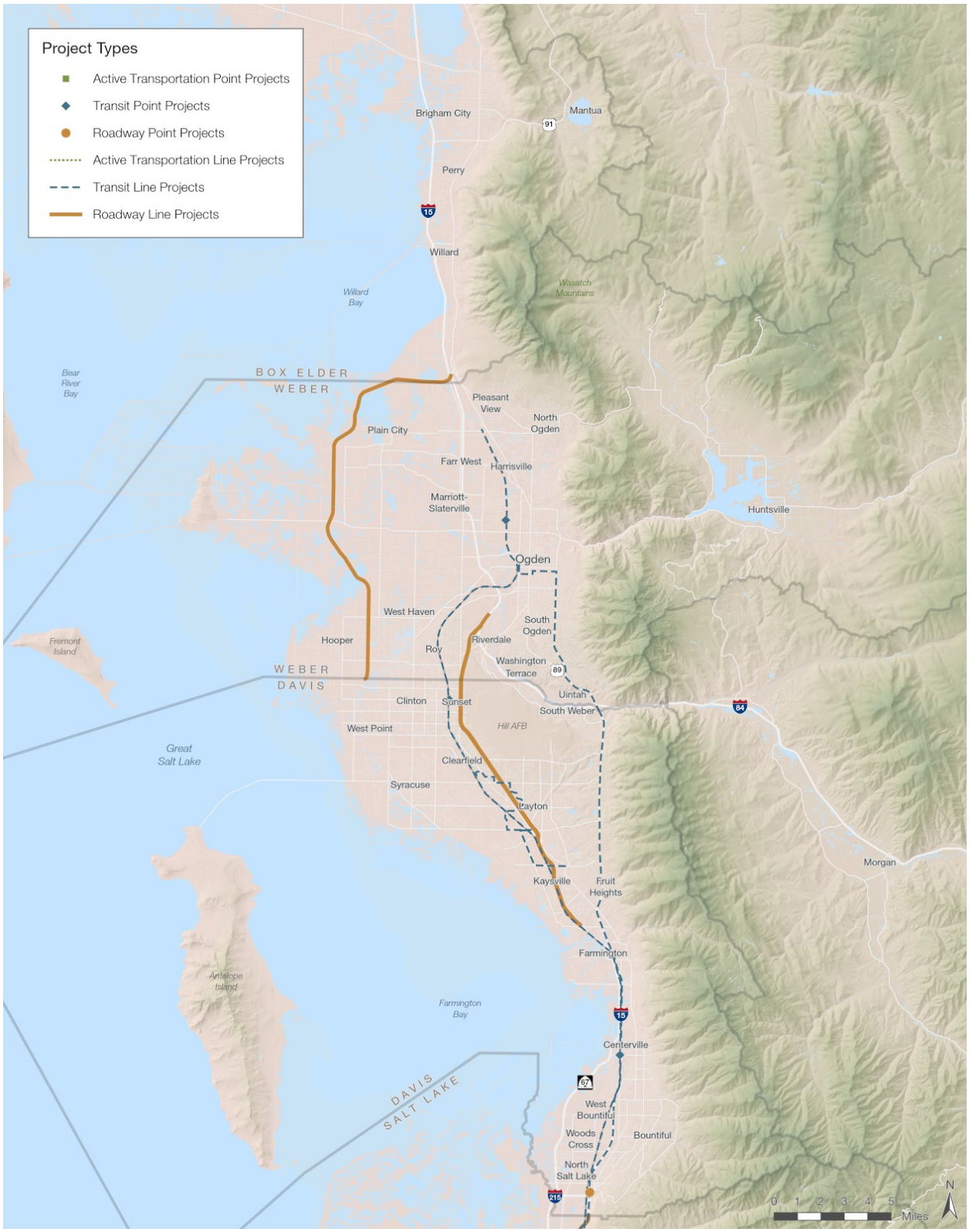
Map 16. Phase 3 Projects (2041-2050) Roadway, Transit, and Active Transportation - Ogden-Layton Urbanized Area



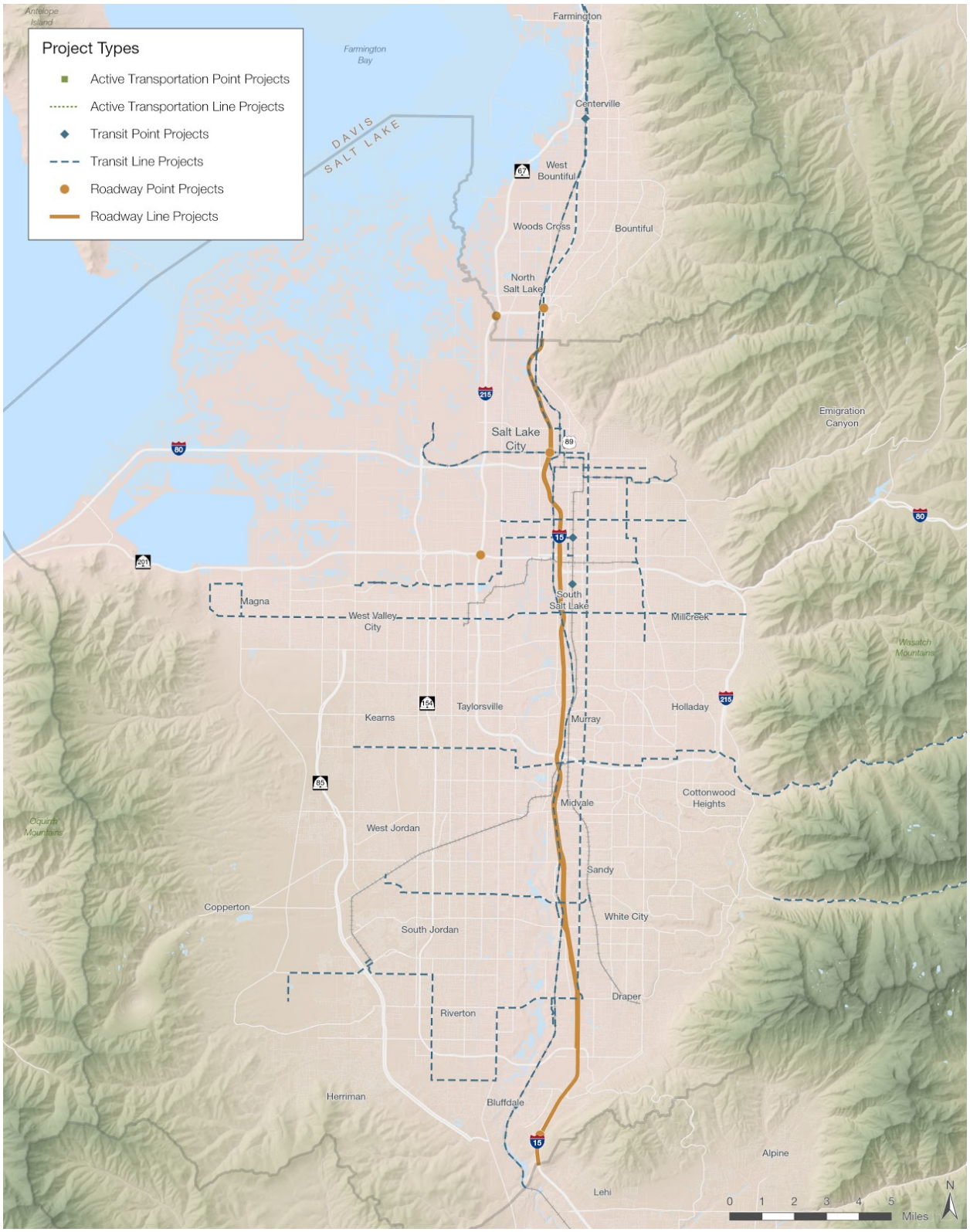
Map 17. Phase 3 Projects (2041-2050) Roadway, Transit, and Active Transportation -Salt Lake City-West Valley City Urbanized Area



Map 18. Unfunded Projects (beyond 2050) Roadway, Transit, and Active Transportation - Ogden-Layton Urbanized Area



Map 19. Unfunded Projects (beyond 2050) Roadway, Transit, and Active Transportation - Salt Lake City-West Valley City Urbanized Area



Public Involvement Process

Vision Workshops

During October and November of 2018, WFRC, in coordination with UDOT, UTA, ULCT, and UAC, hosted the final round of Vision Workshops for the 2019-2050 RTP. This meeting, titled the Wasatch Choice Phasing Workshop, was designed specifically to receive feedback on the draft phased 2019-2050 RTP from city and county planners, engineers, managers, economic development staff, city council members, planning commissioners, mayors, and county commissioners. Neighboring communities were brought together, four to five communities at a time, to provide input on the prioritized 2019-2050 RTP. There were seven total Phasing Workshops held throughout the Region.

