2023-2050 Regional Transportation Plan

DRAFT FOR PUBLIC COMMENT

Acronyms

AASHTO: Association of State Highway and Transportation Officials
AGL: Above Ground Level
AOG: Association of Governments
APA: American Planning Association
APTA: American Public Transportation 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
CMAPP: Congestion Mitigation Air Quality Performance Plan
CMP: Congestion Management Plan
CMP: Congestion Mitigation Process
COG: Councils of Government
CPI: Consumer Price Index
Dixie MPO: Dixie Metropolitan Planning Organization
DMV: Department of Motor Vehicles
DOD: Department of Defense
DOT: Department of Transportation
DSRC: Dedicated Short-Range Communications
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
FLMA: Federal Land Management Agency
FRI: Farmland Reserve Inc
FTA: Federal Transit Administration
GOED: Governor's Office of Economic Development
HOV: High Occupancy Vehicle
HSIP: Highway Safety Improvement Program
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
NPV: Net Present Value
PEA: Planning Emphasis Area
PEL: Planning and Environmental Linkages
PRI: Property Reserve Inc
PTASP: Public Transportation Agency Safety Plan
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
RUC: Road Usage Charge
SFP: State Freight Plan
SGR: State of Good Repair
SHSP: Strategic Highway Safety Plan
SITLA: School and Institutional Trust Lands Administration
SLCIT: Salt Lake City Intermodal Terminal
SLR: Suburban Land Reserve
SOV: Single Occupancy Vehicle
SRTS: Safe Routes to School
STIP: Statewide Transportation Improvement Program
STP: Surface Transportation Program
STRAHNET: Strategic Highway Network
TAC: Technical Advisory Committee
TAMP: Transit Asset Management Plan
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
TRZ: Transportation Reinvestment Zone
TSM: Transportation System Management
TSP: Transit Signal Priority
TTAMP: Transit Transportation Asset Management Plan
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

Executive Summary

The Regional Transportation Plan (RTP) is where our Region's future transportation system is born. The 2023-2050 RTP sets forth the 27-year strategy for regional-scale transportation investments for all modes of transportation. The 2023-2050 RTP addresses:

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

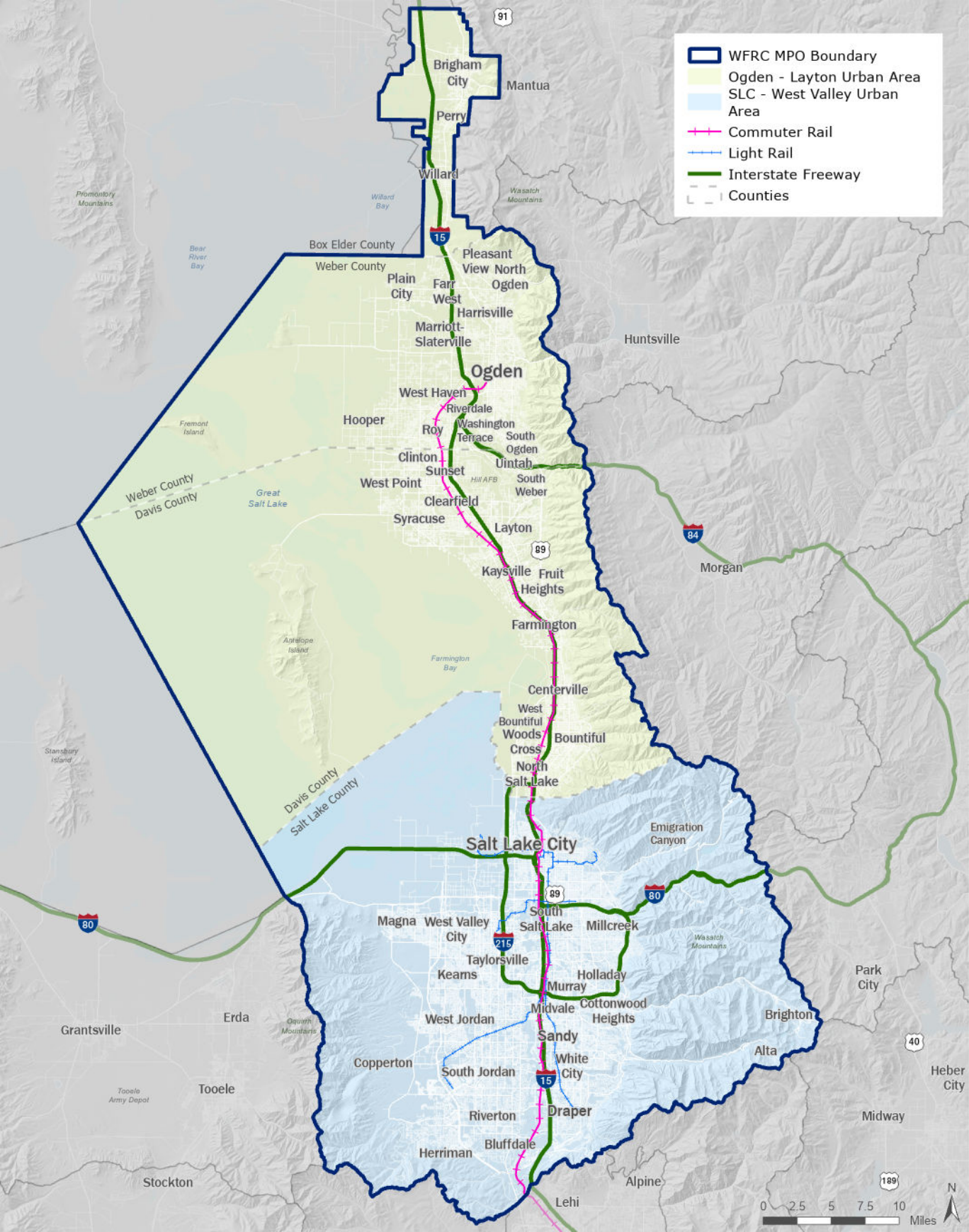
Updated every four years, the RTP also lives within an anticipated budget. Against these constraints, particular transportation projects are prioritized, so we build the most important projects first. The 2023-2050 RTP planning process is coordinated with statewide transportation partners to develop 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 2023-2050 RTP with residents, local government stakeholders, and partner agencies. The 2023-2050 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. Map 1 shows the planning boundary for WFRC.

A key aspect of the 2023-2050 RTP is that it was developed as part of a vision to improve the quality of life along the Wasatch Front known as the Wasatch Choice Vision. The 2023-2050 RTP is the transportation planning details of the Wasatch Choice Vision. This document details planned transportation investments, the process used to collaboratively arrive at those investments, the implications for our Region, and mechanisms to implement the 2023-2050 RTP.

Wasatch Choice Vision: Our Shared Blueprint

The Wasatch Choice Vision is the shared planning framework for all the communities in the WFRC Region that addresses transportation investments, development patterns, and economic opportunities. The Vision strategies and goals show how advancing the Vision can enhance quality of life even as we grow. Wasatch Choice envisions transportation investments and interrelated land and economic development decisions that achieve desired local and regional outcomes. The Wasatch Choice Vision also provides recommendations and resources to help stakeholders achieve those outcomes. The 2023-2050 RTP is the transportation-focused area of the Vision.


WFRC MPO Boundary
Ogden - Layton Urban Area
SLC - West Valley Urban Area
Commuter Rail
Light Rail
Interstate Freeway
Counties
Brigham City
Mantua
Perry
Willard
Box Elder County
Weber County
Pleasant View
North Ogden
Plain City
Farr West
Harrisville
Marriott-Slaterville
Ogden
West Haven
Riverdale
Hooper
Roy
Washington Terrace
South Ogden
Clinton
Sunset
Uintah
West Point
South Weber
Clearfield
Syracuse
Layton
Kaysville
Fruit Heights
Farmington
Centerville
West Bountiful
Woods Cross
Bountiful
North Salt Lake
Davis County
Salt Lake County
Salt Lake City
Emigration Canyon
Magna
West Valley City
South Salt Lake
Millcreek
Taylorsville
Kearns
Holladay
Murray
Midvale
Cottonwood Heights
West Jordan
Sandy
Brighton
Alta
Copperton
South Jordan
White City
Riverton
Draper
Herriman
Bluffdale
Park City
Heber City
Midway
Huntsville
Morgan
Grantsville
Erda
Tooele
Stockton
Lehi
Alpine
Promontory Mountains
Willard Bay
Wasatch Mountains
Bear River Bay
Fremont Island
Great Salt Lake
Antelope Island
Farmington Bay
Stansbury Island
Oquirrh Mountains
Tooele Army Depot
Hill AFB
0 2.5 5 7.5 10
Miles
N

The Wasatch Choice Vision is built upon four key strategies:

1. **Provide transportation choices**: offering better access to transit and bicycle facilities.
2. **Support housing options**: responding to market demands and meeting the needs of a variety of household sizes, types, and budgets.
3. **Preserve open space**: providing unparalleled access to the outdoors, which is key to our quality of life and our state's competitive advantage.
4. **Strengthen centers**: creating and enhancing metropolitan, urban, city and neighborhood centers to improve the links between economic development, transportation and housing decisions.

These strategies are used to achieve the 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.

In light of these strategies and goals, the 2023-2050 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 Choice Vision has been collaboratively developed by cities, counties, community organizations, transportation partners, businesses, the public, and many others. These groups participated in a process that explored future scenarios that articulated the trade-offs associated with different approaches to transportation and land use investments. These trade-offs were evaluated in each part of the Region, with stakeholders actively engaged in the process to select the appropriate path forward, which culminated in the Wasatch Choice Vision. The 2023-2050 RTP's planned investments and recommended policies seek to aid our Region to achieve the shared blueprint for growth.

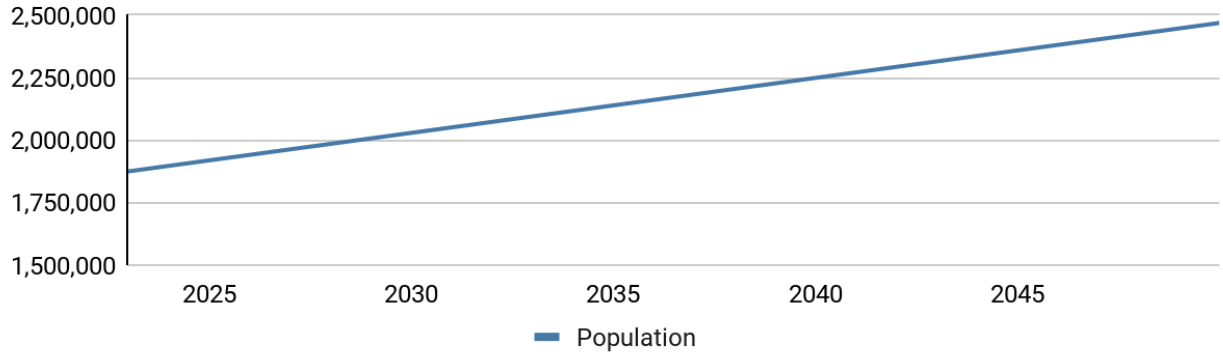
The Wasatch Front's Challenges and Opportunities

Utah continues to experience 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 the development of the 2023-2050 RTP and which the 2023-2050 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 an estimated 3.4 million now and, by 2050, it is expected to grow to roughly five million. From 2010 to 2020, the population of Utah increased at an annual rate of 1.7 percent, while the number of jobs in the state increased far more quickly, at an annual rate of 2.6 percent over the same ten-year period. Figure 1 and Maps 2 and 3 show how and where our population and employment growth is anticipated to occur. Utah's growth will largely happen in the greater Wasatch Front, where about 80 percent of our state's population is currently concentrated. Salt Lake County will continue to be the largest county in the state based on population. 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 accommodate growth?

Figure 1: Population Growth along the Wasatch Front, 2023-2050

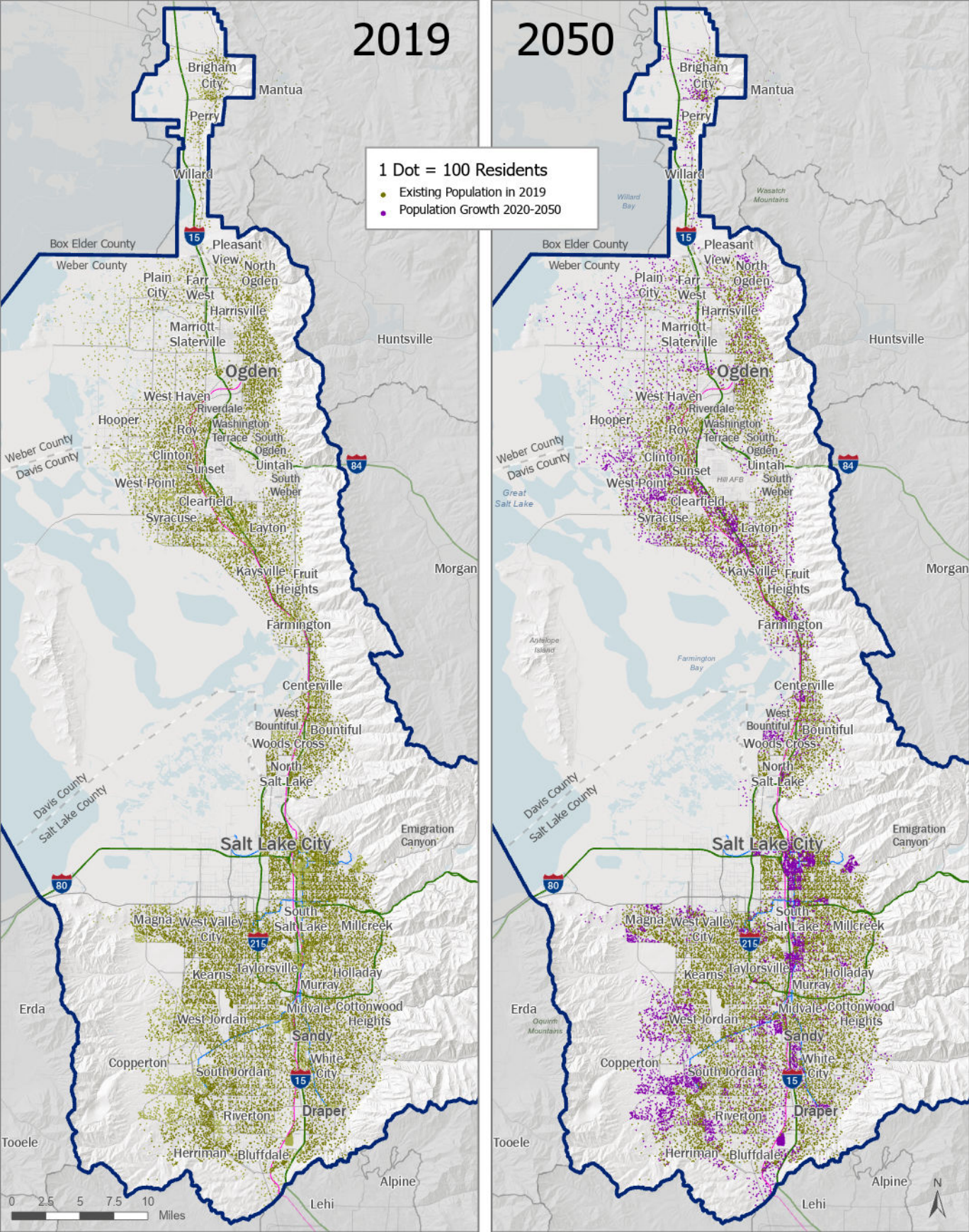


Source: Statewide Travel Demand Model

Mobility

Between now and 2050, the population in the WFRC planning area is expected to increase 32 percent, from approximately 1.9 million to approximately 2.5 million. This additional population, as well as our current population and visitors, will need to travel to jobs, education, recreation, visit friends and family, and other daily activities. It is the goal of the Wasatch Choice Vision for this travel to be reliable, manageable, accessible to destinations, multimodal, and safe. This projection suggests the need to build more road capacity in order to lessen delays; however, investments on roadways alone will not be sufficient. Optimizing our existing system through travel demand management and improved transportation choices can also lessen travel delays. 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.

Transportation demand can also be serviced by our transit system. Figure 2 shows the Utah Transit Authority's (UTA) existing ridership by mode, which demonstrates that the multi-modal transit system supports approximately 152,000 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 2023-2050 RTP explores a variety of modes of travel and ways to reduce growth of travel demands on roadways.


2019
2050
1 Dot = 100 Residents
Existing Population in 2019
Population Growth 2020-2050
Brigham City
Mantua
Perry
Willard
Box Elder County
Weber County
Pleasant View
North Ogden
Plain City
Farr West
Harrisville
Marriott-Slaterville
Huntsville
Ogden
West Haven
Riverdale
Washington Terrace
South Ogden
Hooper
Roy
Clinton
Sunset
Uintah
South Weber
West Point
Clearfield
Syracuse
Layton
Kaysville
Fruit Heights
Morgan
Farmington
Centerville
West Bountiful
Bountiful
Woods Cross
North Salt Lake
Davis County
Salt Lake County
Salt Lake City
Emigration Canyon
Magna
West Valley City
South Salt Lake
Millcreek
Kearns
Taylorsville
Holladay
Murray
Midvale
Cottonwood Heights
West Jordan
Sandy
White City
Copperton
South Jordan
Riverton
Draper
Erda
Tooele
Herriman
Bluffdale
Alpine
Lehi
Willard Bay
Wasatch Mountains
Great Salt Lake
Hill AFB
Antelope Island
Farmington Bay
Oquirrh Mountains
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Miles
N

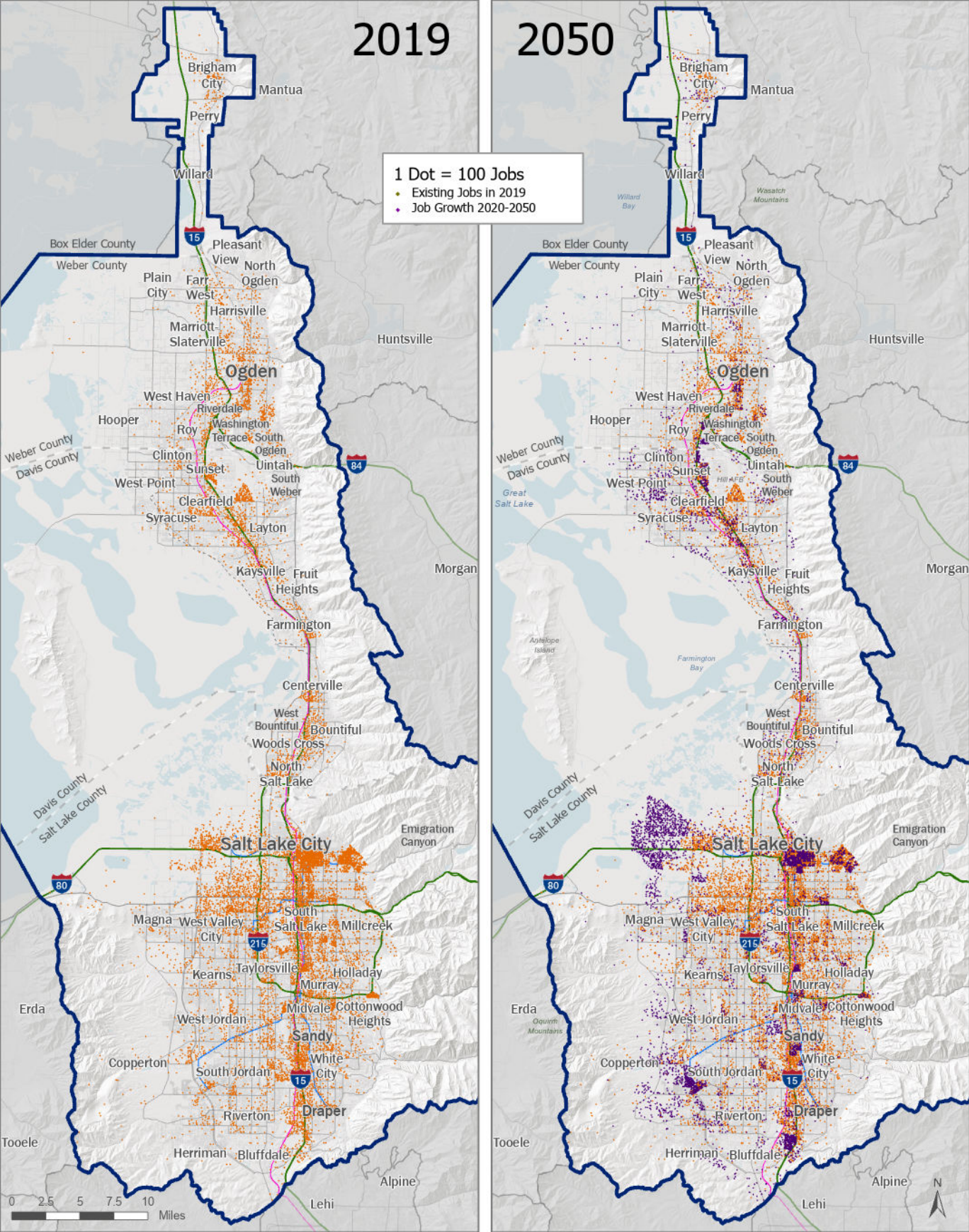
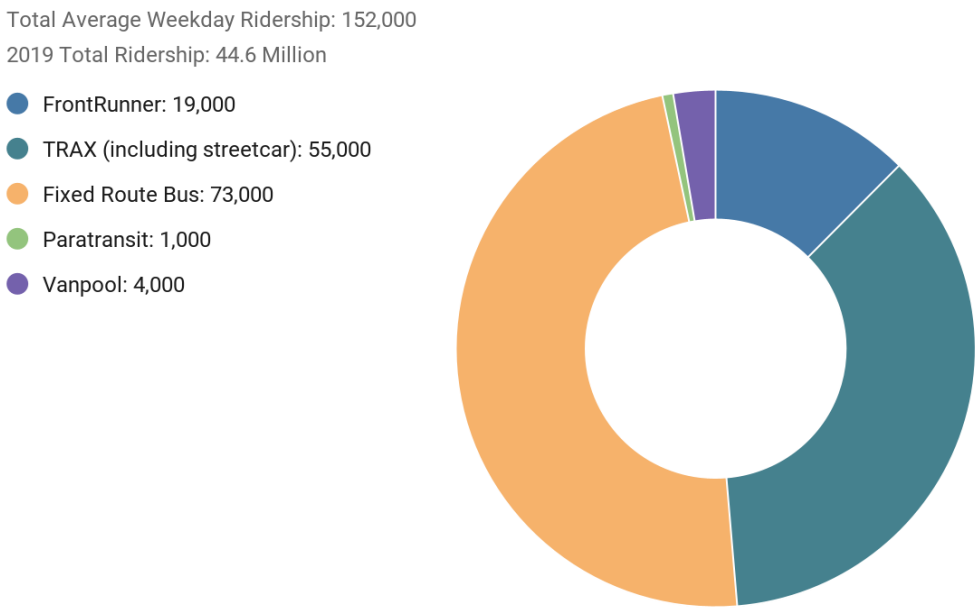

2019
2050
1 Dot = 100 Jobs
Existing Jobs in 2019
Job Growth 2020-2050
Brigham City
Mantua
Perry
Willard
Box Elder County
Weber County
Pleasant View
North Ogden
Plain City
Farr West
Harrisville
Marriott Slaterville
Huntsville
Ogden
West Haven
Riverdale
Hooper
Roy
Washington Terrace
South Ogden
Clinton
Sunset
Uintah
West Point
South Weber
Clearfield
Syracuse
Layton
Kaysville
Fruit Heights
Morgan
Farmington
Centerville
West Bountiful
Bountiful
Woods Cross
North Salt Lake
Davis County
Salt Lake County
Emigration Canyon
Salt Lake City
Magna
West Valley City
South Salt Lake
Millcreek
Kearns
Taylorsville
Holladay
Murray
Midvale
Cottonwood Heights
West Jordan
Sandy
White City
Copperton
South Jordan
Riverton
Draper
Erda
Tooele
Herriman
Bluffdale
Alpine
Lehi
0 2.5 5 7.5 10
Miles
N

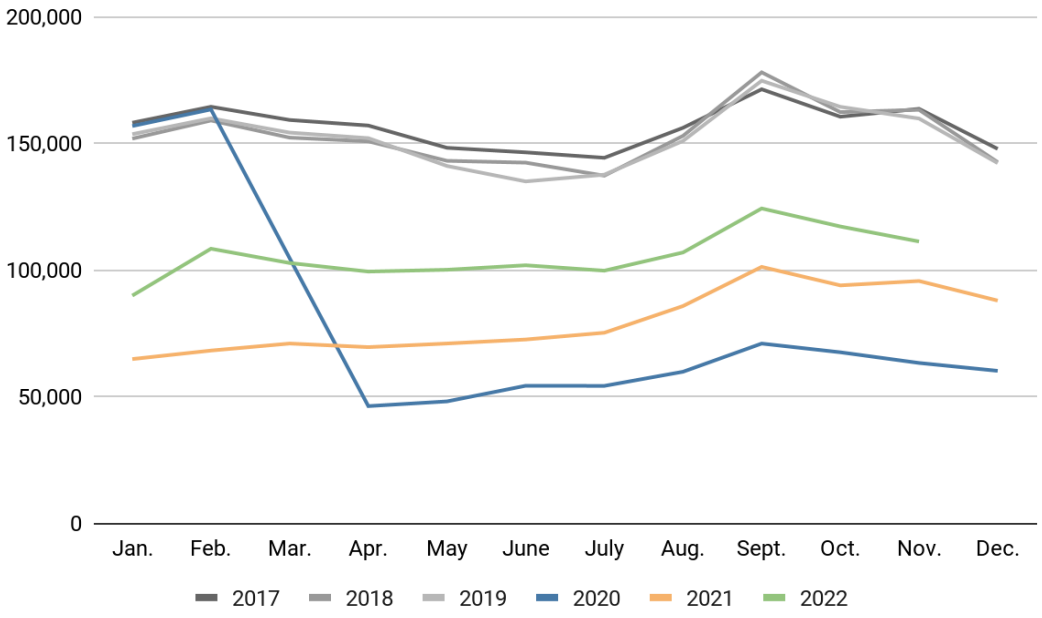
Figure 2: Transit Ridership by Mode



Source: UTA Ridership Portal, National Transit Database

Figure 3 shows systemwide average weekday boardings for years 2017 through 2022. The sharp dip in 2020 is from the COVID-19 pandemic. Following 2020, ridership has begun to steadily increase as people return to work, school, and other in-person obligations.

Figure 3: Systemwide Average Weekday Boardings,2017-2022



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 worked together to research the effects of these technologies and to begin to implement them. More about this work can be found in Chapter 3: Explore External Forces and Forward-Thinking Transportation Policies.

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

Affordability

Home prices have been increasing substantially faster than growth in incomes[1]. By the end of 2020, the median home price in Utah had reached $380,000, pricing out 48.5 percent of Utah households. As prices accelerated in 2021, now more than half of Utahn households can now no longer afford a median-priced home. For renters, the path to ownership has narrowed even further. In 2021, approximately 73 percent of renter households were priced out of the median home price.

While there are many factors that affect housing affordability, the availability of lower cost housing types like small lot single family homes, townhouses, apartments, and condominiums can aid in meeting our housing affordability needs. How might the Wasatch Choice Vision affect the availability of housing choices that are in alignment with prevailing incomes?

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, households along the Wasatch Front spend 24 percent of their income, or over $18,000, on transportation. Transportation expenses are largely a function of housing and employment locations and availability of transportation choices in the areas in which people live and work. How might the 2023-2050 RTP help improve housing and transportation affordability?

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. A recent report[2] by the Utah Department of Environmental Quality states that: "Air quality along the Wasatch Front during winter months shows a clear trend of continued improvement over the past two decades despite a period of unprecedented growth in population and economic activity in the state. All nonattainment areas have now met the 2006 federal standard for fine particulate matter ($PM_{2.5}$)." In addition, four of Utah's five gasoline refineries are now producing Tier 3 fuels. 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 response to "what could most improve your area as a place to live?" Surveys conducted for the Point of the Mountain Commission by Envision Utah show that 69 percent of surveyed employees who work in or around Silicon Slopes stated that air quality was the top reason they might choose to leave Utah. Figure 4 shows estimated air pollutants for 2026[3] by source and indicates that transportation accounts for 22 percent of

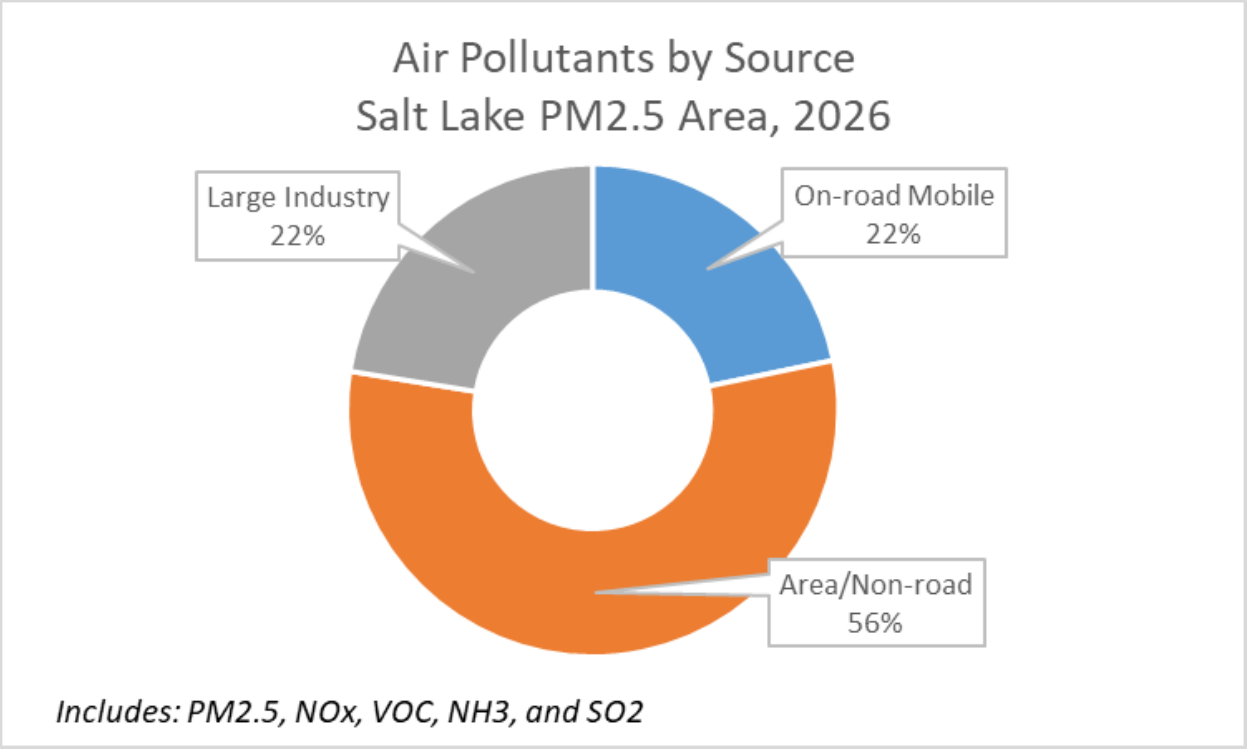
[1] Kem C. Gardner Policy Institute. "The State of the State's Housing Market." October 2021. **https://gardner.utah.edu/wp-content/uploads/StateOfState-Oct2021.pdf?x71849**

[2] Utah Department of Environmental Quality. "Utah's Air Quality: 2022 Annual Report." https://documents.deq.utah.gov/air-quality/planning/DAQ-2023-000445.pdf

[3] Utah Department of Environmental Quality, PM2.5 Maintenance Plan, Salt Lake Area, December 2019, p.39.

our air pollutants. How should the 2023-2050 RTP address transportation-related air emissions which contribute approximately to one fourth of overall emissions?

Figure 4: Air Pollutants by Source[4]



Organization of the 2023-2050 RTP Document

The process to develop the 2023-2050 RTP followed four major stages, integrated with the development of the Wasatch Choice Vision. After the executive summary, the 2023-2050 RTP document begins with the story of these stages.

First, Explore.

Transportation is changing. External forces and forward-thinking transportation policies were explored with stakeholders. Scenarios were used to understand the potential implications of different decisions we might start making today.

Second, Choose.

Our Region chose a desired future or vision. The 2023-2050 RTP aims to improve our Region's transportation system and quality of life through a two-pronged approach - optimization and enhancement. The Vision was refined to include policies to optimize our transportation system, while enhancement focuses on new infrastructure.

[4] Utah Department of Environmental Quality. "Understanding Utah's Air Quality." https://deq.utah.gov/communication/news/understanding-utahs-air-quality#:~:text=Sources%20of%20NOx%20pollution%20include,a%20direct%20component%20of%20PM2.

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 2023-2050 RTP.

Lastly, Implement.

An implementation section outlines mechanisms to turn the 2023-2050 RTP into reality.

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

Utah's Unified Transportation Plan

The WFRC 2023-2050 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), the Utah Department of Transportation (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 2023-2050 RTP seeks to advance ten regional quality of life goals.

On October 27, 2016, WFRC adopted the Wasatch Choice Vision 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 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 2023-2050 RTP in each step: Explore, Choose, Prioritize, and Implement. The ten goals 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 RTP aims to achieve the ten goals for the population in general and for a key vulnerable subset of the population. The WFRC works to ensure that "Equity Focus Area Communities," whose mobility and accessibility needs are acute, benefit from high levels of transportation choice and job accessibility. Equity Focus Area Communities primarily include low-income populations and minority populations. The WFRC defines Vulnerable Communities as Census tracts with any combination of the following: greater than 25 percent low-income and/or greater than 40 percent minority populations and ten percent zero-car households.

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 2023-2050 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.

Regional Transportation Plans should also integrate the priorities, goals, countermeasures, strategies, or projects from the:

- Strategic Highway Safety Plan (SHSP)
- Highway Safety Improvement Program (HSIP)
- Public Transportation Agency Safety Plan (PTASP)
- Transportation Asset Management Plan (TAMP)
- Transit Transportation Asset Management Plan (TTAMP)
- State Freight Plan (SFP)
- Congestion Management Plan (CMP)
- Congestion Management Air Quality Performance Plan (CMAQPP)

The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) Offices of Planning jointly issued updated Planning Emphasis Areas (PEAs) in December 2021. These PEAs include:

- Tackling the Climate Crisis - Transition to a Clean Energy, Resilient Future;
- Equity and Justice40 in Transportation Planning;
- Complete Streets;
- Public Involvement;
- Strategic Highway Network (STRAHNET)/US Department of Defense (DOD) Coordination;
- Federal Land Management Agency (FLMA) Coordination;
- Planning and Environment Linkages (PEL); and
- Data in Transportation Planning.

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 2023-2050 RTP was developed with a focus on meeting national goals and agency targets. More detail on how the 2023-2050 considers planning factors and emphasis areas, integrates related plans, and meets federal performance standards can be found in the Chapter 10: Present Impacts and Benefits.

Key Recommendations

The 2023-2050 RTP includes improvements that optimize and enhance the transportation system. This includes both policies that guide the way WFRC addresses various issues and regional transportation infrastructure. Policies include principles that guide the 2023-2050 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. Policies also suggest implementing actions by other entities that would significantly affect mobility, accessibility, and quality of life along the Wasatch Front. Regional infrastructure improvements include enhancements such as building additional roads, transit lines, and trails. Overall, the 2023-2050 RTP seeks to help improve the resiliency of the Region in the face of economic, technological, and environmental uncertainties.

Policies for System Optimization

System improvements focus on the capacity and operations of regional transportation infrastructure. There are many other ways that can help connect us to the places we need to go in addition to the form and function of regional facilities. Policies can help us optimize our complementary system of transportation and land use, address new considerations like emerging transportation technologies, and suggest implementing actions with other entities that would significantly affect mobility, accessibility, and quality of life in the Wasatch Front (again, that complement efforts to implement regional transportation infrastructure changes).

Below are key considerations in the exploration of policies - issues or outcomes that policy concepts should build upon or advance. The section also includes a list of specific policy concepts that are further articulated in Chapter 6: Optimization in the Preferred Scenario.

Key Considerations for the Exploration of Policies

Each policy concept being explored will seek to consider or advance the following key considerations.

1. Ensure State of Good Repair

Proper repair and regular maintenance of transportation facilities for all modes should be a high priority for any authority responsible for such facilities.

Potholes and uneven pavement are daily reminders of the importance of the maintenance and preservation of our transportation system. The UDOT and local communities invest heavily in the preservation of the roadway system. Good roads cost less. The UDOT includes and prioritizes pavement preservation and structures maintenance projects in its Statewide Transportation Solutions Plan.

The UTA recognizes the need to maintain and operate all elements of the transit system in a safe and efficient manner.

For active well-kept sidewalks, shared-use paths, bike lanes, among other facilities, provide reliability, comfort, and safety to users.

Policy concepts should help advance the key consideration of ensuring a state of good repair.

2. *Mitigate growth of travel demand*

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

Transportation infrastructure is generally 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 by enabling trips to be accomplished more easily. 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.

Policy concepts should mitigate growth in travel demand in ways that maintain or improve the health of the economy.

3. *Explore use of pricing to improve mobility*

The WFRC explores the use of pricing strategies as a way to improve the 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 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, to an extent, harms the economy. Businesses 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 financial expenditure of the toll. 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.

Policy concepts should explore the potential that pricing strategies have to help our economy function better, improve mobility, and further enhance access to opportunities.

4. *Improve fit between transportation and 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 of people. 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.

Policy concepts should seek to improve the fit between transportation and desired nearby land use.

5. Consider long-term needs of all 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 individual modal elements, as outlined in the 2023-2050 RTP.

This includes the needs of people driving, transporting freight, taking transit, bicycling, and walking, as is appropriate. When practical, the timing of construction should consider ways to reduce the aggregate costs of all anticipated improvements of each applicable transportation mode.

Policy concepts should advance this consideration.

6. 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 likely face a variety of shocks to the economy and environment over the 2023-2050 RTP horizon. Any region that is built to only thrive under average or optimal conditions is vulnerable to unusual or significantly negative conditions. We have to develop a transportation system that thrives in a variety of conditions.

Resiliency efforts help the Region protect assets and people from disasters like a changing climate, earthquakes, floods, landslides, and fires as well as prepare for economic recession.

Policy concepts should advance this consideration.

7. Link planning with project development

The WFRC will continue to explore with UDOT and UTA ways to better connect the 2023-2050 and future RTPs 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.

Specific policy concepts should be implemented in ways that help link planning with project development.

8. Maximize the value of emerging technologies

The WFRC, along with its transportation partners, 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 that may accrue 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: life changed in a myriad number of ways, some 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 the net impact of emerging technologies.

Policy concepts should maximize the value of emerging technologies.

Forward Thinking Transportation Policy Areas

Policy areas that consider or address the above key considerations include the following: congestion pricing, curbside management, local street design modifications, managed lanes, parking modernization, road usage charge, street connectivity, transit priority, and zero-fare transit. These nine policy areas are in various stages of implementation. How these were arrived at is articulated in Chapter 3: Explore External Forces and Forward-Thinking Transportation Policies. A status report and next steps for these policies is articulated in Chapter 6: Optimization in the Preferred Scenario.

