Wasatch Front Regional Council

Metropolitan Planning Organization

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WFRC
2040 RTP
Salt Lake City

Charting Our Course

Technical Report 50
2011 - 2040 Regional Transportation Plan

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Technical Abstract Report

Title: Wasatch Front Urban Area Regional Transportation Plan: 2011 - 2040 Technical Report 50

Author: The Wasatch Front Regional Council

Adoption Date: May 26, 2011

Sources of Copies: Wasatch Front Regional Council
295 North Jimmy Doolittle Road
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Website: www.wfrc.org

Abstract: The Wasatch Front Urban Area Regional Transportation Plan: 2011 -2040 (2040 RTP) is the Salt Lake and Ogden / Layton Urbanized Areas' fiscally constrained plan for highway, transit, and other facility improvements to meet projected travel demand over the next 30 years. Developed in accordance with federal guidelines, the 2040 RTP includes highway and transit facilities identified by region-wide planners, engineers, elected officials, various transportation committees, stakeholders, state agencies, and the general public that would best serve the needs of the Wasatch Front Region and its two urbanized areas. The planning process and the steps used to develop the 2040 RTP are presented, along with an analysis and evaluation of four highway and transit alternatives that contributed to the final recommendations. Social, economic, and environmental impacts of the 2040 RTP recommendations were examined, analyzed and documented. The Wasatch Front Urban Area Regional Transportation Plan: 2011 - 2040 also includes recommendations for a regional bicycle network. The financial aspects of the 2040 RTP include projected revenues over the next 30-year period to cover the estimated costs for recommended highway and transit improvements.

Support Documents:

Transportation Improvement Program: 2011-2016

Small Area Socioeconomic Projections: 2007 - 2040
Technical Report 49

Wasatch Front Urban Area Financial Plan: 2011 - 2040
Technical Report 51

Wasatch Front Urban Area Regional Transportation Plan:2011 - 2040 Appendices

Air Quality Memorandum
Report Number 27

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Charting Our Course

The Wasatch Front Regional Transportation Plan: 2011 - 2040 (2040 RTP) has been developed to enhance the ability of our Region's transportation networks to meet the anticipated travel demand for the next 30 years. The 2040 RTP provides programmed capacity improvements and specific recommendations for highway and transit facilities, pedestrian and bicycle paths, park-and ride lots, and airport and freight services for the Salt Lake and Ogden - Layton Urbanized Areas.

Based on an adopted regional land use and transportation vision, known as the "Wasatch Choice For 2040" (Vision), the 2040 RTP was developed in accordance with federal guidelines, is financially constrained, meets state requirements for air quality conformity, is scheduled to be updated every four years, and reflects a continuous effort by regional planners and engineers to identify and successfully meet existing and expected growth in travel demand throughout the Wasatch Front Region through the year 2040.

Chapter 1

Photo at Left: American Fork Interchange with Interstate 15 and the *FrontRunner South* commuter rail line in the background. This new Diverging Diamond Interchange (DDI) is the first of its kind in Utah. These projects, captured in this aerial photo, highlight the cutting edge design and work of the Utah Department of Transportation (UDOT) and the Utah Transit Authority (UTA).

Overview

INTRODUCTION

Formally created on May 27, 1970, the Wasatch Front Regional Council (WFRC) has been responsible for transportation planning in the Salt Lake and Ogden - Layton Urbanized Areas since 1973. On December 26 of that year, Utah Governor Calvin L. Rampton designated the WFRC as a Metropolitan Planning Organization (MPO) responsible for developing area-wide long range transportation plans for Salt Lake, Davis, and Weber Counties. Map 1-1 shows the boundaries of the Metropolitan Planning Area, the Tooele Rural Planning Area, and the Salt Lake and Ogden - Layton Urbanized Areas all located within the Wasatch Front Region.

The 2040 RTP was developed in cooperation with representatives from the Utah Department of Transportation (UDOT), the Utah Transit Authority (UTA), the Utah Division of Air Quality (DAQ), and the cities and counties throughout the region. The 2040 RTP meets federal government requirements (under Title 23, Part 450 and Title 49, Parts 100 to 300 of the Code for Federal Regulations) for metropolitan areas with a population of 50,000 or greater to develop and adopt a long range transportation plan with a minimum planning horizon of twenty years. The planning policies and recommendations of the 2040 RTP are prepared under the guidelines of the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU), adopted by Congress on August 10, 2005. This document, Technical Report 50, details the 2040 RTP planning process, lists new recommended capital improvement projects, provides for upgrades to the existing transportation facilities, and identifies both potential impacts and benefits of the 2040 RTP. This technical report supercedes its predecessor, entitled the Wasatch Front Regional Transportation Plan: 2007-2030, Technical Report 46.

Population along the Wasatch Front is projected to increase by 55 percent, or to be 1.5 times the current population, between now and 2040. If no more transit lines or highways are constructed, the average per capita delay resulting from traffic congestion will increase by nearly 400 percent, or to be six times longer than the current delays. These regional statistics point to the gravity of the Wasatch Front transportation challenge facing the region that will require innovative solutions on a corridor-by-corridor basis.

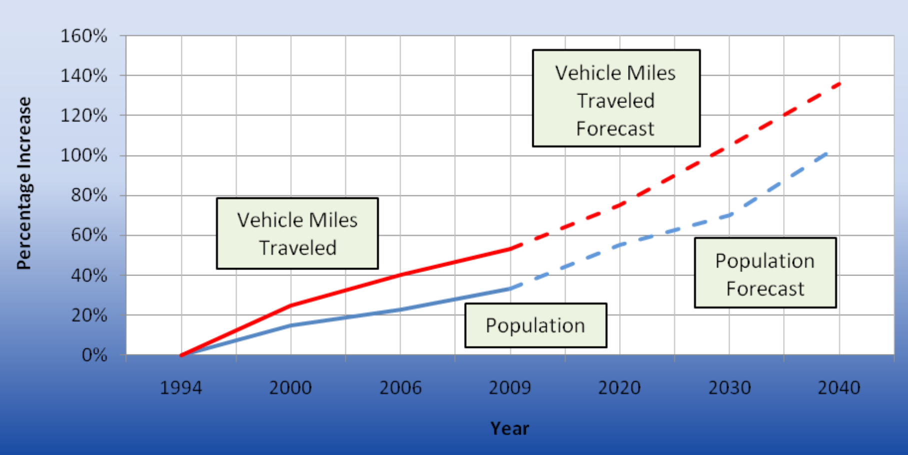
The Wasatch Front's anticipated growth will require significant investment in new transportation capacity. To meet this demand, the 2040 RTP recommends adding approximately 1,071 lane-miles of new capacity improvements to the existing highway system. The 2040 RTP also recommends adding approximately 296 miles of major public transit improvements. These improvements include 12 additional miles of Light Rail Transit, 6 miles of Commuter Rail Transit, 161 additional miles of Bus Rapid Transit (BRT 3), 106 miles of Enhanced Bus (BRT 1) service, and 11 miles of streetcar lines. These major transit improvements will provide an increase of over 60,000 revenue miles of transit service each weekday, or a 94 percent increase in current service. The 2040 RTP recommends that local bus route service throughout the Wasatch Front Region be increased by at least 25 percent over the next 30 years.

Vehicle miles of travel (VMT) and transit passenger miles of travel are measures of how much travel occurs on the transportation system. Vehicle miles traveled is anticipated to increase by nearly 70 percent, or to be approximately 1.7 times the current number of miles traveled. This projection reflects a decrease in growth rate compared to historical trends. The total number of transit passenger miles of travel is expected to increase 200 percent, or approximately three times the current passenger miles traveled. Figure 1-1 illustrates the Wasatch Front trend in population and vehicle miles traveled between 1994 and 2040.

The 2040 RTP was developed within the constraints of reasonable financial assumptions. The list of specific highway and transit facility improvements contain only those projects that can be funded over the next 30 years, or between the years 2011 and 2040. Reasonable assumptions were made concerning both future revenues for transportation improvements and the estimated costs of recommended highway and transit facilities.

Finally, to coincide with anticipated financing and revenue streams, the implementation of the 2040 RTP was divided into four separate phases: Phase 1 (2011-2020); Phase 2 (2021-2030); and Phase 3 (2031-2040), and Unfunded Phase (2040+). The Financial Plan for the Wasatch Front Regional Transportation Plan: 2011-2040, Technical Report 51, documents both the estimated available revenues and projected costs of highway and transit improvements through the year 2040. A separate appendices document provides additional information on the planning process, public involvement, alternatives analysis, and recommendations of the 2040 RTP.

FIGURE 1-1
Wasatch Front Growth in Population and Vehicle Miles Traveled



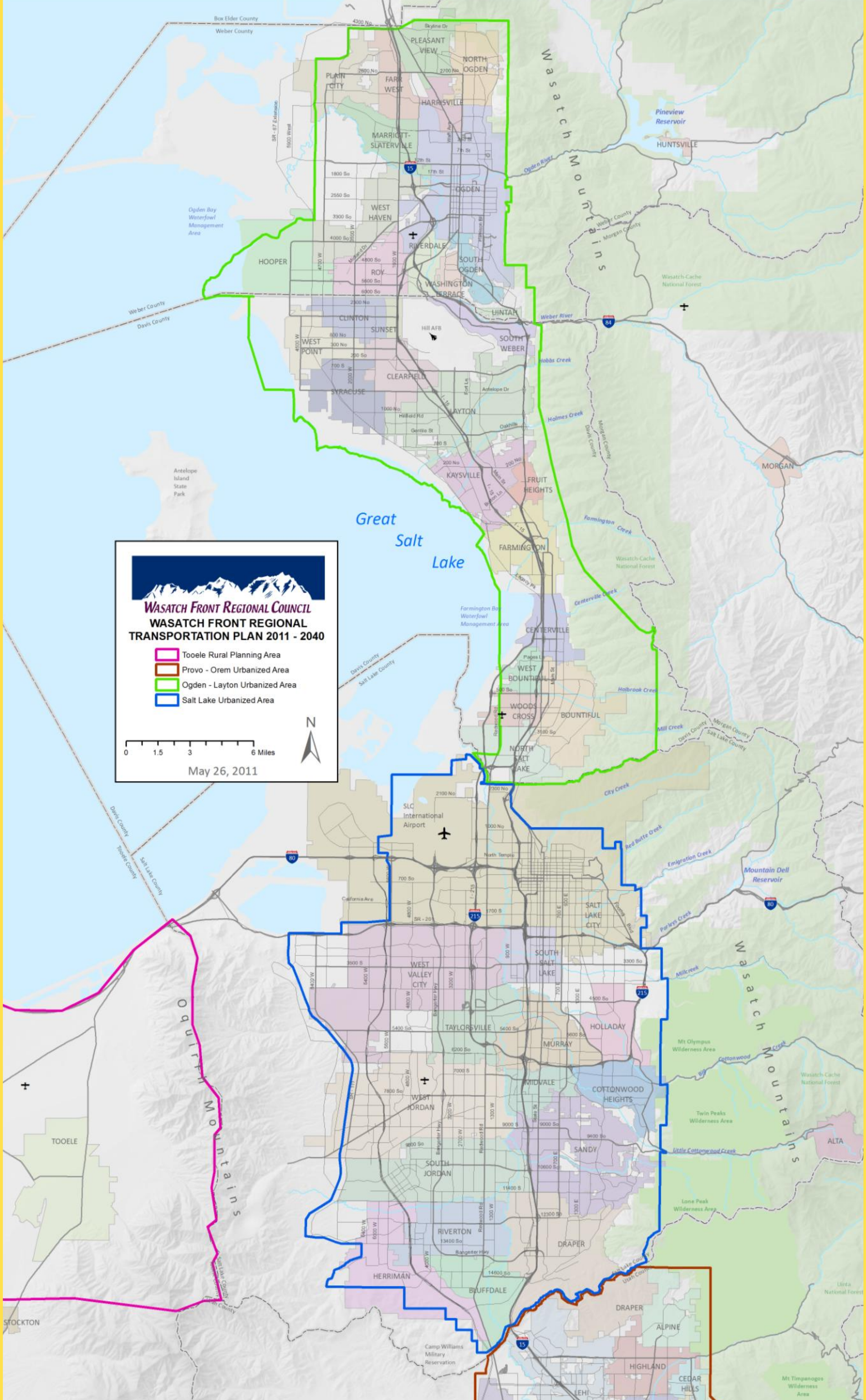
SUMMARY OF PAST PLANNING EFFORTS

The first comprehensive, regional transportation planning efforts in the Wasatch Front Urban Area were undertaken in the early 1960's. At that time, the Utah Department of Transportation worked with local elected officials in the Wasatch Front Region to develop an area-wide Long Range Transportation Plan (LRP) for 1980. As part of this study and analysis, an origin-destination survey for the Region was conducted to develop travel-forecasting models for projecting future traffic flows.

With its designation as an MPO in 1973, the WFRC initiated a major update to the Wasatch Front Region's LRP. The objective was to extend the LRP to the planning horizon of 1995, taking into account the changes in development patterns and travel behavior that had occurred since the first LRP was adopted. The 1979 LRP, with a planning horizon out to 1995, consisted of Technical Report 13 for the Salt Lake Urbanized Area and Technical Report 19 for the Ogden Urbanized Area. This LRP was approved, published, and distributed in September 1977.

In the 1980's, a second update to the Wasatch Front Region's LRP was undertaken by the WFRC. This update effort extended the LRP's time horizon to 2005. While earlier long range transportation plans had provided a far ranging master plan for future transportation facilities with an emphasis on highways, many of the facilities would not be needed during the time frame of the plan and funding for other projects was unlikely to be available. The LRP developed in 1987 took a slightly different approach and made recommendations to address the projected needs for the year 2005. The WFRC also developed a separate plan for facilities needed beyond 2005 as a guide for local communities to use in future local transportation planning. The 2005 LRP was approved

Map 1-1, WASATCH FRONT URBANIZED AREA



by the Wasatch Front Regional Council in 1987, and consists of Technical Report 22 for the Salt Lake Urbanized Area and Technical Report 23 for the Ogden Urbanized Area.

Beginning with the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, all regional transportation plans are now required to include a financial element showing how the recommended projects and facilities, based on reasonable financial assumptions, can be implemented. Thus, financial constraints meant that some needed projects could not be included in LRP recommendations. In 1993, the WFRC adopted an interim long-range transportation plan to address the financial requirements and other criteria established by ISTEA. The Wasatch Regional Council approved a final long range transportation plan in 1995. This LRP, which had a planning horizon out to the year 2015, addressed ISTEA requirements. Three reports were published, including Technical Report 32, The Salt Lake Area Long Range Plan, Technical Report 33, The Ogden Area Long Range Plan, and Technical Report 34, The Financial Plan for the Wasatch Front Region Transportation Plans.

A comprehensive LRP for 2020 was developed and approved by the Wasatch Front Regional Council in October 1998 for the Salt Lake and Ogden Urbanized Areas. This LRP effort placed greater emphasis on public transit improvements than previous long range transportation plans, and identified a system of fixed guideway light rail and regional commuter rail facilities. The Long Range Transportation Plan was documented and summarized in a series of technical reports, including Technical Reports 35, 36, 37, and 38.