Generalized Public Comment Review

A formal public comment period occurred between October 22 and November 30, 2018. The public was invited to provide feedback to the draft financially constrained 2019-2050 RTP via an online interactive map, and notices were distributed via the newspaper, WFRC's email distribution list, and through a social media campaign. The interactive map and notices were also provided in Spanish and, because Utah's primary Spanish newspaper *El Periodico* no longer exists, the public comment period was advertised in Spanish on radio station Latino 106.3.

Stakeholder and Special Interest Group Outreach

Community-based organizations were notified via email about the draft financially constrained plan and invited to provide feedback via the online interactive map. Once again, WFRC met with a number of important landholding corporations and special interest groups, including Rio Tinto Kennecott; The Church of Jesus Christ of Latter-day Saints Property Reserve, Inc. (PRI), Suburban Land Reserve (SLR), and Farmland Reserve, Inc. (FRI); Utahns for Better Transportation (UBET); and urban planners and professors at the University of Utah College of Architecture + Planning. Representatives for each of these groups were provided the opportunity to give input on the financially constrained phasing of roadway, transit, and active transportation projects. The input provided by these stakeholders prove invaluable in determining if the transportation needs of the Wasatch Front Region were successfully met.

Present Impacts and Benefits

The 2019–2050 RTP was evaluated to determine its social, economic, and environmental impacts and how well it would meet the transportation needs of the Region through the year 2050. The goals and objectives for the 2019–2050 RTP helped form the basis for this evaluation. The 2019–2050 RTP was also analyzed with regard to its conformity with state air quality plans and other factors.

Performance Measures

The performance measures used to assess the three Wasatch Choice scenarios and the Preferred Scenario were also used to determine the performance of the phased, financially constrained system. **Criteria, methodologies, models, and project lists were further refined, when needed, and therefore may not be directly comparable to the performance measures as shown in previous chapters.**

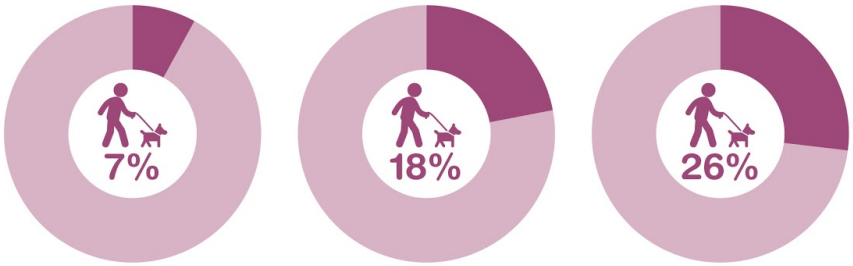
Each measure below compares existing conditions to two future scenarios:

1. **Current path to 2050:** this scenario demonstrates how our transportation system and land development patterns will perform together through the year 2050, if we fund and build only the transportation projects using revenue sources currently in place and if we continue existing land use policies through 2050.
2. **Draft Wasatch Choice 2050 Vision:** this scenario demonstrates how our transportation system and land development patterns will perform together through the year 2050, if we fund and build transportation projects using revenue sources currently in place along with specific additional revenue streams, coupled with the Vision's proposed land use policies through 2050.

Livable and healthy communities

Performance Measure	2015	2050	
Walkability	Today	Current Path to 2050	Wasatch Choice Path to 2050

The percent of streets that are walkable. Whether you drive, bike, or take transit, everyone is a pedestrian at some point in the day. This measures how safe and enjoyable streets are for walking.

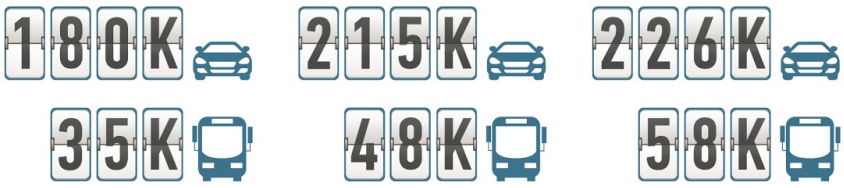


Today, not many of our commercial corridors are a pleasant walking environment. In the future, with investments in our transit and active transportation networks, and increased densities in our land use, the Region will see a significant increase in the amount of walkable streets. Wasatch Choice 2050 and its centered development increases the amount of walkable streets by almost 45 percent more than our current path.

Access to economic and educational opportunities

Performance Measure	2015	2050	
Destination Access	Today	Current Path to 2050	Wasatch Choice Path to 2050

The number of jobs accessible to the average Wasatch Front household. Better access means a bigger labor pool for businesses and opportunities for employment and interaction with friends and family for residents. Access can be increased through transportation improvements, locating development near high-speed transportation, and locating homes near jobs (and vice versa).



The accessibility provided by the Wasatch Choice path transportation networks performs better than that of the current path, about five percent more for auto access and about 21 percent more for transit access. Overall, local residents improve their auto access 26 percent and their transit access 66 percent over today. Among the factors influencing accessibility is the type of transportation improvements, such as strategic widenings, operational projects, new roads, and more frequent core bus routes. In addition, the linking of transportation investment and development decisions provides significant benefit and is one of the main differences between the current path and the Wasatch Choice path.

Performance Measure	2015	2050	
Freight	Today	Current Path to 2050	Wasatch Choice Path to 2050
The average truck speed on freight corridors in the evening commute. Truck speed is a proxy for the ability of goods and services to reach consumers and the market. Freight movement is a vital part of the state's economy.			

One of the most direct measures of economic vitality is truck freight mobility. Unlike the current path, the Wasatch Choice path slightly improves current truck travel speeds. This is in part due to specifically targeted capacity and operational improvements. In addition, the 2019-2050 RTP includes a number of grade-separated crossings over freight rail corridors to reduce conflict and improve safety between regional traffic and freight traffic.

Manageable and reliable traffic conditions

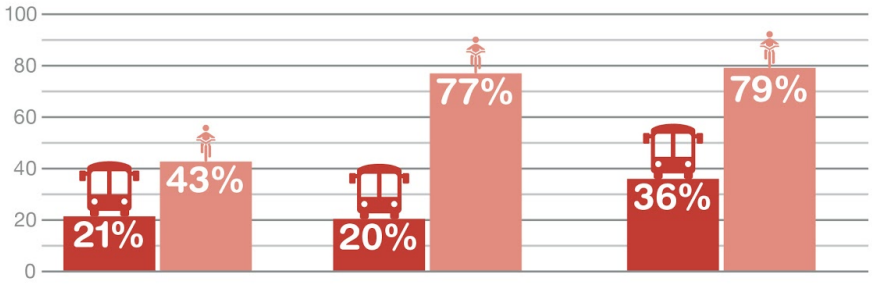
Performance Measure	2015	2050	
Auto Travel Time	Today	Current Path to 2050	Wasatch Choice Path to 2050
The total time per day that the average person spends in a vehicle. Auto travel time increases with added congestion and greater distances between homes and jobs. Shorter travel times mean we spend less time driving and have more time for leisure and recreation.			

Average travel time by car will increase in either future scenario due to a growing region and significant population increase. However, 11 more minutes per day over the next 31 years is a relatively minor increase impact, especially when considered with the significant increases in destination access. It may take longer to travel in the future, but the average person will be able to reach more destinations within that time.

Quality transportation choices

Performance Measure	2015	2050	
Transportation Choices	Today	Current Path to 2050	Wasatch Choice Path to 2050

The percent of people who are nearby (are within one quarter of a mile) a frequent bus route, transit stop/station, or dedicated bike facility.
Multi-modal transportation systems provide transportation choices which may reduce consumer expenses, decrease congestion, or improve air quality.



The Wasatch Choice Vision significantly increases access to transit and active transportation over today's environment, about 70 percent for transit and over 80 percent for active transportation. One of the key differences between the current path and the Wasatch Choice Vision is the assumption of new revenue beyond our existing revenues sources. As shown above, there is a significant reduction in transit access if we do not identify new revenue streams for transit - almost a 78 percent reduction in people who live nearby frequent transit.

Performance Measure	2015	2050	
Transit Use	Today	Current Path to 2050	Wasatch Choice Path to 2050

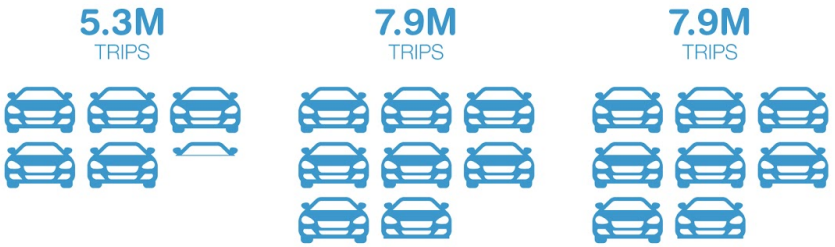
The number of trips per day that residents travel by transit.
Public transit is a transportation choice that costs households less to use, improves air quality, and takes cars off of our busy roads.