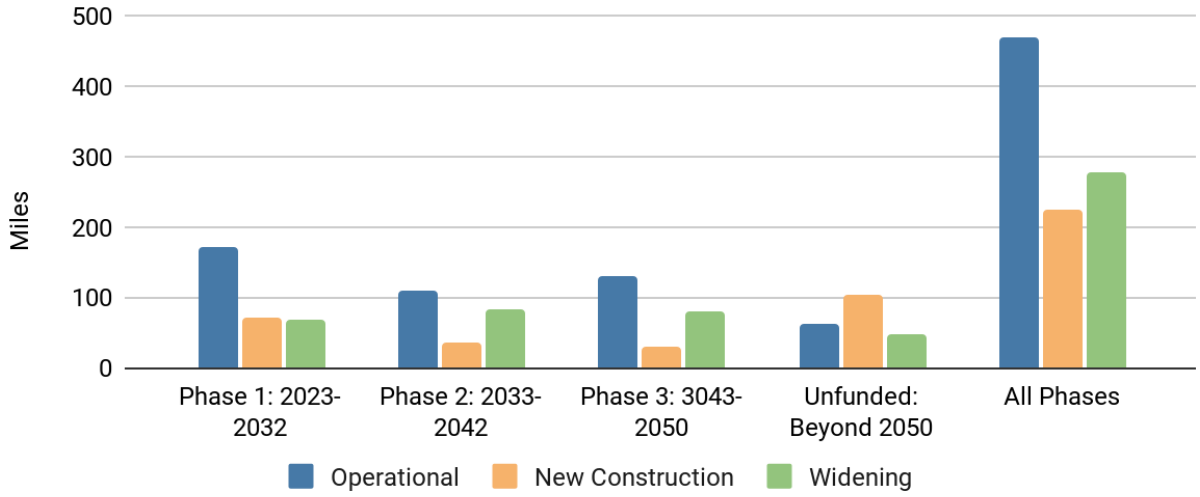
System Infrastructure Enhancements

Roadway System Improvements

Programmed roadway improvements in the 2023-2050 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; new freeways like the Mountain View Corridor; and conversions from an arterial to freeway such as Bangerter Highway. These large-scale projects will help accommodate the growing travel demand throughout the Region.

The 2023-2050 RTP includes capacity and operational improvements to existing surface roads, such as realigning Midland Drive in Weber County, improving operations on 11400 South and 13400 South in Salt Lake County, and preserving mobility on east-west connectors between I-15 in Davis County. The 2023-2050 RTP also identifies 25 grade-separated crossings over railroads and interstates to improve mobility and reduce barriers. Improving connectivity is a key component of the 2023-2050 RTP and included are 151 new construction projects that either complete existing gaps or provide greater localized connectivity, or extend the roadway network. There are approximately 463 roadway projects in the 2023-2050 RTP at an estimated total cost of $23.6 billion, in 2023 dollars. The 2023-2050 RTP identifies that these projects will be built within one of the three financial phases within the 2023-2050 RTP (Phase 1: 2023-2030, Phase 2: 2031-2040, Phase 3: 2041-2050). Figure 5 shows miles of planned roadway facilities in the 2023-2050 RTP by phase and project type. While existing and assumed new funding sources are projected to be available for the majority of the proposed prioritized projects, there is estimated $6.2 billion, in 2023 dollars, of unfunded needs.

Figure 5: 2023-2050 RTP Miles of Planned Roadway Projects by Type



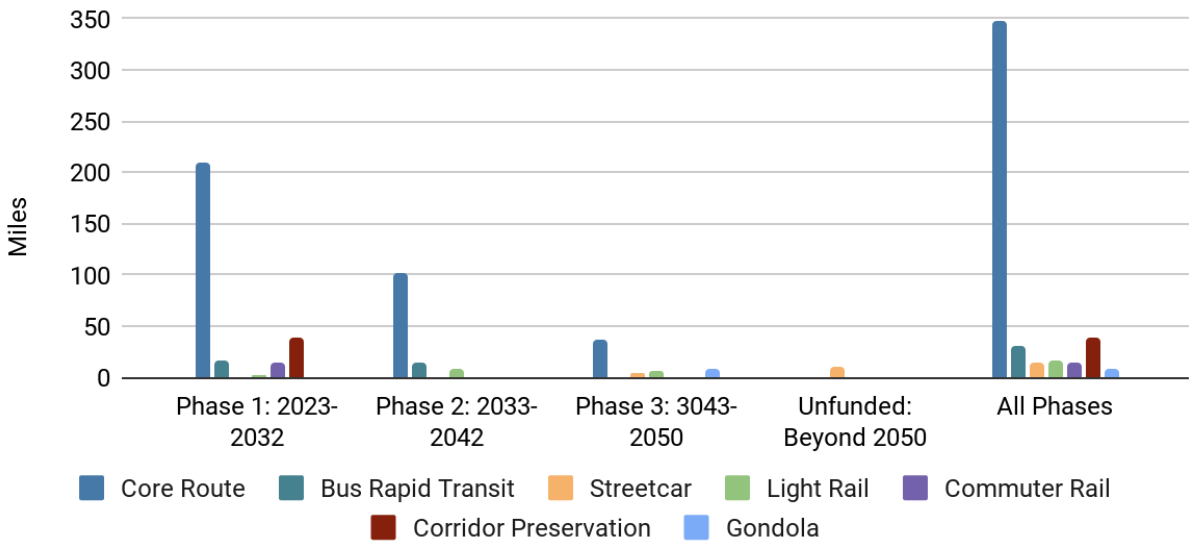
Transit System Improvements

The 2023-2050 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 bus rapid transit (BRT) projects on State Street in Salt Lake County and to the rapidly growing Point of the Mountain area, improvements to regional commuter rail (FrontRunner), and special service bus routes serving key recreational opportunities in Big and Little Cottonwood Canyons.

The 89 prioritized transit projects in the 2023-2050 RTP are estimated to cost $8.8 billion, in 2023 dollars, to construct, operate and maintain with projected available revenues. The 2023-2050 RTP identifies that these projects will be built within one of the three financial phases within the 2023-2050 RTP (Phase 1: 2023-2030, Phase 2: 2031-2040, Phase 3: 2041-2050). It is estimated that there will not be available revenues to construct an additional five needed transit projects costing approximately $1.345 billion to construct by the year 2050. These five projects are referred to as "unfunded" within the 2023-2050 RTP. Figure X shows the miles of planned transit projects by phase and type included in the 2023-2050 RTP.

UTA is developing a Long Range Transit Plan (LRTP) that will complement WFRC's RTP. The LRTP will have both a regional and local focus while breaking down project costs, operations and maintenance, and support. Both the RTP and the LRTP have a four-year planning cycle, are community and data driven, and look approximately 30 years into the future. UTA and WFRC will collaborate on the LRTP just as they do on the RTP.

Figure 6: 2023-2050 RTP Miles of Planned Transit Projects



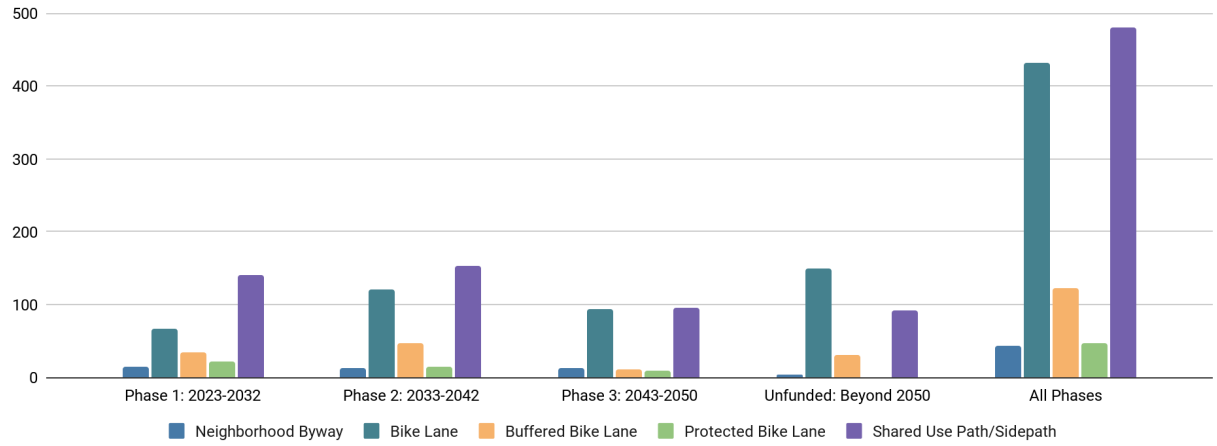
Active Transportation Improvements

In all, 671 active transportation line projects, making up over 1,200 miles of linear regional bicycle infrastructure, are planned through 2050 at a cost of about $1 billion, in 2023 dollars. New, safe, shared use paths, such as the Eagle Mountain Trail in Box Elder County, Three-Gate Trail in Weber County, Davis-Weber Canal Trail in Davis County, and Utah Distribution Canal Trail in Salt Lake County, account for 450 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 104 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 $340 million, in 2023 dollars. Please note that sidewalk infrastructure projects and costs are not identified in the 2023-2050 RTP.

The 2023-2050 RTP phases active transportation projects in ten year increments according to the same timeline as transit and roadway projects (Phase 1: 2023-2030, Phase 2: 2031-2040, Phase 3: 2041-2050). For the first time, active transportation projects have not only been identified by need within the three phases, but also by fiscal constraint according to projected revenues. Figure 7 shows the number of miles of planned regional bicycle network by phase and type in the 2023-2050 RTP.

Many studies have made it clear that in order to increase the number of people biking, networks need to provide high comfort facilities that provide real and perceived safety from vehicular traffic. While all facilities identified in the 2023-2050 RTP have their place, facilities such as shared use paths and protected bike lanes enable people of all ages and abilities to participate in active travel in a safe manner.

Figure 7: 2023-2050 RTP Miles of Planned Regional Bicycle Network by Type



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 2023-2050 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.

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, IIJA, and Clean Air Acts) as well as guidance provided by the US Department of Transportation (USDOT), 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 9 of the Wasatch Front Travel Demand Model (TDM) was used for the 2023-2050 RTP and will be the version released for official use coinciding with the formal adoption of the 2023-2050 RTP document. The travel model includes the phased, fiscally-constrained 2023-2050 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, 2019. 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 2.0. The WFRC/MAG REMM relies on the 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 exercise;
- A synthesized household population dataset for the model's base year (2019) 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 sync with the four-year RTP cycle. These models serve the 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.

Impacts and Benefits

The Wasatch Front 2023–2050 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 2023–2050 RTP, as described earlier, helped form the basis for this evaluation. The 2023–2050 RTP was also analyzed with regard to its conformity with state air quality plans, potential mitigation measures to minimize project impacts, and other factors.

Regional Performance Measures

Performance measures were carefully chosen to give decision makers the opportunity to compare how well the 2023–2050 RTP supports their values and goals. Table 1, organized by regional goal, compares today's conditions with two future scenarios: a future if we build currently funded transportation projects and then make no additional transportation investment, and a future in which the Wasatch Choice Vision is implemented considering future transportation disruptions and additional transportation projects found in the 2023-2050 RTP. More detail about regional performance measures can be found in the Chapter 10: Present Impacts and Benefits.

Implementation

Regional transportation planning, to be effective, is a continuous process. Implementation of the 2023-2050 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 2023-2050 RTP.

Overall, implementation of the 2023-2050 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 2023-2050 RTP and the underlying Wasatch Choice 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.

Table 1. Regional Performance Measures Summary

Metric	Measure		Today	Current Path to 2050	Wasatch Choice Path to 2050
Goal: Access to economic and educational opportunities					
Access to Opportunities	The number of jobs and households that are accessible within a typical commute.	Auto	226,000	244,000	294,000
		Transit	14,000	18,000	24,000
	Auto:transit access to opportunities ratio		16.3	13.7	12.4
Goal: Manageable and reliable traffic conditions					
Freight delay	Hours of total truck delay per day.		98,000	147,000	126,000
Freight speed	The average truck speed on freight corridors in the evening commute.		41 mph	35 mph	39 mph
Auto Travel Time	The time per day spent traveling in a vehicle.	Region	1,047,000	1,589,000	1,518,000
		Avg. Driver	0:55	1:05	1:02
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	16%	16%	32%
		Bike	58%	55%	82%
Walk and Bike Use	The number of trips per day that residents travel by active transportation.	Trips	1,165,000	1,647,000	1,569,000
		Mode Split	12.0%	12.0%	12.1%
Transit Use	The number of trips per day that residents travel by transit.	Trips	128,000	240,000	339,000
		Mode Split	1.3%	1.8%	2.5%
Goal: Clean Air					
Air Quality	The miles of vehicle travel taken in the Region per household.		65.6	55.3	59.6

Funding and Project Development

The implementation of the roadway, transit, and active transportation projects of the 2023-2050 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 Surface Transportation Program (STP), Congestion Mitigation Air Quality (CMAQ), Transportation Alternatives Program (TAP), and Carbon Reduction Program (CRP); 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 programming and funding of various transportation projects is the responsibility of the WFRC short-range planning effort, which develops and utilizes the Transportation 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. An 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 2023-2050 RTP.

Transportation and Land Use Connection Program

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

Promote 2023-2050 RTP Policies

The 2023-2050 RTP contains various transportation-related policies to optimize our transportation system in addition to enhancements to regional transportation infrastructure. The 2023-2050 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 2023-2050 RTP policies.

Wasatch Choice Great Streets

Wasatch Choice seeks to coordinate transportation and land use to maintain overall quality of life. The RTP carries this broad goal to the design and function of regional transportation projects, encouraging these projects to work with envisioned land use, especially the designated Wasatch Choice Centers. This new effort is called the Wasatch Choice Great Streets. Wasatch Choice Great Streets will be incorporated into the RTP upon its completion in Spring 2023. It will put forward initial guidance for local governments and UDOT to jointly consider as RTP projects are designed and constructed within Wasatch Choice Centers. Wasatch Choice centers are focal points for economic development and welcome a variety of transportation choices. As such the design and function of regional transportation facilities should support those two objectives (economic development and transportation choices).

EXPLORE

1: Establish Goals

Wasatch Choice Vision

Because development patterns and transportation improvements affect each other, local governments and regional transportation agencies need 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 Vision.

Our quality of life is impacted by growth patterns, how the Region is served by the transportation system, and the availability of open space. 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 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, where we anticipate growth of well over a million more residents by 2050.

Visioning Process

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.

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.

In early 2018, our local communities refined the draft Vision Map through sub-region meetings and consultation with local city planners. All told, the Wasatch Choice Vision has been built through extensive engagement with local governments, stakeholders, and the public. In May of 2018, WFRC endorsed the Wasatch Choice Vision. Below are the elements of the Wasatch Choice Vision that were considered for endorsement.

ABCs of the Vision

A 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 Vision Map is a blueprint for regional transportation, land use, and open and public spaces. It considers how these elements should work together geographically. Overall, the Wasatch Choice 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 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 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.

Strengthen Centers

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 2023-2050 RTP, 2023 Comprehensive Economic Development Strategy (CEDS), and will be considered for local land use and economic development implementation.

Emphasis on Growth Centers

A key ingredient of the Wasatch Choice 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. 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;
- » 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.

On average, 28 percent of all new residential development and 65 percent of all multifamily residential development in the Wasatch Choice Vision is in the form of mixed-land uses, such as a neighborhood, city, or urban centers. The Wasatch Choice 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. About 30 percent of proposed new housing and a quarter of proposed new employment would take place on land that was developed before 1990. This signifies an interest in the gradual evolution of some commercial areas.

Preference for a Variety of Housing

The Wasatch Choice Vision advocates that neighborhoods maintain much of their current ambience, but with a notable increase in the variety of housing options. During Wasatch Choice Vision workshop exercises conducted to explore housing type preferences, the average housing mix specified by participants was averaged 60 percent detached, stand-alone homes; 25 percent townhouses; and 15 percent apartments or condominiums (the urbanized portions of the Wasatch Front in Davis, Salt Lake, and Weber currently consists of 65 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

Approximately forty-five percent of all transportation comments received during the RTP process represented bike and pedestrian routes, indicating the popularity of these options. The Wasatch Choice Vision includes an extensive system of bike and pedestrian routes that should be encouraged to promote flexibility in transportation choices and to encourage healthy recreational activities.

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 Vision suggests that these centers should absorb some of the expected growth and expand to provide ever-broadening choices to residents.

The Wasatch Choice 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. The 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. The area acts as the region's primary transit hub, and is also supported by a variety of streets, major freeway access, and walking and biking facilities.

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 are served by a variety of walkable major and local roads. They typically benefit from freeway access, as well as high-capacity, high-frequency transit and bicycle facilities. 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. This area is served by a variety of streets that typically include high-capacity transit and bicycle facilities.

Neighborhood Center

A neighborhood center typically revolves around a store or a civic building like a library. The typical building scale varies from one- to three-stories tall. Housing types within this center range between small apartments, townhouses, and small-lot single unit homes. Neighborhood centers are typically located on walkable streets, often with frequent bus service, and bicycle facilities.

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.

Wasatch Choice Vision 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 Vision and 2023-2050 RTP, and inform 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 Vision.

Wasatch Choice Vision goals, shown in Figure 8, 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, in addition to the goals of partner transportation entities, including UDOT and UTA. During development, these goals were discussed and reviewed by the Regional Growth Committee and its Technical Advisory Committee, transportation partners, businesses, and stakeholders. On October 27, 2016, the Council adopted the Wasatch Choice Vision goals.

Figure 8: Wasatch Choice Vision Goals

2: Public Involvement Process

Building on community values through an extensive public input process, the Wasatch Choice Vision and 2023-2050 RTP 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 Vision plans for the Region's transportation future through 2050. This locally driven, regionally significant process Iis key to the success to the creation of a framework that identifies, selects, and prioritizes projects in the 2023-2050 RTP.

Public Involvement Framework

Key stakeholders are integral to achieving the Wasatch Choice Vision and the 2023-2050 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 the 2023-2050 RTP 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 role of various stakeholders in the development of the 2023-2050 RTP.

Table 2. Stakeholder Tiers

Stakeholder		
Tier 1 Stakeholder	Elected Leaders and Partners	Decision makers such as elected officials, staff, and transportation agencies that participate directly in the 2023-2050 RTP creation
Tier 2 Stakeholder	Community and Industry	Freight Stakeholder Group, Wasatch Choice Community Advisory Committee, Natural resource agencies, Point of the Mountain State Land Use Authority
Tier 3 Stakeholder	Community and Industry	Community and industry groups
Tier 4 Stakeholder	The Media and the Public	News media, and residents and commuters of Salt Lake, Weber, Tooele, Morgan, Box Elder, Summit, and Wasatch Counties.

Tier 1 Stakeholders

Tier 1 Stakeholders include decision makers such as elected officials, planning and engineering staff, and transportation agency partners. These are those individuals and groups who need to participate directly in the creation of 2023-2050 RTP. They are the primary decision-makers in local and regional planning. This is the group that sets policy, establishes priorities, and carries out planning. Research shows this is also the

group who can serve as trusted spokespeople to their constituencies about the 2023-2050 RTP and the Wasatch Choice Vision. Decision makers and planners include:

- Local elected and appointed officials (mayors, city/county council members, city/county planning commissioners);
- City/county staff (managers, planners, engineers);
- 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), Envision Utah, etc.); and
- State elected officials.

Tier 2 Stakeholders

Tier 2 stakeholders play an essential role in the long-term implementation of the 2023-2050 RTP. These stakeholders include groups like the Wasatch Choice Community Advisory Committee, the WFRC Freight Stakeholder Group, natural resource agencies, and various land holding and development groups. They are involved in the planning process and potentially in the implementation of planning outcomes. They can have a strong influence on Tier 1 stakeholder audiences and the public. Such stakeholders include:

- Natural resource agencies;
- Business community, including the WFRC Freight Advisory Committee and Chambers of Commerce;
- Community advocacy groups like Bike Utah, the Trails Foundation of Northern Utah, and Utahns for Better Transportation (UBET);
- Larry H. Miller/DayBreak;
- PRI/FRI/SRI Church of Jesus Christ of Latter-day Saints land holding groups;
- Rio Tinto;
- Universities such as Salt Lake Community College, University of Utah, and Weber State University; and
- Point of the Mountain State Land Authority.

Tier 3 Stakeholders

Tier 3 stakeholders consist of community and industry groups that have knowledge and influence as:

- National agencies, industry groups, and associations (Urban Land Institute (ULI), American Planning Association (APA), Institute of Transportation Engineers (ITE);
- Spin and Lime Scooter Share Companies;
- Utah Foundation;
- Rocky Mountain Power;
- Utah Clean Energy; and
- Developers, realtors, and lenders.

Tier 4 Stakeholders

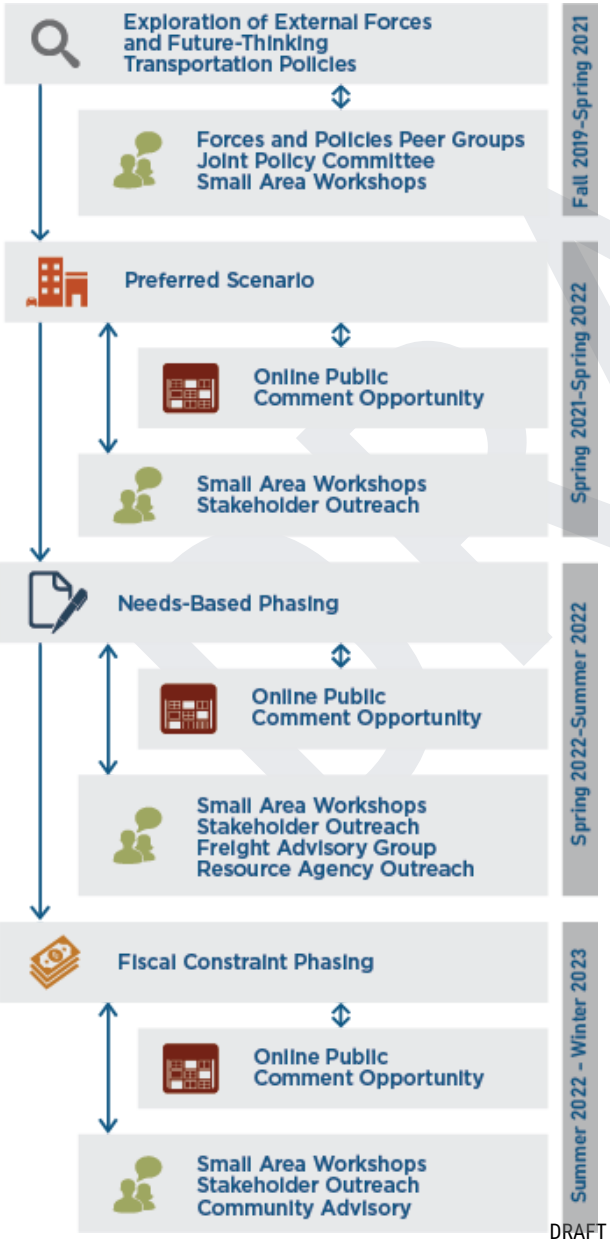
Tier 4 stakeholders consist of residents, commuters, new media, and trade associations. This is a group that will be affected by the rollout of the 2023-2050 RTP in the long-term. The support and participation of Tier 4 audiences is important for the successful implementation of the 2023-2050 RTP. Such audiences include:

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

Partner, Stakeholder, and Special Interest Group Outreach

The WFRC performed significant partner and stakeholder outreach to gather input on the 2023-2050 RTP, ranging from contacting all member cities across the Wasatch Front to engage in the fall workshops, to technical advisory committee meetings, and special peer group discussions. Over 30 unique organizations were sent specific outreach on the RTP, ranging from transportation advocacy groups, community organizations including those representing Title VI and Environmental Justice populations, community advisory committees, and special interest groups. and a number of individual cities who requested additional information or opportunity to comment. The WFRC also offered numerous opportunities for stakeholders to provide feedback through online interactive comment maps, and one-on-one outreach on specific topics related to the RTP. Figure 9 provides a detailed description of the engagement process for different audiences and stakeholder tiers throughout the multi-year development of the 2023-2050 RTP.

Figure 9: Public and Stakeholder Engagement for the 2023-2050 RTP



External Forces and Forward-Thinking Transportation Policies Peer Groups

During April and May of 2020, WFRC convened a series of peer group meetings on External Forces and Forward Thinking Transportation Policies (See Section 3: Explore External Forces and Forward-Thinking Transportation Policies). These peer groups consisted of different subject matter experts as well as UDOT, UTA, cities, and industry experts aware of the changing landscape in technological advancements and how this may shape the future of cities and transportation systems. The peer groups were divided into four subgroups: land use, roadway, transit, and active transportation. Each peer group held two meeting discussions virtually. The first meeting was focused on determining which external forces were highest priorities to each peer group, while the second meeting focused on the forward thinking transportation policies. These priorities were identified to inform the scenario testing for the external forces later on in the 2023-2050 RTP planning process.

Technical Advisory Committees

The Regional Growth Committee Technical Advisory Committees (TACs) are made up of planners and engineers that represent cities across the WFRC Region. These member communities were informed regularly at each meeting about different aspects of the RTP planning process, from the development of

the external forces and forward-thinking transportation policies, to the development of the preferred project scenario, and providing feedback on the phasing priorities of projects by different modes. The TACs provided input many times in the planning cycling, as illustrated in Figure 9 to ensure local and ongoing plans match with the 2023-2050 Regional Transportation Plan.

Small Area Workshops

Each fall, from 2020 to 2022, WFRC hosted eight to ten subregional Wasatch Choice Workshops designed for local government leaders, elected officials, and key staff where the discussion focused on transportation, land use, and economic development opportunities and challenges facing individual communities. All Wasatch Choice Workshops were hosted in partnership with UDOT, UTA, and Utah League of Cities and Towns (ULCT).

The workshops focused on gathering input for the external forces and policies in 2020, and sought out specific roadway, transit, and active transportation project requests in 2021. The 2022 workshops were primarily focused on the phasing and prioritization of projects for each transportation mode. In all workshops, participants were engaged in online surveys, small group discussions, and map-based feedback.

Online Stakeholder Engagement and Public Comment Summary

Several online interactive mapping tools were created to provide opportunity to gather feedback on the Draft 2023-2050 RTP. The mapping tools gave stakeholders and the public the opportunity to comment directly on the various elements identified on the scenario maps.

Table 3. Online Public Comments Received

Public Comment Opportunity	Date	Number of Comments Received
Scenario Development Workshop	Fall 2020/Spring 2021	500
Draft Preferred Scenario Workshop	Fall 2021/Spring 2022	697
Needs-Based Phasing	Spring 2022	292
Fiscally Constraints Draft Phasing	Summer 2022	216
Fiscally Constraints Workshop	Fall 2022	357

A total of 2,062 comments were received through the engagement process for the 2023-2050 RTP. Table 3 provides a breakdown of these comments during the process. See Appendix E - Public Comment (appendix forthcoming) for comments received via the interactive map.

Outreach to Title VI and Environmental Justice Populations

Outreach to Title VI and Environmental Justice populations occurred through the employment of multiple techniques for education and outreach, such as visualization tools, including interactive and static maps. The goal of this outreach was to inform and receive feedback from 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 2023-2050 RTP, the Transportation Improvement Program (TIP), and other WFRC plans and programs. Two meetings were held to discuss the RTP with Title VI and Environmental Justice populations.

On January 25th, 2022, WFRC held a virtual Wasatch Choice Community Workshop. The purpose of this meeting was to meet with diverse stakeholders 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.

The second meeting with Environmental Justice and Title VI populations was through the Wasatch Choice Community Advisory Committee on December 6th, 2022. This meeting empowered attendees to share other avenues of engaging with Title VI and Environmental Justice populations, and this feedback was incorporated into the remaining engagement for the 2023-2050 RTP.

Resource Agency Outreach

WFRC consults with state and federal resource agencies on the projects needed by 2050 and potential impacts to the natural and built environment. Projects in the RTP may affect the programs, lands, or policies over which these various agencies administer. Outreach to resource agencies is key to identify the potential impacts included projects may have on natural and cultural resources and to provide early identification of key concerns, mitigation strategies, and solutions development. WFRC held a virtual resource agency stakeholder meeting in January 2022 and received 70 comments from agencies. A list of attendees and their feedback can be found in Appendix E - Public Comment (appendix forthcoming).

Freight Stakeholder Group

WFRC recognizes the increasing importance of goods movement within and throughout the Region, and freight mobility is a key component of the Wasatch Choice Vision. WFRC convened a Freight Stakeholder group for the first time to support the 2023-2050 RTP planning cycle and advance freight planning in the region. The group has met three times through the course of the 2023-2050 RTP cycle to discuss emerging technologies and the rise of e-commerce as well as weigh in on freight specific transportation projects.

Special Interest Groups

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); Bike Utah; Parley's Rails Trails and Tunnels (PRATT) Coalition; Trails Foundation of Northern Utah (TFNU); the University of Utah (U of U); Salt Lake Community College (SLCC); and Weber State University (WSU); the Western Growth Coalition; the Larry H. Miller Real Estate (Daybreak); Utah Inland Port Authority; the Point of the Mountain Commission; and a variety of Federal, State, Regional and Local Resource Agencies . Representatives and officials for each of these groups were provided the opportunity to give feedback on regional transportation needs. The input provided by these stakeholders were 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.

Please see Appendix X - Public Comment (appendix forthcoming) for a full report capturing the feedback received through these meetings.

Generalized Public Comment

A formal public comment period occurred between February 27 and March 26, 2023. The public was invited to provide feedback to the draft fiscally constrained 2023-2050 RTP via an online interactive map, and notices were distributed via the newspaper, WFRC's email distribution list, and through a social media campaign.

3: Explore External Forces and Forward-Thinking Transportation Policies

The WFRC began the 2023-2050 RTP process with a focus on exploring and understanding external forces (market shifts, transportation technologies, and policy approaches) that would impact our transportation, land use, and economic development decisions. Such forces include transportation technologies and shifts in market and consumer demand. The intent of this approach was to elevate the discussion of these planning uncertainties and understand these changes as a Region. To prepare the Region to be more resilient to uncertain future changes in the next 30 years, WFRC identified 22 initial external forces and forward-thinking transportation policies, as shown in Figure 10. The 2023-2050 Regional Transportation Plan explores a variety of questions such as how might transportation systems change in a world dominated by automated transit? How might micro-mobility and on-demand transportation services be impacted by high adoption rates of e-commerce and telecommuting?

Figure 10. External Forces and Forward-Thinking Transportation Policies

The steps outlined below describes the steps taken at a very high level to explore the external forces and forward thinking transportation policies in the 2023-2050 RTP:

Steps to Exploring External Forces and Forward-Thinking Transportation Policies:

1. Research external forces and their impact to transportation, land use, and economic development, and develop literature review
2. Develop ranges of implementation of external forces to test into scenarios
3. Run and test external forces scenarios
4. Combine test scenarios into plausible external forces scenario
5. Test forward-thinking transportation policies
6. Finalize forces and policies into a preferred scenario

Research on the External Forces and Forward-Thinking Transportation Policies

Following initial research and literature review, WFRC compiled a list of 22 topic areas of external forces and forward-thinking transportation policies, as shown above, that were presented to and discussed with peer groups. The peer groups were grouped by general topic areas - active transportation, local communities, transit and on-demand travel, and roadways - and consisted of staff from local governments, agencies, and businesses whose work is directly tied to, or may be heavily influenced by the identified external forces and forward thinking transportation policies. The purpose of the peer groups was to hold space for meaningful dialogue on the identified influences and policies, develop consensus on which external forces were important to address, approximate the range of impacts from these forces, and determine whether these influences and policies should be tested through simulated scenarios. Each peer group meeting included a discussion of each external force as well as a poll asking each participant how impactful they believed each force would be in the future. WFRC used these discussions and polling results to inform and guide the 2023-2050 RTP planning process. More information about external forces and forward-thinking transportation policies can be found in Appendix X: External Forces And Policies Exploration: Peer Group Discussion (appendix forthcoming).

The four peer groups helped refine the initial list into five external forces and nine forward-thinking transportation policies that WFRC should explore with a higher level of scrutiny. This refinement was done through a variety of polls and discussion within each peer group.

The reduction in external forces was done in part with how impactful the force may be to transportation and land use. For example, electric vehicles were not moved forward after discussions in the peer groups due to the fact that they simply replace a combustion engine vehicle on the road. Another external force like passenger drones drew a lot of interest in the area, but was ultimately not moved forward for further modeling testing due to the nascency of the technology and changing landscape. Other external forces such as telecommuting and connected and autonomous vehicles (CAV) have more implications to shaping our transportation system and land use in the medium and long-term. CAV has substantiated research and manufacturers developing different levels of automation and connectivity in vehicles through mass production. Telecommuting has been a real-time experiment as seen through the global pandemic with COVID-19. Such conditions created confidence in further exploring certain topic areas through the 2023-2050 RTP.

The external forces that WFRC ultimately tested for the 2023-2050 RTP are connected and autonomous vehicles (CAV), high-tech transit systems, micro-mobility and e-bikes, e-commerce and delivery, and telecommuting. COVID-19 recovery was also considered as an overarching external force. Table 4 provides an explanation of each external force.

Table 4. External Forces within the 2023-2050 RTP

External Force	Description
Connected and Autonomous Vehicles (CAV)	Autonomous vehicles (AV) are vehicles that are capable of driving without human intervention (also called self-driving or driverless vehicles). A connected vehicle (CV) is one that communicates with other vehicles (V2V), infrastructure (V2I), and other road users (V2X) via wireless technology.
High-Tech Transit Systems	High-tech transit systems integrate technology within their fleet, often utilizing Intelligent Transportation Systems (ITS) to become more efficient through Transit Signal Priority (TSP), Traffic Signal Coordination (TSC), and other technologies. This also encompasses connected and autonomous shuttles and buses.
Micromobility and E-Bikes	Micromobility refers to the use of lightweight devices typically used for shorter-distance transportation. These can include standard bicycles, electric assisted bicycles (e-bikes), electric scooters (e-scooters), and other mobility devices that have improved electric motor technology. Micromobility devices can be either personally owned or shared among users, such as GREENbike in Salt Lake City.
E-Commerce and Delivery	E-commerce and delivery refers to a series of changes that are occurring in the purchase and delivery of goods. These include, but are not limited to, internet shopping, food delivery, truck automation and platooning, and last-mile delivery logistics, including drones.
Telecommuting	Telecommuting is the act of partially or entirely replacing out-of-home work activities by working at home or at locations close to home.

The WFRC also created a list of policies aimed toward resiliency that could help the Region adapt and respond to the external forces identified. These policies, as shown in Table 5, are congestion pricing, curbside management, local street design modifications, managed lanes, parking modernization, road usage charge, street connectivity, transit prioritization, and zero-fare transit.

Ranges of Implementation for External Forces

Once the forces were refined to what would move forward in the 2023-2050 RTP process, WFRC went through the process of evaluating the external forces and forward-thinking transportation policies through the official Wasatch Front Travel Demand Model (TDM). TDM version 8.3.1 was used for this work, and the "base scenario" was run without modification to serve as a comparison to the modified forces and forward-thinking transportation policy tests.

The WFRC began model testing with the external forces. For each external force, the TDM was modified to account for how the forces would change travel behavior and demand. A low, medium, and high rate of implementation was developed for each external force, as shown in Table 6.

Table 5. Forward-Thinking Transportation Policies within the 2023-2050 RTP

Policy	Description
Congestion Pricing	Tolling to enter a cordoned area within a city. Does not include traditional toll lanes and roads.
Curbside Management	Managing the curb by improving allocation of space for pedestrians, drivers, bicycle infrastructure, transit services, transportation network companies, micro-mobility devices and stations, and personal delivery services.
Local Street Design Modifications	Modifications to the design and speeds of local streets which can improve the suitability of roads for all modes of travel, especially as new technologies such as connected and autonomous vehicles and micro-mobility continue to evolve.
Managed Lanes	Managed lanes are operational strategies that optimize the carrying capacity of existing transportation facilities[5].
Parking Modernization	Modernization of parking systems, including elimination of parking minimums, adoption of paid parking, and unbundled parking costs.
Road Usage Charge	A road usage charge is a usage-based fee based on a certain rate per mile traveled, replacing or supplementing taxes imposed on fuel consumption.
Street Connectivity	Connectivity can be defined as multiple routes and connections serving the same origins and destinations.
Transit Priority	The movement from a direct connect system to a connected network system utilizing lower tech improvements including queue jumping, dedicated lanes, bus-only lanes, intersection improvements, bus stop spacing considerations, bus bulbs, and other spot improvements. Creating a system where transit is the priority and it is fast and frequent.
Zero-Fare Transit	Zero-fare transit is a policy decision to remove the barrier of paying a fare to utilize transit services. This may be done system-wide or within designated zones.

[5] UDOT's Statewide Managed Lanes Study finding is available to access on the project website https://utah-managed-lanes-study-uplan.hub.arcgis.com/

Table 6. 2050 External Forces Implementation Range Summary

External Force	Base Scenario	Low Implementation	Medium Implementation	High Implementation
Connected and Autonomous Vehicles	0%	15% of Level 3/Level 4 Automation for all new vehicle sales; 60% of all roads have CV roadside units	25% of Level 3/Level 4 Automation for all new vehicle sales; 80% of all roads have CV roadside units	50% of Level 3/Level 4 Automation for all new vehicle sales; 100% of all roads have CV roadside units
High-Tech Transit Systems	0% of technology in the system	20% of technology in the system	55% of technology in the system	85% of technology in the system
Micromobility and E-Bikes	3% of trips under three miles are by bicycle	8% of trips under three miles are by micromobility	20% of trips under three miles are by micromobility	40% of trips under three miles are by micromobility
E-Commerce and Delivery	Minimal	25% of total retail sales	45% of total retail sales	65% of total retail sales
Telecommuting	5% of regional jobs telecommute	15% of regional jobs telecommute	20% of regional jobs telecommute	25% of regional jobs telecommute

As a beginning step, each force was evaluated independently to determine individual impacts. Please refer to Appendix X: External Forces and Policies: Scenario Framework Assumptions (appendix forthcoming) for additional detail on further insight into trends, rationale for ranges of implementation, and integration of each force into the TDM environment.

Develop, Run, and Test External Forces 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.

The six external forces were placed into three categories based on feedback from peer groups: Automation, Shared Mobility, and E-living. The categories were developed into scenarios to explore the impact of high levels of implementation of each category, and low or medium implementation of the other forces. For example, e-commerce and telecommuting were combined into an e-living scenario that emphasized these two external forces, while high-tech transit and CAV were combined to develop an automation-focused scenario. Table 7 breaks down the external forces topic areas by the scenarios they were grouped within. Each scenario consisted of various implementation rates, and evaluated how the external forces interacted with each other.

Table 7. External Forces Scenarios Summary

External Force	Base Scenario	Scenario 1 High Automation	Scenario 2 High Shared Mobility	Scenario 3 High E-Living
Connected and Autonomous Vehicles	⊘	H	M	L
High-Tech Transit Systems	⊘	H	M	L
Micromobility and E-Bikes	VL	M	H	L
E-Commerce and Delivery	⊘	L	M	H
Telecommuting	VL	L	M	H

Each scenario was tested within the TDM and performance of the scenario was measured. The following is a high-level overview of each scenario and its outcomes. More detailed information can be found in Appendix X: External Forces: Scenario Performance Measures (appendix forthcoming).

High Automation Scenario

This scenario explores the impacts of robust adoption of connected and autonomous vehicles and high-tech transit systems. It assumes high levels of implementation of AV/CAV and high-tech transit, low levels of implementation of telecommuting and e-commerce, and medium levels of implementation of micro-mobility options.