The Long Range Transportation Plan was revisited beginning in January 1999. The Salt Lake and Ogden Urbanized Areas, treated in the past as two separate and distinct geographic jurisdictions for population projections, travel demand analysis, needs assessment, recommended transportation projects, and supporting documentation, were combined into a single, more complete planning effort for the entire of the Wasatch Front Urban Area. This LRP and supporting documentation, entitled the Wasatch Front Urban Area Long Range Transportation Plan: 2002-2030, was approved and adopted by the WFRC in December 2001. The 2002-2030 LRP was designated Technical Report 40. Technical Report 41, entitled the Wasatch Front Urban Area Long Range Transportation Plan: 2002-2030 Financial Plan, along with appendices and executive summary, provided supporting documentation to the 2002-2030 LRP. In approving this plan, the Regional Council asked the WFRC staff to pursue an expedited and expanded transit plan fo rthe Region. After two years, in December 2003, Regional Council representatives adopted the Wasatch Front Urban Area Long Range Transportation Plan Update: 2004-2030, Technical Report 43, along with its accompanying Financial Plan, Technical Report 44, which included a greater emphasis on transit.

More recently, the Wasatch Front Regional Transportation Plan: 2007-2030, Technical Report 46, was prepared and adopted by the Regional Council on May 24, 2007. This effort featured a compact diskette that contained: (1) Small Area Socioeconomic Projections: 2005-2030 (Technical Report 45); 2030 RTP Appendices (Technical Report 46); 2030 RTP Financial Plan (Technical Report 47) and Air Quality Memorandum (Report Number 21). These previous regional transportation planning efforts provided the groundwork for the current 2040 RTP. Technical Report 50 continued to reflect the recommendations and priorities established in earlier long range plans.

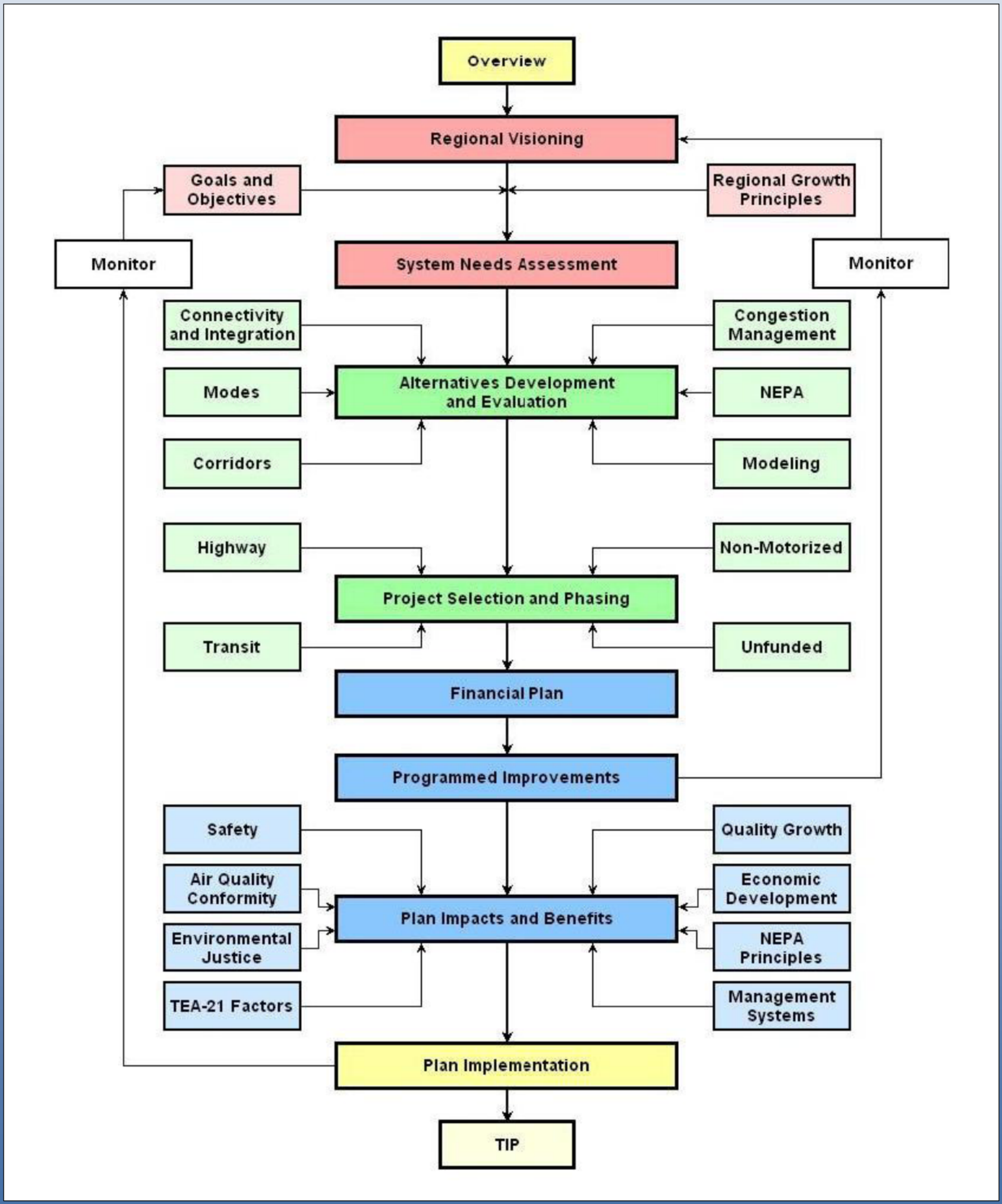
OVERVIEW OF THE 2040 RTP

Purpose For The 2040 RTP

Federal regulations governing the development of transportation plans and programs in urbanized areas require MPO's to update their regional transportation plans every four years. The Wasatch Front's Regional Transportation Plan for 2011-2040 is based on the latest socioeconomic growth forecasts, projected increases in travel demand for the region, and changes in the priority of various planned transportation improvement facilities. Periodic updates to the Wasatch Front's regional transportation plan allow for new information to be incorporated and recommended additions to the list of highway, transit, and other projects to be made. The 2040 RTP specifies a coordinated system of highways, freeways, arterial streets, transit facilities, transit hubs, intermodal centers, park-and-ride lots, airport facility improvements, freight movement corridors, pedestrian paths, and bicycle routes. A 30-year planning horizon was selected for this latest effort. Thus, the 2040 RTP covers the planning period from the year 2011 through 2040. The next planned update to the WFRC regional transportation plan is scheduled for 2015.

FIGURE 1-2

RTP 2040 Planning Process



Review of Planning Process

The Wasatch Front Regional Council utilized a 9-step planning process to guide the preparation of the 2040 RTP. This process consists of: (1) Overview or Problem Identification; (2) Visioning; (3) Needs Assessment; (4) System Alternatives Development And Evaluation; (5) Project Selection and Phasing; (6) Financial Plan; (7) Programmed Improvements; (8) Plan Impacts and Benefits; and (9) Plan Implementation. This simple but effective model not only provides a straightforward approach to the complex task of planning for regional transportation growth and travel demand, but is also used as the format and chapter headings of this report. A series of four system-wide alternatives helped to compared different combinations of proposed highway and transit projects. Realistic assumptions about funding sources and assumptions over the next 30 years allowed the WFRC staff to project anticipated revenue streams needed to finance recommended transportation improvements. Finally, a quantifiable means of phasing both highway and transit projects, which took into account available funding for each phase, was implemented. Specific capacity improvement projects were placed into one of three construction and funding phases, or a fourth "unfunded phase" according to their overall evaluation. The planning steps in the 2040 RTP are detailed in Figure 1-2.

Public And Agency Involvement

The 2040 RTP planning process started with a series of meetings with planners and engineers from UDOT and UTA, who helped identify areas of concern and suggestions for specific transportation facility improvements. The information provided by these professionals was compiled and analyzed. Additional meetings were scheduled with local elected officials, and representatives from UDOT, UTA, and many local, state, and federal resource agencies. An extensive public outreach effort was conduct designed to solicit and identify regional transportation needs from the point of view of the general public. Additional input was provided by members of the Technical Advisory Committees of the Regional Growth Committee. Throughout the planning process, the Regional Growth Committee and the Wasatch Front Regional Council provided needed guidance and direction.

Regional Vision

As part of the 2040 RTP process, an updated regional land use and transportation vision, known as "Wasatch Choice for 2040," helped further define and clarify how the Region's Growth Principles translate into mixed use corridors, transit oriented developments, and higher density centers. This Regional Vision is an attempt to ensure that the billions of dollars programmed for transportation improvements over the next three decades will support planned land uses. The type of growth patterns and planned transportation investments need to work together to create a desired future along the Wasatch Front. The adoption of the Vision, along with its supporting Growth Principles, provides a framework for key transportation decisions and the revised Vision map will help guide transportation improvements and land use decision designed to improve the Region's quality of life.

Socioeconomic Projections

Utilizing population information received from the Governor's Office of Planning and Budget (GOPB), and the "UrbanSim" program as an analytical tool, the WFRC generated population and employment projections for approximately 1,000 traffic zones throughout the Wasatch Front Region. These projections distributed population and employment on the basis of the adopted Wasatch Choice for 2040 transportation and land use Vision. The Wasatch Front Region's socioeconomic projections were reviewed by community planners, engineers, and locally elected officials, allowing for adjustments to be made in this important input to the 2040 RTP process. Population projections indicate that the Wasatch Front Region will increase over the next 30 years from approximately 1,600,000 persons to 2,500,000 persons.

Needs Analysis

Regional traffic modeling, utilizing projected 2040 population, employment, and transportation mode choice information, was generated and analyzed. Projected traffic volume and highway capacity ratios were mapped, allowing the WFRC to locate areas of potential concern. Information was also gathered on the Wasatch Region's pedestrian safety and vehicle accident rates. Additional needs analysis steps included an inventory of UTA bus and light rail service areas, ridership, operational frequency, transit park-and-ride locations, and other facilities. Chapter 3, "Needs Assessment," details the analysis performed.

Strategy Development

The 2040 RTP process utilized several regional land use inventory and environmental databases, including Utah's Planning Environmental Linkages (UPEL), developed by BioWest, and UDOT's UPLAN inventories. These databases were helpful in the preparation and analysis of system-wide alternative transportation possibilities. Four alternative transportation alternatives, including a "no build" scenario, were developed and evaluated by WFRC staff members, local planners and engineers, and UDOT and UTA representatives. Each alternative was based on a different combination of highway and transit projects. These four transportation alternatives were reviewed and refined by local community planners and engineers, elected officials, and the general public.

GOALS AND OBJECTIVES

Following the identification of regional transportation issues and concerns, a series of general and specific goals were developed to meet those needs. A number of these goals focused on increasing mobility through mode choice, minimizing traffic congestion, maintaining the number of vehicle miles of travel per capita, reducing environment impacts, enhancing the Region's economic competitiveness, improving air quality, maximizing accessibility to important services, and linking local land use development decisions with planned improvements to the transportation system.

A number of the goals and objectives that have been used in past regional transportation planning efforts are similar and share common themes. These goals and objectives represent the Wasatch Front Region's shared transportation values and formed the basis for past plans as well as for this most recent effort in preparing the 2040 RTP. In addition to the goals and objectives listed below, adopted WFRC planning policies, such as the Regional Growth Principles, the Wasatch Choice for 2040 Regional Vision (see Chapter 2), and a comprehensive analysis of the Region's transportation needs (see Chapter 3), also helped guide the 2040 RTP process.

1. Provide a balanced, inter-connected transportation system with a range of convenient, efficient, and economical choices.
2. Increase transportation mobility and accessibility for both persons and freight, thus promoting economic vitality in the Wasatch Front Region.
3. Increase transportation safety and security for all modes of travel.
4. Provide a transportation system that both protects and enhances the environment, promotes energy conservation, and improves the quality of life.
5. Protect existing and future transportation systems through adequate ongoing maintenance, preservation, or reconstruction.

In order to further these goals, the following, more specific objectives were developed:

- Maintain Level of Service E (volume/capacity ratio of 1.0) or better in all major corridors
- Manage all major corridors to optimize throughput using congestion pricing and Intelligent Transportation System (ITS) measures
- Reduce the rate of growth in vehicle miles of travel to the rate of growth in population
- Maintain regional vehicle hours of delay through the planning horizon for the 2040 RTP at the present level of per capita growth rates
- Maintain access to major facilities, encourage compatible land uses, and promote economic development
- Early preservation of transportation corridors
- Implement SAFETEA-LU planning principles

Generalized Goals for 2040 RTP

A number of generalized goals for the 2040 RTP were developed and several existing goals were expanded to improve upon past planning efforts. An emphasis of the 2040 RTP process was to draw a stronger link between projected growth in population and regional travel demands, recommended transportation facility additions and improvements to meet that demand, and local land use planning. Additional goals focus on taking advantage of improved methods of evaluating the 2040 RTP's social, economic, and environmental impacts and benefits. Finally, there is a well-recognized need to continue to closely coordinate and build consensus with federal, state, and local transportation planning agencies. The following list summarizes the WFRC staff's objectives that helped guide the overall planning process:

1. Develop a more robust regional transportation and land use Vision, known as the Wasatch Choice for 2040, which, along with the WFRC's adopted growth principles and strategies, can serve as guidelines for development

decision by local governments.

2. Continue to strive for improved quality of life and economic development along the Wasatch Front by developing the most modern, effective, and efficient transportation system that limited resources can provide.
3. Develop a series of performance measures that are directly linked to Wasatch Front Region's transportation goals in order to determine how well the 2040 RTP meets its objectives.
4. Update and formally adopt specific evaluation criteria for the selection of highway and transit projects and for determining phasing priorities.
5. Develop and test through modeling a series of multi-modal and interconnected transportation system alternatives that will allow for the comparison of various transportation choices designed to address projected travel demand throughout the region.
6. Develop an enhanced public outreach and involvement process for the regional Vision and the regional transportation plan that involves innovative techniques and collaboration.
7. Continue to develop and utilize important planning analysis tools such as an enhanced Geographic Information System (GIS) database, UrbanSim, UDOT's UPLAN, and BioWest's Utah Planning and Environment Linkages (UPEL) programs.
8. Incorporate National Environmental Policy Act (NEPA) and other criteria and analyses into the transportation planning process, such as project purpose and need; safety and security; economic development; land use; alternatives analysis; and core system performance measures.
9. Enhance the regional planning process with new technical planning tools, such as UrbanSim; and foster collaboration between MPO organizations, especially when such organizations have contiguous boundaries.
10. Promote regional and community sustainability from a transportation investment standpoint.

Specific Goals for 2040 RTP

In March 2010, the Wasatch Front Regional Council approved a set of goals, objectives, and performance measures that support the Council's mission statement to "serve the mobility needs and enhance the quality of life" in the region. The goals and objectives were developed by the WFRC staff based on goals identified in previous RTP's, outcomes of the 2009 Regional Council retreat, and planning factors identified in the SAFETEA-LU regulations. Including goals and objectives in the 2040 RTP is consistent with FHWA planning guidelines that encourage an objectives based planning process.