Transit use increases substantially in both future scenarios, as compared to current ridership - over doubling. By investing more in our transit system and increasing service breadth and coverage, we can increase ridership by an additional 24 percent, to over 300,000 trips per day.

Clean air

Performance Measure	2015	2050	
Air Quality	Today	Current Path to 2050	Wasatch Choice Path to 2050

The number of vehicle trips the region takes per day. By reducing vehicle trips through carpooling, transit, walking, and biking, congestion and emissions are reduced and air quality is improved. Even removing a short auto trip cuts out the significant emissions that come from starting a "cold" car.

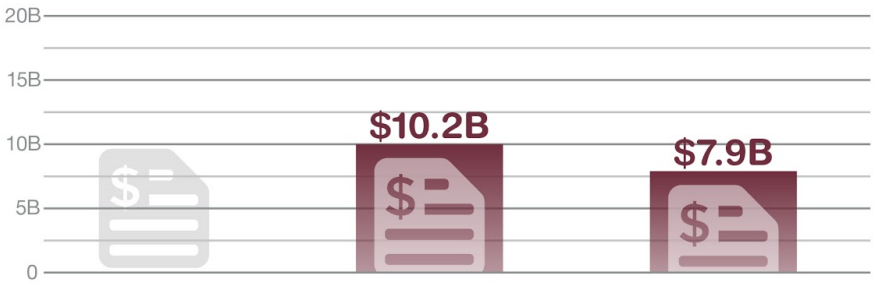


The number of auto trips our Region makes per day will increase as more people move to the Wasatch Front. There is a slight decrease when comparing the number of auto trips in the future scenarios. Part of this difference is due to the build out of our road system compared to our transit and active transportation systems. Part of this difference can also be explained by regional and local policies, such as parking policies, transit fare policies, and other pricing policies, which were not well accounted for in our transportation modeling. These policy changes can change our travel behavior. We can also continue to make impacts on the number of cold starts in the Region by developing around transit stations and stops, which can make transit more convenient.

Fiscally responsible communities and infrastructure

Performance Measure	2015	2050	
Local Infrastructure Costs	Today	Current Path to 2050	Wasatch Choice Path to 2050

The total cost to provide streets and infrastructure to serve new development. New development brings economic growth, but also creates fiscal impacts. Roads and utilities supporting development are costs incurred by cities and their residents. Redevelopment and infill of developed areas, and higher intensity development, can lower the fiscal impact on a community.



Local infrastructure costs shown above include infrastructure such as roads, sewer, and water, but not services such as police and fire. Infrastructure to support new development can be significant. The Wasatch Choice 2050 path provides a 20 percent reduction in infrastructure costs. These cost savings are realized through locating development closer to existing infrastructure, such as greater infill development, more centered development, and locating future developments closer to transportation.

Performance Measure	2015	2050	
Water Use	Today	Current Path to 2050	Wasatch Choice Path to 2050

The number of gallons of water that the average household uses. Water is a key concern along the Wasatch Front. The built environment, including housing types and lot sizes, affects how much water is consumed by households. The more water we use for residential purposes, the less water is available for agriculture and other uses.

How we grow has an impact on our water usage. It is projected that the number of gallons of water the average household uses will decline in the future, by 14 percent, as more people live on smaller lots and in multi-family housing, such as twin homes, condos, townhomes, and apartments.

Performance Measure	2015	2050	
Developed Land	Today	Current Path to 2050	Wasatch Choice Path to 2050

The acreage of farmland and open space converted to development. As the population increases, land will be needed to accommodate growth, putting pressure on lands currently used for food production and agriculture. We can reduce the need to develop farmland through centered growth principles.

Between 2019 and 2050, many acres of farmland and undeveloped open space will be converted to housing and commercial uses. By adhering to the growth principals and the blueprint of the Wasatch Choice 2050 Vision, the Region can reduce the conversion of farmland and undeveloped open space to development by 28 percent.

Federal Performance Measures

In addition to identifying planning factors to guide MPOs, Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation (FAST) Act also provided a performance management framework for state Departments of Transportation, transit agencies, and MPOs to assess and monitor the performance of the transportation system. Outlined were seven national performance goals for the Federal-aid highway program and two national performance goals for transit agencies. Each DOT, transit agency, and MPO is required to coordinate together to set performance targets and report on progress toward meeting national goals and agency targets. Table 19 and 20 provide each of the national goal areas, performance measures, targets, and reported progress.

The RTP should help the DOTs and transit agencies make progress toward achieving performance targets. WFRC incorporated the national goals into the Wasatch Choice 2050 goals:

- Manageable and reliable traffic conditions
- Access to economic and educational opportunities
- Safe, user-friendly streets
- Clean air
- Fiscally responsible communities and infrastructure

These goals were the basis of the creation of the 2019-2050 RTP, from scenario development to project selection to project phasing. Table 19 shows the federally required highway performance measures, targets, and reporting.

Safety

Safe, user-friendly streets is a goal of the Wasatch Choice 2050 Vision and is incorporated into the project selection and project prioritization of the 2019-2050 RTP. Of the 396 total road projects, 118 or roughly 30 percent, improve infrastructure that have a Safety Index rating over six and have been prioritized with respect to safety. The 2019-2050 RTP also includes 23 grade-separated vehicle crossings that will reduce freight conflict with ground transportation, including bicyclists and pedestrians. Overall, it is assumed that any improvement to our streets will improve the safety of the roadway. Financially, the State of Utah is expected to invest $896 million in safety dollars between 2019 and 2050.

Increased use of bicycle and pedestrian facilities is a result of safe, user-friendly streets as well. The 2019-2050 RTP includes 16 miles of protected bike lanes and 125 miles of separated, non-motorized shared use paths. These facilities provide physical protection of one form or another between bicyclists and vehicles, increasing safety and comfort of the user. In addition, there are 63 grade-separated bicycle/pedestrian crossings that will reduce conflict with freight and vehicular transportation and 18 at-grade crossings that will improve safety where potential conflicts between bicycles, pedestrians, and vehicles can occur.

Transit projects within the 2019-2050 RTP were prioritized based on the existence of sidewalks and bicycle connections, in order to support safe, multi-modal travel. Additionally, it is assumed that future transit projects would be built and operated to include safety features such as well-lit shelters and sidewalk bulb outs and marked pedestrian crossings when applicable.

Infrastructure

Fiscally responsible communities and infrastructure is a goal of the Wasatch Choice 2050 Vision and pavement and bridge conditions have been incorporated into the project selection and project prioritization of the 2019-2050 RTP. Our financial analysis has assumed that $8.739 billion will be spent on preservation between 2019-2050 in the Wasatch Front planning area. This is in addition to 2019-2050 RTP roadway capacity projects that will improve pavement and bridges. The WFRC assumes that any roadway widening project will reconstruct the roadway, including pavement. Of the 396 total road projects, 26 projects, or roughly ten percent, improve bridges in poor or fair conditions and 100 projects, or roughly 25 percent, improve pavement deficiencies. These projects have been prioritized with respect to state of good repair.

Table 19. Federally Required Highway Performance Measures and Targets

Performance Measure	Statewide Target[1]	Reported
Safety[2]		
Number of fatalities	≤ 271	262
Fatality rate per 100 million vehicle miles traveled	≤ 0.91	1.34
Number of serious injuries	≤ 1,445	1,412
Serious injury rate per 100 million vehicle miles traveled	≤ 4.87	7.03
Number of non-motorized fatalities	≤ 46	46
Number of non-motorized serious injuries	≤ 162	166
Infrastructure[3]		
Percent of pavement on Interstate System in good condition	> 60%	62%
Percent of pavement on Interstate System in poor condition	< 5%	3%
Percent of pavement on non-Interstate NHS in good condition	> 35%	41%
Percent of pavement on non-Interstate NHS in poor condition	< 5%	3%
Percent of NHS bridges classified as in good condition	> 40%	55%
Percentage of NHS bridges classified in poor condition	< 10%	<1%
System Reliability		
Percent of person miles traveled on Interstate System that are reliable	> 85% (two-year target); > 90% (four-year target)	82%[4]
Percent of person miles traveled on the non-Interstate NHS that are reliable	> 80% (two-year target); > 75% (four-year target)	75%[4]
Freight Movement and Economic Vitality		
Truck travel time reliability index	1.2	1.21
Congestion Reduction[5]		
Annual hours of peak-hour excessive delay per capita	≤12.4	13.6
Percent of non-single-occupant vehicle travel	1.7	20.5

Footnotes:
1. The WFRC concurs with all UDOT targets.
2. Targets set on a rolling five-year average.
3. Targets are two- and four-year targets.
4. The reported percentages apply only to the Wasatch Front Regional Council planning area.
5. Measure only applies to urbanized areas with a population greater than one million. In Utah, the only urbanized area with a population greater than one million is the Salt Lake City-West Valley City Urbanized Area.