High implementation of autonomous vehicles increased roadway capacity on limited-access facilities. This increased efficiency led to a reduction in travel time, even though vehicle miles of travel increased. The overall number of auto trips decreased by 12 percent in this scenario, so the average trip length increased with higher implementation of autonomous vehicles. Higher travel speeds led to increased access to opportunities - over 12 percent for auto access and almost 20 percent for transit access. This was the highest access-to-opportunities gained across the three forces scenarios.

Overall non-auto mode split increased over 60 percent from the base scenario. This was due to an increase in the number of trips less than three miles taken by micromobility. Despite high levels of high-tech transit implementation, the total number of transit trips decreased by almost 70,000 trips, or 20 percent from the base scenario.

Figure 11 summaries the overall outcomes of the High Automation scenario compared to the baseline with respect to the three external forces scenarios.

Figure 11. High Automation Scenario Compared to the 2050 Base

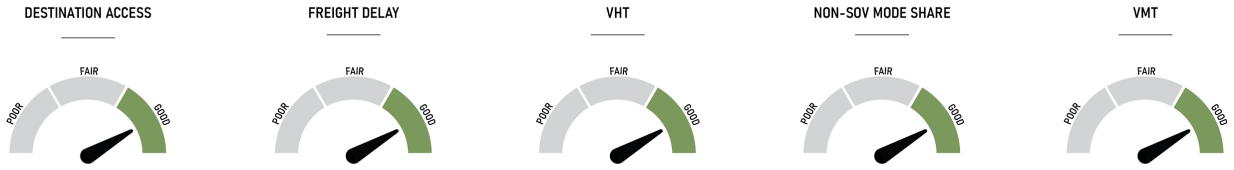
High Shared Mobility Scenario

This scenario imagines the impacts of high use of shared mobility options such as micromobility, such as e-bikes and on demand and ridesharing services. It assumes medium levels of implementation of all other forces.

High implementation of shared mobility, including micromobility and e-bikes, led to a very significant increase in walk and bike trips, which led to both a significant decrease in single-occupant commutes and reduced transit use. In this scenario, the walk and bike mode split increased from 10.5 percent in the base scenario to 30.1 percent, while single-occupant commute mode split decreased from 87.1 percent in the base scenario to 68.3 percent.

The increased use of active transportation also resulted in reduced vehicle miles traveled by two percent, reduced vehicle hours of travel by nine percent, and reduced freight delay by 18 percent.

Figure 12. High Shared Mobility Scenario Compared to the 2050 Base



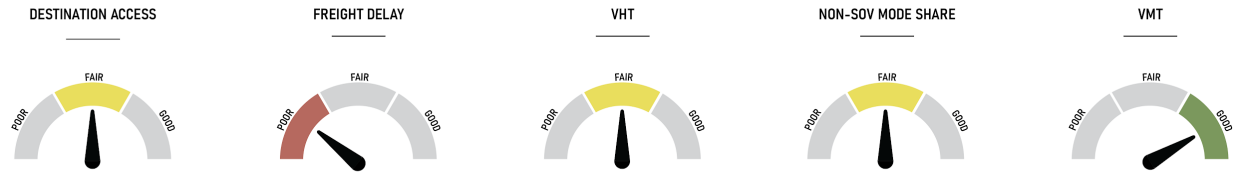
High E-Living Scenario

This scenario investigates the impacts of lifestyle shifts that favor telecommuting and e-commerce and delivery. It assumes high levels of implementation of telecommuting and e-commerce and low levels of implementation of all other forces.

Although high levels of e-commerce increased total hours and vehicle miles of travel over the base scenario, high levels of telecommuting counteracted these disbenefits. Combined together in this scenario, vehicle hours of travel nominally decreased by three percent and vehicle miles of travel decreased by less than a percent.

While this scenario reduced drive alone trips to work by over a million daily trips, transit use also declined by roughly 60,000 daily trips.

Figure 13. High E-Living Scenario Compared to the 2050 Base



Getting to a Plausible External Forces Scenario

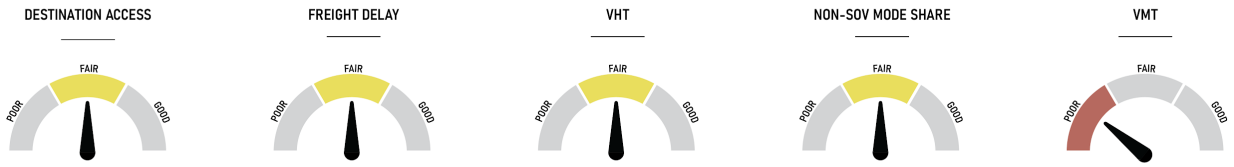
With the three different scenarios developed and tested, the outcomes were taken back out to the peer groups and partner organizations for their review. One of the factors the review teams had to consider was how well calibrated the TDM is to reflect the inputs from the different scenarios. For instance, there is no direct way to measure autonomous vehicle performance nor micromobility use in the model; rather, proxy measures were manipulated to achieve the net effect of any given force. Therefore, there was discussion on how reliable outcomes from the TDM scenario runs were, especially in the High Shared Mobility Scenario, which outperformed all other scenarios by a large margin.

FIgure 14. Plausible External Forces Scenario

Following review and input, the following Plausible External Forces Scenario was developed as shown in Figure 14: connected and autonomous vehicles implementation at a low/medium rate; high-tech transit systems implementation at a medium rate; micromobility and e-bikes implementation at a low rate; e-commerce and delivery implementation at a medium rate; and telecommuting implementation at a low rate.

This Plausible External Forces Scenario produced the following measures compared to the 2050 Base Scenario. Non-SOV mode share increased two percentage points, mostly due to an increase in bicycle and pedestrian usage. There were modest benefits to vehicle hours of travel and freight day.

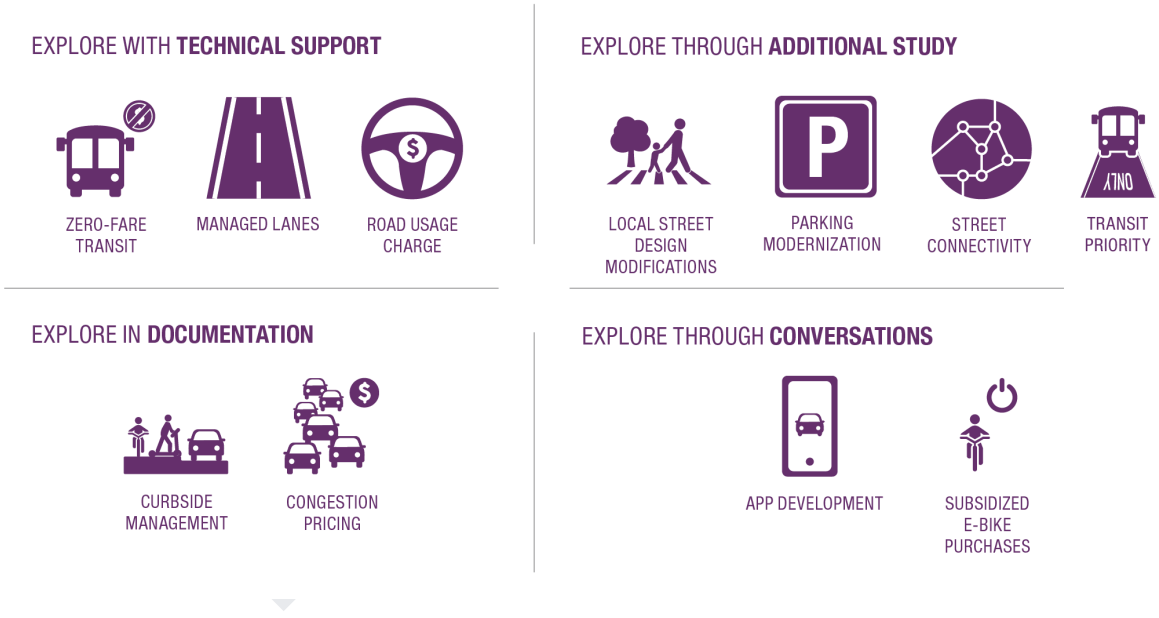
Figure 15. Plausible External Forces Scenario Compared to the 2050 Base



Testing Forward-Thinking Transportation Policies

The WFRC developed a list of policies aimed toward resiliency that could help the Region adapt and respond to the external forces identified. These policies are found in Table X above. Through discussions between WFRC staff, travel modeling experts, peer groups, and transportation partners, three of these policies were moved forward to explore within the abilities of the TDM: zero-fare transit, managed lanes, and road usage charge. The remainder of the policies, some of which were unable to test within technical tools, will either be explored through large, additional studies; or through conversations with local communities and stakeholders; or simply be included in documentation as policies to explore, as shown in Figure 16. For information about many of these policies can be found in Chapter 6: Optimization in the Preferred Scenario.

Figure 16: Forward-Thinking Transportation Policies by Exploration Level



For the three forward-thinking transportation policies that were explored through technical support, the TDM was modified to account for how the forward-thinking transportation policies would change travel behavior and demand. For each policy, different scenarios were tested, as shown in Table 8.

Table 8. 2050 Forward-Thinking Transportation Policy Scenarios

Forward-Thinking Transportation Policy	Base Scenario	Policy Test
Connected and Autonomous Vehicles	Auto operating cost per mile for autos and light, medium, and heavy trucks	20% increase in auto operating costs per mile
Road Usage Charge	No implementation of tollways	Select tollways on limited access freeways
Zero-Fare Transit	Fare structured for system-wide regular and premium bus and rail service and zoned-based commuter rail	Three tests: region-wide zero-fare, region-wide zero-fare with no route transfer penalty, and 50% reduced fare

Increasing the auto operating costs by 20 percent had minimal impact on daily auto trips, while slightly decreasing transit trips and slightly increasing non-motorized trips. In theory, an increase in the cost of driving would reduce auto trips and increase transit and non-motorized trips, having more impact the higher the cost of driving. It is unclear why transit trips declined. Additionally, changes in mode share led to very minor changes in VHT and slightly decreased VMT.

To test full toll roads in the existing modeling framework, the WFRC team removed the HOV lanes from the model network and converted them to general purpose lanes. All lanes on freeways and access-controlled facilities were then modeled as tolled facilities (with the exception of I-15, I-215, and I-80). The project team did not toll any arterials since it was not recommended in the UDOT Managed Lanes study. The outcome was an overall increase in delay on non-freeway facilities such as local streets and arterials. There was an overall increase in delay by 85 percent for the entire transportation network. For non-freeway facilities in particular, delay increased by 17 percent in the managed lanes toll roads scenario. There was a 129 percent increase in overall delay for non-freeway and limited access facilities, indicating that there will be a desire to remain on facilities that have no cost burden rather than utilize tolled facilities. This shift increased vehicle hours traveled by 28 percent for non-freeway facilities and reduced vehicle hours of travel on freeway facilities by 12 percent. The silver lining here is that vehicle delay on local streets and arterials can equate to slower vehicle speeds on those facilities. Slower vehicle speeds produce improved safety outcomes, especially for vulnerable road users.

Zero-fare transit resulted in increased ridership in all three scenarios with a 30 percent increase with region-wide zero-fare, a 35 percent increase with zero-fare and no route transfer penalty, and a 14 percent increase with reduced fare.

Please refer to Appendix X: External Forces and Policies: Scenario Framework Assumptions (appendix forthcoming) for additional detail on further insight into trends, rationale for test scenarios, integration of each force into the TDM environment, and model results.

Finalize Forces and Policies into a Preferred Scenario

Once external forces and forward-thinking policies were tested thoroughly, the TDM was refined to incorporate the plausible conditions awaiting us in the future, thus establishing the preferred scenario. For

instance, an increased, set future telecommuting percentage is now native to the TDM, as real world data can support its inclusion. However, certain other features, such as CAV, micromobility, and e-commerce, are optional dials that can be used for scenario planning, but are not automatically included in the base model. This is due primarily to lack of data that can support future trends. Many of the policies identified in this exploration work are included as recommendations for the Region to implement. More information about these recommended policies can be found in Chapter 6: Optimization in the Preferred Scenario.

Additional Considerations

The WFRC will continue to work with its partners to determine how these disruptive technologies may affect travel behavior, land use, and work to integrate outcomes into regional transportation planning processes. However, due to the evolving nature of the external forces, many changes have occurred in the time frame of when WFRC researched, developed, and formulated external forces into scenarios and in the project development and prioritization. The external forces continue to evolve under many factors, and will be closely evaluated in an ongoing process by WFRC. These considerations are a reminder that even these technological advancements continue to remain in flux and WFRC's planning needs to be nimble as changes evolve.

Although WFRC began the transportation planning process by evaluating a select number of external forces and advancing these in many ways, like connected and autonomous vehicles, there have been advancements and setbacks in different dimensions in the real world for all external forces, including equity of implementation.

Drone Delivery Advancements in Utah

Since the beginning of the 2023-2050 RTP process, there have been major advancements in the space of electrified aviation, and urban aerial mobility. Utah has become one of the country's leading drone testing sites due to the work of the UDOT Aeronautics Division. Third party unmanned aerial mobility providers like Drone Up have worked with local suppliers, cities, and the UDOT Aeronautics Division to test different delivery operations in the Wasatch Front. Drone Up will begin running delivery tests with Walmart in January/February 2023. In addition to Drone Up, drone delivery companies like Zipline have partnered with Intermountain Healthcare to focus on delivery of specialty pharmaceuticals and home-care products to patient homes within a 50 mile radius from the South Jordan distribution/flight center. Intermountain Healthcare hopes to expand this program to deliver a range of medications, products, prescriptions, and other necessary over-the-counter items.

Electric Vehicle Infrastructure Expansion

Although electric vehicles were ruled out as an external force to be further evaluated in the scenarios of the external forces and forward-thinking transportation policies, many policy advancements have been made in the past several years to ensure that zero-emissions vehicles are part of a broader, fundamental shift in U.S. transportation in hopes of benefiting individuals and communities and reducing climate-related emissions from transportation. Much of these changes in policy are due in part to the historic passing of the Infrastructure Investment and Jobs Act in 2021, which created the National Electric Vehicle Infrastructure Formula Program (NEVI). NEVI will provide funding to all states, including Utah, to deploy electric vehicle charging infrastructure along public roads in order to establish interconnected infrastructure across the country. Utah's NEVI plan was approved on September 14, 2022, and contains the blueprint for addressing

electric vehicle charging infrastructure, existing and future conditions, implementation, and program evaluation. It also describes how Utah will address statewide connectivity and charging placement needs while balancing demands for rural and urban areas. The Federal Government has also set a goal of making half of all new vehicles sold in the U.S. by 2030 to be zero-emissions vehicles. Although electric vehicles may not change transportation patterns as dramatically as other external forces, these advancements in funding and policy are long lasting and have long-term consequences to the built environment.

Autonomous Vehicle and Micro-Mobility Advancements and Setbacks

With the different levels of automation and connectivity, there have been different levels of implementation and advancements of connected and autonomous vehicles. The pandemic exacerbated several different external forces to be tested out, such telecommuting and increase in local delivery. However, some connected and autonomous vehicle and micro-mobility programs have faced setbacks with advancing research and implementation. Ford Motors and Volkswagen announced, for example, that they are closing Argo AI, their autonomous vehicle company, in order to adapt to changing market conditions, despite strong customer enthusiasm for the technology. In addition to setbacks on CAV advancements, many micro-mobility startup companies such as Bird and Skip have declared bankruptcy, while other scooter-share companies sink into insolvency or merge with larger companies. Spin Inc. has been acquired by Ford, and Boosted has acquired Lime. The industry-wide consolidation means a few well-funded scooter share companies will dominate a once-crowded field interested in fulfilling last-mile needs within cities. The downtown economy in late 2022 is a factor of concern for micro-mobility companies, with day-time populations yet to recover from COVID-19 ramifications.

Equity Challenges of External Forces

Transportation is one of the key factors to creating upward economic mobility, and the external forces can play a role to fill this need. However, WFRC recognizes that some of these external forces can also exacerbate existing and future inequalities. By creating different sketch scenarios focusing on places, households, and firms, WFRC was able to display the differences in how these different areas may be affected by new and evolving technologies, and how the region can be better equipped to equitably share benefits in the long-term while mitigating negative long-term impacts to different segments of the population.

For example, the household sketch scenario provides opportunities via telecommuting and CAV that allow white-collar workers more freedom and flexibility in housing location and choices. White collar workers may be able to save more money on commuting costs, while blue-collar workers may see a change in job opportunities in the future with many job functions being replaced by automation. The ability to obtain CAV and electric vehicles have also been predominantly attainable for upper-middle class households due to the cost of these types of vehicles. However, there is a growing interest in making these types of technologies more readily available for a broader range of consumers and household types across the country. With all technologies there are challenges on how to equitably share the positive benefits while not exacerbating existing inequalities seen in transportation.

4: Future Demographic and Employment Projections

Understanding where in our Region Wasatch Front residents will live and work in the future is key to the long-range transportation planning work of WFRC, and other planning work conducted by local, regional, and state-level agencies and other stakeholders. WFRC's Analytics Group updates its traffic analysis zone (TAZ) scale population, households, and jobs forecast every four years in conjunction with the RTP process.

To support the population and employment forecasting process, WFRC collaborates with MAG to develop and maintain the Wasatch Front Real Estate Market Model (REMM). REMM is a development simulation tool, built on the UrbanSim software platform, that distributes future *county-level* growth projections developed by the University of Utah's Kem C. Gardner Policy Institute (GPI) to each of the Wasatch Front's 3,500 TAZ, which average about one square mile in size. REMM produces a projected count of the number of people, households, and jobs (by major economic sector) for each TAZ, for each future planning year through 2050.

The final results from REMM are reviewed and, in limited cases, professional judgment is used to make adjustments, prior to releasing the final regional forecast results. The regional population, household, and employment forecast is officially updated every four years with the adoption of each RTP and may be updated through the RTP amendment process. This official RTP regional forecast is the suggested starting point for use for the demographic and employment distribution input to be used with the regional travel demand model.

In addition to the county-level control totals provided by GPI, REMM relies on extensive data inputs specific to the Wasatch Front region to inform its simulation including:

- Local land use plans, standardized and aggregated into a region-wide Generalized Future Land Use GIS layer;
- Wasatch Choice Vision land use centers, updated in collaboration with local government staff and adopted into the 2019 RTP under Amendment 4;
- Parcel-level valuation and other characteristics from County Assessors' offices;
- Job counts and locations from the Utah Department of Workforce Services;
- Commercial lease summary information from local commercial real estate brokerages;
- City and industry provided input about near-term real estate development projects and other economic development opportunities moving forward in the approval and permitting processes; and
- Feedback collected from stakeholders in an interactive web map of a preliminary draft version of the forecast.

The most current version of the official RTP population and employment forecast can be viewed at the TAZ and 'city area' level in the WFRC Household and Job Forecast web map. The map allows users to explore any year of the forecast as well as the projected change between any two years at both geographic levels.

In addition, data from four of the REMM-related inputs summarized above are also available as publicly available interactive maps – designed to support planning work and general understanding of the regional landscape – and downloadable datasets.

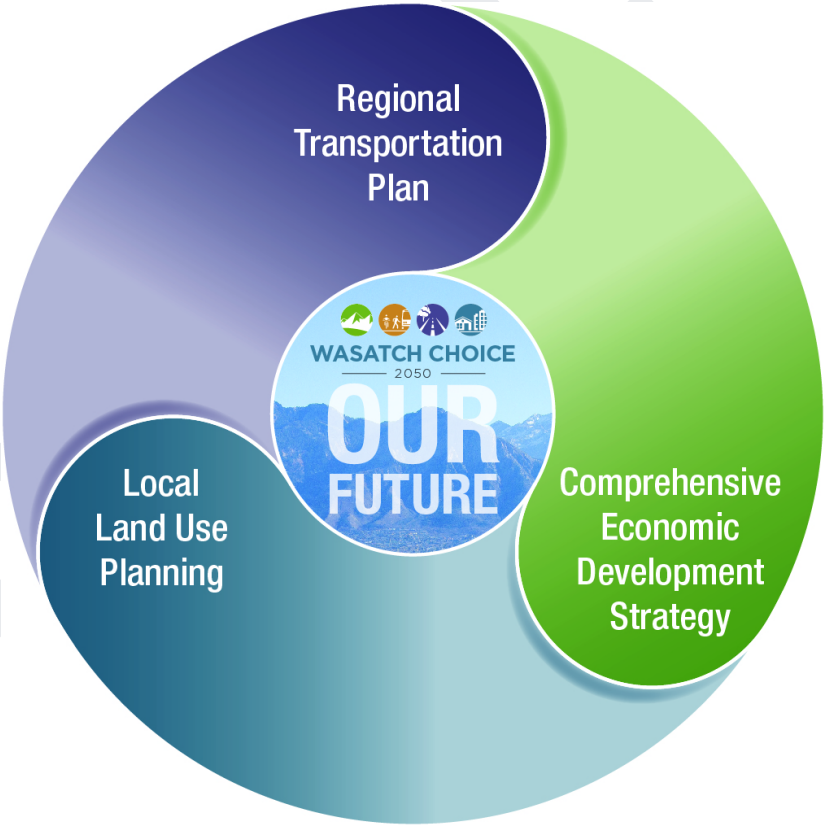
Population and Employment Projection-related Map Resources

- Household and Job Forecast Map (displays the most recent RTP forecast, currently 2023 - 2050)
- Generalized Future Land Use
- Wasatch Front Vision Map – Land Use
- Wasatch Front Housing Unit Inventory

CHOOSE

5: Our Preferred Scenario

The purpose of the 2023-2050 RTP is to address the transportation needs for the Wasatch Front Region and help make the Wasatch Choice Vision a reality. The 2023-2050 RTP planning process produced 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 27 years. The 2023-2050 RTP process also reviewed the work done in previous Wasatch Choice Vision efforts, including the Preferred Scenario of the 2023-2050 Regional Transportation Plan. The planning process evaluated long-range capacity needs and policies to optimize the transportation system, while examining changes in travel patterns and mode choice, land use, economic activities, and anticipated new growth areas. The 2023-2050 RTP, along with comprehensive economic development strategies and local land use planning, form the basis of the Wasatch Choice Vision.



The 2023-2050 RTP aims to improve our Region's transportation system and quality of life through a two-pronged approach - optimization and enhancement. The optimization of our system includes policies aimed at moving more people within existing transportation facilities and enabling people to have greater mobility with less traffic. The enhancement of our system includes building additional roads, transit lines, and urban trails.

6: Optimization in the Preferred Scenario

The system improvements focus on the capacity and operations of regional transportation infrastructure. There are many other ways that can help connect us to the places we need to go in addition to the form and function of regional facilities. In this section we highlight policies that can help us optimize our complementary system of transportation and land use. Policies also address new considerations like emerging transportation technologies, and suggest implementing actions with other entities that would significantly affect mobility, accessibility, and quality of life in the Wasatch Front (again, that complement efforts to implement regional transportation infrastructure changes).

In this chapter we list key considerations in the exploration of policies - issues or outcomes that we will want policy concepts to build upon or advance. We then consider the status and next steps of the "forward thinking policies."

Key Considerations for the Exploration of Policies

Before we articulate each policy concept we first put forward key considerations that will underpin how specific policy concepts are explored.

1 Ensure State of Good Repair

Proper repair and regular maintenance of transportation facilities for all modes should be a high priority for any authority responsible for such facilities.

Potholes and uneven pavement are daily reminders of the importance of the maintenance and preservation of our transportation system. The UDOT and local communities invest heavily in the preservation of the roadway system. Good roads cost less. The UDOT includes and prioritizes pavement preservation and structures maintenance projects in its Statewide Transportation Solutions Plan.

The UTA recognizes the need to maintain and operate all elements of the transit system in a safe and efficient manner.

For active well-kept sidewalks, shared-use paths, bike lanes, among other facilities, provide reliability, comfort, and safety to users.

Policy concepts should help advance the key consideration of ensuring a state of good repair.

2 Mitigate growth of travel demand

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

Transportation infrastructure is generally 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 by enabling trips to be accomplished more easily. 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.

Policy concepts should mitigate growth in travel demand in ways that maintain or improve the health of the economy.

3 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 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, to an extent, harms the economy. Businesses 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 financial expenditure of the toll. 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.

Policy concepts should explore the potential that pricing strategies have to help our economy function better, improve mobility, and further enhance access to opportunities.

4 Improve fit between transportation and 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 of people. 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.

Policy concepts should seek to improve the fit between transportation and desired nearby land use.

5 Consider long-term needs of all 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 individual modal elements, as outlined in the 2023-2050 RTP.

This includes the needs of people driving, delivering goods, taking transit, bicycling, and walking, 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.

Policy concepts should advance this consideration.

6 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 likely face a variety of shocks to the economy and environment over the 2023-2050 RTP horizon. Any region that is built to only thrive under average or optimal conditions is vulnerable to unusual or significantly negative conditions. We have to develop a transportation system that thrives in a variety of conditions.

Resiliency efforts help the Region protect assets and people from disasters like a changing climate, earthquakes, floods, landslides, and fires as well as prepare for economic recession.

Policy concepts should help us prepare for resiliency in the face of uncertainty.

7 Link planning with project development

The WFRC will continue to explore with UDOT and UTA ways to better connect the 2023-2050 and future RTPs 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.

Policy concepts should be implemented in ways that help link planning with project development.

8 Maximize the value of emerging technologies

The WFRC, along with its transportation partners, 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 that may accrue 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: life changed in a myriad number of ways, some 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 the net impact of emerging technologies.

Policy concepts should maximize the value of emerging technologies.

Forward Thinking Policies: Status and Next Steps

The eight policy concepts emerged from a process articulated in Chapter 3: Explore External Forces and Forward-Thinking Transportation Policies. WFRC supports earnest exploration of these policies in order to more fully optimize our transportation system. In this section we consider the status and next steps (for exploration or implementation) of each.

Centered Development

Rationale

A center is a walkable, mixed-use location that provides a variety of amenities and services. Centers are located to benefit from a nexus with regionally significant transportation corridors - high capacity transit and major roadways. Centers draw people from surrounding neighborhoods and serve as lively, central locations for people to gather while also highlighting the uniqueness of an area.

All centers share three fundamental components:

1. A mix of residential, commercial, office, recreation, and/or civic spaces, in a higher concentration than surrounding neighborhoods.
2. Access to regional transportation via car, public transportation, bike, and/or foot.
3. A walkable design that encourages visitors to explore and interact.

Centers including Metropolitan, Urban, City and Neighborhood scale centers are a focal point of the Wasatch Choice Vision.

Benefits and Impacts

When a higher percentage of growth, homes and jobs, are located in centers there are a broad variety of benefits. Centered growth:

Protects rural and single-family neighborhoods. Centers can efficiently accommodate a lot of growth on relatively little land due to their higher level of intensity and walkability. In a scenario in which the same amount of growth occurs overall but more is located within centers, there will be much less resulting growth pressure on rural areas and single family neighborhoods.

Saves households time and money. Centers locate more homes and jobs near each other and in close proximity to transit. By doing so they reduce the time, distance and money it takes for people to reach their destinations. People save money on gas and can possibly live with fewer automobiles in their household.

Improves health through increased physical activity. People that work and live in centers walk and bike more and tend to be healthier.

Improves the economy by improved workforce access to businesses and education. Centered growth helps businesses reach more consumers and employees to have a bigger selection of jobs within a typical commute. When more growth is near speedy regional infrastructure, as centered growth engenders, it means more residents can access opportunities.

Improves air quality. More transit, walk, bike, and shorter commutes means less pollution in the air.

Saves tax expenditures. Centers naturally have lots of tax revenue per mile of public streets and pipes.

Reduces environmental impacts. Centers have low environmental impacts per person: water, energy, air, green-house gasses.

Centered growth can be locally controversial by increasing traffic within the area of the center and by creating intensity near locations that have less intensity. The very definition of a center is that it is more intense than its surroundings. A shift in development intensity from one area to a center can decrease the degree to which residents will accept growth in centers. Importantly, centered growth tends to be less controversial than accommodating more development within existing neighborhoods.

Next Steps (further exploration to initial implementation)

Centers are implemented locally through general plans and land use ordinances. The Transportation Land Use Connection program is available to help.

Tools and Resources

- State of the Centers Report
- Wasatch Choice Vision resources
- Transportation Land Use Connection program

Congestion Pricing

Rationale

Congestion Pricing refers to variable road tolls (higher prices under congested conditions and lower or no prices at less congested times and locations) intended to reduce peak-period traffic volumes to optimal levels. The rationale is that the value lost by a driver due to traffic congestion - in terms of the value of lost time and the need to plan on a "bad traffic day" - is very high. Meanwhile the cost of a toll that is "just high enough" to convince just enough drivers to make alternative arrangements in order for the road to be free flowing is significantly lower than the congestion cost. Congestion Pricing makes sense in theory for both individual drivers and society as a whole. This has led some transportation planners to refer to it as "Value Pricing" instead.

With Congestion Pricing, tolls can vary based on a fixed schedule, or they can be dynamic, meaning that rates change depending on the level of congestion that exists at a particular time. It can be implemented when road tolls are implemented to raise revenue, or on existing roadways as a demand management strategy to avoid the need to add capacity.

Addressing induced demand. In the absence of pricing mechanisms, induced traffic demand typically consumes road capacity improvements. Induced demand refers to the fact that households tend to choose to travel more or disproportionately choose peak travel times where there is a lack of traffic congestion. They tend to travel more or at the peak until the congestion largely returns which undermines the capacity increasing road investment. Congestion pricing is a means of holding on to the congestion reduction by counteracting induced demand.

Highway implementation. One implementation scenario is to have a highway in which there is a combination of unpriced lanes and Value Priced lanes, allowing motorists to choose between driving in congestion and paying a toll for an uncongested trip.

Area implementation. Another implementation scenario is to cordon off an area and apply congestion pricing to the area. Cordon tolls are fees paid by motorists to drive in a particular area, usually a city center or a canyon(s). Some cordon tolls only apply during peak periods, such as weekdays. This can be done by simply requiring vehicles driven within the area to display a pass, or by tolling at each entrance to the area.

Benefits and Impacts

Impacts on adjacent streets. One fear is that congestion pricing would lead to significant avoidance behavior by drivers that would burden adjacent streets. However, avoidance of significant congestion already burdens adjacent streets. Because a free flowing road actually moves more people, the overall avoidance burden on adjacent streets is anticipated to be lower. This is based on having tolling levels be "just high enough" to convince just enough drivers to make alternative arrangements which in turn enable the priced roadway to move many more people in a free-flowing condition.

Revenue Neutrality. Congestion pricing can be explored only as a mechanism to help the traveling public and not as a revenue generator for transportation. As such the revenue collected could be distributed to cities and counties that are part of implementing congestion pricing.

Equity Considerations. One fear is that congestion pricing would have a disproportionate negative impact on low income households. Some level of revenue generated by Congestion pricing can be distributed to affected low income households to help them pay for their transportation including the tolls put in place by the congestion pricing program. This gives those households the power to make a decision that works best for them. That might enable them to pay the during-congestion-toll, defraying the trip to earlier or later, or taking public transportation. Often the congestion pricing concept is explored in locations where high quality public transportation alternatives exist. An additional option is to utilize some of the congestion pricing revenue to fund improvements to adjacent public transportation.

Next Steps (further exploration to initial implementation)

Conduct initial study to inform the conversation. Details of how this concept might be applied in Utah have not been studied, including the potential of where, how, and benefits and impacts. A first step would be to fund an exploratory study. Such a study would help policymakers more fully understand the pros and cons and what it might look like if put in place in Utah.

Congestion pricing has potential controversy since almost all driving routes and locations in Utah are currently offered free to the user. As such, part of study could also consider how to introduce the concept and rationale to a broad audience.

Congestion pricing through dynamic tolling could most easily be explored in the following conditions or locations:

- Where existing HOT lanes exist.
- Where high quality transit options are adjacent
- In locations where there is a severe disparity between peak congestion and off peak congestion, such as ski-serving canyon(s)

Tools and Resources

FHWA Congestion Pricing Webpage

Local Street Design Modifications

Rationale

Street design and function has significant impacts on quality of life. The concept of the "local street design modifications" policy concept is to match the design and function of a roadway to its surrounding context (and vice versa) in order to maximize shared objectives. Context is important even while also continuing to balance the regional mobility role of a road. As an example, a road should look, feel and operate differently in a downtown area compared to an industrial area. The downtown should have slower speeds and wider sidewalks while the industrial road should have smoother turning radii and wider roads. By having these two roadways match their respectives contexts it makes both the downtown and the industrial area work better for the economy and improves safety.

Local street design impacts driver behavior and the speed they will choose to travel, known as the "design speed." Evidence on the safety effect suggests, for example, that conversions of arterial streets to better accommodate a walkable context achieves a 19 percent reduction in crashes. Street design also affects transportation safety both from the speed of traffic and the comfort and protection afforded to pedestrians and cyclists.

Street design impacts economic opportunity by influencing both the likelihood and the type of buildings that landowners want to develop. A fast moving road with narrow sidewalks and no accommodation for on-street parking will reduce the likelihood that a developer will build a mainstreet style restaurant or place an walkable apartment next to a street. Meanwhile a road that is too narrow to accommodate high volume freight movement will dissuade firms from locating their industrial business within an area.

Benefits and Impacts

Most roadways need to accommodate many different types of users. There are invariably some design and operational decisions that work better for some users at the expense of others. Freight and pedestrian needs can be at odds. As design decisions are made there must therefore be a balance of considering context as well as the overall function of the transportation route and facility.

As context sensitive solutions are explored, there may be a predilection toward customizing each solution to the particular issues at hand. Customization ensures solutions `fit like a glove' and increase the level of control by stakeholders. However, a major tradeoff is that custom solutions tend to increase the cost and time associated with roadway planning and design. An approach to develop clear standards that vary based on the street type can be a way to address the shortcomings of customized design solutions.

Next Steps (further exploration to initial implementation)

Transportation partners in Utah, Wasatch Front Regional Council (WFRC), Mountainland Association of Governments (MAG), Utah Department of Transportation (UDOT), and Utah Transit Authority (UTA), collectively referred to as Partners, have identified long range planning-level methods to reconcile potential incompatibilities with transportation facilities and context.

This effort is called Wasatch Choice Great Streets. It is the shared desire of the partners, including local governments represented by WFRC and MAG, that the Wasatch Choice Great Streets framework will inform design and planning decisions that build on the Wasatch Choice Regional Transportation Plan.

Tools and Resources

Context Sensitive Solutions and Design resources from FHWA

Wasatch Choice Great Streets Framework (links to be added in Spring 2023)

Managed Lanes

Rationale

Managed lanes are operational strategies that optimize the person moving capacity of existing transportation facilities. "Managed lanes" refers to a broad variety of strategies such as coordinated ramp signaling, lane use management, and variable message signing. For example, in order to optimize the overall travel time on the freeway, users may spend more time waiting to enter the freeway and speeds may be adjusted downward.

Benefits and Impacts

In 2021, UDOT developed a Statewide Managed Lanes Study to review a number of strategies. According to UDOT, three main benefits can be achieved through managed lanes strategies, including congestion management, demand management, and potential revenue source. There are a suite of strategies which fall under the managed lanes concept. The following is a list of managed lanes strategies UDOT has explored:

1. High-occupancy vehicle (HOV) lanes
2. High-occupancy toll (HOT) lanes
3. Toll roads and toll lanes
4. Reversible lanes
5. Part-time shoulder use
6. Bus lanes
7. Ramp metering
8. Managed motorways
9. Truck lanes
10. Connected Autonomous Vehicles (CAV) lanes
11. Advanced road usage charge (RUC)

Managed lanes can increase mainline throughput, network productivity, and overall travel time reliability depending on which type of strategy is applied.

Pros: Applying managed lanes concepts can reduce expenditures for additional projects that require widening or traditional forms of meeting demand for roadway capacity with new lanes. Managed Lanes are also included in the 2019-2050 RTP.

Cons: There are a lot of strategies which overlap and make up the managed lanes concept which can be challenging for tracking or advancing broader understanding of managed lane strategy benefits.

Next Steps (further exploration to initial implementation)

UDOT is currently studying Managed Motorways from southern Davis County, through Salt Lake County, and into northern Utah County. These segments have been identified as the top priorities across the greater Wasatch Front with an eye toward implementation in the next few years.

UDOT has a team exploring Connected and Autonomous Vehicles (CAV) lanes along with the Road Usage Charge (RUC).

Many of the strategies listed above will also be explored in more detail in existing and future environmental studies.

WFRC and UDOT will explore and review a network of managed lanes options for future studies or inclusion into future RTPs.

Tools and Resources

Managed Lanes a Primer

Parking Modernization

Rationale

Parking demands are in a state of significant flux. They are affected by a variety of historically unusual external forces such as telecommuting, the growth of transportation network companies (TNCs) like Uber and Lyft, and the spread of first-/last-mile solutions including micro-mobility. All communities that have parking regulations that don't address these considerations should update their standards.

Parking regulations can be modernized as well to achieve community benefits like freeing up additional land for development or open space. This in turn would improve destination accessibility; increase the propensity for transit, walk and bike; and improve the fiscal health of a community.

Benefits and Impacts

Parking availability has a significant influence on mode choice. Parking maximums have been shown to be an effective way of reducing car use, as has priced parking. Parking availability and pricing specifically at places of work affects commute mode choice. Evidence is growing that residential parking might be just as influential as workplace parking related to mode choice and vehicle ownership.

The recently-completed Utah Parking Modernization Study conducted two local case studies (South Salt Lake City and Ogden) and showed that both cities are overparked (significantly more supply than is warranted by demand) in almost every land use where data was collected. Parking modernization also includes re-examining parking needs for bikes and other mobility devices.

Pros: Parking regulation modernization could lead to more efficient land use, both in urban and other settings. This can lead to higher revenue for local governments, higher land values and rents for property owners, less waste spent on construction of unnecessary parking facilities, and decreased congestion, among other things. However, not all communities will be impacted in the same way from forces like freight, TNCs, and micro-mobility.

Cons: A comprehensive modern parking regulation program would use technology to inform real-time parking availability and prices; this can be expensive to deploy and implement. Also, many cities rely on parking fees and tickets as revenue; any changes to the parking regulation will have to take changes of revenue into account.

Next Steps (further exploration to initial implementation)

WFRC will be disseminating the Utah Parking Modernization Study around the release of the 2023-2050 RTP.

Potential Costs and Responsibilities

The Transportation and Land Use Connection is also available to assist communities that are interested in exploring modernization of their parking regulations.

Tools and Resources

Links to the Utah Parking Modernization Study will be forthcoming Spring 2023.

A Business Case for Dropping Parking Minimums

Road Usage Charge

Rationale

A road usage charge is a usage-based fee based on a certain rate per mile traveled, which would replace or supplement taxes imposed on the amount of fuel consumed. The Utah State Legislature has passed legislation requiring UDOT to enroll all vehicles registered in the state in the road usage charge program by 2031.

Benefits and Impacts

Interest in road usage charges as a replacement for gas taxes is increasing around the nation as vehicles become more efficient and as fuel taxes have not increased with inflation. It could take 10 to 25 years to fully transition from a gas tax to a road usage charge system. There has been significant discussion about the impacts to rural drivers, but there has been no evidence that rural drivers would be impacted disproportionately, with studies showing rural drivers would pay less compared to their urban counterparts.

One major concern from the public is the privacy of personal information, although many vehicles and cell phones already collect and share numerous pieces of personal information, including location. Pilot programs have mitigated privacy concerns by using third-party vendors with limits on how long data may be stored. UDOT's road usage charge pilot program is exploring many other typical considerations in implementing a road usage charge. Addressing and accounting for out-of-state users is another consideration that is being explored in pilot programs along the eastern coast of the U.S.