For each goal, specific actionable objectives that support these goals have been identified. The objectives are in turn supported with measurable performance indicators. Each performance measure will be evaluated for current conditions, future conditions with the implemented 2040 RTP, and future conditions without the 2040 RTP. Additional detail about performance measures is found in Chapter 8 on page 287. After some history of tracking these performance measures, WFRC staff will recommend specific improvement targets for Regional Council consideration and approval. Future updates to the regional transportation plan will include specific recommendations for achieving each of the goals and objectives identified in Table 1-1.

PLANNING ORGANIZATIONS AND COMMITTEES

The development of the 2040 RTP required the involvement, cooperation and coordination of various federal, state, local, and public organizations and committees. The WFRC worked closely with a number of agencies and organizations to ensure that the 2040 RTP serves the needs and values of the region for which it is developed. The 2040 RTP planning process utilized input and recommendations from the following groups:

Federal Agencies

- Federal Highway Administration
- Federal Transit Administration
- Federal Aviation Administration
- U.S. Environmental Protection Agency
- U.S. Army Corp of Engineers
- U.S. Bureau of Land Management
- U.S. Fish & Wildlife Service
- U.S. Forest Service

TABLE 1-1

2040 RTP Goals and Objectives

Goals	Objectives
Economic - Promote economic vitality.	a. Maintain, improve, and expand the transportation system to meet the demands of increased population and employment.
Safety - Increase transportation safety and security for all modes of travel.	a. Identify the most critical safety needs in the transportation system and select projects and improvements that will reduce the accident rate at specific locations.
Security - Enhance regional security.	a. Implement a transportation system that can rapidly respond to a variety of emergency situations. b. Plan a flexible and adaptive transportation system including redundant facilities and remote sensing and management of traffic operations.
Accessibility and Mobility - Provide a balanced, inter-connected transportation system with a range of accessible choices for people and freight.	a. Identify and mitigate congested highway corridors and choke points. b. Support a multimodal transportation system including continued investment in highways, public transit, pedestrian accommodations, and bicycle facilities. c. Identify and eliminate congestion points for freight movement.
Energy / Environment - Promote energy conservation, improved quality of life, and a clean environment.	a. Reduce delay due to congestion and incidents. b. Reduce VMT growth by promoting increased automobile occupancy. c. Promote transit use through improved transit service. d. Reduce transportation related emissions of CO, CO_2, NOx, VOC, and Particulate Matter.
Livability - Protect and enhance improved quality of life.	a. Accommodate the needs of an aging population as well as a growing general population, including continued investment in transit and pedestrian friendly communities. b. Promote in-fill development.
Efficiency - Maximize the productivity of the transportation system for each dollar invested.	a. Implement transportation demand management and transportation system management strategies. b. Improve access to alternative transportation modes such as transit, bicycles, and pedestrian.
Preservation - Protect existing and future transportation systems with maintenance, preservation, or reconstruction.	a. Incorporate and advocate UDOT access management principles. b. Identify critical corridor preservation priorities and a plan to secure rights-of-way for these corridors.

State Agencies and Organizations

Utah Department of Transportation
Utah Division of Air Quality
Utah Division of Parks & Recreation
Utah Division of State Lands, Fire, and Forestry
Utah State Historic Preservation Office
Utah State Department of Natural Resources
Governor's Office of Planning and Budget
Governor's Office of Economic Development

Local Governments

Wasatch Front Regional Council
Regional Growth Committee
Transportation Coordination Committee
Utah Transit Authority
Salt Lake County Council of Governments
Davis County Council of Governments
Weber Area Council of Governments
Salt Lake Area Transportation Technical Advisory Committees
Ogden - Layton Area Transportation Technical Advisory Committees
Municipal and County Planners and Engineers
Local school and water districts

General Public

Envision Utah
Public Open Houses
Outreach interviews with select special interest and environmental justice groups

In addition to the above organizations, the WFRC held two meetings for various federal, state, local, and private resource agencies providing for early participation and input into the 2040 RTP process. These meetings were held on August 12, 2009 and October 26, 2010. Participating organizations included the U.S. Army Corps of Engineers, Utah Department of Natural Resources, Utah Department of Agriculture and Food, Utah Geological Survey, Utah Open Lands, Utah Division of State History, Utah Division of Water Resources, Utah Division of Water Quality, Jordan Valley Water Conservancy District, Utah Division of Wildlife Resources, Utah Heritage Foundation, Utah State Historic Preservation Office, and various school districts located within the study area. Thus, these organizations were able to be part the 2030 RTP process, analysis, and solution development. These resource agency groups provided early identification of key concerns, mitigation strategies, and solution development, including the type and scope of needed transportation projects.

Finally, the WFRC was assisted in developing the 2040 RTP by its two Regional Growth Committee (RGC) Technical Advisory Committees (TAC), whose membership is made-up of the Wasatch Front Region's municipal and county planners. The Wasatch Front's Regional Growth Committee (RGC) and the Transportation Coordination Committee (Trans Com), each with its respective TACs, were key participants in the RTP process. Timely input from the TACs helped to guide the 2040 RTP planning process and identify various issues and concerns.

FEDERAL PLANNING REGULATIONS

The United States Congress, through the Safe, Accountable, Flexible, Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU), passed on August 10, 2005, identified eight planning factors that need to be considered and addressed in regional transportation planning. All relevant modes of transportation are considered when developing plans and programs. Metropolitan Planning Organizations, under SAFETA-LU, are to develop transportation plans and programs for their urbanized areas in cooperation and coordination with state transportation departments and public transit agencies. SAFETA-LU provides the planning strategies, goals, and responsibilities for the MPO. The plans and programs adopted by the MPO provide for the development and the integrated management of a regional transportation systems which are coordinated with the national system of road and transit facilities. SAFETA-LU expired in September 2010 and a new federal reauthorization bill is yet to be enacted. The manner in which the 2040 RTP addresses each factor can be found in Chapter 8, Page 281, of this document. Below is a list of the eight SAFETEA-LU planning factors.

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
2. Increase the safety and security of the transportation system for motorized and non-motorized users.

3. Increase security of the transportation system for motorized and non-motorized users.
4. Increase the accessibility and mobility of people and freight.
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.
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
7. Promote efficient system management and operations.
8. Emphasize the preservation of the existing transportation system.

AREA CHARACTERISTICS

Geography

The Wasatch Front Urban Area is located in northern Utah and is comprised of the Salt Lake City and Ogden - Layton Urbanized Areas, which encompass the developed portions of Salt Lake, Davis and Weber Counties. In general, the area is bounded by the Great Salt Lake and the Oquirrh Mountains on the west, the Wasatch Mountains on the east, Utah County on the south and Box Elder County on the north. The geographic features which bound the area on the east and west create a natural growth boundary. The area has a general linear configuration, being over 60 miles from north to south, while only 20 miles east to west at the widest point.

Environment

The Wasatch Front Region's physical environment will affect the type and location of future development, and the transportation system constructed to serve development. The area is situated in a unique environment that presents both opportunities and potential problems for the region.

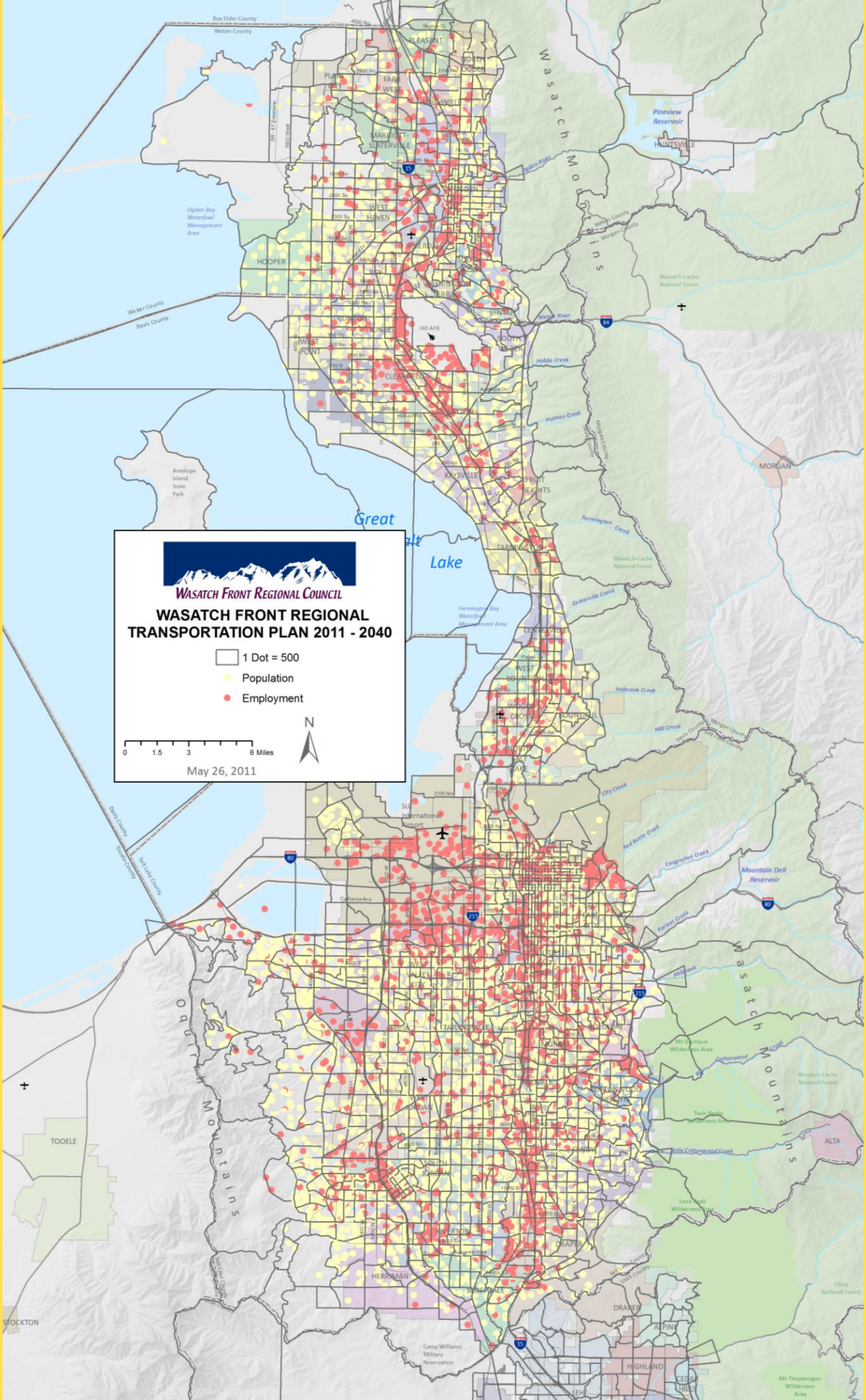
The Great Salt Lake is the dominant water feature in the area. Depending on the time of year and the drought cycle, the lake covers an average of 2,300 square miles in size. It is relatively shallow with maximum depths of not much greater than 20 feet. Variations in precipitation affect the stream flows and groundwater levels, and thus cause the lake to fluctuate dramatically in water level and area of coverage. The federal government, the State of Utah, and local governmental jurisdictions recognize that the Great Salt Lake has reached the flood stage when the water level is at an elevation of 4,217 feet. Hence development is restricted to the area above this level.

The greatest and most significant complex of wetlands in the intermountain area can be found adjacent to and surrounding the Great Salt Lake and along the Jordan River. These wetlands provide important marshland habitat to resident wildlife and internationally significant habitat for part of the year to possibly as many as one million migratory shorebirds and waterfowl that make annual migrations across North America. A majority of these wetlands are found on the east side of the lake, where most of the fresh water is received from the streams and river flowing form the Wasatch Mountains.

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.

Population

The first permanent Anglo settlers in the region arrived in the Salt Lake Valley in 1847. They soon began settling other parts of the region. In the 1850 Census, the population of Davis, Salt Lake, and Weber counties was 8,471 or 74.8 percent of the state total. By 2000, the combined population had increased to 1.3 million persons, but the share had dropped to 59.7 percent of the state total. The state Governor's Office of Planning and Budget projects the combined population to grow to 2.5 million by 2040, with the share dropping even further, to 44 percent of the state total. Much of the growth is projected to occur in western Salt Lake County, northern Davis County, and western Weber County. Even with most of the projected growth in these areas, there will be significant infill and redevelopment in the currently developed areas. Map 1-2 shows the projected population and employment densities in the Wasatch Front Region in 2040. Land supply in Salt Lake and Davis Counties may also come into play in this planning horizon. These two counties may approach "build-out" population during this time frame.



Map 1-2, 2040 POULATION AND EMPLOYMENT DENSITY

Employment

In the past, the regional economy was heavily dependent on a limited number of industrial sectors, particularly mining (Kennecott Utah Copper Corporation), government (Internal Revenue Service), and military (Hill Air Force Base). In the past 30 years, the region's economy has diversified. No longer dependent on a limited number of sectors, the economy is now based on the service sector and other industries, such as health care, education, and local government. Agricultural industries continue to decline in importance on a regional scale.

New commercial development is projected in South Jordan City, Riverton City, Sandy City, Tooele County, and along the I-15 corridor. Additionally, dispersed areas of significant commercial activity have developed, such as the Fort Union area, Cottonwood Corporate Center, and Jordan Landing in the Salt Lake Valley. Smaller pockets of neighborhood scale commercial development are emerging throughout the Wasatch Region and could make neighborhoods more pedestrian-friendly. Large employment centers, such as Hill AFB, University of Utah, Salt Lake City International Airport, and downtown Central Business Districts will need to be served with an improved transportation system. The distribution of commercial and industrial development will remain much as it is today. Detailed Population and Employment forecasts can be found in Appendix A – Socioeconomic Forecasts.

Commuter Characteristics

The 2006-2008 American Community Survey (ACS) provides a snapshot of the commuter characteristics in the region. Each workday, approximately 92,000 commuters travel to Salt Lake County, mainly from Davis, Tooele, Weber, and Utah Counties. There are also a significant number of commuters that leave Salt Lake County for other counties. Inside the Region, the commuter patterns become less clear. Major commuting destinations include downtown Salt Lake City, West Valley City, and Provo.

Even with the construction of fixed-guideway transit service, the vast majority of commuting takes place in the single occupant vehicle. With some TRAX extensions already completed, more in various planning phases and under construction, and the FrontRunner commuter rail line between Provo and Salt Lake City under construction, the transit mode share for work trips should increase beyond the 3.6 percent in the ACS data.

TRANSPORTATION AND LAND USE RELATIONSHIP

The relationship between transportation and land use is relatively complex and there are a number of factors about their inter-relationship that are not well understood. However, additional research continues to contribute to our increased understanding. Although it is understood that transportation and land use patterns are directly linked, the public process for making local land use decisions often fail to consider the long term consequences of incremental land development choices on a region's transportation system.