Also, communities need to build into their maintenance budgets preservation of active transportation facilities such as sidewalks and shared use paths. Many on-street facilities, such as buffered bike lanes, will be considered as part of roadway pavement width maintenance. However, even in those cases, upkeep of painted markings and signage must also be factored into the cost of maintaining good infrastructure.

System Reliability

Manageable and reliable traffic conditions is a Wasatch Choice 2050 goal. Reliability is directly tied to the congestion of the system, and as such, congestion-related measures are integrated into the performance-based planning of the 2019-2050 RTP. This includes roadway volumes, volume-to-capacity ratios, connectivity, and vehicle hours of delay. The 2019-2050 RTP contains almost 66 miles of managed motorways, including ramp metering and system-to-system metering, on I-15 through Salt Lake, Davis, and Weber Counties to improve reliability of the most-traveled road in the state. The 2019-2050 RTP also contains over 360 miles of operational projects on interstates, freeways, arterials, and collectors to make travel times around the Region more predictable.

Congestion Reduction

Congestion reduction performance measures include peak hour excess delay and percent non-single occupancy vehicle (SOV). Both manageable and reliable traffic conditions and quality transportation choices are goals of the Wasatch Choice 2050 and have been integrated throughout the process to select and phase projects for the 2019-2050 RTP. The 2019 -2050 RTP includes a variety of roadway project types, but widening existing roads, constructing new roads to provide greater access and alleviate existing facilities, improving interstate and freeway interchanges, and grade-separating railroad crossings all contribute to reducing congestion in our Region. The 2019-2050 RTP includes 337 miles of roadway widening, 221 miles of new roadway construction, 34 interchange improvements, and 23 grade-separated crossings.

Reducing single-occupancy travel can not only help improve congestion, but can also help improve our Region's air quality. High-occupancy vehicle (HOV) lanes are mandated to have travel speeds greater than general purpose lanes on the interstate during the peak hour, providing an incentive to carpool. The 2019-2050 RTP includes 90 miles of additional HOV lanes. In addition, the roadway projects prioritization included whether projects accommodated transit and active transportation. The 2019-2050 RTP includes over $5 billion of transit projects, which amounts to 886 miles of additional transit, and over $46 million of active transportation projects, which amounts to 1,003 miles of additional active transportation facilities. With the high rate of single-occupancy vehicle travel in the Region, it is safe to conclude anyone traveling by transit, biking, or walking is taking one more car off the road thus improving congestion conditions for those who have to drive.

Freight Movement and Economic Vitality

Access to economic and educational opportunities is a goal of the Wasatch Choice 2050 Vision and freight considerations have been incorporated into the project selection and project prioritization of the 2019-2050 RTP. The 2019-2050 RTP is aligned closely with the UDOT Freight Plan, including 35 projects from the Freight Plan into the 2019-2050 RTP. There are 83 projects, or 21 percent, that directly tie to a freight center. These projects have allowed freight speeds to increase from 56 miles per hour (mph) today to 57 mph in 2050. In addition, the 2019-2050 RTP was developed with considerations for freight-oriented developments such as the Inland Port in northwest Salt Lake County.

There are two federal transit performance measures - state of good repair and safety. As the effective date for safety performance measures is after the date of adoption for the 2019-2050 RTP, safety performance measures, targets, and reporting is not included. Table 20 shows the state of good repair measures, targets, and reporting by mode.

Table 20. Federally Required Transit Performance Measures and Targets

Performance Measure	Mode	UTA Target[1]	Reported
State of Good Repair			
Rolling stock: Percent of revenue vehicles (by type) that exceeded their Useful Life Benchmark	Articulated bus Over-the-road bus Bus Cutaway bus Light rail vehicle Commuter rail locomotive Commuter rail passenger coach Van	40% 60% 60% 60% 60% 60% 60% 60%	0% 56% 19% 18% 0% 0% 0% 26%
Facilities: Percent of facilities (by group) with a condition rating below 3.0 on the Transit Economic Requirements Model scale	Passenger facilities Passenger parking facilities Maintenance facilities Administrative facilities	60% 60% 60% 60%	0% 0% 17% 4%
Infrastructure: Percent of track segments (by mode) with performance restrictions	Commuter rail Light rail Streetcar rail	40% 40% 40%	5% 27% 0%
Equipment: Percent of non-revenue vehicles (by type) that exceeded their Useful Life Benchmark	Automobile Trucks & other rubber tire vehicles Steel wheel vehicles	40% 40% 40%	0% 0% 0%

Footnotes:
1. The WFRC concurs with all UTA targets.

As shown below, UTA meets it targets for rolling stock, facilities, infrastructure, and equipment. In developing the 2019-2050 RTP, WFRC worked closely with UTA to incorporate state of good repair costs into financial planning. Costs for every transit project included the costs required to keep the project in a state of good repair until the 2019-2050 RTP horizon year. State of good repair represents approximately ten percent of all new transit project costs.

Other Transportation Performance Metrics

The way in which people choose to travel can be largely influenced by the options they have. The intent of the 2019-2050 RTP is to provide transportation choices to residents living along the Wasatch Front. By supporting people to take transit, walk, or bike for more trips, the Region will experience benefits such as decreased congestion, better air quality, and active streets. With implementation of the 2019-2050 RTP, 79 percent of the Region's population will have access to active transportation infrastructure within a quarter mile of their home and 36 percent of the Region's population will have access to frequent transit within a quarter mile of their home. This is an increase of 84 and 71 percent, respectively, when compared to today.

The increase in people living and working around transit and active transportation facilities translates to an increase in people using transit and active transportation. Based on modelling projections, it is expected that a higher percentage of people will be walking, biking, and taking transit with the implementation of the Wasatch Choice Vision than today, regardless of time of day, as shown in Table 21.

Table 21. Mode Share by Time of Day

	Existing	Wasatch Choice 2050
Daily		
Carpool	47.6%	46.8%
Single-Occupancy Vehicle	42.5%	42.1%
Auto Total	**90.1%**	**88.9%**
Train	0.9%	1.3%
Bus	0.5%	1.0%
Transit Total	**1.4%**	**2.3%**
Active Transportation	**8.5%**	**8.8%**
Peak Period		
Carpool	43.0%	42.8%
Single-Occupancy Vehicle	47.7%	46.7%
Auto Total	**90.7%**	**89.4%**
Train	1.4%	2.0%
Bus	0.8%	1.4%
Transit Total	**2.3%**	**3.4%**
Active Transportation	**7.1%**	**7.1%**
Off-Peak Period		
Carpool	50.6%	49.4%
Single-Occupancy Vehicle	39.1%	39.2%
Auto Total	**89.7%**	**88.6%**
Train	0.6%	0.9%
Bus	0.3%	0.7%
Transit Total	**0.9%**	**1.5%**
Active Transportation	**9.4%**	**9.9%**

Most TDM programs and other mode choice interventions often focus on the peak period commute, trying to reduce single-occupancy-vehicle trips to work with carpool, transit, and biking trips. Table 22 shows the peak period commute mode share, now and in 2050, and shows approximately four percent of the population switching from driving alone to another mode.

Table 22. Peak Period Home-Based Work Mode Share

	Existing	Wasatch Choice 2050
Daily		
Carpool	16.8%	18.9%
Single-Occupancy Vehicle	75.8%	71.7%
Auto Total	**92.6%**	**90.6%**
Train	2.3%	3.2%
Bus	1.1%	1.7%
Transit Total	**3.4%**	**5.0%**
Active Transportation	**4.1%**	**4.5%**

Vehicle miles traveled (VMT) is a performance metric used to measure how far people need to travel to reach destinations. Based on modelling projections, regional VMT is expected to increase from 36.1 million miles today to 57.7 million miles in 2050, or 1.9 percent per year, while our VMT per capita increases from 20.3 miles to 24.3 miles, or 0.6 percent per year. As our Region grows, we will see an increase in VMT unless dramatic changes occur in our land use, funding, and transportation policies, and, moreover, our personal transportation choices.

Social Impacts and Benefits

Transit, roadway, and active transportation projects and facilities identified in the 2019-2050 RTP are socially beneficial. Such improvements help people travel to destinations they want to reach while providing choices for how trips are made. However, the construction of projects does have the potential, without proper implementation, of having adverse social effects on existing urban areas and on future development. Negative social impacts include increased noise, neighborhood disruption, and residential and commercial dislocations.

Economic Impacts and Benefits

Consistent with the Wasatch Choice 2050 Vision, WFRC believes in a transportation network that enhances the regional economy. To this end, WFRC seeks to improve mobility and make transportation investment and land use decisions that retain and recruit businesses, labor, and keep the Region an affordable place to live and do business.

The WFRC sought feedback from the Wasatch Front Economic Development District (WFEDD) in order to gain a better understanding of transportation related economic needs, impacts, and benefits. The Comprehensive Economic Development Strategy (CEDS) is one of the three legs upon which the Wasatch Choice 2050 Vision is based. One of WFEDD objectives is to encourage development near transportation hubs and along public transit corridors. Another objective is to promote multi-modal transportation options, especially those that encourage and promote existing corridors. The State of Utah

has worked hard to improve its transportation infrastructure in order to allow Utah to better support large consumer markets and population centers.