Pros: Road usage charge programs provide fairness in that they can effectively match user impacts to the fees users pay. For example, through road usage charge a rancher that predominantly uses dirt roads would no longer be subsidizing urban area drivers.

Oregon's road usage charge program has been shown to reduce vehicle miles traveled (VMT). Similar programs in Germany have resulted in declines in empty freight vehicles, purchase of more energy efficient trucks, and a shift from moving freight by trucks to by trains.

Cons: Gathering of road usage data may be seen as intrusive by some. The visibility of paying on a per-mile basis may be difficult for many to accept and may be challenging to discuss with the public and policy-makers.

Utah-specific impacts as UDOT's pilot program has been underway for a couple of years. Nationally, there is concern that implementing a road usage charge only on fuel-efficient vehicles would negatively impact purchases of fuel efficient vehicles, but this is not well studied.

Next Steps (further exploration to initial implementation)

UDOT is exploring scenarios that would see full implementation of the RUC program by the end of 2031. These are detailed in S.B. 150 Transportation Governance and Funding Amendments from 2020.

The RUC program currently has multiple federal grants aimed to further the implementation of the program, including:

- Utah Alternative Fuel Vehicle Road Usage Charge Program - statewide implementation of a fully functional Road Usage Charge program for alternative fuel vehicles. Owners of such vehicles have the option to enroll in the Road Usage Charge program instead of paying the alternative fuel vehicle fee at time of registration.
- Integration of Road Usage Charge & Express Lanes Tolling: possibility of combining the Road Usage Charge program with UDOT's Express Lanes tolling system. Technologies, processes, and customer communication will be tested.
- Road Usage Charge Local Overlay: Feasibility of local government agencies (i.e. cities and counties) to use Utah's Road Usage Charge platform as a means to generate user-based revenue to pay for their transportation needs. Technologies, processes, and customer communication will be tested.
- Road Usage Charge Customer Service Optimization: explore participant experience and how UDOT and other state and federal governments can optimize the Road Usage Charge customer experience.

Tools and Resources

- Utah's Road Usage Charge Program
- UDOT's Road Usage Charge History and Technical Information

Street Connectivity

Rationale

Connectivity can be defined as multiple routes and connections serving the same origins and destinations. Connectivity has long been known as providing multiple benefits.

Benefits and Impacts

Street connectivity is manifest in street networks that have short block lengths and high intersection density. When this condition is present, it enables people to travel straighter, more as the crow flies. This

shortens travel distances, reducing VMT. It also increases the number of people with transit access within a short walk or bike ride (again stemming from the ability to travel more directly). Better connectivity also results in a more balanced distribution of traffic flows within the roadway network, reducing travel times and delays throughout the system.

Greater connectivity leads to significant increase in walking. In built-out cities and neighborhoods, some properties or easements may need to be acquired to connect roads, providing more route choices and taking less pressure off heavily congested arterials. Connectivity also enables areas to achieve higher levels of development intensity because a connected network handles more vehicles. By enabling higher development intensity connectivity further enables more walking. Regarding safety, limited research has shown that low intersection density networks had the highest risks of fatal and severe crashes.

Pros: High levels of street connectivity has a significant positive impact on the propensity to walk and to use public transportation. Street connectivity is associated with reduced VMT, overall reductions in vehicle hours of delay, and reduced average trip length. These benefits are highest between low and moderate connectivity and diminish between moderate and high connectivity. With an increase in connectivity, some traffic will divert onto the local street network, but these impacts can generally be mitigated.

Cons: Street connectivity can increase the linear feet of roads per acre which may increase costs. These cost increases may be offset by changes to street width (enabled by a more efficient street system derived by connectivity) or increases in development intensity.

Connected local streets can see higher traffic volumes compared to poorly connected local streets. Without efforts to reduce the design speed for traffic, highly connected local streets can be less safe than poorly connected streets. However, the poorly connected streets are less likely to be used for walking in the first place because they increase travel distances.

Next Steps (further exploration to initial implementation)

The Transportation and Land Use Connection program offers assistance to local governments interested in addressing street and trail connectivity through transportation planning.

First-/Last- Mile RAISE grant. Transportation partners and local governments will be pursuing a Federal RAISE grant to fund transportation improvements that reduce barriers for the First and Last Mile to and from transit, Wasatch Choice centers, and other major destinations. This effort will build on a previous "First Last Mile" TIGER grant from 2016.

Multimodal grid analysis. Connectivity of local streets is an area of interest for the next RTP cycle. WFRC will work with local governments to conduct a multimodal grid analysis that will assess opportunities for new connections and seek to understand the regional benefits of such connections.

Tools and Resources

The Utah Street Connectivity Guide which is a comprehensive resource for improving street connectivity in communities. This guide also identifies what street connectivity is, what the measured benefits of street connectivity are, and Utah-specific examples of how strategies can be implemented on the ground.

Zero-Fare Transit

Rationale

Investing in a zero-fare transit system has been shown to be one of the fastest ways to increase sustained ridership for a lower cost than any other investment. In the Wasatch Front Region, zero-fare transit has been the focus of recent conversations as well as at the state level.

The Utah Transit Authority (UTA) is the primary public transportation provider within the Region, responsible for providing fixed-route bus, light rail, commuter rail, paratransit, on-demand, and vanpool service. UTA currently offers zero-fare service within the downtown Salt Lake City area and on some specific services like the Utah Valley Express route. Following the positive reception of the Fare Free February pilot, in which fares on UTA service were suspended for the month of February 2022, there has been increasing interest in evaluating the potential impacts associated with various levels of zero-fare transit service for the region.

Benefits and Impacts

Pros - Financial Health

Zero-fare transit can have financial benefits for transit agencies, such as reductions in fare collection costs, lower operating cost per passenger, and access to more stable funding. Long-term financial health is almost always the first concern facing transit agencies when considering zero-fare programs. The impact of zero-fare transit on costs and revenues varies widely depending on existing ridership, transit agency size, alternate funding sources, and previous fare systems.

Cons - Financial Health

Challenges finding replacement revenue. Full zero-fare transit has proven more viable for small- to mid-sized transit agencies than for large transit agencies, as revenue from lower farebox recovery rate-systems is more easily replaced. For larger transit agencies where fare revenue is a larger portion of operating revenues, considerable replacement revenue would be required for the transit agency to go full zero-fare without cutting service. Finding replacement revenue is often cited as the largest challenge to providing partial or full zero-fare transit on a high-farebox recovery ratio transit system.

Fares also provide a mechanism for employer and institutional support for transit agencies through pass programs.

Pros - Community Effects

Improved mobility. Zero-fare transit almost always causes an immediate increase in transit ridership. Transit agencies that went zero-fare prior to the COVID-19 pandemic saw an increase in fixed-route ridership anywhere between 20 percent and over 100 percent in the first two years, especially among young and low-income populations. Most transit agencies that went partially zero-fare for select populations did not see significant increases in ridership. Transit agencies that piloted or implemented long-term zero-fare transit following the COVID-19 pandemic have also seen increased ridership up to 20 percent.

Greater access to opportunity. In many instances, improved mobility from reducing financial barriers to transit means greater access to school, shopping, recreation, and healthcare for community members.

Advancing social equity outcomes. Zero-fare transit is assumed to improve social equity outcomes, as lower-income passengers save money they might otherwise have spent on transit. Existing transit subsidies, such as employer passes, often provide de facto zero-fare transit to certain riders, many of

whom are higher-income. This is a less equitable outcome where riders who can afford transit receive discounts, and riders who may benefit more from zero-fare transit do not have access to these discounts. Zero-fare transit can reduce this inequity.

Environmental and quality of life improvements. Mode shift to transit that occurs from free fare transit reduces carbon emissions, reduces traffic congestion, and improves air quality.

Redirected spending. Although zero-fare transit reduces or eliminates fare revenue to a transit agency, the money passengers save is likely circulated elsewhere in the community, potentially increasing its impact.

Cons - Service trade-offs
Reduced revenue of a zero-fare system could result in reduced quality of transit services hours. Eliminating fare revenue could cause service cuts, which may significantly negatively impact transit riders' mobility.

There is general fairness in expecting a recipient to pay for some of the cost of what they benefit from.

Next Steps (further exploration to initial implementation)

Zero fare transit is being studied by a partnership of Wasatch Front Regional Council (WFRC), Mountainland Area Governments (MAG), UTA, and the Utah Department of Transportation (UDOT). The study is exploring four options: zero-fare, partial zero-fare, and other fare structure alternatives. The study is concluding near the time of RTP adoption.

Governor Cox included a one-year, statewide zero-fare pilot program in his FY24 proposed budget. It remains to be seen if this pilot receives one-time funding in the 2023 Legislative Session.

Tools and Resources

- Fare-Free Transit Evaluation Framework, TCRP Research Report 237
- Zero fare transit study links will be forthcoming.

7: Enhancement in the Preferred Scenario

In addition to policies that can help optimize the transportation system, the 2023-2050 RTP includes enhancements to infrastructure for roadways, transit, and active transportation. Each project in the 2023-2050 RTP went through a process of ensuring project need, prioritizing that need, and vetting through transportation agencies, stakeholders, and the public.

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 craft a preferred regional vision. These criteria 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. The WFRC crafted the 2023-2050 RTP project selection criteria in partnership with UDOT and UTA, local planners and engineers, the Active Transportation Committee, and the Regional Growth Committee.

Roadway

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

1. Stakeholder feedback was reviewed. Feedback considered information from the Regional Growth Committee (RGC) and RGC and TransCom technical advisory committees; comments received from External Forces and Policies Peer and Technical Groups; small area workshops, including online map comments; coordination with UDOT, UTA, and MAG; and feedback gathered from stakeholder meetings. This feedback informed WFRC on which projects support livable and healthy communities, transportation choices, and fiscally efficient communities and infrastructure goals, projects that may have already been constructed or will be constructed by 2023, as well as those projects that are not needed or desired by the year 2050.
2. Consideration and incorporation of relevant planning efforts such as Southwest Salt Lake County Transportation Solutions Study, Point of the Mountain Study, Transportation Investment Fund (TIF), Transportation Improvement Program (TIP), environmental reviews, multi-modal reviews, transportation master plans, and other planning analyses.
3. Technical evaluation using measures based on the Wasatch Choice Vision goals, and influenced by federal goals and performance measures, was conducted. Proposed roadway projects undergo a robust technical evaluation process which must meet at least one of the six factors which determine project need and whether a project is included within the RTP. The technical evaluation utilized screening criteria to include projects that a) mitigate safety issues; b) meet volume thresholds for additional lanes, increases connectivity, or is identified as a Congestion Management Program project; c) improve the operations of a roadway without increasing through capacity; d)

improves the freight network and prioritizes needs for improving and facilitating the movement of goods; e) preserves a corridor; and/or f) improves network connectivity.

See Appendix X - Preferred Scenario Project Selection Criteria (appendix forthcoming) for further details on project selection, including volume thresholds for additional lanes.

Transit

To develop the preferred transit scenario, a three-step project selection process occurred as follows in close collaboration with UTA.

1. Stakeholder feedback as provided by small area meetings held throughout the Region and an online public comment period. This feedback informed staff on which projects support community mobility goals and those that are not needed or desired by 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. 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 Equity Focus Areas, and connecting to Wasatch Choice Vision centers. Projects were also screened to remove any with potential significant environmental impacts.
3. Incorporation of relevant efforts such as ensuring alignment with centers and noting corridors with overlapping road and active transportation projects; incorporating findings from other efforts such as Local Link Study, Point of the Mountain, and small area studies; and incorporating alignments and operating characteristics that are defined from existing/ongoing environmental analyses.

See Appendix X - Preferred Scenario Project Selection Criteria (appendix forthcoming) for further details on project selection, including ridershop thresholds.

Active Transportation

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

1. 2019 RTP active transportation projects, including amendments, served as the foundation for the 2023 RTP. Projects were removed from this original list if they were completed or anticipated to be under construction by May of 2023. Projects may also have been modified by combining two projects together based on a shared facility type and extent. At times, one project was split into two, depending on relationships with RTP road projects.
2. Stakeholder Feedback as provided in several forums, including Technical Advisory Committee meetings and small area workshops held throughout the Region. This information was received from polling results, map comments from the scenario workshops, and map comments from the online interactive map. Consultations with UDOT Regions 1 and 2 informed projects affecting UDOT facilities were also undertaken on several occasions.
3. Incorporation of relevant efforts such as the Hooper General Plan update, West Weber County General Plan update as well as active transportation plans completed after the adoption of the 2019 RTP such as the Midvalley Active Transportation Plan (Holladay, Millcreek, Murray, Taylorsville, Midvale, and Cottonwood Heights), and plans in Bountiful, Centerville, Clearfield,

Clinton, Farr West, Herriman, Riverdale, South Ogden, South Salt Lake, Sunset, Syracuse, Washington Terrace, West Point, and West Valley City.

See Appendix X - Preferred Scenario Project Selection Criteria (appendix forthcoming) 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 2023–2050 RTP.

Roadway Improvements

The preferred roadway scenario in the 2023-2050 RTP includes 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 2023-2050 RTP. More information about fiscal constraints is contained with the Prioritize section of the document. Project types, functional classification, and ROW needs are described within this section.

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 at-grade intersections.

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 need to be purchased 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 X shows the Region's functional classification.

Freeways are the largest traffic facility. They are built with complete control of access with high design speeds and provide the greatest mobility for regional traffic. Existing freeways with planned improvements in the 2023-2050 RTP are I-15 operational and widening 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. Bangerter Highway in Salt Lake County is also planned to be finished being converted to a freeway. In addition, collectors and distributors are planned along I-15 and Bangerter Highway and frontage roads are planned along I-15 and I-215. There are 364 miles of freeway projects planned.

Principal arterials serve the major centers of activity of a metropolitan area, providing a high degree of mobility. There are 245 miles of principal arterials planned to be constructed or improved. Some of the principal arterials that have operational or widening improvements planned in the 2023-2050 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 West Weber Corridor in Weber County and Highland Drive 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 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 167 miles of minor arterials. There are a number of new or extensions of minor arterials included in the 2023-2050 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.

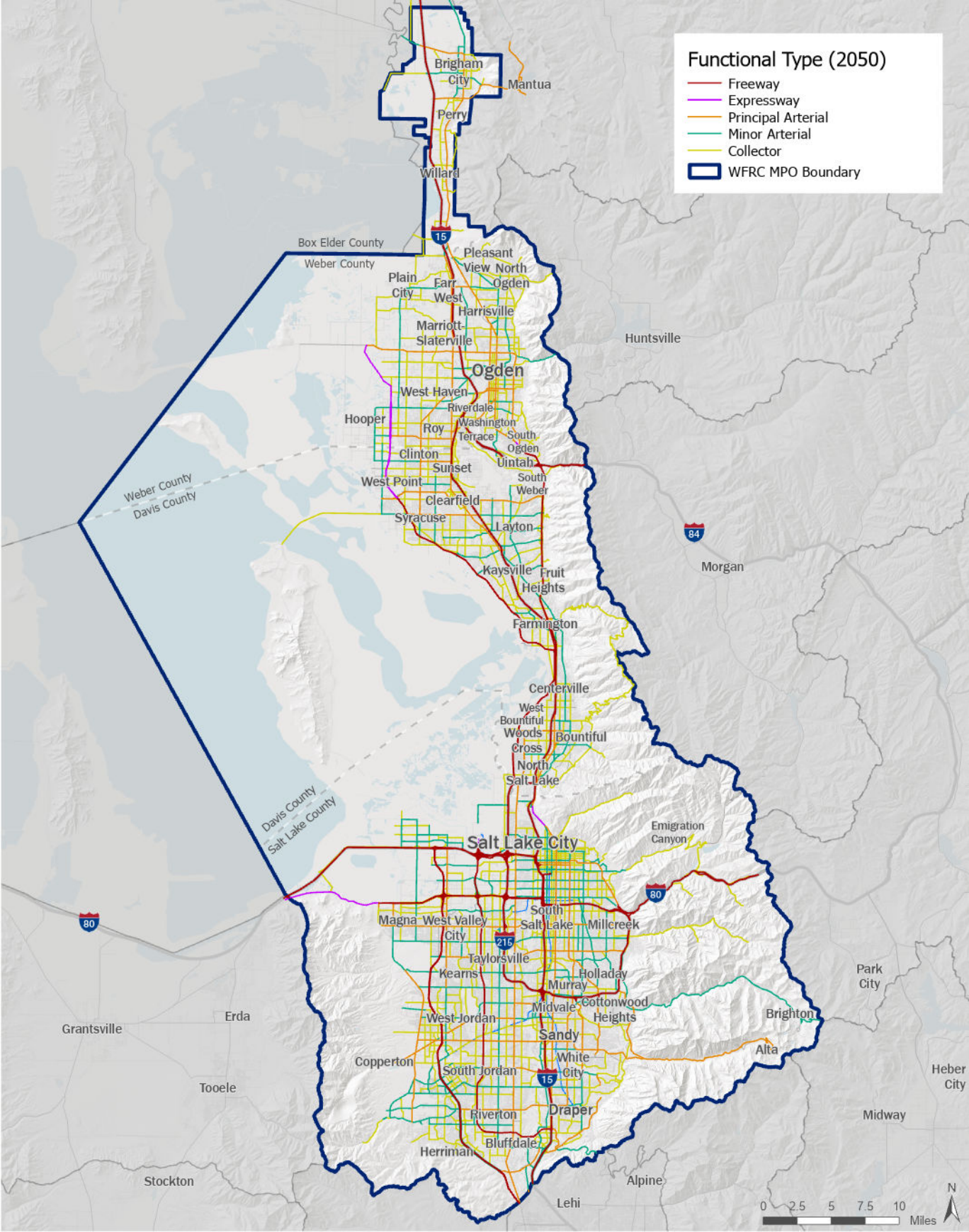
Collector streets provide for both land access and movement for local traffic within residential, commercial, and industrial areas. Collectors can penetrate neighborhoods distributing trips from arterial streets through developed areas to ultimate destinations. Conversely, collector roads can also be expected to collect traffic from local streets and channel it onto the arterial system. Most improvements to collector streets in the 2023-2050 RTP are new construction or operational improvements. There are 252 miles of collectors planned to be constructed or improved. Examples include extending Perry Street in Box Elder County, 900 East in Salt Lake County, and constructing the remainder of Skyline Drive in Weber County.

Transit Improvements

A variety of transit system improvements and accompanying types of modes and technologies are included in the 2023-2050 RTP. A description of these transit modes and examples of these projects found in the 2023-2050 RTP are found below.

Transit Service Types

Core routes are frequent bus services that run seven days a week and, on most days, run every 15 minutes or better from early morning to late evening. These routes will often have increased amenities at bus stops, particularly in locations of high ridership and/or frequent transfers. The creation of a network of connected high-frequency Core Routes facilitates improved connections via transit throughout the Region. The routes generally operate in mixed traffic but are planned to include capital investment in the form of infrastructure and technology improvements to improve travel times while maintaining reliability.


Functional Type (2050)
Freeway
Expressway
Principal Arterial
Minor Arterial
Collector
WFRC MPO Boundary
Box Elder County
Weber County
Davis County
Salt Lake County
Brigham City
Mantua
Perry
Willard
Pleasant View
North Ogden
Plain City
Farr West
Harrisville
Marriott-Slaterville
Ogden
West Haven
Riverdale
Washington Terrace
South Ogden
Hooper
Roy
Clinton
Sunset
Uintah
West Point
South Weber
Clearfield
Syracuse
Layton
Kaysville
Fruit Heights
Farmington
Centerville
West Bountiful
Woods Cross
Bountiful
North Salt Lake
Salt Lake City
Emigration Canyon
South Salt Lake
Millcreek
Magna
West Valley City
Taylorsville
Kearns
Holladay
Murray
Midvale
Cottonwood Heights
West Jordan
Sandy
White City
Copperton
South Jordan
Riverton
Draper
Bluffdale
Herriman
Huntsville
Morgan
Park City
Brighton
Alta
Heber City
Midway
Alpine
Lehi
Stockton
Tooele
Grantsville
Erda
15
84
80
215
0 2.5 5 7.5 10
Miles
N

Examples of corridors supporting this service found in the 2023-2050 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 Boulevard 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 of its route. BRT service typically operates at a minimum of ten-minute headways, with peak period headways being six minutes, 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 2023-2050 RTP include 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 the mode(s) and alignment(s) for the transit 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 2023-2050 RTP are illustrative at this point in the process. State Street BRT in Salt Lake City, South Salt Lake City, Murray, and Midvale, and the Midvalley Connector in Murray, Taylorsville, and West Valley City are other projects in the RTP.

Streetcar provides local train service at slow speeds (about 15 miles per hour). 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 to the sidewalk.

Examples of Streetcar projects found in the 2023-2050 RTP include the S-Line extension to Highland Drive and the SLC Downtown Streetcar.

Light rail provides high-capacity electric train service, typically operating within a compact urban center or utilized to connect centers in a 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 (one-or-more-mile station spacing).

Capacity improvements to the existing Salt Lake City TRAX system are contemplated, including an additional TRAX line from the Salt Lake City International Airport to the University of Utah and Research Park, and a north-south line reconfiguration.

Commuter Rail is a high-capacity regional rail service that links urban and suburban centers. Commuter rail links multiple train cars and station spacing is the longest of all types of transit service (five or more miles), with connections to other modes at stations.

The 2023-2050 RTP calls for double-tracking FrontRunner, the Region's commuter rail line, which is the first critical step needed to improve service frequencies on the line. Electrification of the rail is unfunded in the 2023-2050 RTP, but is a needed operational improvement that would allow for increased frequencies and would increase the efficiency of the system.

Gondola (this reflects the current status of the federally mandated EIS process; if that process ultimately results in a modified approach, the RTP will be changed to reflect that modified approach) is a means of cable transport and type of aerial lift which is supported and propelled by cables from above.

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 Transportation Network Companies (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 2023-2050 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 2023-2050 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 on a broader geographic level.

Transit Point Projects

Point projects in the 2023–2050 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 on existing rail lines.

In August of 2021, UTA adopted a standard operating procedure (SOP) for infill stations. The SOP defines evaluation criteria and procedures to be used when considering a request to add a new station between two existing stations on an existing corridor for commuter rail transit (FrontRunner), light rail transit (TRAX), or bus rapid transit (BRT).

Transit Mode Selection Process

In the 2023-2050 RTP 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

2023-2050 RTP process establishes a 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. The following is a summary of the transit mode selection process.

Transit System and Corridor Evaluation

1. Utilize chosen transit corridors as developed through the Project Selection process.
2. All transit routes were then tested on the updated Travel Demand Model (TDM) with their assigned mode.
3. Route-level ridership was then evaluated by utilizing daily boardings per mile (DBM) outputs from the TDM. 15-minute core route service was the mode assigned for routes with 200-400 DBM. 10-minute core route service was the mode assigned for routes with 400-800 DBM. Bus rapid transit (BRT) service was the mode assigned for routes with 800-1,000 DBM. Streetcar and Light Rail services were assigned for routes with 1,000 or more DBM.

Table 9 describes the 2050 ridership forecasts (total daily boardings) that have been utilized for mode assignments per project.

Table 9. Transit mode ridership thresholds

Transit Mode	Weekday Riders, 2050 Forecast
Core Route 15-Minute Service	200-400 riders per mile
Core Route 10-Minute Service	400-800 riders per mile and 50 percent increase in ridership over 15-minute service
Bus Rapid Transit	800-1,000 riders per mile
Streetcar	1,000 or more riders per mile
Light Rail	1,000 or more riders per mile

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, and Davis County Active Transportation Committee. Specific meetings were also held with Bike Utah, Parley's Rails, Trails, and Tunnels Coalition, and Trails Foundation of Northern Utah. 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 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. Facilities such as shoulder bikeways, shared lanes, bike lanes, and buffered bike lanes are less comfortable for a novice user,

while facilities such as protected bike lanes, shared use paths, sidepaths, and trails are more comfortable. While identifying more comfortable facilities is the preferred outcome, less comfortable facilities are used when limitations such as limited right of way are present. As shown in Table 10, total project miles are split fairly evenly between less and more comfortable facilities. Point projects are intersections or other major obstacle crossings that facilitate safe, convenient travel by foot or bicycle.

Table 10. Regional Bicycle Plan Project Summary

Point Projects Total	**104**
Less Comfortable Facility Miles	616
More Comfortable Facility Miles	596
Total Miles	**1,212**

It should be noted that the 2023-2050 RTP does not show the local bicycle networks that support the regional network, nor are future sidewalks identified.

Active Transportation 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 are 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.

Future study needed are areas where a corridor is in need of a bicycle facility, but the scope of recent planning efforts was not able to identify an appropriate facility.

Phased implementation is when a project's ultimate build out is not realized at once, but rather goes through different iterations based on other projects, redevelopment, funding, etc.

Protected bike lanes, also known as 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.

Grade-separated crossings are either overhead or underground crossings but the ultimate decision on which type of crossing is yet to be determined.

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.

PRIORITIZE

8: Assess Fiscal 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 are to be included in MPO long-range transportation plans. The purpose of these requirements is to ensure that planned improvements included in the 2023-2050 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 2023–2050 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 2023-2050 RTP are summarized in this section, with more detailed information about these sources and expenditures contained within Appendix X - Revenue and Cost Assumptions (appendix forthcoming). 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 2023-2050 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 fiscally constraining their respective plans. A more detailed description of potential federal, state, and local revenue sources for the 2023-2050 RTP has been provided in Appendix X - Potential Federal, State, and Local Revenue Sources (appendix forthcoming).

Roadway Revenue Sources

The WFRC assumed that federal, state, and local government revenues will be available for the recommended roadway improvements in the 2023-2050 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 X - Revenue and Cost Assumptions (appendix forthcoming).

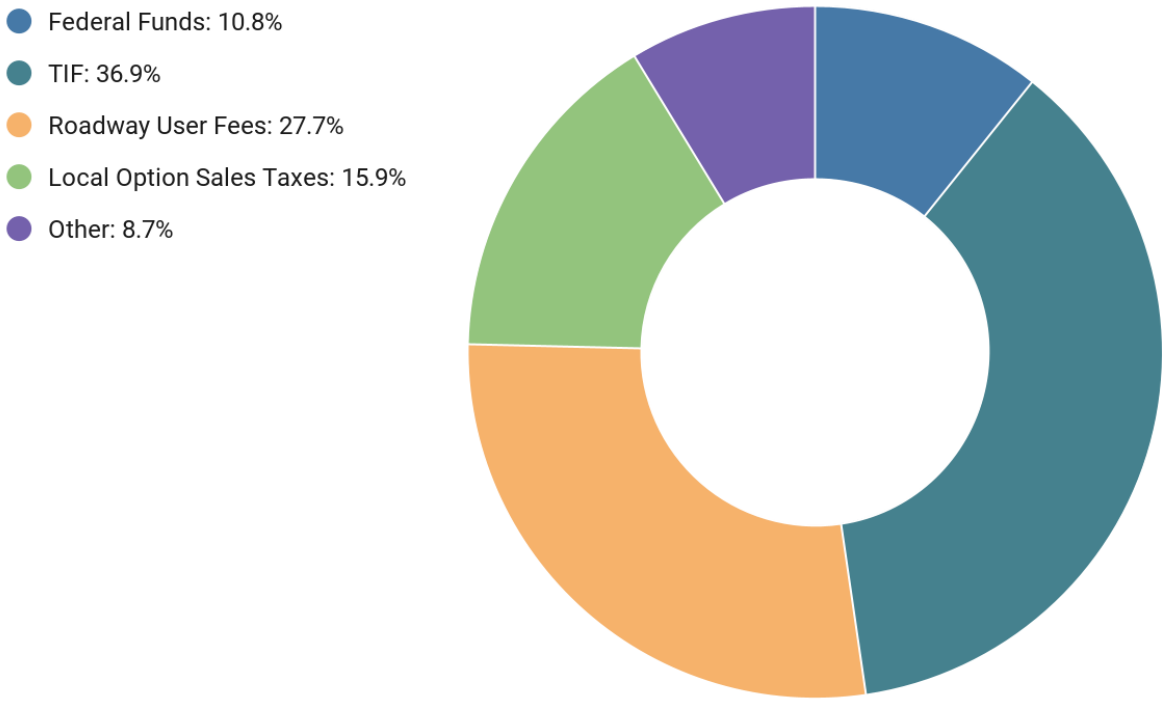
Revenue sources for state road estimates include both federal and state funds, such as motor fuel taxes, special fuel taxes, vehicle registration, and the Transportation Investment Fund (TIF). The TIF is the main source of funding for state-owned, capacity-increasing roadway projects and is mostly funded using a portion of auto-related Utah State sales tax (approximately 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, mostly motor fuel tax, designated for counties and municipalities;
- Local entity general funds;
- Local vehicle registration fee; and
- Local option sales taxes.

Figure 17 shows the breakdown of existing and assumed new roadway revenue assumptions for both the state and local systems.

Figure 17. Roadway Revenue Sources



State Roadway Revenues

The Unified Plan Financial Model was developed with estimates of projected revenues that will be available to UDOT in the WFRC Urbanized Areas for preservation, capacity, and operations between 2023 and 2050. These existing and assumed new revenues come from federal and state transportation funds, as presented on the following pages and shown in Table X.

Federal Revenue

A number of federal transportation laws and regulations establish 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 $2.430 billion in current dollars for UDOT federal expenditures related to preservation and other non-capacity programs and $0.237 billion in capacity programs.

State Revenue

Revenues provided by the State of Utah for transportation are generated through roadway user fees, such as fuel taxes, registrations, and permits, but also includes additional funding such as state sales tax revenue, federal contracts and grants, department collections, and investment income. 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 $5.131 billion in current dollars, between 2023 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 sales tax, which is approximately equivalent to the amount of transportation-related sales tax collected, as well additional state sales tax revenue, gas tax revenue, and registration fees. 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, VMT, and historic distributions. It is expected TIF will generate approximately $13.773 billion for use in WFRC Urbanized Areas, in current dollars, from 2023 to 2050 for future transportation projects.

State revenue projections also assume future increases in State of Utah motor fuel and special fuel tax or equivalent. 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 equated to an immediate 4.9 cents per gallon increase in the state fuel tax, with potential growth over time 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. The 2023–2050 RTP assumes the ceiling for fuel tax will rise at the equivalent of ten cents per gallon of gasoline and special fuel in the years 2034 and 2044. An increase in vehicle registration fees is assumed in 2025, 2035, and 2045. These new revenues are estimated to generate approximately $844 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, with full implementation planned for 2030.

When initially 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 11. Projected UDOT Roadway Revenue for the WFRC Urbanized Area, 2023-2050

Source	Amount (in current dollars)
Federal Revenue	
UDOT federal expenditures related to preservation and other non-capacity projects	$2,430,000,000
UDOT federal expenditures related to capacity projects	$237,000,000
State Revenue	
Roadway user funds	$5,131,000,000
Transportation Investment Fund (TIF)	$13,773,000,000
New Revenue	$844,000,000
Total Statewide Revenue Available	$22,415,000,000

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 (2023, 2032, 2042) local option sales taxes or its equivalent;
- Existing and future (2025, 2032, 2042) 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 2023–2050 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 $1.108 billion is projected to be available for STP and approximately $124 million is projected to be available for CMAQ between 2023 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 $114 million between 2023 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 directed 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 2023–2050 RTP. Approximately $2.923 billion, in current dollars, is projected to be generated between 2023 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 $587 million for local communities between 2023 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 Areas are projected to spend about $2.809 billion on roadway improvements between 2023-2050.

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 (0.25 percent) sales taxes, 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, although each quarter may have specific allowed uses. Table 12 provides information regarding allocation and assumptions of the local option sales tax. Existing and assumed new local option sales taxes are expected to generate approximately $5.948 billion, in current dollars, between 2023 and 2050 for the WFRC urban area.

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 $468 million in current dollars. The local option vehicle registration fee is assumed to be increased by $5 per vehicle in 2026, 2032, and 2042. The increase in local option vehicle registration fees could generate approximately $367 million in current dollars.

Table 12: 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	2032	60%	40%	0.15%	0.10%
5th	2042	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	2032	60%	40%	0.15%	0.10%
7th	2042	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	2032	60%	40%	0.15%	0.10%
7th	2042	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	2032	60%	40%	0.15%	0.10%
7th	2042	60%	40%	0.15%	0.10%
			Total	**0.65%**	**1.10%**

Private Developer Funding

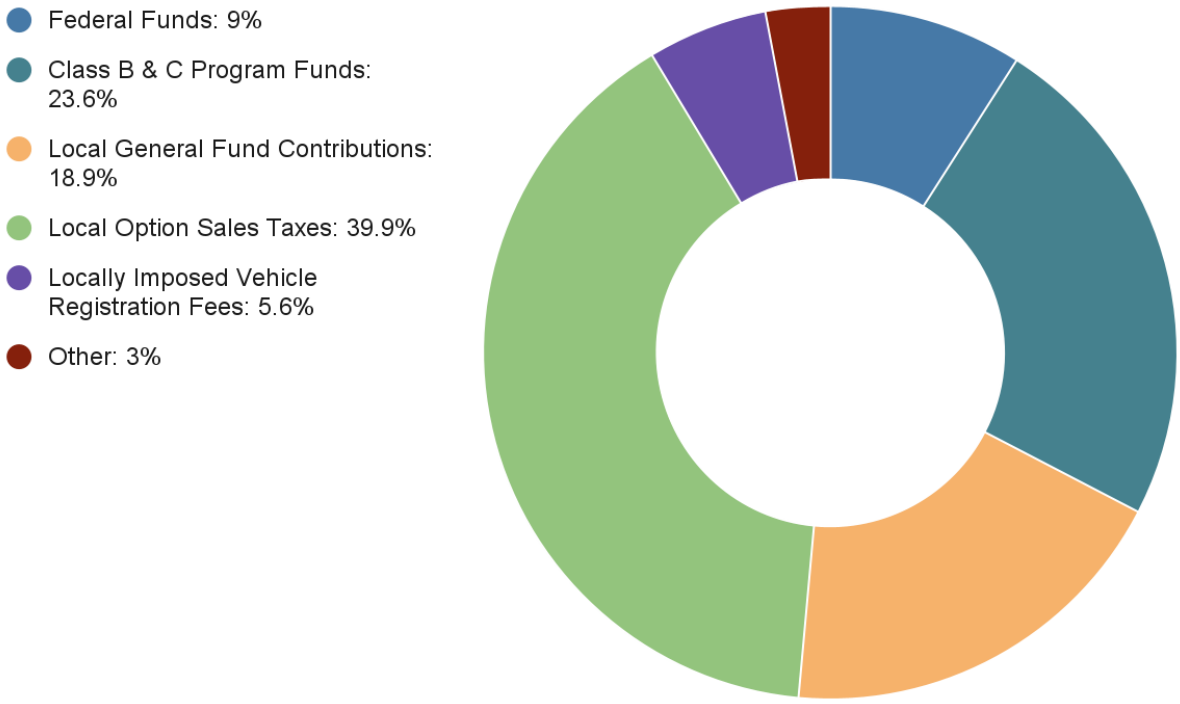
The 2023-2050 RTP assumes that private developer funding will fund some new local road construction as part of new developments. Roads that will be constructed with private developer funding were identified by local communities. It is estimated that private developer funding will generate approximately $443 million through 2050 for construction of local roadways of regional significance.

Table 13 shows the projected local roadway revenues between 2023 and 2050 in current dollars, while Figure 18 shows the percent each of the revenue sources contributes to the total local roadway revenue.

Table 13. Projected Local Roadway Revenue for the WFRC Urbanized Area, 2023-2050

Source	Amount (in current dollars)
Regional and Local Revenue	
Federal Funds (STP, CMAQ)	$1,346,000,000
Existing Class B & C Program Funds	$2,923,000,000
New Class B & C Program Funds	$587,000,000
Local General Fund Contributions	$2,809,000,000
Existing Local Option Sales Taxes	$3,899,000,000
New Local Option Sales Taxes	$2,049,000,000
Existing Locally Imposed Vehicle Registration Fees	$468,000,000
New Locally Imposed Vehicle Registration Fees	$367,000,000
New Private Developer Funding	$443,000,000
Total Regional and Local Revenue Available	$14,892,000,00

Figure 18. 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 2023-2050 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 X - Revenue and Cost Assumptions (appendix forthcoming).

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 2023–2050 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);
- Cottonwood Canyon Transportation Investment Fund (CCTIF);
- Future increases in local option sales taxes or its equivalent for transportation projects in Box Elder, Davis, Salt Lake, and Weber Counties in 2023, 2033, and 2043;
- Fares forecasted from the increased transit ridership tied to transit investments proposed in the 2023-2050 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 2023-2050 RTP totals $7.398 billion. These funds are in addition to the $25.743 billion budget that is currently forecasted in UTA's Transit Financial Plan for operating and maintaining the existing UTA transit system in a state of good repair within the entire UTA planning service area, including the WFRC planning area and Tooele and Utah Counties, during the same time frame. Table X shows the projected new transit revenues from major sources between 2023 and 2050 in current dollars.

With the exception of federal formula grants, each source will be discussed on this and the following pages. 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 cents per gallon. The State began transferring approximately $5 million in general funds 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. It is assumed the TTIF will generate approximately $1.415 billion (in current dollars), or 20.5 percent of assumed transit revenues, between 2023 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 $3.774 billion, representing 54.8 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 Legislature have resulted in significant new local option sales tax being approved for transit expansion. As of January 2023, Davis, Salt Lake, and Weber Counties have enacted all four local option transportation sales tax "quarters." By enacting 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 2023-2050 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 2033 and 2043, respectively. See Table X 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.

Fare Revenue

The WFRC anticipates that 8.3 percent of revenues, or $574 million, will be generated from passenger fares which patrons will pay to use new transit services over the life of the 2023-2050 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 one-way, but fares range from $1.25 for senior citizens up to $11.50 for the longest premium service. Individual base fares can be even lower in instances of pass sales for corporate businesses or otherwise, in which a large amount of passes are sold in bulk at a discounted rate. The average revenue per ride collected by the agency has ranged between $1.11 and $1.16 between 2016 and 2022. UTA's most recent passenger revenue accounting reported the agency collected $31 million from 24 million passenger trips in 2021.

UTA systemwide average weekday ridership dropped significantly in the first month of the COVID-19 pandemic from about 160,000 to just under 50,000 riders. Ridership has rebounded and is currently over 100,000, but has not reached pre-pandemic levels (as discussed in the Executive Summary). Since the fare revenues are directly tied to ridership, this has had an impact on the UTA annual budget. Regional transportation agencies and others around the Region are working to understand the ridership and financial impacts of a zero-fare system. Although a zero-fare system would result in loss fare revenue, if a sustainable revenue replacement was found, it would strengthen UTA's overall financial picture during times of unpredictable ridership.

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. The United States Congress appropriates roughly $4.6 billion each budget year for the New Starts, Small Starts, Core Capacity, and Bundling programs.

WFRC anticipates that 2.0 percent of new revenues (or $136 million) for the 2023 – 2050 RTP could come from federal grants awarded to the following noteworthy projects within the plan horizon:

- 200 South BRT (Salt Lake City),
- Davis-Salt Lake City Community Connector Core Bus Route,
- Mid-Valley Core Bus Route (Salt Lake County),
- State Street Corridor BRT (Salt Lake County), and
- Double-tracking and electrifying FrontRunner.