This is ironic, given that no singular force has had a greater influence on the overall pattern of land development in American cities than roads and highways. Building a road is fundamental to land development. Roads and public mass transit provide new or improved access to land, which in turn is more likely to be developed because of its resultant increase in value and desirability. More and better transportation facilities decrease the cost, time, and money of travel within and between urban areas. Roads and the vehicles that use them are, therefore, instrumental and essential in the development of property.

However, would the road have been built were it not for a demand or need for the land on which development could occur? And, what role do land use plans and public policy play in the pattern of development? The answer to the first question is yes. However, the answer to the second question requires a somewhat more involved response. There is a significant role that land-use plans and public policy play in land development. The decision as to whether or not to build roads, and where and what type of development should be allowed and possibly encouraged is a matter of public policy, as reflected in land-use plans, zoning ordinances, and price of property.

There are many other issues that should be addressed in analyzing the relationship between transportation and land use. For instance: Will building a new highway to relieve traffic congestion also encourage sprawling development in the areas served by the road? What supporting land-use policies should be adopted to take full advantage of expensive investments in new rail transit? And, are there specific policies and practices that can help state and local government officials cope more effectively with traffic congestion, urban form, infrastructure costs, quality of life, and other growth-management issues? Important questions such as these will need to be considered if a greater understanding between the transportation and land-use linkages are to be reflected in the planning processes, and more effective actions are to be implemented.

There are many questions to be answered about the relationship between transportation and land use, and academic research will continue. However, there are some conclusions about these relationships where a relatively strong consensus exists. These conclusions were articulated in a "White Paper" prepared for the Florida Department of Transportation by Steven E. Polzin, PhD. of the Center for Urban Transportation Research, University of South Florida, and are used as a resource for the following discussion.

Development Density Or Intensiveness

Independent of other factors, higher density and / or intensity creates higher total travel demand from a given geographic zone, but enables and encourages shorter auto trips and higher pedestrian, bike, and transit use due to the concentration of activities. A higher development density is more supportive of viable transit alternatives and enables more activities to be served with shorter auto trips or pedestrian and bike modes of travel. Density (both residential and employment) is correlated with a host of other factors that influence travel behavior, such as transit availability, income, auto availability, operating costs, parking costs, centrality of location, and urban design features including pedestrian amenities. There appears to be a connection between density and vehicle miles traveled (VMT), with a certain amount of reduction in VMT being made possible, depending on the travel behavior variables listed above.

Mixed Use

Within a given area, the mix of uses influences the extent to which personal activity needs, such as employment, school, shopping, etc., can be served by development in the area. Mixing of compatible land uses enables shorter trips where biking and walking become viable options. This also enables shorter auto trips and supports efficient transit operations. The nature of the activity and the nature of the "mixing" of uses may influence the travel response. Mixing of uses can facilitate combining of trips, further impacting travel demand. Job-housing balance is most beneficial if there is balance in income distribution and in the coordinated development of housing and employment opportunities.

Urban Form

Urban form encompasses the nature of the transportation networks, whether grid, radial, or other; as well as the configuration of land use, such as monocentric versus polycentric. Urban form can favor one mode over others and may influence overall number of vehicle miles traveled by changing the cost of such travel. The characteristics of urban form are clearly factors in travel behavior and VMT. The nature of the transportation network can influence the directness or indirectness of travel routes while the pattern of development can influence the viability of transit and other modes and the length of trips. Urban form influences accessibility, which is unquestionably a factor in travel behavior.

Urban Design

The orientation of a structure on a site relative to transportation infrastructure (parking, sidewalks, bus stops, covered walkways, seating, and other amenities) can impact the choice of modes. Transportation sensitive urban design generally offers an opportunity to make property more accessible for alternative modes, while providing aesthetic,

safety, convenience, and other benefits. When urban design is targeted to favor pedestrian, bike, and transit services, it can help reduce VMT.

Contiguousness of Development

It is common, particularly at the outer edges of developed areas, for a significant mix of undeveloped land to be interspersed with pockets of development. The skipped-over undeveloped land usually makes alternative transportation unworkable and requires all external trips to or from the new development to be in motor vehicles. This mix of developed and undeveloped parcels produces longer auto trips and increased VMT. Encouraging contiguous development can result in reduced VMT. Contiguousness has been shown to increase density in study areas and reduce travel. Contiguous growth can also result in reduced infrastructure costs, habitat preservation, and efficiencies in service delivery.

Regional Growth Prinicples and Vision

Wasatch Choices 2040, a four county land use and transportation vision plan, was developed as a new approach for the WFRC to use in creating a new transportation paradigm for the Region. This vision plan is an attempt to ensure that the billions of dollars allocated for regional transportation improvements over the next 30 years will support planned local land uses. In other words, anticipated growth patterns and programmed transportation investments need to work together to maintain the high quality of life enjoyed along the Wasatch Front. The Wasatch Choices 2040 planning process generated a set of nine Growth Principles and “Implementation Strategies For Local Governments” to help achieve this regional goal. The formal adoption of the Growth Principles, in October 2005, means that over time officials will make key transportation decision only after considering their impact on long-term quality of life issue and cost effectiveness. The framers of these Principles recognized that collaboration is needed among the Region’s local governments if potential benefits are to be realized. As part of that collaborative effort, the WFRC and Envision also developed a regional vision in 2005. This Vision, known as Wasatch Choice for 2040, was updated and adopted by the Regional Council in May 2010, is a graphical representation of how the Wasatch Front Region could absorb projected growth. The purpose of the Vision is to guide the development of our Region’s transportation planning efforts. While the Vision has no regulatory authority, the WFRC encourages municipalities and counties to consider areas for mixed use development, boulevard communities, and higher density centers as local plans are updated. Implementing the Growth Principles and the Vision will help our communities maintain their high quality of life.

REGIONALLY SIGNIFICANT FACILITIES

The 2040 RTP must include all improvements planned for the next 20 to 30 years on regionally significant transportation facilities. This is a requirement of the Environmental Protection Agency (EPA) transportation conformity regulations. Regionally significant roadway projects, as defined in the Code of Federal Register, Chapter 40, Section 93.101, are those projects that are functionally classified as principal arterials or larger, such as freeways, and a number of select minor arterials that should be treated as principal arterials. Regionally significant transit facilities are defined as fixed guideway systems and include Commuter Rail (FrontRunner), Light Rail Transit (TRAX), Streetcar, and Bus Rapid Transit (BRT 3) projects that enjoy their own dedicated right-of-way. For the purposes of the Wasatch Front Region, the WFRC established the following guidelines to determine whether or not a highway and transit facility was to be defined as regionally significant or not.

- Any new or existing facility with a functional classification of principal arterial or higher on the latest UDOT Functional Classification Map shall be considered regionally significant.
- Any fixed guideway transit service including light rail, commuter rail, or portions of bus rapid transit that involve exclusive right-of-way shall be considered regionally significant.
- As traffic conditions change in the future, the MPOs - in consultation with DAQ, UDOT, FHWA, and EPA (and UTA and FTA in cases involving transit facilities) - will consider (1) the relative importance of minor arterials serving major activity centers, and (2) the absence of principal arterials in the vicinity to determine if any minor arterials should be considered as regionally significant for purposes of regional emissions analysis.

A list of regionally significant minor arterials, along with the process used to determine what changes to a project’s

concept and scope are to be considered significant enough to warrant a new regional emissions analysis, are provided in Appendix B - Regionally Significant Minor Arterials.

TRANSPORTATION MODELING AND ANALYSIS TOOLS

The Wasatch Front Regional Council and the Mountainland Association of Governments Travel Demand Model (Model) is a tool for analyzing integrated land-use, transportation, and air quality factors. The Model estimates the travel patterns of people, based on their demographic characteristics, where they reside and are employed, and transportation facilities available to them. The Model forecasts where people are likely to travel and by what mode, such as single occupancy autos, local bus, light rail, etc., people are likely to use. It assigns these trips to the travel mode that represents the best route for each particular trip. Travel model output is used to evaluate transportation corridors where future travel demand is likely to exceed the capacity of the facilities in the corridor, to identify and assess projects that meet travel demand, and to analyze air quality impacts of the transportation system.

The model includes several advanced features including improved modeling methodology needed to meet the requirements of SAFETEA-LU and the Clean Air Act Amendments of 1990. In addition, several features recommended by the Travel Model Improvement Program (TMIP) of the US Department of Transportation, the Federal Highway Administration, the Federal Transit Administration, and the Environmental Protection Agency are incorporated into the model. The WFRC uses the model to perform comprehensive regional transportation analyses, and to evaluate various transportation and traffic impacts. Some of the most useful model outputs include: origin-destination flows, directional link vehicle volumes, vehicular travel times and speeds, and transit ridership estimates.

The target area considered by the model includes all of the developable portions of Utah, Salt Lake, Davis and Weber Counties. They do not consider the canyons and the mountains to the east of the urbanized areas. The model is calibrated to reasonably represent 2007 "base year" travel conditions and patterns, a process in which model output is checked or "validated" against hard data. Trip rates, transit ridership and highway volumes are examples of the types of model outputs that are validated. When the model results do not match the base-year values within an acceptable tolerance, parameters are adjusted until the model is acceptable. For future forecast years, the model output is reviewed for "reasonableness" to validate model results and model sensitivities. A detailed explanation of the WFRC's transportation modeling process and analytical tools can be found in Appendix C – Transportation Modeling and Analysis Tools.

PUBLIC INVOLVEMENT SUMMARY

The WFRC solicited public participation and integrated oral and written comments received into the development of the Regional Transportation Plan (RTP) alternatives, the draft 2040 RTP, and the final adopted 2040 RTP. Input for the 2040 RTP was sought from various groups including freight hauling organizations, Native American groups, advocates for people with limited incomes, minority organizations, senior citizens groups, community councils, city councils, local councils of governments, other government agencies (especially natural resource agencies), environmental groups, disabled rights advocates, chambers of commerce, state legislators, the

Utah Congressional Delegation, and the general public. The WFRC considered comments received from these groups and individuals in the scoping, alternatives, draft and final document phase of Plan development. A summary of the public review process and a record of public involvement in the 2040 RTP can be found in Appendix D – Public Involvement Summary.

Special Interest Outreach

WFRC staff members made dozens of visits to private citizens and the organizations noted above in order to identify transportation related problems and issues, receive input on possible solutions to growing travel demand, develop a series of RTP alternatives, and solicit comment on the draft 2040 RTP document. This was done both in the scoping and draft phases of RTP development. Also, notification was made on the WFRC website that materials in Spanish are available upon request.

Visioning Process

In 2005, the WFRC, in partnership with the Mountainland Association of Governments and Envision Utah, engaged the public in an 18 month visioning process to establish "Wasatch Choices 2040 – A Four County Land-Use and Transportation Vision." This was an extensive process with thirteen workshops, four open houses and over 1,000 participants from all parts of the community and government. The result of the process was a set of nine Growth Principles derived by consensus and adopted by the Wasatch Font Regional Council and most of its member entities. These Growth Principles continued to guide the development of the 2040 RTP and are an excellent example of how the public involvement process influences policy.

For the 2040 RTP, the Regional Council reviewed the Vision and adopted a revised, more current version, entitled "Wasatch Choice for 2040" Vision. This Vision includes a more detailed and complete map showing suitable locations for mixed use development, transit oriented development, and centers of higher density. The Regional Council staff has also made it a point in all 2040 RTP presentations that the Wasatch Choice for 2040 is the foundation of the 2040 RTP.

As part of the Vision update process, the WFRC held a formal, well-advertised comment period. The Regional Council also sought input on the draft Vision update from area County Councils of Governments, city councils, local government planning commissions and individual planners and engineers. During this process there were numerous revisions to the draft Wasatch Choice for 2040 document based on comments from municipal and county officials and the public at large.

Public Open Houses

Three series of open houses regarding the 2040 RTP were held in Salt Lake, Davis and Weber Counties. The first series of these meetings helped identify the region's transportation needs and were held in October 2009. The second series was held for the Alternatives Phase in August 2010 and the third for the draft 2040 RTP were held in March 2011. All public open houses were announced through notices and advertisements in local newspapers including those in the Spanish language. Many local newspapers also ran news articles announcing the open houses and some ran articles on the open houses themselves. Also, approximately 2,000 e-mails were sent to interested stakeholders on the WFRC mailing list who received electronic notice of the upcoming open houses with an invitation to attend.

The public open houses served as a forum to receive input and to gauge public opinion concerning the 2040 RTP and its underlying planning process. All comments were carefully summarized and responded to by the WFRC staff. The last series of public open houses, held March 2011, presented the draft 2040 RTP for public review and comment. The WFRC staff compiled written comments and summarized verbal comments received from the public after each open house and prepared a written response to each concern. All comments were made available to the members of the Regional Council and the public at large. A general summary of comments received was also made available.

Electronic Communication

All 2040 RTP documents, comments, responses, and maps were made available on the WFRC website. Interested parties were invited to visit the website, review the documents posted there, and comment as desired. In addition, meeting packets for the Regional Growth Committee and the Regional Council were sent electronically. These same packets were made available to the members of the public. Lastly, thousands of e-mails and quarterly newsletters were sent out soliciting public review and comment.

Media Relations

Regular efforts to include the news media in WFRC meetings resulted in many news articles about Regional Council planning efforts. This was made possible because the WFRC enjoys generally good relations with area news reporters. Regional Council and WFRC staff members were quoted at length in numerous articles during the RTP development process. Also, various Council members and staff made individual visits to newspaper editorial boards to discuss the benefits of the 'Vision' update. Lastly, personal visits were made to area Spanish language newspapers to introduce the Regional Council and the draft 2040 RTP.

In January and February 2011, the WFRC staff prepared the draft supporting document, entitled The Wasatch Front Urban Area Regional Transportation Plan: 2011-2040 for distribution to interested public agencies, elected officials, local communities and the general public. A formal public review period was held during March 2011. Interested person and groups were invited to review and offer comments on the draft 2040 RTP in either formalized public open houses or individually at their convenience. The final document was reviewed and approved by the Wasatch Front Regional Council in May 2011. An electronic copy of the final adopted version of the 2040 RTP is available on the WFRC website (www.wfrc.org). Printed copies can be obtained at the WFRC office and are available at select area libraries.

THE UNIFIED PLAN

Utah's Unified Transportation Plan: 2011-2040 was revised and updated as part of the 2040 RTP and followed the same general process that was established during the development of the 2007-2030 RTP. The Wasatch Choice for 2040 Vision was used as the basis for the urbanized area of the Wasatch Front. The Regional Vision, and its supporting Regional Growth Principles, which have been adopted by a majority of member cities and counties, helped guide the 2040 Unified Plan. Statewide transportation planning efforts are now much more closely coordinated then in the past and the updated Unified Plan for 2040 continues this tradition.