Access to Opportunity

Improving the ability of residents to travel to job sites in a reasonable amount of time can be thought of as the basic purpose of transportation - to help people go to desired destinations and return. It is also one important measure of how well the transportation system helps the economy thrive. Improving job accessibility for homes is similar to improving labor and patron accessibility to businesses – a better score means a broader pool of potential employees, more patrons that can access a business easily, and also relates to freight movement considerations. Analysis was done on a composite network and assumed a decay function to weigh jobs - jobs that could be reached in a shorter travel time were weighed more than jobs that had a longer travel time. It was determined that implementation of the transportation and land use in the 2019-2050 RTP improves job accessibility for both roads and transit when compared to today, with an additional 46,000 jobs (26 percent increase) and 23,000 jobs (66 percent increase) accessible, for roads and transit, respectively.

Redevelopment

The center-based land use assumptions for the 2019-2050 RTP include growth of housing units and commercial space through infill and redevelopment. Over the past few years, up to 25 percent of the Region's housing growth has occurred through infill and redevelopment. The 2019-2050 RTP supports this pattern of infill and redevelopment and it is consistent with the feedback received through the planning process. Growth in infill and redevelopment helps cities and towns to remain viable while also protecting against deterioration as buildings age and become obsolete. Infill or redevelopment takes growth pressure off vacant areas and puts people and jobs close to existing infrastructure. Infill/redevelopment reduces the need to build new infrastructure, reduces average driving distances, and tends to enable more people to use transit. Fundamentally, it also improves job accessibility helping residents more easily and effectively participate in the economy.

Impacts to Title VI and Environmental Justice Populations

The WFRC considered and utilized demographic information throughout the entire 2019-2050 RTP process, including screening roadway projects that may adversely impact vulnerable populations, and planning transit and active transportation projects that would provide transportation choices in critical neighborhoods.

Supporting residents to access jobs and educational opportunities is a powerful tool to promote equity, and for helping residents to find economic opportunities and escape poverty. To understand how well the future transportation system will support residents in accessing opportunities that will promote a high quality of life, WFRC analyzed the impact the 2019-2050 RTP would have on the ability of residents living in neighborhoods with high concentrations of minority, low-income, and zero-car households (termed Vulnerable Communities) to reach employment and educational opportunities. This measure would increase by 80 percent between today and 2050 for those traveling by transit, and would increase by 31 percent for those using a car. Vulnerable communities will be able to access an average of 300,000 jobs by auto and 103,000 jobs by transit in 2050, compared to 200,000 by car and 42,000 for those living in neighborhoods without high concentrations of these populations.

Environmental Impacts and Benefits

NEPA Principles and Requirements

During the preparation of the 2019-2050 RTP, certain aspects and principles derived from the National Environmental Policy Act (NEPA) were considered and incorporated into the planning process. In total, these actions meet and exceed the federal planning and environmental requirements found in the Code of Federal Regulations (CFR) - 23 CFR Part 450.316 & 318. A number of environmental factors, or categories to be considered, and types of analyses required by NEPA were utilized, such as the manner of describing project purpose and need, safety and security, economic development, land use, alternatives analysis, and core system performance measures. Systems proposed for and projects selected for inclusion in the 2019-2050 RTP were evaluated for their potential impact on the environment.

With the retirement of the uPlan tool at UDOT, the analysis of the 2019-2050 RTP projects was limited in scope. The linkage between planning and the NEPA process, is in the accessibility of datasets, maintained by various resource agencies. As they are maintained by the responsible agencies, they are authoritative, mature, and highly available. Many of these datasets are included in the interactive map. Datasets such as archaeological resources and threatened and endangered species are access restricted by the public, and, therefore, not included in the interactive map or analysis.

Projects included in the 2019-2050 RTP have been analyzed using a high-level process in the project selection stage, as well as in the phasing stage of the RTP development. These projects will still be subjected to the rigors of a full NEPA process before design and construction can commence.

Climate Change

Local emission impacts from mobile, area, and point sources can affect climate change. By investing in transit and active transportation network development, as well as encouraging center-based land use development, emissions per capita can be reduced, which can affect climate change, at least at the local and regional levels.

Green Infrastructure

Green infrastructure is an interconnected network of natural systems that provide a diverse range of environmental, social, recreational, psychological, public health, and economic benefits. The natural systems that make up green infrastructure include features such as forest preserves, historic sites, agricultural lands, rivers, wetlands, parks, and nature reserves. The term “green infrastructure” originated in the strategic conservation planning field led by The Conservation Fund and the U.S. Forest Service. Their emphasis was primarily on forests, wetlands, and large natural areas. These agencies propose that natural systems are identified as infrastructure because they support essential ecosystem functions upon which all life depends. Large protected and connected areas are the foundation for a sustainable green infrastructure network.

Connectivity is important in planning for and upgrading man-made infrastructure (gray infrastructure) such as roads, storm drains, sewers, utilities and levees. This large scale connected approach is just as important in understanding and improving green infrastructure. An interconnected system allows for

greater vitality, value and function of ecological, hydrological, recreational, and agricultural networks, promoting the economy and contributing to the health and quality of life of residents.

Benefits of Green Infrastructure

Green infrastructure benefits a large number of people in the Wasatch Front in numerous ways. It enhances public health and safety through increased access or availability of parks, trails, walking paths, trees, recreation areas, and wildfire suppression. It can provide a natural method for capturing and cleansing drinking water and stormwater. It can promote healthy food production through increased community supported agriculture, pocket gardens, and the protection or preservation of agricultural lands and prime farmland soil. Green infrastructure can also mitigate flood hazards through the implementation of natural storm water detention basins.

Some green infrastructure benefits, such as water purification, nutrient storage and cycling, flood attenuation, soil generation, and carbon sequestration are necessary functions that otherwise would be ignored or provided by construction expensive gray infrastructure systems. The ecosystem benefits provided by green infrastructure have considerable financial value when compared with the costs of generating equivalent benefits from gray infrastructure.

Green Infrastructure and Transportation Planning

If green infrastructure and gray infrastructure are considered as two different systems within the same overarching network, then green infrastructure planning and transportation planning are simply two strategies for assessing and improving the same interconnected regional network. The tenets of green infrastructure can help transportation planners more fully understand the benefits of an integrated planning approach and vice versa. In other words, green and gray infrastructure function together; they are inherently connected, and planners should be able to draw from both fields to understand the complexities of the urban landscape and the potential benefits afforded by increased connectivity.

Air Quality Conformity Determination

Davis and Salt Lake Counties, Salt Lake City, Ogden City, and portions of Weber, Box Elder, and Tooele Counties are designated as non-attainment (or maintenance) areas for one or more air pollutants. Specifically, there are five areas in the Wasatch Front Region which are subject to air quality conformity regulations. These areas are listed in Table 23.

An analysis of projected vehicle related emissions from the transportation network, as defined in the RTP, shows that vehicle emissions will pass the conformity tests for each of the non-attainment areas along the Wasatch Front. A summary of the mobile source emission budgets as defined in the State Implementation Plan (SIP) is given in Table 22. The analysis demonstrating conformity is contained in “Air Quality Memorandum 39.”

Table 23. Wasatch Front Region Non-Attainment Designations

Area	Designation	Pollutant
Salt Lake City	Maintenance Area	Carbon Monoxide (CO)
Ogden City	Maintenance Area	Carbon Monoxide (CO)
	Moderate Non-Attainment Area	Particulate Matter (PM_{10})
Salt Lake County	Moderate Non-Attainment Area	Particulate Matter (PM_{10})
Salt Lake (including Davis, Salt Lake, and portions of Weber, Box Elder, and Tooele Counties)	Serious Non-Attainment Area	Particulate Matter ($PM_{2.5}$)
Northern Wasatch Front (including Salt Lake, Davis, and portions of Weber and Tooele Counties)	Marginal Non-Attainment Area	Ozone (O_3)

Table 24. State Implementation Plan Mobile Source Emission Budgets

Area	Pollutant	Years	SIP Budget
Salt Lake City	CO	2019-2050	278.62
Ogden City	CO	2019	75.36
	CO	2021-2050	73.02
	PM10*- NOx	2019-2050	6.92
	PM10 – Dust*	2019-2050	1.28
Salt Lake County	PM10 – NOx**	2019-2050	32.30
	PM10 – Dust	2019-2050	40.30
Salt Lake**	PM2.5 – Nox	2019-2050	89.35
	PM2.5 - VOC	2019-2050	53.55
	PM2.5 – Direct Particulates	2019-2050	7.06
Northern Wasatch Front#	O3 – Nox	2021-2050	48.64
	O3 - VOC	2021-2050	31.69

* Use “Build less than 1990” Test
**State air quality rules allows for a portion of the surplus primary PM10 budget (PM10 – Dust) to be applied to the PM10 secondary (PM10 – NOx) budget.
***Use “Build less than 2008” Test
Use “Build less than 2017” Test

Vehicle Emission Modeling

Vehicle emissions were estimated using the Environmental Protection Agency (EPA) approved MOVES2014 model. Data from the WFRC travel model was used to describe the transportation network for the analysis years 2019, 2021, 2030, 2040, and 2050. The travel model provides data for VMT distribution by hour, speed, and highway facility type for each analysis year. Local data was prepared to determine the age distribution of the vehicle fleet using Department of Motor Vehicle (DMV) data for 2017, and the vehicle type distribution using UDOT vehicle classification counts for 2017. Local emission inspection and maintenance programs for each county were also coded for input to the MOVES2014 model.