Cottonwood Canyons Transportation Investment Fund

The Cottonwood Canyons Transportation Investment Fund (CCTIF), is provided by the State of Utah for transportation or transit projects within Big or Little Cottonwood Canyons in Salt Lake County. Revenue amounts provided to the CCTIF are determined based on a combined amount of the previous fiscal year's CCTIF deposit and 25 percent of the revenue growth between the current fiscal year and the previous fiscal year of the 17 percent of state sales tax revenue deposited into the TIF that exceeds three percent. Revenues deposited into the CCTIF reduce the revenue available in the TIF. The annual maximum combined amount for any single fiscal year is $20 million. The State began transferring revenues to the CCTIF beginning in fiscal year 2020. The 2023-2050 RTP financial analysis assumes that the CCTIF will generate approximately $385 million (in current dollars) between 2019 and 2050 for use on projects within the Cottonwood Canyons in Salt Lake County.

Although CCTIF can be used for all transportation modes, the 2023-2050 RTP assumes the CCTIF will be used for transit.

One-Time Funds

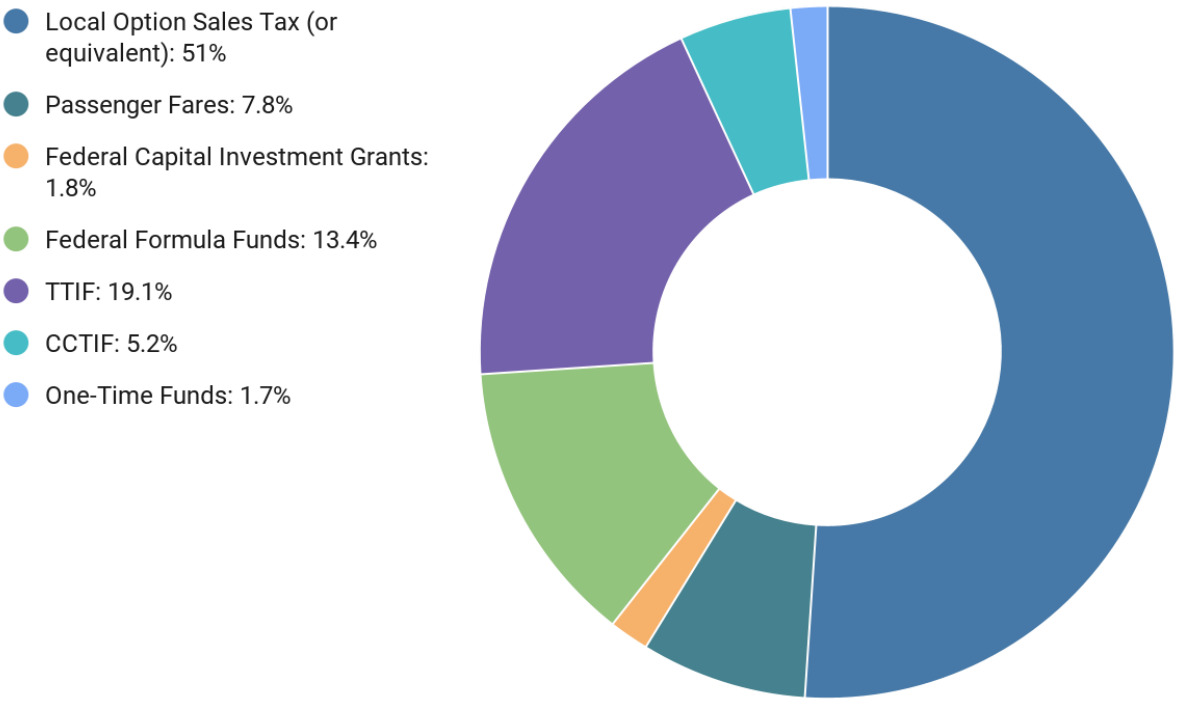
The 2023-2050 RTP assumes that one-time funding would be available to fund projects. It is estimated that one-time funding will generate approximately $126,00,000 million through 2050 for projects.

Table 14 shows the projected transit revenues between 2023 and 2050 in current dollars, while Figure 19 shows the percent each revenue source contributes to the total projected transit revenue.

Table 14. Projected Transit Revenue for the WFRC Urbanized Area, 2023-2050

Source	Amount (in current dollars)
Transit Revenue	
Local Option Sales Tax (or equivalent)	$3,774,000,000
Transit Transportation Investment Fund	$1,415,000,000
Passenger Fares	$574,000,000
Federal Competitive Grants	$136,000,000
Federal Formula Funds	$987,000,000
One-Time Funds	$126,000,000
CCTIF	$385,000,000
Total Transit Revenue Available	**$6,888,000,000**

Figure 19: Projected Transit Revenue for the WFRC Urbanized Area, 2023-2050



Active Transportation Revenue Sources

The current funding climate for active transportation includes both dedicated and non-dedicated revenue streams. Recent years have seen increased focus on biking and walking project funding, with help from increases in federal funding from the Infrastructure Investment and Jobs Act and state funding.

Dedicated active transportation revenue sources in the WFRC area projected through 2050 include the following: Transportation Investment Fund - Active Transportation at approximately $509 million; Transit Transportation Investment Fund - First/Last Mile at approximately $74 million; Transportation Alternatives Program at approximately $98 million; and the Utah Safe Routes to School (SRTS) Program which is approximately $39 million.

Other potential revenue sources include Federal funds through WFRC 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) which together are projected at approximately $81 million through 2050; one-time Federal assistance grants such as Rebuilding American Infrastructure with Sustainability and Equity (RAISE); one-time appropriations from the state legislature; 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 Highway Safety Fund; local entity general funds; developer funding; and road projects that build active transportation infrastructure as part of a project. Unless otherwise noted, these additional sources are projected to produce approximately $250 million in revenue in the WFRC area through 2050.

Bonding

Bonding can generally be used to accelerate the implementation of larger projects. Bonding in long range plans or for project construction is a financing tool that allows funding to be available in earlier phases or years. The general impact of bonding is that upfront capital is moved forward and then paid over time. The state's transportation agencies discussed and agreed to general planning level assumptions behind the use of debt financing to pay for certain amounts of capital. The efficiency of this borrowing is based upon future projections of bonding rates and inflation rates along with the states overall bonding capacity. The assumptions for debt were heavily influenced by the State's historic use of debt which has been limited to 15-year payoff timeframes. Bonding in the 2023-2050 RTP is assumed as a 15-year debt with a four percent rate.

The 2023 – 2050 RTP recommends incurring additional debt and debt payments for state roads and transit, including improvements in Little Cottonwood Canyon. In Phase 1, the RTP assumes an estimated $342 million bond against TTIF revenues for transit capital projects with a total debt repayment of about $342 million. In Phase 2, the RTP assumes an estimated $260 million bond against TIF revenues for state road capacity with a total debt repayment of $233 million with an outstanding debt of $26 million after 2050. In Phase 3, the RTP assumes an estimated $81 million bond against CCTIF revenues for gondola (this reflects the current status of the federally mandated EIS process; if that process ultimately results in a modified approach, the RTP will be changed to reflect that modified approach) capital construction with a total debt repayment of $26 million in the planning horizon of the RTP with an outstanding debt of $55 million after 2050. Bonding incurred in Phases 2 and 3 will have additional debt outstanding at the end of 2050.

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 2023-2050 RTP. These funding sources may apply on a project-by-project basis, and will require strong coordination among relevant stakeholders. Other potential funding sources include private-public partnerships, private funding, and/or value capture strategies such as tax increment financing/transportation reinvestment zones (TRZs). If these sources become available, they could advance projects by providing funding not yet available and/or replacing public revenues.

For illustrative purposes, an example of a possible application of value capture strategies might include a multi-jurisdictional area such as Point of the Mountain or the Inland Port, which have significant needs for transportation infrastructure. In theory, by building or improving transportation infrastructure in these areas, additional property and sales tax revenues could be generated - new development will be more feasible and attractive to build due to the increased access provided by the transportation infrastructure. By identifying a portion of these areas as a Housing and Transportation Reinvestment Zone (HTRZ) prior to building the infrastructure, the affected cities may establish a base tax year from which point the land's assessment value will be identified. As new development occurs, the municipalities may capture the value of the taxes generated from the base year forward in order to fund said transportation projects. HTRZs are currently being pursued in Sandy and Vineyard, Utah.

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 2023-2050 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 2023–2050 RTP's three funded phases. The costs for making needed improvements for roadways, transit, and active transportation, as identified by the 2023–2050 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 2023–2050 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 4.00, 3.25, 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 2023-2050 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 2023-2050 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 15 shows roadway unit costs per project type. Roadway costs were initially estimated

in 2023 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 X - 2023-2050 Phased Project Lists by Mode (appendix forthcoming), provides planning-level total costs for each project.

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

For purposes of the 2023–2050 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.

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 $3.379 billion is needed for all UDOT pavement needs, bridge maintenance and replacement, and other expenditures related to preservation in the WFRC Urbanized Areas between 2023 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 to cities and counties, safe sidewalks, mineral lease, corridor preservation, toll way, counties of the 1st and 2nd class, and highway projects within counties. 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 $4.986 billion through 2050, in current dollars for the WFRC Urbanized Area. For the planning purposes of the 2023–2050 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 are not specific to the 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 2023–2050 RTP will be explained in more detail in the Phase Projects chapter, but total approximately $17.227 billion for UDOT projects in the WFRC area.

Table 16 summarizes the amount of state roadway expenditures projected from 2023 to 2050. The total UDOT projected needs for the Wasatch Front Region totals $25.592 billion.

Table 15. Roadway Unit Costs

Type	Unit	2023 Cost
Right-of-Way Costs		
Right-of-Way	per sq ft	$16.34
Bridge Costs		
Simple Bridge	per	$13,000,000
Complex Bridge	per	$32,000,000
Spot Improvement Costs		
System Interchange	per	$168,000,000
Simple Interchange	per	$50,000,000
Complex Interchange	per	$96,000,000
Interchange Upgrade	per	$22,000,000
Operational Costs		
Operational	per mile	$3,500,000
Restriping Costs		
Restripe	per mile	$20,000
New Construction/Widening Costs		
Collector	per mile	$9,000,000
Arterial - Urban	per mile	$20,000,000
Arterial - Rural	per mile	$10,000,000
Expressway - Urban	per mile	$50,000,000
Expressway - Rural	per mile	$15,000,000
Freeway - Complex	per mile	$96,000,000
Freeway - Simple	per mile	$50,000,000
Freeway - Add a lane - Urban	per mile	$13,000,000
Freeway - Add a lane - Rural	per mile	$3,7000,000

Table 16. Projected State Roadway Costs, 2023-2050

UDOT Expenditures	Amount (in current dollars)
Roadway, bridge, and other preservation needs	$3,379,000,000
Operations and various needs	$4,986,000,000
Capacity needs	$17,227,000,000
Total UDOT costs	**$25,592,000,000**

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 2023 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 2023–2050, local governments maintenance and preservation needs will be approximately $6.186 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 $1.406 billion between 2023 and 2050, in current dollars.

Capacity needs and the selection process for projects in the 2023–2050 RTP will be explained in more detail in the Phase Projects chapter, but total approximately $6.296 billion for capacity projects on local roads of regional significance in the WFRC area. Locally classified road capacity needs will be approximately $849 million by 2050. These total $7.145 billion of local capacity needs.

Table 17 summarizes the amount of local roadway expenditures projected from 2023 to 2050. The total local projected needs for the Wasatch Front Region totals $14.737 billion.

Table 17. Projected Local Roadway Costs, 2023-2050

Local Expenditures	Amount (in current dollars)
Maintenance and preservation needs	$6,186,000,000
Administration/traffic operations and safety/other needs	$1,406,000,000
Capacity needs	$7,145,000,000
Total local roadway costs	**$14,737,000,000**

The total roadway projected needs for the Wasatch Front Region totals $40.329 billion.

Transit

For purposes of the 2023–2050 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 2023–2050 RTP were initially estimated in 2023 dollars and then inflated to year of expenditure dollars using a four percent annual rate for capital costs and a 3.25 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 - Fiscal Constraint Phasing. The project list, located in Appendix X - 2023-2050 Phased Project Lists by Mode (appendix forthcoming), provides planning-level capital and operating cost estimates for each project. A more detailed breakdown of the unit costs is provided in Appendix X - Revenue and Cost Assumptions (appendix forthcoming).

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 18 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 3.25 percent for operating costs when fiscally constraining the 2023-2050 RTP.

Table 18. Estimated Planning-Level Transit Costs per Mile, 2023-2050

Transit Mode	Capital Cost Amount (per mile, in current dollars)	Operating Cost Amount (per mile per year, in current dollars)
Core Route Service	$600,000-$1,100,000*	$130,200-$250,000*
Bus Rapid Transit	$23,600,000	$48,200
Streetcar	$57,800,000	$530,000
Light Rail	$70,600,000	$1,270,000
Commuter Rail	$34,700,000**	$590,000
Gondola (this reflects the current status of the federally-mandated EIS process; if that process ultimately results in a modified approach, the RTP will be changed to reflect that modified approach)	$46,000,000***	$471,000***

* 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 constriction of new rail. For more information regarding needed commuter rail investments, see the FrontRunner Forward Program.
***Total cost of the project broken down by mile from the UDOT LCC EIS (this reflects the current status of the federally-mandated EIS process; if that process ultimately results in a modified approach, the RTP will be changed to reflect that modified approach)

Transit Point Projects

Transit point projects in the 2023-2050 RTP include park-and-ride lots, transit hubs, and vehicle maintenance facilities or garages. The total cost of point project construction is $384 million. Transit point projects vary by type and scope. 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 19. Estimate Planning-Level Transit Point Project Costs

Point Project Type	Base Cost per Project (in current dollars)
Transit Hub	$14,000,000
Park & Ride Lot (structured)	$1,800,000-4,500,000
Maintenance Facility (bus)	$5,000,000-7,500,000
Light Rail Station	$2,000,000

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 $6.585 billion in new capital cost needs in the fiscally unconstrained 2023-2050 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 $2.233 billion to operate the proposed transit projects between 2023 and 2050, in current dollars, and $15.680 billion to operate the existing system through the life of the plan.

State of Good Repair

State of good repair (SGR) refers to the maintenance, overhaul, and replacement of assets such as rail, bus, and rideshare 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, SGR is accounted for in the 2023–2050 RTP for the management of future planned assets, and is expected to be about $2.580 billion.

It should be noted that SGR for the existing transit systems is not included in the 2023-2050 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 $102 million between 2023 and 2050, in current dollars.

Table 20 summarizes the needed expenses associated with transit capital, operation, and SGR costs projected from existing and new projects within the fiscally unconstrained 2023 to 2050 RTP, which total $27.077 billion.

It is important to note that UTA allocates existing revenue sources to pay for operating and maintaining the existing transit system in a state of good repair. Any expansion to the transit system, as identified as transit projects in the 2023-2050 RTP, will be paid for with new transit revenue sources. With $6.887 billion of identified new projected revenues, the process for how the above new transit needs were prioritized against fiscal constraints is explained in the Phase Projects chapter.

Table 20. Projected Transit Costs, 2023-2050

Transit Expenditures	Amount (in current dollars)
Capital project needs	$6,585,000,000
Operating costs/administration/safety needs	$17,912,000,000
State of good repair needs	$2,580,000,000
Total Transit Needs	**$27,077,000,000**

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 and grade-separated projects. Costs per unit were determined based on 2019 RTP costs and in consultation with Unified Plan transportation partners. Cost for the approximately 1,200 miles of planned linear projects is estimated at $1.354 billion, in 2023 dollars. Table 21 shows active transportation unit costs.

Point projects (crossings) were estimated based on UDOT-provided costs for overhead and underground crossings. Overhead crossings were based on a 14-foot wide bridge. Underground crossings were based on a 10'x16' concrete culvert. Cost for the 104 planned point projects is estimated at $341 million, in 2023 dollars.

Where more detailed project costs were available, the cost estimates below were updated with the relevant cost information for that specific project.

Table 21. Active Transportation Unit Costs

Type	Unit	2023 Cost per Unit (Rounded)
Bike Boulevard	Mile	$65,000
Bike Lane	Mile	$126,000
Bike Lane - Complex	Mile	$500,000
Buffered bike lane	Mile	$190,000
Neighborhood byway	Mile	$65,000
Phased implementation	Mile	$126,000
Protected bike lane	Mile	$1,270,000
Shared lane	Mile	$23,000

Shared use path	Mile	$1,220,000
Shoulder bikeway	Mile	$63,000
Sidepath	Mille	$1,220,000
Trail	Mile	$260,000
At-grade crossing	Each	$200,000
Overhead crossing	Each	$6,300,000
Underground crossing	Each	$3,600,000
Grade separated crossings	Each	$5,000,000

Comparison of Revenue and Cost Estimates

Roadway

Of the approximate $23.523 billion of capacity project needs on state and local roads of regional significance, there will only be about $17.709 billion of funding, in current dollars. It is projected that approximately $16.333 billion from existing funding sources, about $1.349 billion from new revenue sources, and $26 million from bonding is available for capacity improvements to roadways within the WFRC planning area, in current dollars. This results in $6.237 billion of unfunded roadway capacity projects that are needed between 2023 and 2050.

Preservation and maintenance funds for the state roadways are estimated to be approximately $3.946 billion through existing revenues and $336 million from new revenues for the Wasatch Front Region.

Funding available for operations for UDOT and the local communities is approximately $5.884 billion from existing revenues, with $508 million assumed from new revenue sources. Existing and assumed new funding sources are projected to meet all operational needs between 2023 and 2050.

Transit

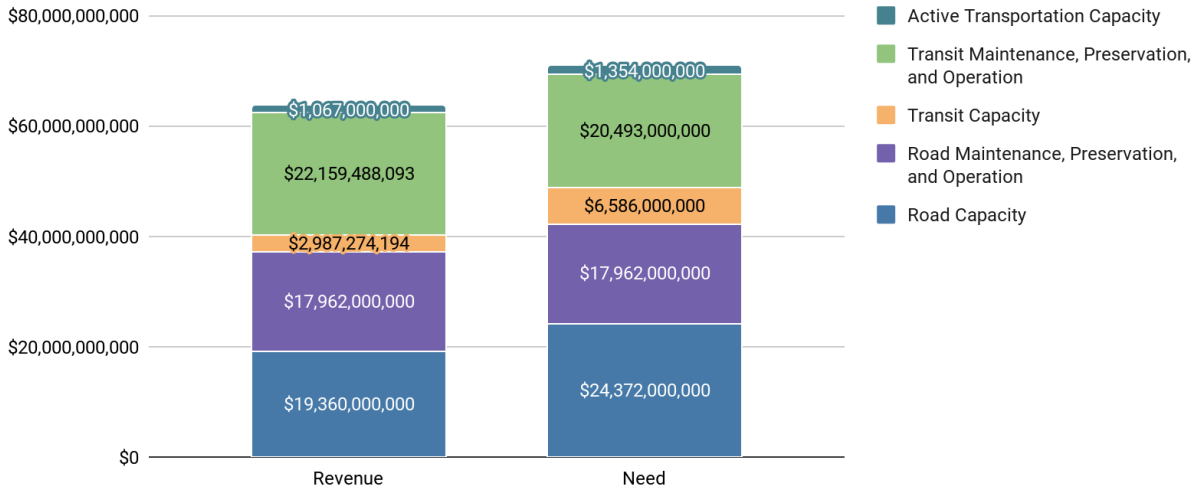
Approximately $18.260 billion in current dollars is projected to be available for transit services with existing funding sources between 2023 and 2050, which is to be spent on operating and maintaining the existing transit system in a state of good repair. There is approximately $7.274 billion projected to be available for new transit projects within the RTP through the identified new funding sources and $342 million from bonding, which will be balanced between capital, operations, and preservation expenses.

Active Transportation

The 2023-2050 RTP contains the first effort to fiscally constrain active transportation projects. Previous plans have determined needs by phase, but have not applied any revenue assumptions to get those projects built. Overall, approximately $1.07 billion in revenue (current dollars) is expected to be generated for active transportation projects contrasted with approximately $1.36 billion in needs, leaving nearly $300 million in unfunded projects. The majority of the expected revenues come from the state Transportation Investment Fund, which is a relatively new source of funding for active transportation. Additionally, many active transportation projects follow similar extents as roadway construction projects. From an efficiency standpoint, constructing the active transportation project as part of the roadway project is prudent. When such opportunities were identified in the RTP, active transportation project costs were assumed in the roadway costs and not reflected in the overall active transportation costs. This allows many more active transportation projects to be built and placed in a fiscally constrained phase than would have been otherwise.

It is important to keep in mind that there are no assumptions for sidewalk projects nor maintenance in these dollar figures nor are local projects accounted for. As this is the first effort to fiscally constrain active transportation projects, it is anticipated that the process will become more refined in future iterations.

Figure 20. Roadway, Transit, and Active Transportation Needs vs. Available Revenue, 2023-2050



9: 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 fiscal constraints for 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 2023-2050 RTP are:

- Phase 1: 2023 to 2032;
- Phase 2: 2033 to 2042; and
- Phase 3: 2043 to 2050.

Funding is not projected to be available for all projects and some 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 2023-2050 RTP roadway, transit, and active transportation projects was guided by the Wasatch Choice Vision 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 2023-2050 RTP's project selection and phasing criteria by mode are as follows:

Roadway

Evaluation criteria was based on the Wasatch Choice Vision goals of:

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

See Appendix X - Needs-Based Phasing Criteria (appendix forthcoming) for additional information regarding roadway phasing.

Transit

Evaluation criteria was based on the Wasatch Choice Vision goals of:

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

See Appendix X - Needs-Based Phasing Criteria (appendix forthcoming) for additional information regarding transit phasing.

Active Transportation

Evaluation criteria was based on the Wasatch Choice Vision goals of:

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

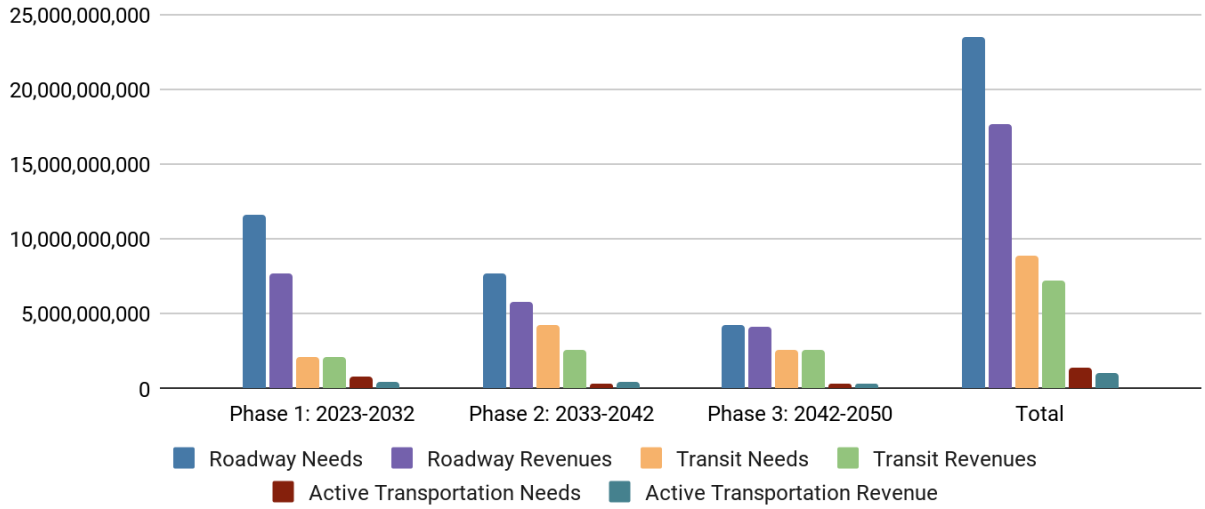
See Appendix X - Needs-Based Phasing Criteria (appendix forthcoming) for additional information regarding active transportation phasing.

Fiscal Constraint Phasing

After roadway, transit, and active transportation 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, transit, and active transportation financial plans, including revenue and costs assumptions within 2023 to 2050, can be reviewed in the chapter titled Assess Fiscal Considerations. There

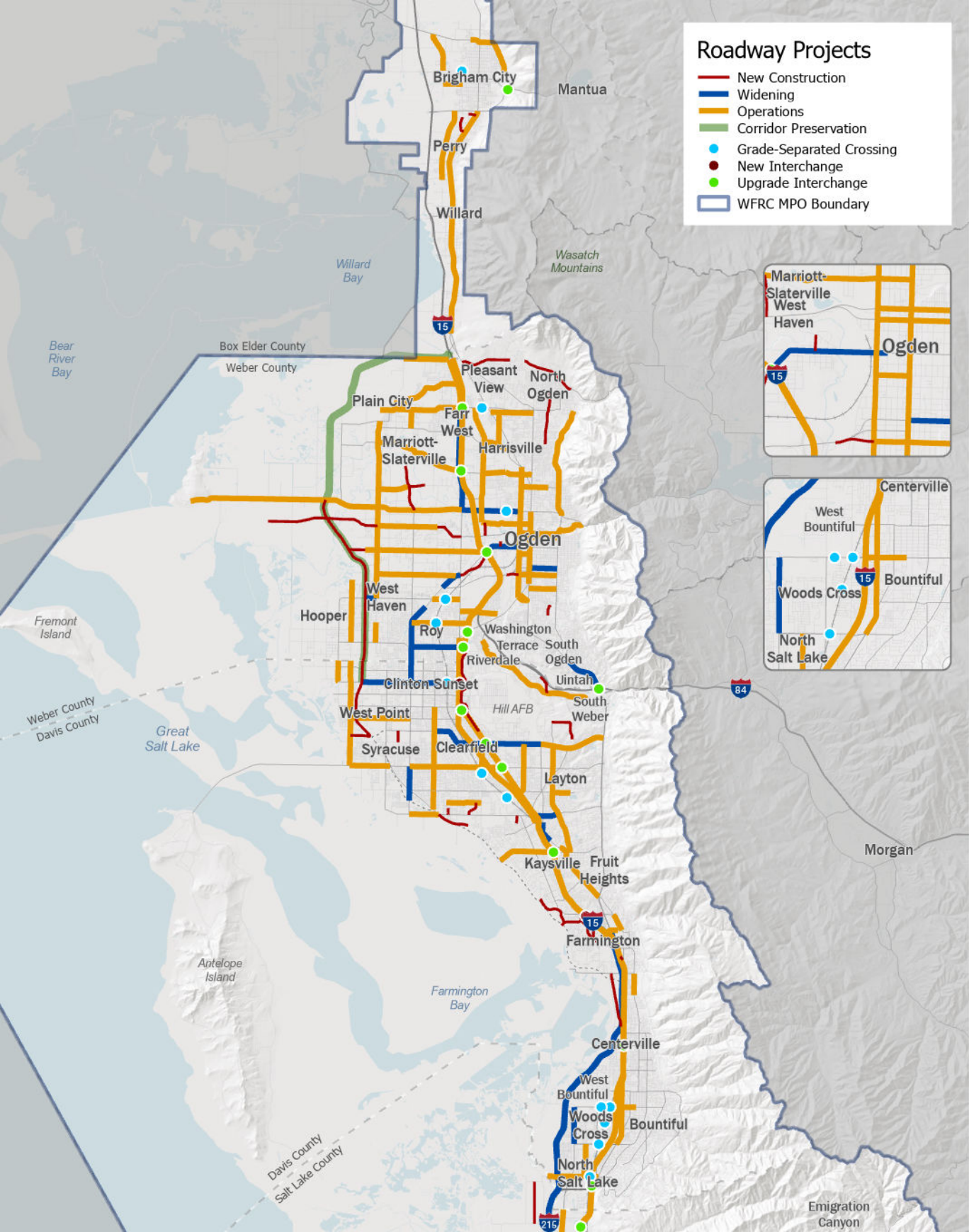
were more needed projects than anticipated revenues could fund. Therefore, some projects were moved to future phases or placed into the "unfunded" category. Figure 21 shows the needs and available revenue by phase for road, transit, and active transportation projects.

Figure 21. Roadway, Transit, and Active Transportation Capacity Needs vs. Available Revenue, 2023-2050



Roadway Projects and Phasing

The 2023-2050 RTP roadway projects are identified segments of corridors or point locations that will require new construction, widening, upgrades, or operational improvements. Maps 5 and 6 show the location and type of each roadway project. Table 22 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, fiscally constrained phase, current cost, and phased cost, is located in Appendix L - 2023-2050 Phased Project Lists by Mode (appendix forthcoming). The 2023-2050 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.


Roadway Projects
New Construction
Widening
Operations
Corridor Preservation
Grade-Separated Crossing
New Interchange
Upgrade Interchange
WFRC MPO Boundary
Brigham City
Mantua
Perry
Willard
Willard Bay
Wasatch Mountains
Bear River Bay
Box Elder County
Weber County
Pleasant View
North Ogden
Plain City
Farr West
Harrisville
Marriott-Slaterville
Ogden
West Haven
Hooper
Roy
Washington Terrace
South Ogden
Riverdale
Clinton
Sunset
Uintah
South Weber
West Point
Hill AFB
Syracuse
Clearfield
Layton
Kaysville
Fruit Heights
Farmington
Centerville
West Bountiful
Woods Cross
Bountiful
North Salt Lake
Fremont Island
Great Salt Lake
Weber County
Davis County
Antelope Island
Farmington Bay
Davis County
Salt Lake County
Morgan
Emigration Canyon
Marriott-Slaterville
West Haven
Ogden
Centerville
West Bountiful
Bountiful
Woods Cross
North Salt Lake
15
84
215

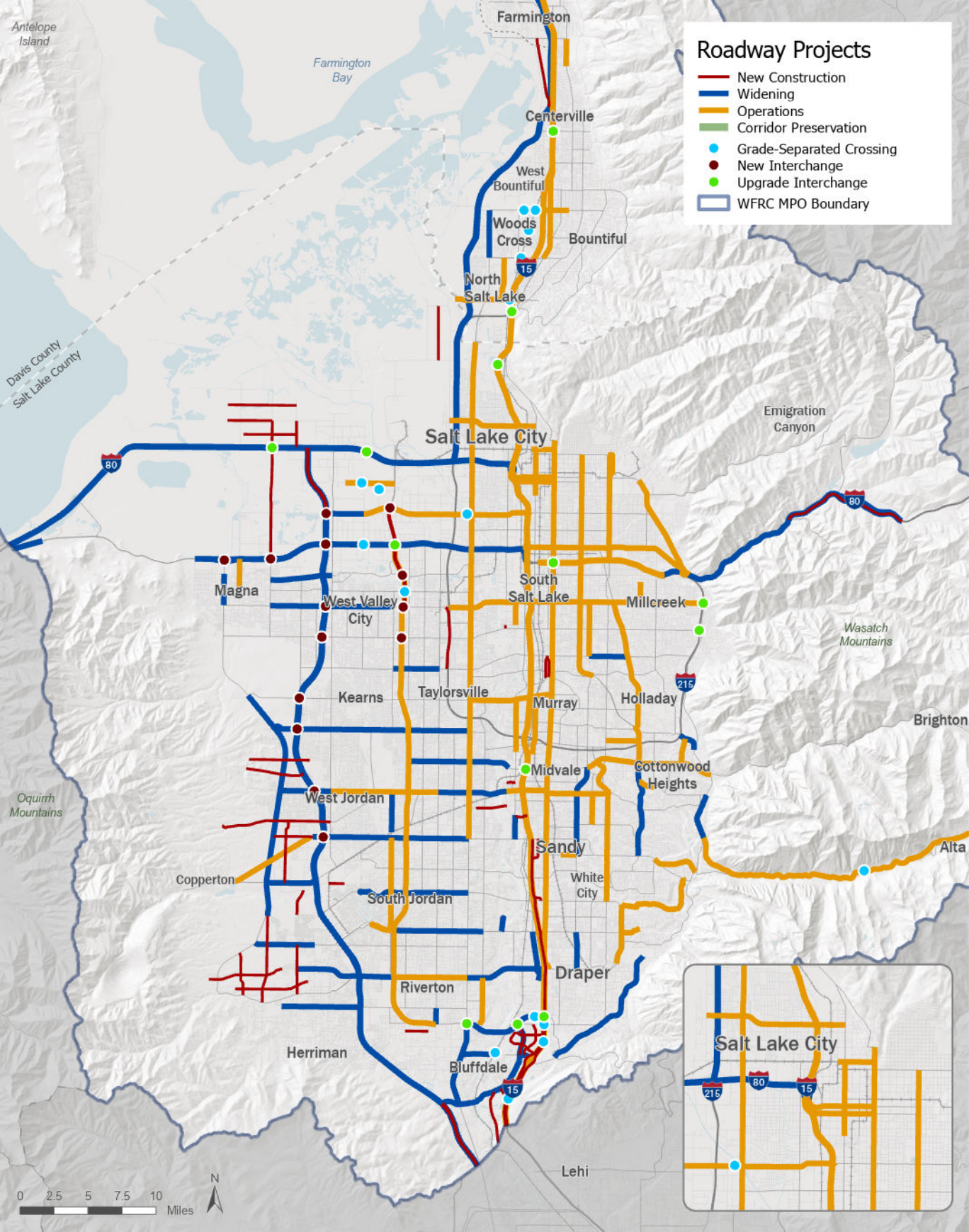

Roadway Projects
New Construction
Widening
Operations
Corridor Preservation
Grade-Separated Crossing
New Interchange
Upgrade Interchange
WFRC MPO Boundary
Antelope Island
Farmington Bay
Farmington
Centerville
West Bountiful
Woods Cross
Bountiful
North Salt Lake
Davis County
Salt Lake County
Salt Lake City
Emigration Canyon
Magna
West Valley City
South Salt Lake
Millcreek
Wasatch Mountains
Kearns
Taylorsville
Murray
Holladay
Brighton
Midvale
Cottonwood Heights
Oquirrh Mountains
West Jordan
Sandy
Alta
Copperton
South Jordan
White City
Draper
Riverton
Herriman
Bluffdale
Lehi
Salt Lake City
0 2.5 5 7.5 10 Miles
N

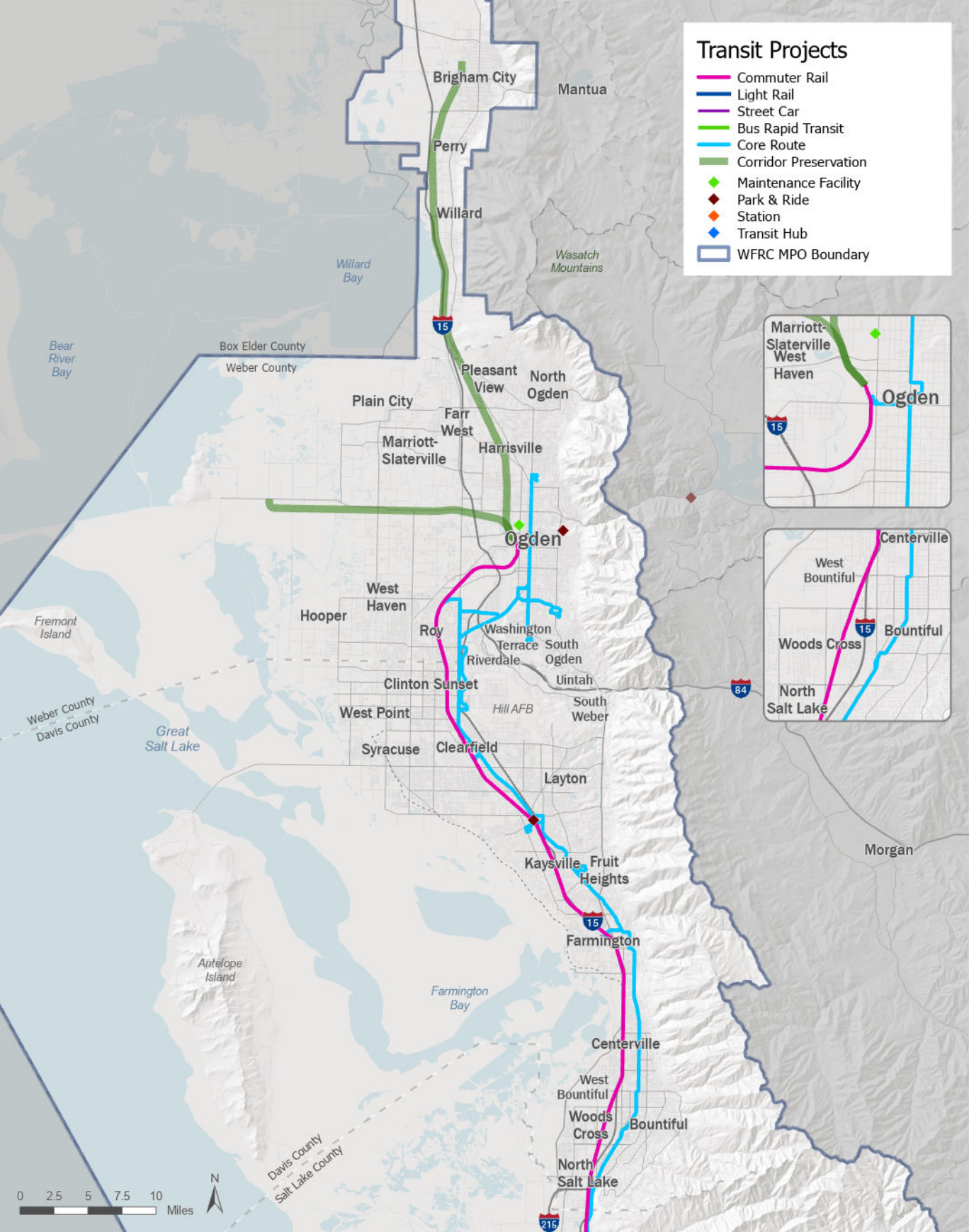
Table 22. Roadway Project Summary

Type	Number of Projects	Number of Miles	2023 Cost
Phase 1			
New Construction	35	59.1	$1,593,000,000
Widening	24	77	$3,841,000,000
Operational	49	170.1	$502,000,000
Interchange Improvements	10	-	$497,000,000
New Interchanges	13	-	$982,000,000
Grade-Separated Crossings	5	-	$209,000,000
Phase 1 Total Cost			**$7,624,000,000**
Phase 1 Revenue			**$7,723,000,000**
Phase 2			
New Construction	21	33.5	$1,579,000,000
Widening	36	79.6	$2,411,000,000
Operational	38	92.6	$343,000,000
Interchange Improvements	8	-	$830,000,000
New Interchanges	3	-	$304,000,000
Grade-Separated Crossings	10	-	$356,000,000
Phase 2 Total Cost			**$5,823,000,000**
Phase 2 Revenue			**$5,829,000,000**
Phase 3			
New Construction	21	29.1	$964,000,000
Widening	22	79.6	$1,882,000,000
Operational	47	146.4	$613,000,000
Interchange Improvements	6	-	$198,000,000
New Interchanges	1	-	$50,000,000
Grade-Separated Crossings	8	-	$308,000,000

Phase 3 Total Cost			**$4,015,000,000**
Phase 3 Revenue			**$4,157,000,000**
Unfunded			
New Construction	55	102.3	$2,411,000,000
Widening	20	36.7	$1,241,000,000
Operational	6	61.3	$230,000,000
Interchange Improvements	16	-	$2,169,000,000
New Interchanges	2	-	$121,000,000
Grade-Separated Crossings	2	-	$64,000,000
Unfunded Total Cost			**$6,237,000,000**
All Phases			
New Construction	132	224	$6,547,000,000
Widening	102	273	$9,375,000,000
Operational	140	470	$1,688,000,000
Interchange Improvements	40	-	$3,694,000,000
New Interchanges	19	-	$1,457,000,000
Grade-Separated Crossings	25	-	$937,000,000
All Phases Total Cost			**$23,698,000,000**
Total Phases Revenue			**$17,709,000,000**