Historically, until the adoption of the WFRC's 2007 - 2030 RTP in May 2007, UDOT and the state's four MPOs communicated and notified each other about their planning efforts, but there was no real effort made to coordinate certain or all aspects of the five entities' transportation plans. Each planning organization used different financial assumptions, planning cycles, baseline data, priority-setting procedures, formats, etc. As the Unified Plan process has evolved, many of these inconsistencies have been resolved. Each of the MPO's has accepted responsibility for preparing a transportation plan for the urbanized area for which it has planning responsibility. The Statewide Unified Plan contains the essence of these plans and reflects a common approach and planning schedule, uniform financial assumptions and inflation factors, consistency in document organization, a common public involvement approach, consistent criterion for project selection and prioritization process, etc. With this Unified Plan it is hoped that many of the criticisms and inconsistencies that were apparent in the past have been overcome, and that interactions with the Utah State Legislature on transportation priorities and funding issues will continue to be productive.

Joint Policy Advisory Committee

The WFRC and the Mountainland Association of Governments agreed in 2004 to form a joint committee to look at areas of common interest in transportation planning. The metropolitan areas of Utah County and Salt Lake County have essentially grown together and creation of the Joint Policy Advisory Committee was a response to the recognized need for a coordinated planning process. The Utah State Legislature has also mandated cooperation between adjacent metropolitan planning organizations. The Committee has grown to include senior representatives from UDOT, UTA, the Dixie MPO and the Cache MPO. Important topics of discussion include the development of the 2040 RTP, discussion of smart growth principles, transportation funding and legislation, coordination of major transportation projects, and the adoption of the Wasatch Choice for 2040 Vision.

WFRC 2040 RTP
Salt Lake City

Chapter 2

Need for Regional Visioning

Utah is one of the fastest growing states in the country. Population along the Wasatch Front is projected to increase by 55 percent, or to be 1.5 times the current population, between now and 2040. How we accommodate this growth will largely determine the quality of life residents will experience.

Along with opportunities, growth creates challenges for transportation, housing choice and affordability, air quality, the economy, cost of living, critical lands, outdoor recreation areas, water, and public health. Many current trends are troubling, jeopardizing what we value most about life in Utah.

Concerned with growth-related challenges, elected officials recognized the need to look well into the future and plan for the changes that are coming. In response to these concerns, W*asatch Choices 2040 - A Four County Land Use and Transportation Vision* was developed and included both a Regional Vision and a set of Growth Principles. For the 2011-2040 RTP, the WFRC updated its original work. Known as the *Wasatch Choice for 2040*, this reined version of the Region Vision has been adopted by a number of local officials and the Wasatch Front Regional Council.

Photo at Left: The Interstate 15 corridor and *FrontRunner* commuter rail run parallel to Legacy Parkway, which is under construction in this photo. This critical transportation corridor facilitates commuter mobility between northern and southern Davis County and is an integral transportation component in the larger, regional context.

WASATCH CHOICE FOR 2040

In 2004, the WFRC, MAG, UDOT and UTA, with assistance from staff members of Envision Utah, initiated the Wasatch Choices 2040 effort with the goals of finding a more effective approach to transportation planning in Weber, Davis, Salt Lake and Utah Counties. Thousands of residents, local technical experts and elected officials contributed to Wasatch Choices 2040 through workshops, scenario building, independent polling, and on-line surveys. Wasatch Choices 2040 identified a series of growth principles, a regional vision and implementation strategies to guide local development decisions and make the Region's transportation system more efficient and cost-effective. Subsequently, the WFRC, MAG and Envision Utah, in close collaboration with local elected officials, further refined the vision, creating The Wasatch Choice for 2040. In 2010, WFRC formally adopted The Wasatch Choice for 2040 as the Regional Vision designed to address our Region's growth and provide the foundation for the 2040 RTP.

Reasons for Visioning

The Wasatch Front Region is creating the type of future it desires with the decision we make today. Visioning allows planners to explore potential futures relative to growth patterns, transportation solutions, and the environment. By understanding the needs of the future, planners can work backward to the decisions that need to be made today. The regional visioning process emphasizes using our limited financial resources more effectively, integrating land-use and transportation systems, meeting housing needs, building in areas with existing infrastructure, and energy conservation. It envisions new mixed-use villages and economic centers tied together by an efficient, modern transportation system. This Vision for the future of the four urban counties is based on extensive market research showing that changing consumer demographics and preferences, increasing land and energy costs, and a growing desire to trade commute time for family and recreation time are driving demand for living in or near centers. In short, it gives people the housing and transportation choices they want in a way that maximizes land use and benefits everyone.

Growth Issues

The State of Utah enjoys an unparalleled quality of life, access to the outdoors and rich economic opportunities. The State also has a significant population growth challenge. Utah has one of the nation's highest population growth rates, recently ranked as sixth highest in the country. A majority of anticipated growth will occur within the urbanized areas of Weber, Davis, Salt Lake, and Utah County. In the next 30 years, population will increase by 61 percent, adding another 1.3 million residents. If growth patterns of the past few decades continue, the consequences will be an intensification of the social, economic, and environmental impacts noted elsewhere in this document. With the growth in population, the anticipated growth of daily VMT on the Region's roads will nearly double from 49million to 90 million by 2040.

As the population continues to grow, and VMT nearly doubles, the Region's overall air quality will deteriorate, threatening our health and economic prosperity. If current trends continue, nearly 300 square miles in the Weber, Davis, Salt Lake, and Utah Counties will be converted to urban use by 2040. About 100 square miles of this land will have formerly been used for agricultural purposes. Finally, the cost of growth-related municipal infrastructure is also of concern. Growth-related expenditures which include transportation, water and utilities rose from 31 percent of local municipal budgets in 1982 to 61percent in 2002.

Addressing Needs Through Land Use and Urban Form

In order to address the growth-driven needs for new investments in the region's infrastructure, realistic alternatives need to be considered. Many of these alternatives emerged during the workshop and open house phases of the visioning process. Some of the ideas for alternatives included: (1) encouraging more compact growth and less sprawl; (2) creation of a better geographic balance between housing and the workplace; (3) encouraging mixed land use and transit oriented development; and (4) making greater use of public transportation. Many of these ideas have been studied extensively, and, if implemented properly, could help reduce travel demand and the need to construct traditionally more costly transportation infrastructure.

DESCRIPTION OF VISION METHODOLOGY

The visioning process was accomplished over several years. It was a new approach for laying down an informational base for the regional transportation plan and involved many technical planning and public involvement tasks. The collection of regional population, employment, land use, transportation, and socio-economic data; and the development of specialized studies, data analyses, and public surveys were essential parts of the process. The public outreach process engaged local governments as partners in identifying stakeholders who would be willing to participate in the workshops. Workshop participants were asked the following two basic questions: "What is the future we want to create?" and "What will help us create that future?"

Public Outreach Process

The visioning process involved an extensive public outreach program. From beginning to end, the general public, local elected officials, and others representing specific interests were given an opportunity to participate in workshops, open houses, and surveys. Much valuable information was gleaned from the outreach activities, without which the project outcomes could not have been achieved. The collaborating parties all agreed that there were many good reasons to embark on an elaborate public outreach, or visioning process. One of the reasons was clear - it is always a positive factor to encourage public participation in the development of plans. There was also a desire to involve a full range of other interested parties, such as representative of local governments, resource agencies, transportation service providers, etc. By the end of the process, all of the participants became partners in the process which helped to ensure its success. Besides the desire of the sponsors for a broad-based community-wide effort, there were other conditions which helped decision-makers determine the time was right to conduct a region-wide visioning process. These conditions included the general recognition that rapid growth is taking place, unfunded needs within the regional transportation system that needed to be addressed, the desire to maintain or even improve the Region's economic competitiveness, and strong interest in maintaining the quality of life.

Meetings With Local Government Officials

At the beginning of the visioning process, MPO staff members and representatives from Envision Utah met with each local government entity to educate them on the visioning process, address any questions, and to develop inclusive stakeholder invitation lists for the thirteen scheduled workshops. Face-to-face meetings were held with the chief elected official and key staff members and, at their discretion, meetings were also held with the governing body and / or the planning commission.

Public Workshops

A total of thirteen workshops, involving over 1,000 participants were held as part of the visioning process. Meetings took place in the cities of Ogden, Roy, Bountiful, Layton, Sandy, Riverton, South Salt Lake, Taylorsville, Pleasant Grove, Orem, Lehi, Payson, and Salt Lake City. At each workshop participants received instructions on the visioning process and copies of preference questionnaires. Participants were organized into small, randomly assigned groups. They were given a map of their county and asked to indicate: (1) where growth should take place; (2) the density of growth they would prefer; and (3) their transportation preferences. This resulted in the production of 119 maps for the four-county area indicating opinions, ideas and preferences about growth. Each group received chips

representing different types of residential, commercial, and mixed-use development. The total number of chips equaled the 2040 growth projections made by the Governor's Office of Planning and Budget for the four-county area. Each group was asked to accommodate projected growth through current types of development or through alternative approaches such as mixed-use activity centers or linear (boulevard) corridors. Workshop groups also indicated where they wanted transportation facilities, including new or improved transit, roadways, and bicycle lanes, and pedestrian trails.

The results of the workshops and surveys were tallied and analyzed. Common themes and concepts emerged that guided the development of four growth scenarios that can be described as:

- Scenario A: Business as Usual (baseline)
- Scenario B: Transit Station Villages
- Scenario C: Interconnected Network of Complete Streets
- Scenario D: Centers of Employment

Public Open Houses

Five stakeholder open houses involving 500 participants were held in cities throughout the region to review and consider the four growth scenarios that emerged from the public workshops. At each open house, participants were surveyed to identify the scenario they preferred and asked to respond to other growth-related questions. The findings of this survey, as well as comments received on-line, from a variety of public meetings and from members of city councils and planning commissions, served as the basis for initial drafts of the vision scenario.

Surveys and Questionnaires

As noted above, surveys were conducted at various stages of the visioning process. Early in the process the workshop survey was conducted, followed by a Dan Jones telephone survey, and the open house participant surveys. During workshops, questionnaires were distributed to determine the opinion of participant's regarding the natural environment, growth, and transportation issues that are challenging the region. Those surveyed indicated they generally enjoyed their quality of life, but are concerned about growth. Most residents supported adopting and integrating growth principles into future land use and transportation planning decisions.

Local Government Visits, Presentations, and Input

Once the visioning process was concluded, the results were shared with the local government officials. The Regional Growth Principles and Vision were presented to all 47 local governments in the urbanized areas of the region. Representatives from the WFRC and Envision Utah met with municipal and county elected officials. A slide presentation highlighting the growth principles and Vision was used to explain how the Growth Principles were generated and would be used to prepare the Regional Transportation Plan. An overwhelming majority of these officials said they would support the growth principles. Most responded positively to the land use scenarios proposed in the Vision statement calling for the establishment of mixed-use activity centers of various sizes, connected by high capacity transportation facilities, an enhanced public transit system, and somewhat more compact growth. By and large, local government officials agreed with the proposed land use recommendations, with some suggesting minor changes to the proposed Vision land use map. A few communities indicated they would use their existing plans as a guide to future development, rather than the Vision statement. The input received during these meetings was noted and used in creating a refined land use Vision map. Subsequently, this refined map was used as a basis for generating the land use inputs to the transportation demand modeling process.

Technical Support Activities

The WFRC staff provided significant technical support to the visioning process. During the workshops and open houses, information which was used to develop various growth scenarios was obtained from the participants. The workshop activities resulted in the generation of valuable input, were useful in determining community values, and helped identify the types of development that is most desired. The growth scenarios presented in the workshops required data support and modeling so that they could be tested to determine practicality and effectiveness. What follows is a detailed explanation of what was accomplished and methods used in developing and testing the growth scenarios.

Map Analysis of Land Use and Transportation

Each of the 119 maps produced during the workshop process were generated by groups of six or seven participants. The maps show local community desires for the distribution of future Regional growth in population, employment,

commercial businesses, office, schools, trails, and transportation; and how to protect critical and sensitive lands. These maps were digitized into a geographic information system (GIS), which allowed for an analysis of preferences, and a summarization of issues, concerns, and common themes.

The information provided by the 119 workshop maps was digitized into 5-acre grid cells to produce GIS maps, which helped answer the following questions: (1) Where did the participants of each group desire new development to take place and critical lands to be preserved?; (2) What type of development did the groups desire - residential, commercial, or mixed-use?; and (3) How dense or intense did the groups want development to be? The maps were also analyzed to identify preferred types of development in any given area, such as: residential, commercial, mixed-use, or open space.

Based on input from the maps, participants desire that growth take place in older urbanized areas and along heavily used transportation corridors and around specific types of development nodes. The participants also encouraged mixed-use forms of development in existing commercial centers, such as the Layton Mall and downtown Salt Lake City. “Hot spots”, where intense employment centers would be appropriate, were also identified. The summary GIS maps were subsequently used to serve as a basis in further elaborating the alternative growth and “vision” scenarios.

Managing the Process

The visioning process started with a work scope, funding plan, budget and a Memorandum of Agreement between the three participating organizations. The work scope outlined work tasks to be undertaken through the visioning, and identified a division of responsibility between the partnering entities. A working group was organized early to help guide the process. This group was called the “Collaboration Group”, and was comprised of representatives of the partnering entities, the Utah Department of Transportation, the Utah Transit Authority, and the Governor’s Office of Planning and Budget. In addition, the Regional Growth Committee of the WFRC was expanded to include a broader spectrum of stakeholders from the business community, local governments, state and federal agencies, special interest groups, and others. Representatives of local government, and the business community from Utah County were also invited to participate in the expanded RGC. The expanded Regional Growth Committee was temporarily designated as the RGC Steering Committee, and was given responsibility for guiding the process and making recommendations to the WFRC and MAG.

COMMON REGIONAL THEMES

An analysis of the 119 maps developed during the workshops showed striking similarities tempered with some divergent ideas. After an extensive review of the workshop maps, the general themes discussed in the following paragraphs emerged. These themes became part of the overall visioning recommendations and were incorporated into the Wasatch Choices for 2040 draft document.

Emphasis on Growth Centers

Workshop participants envisioned approximately 40 percent of all new residential development be in the form of a mixed-use scenario, such as a village, town center, or city center. This may signify a desire to have 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, workshop participants preferred that the centers be located in existing commercial areas adjacent to major transportation facilities. Participants placed nearly 50 percent of the proposed housing and 45 percent of the proposed employment on land that is currently occupied. Perhaps this signifies an interest in the gradual evolution of some commercial areas.

Preference for a Variety of Housing

Workshop participants preferred that neighborhoods maintain much of their current ambience, but with a notable increase in the variety of housing options. Residential chips placed on workshop maps averaged 60 percent detached stand-alone homes, 25 percent townhouses, and 15 percent apartments or condominiums. The urbanized portion of the region currently consists of 67 percent single family dwellings. Although participants expressed an interest in a greater variety of housing, they still desired detached single-family residences to predominate in future communities.

Emphasis on Bicycle and Pedestrian Routes

Approximately 30 percent of all transportation routes placed on workshop maps represented bicycle and pedestrian routes, indicating the popularity of these options. Clearly, participants felt that an extensive system of bicycle and pedestrian routes should be encouraged to promote flexibility in transportation choices and to encourage healthy recreational activities.