Federal Highway Administration Planning Factors

The United States Congress, through the MAP-21 and FAST Act, identified ten planning factors for consideration in the development of long-range transportation plans. These factors are designed to assist planners in developing comprehensive solutions to area transportation needs. The FAST Act planning factors for improving transportation system management, operation, efficiency, and safety are consistent with the goals and objectives of the 2019–2050 RTP. The following paragraphs list the ten planning factors and describe how the 2019–2050 RTP has considered each requirement.

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.

The 2019–2050 RTP provides a network of improved transportation facilities - roadway, transit, and active transportation - which are essential to the economic vitality of the Region. The 2019–2050 RTP calls for the modernization of a critical portion of the local interstate freeway system, an improved regional roadway network, more efficient regional commuter rail, the extension of the light rail system, strategic bus rapid transit, a core network of bus service, and robust, safe active transportation system. The 2015-2050 RTP pays increased attention to access to opportunity and the linkages between land use, economic development, and transportation. In doing so, the 2019-2050 RTP improves the ability of both the workforce to reach a higher proportion of jobs within typical commute times and businesses to reach a higher proportion of the workforce and potential patrons. This improved accessibility benefits both individuals who rely on private automobiles and for persons using public transportation. Improved local and regional accessibility and connections to large employment centers, business districts, commercial developments, industrial parks, educational institutions, neighborhoods, and area airports will promote the Wasatch Front Region's competitiveness, productivity, and efficiency.

2. Increase the safety of the transportation system for motorized and non-motorized users.

The WFRC participates as a member of UDOT's Safety Leadership Team and is a sponsor of UDOT's "Zero Fatalities" campaign. The roadway, transit, and active transportation facilities proposed in the 2019–2050 RTP will increase the safety of motorized and non-motorized users through new construction and other improvement projects. Safety was a key project selection and phasing criteria across all three modes discussed in the 2019-2050 RTP. While safety-related improvements, because of their relatively small scale, are not specifically listed or mapped, safety issues are given due consideration through WFRC's Transportation Improvement Plan (TIP) project selection criteria. Controlling facility

access, managing congestion, reducing traffic choke points, and modernizing the design of facilities improves overall network safety. The 2019–2050 RTP also includes a Regional Bicycle Facilities Plan. Improved bike routes from bike lanes to separated facilities will increase the ability to bicycle safely. One of the goals of the regional Bicycle Facilities Plan is to identify improvements that enhance the safety of bicycle travel and increase the appeal for the general population.

3. Increase security of the transportation system for motorized and non-motorized users.

The WFRC continues to coordinate its planning processes with the Utah State Division of Public Safety and Homeland Security and with the Utah Local Governments Association for Emergency Services and Security in an effort to identify security issues regarding the transportation system. Both UDOT and UTA have established plans that address emergency and security issues. The roadway, transit, and active transportation recommendations in the 2019–2050 RTP will increase security for motorized and non-motorized users through maintenance and preservation, new construction, improvement projects, and the expansion of the Intelligent Transportation System (ITS), which will help to provide alternative routes and modes, especially through confined regional corridors and area choke points and thereby decreasing the likelihood of a catastrophic system failure.

Security is an important consideration in designing and operating UTA's public transportation services. UTA employs security personnel to ensure the safety of its patrons, and has installed security cameras at stations, on all UTA buses and on most trains. Park-and-ride lots and station platforms are well lit and frequently patrolled and finally, emergency call boxes are installed at every station.

UDOT also continues to embrace security of the transportation system through improvements to their incident management practices, Utah Highway Patrol (UHP), and ITS program. Recommended improvements for the ITS including "Commuter Link" which provides valuable information to users. ITS will continue to be improved with additional sensors, and use of the 511 Travel Information Line. Integrally linked to the ITS system, the UDOT Traffic Operations Center (TOC) is able to monitor smaller traffic control centers in Salt Lake City, Salt Lake County, and UTA to improve the security of critical motorways along the Wasatch Front.

4. Increase the accessibility and mobility of people and freight.

Accessibility and mobility are at the heart of three goals of the 2019–2050 RTP:"access to economic and educational opportunities," "manageable and reliable traffic conditions," and "quality transportation choices." The roadway, transit, and active transportation improvements recommended in the 2019–2050 RTP will help improve mobility and enhance destination accessibility. Increased mobility is provided by a variety of travel options including new or widened highways, primary arterial streets, and connections across barriers; new and expanded light rail, BRT, core route bus service, more efficient regional commuter rail service, and additional mobility hubs and transit amenities, such as park-and-ride lots; and additional active transportation underpasses, overpasses, and trails. The 2019–2050 RTP anticipates an increase in the number of miles of bus service, including expansion of weekend and night routes, and additional paratransit service to major travel demand generators. Freight movement, both interstate and intrastate, will benefit from the reconstruction and modernization of the local interstate system, improvements to the regional roadway network, conversion of at-grade intersection to interchanges, and other access enhancements. The Region's highway system will continue to provide convenient access to air cargo facilities. Access to opportunity played a key role in developing and prioritizing the 2019-2050 RTP and is also integrated into the prioritization process for the TIP.

5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.

The Wasatch Choice 2050 process, which developed a Vision and key strategies for future growth, includes a significant amount of input on what kind of future development the public would like to see. One of the purposes of this effort was to identify quality of life issues and establish approaches to enhance the quality of life. The WFRC developed the 2019–2050 RTP's recommendations for roadway, transit, and active transportation improvements consistent with the Wasatch Choice 2050 growth principles and growth concepts to support a high quality of life throughout the Region. State and local plans for growth and economic development are part of the foundation of the 2019–2050 RTP transportation recommendations. The WFRC met with elected and appointed officials of every municipality and county to ensure that socioeconomic projections developed by WFRC are consistent with local plans and Wasatch Choice 2050.

Concern for the environment of the Wasatch Front Urbanized Area is an integral part of the 2019–2050 RTP planning process. Recommended facilities are considered with respect to environmental impacts at the system level, utilizing maps and other information identifying environmental concerns. As facilities are brought forward through the planning, design, and construction process, appropriate environmental reviews will be conducted. By attempting to maximize destination accessibility and minimize travel time, energy conservation is promoted through successful congestion management strategies, increased system capacity, the provision of transit alternatives, and the provision of active transportation facilities. The 2019–2050 RTP provides a number of recommendations for improved regional transit in key corridors and centers, and supports future collaborative actions to decrease SOV trips such as transit fare programs, roadway tolling, and dockless active transportation programs, as well as growth strategies such as compact, centered development. These efforts combine to enhance mobility and accessibility to home and work, while minimizing impacts on the natural environment and reducing energy use.

6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.

One of the 2019–2050 RTP's goals is "quality transportation choices," and as such the 2019-2050 RTP promotes shared opportunities for multimodal transportation by planning east-west and north-south core route and BRT service to existing light and commuter rail infrastructure, and light rail capacity and track expansions in key dense, high-growth areas. Future transit routes are coordinated in and to metro, urban, city, and village centers and industry clusters and pedestrian and bicycle connections are planned to provide safe first-/last-mile connections to transit facilities. The RTP recommends the development of intermodal centers, transit hubs, and park-and-ride lots at optimum locations to improve transfers and connectivity of the regional transportation. The RTP also recommends improvements to major freight corridors, as well build out of surface streets and railroad crossing near freight centers, to improve mobility of goods within and to and from our Region.

7. Promote efficient system management and operations.

The WFRC conducts a congestion management process that encourages implementation of transportation demand management and transportation system management strategies developed to promote efficient system management and operations. These strategies rely on specific recommendations to be implemented regionally, as well as within individual roadway and transit facilities.

Each facility type identified in the 2019 – 2050 RTP is accompanied by a list of specific methods to improve system efficiency. These lists include techniques such as access management improvements, signal coordination, and travel demand concepts designed to promote the efficient use and management of the existing and proposed transportation network.