Transit Projects and Phasing

The 2023-2050 RTP transit projects include identified corridors with planned transit routes and point projects that enhance existing or planned service, as shown in Maps 7 and 8. 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 23 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 fiscally constrained phase, current cost, and phased cost can be found in Appendix L - 2023-2050 Phased Project Lists by Mode (appendix forthcoming). The 2023-2050 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.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Light Rail
Street Car
Bus Rapid Transit
Core Route
Corridor Preservation
Maintenance Facility
Park & Ride
Station
Transit Hub
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Brigham City
Mantua
Perry
Willard
Willard Bay
Wasatch Mountains
Bear River Bay
Box Elder County
Weber County
Pleasant View
North Ogden
Plain City
Farr West
Marriott-Slaterville
Harrisville
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Washington Terrace
South Ogden
Riverdale
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Kaysville
Fruit Heights
Farmington
Antelope Island
Farmington Bay
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Woods Cross
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North Salt Lake
Fremont Island
Great Salt Lake
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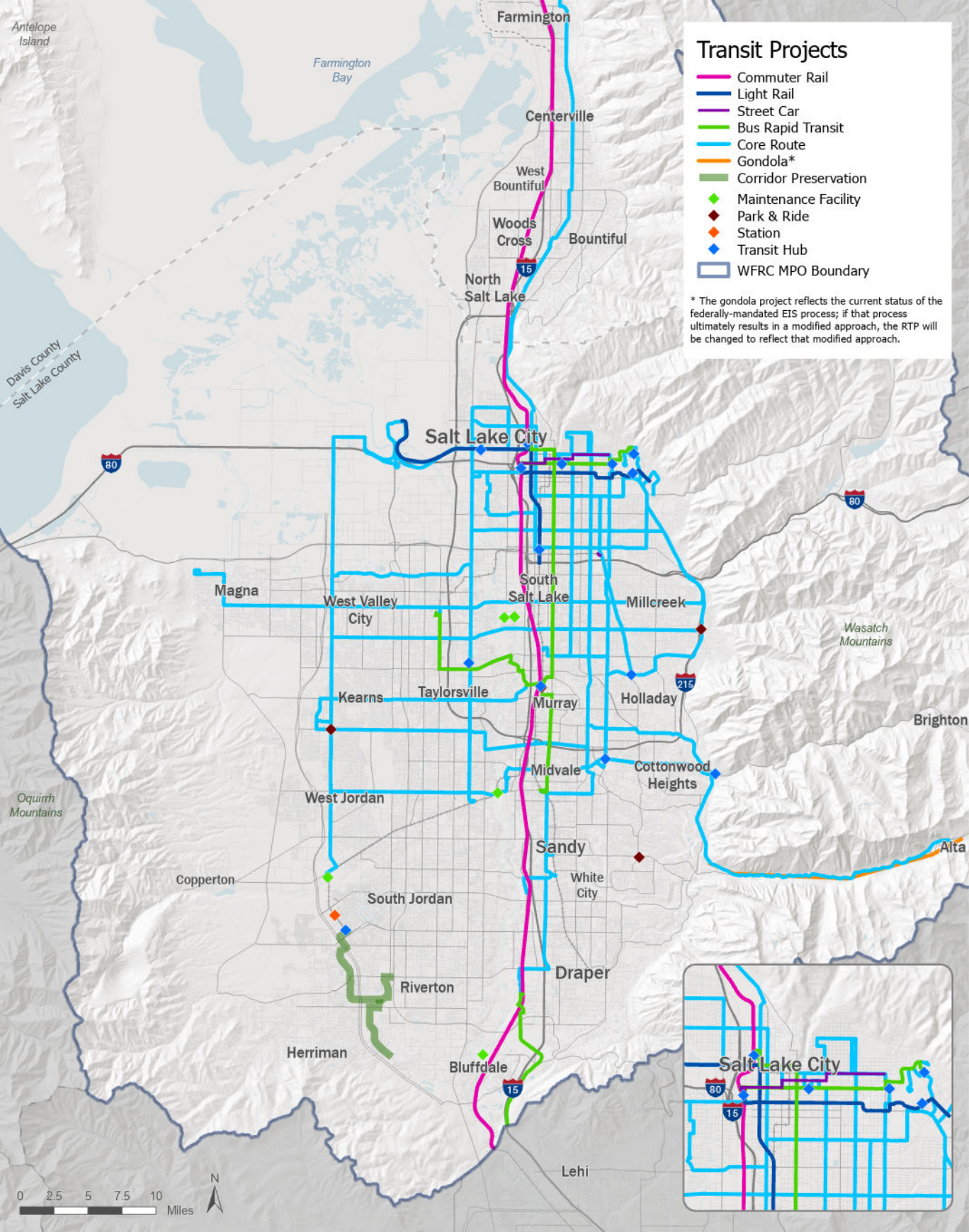
West Bountiful
Woods Cross
Bountiful
North Salt Lake


Transit Projects
Commuter Rail
Light Rail
Street Car
Bus Rapid Transit
Core Route
Gondola*
Corridor Preservation
Maintenance Facility
Park & Ride
Station
Transit Hub
WFRC MPO Boundary
* The gondola project reflects the current status of the federally-mandated EIS process; if that process ultimately results in a modified approach, the RTP will be changed to reflect that modified approach.
Antelope Island
Farmington Bay
Farmington
Centerville
West Bountiful
Woods Cross
Bountiful
North Salt Lake
Davis County
Salt Lake County
Salt Lake City
Magna
West Valley City
South Salt Lake
Millcreek
Wasatch Mountains
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Brighton
Midvale
Cottonwood Heights
Oquirrh Mountains
West Jordan
Sandy
Alta
Copperton
White City
South Jordan
Draper
Riverton
Herriman
Bluffdale
Lehi
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Miles
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Salt Lake City

Table 23. Transit Project Summary

Type	Number of Projects	Number of Miles	2023 Capital Costs	2023 Annual Operating Costs
Phase 1				
Core Route	17	214.2	$437,690,000	$44,775,000
Bus Rapid Transit	2	9.8	$501,000,000	$4,706,000
Streetcar	1	0.2	$11,560,000	$106,000
Light Rail	1	1.6	$4,867,000	-
Commuter Rail	3	14.7	$718,441,000	$6,556,000
Corridor Preservation	5	39.5	$58,728,000	-
Gondola (this reflects the current status of the federally-mandated EIS process; if that process ultimately results in a modified approach, the RTP will be changed to reflect that modified approach)	0	0	$0	$0
Transit Hub	7	-	$132,102,000	-
Maintenance Facility	5	-	$79,349,000	-
Park & Ride	2	-	$8,423,000	-
Infill Station	1	-	$2,989,000	-
Phase 1 Cost (One-Year Operating Expense)			**$1,955,149,000**	**$6,711,481**
Phase 1 Total Cost (Multi-Year Operating Expense)				**$2,094,000,000**
Phase 1 Revenue				**$1,534,000,000**
Phase 2				
Core Route	11	93.9	$56,340,000	$12,225,780
Bus Rapid Transit	1	13.5	$243,000,000	$6,482
Streetcar	0	-	-	-
Light Rail	2	2.25	$221,040,000	$9,407,500
Commuter Rail	3	-	$700,000,000	-
Corridor Preservation	0	0	$0	-

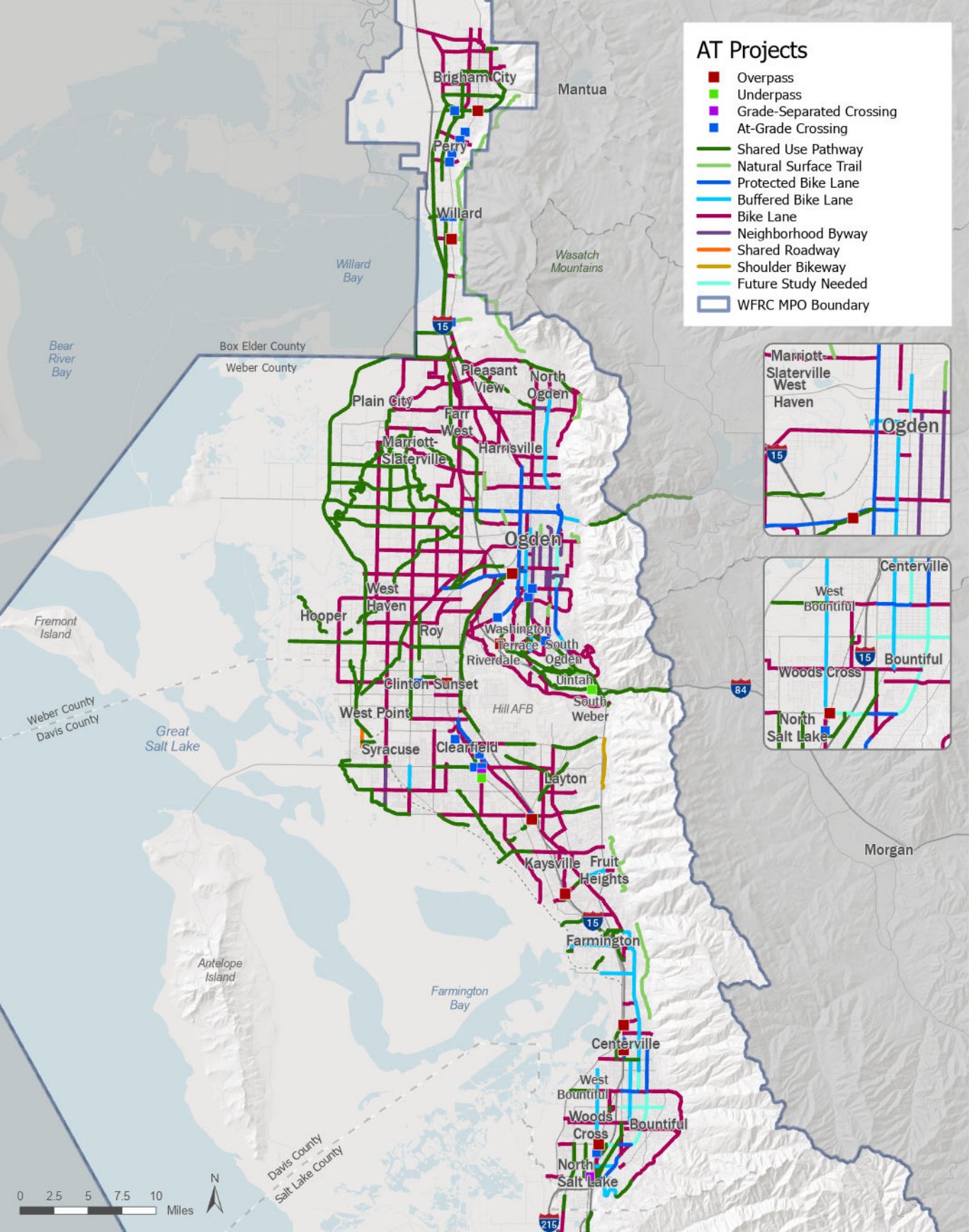
Gondola (this reflects the current status of the federally-mandated EIS process; if that process ultimately results in a modified approach, the RTP will be changed to reflect that modified approach)	0	0	$0	$0
Transit Hub	8	-	$118,858,000	-
Maintenance Facility	1	-	$20,000,000	-
Park & Ride	1	-	$4,211,000	
Infill Station	0	-	$0	-
Phase 2 Cost (One-Year Operating Expense)			**$1,363,000,000**	**$28,000,000**
Phase 2 Total Cost (Multi-Year Operating Expense)				**$2,633,000,000**
Phase 2 Revenue				**$2,155,000,000**
Phase 3				
Core Route	4	36.1	$17,100,000	$3,711,000
Bus Rapid Transit	0	0	$0	$0
Streetcar	1	3.4	$196,520,000	$1,802,000
Light Rail	1	0	$30,000,000	$7,490,000
Commuter Rail	3	0	$1,270,020,000	-
Corridor Preservation	0	0	$0	-
Gondola (this reflects the current status of the federally-mandated EIS process; if that process ultimately results in a modified approach, the RTP will be changed to reflect that modified approach)	1	8.5	$391,000,000	$4,000,000
Transit Hub	0	-	$0	-
Maintenance Facility	1	-	$5,849,000	-
Park & Ride	3	-	$12,634,000	-
Infill Station	0	-	$0	-
Phase 3 Cost (One-Year Operating Expense)			**$1,532,000,000**	**$13,000,000**

Phase 3 Total Cost (Multi-Year Operating Expense)				**$2,547,000,000**
Phase 3 Revenue				**$2,269,000,000**
Unfunded				
Core Route	0	0	$0	$0
Bus Rapid Transit	0	0	$0	$0
Streetcar	2	10.2	$498,180,000	$4,293,000
Light Rail	0	0	$0	$0
Commuter Rail	3	0	$846,680,000	-
Corridor Preservation	0	0	$0	-
Gondola (this reflects the current status of the federally-mandated EIS process; if that process ultimately results in a modified approach, the RTP will be changed to reflect that modified approach)	0	0	$0	$0
Transit Hub	0	-	$0	-
Maintenance Facility	0	-	$0	-
Park & Ride	0	-	$0	-
Infill Station	0	-	$0	-
Unfunded Total Cost			**$1,345,000,000**	**$4,000,000**
All Phases				
Core Route	32		$511,130,000	$60,711,100
Bus Rapid Transit	3		$744,000,000	$11,188,660
Streetcar	4		$706,260,000	$6,201,000
Light Rail	4		$255,040,000	$16,897,500
Commuter Rail	12		$3,535,141,000	$6,556,000
Corridor Preservation	5	39.5	$58,728,000	-
Gondola (this reflects the current status of the federally-mandated EIS process; if that process	1	8.5	$391,000,000	$4,000,000

ultimately results in a modified approach, the RTP will be changed to reflect that modified approach)				
Transit Hub	15	-	$250,959,000	-
Maintenance Facility	7	-	$105,199,000	-
Park & Ride	6	-	$25,269,000	
Infill Station	1	-	$2,989,000	-
All Phase Total Cost (One-Year Operating Expense)			**$6,196,000,000**	**$1,877,000,000**
Total Cost Fiscally Constrained Plan (Multi-Year Operating Expense)				**$8,073,000,000**
Total Phases Revenue				$7,200,000,000

Active Transportation Projects and Phasing

The 2023-2050 RTP active transportation projects list can be found in Appendix X - 2023-2050 Phased Project Lists by Mode (appendix forthcoming) and identifies planned active transportation routes and point projects. Each project description includes the project name, project length, facility type, when the project is needed, the fiscally constrained phase, current cost, and phased cost. The 2023-2050 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 9 and 10 show the locations and Table 24 provides a summary of active transportation projects included in the 2023-2050 RTP.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Overpass
Underpass
Grade-Separated Crossing
At-Grade Crossing
Shared Use Pathway
Natural Surface Trail
Protected Bike Lane
Buffered Bike Lane
Bike Lane
Neighborhood Byway
Shared Roadway
Shoulder Bikeway
Future Study Needed
WFRC MPO Boundary
Brigham City
Mantua
Perry
Willard
Willard Bay
Wasatch Mountains
Bear River Bay
Box Elder County
Weber County
Pleasant View
North Ogden
Plain City
Farr West
Marriott-Slaterville
Harrisville
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West Haven
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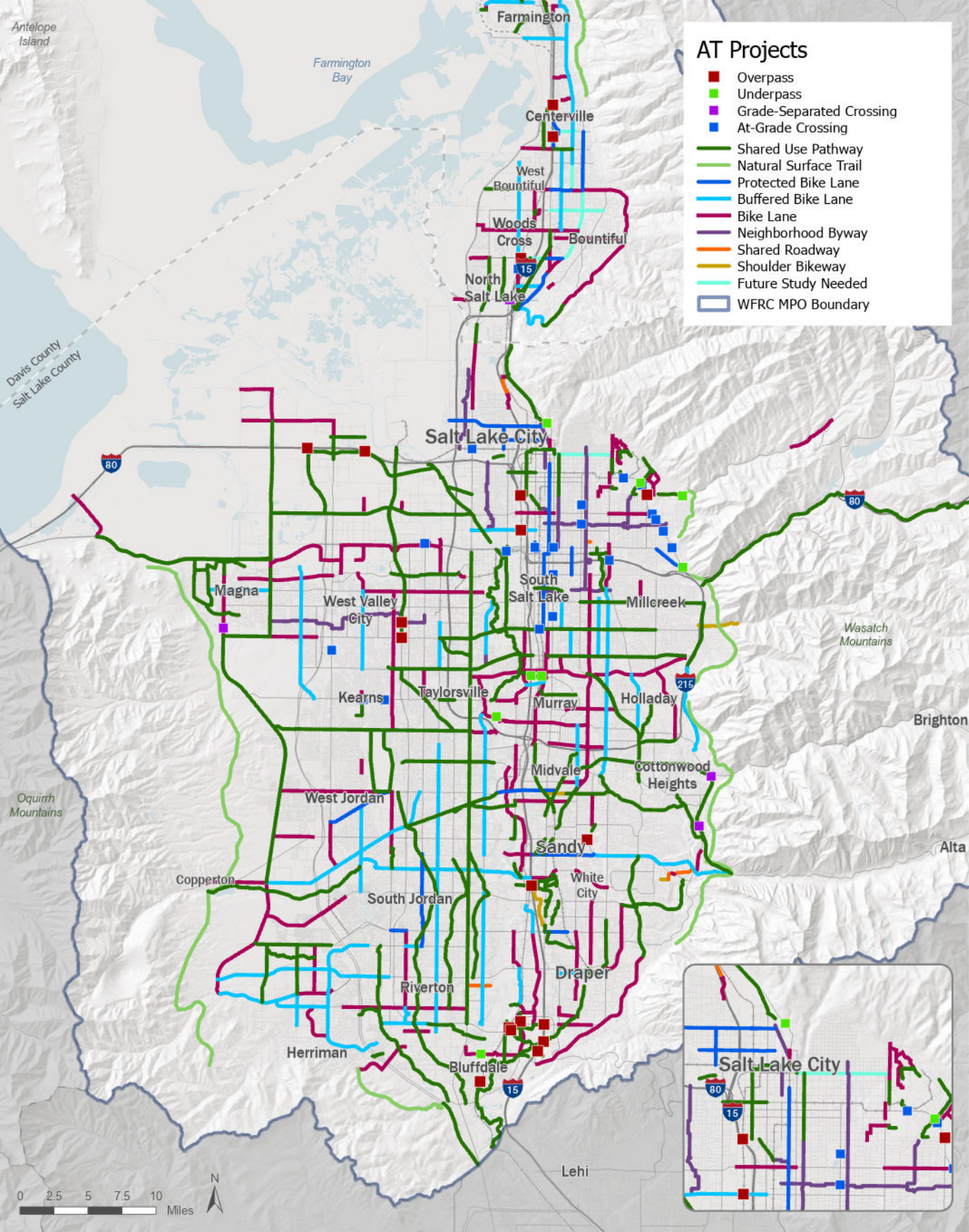
AT Projects
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Grade-Separated Crossing
At-Grade Crossing
Shared Use Pathway
Natural Surface Trail
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Buffered Bike Lane
Bike Lane
Neighborhood Byway
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Future Study Needed
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Murray
Holladay
Brighton
Midvale
Cottonwood Heights
Oquirrh Mountains
West Jordan
Sandy
Alta
Copperton
South Jordan
White City
Draper
Riverton
Herriman
Bluffdale
Lehi
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Miles
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Table 24: Active Transportation Project Summary

Type	Number of Projects	Number of Miles	2023 Capital Cost
Phase 1			
Bike Boulevard	8	15	$5,400,000
Bike Lane	35	67	$17,800,000
Buffered Bike Lane	17	34	$7,500,000
Neighborhood Byway	0	0	$0
Phased Implementation	0	0	$0
Protected Bike Lane	10	22	$31,000,000
Shared Lane	1	0.2	$5,000
Shared Use Path	74	140	$267,000,000
Shoulder Bikeway	1	0.6	$38,000
Side Path	2	5	$5,600,000
Trail	0	0	$0
Future Study Needed	3	3	$300,000
At-Grade Crossing	15	-	$5,500,000
Overhead Crossing	8	-	$50,600,000
Underground Crossing	1	-	$3,600,000
Grade Separated Crossing	0	-	$0
Phase 1 Total Cost			**$395,000,000**
Phase 1 Revenue			**$396,000,000**
Phase 2			
Bike Boulevard	8	11	$2,000,000
Bike Lane	66	121	$19,600,000
Buffered Bike Lane	227	47	$9,900,000
Neighborhood Byway	3	2	$110,000
Phased Implementation	0	0	$0

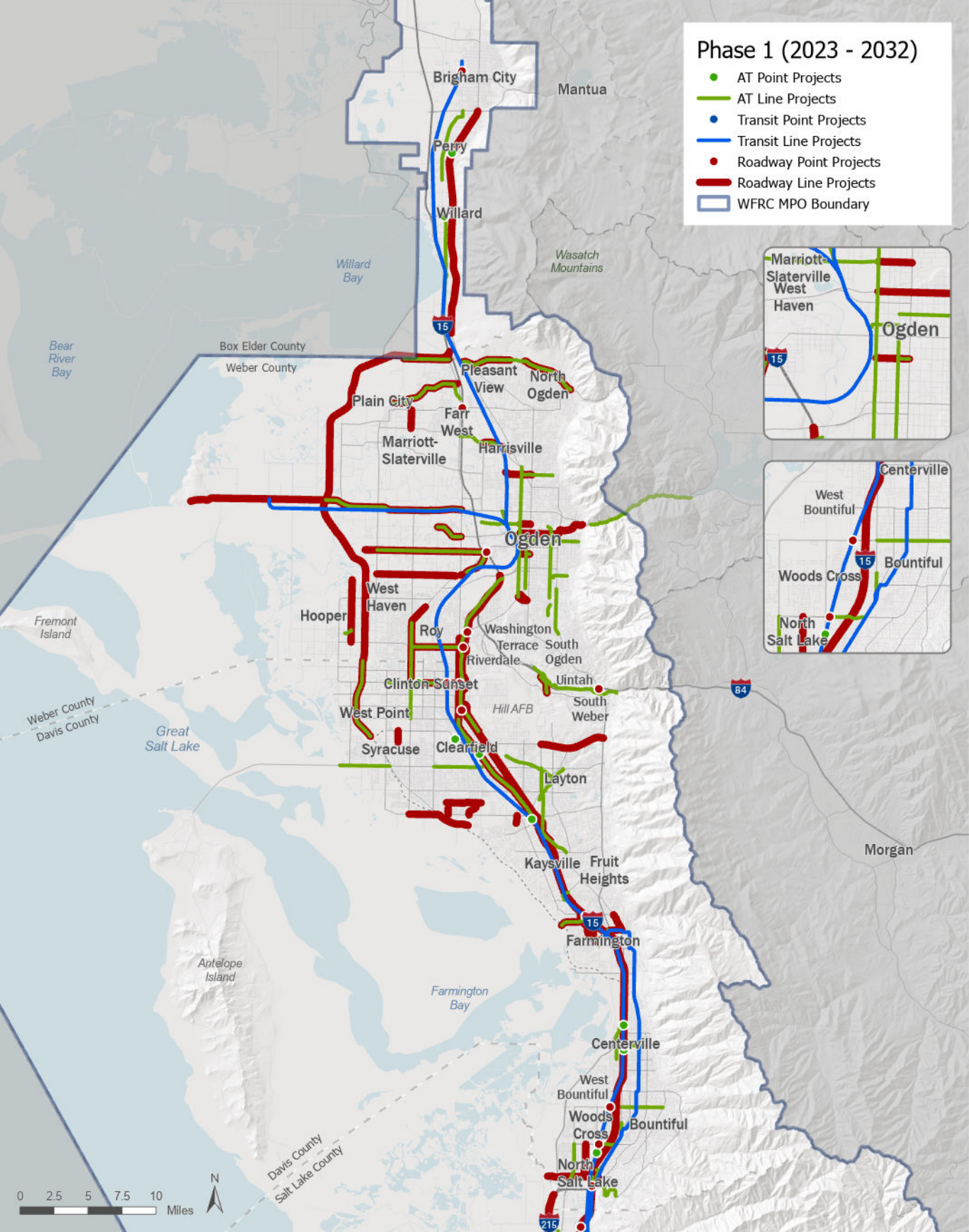
Protected Bike Lane	120	15	$19,000,000
Shared Lane	1	1	$18,000
Shared Use Path	77	143	$232,600,000
Shoulder Bikeway	1	1	$700,000
Side Path	5	10	$11,600,000
Trail	2	2	$450,000
Future Study Needed	1	2	$4,000,000
At-Grade Crossing	16	-	$3,200,000
Overhead Crossing	11	-	$84,500,000
Underground Crossing	0	-	0
Grade Separated Crossing	3	-	$13,500,000
Phase 2 Total Cost			**$401,200,000**
Phase 2 Revenue			**$404,600,000**
Phase 3			
Bike Boulevard	3	5	$1,600,000
Bike Lane	52	94	$18,700,000
Buffered Bike Lane	9	11	$2,000,000
Neighborhood Byway	3	8	$474,000
Phased Implementation	1	2	$240,000
Protected Bike Lane	5	10	$12,700,000
Shared Lane	3	2	$40,000
Shared Use Path	37	84	$130,000,000
Shoulder Bikeway	0	0	$0
Side Path	8	8	$9,800,000
Trail	1	2	$470,000
Future Study Needed	1	1	$88,000
At-Grade Crossing	7	-	$1,400,000

Overhead Crossing	7	-	$44,300,000
Underground Crossing	8	-	$28,000,000
Grade Separated Crossing	3	-	$14,900,000
Phase 3 Total Cost			**$265,500,000**
Phase 3 Revenue			**$266,900,000**
Unfunded			
Bike Boulevard	2	2	$110,000
Bike Lane	113	149	$30,600,000
Buffered Bike Lane	11	30	$6,600,000
Neighborhood Byway	1	2	$100,000
Phased Implementation	1	2	$100,000
Protected Bike Lane	0	0	$0
Shared Lane	2	1	$20,000
Shared Use Path	41	87	$144,900,000
Shoulder Bikeway	4	4	$2,500,000
Side Path	2	4	$5,000,000
Trail	22	64	$16,700,000
Future Study Needed	1	2	$240,000
At-Grade Crossing	7	-	$1,400,000
Overhead Crossing	8	-	$50,600,000
Underground Crossing	8	-	$28,800,000
Grade Separated Crossing	2	-	$9,900,000
Unfunded Total Cost			**$297,600,000**
All Phases			
Bike Boulevard	21	33	$9,100,000
Bike Lane	266	431	$86,700,000
Buffered Bike Lane	59	122	$26,000,000

Neighborhood Byway	7	11	$680,000
Phased Implementation	1	2	$240,000
Protected Bike Lane	27	47	$62,600,000
Shared Lane	7	7	$80,000
Shared Use Path	229	454	$774,700,000
Shoulder Bikeway	6	6	$3,300,000
Side Path	17	26	$32,100,000
Trail	25	68	$17,600,000
Future Study Needed	6	8	$4,600,000
At-Grade Crossing	45	-	$11,500,000
Overhead Crossing	34	-	$230,100,000
Underground Crossing	17	-	$61,200,000
Grade Separated Crossing	8	-	$38,300,000
All Phases Total Cost			**$1,358,900,000**
Total Phases Revenue			$1,061,300,000