SPECIAL STUDIES

In support of the visioning process, several specialized studies were conducted to provide additional information and direction in establishing realistic assumptions about redevelopment, infill, housing market demand, open space and corridors. The visioning process benefited from these studies, which highlighted important areas of concern.

Redevelopment and Infill Potential Analysis

A local consulting firm was hired to assist with creating estimates of long-term redevelopment and infill activity that could be reasonably anticipated, given different patterns of development and transportation investments. As a part of this effort, tax lot parcel databases were consulted for the affected counties. An effort was made to account for the availability of underutilized land not readily apparent from the county databases.

To further the effort, the University of Utah's Energy and Geosciences Institute provided information from its satellite imagery database. Parcels greater than one acre in size were analyzed to distinguish the degree to which they had already been developed. Exceptions were made in analyzing the parcels to account for vacant properties associated with public uses and other factors that precluded them from future development. The output of this analysis was then applied to the land use modeling process for each of the four general growth scenarios evaluated in the visioning process allowing for further refinement and accuracy. These four growth scenarios are detailed in the following section.

Housing Needs and Market Trends Assessment

A market study was also conducted to identify the anticipated residential development preferences during the 2040 forecast period. The results were to be used to evaluate the growth scenarios and how they relate to the potential demand for various kinds of housing. The primary goal of the study was to document market conditions and forecast residential demand. It focused on the evaluation of the residential market trends and factors, which would affect demand and preferences, and to use this information to forecast the types of homes future residents would prefer in an unconstrained market. The methodology intentionally eliminated from consideration the impact of, or potential changes to local or regional land use policy, as they would be addressed in the visioning process and did not reflect potential environmental constraints, such as water supply or air quality. An independent forecast of future single-family lot sizes was also provided.

Quantitative and qualitative trends and factors were used in the study. Quantitative data included demographic trends and forecasts, housing production trends, residential sales, and development densities. It also included a broad analysis of qualitative trends reflecting demographic preferences, relevant development case studies, and evaluations of other metropolitan areas. The analysis also accounted for new opportunities for transit-oriented development (TOD). The study results were synthesized into specific calculations of forecast demand by decade, by county, for single family and multi-family units, with details regarding densities and configurations.

Critical Lands and Regional Trails Network

A third study was conducted to review critical lands in conjunction with the visioning process. The purpose was to evaluate the impact that land use and transportation (growth) scenarios would have on a variety of critical lands, and to incorporate a regional open space and trails component into the preferred Vision for the region. To facilitate the analysis GIS mapping of open space and trails was augmented by the workshop process. Participants were given the opportunity to draw "green areas" on the maps to indicate preferences for open space and to delineate trail routes. In addition, at the open houses that followed the workshops, public surveys were conducted relating to critical lands and trails.

The findings of the study provided data for analysis of how future growth within the region could either downgrade or remove critical lands, or preserve key areas for the enjoyment of future generations. The study also created a vision of a regional trails network that could encourage walking, other recreational uses, and improve access to open areas. This information was then used in the UrbanSim land use allocation model for each growth scenario and precluded any type of development from being allocated to the parcels identified as critical lands.

SCENARIO DEVELOPMENT PROCESS

With public outreach well underway and completion of the special studies the WFRC, MAG, and Envision Utah identified common themes and began to develop planning scenarios. Planners from these three organizations, guided by the workshop maps and survey results, developed four sketch scenarios - or visions - of what the region could become by 2040. The sketch scenarios reflected the common themes and notable differences identified in the workshops.

Scenario Development

The four sketch scenarios for the horizon year 2040 were tested and compared to one another using various growth and transportation ideas identified in the workshops, to determine how well they performed in achieving the Regional Vision. All four of the scenarios incorporated the same projected population and employment figures. However, each, scenario separately highlighted different transportation choices, the cost of which was approximately the same for each scenario. By eliminating differences in population, employment and transportation costs, the four scenarios could be tested for the effects of different growth and the transportation strategy options.

- **Scenario A**: This scenario reflected current trends and was named the "Business as Usual Scenario." It was based on the existing municipal, county and multi-county plans to guide future growth and transportation. To determine how the impacts of each scenario might differ from current trends, Scenarios B, C, and D were compared to Scenario A.

- **Scenario B**: This scenario named "Transit Station Villages" is characterized by activity centers clustered near transit stops and stations. The suburbs generally retain the same density as found in the "Business as Usual" Scenario - with occasional neighborhood villages having a mix of apartments, condos, and neighborhood shopping. Scenario B included a significant increase in the amount of rail transit by emphasizing rail extensions and bringing light rail and commuter rail to more communities than currently planned.

- **Scenario C**: This scenario was named "Interconnected Network of Complete Streets". Rather than encouraging development around transit nodes as in Scenario B, Scenario C intensified mixed-use development along walkable boulevards. These boulevards would be lined with townhouses, shopping, and office development (employment). New suburban neighborhoods in Scenario C remained largely residential and lower density in character. Scenario C's boulevards would represent an interconnected network of complete streets that encourage the use of streetcars, biking and walking.

destinations, which significantly reduced average diving distances. This in turn reduced traffic congestion and improved air quality.

Urban growth near transit opportunities encourages people to ride transit. Scenario B shows that if transit stations or bus stops are within walking distance of homes and businesses, more people find riding transit to be convenient. People will walk or use bicycles if the trip is short and the design (for pedestrians and cyclists) is convenient. If commercial destinations, like an office building or restaurant, are very close to each other and are located in a pedestrian-friendly setting, many people will choose to walk between them, rather than drive their vehicle.

- **Scenario D**: This scenario was named "Centers of Employment." Scenario D was characterized by a greater number of strong suburban centers of employment in closer proximity to housing areas. Suburban neighborhoods had a greater mix of lot sizes and included more townhouses, apartments and condos. Scenario D emphasized new freeways and major roads to serve the Wasatch Front Region's growing areas.

Scenario Evaluation

Examination of the scenarios and evaluation criteria resulted in some interesting observations. For instance, different patterns of land development can ease vehicle access, but aggravate mounting transportation challenges. By contrast, in a different scenario, the proposed future development patterns can help solve the mounting transportation challenges and reduce the rising cost of providing growth related infrastructure. Specific observations about the effects of different patterns of development follow.

Mixed-use development reduces driving distances and congestion. The distance traveled to work, shopping, schools, or parks is largely a function of the distance between these destinations and residences. The distance traveled per person directly affects the collective time it takes travelers to get where they need to go and the traffic congestion they are part of. Scenario C contained a higher mix of homes with

Transit-oriented development is a key strategy to increase redevelopment in existing urban areas and to reduce demand for growth on underdeveloped land. Scenario B's emphasis on high capacity transit coupled with transit villages created more opportunities for reuse of land or "redevelopment." Scenario B also exhibited the highest rate of redevelopment and, not surprisingly, also exhibited the lowest amount of development on vacant and critical lands.

Transportation choices help to determine where growth will occur and how much land area will be developed. The type of transportation solutions that are provided has an impact on the way communities grow and develop. New roadways and transit facilities, wherever they are built or expanded, increase accessibility, which in turn attracts growth. As planners and decision-makers consider where they should invest transportation dollars, they should ask the question, "Where do we want to encourage new growth - on redeveloping industrial and other urbanized properties, on vacant land near existing communities, or in new undeveloped areas?"

Interconnected streets help keep short trips off major highways and reduce congestion. Interconnected streets facilitate free traffic flow and the use of more direct routes. They also promote neighborhood cohesion. The length of time it takes to reach destinations is a function of distance as well as congestion. Shorter driving trips and less congestion mean that if regional development takes place in accordance with the strategies embodied in Scenario C, there will be more time available for people to pursue individual choices and less time in congestion. The scenarios generally assumed that people who ride public transportation with its own dedicated right-of-way mostly bypass congestion. Generally, transit is a key means of reducing congestion during the all-important peak use periods. Even if transit carries only a small percentage of overall trips, it plays an important role in relieving rush-hour congestion. Data indicates that In Salt Lake County, TRAX carries the equivalent of one lane of freeway traffic during peak hours.

Strategic changes make a big difference. Surprisingly, the benefits of Scenarios B, C, and D, when compared to the "business as usual" Scenario A, are the result of relatively minor changes to the density of the region's housing and land use. For example, Scenario C assumes about 27 percent townhouse and multifamily development, only 6 percent more than the "business as usual" Scenario A. The strategic placement of this type of development in walkable and mixed-use settings adjacent to transit is largely responsible for the advantages that Scenario C anticipates. This Scenario realized nearly a 10 percent reduction in congestion and a 3 percent reduction in vehicle miles traveled. Strategic changes throughout the region can vastly improve the individual quality of life without negatively impacting existing single-family neighborhoods to the degree that a more sprawling pattern of development would create.

SCENARIO MODELING PROCESS

The patterns of land use and the transportation systems in urban communities play a critical role in determining the livability and sustainability of those urban areas. It is important to model these patterns in an integrated way to reflect the strong interaction between land use and transportation. In this effort, the WFRC used an integrated modeling system, UrbanSim, as an analytical tool for the scenario modeling process to compare multiple land-use and transportation scenarios in a manner consistent with urban growth theory.

UrbanSim is a state-of-the-art approach to forecasting future land-use growth with growth forecasts influenced by the nature of the proposed transportation system. By coupling UrbanSim with the regional travel demand model system, a range of land use and transportation policy interventions are combined into policy 'scenarios', and the systematic effects of these intervention strategies can be expressed in terms of projected urban development outcomes and the quality of the transportation system.

Modeling System Input

Critical inputs to the modeling system include base year socio-economic data, jurisdictional master plans, environmental constraints and the proposed future transportation system. The primary input for the UrbanSim model includes the base year data and future land use policy data. The base year data describes existing development and socioeconomic environment for the base year. This information includes households, employment, dwelling units, non-residential square footage, stated local government land use planning preferences, and environmental factors. All of this information is broken down to a 150-meter by 150-meter square area, called a grid cell, which contains an area of just over 5.5 acres. The grid cell is the basic unit for the UrbanSim model. There are approximately 150,000 grid cells covering the entire region.

The future land use policy data includes the land use plans of various municipalities and the counties for the unincorporated areas. For the regular travel demand model, the main inputs include socioeconomic data and transportation system data. In the integrated modeling process the socioeconomic data is automatically derived from the UrbanSim modeling process. Therefore, the main input data for the travel demand model is the proposed future transportation system, which is described as the highway network, transit networks and other features. From a modeling perspective, the highway network data are the number of lanes and the functional type for each roadway facility of every model year. The transit network data include all modes (Local Bus, Express Bus, Bus Rapid Transit, Light Rail/Streetcar, and Commute Rail) and all transit routes, their frequency and speed, park and ride nodes, walk access links, etc.

Based on the output from workshops and input from local government planners, four land use and transportation scenarios were developed to test various growth and transportation concepts. The tested scenarios are described in the Scenario Development section of this chapter.

Modeling System Output

In this iterative land use and transportation model system, the resultant UrbanSim socio-economic data for each future year that falls within the 2040-planning horizon is entered into the Travel Demand Model. Various UrbanSim output data for every future year are analyzed before use in this process. These data include dwelling units, households, non-residential square foot, employment, land use consumption, land use type etc.

The travel demand model output consists of highway related and transit related information. The highway related information includes vehicle miles traveled (VMT), vehicle hours traveled (VHT), delay, speed, lane miles, etc. This information can be reported at different geographic levels such as region, county or municipality. It can also be classified for different functional types for the roadway facilities in the region. Transit information includes mode share by purpose and boardings, and other information collected at stations or a route level. On the basis of these model outputs, the tested scenarios were examined, compared and evaluated.

DEVELOPMENT OF THE REGIONAL VISION

Extensive surveys conducted for the visioning process were used to determine the general population's preferences and values with regard to growth and development. The results were used to develop criteria by which the various scenarios were tested. The preferred scenario of transit station villages, Scenario B, is characterized by activity centers clustered near transit stops and stations with the remainder of suburban areas generally remaining at the same density and with occasional neighborhood villages having a mix of apartments, condos, and neighborhood shopping. The second most preferred scenario of an interconnected network of complete streets, Scenario C, intensified mixed-use development along walkable boulevards lined with townhouses, shopping, and office development with new suburban neighborhoods remaining largely residential and lower density in character. This scenario represented an interconnected network of complete streets that encourage the use of streetcars, biking and walking. The WFRC's evaluation of these scenarios resulted in a combination of the best aspects of each, and the emergence of the draft Vision.

Refinement of the Regional Vision

The draft Vision was based on taking a combination of the best components of the preferred Scenarios. Revisions were undertaken based on input from the Technical Advisory Committees, the Regional Growth Committee, and various jurisdictions and stakeholders. Cues were taken directly from workshop results for locating mixed-use development centers and new transportation concepts. As a result, centers of development were located in central locations well served by existing and projected high capacity transportation facilities.

As the Vision matured the Regional Council Staff with the assistance of Envision Utah and other consultants continued to refine the Vision. Workshops were held in each of the four urbanized counties along the Wasatch Front. Local government planners and engineers provided input on how land use within their respective general plans could be improved to better reflect the projected growth throughout the region. Specific growth assumptions associated with the draft refined vision were reviewed for plausibility, consistency with local plans, and to incorporate knowledge of major development proposals that have a reasonable likelihood of being developed over the RTP planning horizon. As jurisdictional planners reviewed the draft vision refinement, they were reminded that county control totals would be maintained and, for that reason, many areas would have a growth assumption for 2040 that is below what their individual general plans allow, or the total jobs and households one might see in a potential major development.

Consultants considered the balance of households and jobs in sub-county areas to ensure the vision assumes a reasonable complement of retail and non-retail jobs in housing-rich areas. A balance of jobs and housing is a principle of the Wasatch Choice for 2040, so housing was likewise added to job-rich areas. Consultants ensured that the overall assumption for infill and redevelopment region-wide was also plausible. Consultants considered redevelopment and infill rates in other metropolitan areas whose current population approximates the WFRC/Mountainland MPO population project for 2040. As the Vision was refined, the approximate percentage of growth that could be assumed through infill and redevelopment was maintained. Consultants also revised the Vision to better approximate recent land use trends. For example, more growth was assumed in southwestern portions of Salt Lake County.

Application of the Vision Scenario and Growth Principles

Once the Vision Scenario was finalized, the WFRC used it as a guide in the development of the Regional Transportation Plan. The land use suggestions that were used as an input to the demand modeling process were developed from the land use preference generated through the Vision Scenario. Revisions to the Vision Scenario land use recommendations were based on input from local government staffs and elected officials. The Regional Growth Principles were a resource in developing the evaluation and performance criteria used in the evaluation of future transportation needs, and the transportation system. The growth principles were also used in determining, ranking and projecting highway and transit projects in the 2040 RTP.

Urban Sim

Urban Sim relied on a set of statistical models that note patterns in the way the region has developed. The approach is designed to support metropolitan planning and policy analysis. One important advantage to this approach is that growth forecasts are influenced by the quality of the proposed transportation system. By coupling UrbanSim with the regional travel demand model system, a range of land use and transportation policy interventions are combined into policy 'scenarios', and the systematic effects of these intervention strategies can be used to project urban development outcomes and to assess the quality of the transportation system.