8. Emphasize the preservation of the existing transportation system.

The financial analysis section of the 2019–2050 RTP assures that adequate funding for maintenance, operation, and preservation of roadway and transit facilities is provided. This is a priority of UDOT, UTA, and local governments. UDOT has recently updated its asset management program that identifies funding levels needed to maintain and preserve UDOT's pavements and structures, and to improve the safety of its system. These new projections of funding needed to preserve the existing system show an increase from previous estimates and are included in the financial plan. This program, combined with proper access management, incident management, and the updating of signal timing, will help preserve the existing transportation system.

The 2019-2050 RTP also recommends the future transit system maintain a SOGR, and accounts for the costs associated with constructing and maintaining new transit facilities, and the replacement of all vehicles, operational systems, stations, and guideway or track, when relevant, on a regular schedule. Funding projections for transit preservation and maintenance have been developed in conjunction with UTA, and are accounted for as project lifecycle costs through the RTP's planning year horizon. The transit portion of the 2019–2050 RTP assumes replacement of buses every 12-13 years and new rail cars every 16 years. The financial plan also recommends and accounts for the construction of additional maintenance facilities with the construction of transit projects.

9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.

The distinctive regional topography and associated climates have a conspicuous impact on the entire Wasatch Front Region in the form of natural hazards - earthquakes, landslides, flooding, heavy snowfall, wildfires, to name a few. The transportation system needs to be able to withstand and provide support when a man-made or natural disaster occurs. The 2019-2050 RTP takes a comprehensive look at resiliency in the area and where the system may fail during a disaster. In addition to disasters, a resilient system should be able to react to changes in travel patterns and influxes of users. For example, conferences, sporting events, or other large events where many people who do not normally congregate, come together all at once. The managed motorway projects, better street connectivity, a gridded transit network, and safe bicycling facilities are some of the projects planned for the future that can provide resiliency and redundancy in the system and allow the Region's communities to handle anomalies of higher travel demand.

10. Enhance travel and tourism.

Utah is a destination for business and thought leaders as well as recreators and thrill seekers. Travel and tourism accounted for $1.34 billion in state and local tax revenue in 2017. Over 19 million visitors annually travel to the state with many of those visits beginning in Wasatch Front Region, especially at the Salt Lake City International Airport. Numerous cultural events, convention centers, industry hubs, universities, professional and amateur sporting events, and outdoor recreation opportunities, including many of Utah's notable ski resorts, are available within the Region.

A visitor's ability to easily navigate, use, and be efficiently moved by the multi-modal transportation system in place is crucial to the visitor experience. The 2019-2050 RTP considers primarily intra-regional travel to ensure that visitors to the area have not only great access to local attractions, but also a choice in how they arrive. This is reflected in the road, transit, and active transportation systems that used the identified Wasatch Choice 2050 centers as a factor in prioritizing future transportation investment. Additionally, the financial analysis provides adequate funding for maintenance, operation, and upkeep of roads and transit. In certain cases, the transportation system itself is the reason for the visit. Such is the case with the Golden Spoke Network which is a series of off-street, paved pathways that make up over 100 miles of trail, the longest such trail system west of the Mississippi and can be used for both commuting and recreational activities.

Implementation of the Plan

Regional transportation planning, to be effective, is a continuous process. Implementation of the 2019-2050 Regional Transportation Plan (RTP) is a cooperative effort of local, state, and federal officials. In addition to working with various agencies and partnerships throughout the Region, the Wasatch Front Regional Council (WFRC) has established a process to continuously monitor the progress of transportation performance and the progress of various transportation improvement projects. WFRC also works with other agencies to address short-range congestion, pavement preservation, and bridge replacement and rehabilitation needs. Various corridor and environmental studies for major roadway and transit projects help to refine and implement the recommendations of the 2019-2050 RTP.

Overall, implementation of the RTP comes through funding and development of the planned projects, promoting adoption of policies by implementing agencies, and technical assistance and training to assist the implementers. Tracking or monitoring progress in turn helps inform implementation efforts and future modifications to the RTP and the underlying Wasatch Choice 2050 Vision.

Finally, the RTP will be updated every four years to consider changing development patterns, new technologies, and evolving goals and vision for the Wasatch Front Region.

Transportation Improvement Program

The WFRC's Transportation Improvement Program (TIP) is a six-year program of funded roadway, transit, and active transportation projects for the Salt Lake City-West Valley City and the Ogden-Layton Urbanized Areas. Along with numerous other projects, included in the TIP are Phase 1 projects found in the RTP for which funding has been identified. A Metropolitan Planning Organization (MPO) approved TIP is required by federal legislation for a region to receive federal highway, transit, and active transportation funding. The TIP reflects the Region's priorities, represents a consensus among state and regional officials, shows a direct relationship to the RTP, is financially constrained, and conforms with federal air quality regulations as they relate to transportation. The TIP receives public review during development. The WFRC develops the TIP in cooperation with the Utah Department of Transportation (UDOT), the Utah Transit Authority (UTA), and other agencies.

The WFRC, UDOT, and UTA have developed methods and procedures for selecting, evaluating, and prioritizing projects to be included in the TIP. The WFRC has also developed policies to guide the approval of the TIP and the project selection process required by Fixing America's Surface Transportation (FAST) Act. The WFRC TIP is a six-year process, which includes four funded years plus two years of

projects in concept development. The adoption of the TIP each year allows WFRC to monitor the implementation of recommended RTP projects and evaluate the needs of the Region's two Urbanized Areas.

WFRC-Administered Funds

Municipalities and counties in the Wasatch Front Region, UDOT, and UTA are primarily responsible for implementing the projects in the 2019-2050 RTP. The WFRC works with these agencies to encourage them to pursue the facility capital improvements identified in the RTP. WFRC is responsible for administering six programs that provide funding and resources for local governments which, in turn, help to fund and build roadway, transit, and active transportation projects found in the 2019-2050 RTP. These programs are briefly described below.

Surface Transportation Program

The Surface Transportation Program (STP) provides funding that may be used for projects on federal-aid highways and bridges, transit capital improvements and projects, and active transportation projects.

Congestion Mitigation Air Quality

The Congestion Mitigation Air Quality (CMAQ) provides funding for transportation projects that improve air quality.

Transportation Alternatives Program

The Transportation Alternatives Program (TAP) funds construction and planning of bicycle and pedestrian facilities.

Transportation and Land Use Connection Program

The Transportation and Land Use Connection (TLC) supports local governments with technical assistance to integrate land use planning and regional transportation, implementing the Wasatch Choice Vision. The TLC program is made available through a partnership with Salt Lake County, UDOT, and UTA.

Community Development Block Grant

The Community Development Block Grant (CDBG) Small Cities Program provides funding to local governments and public service providers for a variety of housing, infrastructure, public service, and community development projects that principally benefit low to moderate-income persons in Morgan, Tooele, and Weber counties, excluding the entitlement city of Ogden.

Wasatch Front Economic Development District

The Wasatch Front Economic Development District (WFEDD) is a federally recognized Economic Development District created to foster regional economic developments and assist eligible entities in developing competitive grant applications from the U.S. Department of Commerce Economic Development Administration.

Project Development

In addition to preparing the regional transportation plan, the WFRC works continuously with UDOT, UTA, and local communities on alternatives analysis, environmental studies, corridor plans, and master plan updates. These efforts help to develop and refine specific projects found in the 2019-2050 RTP. These studies achieve several important goals by:

1. Better identifying project purpose, need and scope;
2. Better identifying needed right-of-way (ROW) for projects to allow UDOT, UTA, and local communities to successfully pursue corridor preservation funding; and
3. Better identifying roadway and transit facility alignments.

These efforts enable communities to begin planning for supporting land uses at specific locations in order to better integrate transportation projects into the fabric of the Region's urban environment.

For many major roadway and transit improvements, WFRC, in cooperation with state and local engineers and planners, prepares an alternative analysis or corridor study. The purpose of an analysis study is to provide input when refining the regional transportation plan and to allow for decisions to be made on the scope of the improvement(s) during the planning process prior to project development and engineering. Several major corridors studies and alternative analyses have recently been completed or are currently underway throughout the Wasatch Front Region and the recommendations made at this stage of the planning process will aid in furthering project development and refinement. Other steps and considerations in project development are described below.

Promote 2019-2050 RTP policies

While the system improvements in the 2019-2050 RTP are limited to regional transportation infrastructure, the 2019-2050 RTP policies guide the way WFRC addresses various issues, like mitigating growth in travel demand, addressing new considerations like emerging transportation technologies, or exploring implementing actions with other entities. The WFRC will work with transportation partners and local governments to further the utilization of shared 2019-2050 RTP policies.

Systems Monitoring and Management

The WFRC annually publishes socioeconomic information for the Region including population projections for each community. The State of Utah provides both population and economic forecasts and WFRC then divides and allocates these projections for both Regional cities and the Urbanized Areas. UDOT highway traffic surveillance data, published every two years, along with periodic UTA ridership updates, also contribute information needed to update the 2019-2050 RTP. In addition, as part of the continuing planning process, WFRC and the Salt Lake City-West Valley City and Ogden-Layton Technical Advisory Committees (TACs) continue to identify and respond to transportation issues which impact their respective Urbanized Areas.