Phased Project Maps

Roadway, transit, and active transportation projects work together to create a comprehensive, multimodal system. Maps 11 through 18 show the 2023-2050 RTP roadway, transit, and active transportation projects by phase. For more detail, these maps have been shown by Urbanized Area.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Transit Point Projects
Transit Line Projects
Roadway Point Projects
Roadway Line Projects
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Willard Bay
Wasatch Mountains
Bear River Bay
Box Elder County
Weber County
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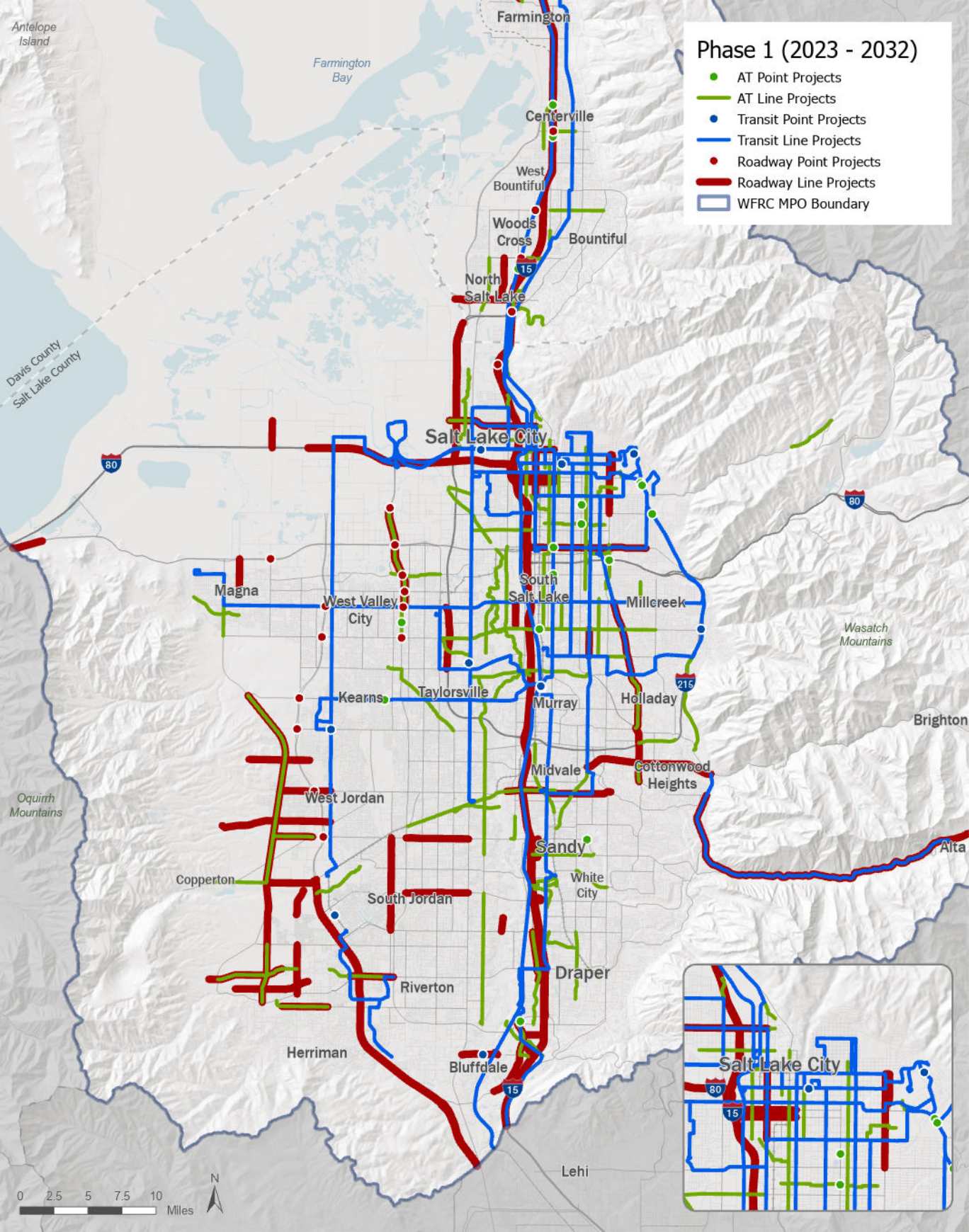
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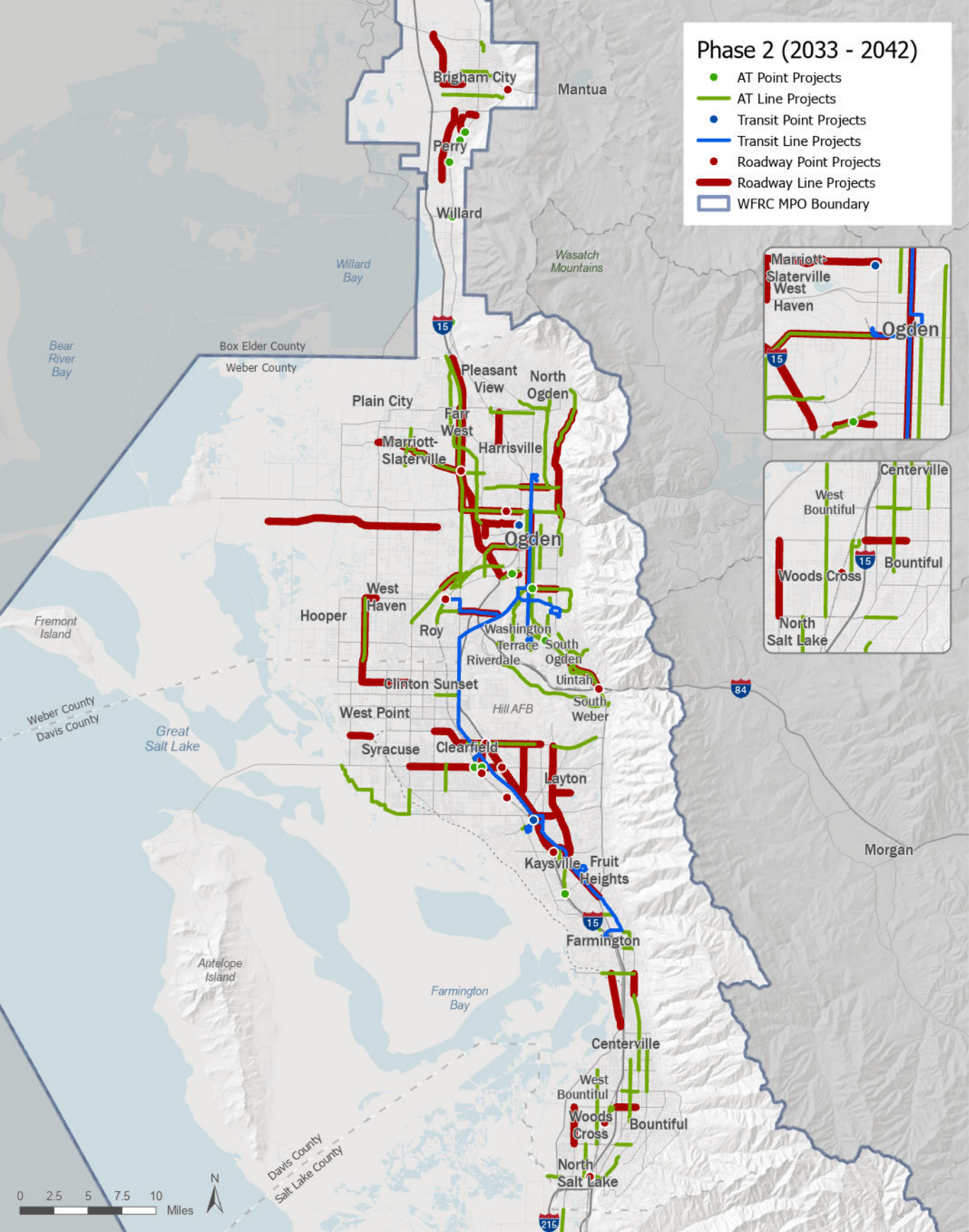
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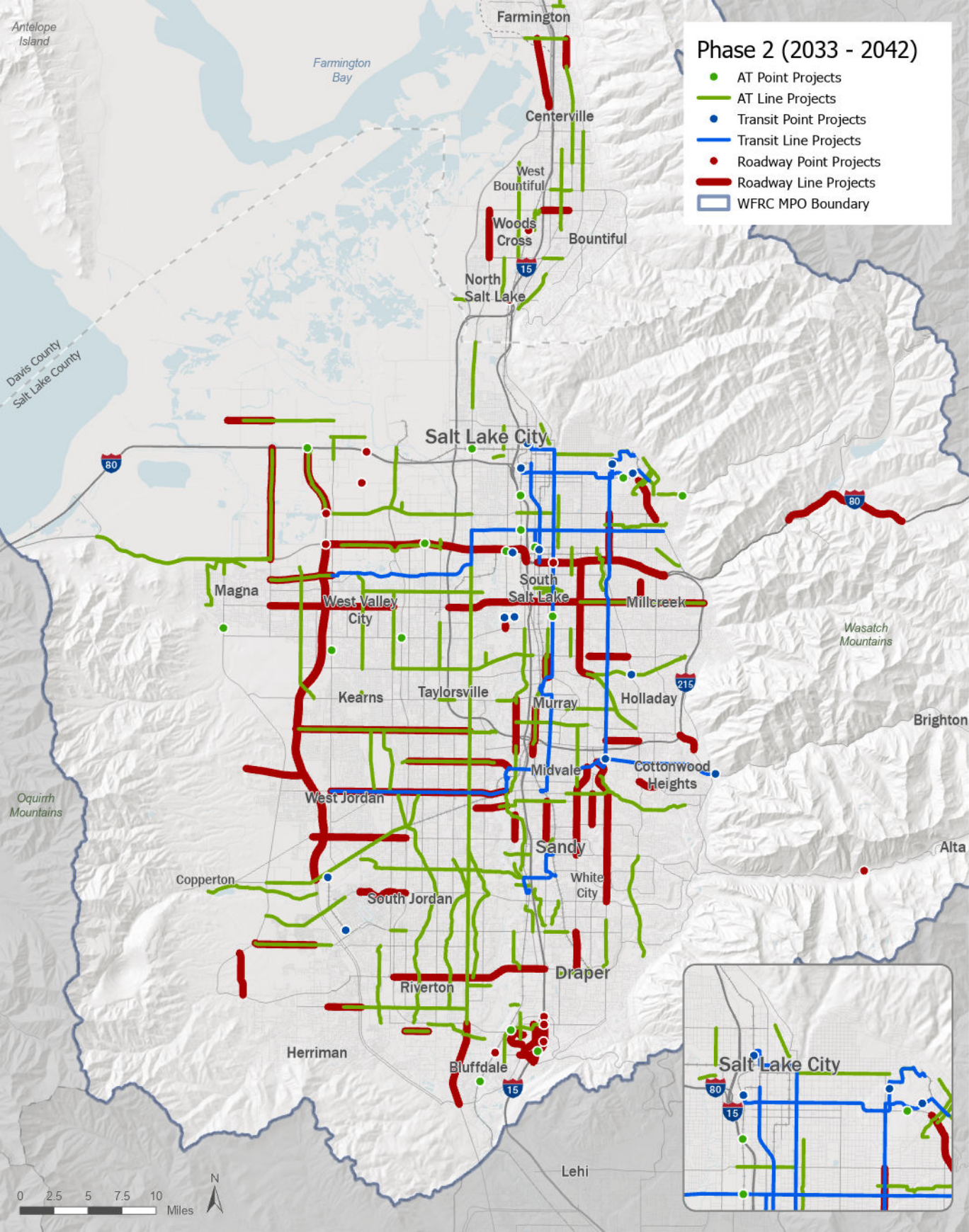
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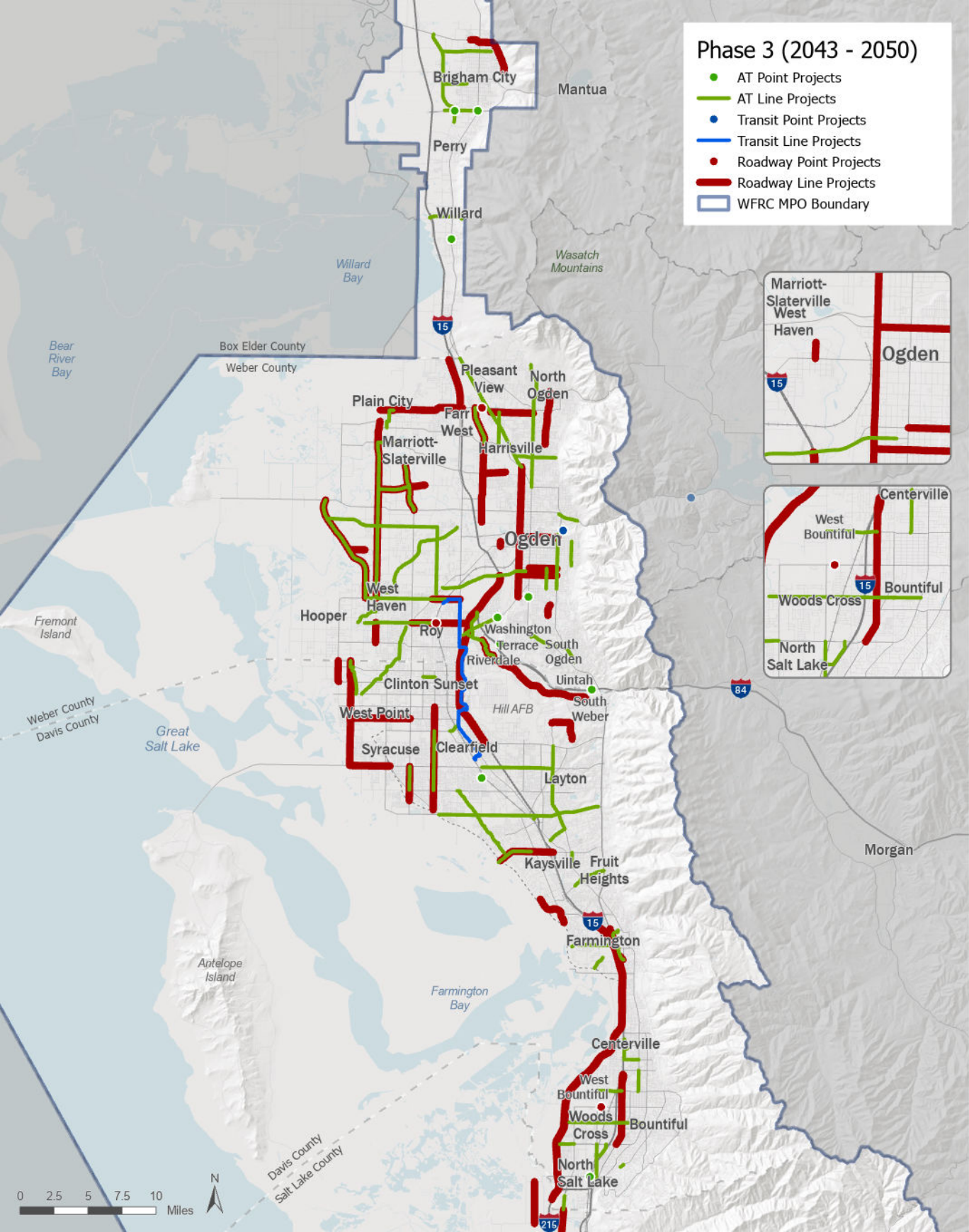
Phase 3 (2043 - 2050)
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Transit Line Projects
Roadway Point Projects
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Willard
Willard Bay
Wasatch Mountains
Bear River Bay
Box Elder County
Weber County
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Woods Cross
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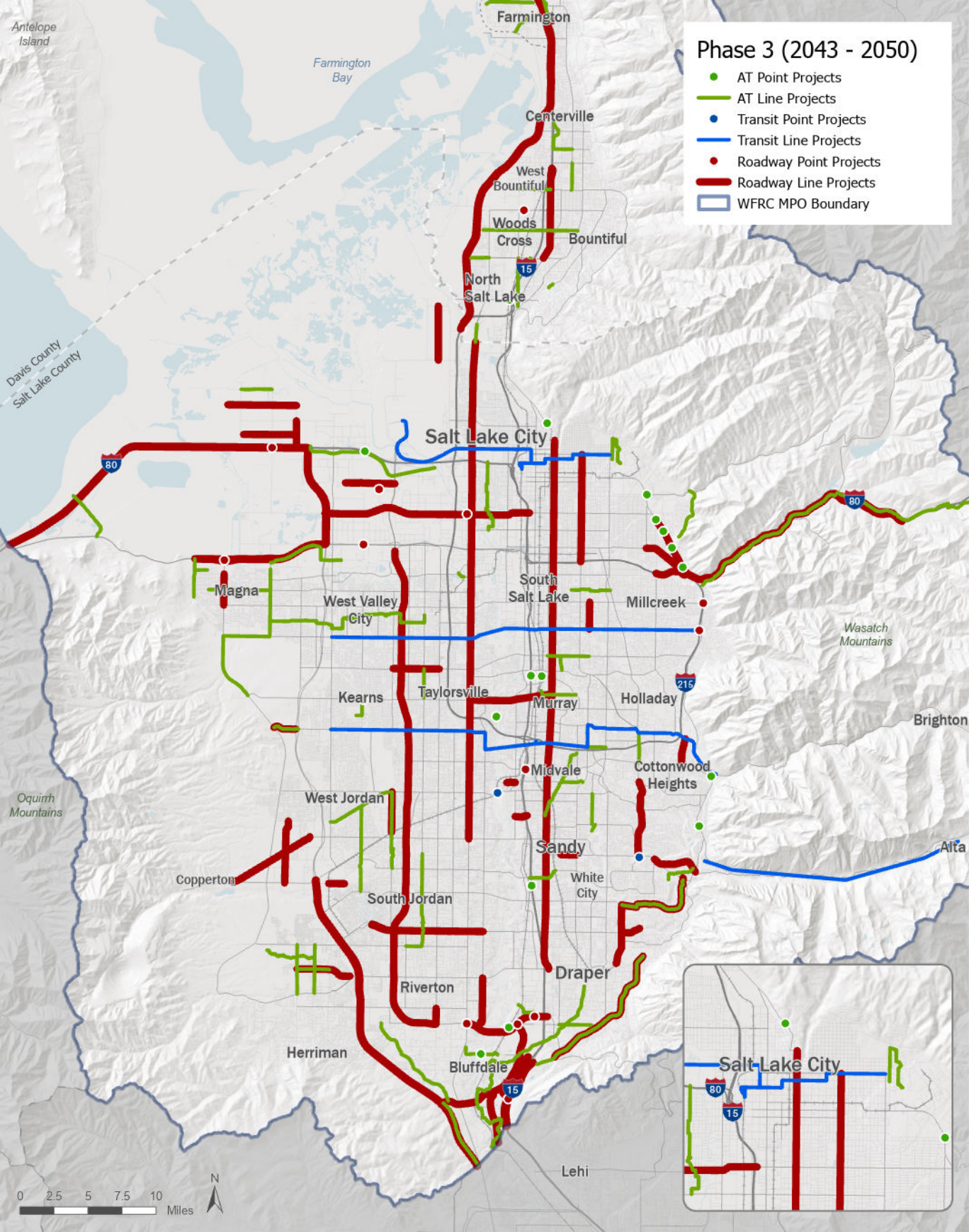
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White City
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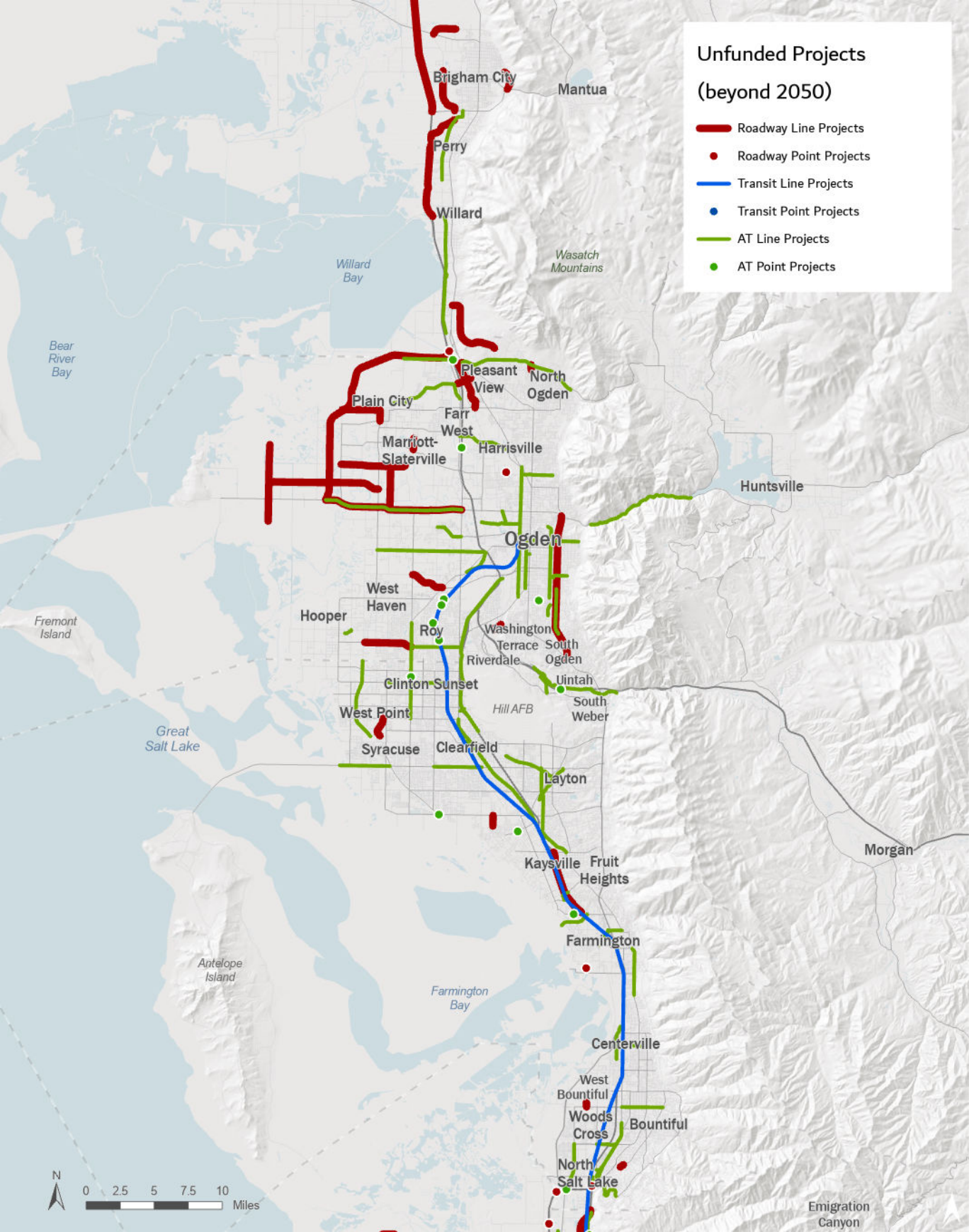
Unfunded Projects
(beyond 2050)
Roadway Line Projects
Roadway Point Projects
Transit Line Projects
Transit Point Projects
AT Line Projects
AT Point Projects
Brigham City
Mantua
Perry
Willard
Willard Bay
Wasatch Mountains
Bear River Bay
Pleasant View
North Ogden
Plain City
Farr West
Marriott-Slaterville
Harrisville
Huntsville
Ogden
West Haven
Hooper
Roy
Washington Terrace
South Ogden
Riverdale
Fremont Island
Clinton
Sunset
Uintah
South Weber
Hill AFB
West Point
Great Salt Lake
Syracuse
Clearfield
Layton
Kaysville
Fruit Heights
Morgan
Farmington
Antelope Island
Farmington Bay
Centerville
West Bountiful
Woods Cross
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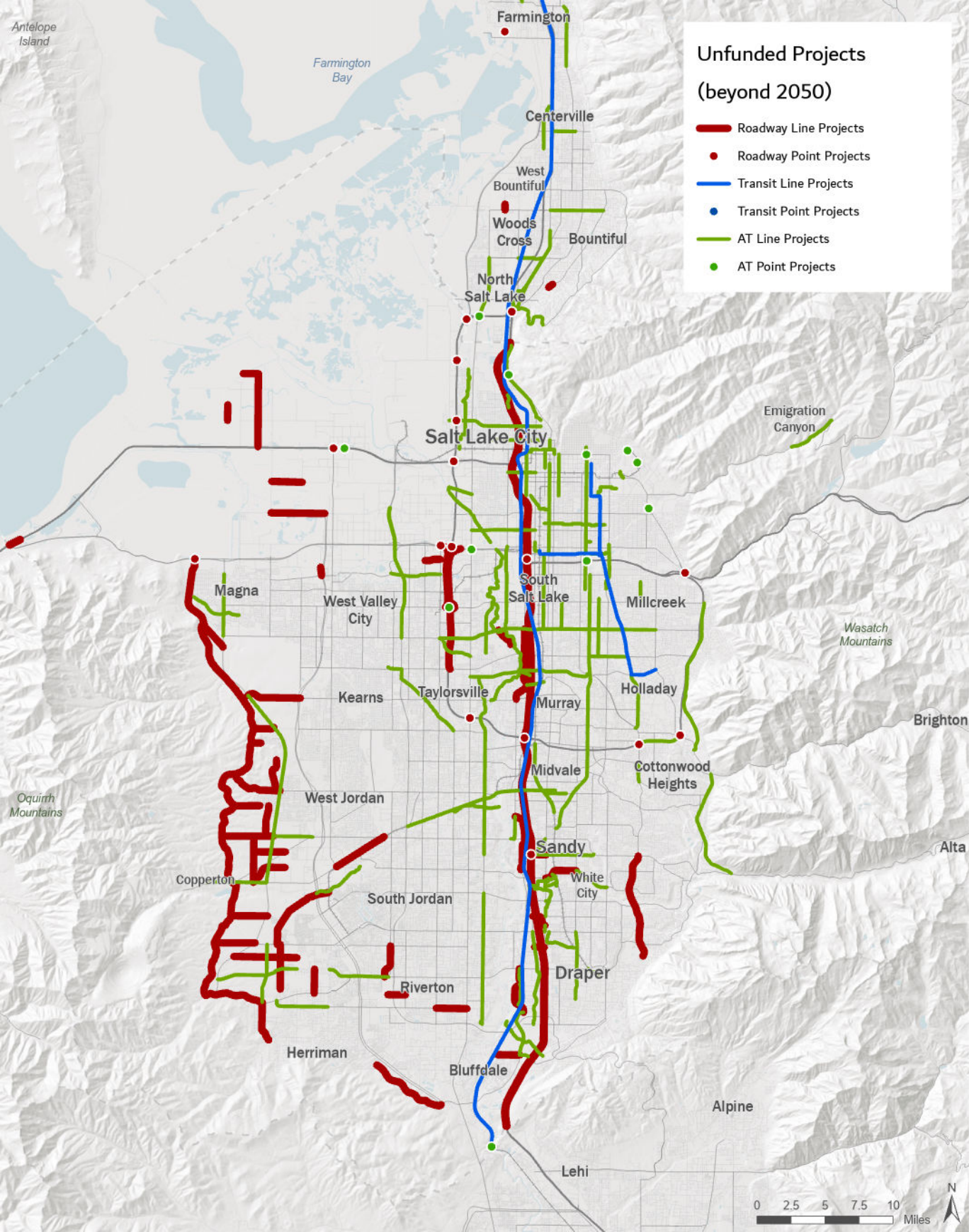
Unfunded Projects
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Roadway Line Projects
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Transit Point Projects
AT Line Projects
AT Point Projects
Antelope Island
Farmington Bay
Farmington
Centerville
West Bountiful
Woods Cross
Bountiful
North Salt Lake
Salt Lake City
Emigration Canyon
Magna
West Valley City
South Salt Lake
Millcreek
Wasatch Mountains
Kearns
Taylorsville
Murray
Holladay
Brighton
Midvale
Cottonwood Heights
Oquirrh Mountains
West Jordan
Sandy
Alta
Copperton
White City
South Jordan
Draper
Riverton
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0 2.5 5 7.5 10
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10: Present Impacts and Benefits

The 2023–2050 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 2023–2050 RTP helped form the basis for this evaluation and the RTP was also analyzed with regard to its conformity with state air quality plans and other factors.

Wasatch Choice Vision Performance Measures

Performance measures were used to assess the performance of the phased, fiscally constrained preferred Wasatch Choice scenario. Each measure below compares existing conditions to two future scenarios:

1. Existing plans funded through 2028: 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. Wasatch Choice 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 transportation projects using revenue sources currently in place along with specific additional revenue streams, considering how future technologies may impact our travel behavior, coupled with the Wasatch Choice Vision's proposed land use policies through 2050.

Between now and 2050, the population in the WFRC planning area is expected to increase 32 percent, from approximately 1.9 million to approximately 2.5 million. This additional population, as well as our current population and visitors, will need to travel to jobs, education, recreation, visit friends and family, and other daily activities. It is the goal of the Wasatch Choice Vision for this travel to be reliable, manageable, accessible to destinations, multimodal, and safe. Table 25 shows relatively modest benefits in some performance areas, but this is somewhat impressive given the substantial increase in population.

Table 25. Regional Performance Measures Summary

Metric	Measure		Today	Current Path to 2050	Wasatch Choice Path to 2050
Goal: Access to economic and educational opportunities					
Access to Opportunities	The number of jobs and households that are accessible within a typical commute.	Auto	226,000	244,000	294,000
		Transit	14,000	18,000	24,000
	Auto:transit access to opportunities ratio		16.3	13.7	12.4
Goal: Manageable and reliable traffic conditions					
Freight delay	Hours of total truck delay per day.		98,000	147,000	126,000
Freight speed	The average truck speed on critical urban freight corridors in the evening commute.		41 mph	35 mph	39 mph
Auto Travel Time	The time per day spent traveling in a vehicle.	Region	1,047,000	1,589,000	1,518,000
		Avg. Driver	0:55	1:05	1:02
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	16%	16%	32%
		Bike	58%	55%	82%
Walk and Bike Use	The number of trips per day that residents travel by active transportation.	Trips	1,165,000	1,647,000	1,569,000
		Mode Split	12.0%	12.0%	12.1%
Transit Use	The number of trips per day that residents travel by transit.	Trips	128,000	240,000	339,000
		Mode Split	1.3%	1.8%	2.5%
Goal: Clean Air					
Air Quality	The miles of vehicle travel taken in the Region per household.		65.6	55.3	59.6

The accessibility provided by the Wasatch Choice path transportation networks performs better than that of the current path, about 21 percent more for auto access and about 33 percent more for transit access. Overall, local residents improve their auto access 30 percent and their transit access 71 percent over today. Among the factors influencing accessibility is the type of transportation improvements, such as strategic widenings, operational projects, new roads, expanded rail, new BRT routes, and more frequent core bus routes. In addition, the linking of transportation investment and development decisions provides significant benefit and is one of the key strategies of the Wasatch Choice Vision.

Average travel time by car will increase in either future scenario due to a growing region and significant population increase. However, seven more minutes per day over the next 27 years is a relatively minor increase, especially when considered with the significant increases in destination access. It may take longer to travel the same distance in the future, but the average person will be able to reach more destinations within that time, as noted by the access to opportunities performance measure.

One of the most direct measures of economic vitality is truck freight mobility. Overall truck delay increases in both future scenarios, but is about 14 percent less in the Wasatch Choice path. This is in part due to specifically targeted capacity and operational road improvements. In addition, the Wasatch Choice path includes a number of grade-separated crossings over freight rail corridors to reduce conflict and improve safety between regional traffic and freight traffic.

The Wasatch Choice path significantly increases access to transit and active transportation over today's environment, doubling access for transit and over 40 percent for active transportation. One of the key differences between the current path and the Wasatch Choice path is the assumption of new revenue beyond our existing revenue sources. There is a significant unrealized transit access if we do not identify new revenue streams for transit. This access to transit translates into substantial increase in transit use, as compared to both current ridership and current path ridership. By investing more in our transit system and increasing service breadth and coverage, we can increase ridership by an additional 41 percent, to over 339,000 trips per day.

Vehicle miles traveled (VMT) is a performance metric used to measure how far people need to travel to reach destinations. Based on modeling projections, regional VMT is expected to increase from 42.3 million miles today to 58.8 million miles in 2050, or 1.4 percent per year, while our VMT per household decreases from 65.6 miles to 59.6 miles, or 0.3 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.

Mode Share Metrics

The way in which people choose to travel can be largely influenced by the options they have. The intent of the 2023-2050 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 2023-2050 RTP, 82 percent of the Region's population will have access to active transportation infrastructure within a quarter mile of their home and 33 percent of the Region's population will have access to frequent transit within a quarter mile of their home. This is an increase of 41 and over 100 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 modeling 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 for daily and non-peak-period trips, as shown in Table 26.

Table 26. Mode Share by Time of Day

	Existing	Wasatch Choice Vision
Daily		
Single-Occupancy Vehicle	40.1%	40.1%
Multiple-Occupancy Vehicle	46.6%	46.1%
Auto Total	**86.7%**	**86.2%**
Bus (Local, Core Route)	0.4%	0.9%
Fixed Guideway (BRT, TRAX, FrontRunner)	0.9%	1.5%
Transit Total	**1.3%**	**2.5%**
Active Transportation	**12.0%**	**11.4%**
Peak Period		
Single-Occupancy Vehicle	43.7%	43.1%
Multiple-Occupancy Vehicle	41.3%	41.9%
Auto Total	**85.0%**	**85.0%**
Bus (Local, Core Route)	0.6%	1.2%
Fixed Guideway (BRT, TRAX, FrontRunner)	1.4%	2.4%
Transit Total	**2.0%**	**3.6%**
Active Transportation	**13.0%**	**11.4%**
Off-Peak Period		
Single-Occupancy Vehicle	37.7%	37.7%
Multiple-Occupancy Vehicle	50.0%	49.1%
Auto Total	**87.7%**	**86.8%**
Bus (Local, Core Route)	0.3%	0.8%
Fixed Guideway (BRT, TRAX, FrontRunner)	0.6%	0.9%
Transit Total	**0.9%**	**1.7%**
Active Transportation	**11.4%**	**11.4%**

Most TDM programs and other mode choice interventions often focus on trying to reduce single-occupancy-vehicle trips to work with carpool, transit, and biking trips. Table 27 shows the commute mode share, now and in 2050, and shows almost five percent of the population switching from driving alone to another mode.

Table 27.Mode Share by Trip Purpose

	Home-Based Work	Home-Based College	Home-Based Other	Non-Home Based
Existing				
Single-Occupancy Vehicle	77.1%	48.1%	30.0%	39.8%
Multiple-Occupancy Vehicle	15.4%	16.7%	58.1%	53.4%
Auto Total	**92.5%**	**64.9%**	**88.1%**	**93.2%**
Bus (Local, Core Route)	0.9%	4.6%	0.3%	0.1%
Fixed Guideway (BRT, TRAX, FrontRunner)	1.8%	11.9%	0.5%	0.5%
Transit Total	**2.8%**	**16.6%**	**0.9%**	**0.6%**
Active Transportation	**4.7%**	**18.6%**	**11.0%**	**6.2%**
Wasatch Choice Vision				
Single-Occupancy Vehicle	72.4%	47.0%	29.6%	39.4%
Multiple-Occupancy Vehicle	17.0%	16.3%	56.7%	53.4%
Auto Total	**89.4%**	**63.3%**	**86.3%**	**92.8%**
Bus	1.6%	7.1%	0.9%	0.3%
Train	4.1%	13.8%	0.8%	0.6%
Transit Total	**5.7%**	**20.9%**	**1.7%**	**0.9%**
Active Transportation	**4.9%**	**15.8%**	**12.0%**	**6.3%**

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 (DOTs), 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 for transit agencies.

In support of the national performance goals, the 2023-2050 RTP integrates the priorities, goals, countermeasures, strategies, or projects from the:

- Strategic Highway Safety Plan (SHSP)
- Highway Safety Improvement Program (HSIP)
- Public Transportation Agency Safety Plan (PTASP)
- Transportation Asset Management Plan (TAMP)
- Transit Transportation Asset Management Plan (TTAMP)
- State Freight Plan (SFP)
- Congestion Management Plan (CMP)
- Congestion Management Air Quality Performance Plan (CMAQPP)

The 2023-2250 RTP should help UDOT and UTA make progress toward achieving performance targets. 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. WFRC incorporated the national goals into the following five Wasatch Choice Vision goals:

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

These goals and five other goals were the basis of the creation of the 2023-2050 RTP, from scenario development to project selection to project phasing.

The System Performance Report in Appendix X (appendix forthcoming) provides further detail about federal performance measures and how the 2023-2050 RTP integrates key elements from related plans.

Highway Performance

Table 28 shows the federally required highway performance measures, targets, and reporting.

Table 28. Federally Required Highway Performance Measures and Targets

Performance Measure	Baseline	Baseline Four-Year Target[1]	Four-Year Actuals[2]	Status	Current Four-Year Target[1]
Highway Safety Improvement Program[3]					
Number of fatalities	273	2.5% decrease over the last 5-year average	277	✗	2.5% decrease over the last 5-year average
Fatality rate per 100 million vehicle miles traveled	0.87		0.81	✓	
Number of serious injuries	1,453		1,502	✗	
Serious injury rate per 100 million vehicle miles traveled	4.62		4.39	✓	
Number of non-motorized fatalities and serious injuries	219		224	✗	
National Highway Performance Program					
Percent of pavement on Interstate System in good condition	59.4	>60% in good condition	67.8	✓	>50
Percent of pavement on Interstate System in poor condition	0.4	<5% in poor condition	0.2	✓	<5
Percent of pavement on non-Interstate NHS in good condition	58.1	>35% in good condition	49.3	✓	>30
Percent of pavement on non-Interstate NHS in poor condition	41.2	<5% in poor condition	0.9	✓	<10
Percent of NHS bridges classified as in good condition	5.8	>40% in good condition	28.6	✗	>40
Percent of NHS bridges classified as in poor condition	1.0	<10% in poor condition	0.1	✓	<10
Percent of person miles traveled on Interstate System that are reliable	90.3%	85%	98.9%	✓	80%
Percent of person miles traveled on non- Interstate System that are reliable	85.7%	75%	90.1%	✓	65%

National Highway Freight Program					
Truck travel time reliability index	1.21	1.3	1.16	✓	1.4
Congestion Mitigation and Air Quality Improvement Program					
Annual hours of peak-hour excessive delay per capita	10.6[4]	13.0[4]	8.8[4]	✓	8.0[5] 14.0[4]
Percent of non-single-occupant vehicle travel	24.9[4]	24.9[4]	26.8[4]	✓	20.1[5] 25.0[4]

1. The WFRC concurs with all UDOT targets.
2. Baseline performance period from January 1, 2018 to December 31, 2021. Second performance period from January 1, 2022 to December 31, 2025.
3. Targets are set on a rolling five-year average.
4. Data applies to the Salt Lake City-West Valley City Urbanized Area.
5. Data applies to the Ogden-Layton Urbanized Area.

Safety

Safe, user-friendly streets is a goal of the Wasatch Choice Vision and is incorporated into the project selection and project prioritization of the 2023-2050 RTP. It is assumed that any improvement to our streets will improve the safety of the roadway. More than half of the road projects within the 2023-2050 RTP will improve infrastructure with a usRAP rating less than four (out of five) and have been prioritized with respect to safety. The 2023-2050 RTP also includes 25 grade-separated vehicle crossings that will reduce freight conflict with ground transportation, including bicyclists and pedestrians.

Increased use of bicycle and pedestrian facilities is a result of safe, user-friendly streets as well. The 2023-2050 RTP includes 169 miles of protected and buffered bike lanes and 548 miles of separated, non-motorized shared use paths, side paths, and trails. 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 104 enhanced bicycle/pedestrian crossings that will reduce conflict with freight and vehicular transportation and/or will improve safety where potential conflicts between bicycles, pedestrians, and vehicles can occur.

Infrastructure

Fiscally responsible communities and infrastructure is a goal of the Wasatch Choice Vision and pavement and bridge conditions have been incorporated into the project selection and project prioritization of the 2023-2050 RTP. Our financial analysis has assumed that $9.565 billion will be spent on preservation between 2023-2050 in the two Wasatch Front Urbanized Areas. This is in addition to 2023-2050 RTP roadway capacity projects that will improve pavement and bridge conditions. The WFRC assumes that any roadway widening project will reconstruct the entire roadway.

Also, communities need to build into their maintenance budgets preservation for 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 Vision 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 2023-2050 RTP. This includes roadway volumes, volume-to-capacity ratios, connectivity, and vehicle hours of delay. The 2023-2050 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 2023-2050 RTP also contains over 470 miles of operational projects on interstates, freeways, arterials, and collectors to make travel times around the Region more predictable.

Freight Movement and Economic Vitality

Access to economic and educational opportunities is a goal of the Wasatch Choice Vision and freight considerations have been incorporated into the project selection and project prioritization of the 2023-2050 RTP. Projects were evaluated on their ability to enhance freight mobility by considering locations with high truck volume percentages. These projects have allowed freight speeds on critical freight corridors to remain relatively stable, decreasing from 41 miles per hour (mph) today to only 39 mph in 2050. In addition, the 2023-2050 RTP was developed with considerations for freight-oriented developments such as the Inland Port in northwest Salt Lake County, the Business Depot - Ogden, and the Freeport Center in Davis County. Extra freight-planning related outreach to a newly-formed WFRC Freight Advisory Committee and a standalone WFRC Urban Freight Study enhanced freight planning in the 2023-2050 RTP.

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 Vision and have been integrated throughout the process to select and phase projects for the 2023-2050 RTP. The 2023-2050 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 2023-2050 RTP includes 273 miles of roadway widening, 224 miles of new roadway construction, 40 interchange improvements, 19 new interchanges, and 25 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 by FHWA to have travel speeds greater than general purpose lanes on the interstate during the peak hour, providing an incentive to carpool. The 2023-2050 RTP includes 88 miles of additional HOV lanes. In addition, the roadway project prioritization includes whether projects accommodate transit and active transportation. The 2023-2050 RTP includes over 470 miles of additional transit, and over 1,200 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 drive.

Transit Performance

There are two federal transit performance measures - SGR and safety. Table 29 shows the SGR measures, targets, and reporting by mode.

Table 29. Federally Required Transit Performance Measures and Targets

Performance Measure	Mode	Transit Service Area Target[1]	Actual	Status
State of Good Repair				
Rolling stock: Percent of revenue vehicles (by type) that exceeded their Useful Life Benchmark	Articulated bus	0%	0%	✓
	Over-the-road bus	<35%	31.2%	✓
	Bus	<15%	13.0%	✓
	Cutaway bus	<15%	0%	✓
	Light rail vehicle	0%	0%	✓
	Commuter rail locomotive	0%	0%	✓
	Commuter rail passenger coach	<40%	30.9%	✓
	Van	<30%	11.8%	✓
Facilities: Percent of facilities (by group) with a condition rating below 3.0 on the Transit Economic Requirements Model scale	Passenger/parking facilities	<5%	0%	✓
	Maintenance/administrative facilities	0%	0%	✓
Infrastructure: Percent of track segments (by mode) with performance restrictions	Commuter rail	<5%	18%	✗
	Light rail	<10%	55%	✗

	Streetcar	<10%	0%	✓
Equipment: Percent of non-revenue vehicles (by type) that exceeded their Useful Life Benchmark	Automobile	<35%	3.0%	✓
	Trucks & other rubber tire vehicles	<35%	66.9%	✗
	Steel wheel vehicles	<35%	100%	✗
Safety (safety data forthcoming)				
Avoidable accident rate per 100,000 miles	Bus	<1.0	N/A	–
Reportable accident rate per 100,000 miles	FrontRunner	<0.5	N/A	–
Injuries per 100,000 miles	Bus	<0.2	N/A	–
	Light rail	<1.1	N/A	–
Fatalities per 100,000 miles	Bus	0.0	N/A	–
	Light rail	0.0	N/A	–
	FrontRunner	0.0	N/A	–
Safety events per 100,000 miles	Bus	<0.35	N/A	–
	Light rail	<2.5	N/A	–
Mean distance between major mechanical failures	Bus	>18,000 miles	N/A	–
	Light rail	>7,000 miles	N/A	–
	FrontRunner	>14,000 miles	N/A	–

	Paratransit	>23,000 miles	N/A	
Total employee industrial injuries per 100 employees	All modes	<0.75	N/A	

1. The WFRC concurs with all UTA targets.

As shown in Table X, UTA meets its targets for rolling stock and facilities. UTA did not meet two of its targets for infrastructure restrictions. Due to our mountainous area, sometimes erosion, weather, or other issues can result in speed restrictions. However, UTA has recently installed positive train control and other rehabilitation projects. UTA did not meet its targets for equipment, primarily due to the number of vehicles purchased as part of UTA's 2015 rail expansion program. Maintaining funding levels will be critical for UTA replacing end-of-life no-revenue vehicles. In developing the 2023-2050 RTP, WFRC worked closely with UTA to incorporate state of good repair costs into financial planning. UTA replaces buses and other revenue vehicles every year on an annual basis and forecasts upcoming fleet purchases. Costs for every transit project included the costs required to keep the project in a state of good repair until the 2023-2050 RTP horizon year.

Transit projects within the 2023-2050 RTP were prioritized based on the walkability and connectivity of the project area, 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. A 2016 study conducted by the American Public Transportation Association (APTA) found that commuters can decrease their risk of being in a travel-related accident by as much as 90 percent by choosing to take transit over driving. The construction and utilization of our transit system therefore, on the whole, contributes to the overall safety of our transportation system.

Social Impacts and Benefits

Transit, roadway, and active transportation projects and facilities identified in the 2023-2050 RTP are socially beneficial. Such improvements help people travel to destinations they want to reach while providing choices for how and when trips are made. Projects in all modes increase access to social, educational, and job opportunities. Road projects enable people who own vehicles to travel long distances in minimal amounts of time while also providing for the increased movement of goods and services. Transit projects not only provide an alternative to vehicle travel during peak commute periods, but also throughout the day. They are especially beneficial to people who reside in one-car or zero-car households. Additionally, the efficiency of moving people that transit provides is important for air quality and traffic congestion. Biking and walking are universally recognized for their benefits to individual and community health across all demographic groups. They improve air quality and decrease traffic congestion while increasing physical activity and decreasing healthcare costs and they bring recreational opportunities to the front door of Utah residents. Biking and walking are also very inexpensive compared to other modes of travel.

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. Additionally, certain

projects can create barriers, such as expanded roadways or new highways, to forms of mobility like walking and biking. When such projects are built, it is imperative that the mitigation of these impacts is included in the project design. Transit and biking projects can have the perceived effect of increased gentrification of certain neighborhoods as well. Public investment in any of the travel modes needs to serve people climbing the social ladder so that they may participate fully in the social and economic fabric of our communities.

Economic Impacts and Benefits

Consistent with the Wasatch Choice 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.

Through the public involvement process, the 2023-2050 RTP sought to gain a better understanding of transportation related economic needs, impacts, and benefits from a variety of stakeholders. The 2023-2050 RTP will continue to inform the Comprehensive Economic Development Strategy (CEDS) as one of the three legs upon which the Wasatch Choice 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 by the development of Utah's Coordinated Action Plan for Economic Vision 2030, allocations of funding, and notably passing significant station area planning legislation in the 2022 Legislative Session.

Access to Opportunities

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.

Access to opportunities is a key performance measure of the 2023-2050 RTP and the Wasatch Choice Vision. The 2023-2050 RTP uses access to opportunities in project selection, project prioritization, and overall system performances. Analysis done was 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 2023-2050 RTP improves job accessibility for both roads and transit when compared to today, with an additional 68,000 jobs (30 percent increase) and 10,000 jobs (71 percent increase) accessible, via roads and transit, respectively.

Redevelopment

The centers-based land use assumptions for the 2023-2050 RTP include growth of housing units and commercial space through infill and redevelopment. Between 2014 and 2019, approximately 29 percent of the Region's housing growth occurred through infill. The 2023-2050 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 update and revitalize commercial and mixed use areas protecting against deterioration as buildings age and become obsolete. Infill or redevelopment also takes growth pressure off lower density neighborhoods and rural areas. Generally, having a higher percentage of our growth occur in Wasatch Choice centers means more people have easy access to jobs and services. Infill/redevelopment reduces the need to build new infrastructure, reduces average driving distances, and tends to enable more people to use transit, bike, and walk. 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 utilized demographic information throughout the entire 2023-2050 RTP process, including screening roadway projects that may adversely impact access to opportunities for equity focus area 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 of each project on the 2023-2050 RTP to access to opportunity for residents living in neighborhoods with high concentrations of minority, low-income, and zero-car households (termed Equity Focus Area Communities) to reach employment and educational opportunities based on a project-level analysis.

Environmental Impacts and Benefits

NEPA Principles and Requirements

During the preparation of the 2023-2050 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. 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 2023-2050 RTP were evaluated for their potential impact on the environment.

With the retirement of the uPlan tool at UDOT, the analysis of the 2023-2050 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. 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 2023-2050 RTP have been analyzed for environmental suitability and vulnerability. Environmental suitability analysis seeks to examine potential environmental issues and sensitive areas to show which corridors have the highest – and lowest – potential for environmental impacts from transportation projects. Potential environmental issues and sensitive areas include hydrological areas;

habitat and wildlife areas; hazardous materials/contaminated sites; cultural and historic resources; environmental justice consideration areas; open space, parks, and recreation areas; agricultural and farmland; and land use. Vulnerable transportation assets analysis seeks to understand what areas would be impacted from environmental abnormalities and/or disasters, such as those resulting from climate change, like increased snowmelt, mudslide areas from forest fires, or earthquakes, to determine what projects may be most vulnerable to changes in our environments. These environmental analyses are done on a high-level and projects in the 2023-2050 RTP are still subject to the rigors of a full NEPA process before design and construction can commence.

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 constructing 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 practitioners 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 practitioners should be able to draw from both fields to understand the complexities of the urban landscape and the potential benefits afforded by increased connectivity.

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 roadway congestion conditions and identified a number of locations where congestion mitigation is or may be needed. The CMP involves an evaluation of Transportation System Management (TSM) strategies, such as signal coordination, intersection widening, and access management, and Transportation Demand Management (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 by applying TSM strategies in order to maximize the effectiveness of new capacity and minimize the need for future capital investments in highways. More information on the CMP can be found in Appendix X - Congestion Management (appendix forthcoming).