Modeling System Inputs and Outputs

Critical inputs to the modeling system include base year socio-economic data, jurisdictional master plans, environmental constraints and the proposed future transportation system. The model outputs include dwelling units, households, non-residential square footage, employment, land use consumption and land use type, as well as highway and transit related information. More detailed information on model inputs and outputs can be found in the previous section entitled, "Scenario Modeling Process."

WASATCH CHOICE FOR 2040 VISION

The Wasatch Choice for 2040 Regional Vision is used to guide implementation of land use and transportation strategies that will result in more sustainable and livable communities for generations to come. The Vision will help maintain the high quality of life for the residents of the Wasatch Front as the population increases dramatically over the next three decades. Among other things, the Vision emphasizes using our limited financial resources more effectively, integrating land-use and transportation systems, meeting housing needs, building in areas with existing infrastructure, and energy conservation. It envisions new mixed-use villages and economic nodes with higher density centers tied together by an efficient, modern transportation system. This Vision for the future of the four urban counties is based on extensive market research showing that changing consumer demographics and preferences, increasing land and energy costs, and a growing desire to trade commute time for family and recreation time are driving demand for living in or near centers. In short, the Vision gives people the housing and transportation choices they want while maximizing transportation investments and land use benefits. Implementing The Wasatch Choice for 2040 will provide significant quality-of-life benefits:

- Billions of dollars saved in infrastructure, housing and transportation costs
- Savings in travel time which can be used for other purposes
- Improves air quality for our health and economic growth

- Maintains the character of existing neighborhoods
- Preserves key agricultural lands and other open spaces
- Provides housing for people of all life stages and incomes
- Uses less of our limited water resources
- Creates more active neighborhoods, supporting increased recreational activities
- Enhances the local economy and the ability to attract and retain skilled workers
- Provides more choices for how this and the next generation will live, work, and travel

By implementing the Vision, we can accommodate growth, enjoy more financial security, build first-class communities, and preserve the stunning beauty of our state.

Regional Growth Principles and Objectives

The nine Regional Growth Principles embody many of the values held by residents of the Wasatch Front Region. These Principles were adopted by the Regional Council after reviewing input from community workshops, open houses, committee deliberations, and polling. The Growth Principles are intended to promote quality growth throughout the Region. It is important that new growth be guided so that it can occur and be accommodated in the most efficient and cost effective way.

The Growth Principles were also intended to serve as a context for implementing general plans developed by local, state, and other entities. The Principles reflect community values and recognizes the importance of long-term sustainability and the need to make wise choices with limited resources. They serve as a resource in developing criteria and performance measures for regional transportation planning relating to the environment, economy, transportation, and other factors. It is recognized that collaboration will be needed among the Wasatch Front Region's local governments and others if these principles are to be implemented and their potential benefits realized.

Regional Growth Principles

1. Provide public infrastructure that is efficient and adequately maintained
2. Provide regional mobility through a variety of interconnected transportation choices
3. Integrate local land-use with regional transportation systems
4. Provide housing for people in all life stages and incomes
5. Ensure public health and safety
6. Enhance the regional economy
7. Promote regional collaboration
8. Strengthen sense of community
9. Protect and enhance the environment

The Regional Vision

The Regional Vision, the Wasatch Choice for 2040, aims to represent a pattern of growth and transportation solutions that reflect the spirit of the Growth Principles and is a plausible future. For example, the Wasatch Choice for 2040 pictures walkable villages - centers of housing and commercial enterprises arranged in a pedestrian-friendly setting - emerging in areas that are currently used for commerce and industry, but not in current residential subdivisions where such change would likely not be welcomed by the community. Change is envisioned primarily in strategic areas of regional transportation significance, which are the most central, accessible and high capacity transportation locations in the Region.

The Vision and Development Patterns

In The Wasatch Choice for 2040 Vision, the walkable, mixed-use centers of development would act like a growth sponge, absorbing future growth that would otherwise occur on the edge of our suburban communities. These centers help to create community gathering spaces, giving communities a sense of place. Opportunities for moderately priced housing with readily accessible public transportation would be important components of the mixed-use centers. Mixing land uses would allow for more efficient use of available land. The concentration of residential, office, retail, and well-planned open space would allow individuals the opportunity to live, work, shop, and recreate all within the confines of a limited geographic area or neighborhood.

The Vision and Critical Lands

The Wasatch Choice for 2040 Vision pictures a comprehensive system of green corridors connecting communities with trails and providing green buffers next to creeks and rivers. This trail and open space network includes the Jordan River Parkway, the Bonneville Shoreline Trail, Farmington Bay Bird Refuge, and a wide variety and location of regional and neighborhood parks. The system of trails would allow for increased opportunities for walking, biking, wildlife viewing, and relaxing. The protection of open space would offer opportunities for the protection of critical habitat areas, improving water quality, and protecting watersheds.

The Vision and Transportation

The Wasatch Choice for 2040 Vision balances a variety of transportation forms: (1) The Vision highlights the role that walking and bicycling can play as options for making daily trips; (2) The Vision recognizes that auto travel will continue to be the dominant form of transportation, but that greater use of interconnected boulevards from community center to community center can reduce the need to use freeways and expressways; (3) The Vision highlights the value that transit has in providing a more efficient alternative to single occupant auto travel, while reducing household transportation expenses. As growth continues, opportunities for proper planning and infrastructure investments will become apparent, thereby minimizing congestion and increasing transit options. Map 2-1 shows the Wasatch Choice for 2040 Region Vision with a description of green space, centers, and corridors. Appendix E is a specially developed brochure, entitled "Wasatch Choice for 2040, We Can Choose a Better Future," which highlights the planning process, the benefits, and illustrations of different strategies to better implement the of the Regional Vision.

Implementation Strategies for Local Governments

The Growth Principles and Objectives laid the foundation for maintaining or improving the quality of life as the Wasatch Front Region continues to grow. The Wasatch Choice for 2040 Vision process also identified strategies for implementing these growth principles. Below is a list of ten strategies for local governments to consider as they explore various methods by which Growth Principles and Objectives could be implemented. These strategies are basic primers intended to highlight initial steps and considerations.

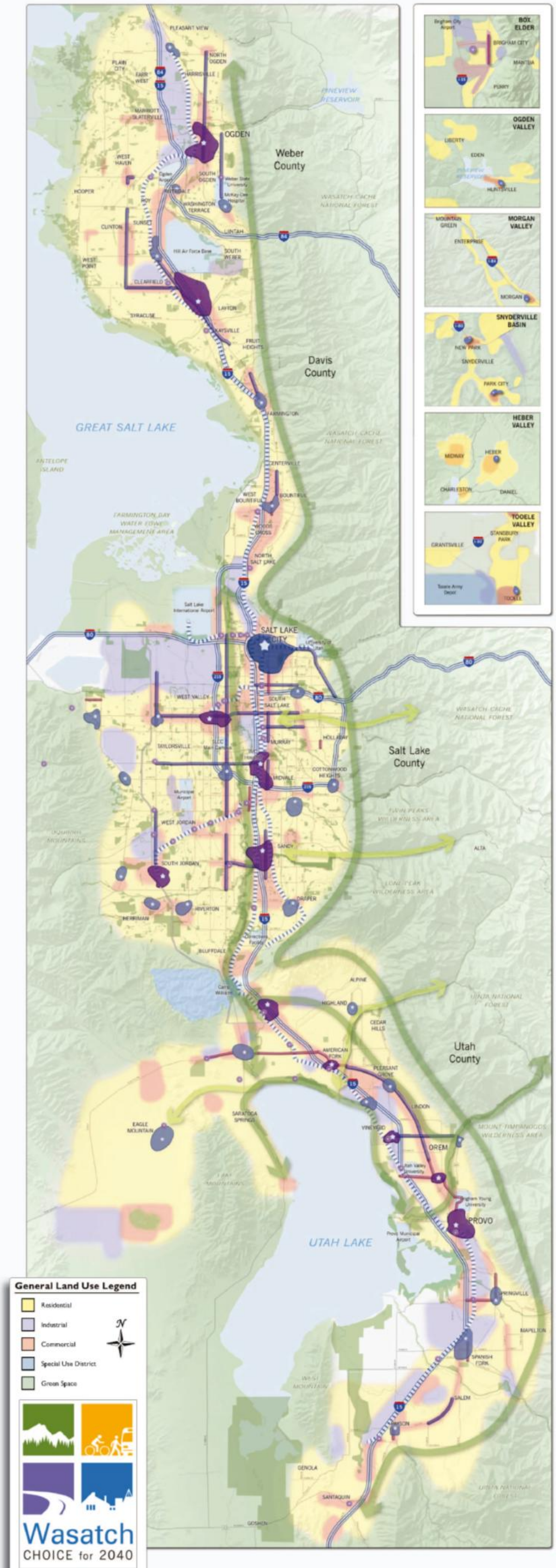
Strategies For Local Governments

1. Develop a local land re-use strategy
2. Provide incentives for contiguous growth and infill
3. Preserve future transportation and utility corridors
4. Create walkable commercial and mixed-use districts
5. Plan for transit oriented development
6. Plan for and build neighborhood-friendly elementary schools
7. Crate a plan for workforce housing
8. Interconnect roadways and pedestrian paths
9. Plan for job centers and economic development readiness
10. Minimize development and maximize conservation on and near critical lands

IMPLEMENTATION OF THE VISION

The implementation of the Wasatch Choice for 2040 Vision is a priority if the Region is to ensure it future quality of life. The WFRC staff conducted a special study to explore how the Vision and Regional Growth Principles might be utilized to produce the type of sustainable corridor development desired. The historic and regionally important State Street corridor was selected as a case study example. This Visioning exercise, entitled Life On State - Our Street, Our Vision (LOS), was a collaborative planning effort to develop a: (1) vision for the future of State Street; (2) a toolbox to aid in vision implementation; and (3) a focused planning effort on three or four defined areas where the Growth Principles can be applied directly to improve the overall quality of this important

Map 2-1, WASATCH CHOICE FOR 2040 VISION MAP



The Wasatch Choice for 2040
Vision Map

The Greater Wasatch is one region, stretching from Weber County south to Utah County and from Tooele County east to the Wasatch Back. We compete economically with other regions, comprise one job and housing market, and share the same air and water. Where and how we shape tomorrow's neighborhoods, communities, and economic centers within our region will dramatically affect the quality of our lives, including how much time and money we spend getting around, the quality of the air we breath, and the choices we have available to live, work, shop, and play.

Greenspace

Greenspace rings our valleys, connects our cities, and provides space for civic and social functions in our towns and neighborhoods. The Wasatch Choice for 2040 affirms that our natural resources and working lands provide immense benefits. We should safeguard them to preserve our regional food system, protect our water quality, and maintain our recreational opportunities. These lands also provide needed wildlife habitat, help to clean our air, and provide relief from our urban environment. Even closer to home, our parklands and greenways provide critical gathering spaces, recreational amenities, and connection to the natural world.

Regional Greenways — *The Bonneville Shoreline Trail, the Jordan River Parkway, and the Provo River Parkway*

Regional Connections — *Links between greenways and greenways and major population centers*

Green Context — *The Wasatch and Oquirrh Mountains, the Great Salt Lake, and Utah Lake*

Centers

Centers are historical and emerging regional destinations of economic activity. The vision suggests that these centers should expand to provide ever-broadening choices for residents to live, work, shop and play; a mix of all of these activities is welcome. Centers should work with the long-term market, helping provide opportunities to residents who want to live close to work, walk or bike to shop, and have both great transit and road access – desperately needed as our population ages, gas prices and congestion increase, and housing prices inch upward.

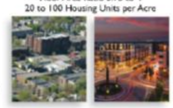
Metropolitan Center

Floor Area Ratio 1 to 10
20 to 200 Housing Units per Acre

Downtown Salt Lake City is the metropolitan center, serving as the hub of business and cultural activity in the region. It has the most intensive form of development for both employment and housing, with high-rise development common in the central business district. It will continue to serve as the finance, commerce, government, retail, tourism, arts, and entertainment center for the region.

Urban Center

Floor Area Ratio 0.75 to 4
20 to 100 Housing Units per Acre



Urban centers are the focus of commerce and local government services benefiting a market area of a few hundred thousand people. Urban centers will be served by high-capacity transit and major streets. They are characterized by two- to four-story employment and housing options.

Town Center

Floor Area Ratio 0.5 to 1.5
10 to 50 Housing Units per Acre

Town 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 characteristic.

Station Community

Floor Area Ratio 0.5 to 2.5
20 to 100 Housing Units per Acre

Station communities are geographically small, high-intensity centers surrounding high-capacity transit stations. Station communities vary in their land use: some feature employment, others focus on housing, and many will include a variety of shops and services.

Main-Street Community

Floor Area Ratio 0.5 to 1.5
10 to 50 Housing Units per Acre

Main streets are linear town centers. Each has a traditional commercial identity but on a community scale. Main-street communities prioritize pedestrian-friendly features, but also benefit from good auto access and often transit.

Boulevard Community

Floor Area Ratio 0.35 to 1.0
0 to 50 Housing Units per Acre

A boulevard community is a linear center coupled with a transit route. Unlike a main street, a boulevard community may not necessarily have a commercial identity, but may vary among housing, employment, and retail along any given stretch.

Corridors

Corridors combine a mix of uses—retail, offices, and residences—with multiple transportation options (sidewalks, bike lanes, roadways, and public transportation). Two types of corridors are identified in the Vision: Boulevard Communities and Main Streets. Examples of Boulevard Communities might include State Street or Redwood Road—with higher traffic volumes, yet envisioned as multi-modal boulevards with public transportation systems supporting increased residential, office, and commercial development. Main Street examples might include Magna or Lehi—more historic in character with lower traffic volumes, wider sidewalks, and more on-street parking.

Commuter Rail / TRAX — Freeways

regional corridor. The LOS partners included the WFRC, UDOT, UTA, Salt Lake County, Salt Lake City, South Salt Lake, Murray, Midvale, Sandy, Draper, the Salt Lake Chamber of Commerce, and the Downtown Alliance.

The Wasatch Choice for 2040 Regional Vision recognizes that local government planning agencies, working together with the local business community, can create a livable corridor for State Street that will help reduce the problems and impacts associated with this high traffic volume arterial street. These impacts include congestion, deterioration, visual blight, unfriendly pedestrian environments, and lack of residential population. The primary goal the LOS study was to develop specific strategies that are designed to enhance State Street and its surrounding land so that good planning and market forces will help form a more livable corridor over time. These strategies include establishing a visually pleasing boulevard, diversifying the land use character of the street frontage, eradicating pockets of blighted land uses, pruning back retail-zoned land, creating a sense of place, increasing street amenities, utilizing context sensitive solutions, managing property access, promoting different transportation modes, investigating various mixed-use develop concepts, and introducing various livable corridor concepts. A livable corridor would include many of the following elements:

- Access to high frequency and reliable transit that connects to desired destinations
- Provisions for various motorized and non-motorized transportation modes
- Creation of purposeful walking opportunities for a higher percentage of residents
- Traffic calming, reduced accidents, and greater safety
- Redevelopment that will intensify the use of land adjoining the corridor to help achieve its "highest and best" use
- Trans-jurisdictional zoning ordinances that establish land use, building height, street setbacks, footprint, parking restrictions, type of signage, and access management
- A coordinated streetscape design that allows for visual themes, lighting, art, street furniture, trees and landscaping, awnings, open space, plazas, sidewalk, pavement treatment, etc.