Future Plan Updates

As previously mentioned, transportation planning is a continuous process. Changing development patterns resulting from continued growth in the Region, a gradual shift toward higher density urban centers, fluctuating economic conditions, and shifting energy and environmental concerns all impact transportation needs along the Wasatch Front. The types of transportation responses needed to successfully address these changes are constantly reviewed and evaluated. In order to keep the 2019-2050RTP current, WFRC reviews the current 2019-2050 RTP itself, along with the process to develop the next RTP at least every four years providing necessary changes. The next revision to the Region's RTP is scheduled to begin in May 2019, with anticipated adoption of the 2023-2050 RTP taking place in May 2023.

During the next four years, WFRC will build upon the regional transportation planning work that has been completed. As part of the planning process, each RTP builds upon its predecessor. The future RTP planning process will include continued emphasis on understanding and linking land use with transportation and using information to refine the Region's Vision. The WFRC will monitor changing land use patterns and major new developments, including job, industrial, and special district centers. Future financial projections will depend on the United States Congress, the Utah State Legislature, local officials, and voters. As always, WFRC continues to update its planning capabilities through improvements to the Region's travel models. Incorporating the National Environmental Protection Act provision into the planning process will be another area that WFRC will continue to emphasize. Finally, WFRC will remain open to new ideas and the "best practices" available to address the future transportation issues in the most effective manner possible.

Ongoing Visioning

The WFRC developed a vision for the Region, entitled Wasatch Choice 2050, which served as the foundation for 2019-2050 RTP. The Wasatch Choice 2050 Vision, based on ten adopted Regional goals, identified growth centers, transportation networks, and open spaces to be preserved. This effort included a number of workshops, open houses, and meeting with municipal council members, local planners and engineers, and elected officials throughout the Region. Future RTP updates will include revisions to this Vision. WFRC will work closely with its partners to further refine the Vision and will continue to seek strategies and programs designed to help implement this response to anticipated growth. Discussions will focus on how the transportation system can support local and regional land use and how land use type and intensity can, in turn, support regional transportation improvements.

Changing Growth Patterns

Over the next several decades, new development and redevelopment will take place and as such will need to be considered in future transportation plans. Among the factors that will be considered are the location, size, and intensity of existing and planned urban, city, and town centers. Activity and job centers will continue to be of interest in future plans. New development will occur around light and commuter rail transit stations. Areas that have not experienced a great deal of growth, such as western Weber County, will begin to do so. Future RTPs will need to address a changing urban environment as growth takes place.

Funding Sources

The WFRC will continue to monitor funding levels for transportation improvements. Over the past several years, the Utah Legislature has significantly increased state funding for roadway improvements. Recently adopted legislation also allows greater flexibility in allocating state funding for transit. In addition, the Legislature has authorized new local option sales taxes and vehicle registration fees for roadway, transit, active transportation, and airport improvements. These funds can be used for congestion mitigation, new capacity, and corridor preservation. Future planning efforts and updates to the RTP will need to track the change in funding sources in order to take advantage of all available revenue.

New Technologies

In the summer of 2018, the Salt Lake City area was introduced to new shared, dockless mobility devices. The first devices were electric scooters which were later joined by electric bikes in the fall. Shared mobility is not new to the Region, with docked bike sharing having been in use for a number of years. Although there has been much discussion among regional partners on appropriate regulation of the new dockless devices, it is clear they are being used (data is being provided by the device deployment companies). Currently, the prevailing thought is that such devices will be accommodated within existing and planned bicycle infrastructure, rather than providing new infrastructure or encouraging them to mingle with pedestrians on sidewalks. Such dockless devices do have great potential to improve convenience for first-/last-mile connectivity to transit, in addition to providing an alternative to short vehicular trips. Also, the devices can provide additional access to opportunity by providing mobility options to underprivileged populations. The WFRC fully expects the deployment of these devices to expand to the greater Wasatch Front Region in the coming years.

This RTP addresses these uncertainties by exploring resiliency scenarios. The next RTP will more fully flesh-out the implications and appropriate policy and investment responses to these technologies. The purpose will be to improve the utility and mitigate the negative impacts.

Travel Demand Modeling

The WFRC uses travel forecasting models to project future roadway traffic and transit ridership based on existing and proposed transportation networks and forecasted land uses. These travel forecasts are used to identify needed highway and transit improvements. The WFRC will continue to upgrade its traffic modeling capabilities in order to better represent freight traffic in the travel demand modeling process and to allow for more comprehensive planning for freight demand. It is anticipated that improvement in freight modeling will be able to test the effect of different policies on freight movement throughout the Region. Other planned improvements to the travel demand models include incorporating market segmentation into trip distribution and further enhancements in the traffic assignment process.

NEPA and Planning

The utilization of the National Environmental Protection Act (NEPA)in its planning process helps to ensure that specific federal guidelines and requirements are met. The WFRC will continue to identify and evaluate multi-modal alternatives in major corridors, address environmental factors in the evaluation process, and prepare a draft purpose and need statement to be used in preparing necessary environmental studies.

Ongoing Performance Monitoring

The Wasatch Choice 2050 Vision and the 2019-2050 RTP are rooted in performance-based planning. The main outcome of these efforts is the implementation of transportation projects and land use centers to improve the quality of life in our communities. To ensure that the Region is making progress towards the goals of the Wasatch Choice 2050 Vision, WFRC, along with partner agencies and stakeholders, will monitor the progress of the Wasatch Choice 2050 Vision and associated centers. Progress monitoring will be updated at regular intervals, available online, and a report card will be included in the 2023-2050 RTP.

Acronyms

AOG: Association of Governments

APA: American Planning Association

APWA: American Public Works Association

BRT: Bus Rapid Transit

BUILD: Better Utilizing Investments to Leverage Development

Cache MPO: Cache Metropolitan Planning Organization

CanaMex: Canadian - Mexican

CDBG: Community Development Block Grant

CEDS: Comprehensive Economic Development Strategy

CFR: Code of Federal Requirements

CMAQ: Congestion Mitigation Air Quality

CMP: Congestion Mitigation Process

COG: Councils of Government

CPI: Consumer Price Index

Dixie MPO: Dixie Metropolitan Planning Organization

DMV: Department of Motor Vehicles

DWS: Department of Workforce Services

EDCU: Economic Development Corporation of Utah

EPA: Environmental Protection Agency

FAC: Freight Advisory Committee

FAST Act: Fixing America's Surface Transportation Act

FHWA: Federal Highway Administration

FRI: Farmland Reserve Inc

FTA: Federal Transit Administration

GOED: Governor's Office of Economic Development

HOV: High Occupancy Vehicle

ITS: Intelligent Transportation Systems

LTAP: Local Technical Assistance Program

MAG: Mountainland Association of Governments

MAP-21: Moving Ahead for Progress in the 21st Century Act

MPH: Miles per Hour

MPO: Metropolitan Planning Organization

NAACP: National Association for the Advancement of Colored People

NARC: National Association of Regional Councils

NEPA: National Environmental Protection Act

NHS: National Highway System

PRI: Property Reserve Inc

REMM: Real Estate Market Model

RGC: Regional Growth Committee

RGC TAC: Regional Growth Committee Technical Advisory Committee

ROW: Right-of-Way

RTP: Regional Transportation Plan

SITLA: School and Institutional Trust Lands Administration

SLCIT: Salt Lake City Intermodal Terminal

SLR: Suburban Land Reserve

SOGR: State of Good Repair

SOV: Single Occupancy Vehicle

SRTS: Safe Routes to School

STIP: Statewide Transportation Improvement Program

STP: Surface Transportation Program

TAC: Technical Advisory Committee

TAM: Transit Asset Management

TAP: Transportation Alternatives Program

TAZ: Traffic Analysis Zones

TDM: Transportation Demand Management

TDM: Travel Demand Model

TIF: Transportation Investment Fund

TIGER: Transportation Investment Generating Economic Recovery

TIP: Transportation Improvement Program

TLC: Transportation and Land Use Connection

TNC: Transportation Network Companies

TOC: Traffic Operation Center

TOD: Transit-Oriented Development

TSM: Transportation System Management

TTIF: Transit Transportation Investment Program

UAC: Utah Association of Counties

UBET: Utahns for Better Transportation

UDOT: Utah Department of Transportation

UFP: Utah Freight Plan

UHP: Utah Highway Patrol

ULCT: Utah League of Cities and Towns

ULI: Urban Land Institute

Unified Plan: Utah's Unified Transportation Plan

USDOT: United States Department of Transportation

usRAP: United States Road Assessment Program

UTA: Utah Transit Authority

Utah LTAP: Utah Local Technical Assistance Program

VMT: Vehicle Miles Traveled

WFEDD: Wasatch Front Economic Development District

WFRC: Wasatch Front Regional Council

WTS: Women's Transportation Seminar