Freight Needs

The efficient movement of freight is a critical component of a healthy 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 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

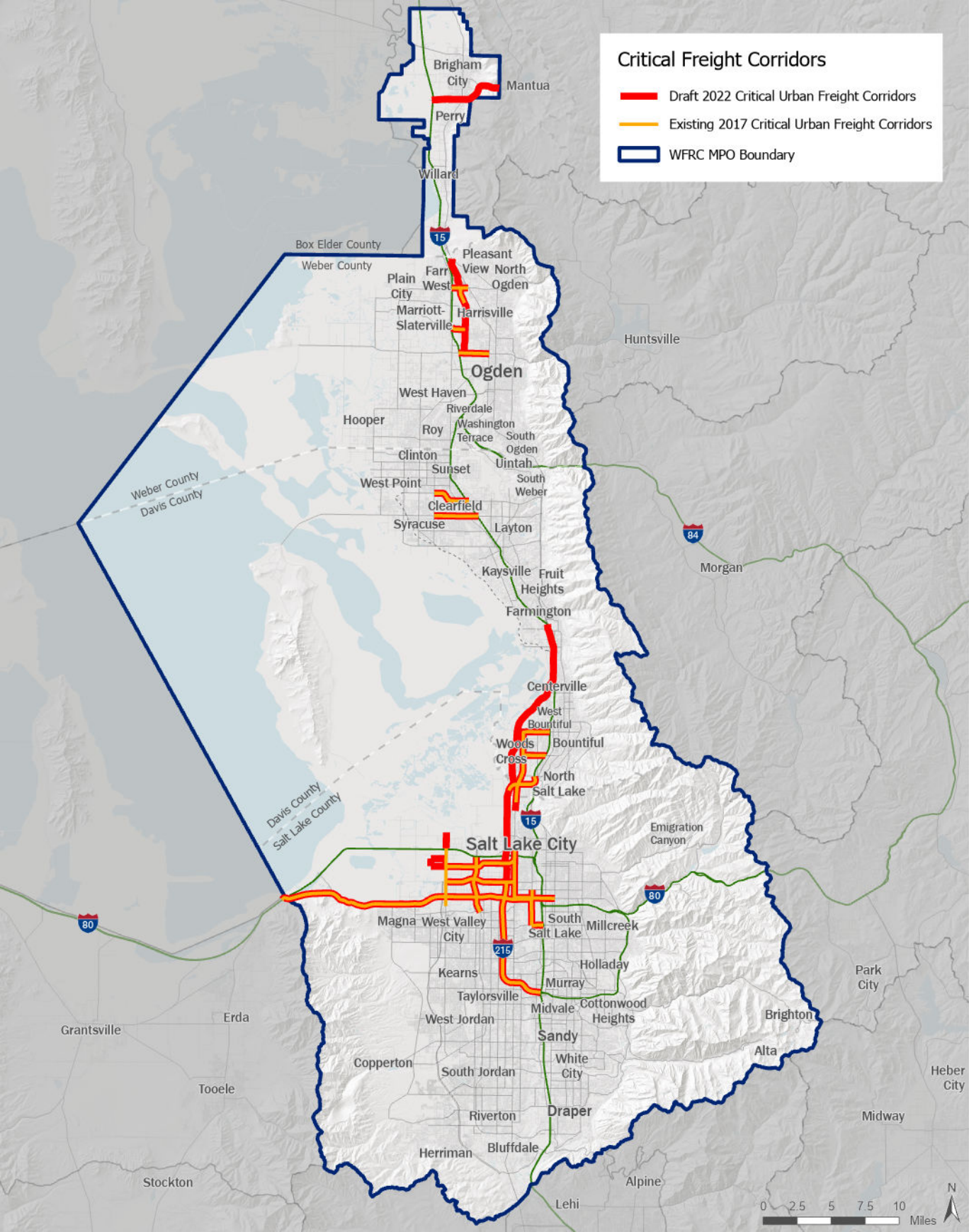
five percent of the tonnage and 18 percent of the value. Meanwhile, air cargo accounts for less than one percent of the total freight tonnage moved to, from, and within Utah, but seven percent of its value.

WFRC has worked in close cooperation with UDOT in developing the "Utah Freight Plan (UFP)," and continues to do so. The UFP was funded by UDOT and subject to approval by the United States 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 compliant with requirements enacted in 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.

1. An identification of significant freight system trends, needs, and issues;
2. A description of freight policies, strategies, and performance measures;
3. Critical urban and rural freight facilities and corridors;
4. A description of how the UFP will meet national multimodal freight goals;
5. A description of how innovative technologies and operational strategies were considered;
6. A description of facility improvements that may be required to reduce or impede the deterioration of roadways used by heavy vehicles;
7. An inventory of facilities with freight mobility issues, such as bottlenecks, and a description of strategies to be employed to address these issues;
8. Consideration of any significant congestion or delay caused by freight movement;
9. A freight investment plan that includes a list of priority projects and a description of how funding would be matched and invested; and
10. 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 carriers 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 west side 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.


Critical Freight Corridors
Draft 2022 Critical Urban Freight Corridors
Existing 2017 Critical Urban Freight Corridors
WFRC MPO Boundary
Brigham City
Mantua
Perry
Willard
Box Elder County
Weber County
Pleasant View
North Ogden
Plain City
Farr West
Marriott-Slaterville
Harrisville
Huntsville
Ogden
West Haven
Riverdale
Hooper
Roy
Washington Terrace
South Ogden
Clinton
Sunset
Uintah
South Weber
West Point
Clearfield
Syracuse
Layton
Davis County
Kaysville
Fruit Heights
Morgan
Farmington
Centerville
West Bountiful
Woods Cross
Bountiful
North Salt Lake
Salt Lake City
Emigration Canyon
Magna
West Valley City
South Salt Lake
Millcreek
Holladay
Kearns
Murray
Taylorsville
Midvale
Cottonwood Heights
Brighton
Park City
Grantsville
Erda
West Jordan
Sandy
Alta
Copperton
South Jordan
White City
Heber City
Tooele
Riverton
Draper
Midway
Herriman
Bluffdale
Stockton
Alpine
Lehi
Salt Lake County
0 2.5 5 7.5 10
Miles
N

Safety Issues and Concerns

UDOT collects data on roadway crashes since 2013 and reports this for each roadway segment in the form of a "safety index," which also incorporates the severity of the crash. The Safety Index can be helpful for identifying where safety issues may be a concern, but often the crash data becomes more of a reflection of traffic volume, or a random display of where the most recent crashes have occurred.

UDOT has also invested considerable resources and is a national leader in identifying safety needs in the roadway system using 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 completed in 2018. Based on the roadway assets, traffic volumes, and historical crashes, the usRAP program can assign a safety attribute star rating to each roadway segment, 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 and hence the greatest potential for crashes. For the 2023-2050 RTP, the usRAP model was used to identify the Star rating for the roadway segments underlying each proposed project. RTP projects were ranked according to Star rating, and weighted by traffic volume. Projects with the highest rank (meaning those projects with the greatest need and potential to implement crash mitigation strategies), were given the lowest Star rating, indicating the greatest potential safety improvement as shown in Map 20.

The black and red segments (Star rating 1 and 2) of the usRAP Roadway Safety Rating (Star rating), identifies those roadway segments that are deficient in certain safety attributes relative to other roadways with similar functional classification and operating characteristics. This is not to say that roadways with Star ratings of 1 or 2 are inherently unsafe, it only indicates that there may be opportunities to make this roadway safer with state of the art safety strategies found on similar roadways. The Star rating is used in this fashion as one of several criteria for scoring and prioritizing projects in the RTP. In addition to project selection and prioritization, WFRC also addresses safety concerns at the project implementation phase. The TIP evaluates crash history and Star rating 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 22 shows the trend of roadway crashes and fatal crashes per million vehicle miles (or crash rate) for the State of Utah compared with other state and national trends. While it is encouraging that the crash rate is on a declining trend, fatal and serious injury crashes for the State of Utah have increased in the last three years as shown in Figure 23. Vulnerable road users including pedestrians, bicyclists, and motorcycles are a segment of roadway users that require special attention as more emphasis is placed on active transportation modes often used to access public transit.

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 2023-2050 RTP. The recent increase in pedestrian and bicyclist fatalities is shown in Figure 24.

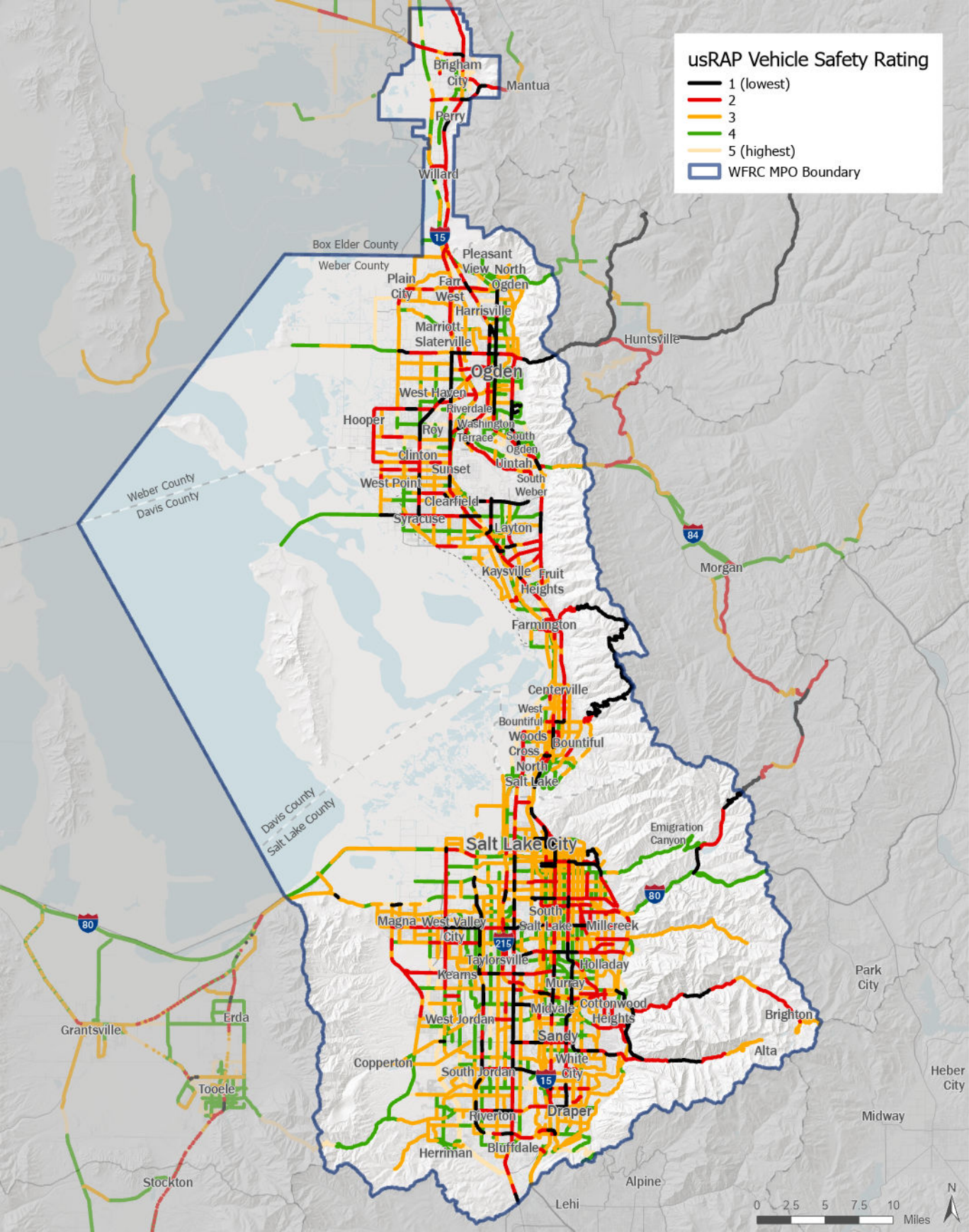
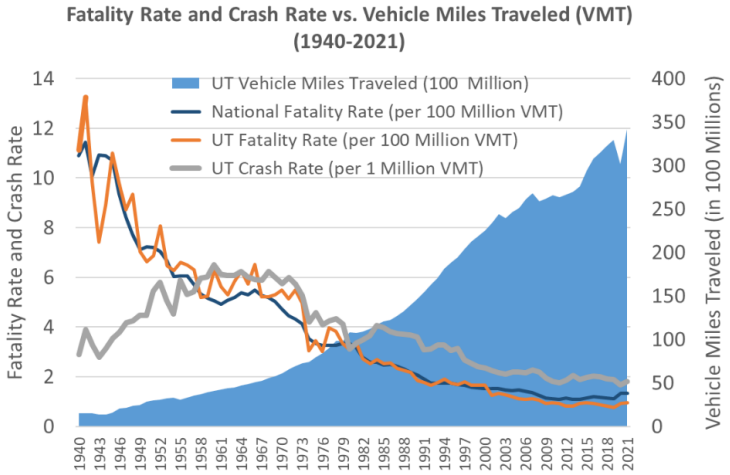

usRAP Vehicle Safety Rating
1 (lowest)
2
3
4
5 (highest)
WFRC MPO Boundary
Brigham City
Mantua
Perry
Willard
Box Elder County
Weber County
Pleasant View
North Ogden
Plain City
Farr West
Harrisville
Marriott-Slaterville
Huntsville
Ogden
West Haven
Riverdale
Hooper
Roy
Washington Terrace
South Ogden
Uintah
Clinton
Sunset
West Point
South Weber
Clearfield
Syracuse
Layton
Kaysville
Fruit Heights
Morgan
Farmington
Centerville
West Bountiful
Woods Cross
Bountiful
North Salt Lake
Davis County
Salt Lake County
Salt Lake City
Emigration Canyon
Magna
West Valley City
South Salt Lake
Millcreek
Taylorsville
Holladay
Kearns
Murray
Park City
Midvale
Cottonwood Heights
Brighton
West Jordan
Sandy
Alta
Grantsville
Erda
Copperton
South Jordan
White City
Heber City
Tooele
Riverton
Draper
Midway
Herriman
Bluffdale
Stockton
Alpine
Lehi
0 2.5 5 7.5 10
Miles
N

Figure 22. Roadway Crashes per Million Vehicle Miles

SAFETY

Utah Highway Crash Trend Data:

- Country's fastest-growing state between 2010 and 2020
- Had the 2nd largest percent growth from 2020 to 2021
- Vehicle miles traveled (VMT) is increasing with population growth

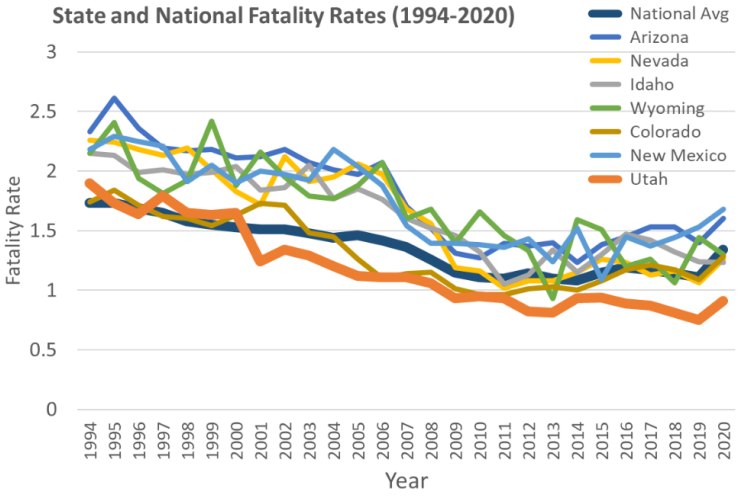


https://www.udot.utah.gov/strategic-direction/zero-fatalities.html

SAFETY

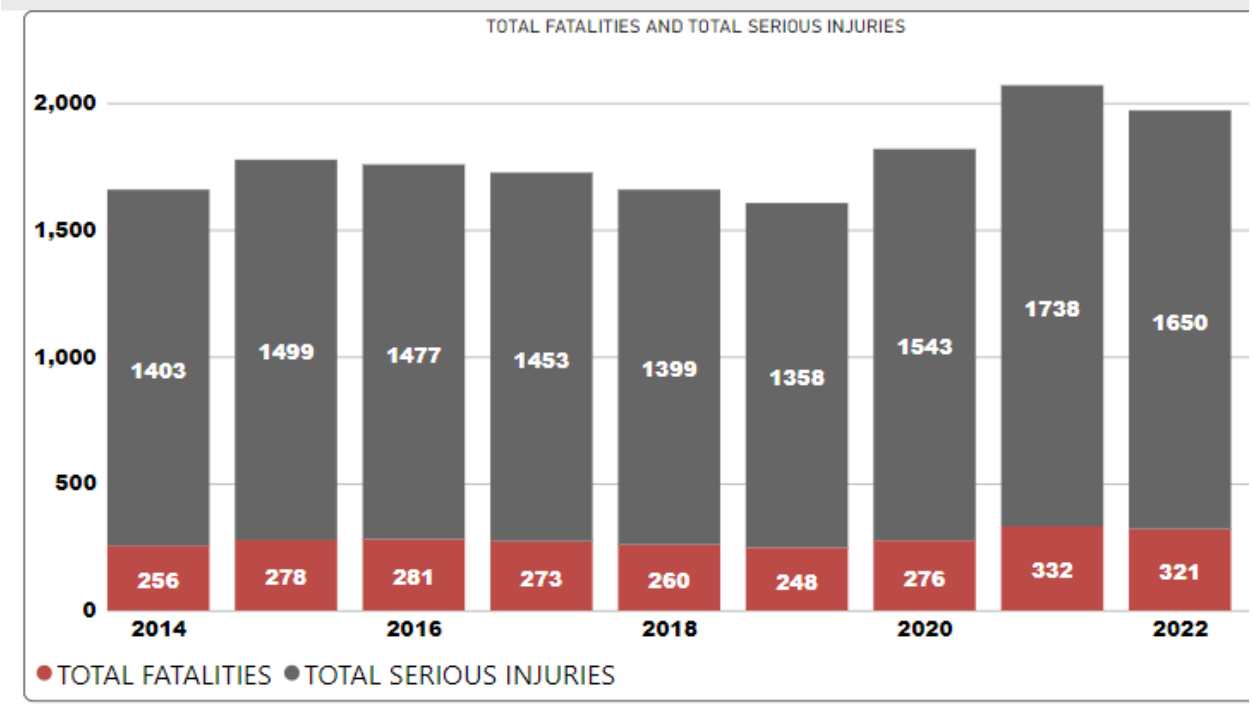
Utah Highway Crash Trend Data:

- Fatality rate is increasing but the 2021 fatality rate of 0.97 was 28% lower than the national average of 1.33 fatalities per 100 million vehicle miles traveled
- Fatality rate continues to be the lowest among surrounding western states; and 5th lowest in the Nation



https://www.udot.utah.gov/strategic-direction/zero-fatalities.html

Figure 23: Fatal and Serious Injury Crashes [this is statewide, WFRC urban area would be better if we could find it]

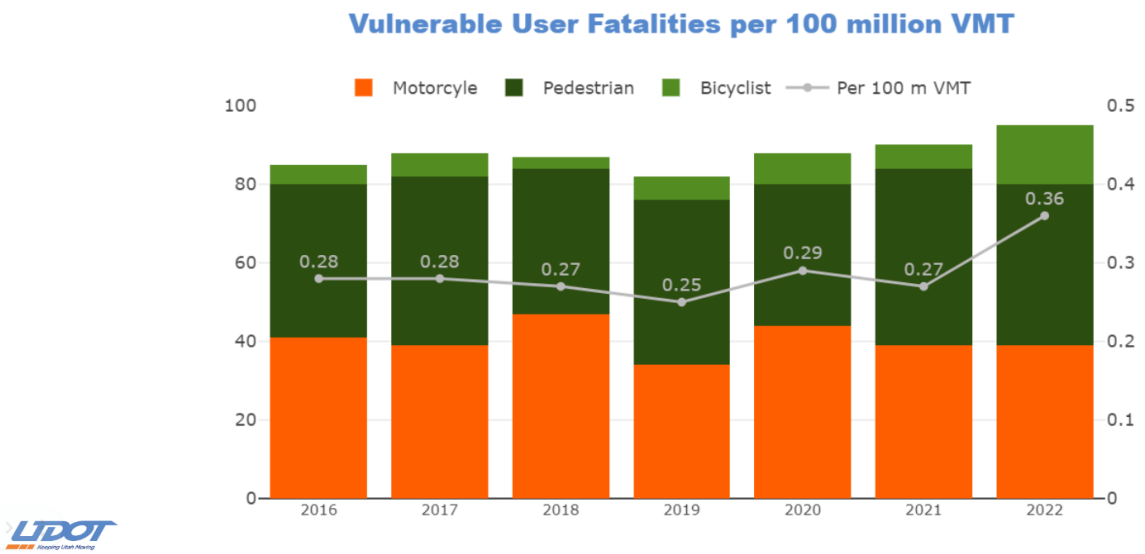


https://www.udot.utah.gov/shsp/evaluation.html

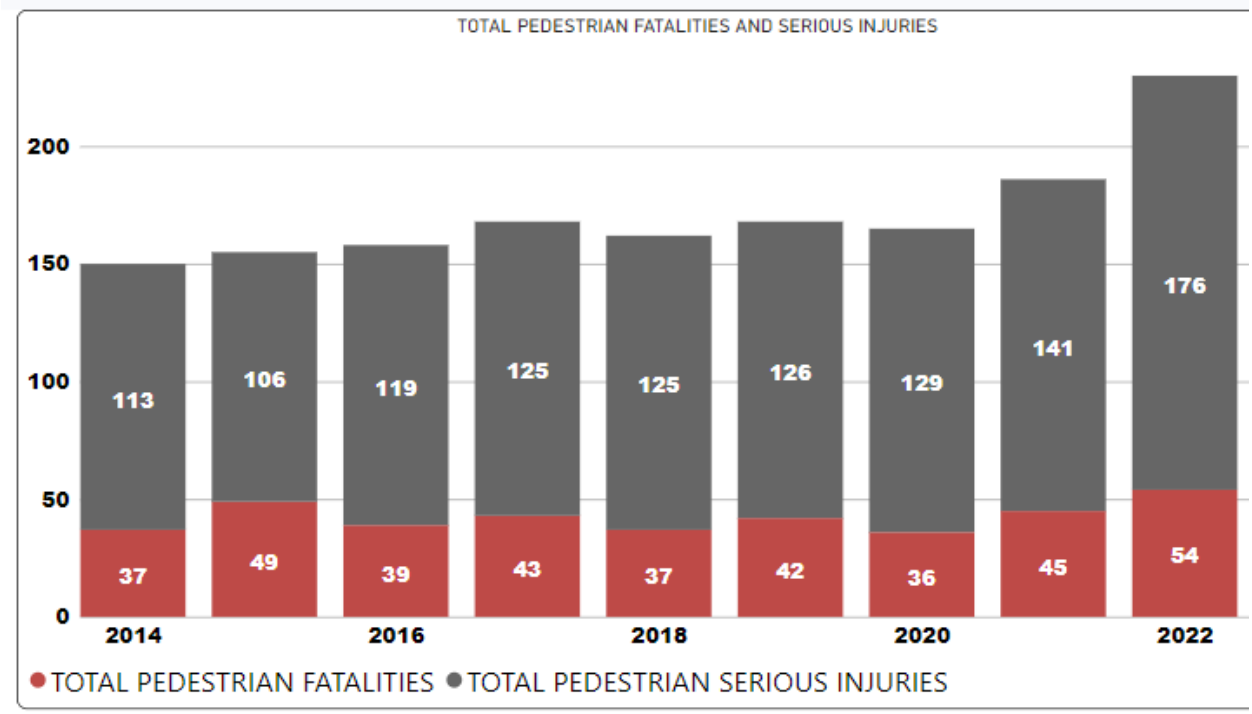
Figure 24. Fatal and Serious Injury Crashes by Mode, 2000-2021? [this is statewide, WFRC urban area would be better if we could find it]

VULNERABLE USERS

One group of roadway users we are focusing on is Vulnerable Users, Vulnerable users include pedestrians, cyclists and motorcyclists. Individuals who use the transportation system without being enclosed in a vehicle.



https://www.udot.utah.gov/strategic-direction/zero-fatalities.html



https://www.udot.utah.gov/shsp/pedestriansafety.html

Homeland Security Needs

The Wasatch Front Region is oftentimes 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 as part of the 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), power corridor(s), 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 City International Airport (SLCIA) 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 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 nation-wide railroads, 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 on 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

In 2020, residents along the Wasatch Front experienced two events that reinforced the need to plan for resiliency - the onset of the COVID-19 pandemic, followed by the Kearns Earthquake. In addition, 2011 was the last year that nowhere in Utah was considered in drought for part of the year. The most intense period of drought occurred the week of January 19, 2021, where exceptional drought affected 70 percent of Utah land[6]. As our population grows and our transportation system expands to accommodate that growth, one challenge we face is how to grow in a way that minimizes environmental impacts and prepares the system to be more resilient to a changing environment.

- Transportation security refers to infrastructure protection and emergency response. Are we safeguarding our transportation system and ready to respond when something happens?

- Resilience refers to the ability to prepare for changing conditions and withstand, respond to, and recover from disruptions. Are we planning for how to prepare for, and recover from, what may happen in the future?

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, such as a major landslide.

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. Many historic buildings were impacted by the 2020 Kearns Earthquake, including the 126-year-old Salt Lake City Hall.

The Wasatch 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. Winter avalanches and spring runoff are major concerns in the Wasatch Front Region after historic snowfall in the winter of 2023.

Resiliency expands beyond natural disasters to also include one-time events. 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

[6] National Integrated Drought Information System. https://www.drought.gov/states/utah

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 X - System Resiliency (appendix forthcoming) for more information about how the Region's transportation system is prepared for resiliency and how the projects with the 2023-2050 RTP are vulnerable to changing landscapes.

Air Quality Conformity Determination

Davis and Salt Lake Counties, 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 30.

Table 30. Wasatch Front Region Non-attainment Designations

Area	Designation	Pollutant
Ogden City	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 Weber, Box Elder, and Tooele Counties)	SeriousNon-attainment Area	Particulate Matter ($PM_{2.5}$)
Northern Wasatch Front (including Salt Lake, Davis, and portions of Weber and Tooele Counties)	Moderate Non-attainment Area	Ozone (O_3)

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 31. The analysis demonstrating conformity is contained in "Air Quality Memorandum 41."

Table 31. State Implementation Plan Mobile Source Emission Budgets

Area	Pollutant	Years	SIP Budget (tons/day)
Ogden City	PM_{10}*-NOx	2023-2050	6.92
	PM_{10}-Dust*	2023-2050	1.28
Salt Lake County	PM_{10}-NOx**	2023-2050	32.30
	PM_{10}-Dust	2023-2050	40.30
Salt Lake (including Davis, Salt Lake, and portions Weber, Box Elder, and Tooele Counties)***	$PM_{2.5}$-NOx	2023-2050	89.35
	$PM_{2.5}$-VOC	2023-2050	61.35
	$PM_{2.5}$-Direct Particulates	2023-2050	7.33
Northern Wasatch Front (including Salt Lake, Davis, and portions of Weber and Tooele Counties)#	O_3-NOx	2021-2050	85.63
	O_3-VOC	2021-2050	71.15

* Use the "Build less than 1990" Test.
** State air quality rules allow for a portion of the surplus primary PM10 budget (PM10-dust) to be applied to the PM_{10} secondary (PM_{10} - NOx) budget.
***Use the "Build less than 2008" Test for interim conformity analysis until a new PM2.5 SIP is approved.
Use the 1997 Ozone SIP budgets for interim conformity analysis until a new Ozone SIP is approved.

Vehicle Emission Modeling

Vehicle emissions were estimated using the Environmental Protection Agency (EPA) approved MOVES3.1 model. Data from the WFRC travel demand model (TDM) version 9.0 was used to describe the transportation network for the analysis years 2019, 2023 2028, 2032, 2042, and 2050. The TDM provides data for VMT and VHT (vehicle hours traveled) 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 MOVES3.1 model.

Federal Highway Administration Planning Factors

The United States Congress, through the IIJA, MAP-21, and FAST Act, identified ten planning factors for consideration in the development of long-range transportation plans, as noted in 23 CRF 450. 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 2023–2050 RTP. The following paragraphs list the ten planning factors and describe how the 2023–2050 RTP has considered each requirement.

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

The 2023–2050 RTP provides a network of improved transportation facilities - roadway, transit, and active transportation - which are essential to the economic vitality of the Region. The 2023–2050 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 2023-2050 RTP pays increased attention to access to opportunity and the linkages between land use, economic development, and transportation through the Wasatch Choice Vision. In doing so, the 2023-2050 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. Additionally, the improved active transportation system will aid in employee attraction, retention, and health outcomes, which all support this planning factor.

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

The roadway, transit, and active transportation facilities proposed in the 2023–2050 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 2023-2050 RTP and safety issues are given due consideration through WFRC's Transportation Improvement Program (TIP) project selection criteria. Controlling facility access, managing congestion, reducing traffic choke points, and modernizing the design of facilities improves overall network safety. The 2023–2050 RTP also identifies regionally important bicycle facilities. Improved bike routes focusing on increased separation from vehicle traffic are prioritized, increasing the ability to bicycle safely. Additionally, identifying crossing improvements of major roadway and rail facilities for people walking and biking is an important aspect of the RTP, improving safety for all non-motorized users.

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 2023–2050 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 2023–2050 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 2023–2050 RTP will help improve mobility and enhance destination accessibility. Increased mobility is provided by a variety of travel options including optimizing the roadway system through policies, operational projects, and the CMP; new or widened highways, primary arterial streets, and connections across barriers - natural and manmade; 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 2023–2050 RTP anticipates an increase in the number of miles of bus service, including expansion of weekend and night routes; additional on-demand transit service; 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 intersections to interchanges, and other access enhancements. WFRC has also placed more focus on understanding urban goods movement, particularly the rise of e-commerce and local delivery, and what implications these may have in the region's freight network. The Region's highway system will continue to provide convenient access to air cargo facilities, particularly with recently adopted and ongoing airport master plans in the Region. Access to opportunity played a key role in developing and prioritizing the 2023-2050 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 Vision 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 2023–2050 RTP's recommendations for roadway, transit, and active transportation improvements consistent with the Wasatch Choice Vision goals and strategies 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 2023–2050 RTP transportation recommendations. The WFRC met with elected and appointed officials of municipalities and counties to ensure that socioeconomic projections developed by WFRC are consistent with local plans and Wasatch Choice Vision.

Concern for the environment of the Wasatch Front Urbanized Areas is an integral part of the 2023–2050 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 and GHG reduction is promoted through successful congestion management strategies, increased system capacity, the provision of transit alternatives, and the provision of active transportation facilities. The 2023–2050 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 2023–2050 RTP's goals is "quality transportation choices," and as such the Plan 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 2023-2050 RTP recommends the development of intermodal centers, transit hubs, and park-and-ride lots at optimum locations to improve transfers and connectivity of regional transportation. The 2023-2050 RTP also recommends improvements to major freight corridors, as well as build out of surface streets and railroad crossings near freight centers, to improve mobility of goods within, to, and from our Region.

Improvements to the active transportation network that result in better transit station/stop accessibility are prioritized. This enables greater access to opportunities without dependence on personal vehicles and allows transit to fulfill its role as the great walk/bike trip extender. Additionally, grade separated pedestrian/bicycle crossings of major vehicle and freight corridors allow for the movement of people while still allowing for the free movement of vehicles and goods.

The 2023-2050 RTP recommends increased street connectivity as a policy for local and regional implementation. Street connectivity is manifest in street networks that have short block lengths and high intersection density. When this condition is present, it enables people to straighter, more as the crow flies. This shortens travel distances, reducing VMT. It also increases the number of people with transit access within a short walk or bike ride (again stemming from the ability to travel more directly). Better connectivity also results in a more balanced distribution of traffic flows within the roadway network, reducing travel times and delays throughout the system. WFRC and its regional transportation partners created a Local Street Connectivity Guide for local governments. We will build on this work through three approaches: assistance to local governments through WFRC's Transportation and Land Use Connection grant program; pursuing federal grant opportunities to reduce barriers and better connect communities to transit; and additional multimodal grid analysis in the next RTP cycle.

7 Promote efficient system management and operations.

The WFRC conducts a congestion management process (CMP) with the purpose of identifying where future congestion may occur throughout the region, and encourages implementation of transportation demand management and system management strategies to promote an efficient transportation network without adding highway capacity.

The congestion management process strategies rely on specific recommendations to be implemented regionally, as well as within individual roadway and transit facilities. Each facility type identified in the 2023-2050 RTP is accompanied by a list of specific methods to improve the transportation system efficiency. For more information on the congestion management process, please refer to Appendix X: Congestion Management Process (appendix forthcoming).

8 Emphasize the preservation of the existing transportation system.

There are tens of thousands of miles of existing State, local, and transit facilities across the state and within the WFRC Region. UDOT estimates that for every one dollar invested in preservation now, $25 is saved in future reconstruction. Following the good roads cost less philosophy, one of UDOT's strategic goals is to preserve infrastructure, a few of the Wasatch Choice Vision goals are in alignment, and UTA has put an emphasis on its system and vehicles' state of good repair. The financial analysis section of the 2023–2050 RTP assures that adequate funding for maintenance, operation, and preservation of roadway and transit facilities are 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 and preserve infrastructure. 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 2023-2050 RTP also recommends the future transit system maintain a state of good repair, 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 2023-2050 RTP's planning year horizon. The transit portion of the 2023–2050 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, and wildfires, to name a few. The transportation system needs to be able to withstand and provide support when a human-made or natural disaster occurs. The 2023-2050 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 cause many people who do not normally congregate to 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.

Furthermore, building our transportation facilities using green infrastructure techniques helps these transportation facilities better withstand water-related events as well as avoid causing urban heat island effects, both of which enhance long-term community resiliency. Transportation facilities that integrate green infrastructure also reduce run off of pollutants into waterways and keep the natural and built environment healthier. However, the best way to mitigate stormwater impacts of surface transportation is to optimize the existing system and introduce travel demand techniques that preclude the need for new facilities being built.

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 $1.81 billion in state and local tax revenue in 2021[7]. Over 17 million visitors annually travel to the state[8] with many of those visits beginning in the Wasatch Front Region, especially at the Salt Lake City International Airport (SLCIA). 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 2023-2050 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 Vision 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.

Emphasis Areas

FHWA and FTA Offices of Plannings jointly issued updated Planning Emphasis Areas (PEA) in December 2021. The PEAs are areas that FHWA and FTA field offices emphasize when meeting with the metropolitan planning organizations, State departments of transportation, Public Transportation Agencies, and Federal Land Management Agency counterparts to identify and develop tasks associated with the Unified Planning Work Program and the Statewide Planning and Research Program. These PEAs include:

- Tackling the Climate Crisis - Transition to a Clean Energy, Resilient Future;
    a. Coordination with ASPIRE on U.S. Department of Energy (DOE) and National Science Foundation (NSF) Grants
    b. Envision Utah Disaster Resiliency Lifeline Infrastructure working group
    c. Environmental Suitability and Vulnerable Transportation Assets analysis
    d. Water District coordination

[7] Utah Office of Tourism. "Utah Tourism 2021 Overview." https://travel.utah.gov/research-planning/utah-tourism-industry-metrics
[8] Utah Office of Tourism. "2021 Utah Visitor Profile & Insights Report." https://travel.utah.gov/wp-content/uploads/Utah-Visitors-Report-CY2021-FINAL.pdf

» Equity and Justice40 in Transportation Planning;
    a. Establishment of and coordination with the Wasatch Choice Community Advisory Committee
    b. Inclusion of Equity Focus Areas (EFA) in the prioritization process
    c. Access to Opportunity (ATO)
    d. First-/Last-Mile project identification for transit stop in identified EFAs
» Complete Streets;
    a. Initiation of Wasatch Choice Greet Streets initiative to improve the understanding through analytics of the location of potential incompatibilities between infrastructure and adjacent land use
    b. Local street design modifications - policies that improve the safety of all roadway users
    c. Vulnerable road user safety presentations in various forums - ways to improve safety via vehicle speed reductions or greater separation between vulnerable users and vehicles
    d. Participation in various studies including UDOT Pedestrian and Bicycle Serious Injuries and Fatalities Study; UDOT Vulnerable Road User Safety Assessment; Move Utah Regional Active Transportation Corridor Partnerships
    e. Local and out-of state Mobile Active Transportation Tours (MATTs) - field tours with elected officials, managers, and staff highlighting the successes and challenges of traveling by foot or bike.
» Public Involvement;
    a. Yearly public comment open houses in coordination with the State Transportation Improvement Programs/WFRCs Transportation Improvement Program (STIP/TIP)
    b. Online interactive maps with the availability to make comments
    c. Increase awareness via WFRC's newsletter and social media outlets
    d. Leverage newly formed Wasatch Choice Community Advisory Committee
    e. Key stakeholder outreach efforts
    f. Presentations and outreach at various local, regional, statewide, and national conferences
» Strategic Highway Network (STRAHNET)/U.S. Department of Defense (DOD) Coordination;
    a. Coordination with Hill Air Force Base (HAFB), the Military Installation Development Authority (MIDA), UDOT, UTA, and local communities regarding:
        i. New HAFB access / gate and
        ii. Falcon Hill Development
        iii. 3 Gate Trail Shared Use Path
        iv. Transit coordination
        v. Interchanges improvements
        vi. Roadway network within Falcon Hill
        vii. Redwood Road and Mountain View Corridor coordination with Camp Williams
        viii. West Traverse Mountain Compatible Area Study
» Federal Land Management Agency (FLMA) Coordination;
    a. Annual resource agencies outreach and coordination efforts
    b. Tri-Canyons Trail Master Plan
» Planning and Environment Linkages (PEL); and
    a. Environmental Suitability and Vulnerable Transportation Assets analysis
    b. Parks and Public Space community education and coordination
    c. Jordan River Commission Technical Advisory Committee (TAC) participation
    d. Participation and coordination on a variety of planning, corridor, and environmental documents

» Data in Transportation Planning.
    a. Project-level ATO impact tool
    b. WFRC Map of the Month
    c. Online data portal
    d. New Micro Mobility Travel Demand Model
    e. Bicycle Counter Program development with partners

IMPLEMENT PLAN

12: Implementation of the 2023-2050 Regional Transportation Plan

Regional transportation planning, to be effective, is a continuous process. Implementation of the 2023-2050 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 2023-2050 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 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.

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 2023-2050 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 corridor 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 within this chapter.

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 fiscally 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 the 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 2023-2050 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 2023-2050 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.

Carbon Reduction Program

CRP funding may be used on a wide range of projects that support the reduction of on-road CO2 emissions.

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.

Utilize and Promote 2023-2050 RTP Policies

The 2023-2050 RTP contains various transportation-related policies to optimize our transportation system in addition to enhancements to regional transportation infrastructure. The 2023-2050 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 2023-2050 RTP policies.

Wasatch Choice Great Streets

Wasatch Choice seeks to coordinate transportation and land use to maintain overall quality of life. The RTP carries this broad goal to the design and function of regional transportation projects, encouraging these

projects to work with envisioned land use, especially the designated Wasatch Choice Centers. As the RTP is implemented, the Wasatch Choice Great Streets initiative will put forward initial guidance for local governments and UDOT to jointly consider as RTP projects are designed and constructed within Wasatch Choice Centers. Wasatch Choice centers are focal points for economic development and welcome a variety of transportation choices. As such the design and function of regional transportation facilities should support those two objectives (economic development and transportation choices).

More details will be added to this section in the Spring of 2023 to inform implementation of the RTP.

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 2023-2050 RTP current, WFRC reviews the current 2023-2050 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 2023, with anticipated adoption of the 2027-2050 RTP taking place in May 2027.

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.

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.

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 continues to enhance and update its travel modeling capabilities in order to better:

- Account for how residents value time spent traveling in their trip decision making;
- Account for the effects of varying levels of auto ownership across the regions diverse households' size and demographics;
- Align traffic analysis zones boundaries to recent transportation infrastructure improvements, land use development activity, and civic boundaries;
- Reflect post-pandemic telecommuting and work-from-home patterns and to allow for assertion of future assumptions;
- Reflect updated transportation agency assumptions about future managed motorway projects on limited access highways;
- Allow flexibility in assumptions used within the model for internet shopping and connected and autonomous vehicles adoption rates;
- Forecast transit ridership, factoring in new information about recent ridership, transit rider decision-making including sensitivity to service frequency;
- Represent the most current transit service vehicle speeds between route stops and first mile/last mile travel options for travelers using transit services; and
- 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. Additionally, WFRC has partnered with MAG to create and calibrate a bicycle-specific travel demand model. It is expected that the bicycle travel demand model will be used to test future projects. A planned update to the mode-share component of the primary regional travel demand model is expected for the next 2027-2050 RTP. In addition to incorporating new mode considerations, the mode-share update includes plans for incorporating bicycle trip patterns projected by the bike model. 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.