The LOS study was initiated in April 2009 with several problem scoping meetings, goal setting, and direction from the partnership. Several public outreach efforts, including open houses, a visual preference survey, and several land use mapping exercises took place the following month. In August 2009, a design charette was held hosted by several notable local and national architects examined possible aesthetic and land use improvement for the State Street corridor. In September and October of that year, a series of Town Home meetings were held to provide feedback on the public input received to that date, along with the results of the design charette. Presentation on LOS recommendation to various municipal councils, chambers of commerce, and planning commission took place during October while the draft of the LOS document was being prepared. The final LOS report was released in March 2010. The Life On State study and results is an excellent example of a planning process that reflects the aspirations of local and state government officials and others who created and adopted the planning philosophies that formed the basis of Wasatch Choice for 2040 Regional Vision.

System Needs Assessment

As the Wasatch Front Region grows and development patterns emerge, the travel demand for all transportation modes will increase and the need to manage all elements of the transportation system will become much more pronounced. This Chapter describes the system-wide needs the WFRC has identified through public input, analysis of current and future travel patterns, and other means. Critical regional corridors are identified on page 54, General Needs Overview.

WFRC 2040 RTP
Salt Lake City

Chapter 3

Photo at Left: The *Wasatch Weave* interchange provides automobile access between Interstate 15, Highway 89 and the Legacy Parkway at Farmington. This complex interchange also accomodates freight train and *Front Runner* commuter rail corridors at the new Station Park transit-oriented development.

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PUBLIC SCOPING OF NEEDS

The following is a summary of public involvement work and comments received during the scoping phase of the 2040 RTP. Open houses were held and other efforts made to determine the views of the general public concerning needed and desirable changes and enhancements to the Regional Transportation System. Those efforts included an update to the Regional Vision in partnership with the Mountainland Association of Governments (MAG) and Envision Utah which involved the general public as well as many representatives from local jurisdictions. In addition, presentations on transportation issues were made to numerous groups including members of the State Legislature, the Governor's Office, civic groups, chambers of commerce, service clubs, environmental justice and low income groups, groups focused on protecting the environment, and motor cargo organizations.

During the process of preparing the 2040 RTP, the Wasatch Front Regional Council participated in dozens of open houses sponsored by other transportation agencies in order to receive comments and recommendations. Thousands of copies of the September 2007 brochure outlining the 2030 RTP were distributed. Quarterly newsletters were also mailed, and annual presentations made on transportation needs were made to the respective county councils of government. Based on the above public involvement efforts, it became clear that the following transportation needs were perceived by members of the general public and representatives of the interested groups.

Weber County

- Increase transit service options (streetcar, local bus routes, connections to commuter rail, express bus)
- Improve and increase bicycle and pedestrian facilities and safety (pedestrian overpass
- Operational improvements on major arterials (signal timing, turn lanes)
- Support new and upgrades to facilities in growing areas of the county
- Preservation and Improve air quality
- Adjust development patterns to provide more housing near employment centers

Davis County

- Increase access to the freeway system
- Expand and improved east-west facilities and movement
- Provide more pedestrian and bicycle facilities (pedestrian bridges, like lanes, pathways)
- Improve transit service through Davis and to Salt Lake County
- Improve and increase the north-south facilities on west side of county

Salt Lake County

- Increase and improve freeway access
- Fund more pedestrian and bicycle facilities and safety improvements (sidewalks, paths-separate from roads, bike parking, bike lanes-separate from traffic)
- Improve and expand transit facilities (park and rides, TRAX stations, east-west routs, service throughout the valley)
- Increase north-south roadway capacity
- Increase east-west roadway capacity
- Air Quality improvements
- Innovative roadway improvements (reversible lanes, one-way streets, congestion mitigation strategies)

GENERAL NEEDS OVERVIEW

In order to assess transportation needs in the Wasatch Front Region, the WFRC established 14 subareas and identified issues and opportunities within each. These regional subareas are graphically depicted in Chapter 4, Map 4-5. In addition to compiling needs noted by the public, the WFRC researched various data sources. The types of issues and concerns identified in most of the subareas included: bottlenecks, underdeveloped transportation networks, sensitive lands, lack of adequate transit service, safety concerns, congestion, geometric deficiencies, and lack of sufficient freeway access. A complete listing of regional transportation and land use issues and opportunities identified can be found in Appendix F – Issues and Opportunities.

Major Travel Demand Corridors

In order to fully identify transportation system needs, future travel demand must be quantified. The regional travel demand model facilitates analyses to provide this

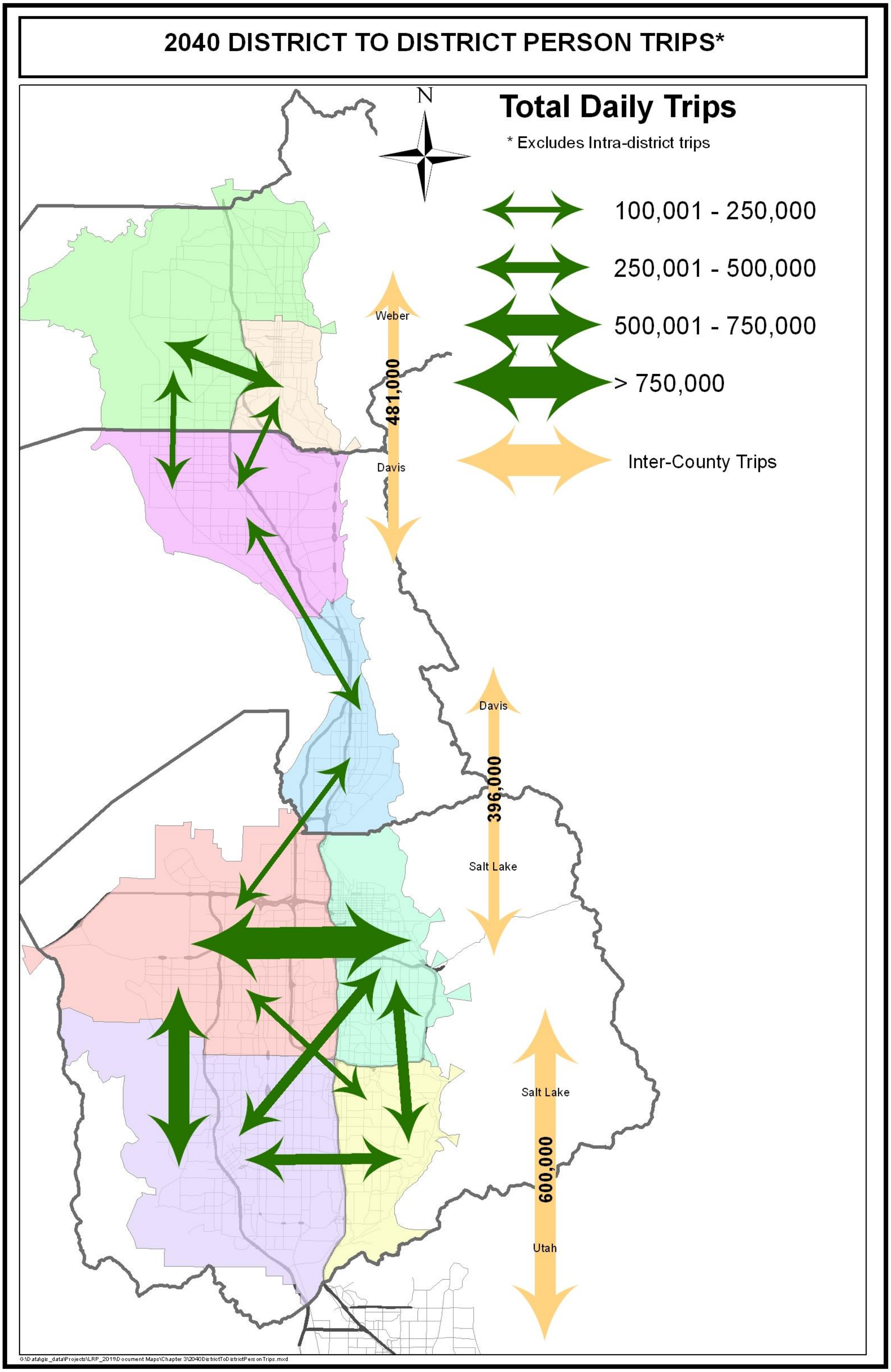


Fig. 3-1, 2040 TRAVEL DESIRES

information. A detailed documentation of this modeling process is provided in Appendix C – Transportation Modeling and Analysis Tools. The projected 2040 desire lines of travel are displayed in Figure 3-1, the width of the line indicating the magnitude of the travel flows. The largest intra-county 2040 travel flows are shown in addition to each of the north-south, urban inter-county flows. The magnitude of the inter-county travel flow arrows illustrates the interconnected economy of the Wasatch Front Region. Based upon regional travel demand illustrated in Figure 3-1, it appears that the primary travel flows, in order of magnitude, will be as follows.

- East / West flow between northwestern and northeastern Salt Lake County
- North / South flow across the Salt Lake / Utah County line
- North / South flow between southwestern and northwestern Salt Lake County
- North / South flow across the Davis / Weber County line
- East / West flow between southeastern and southwestern Salt Lake County
- North / South flow across the Salt Lake / Davis County line
- East / West flow between western and southeastern Weber County

Finding Future (2040) Deficiencies

An essential analytical step in the process of identifying needs is to calculate how the existing transportation system would perform in the horizon year, 2040. In other words, what will be the deficiencies of the existing transportation system? For the purposes of this analysis, the "existing" system is assumed to be the facilities currently in use as well as funded projects. The highway and transit projects included are those to be constructed by 2016 (funded projects).

The following Figures 3-2, 3-3, and 3-4 identify the deficiencies of the existing transportation system through the year 2040. In each county the future (2040) travel demand (red or green) is compared to the existing plus funded highway capacity (blue outline) across a set of screenlines. Where demand exceeds capacity the screenlines show up as red. As could be expected, the largest capacity deficiencies along the Wasatch Front will be primarily in the high growth areas where there is limited infrastructure, plus the heavily traveled I-15 corridor.

A review of these graphics indicated that the following six major corridors will experience the most serious mobility deficiencies.

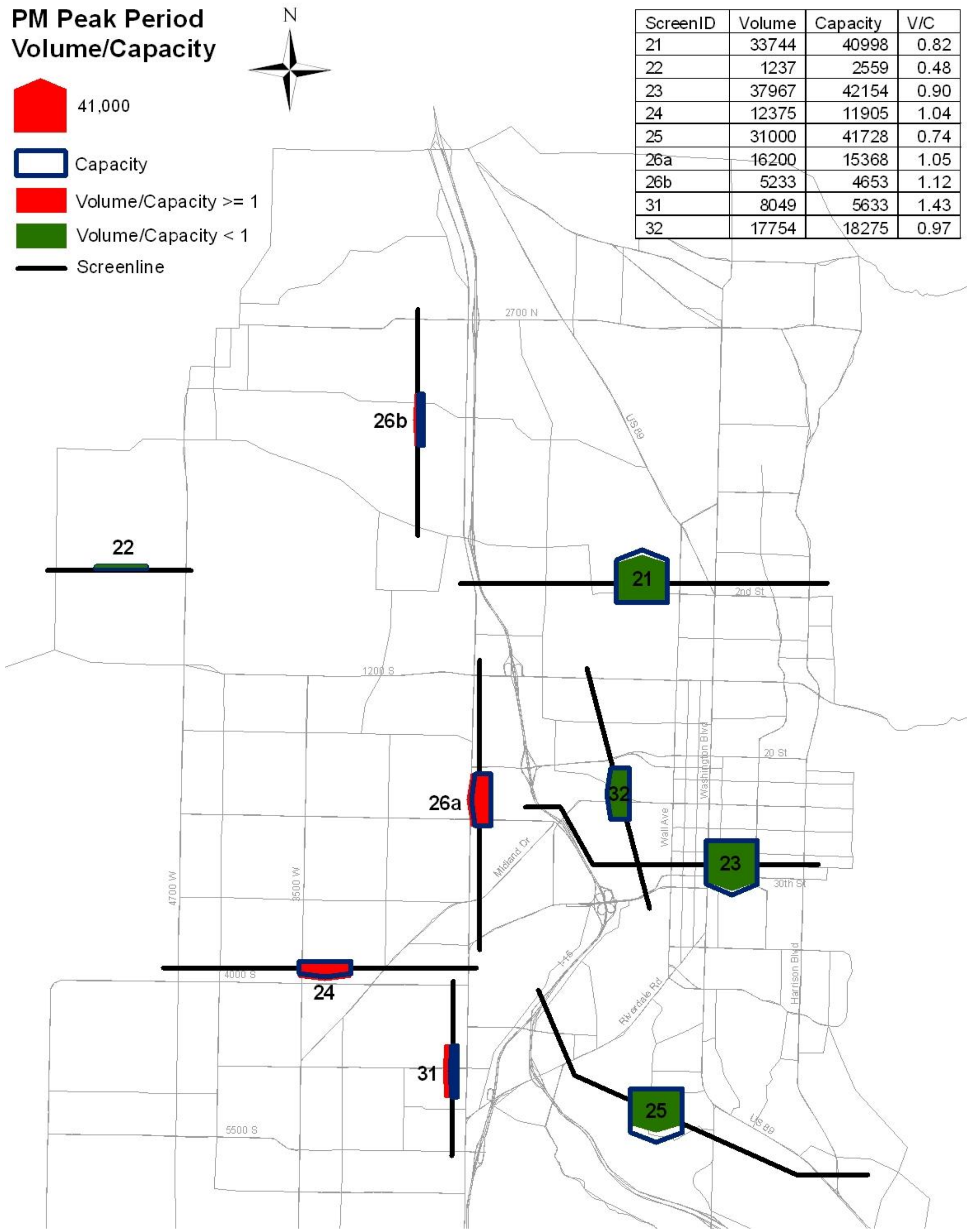
- I-15 along the Wasatch Front in Weber, Davis and Salt Lake Counties
- East / West flow in the southwest quadrant of Salt Lake County (between 6200 South and 14600 South)
- East / West flow in the central west portion of Salt Lake County (between 3100 South and 6200 South)
- North / South flow in southern and western Salt Lake County
- North / South and East / West flow in northwestern Davis County
- East / West flow in western Weber County

Traffic Congestion

Often in high growth areas, new capacity (supply) seems to be prematurely congested by recurring commuter traffic and non recurring accidents and construction. In "supply" and "demand" terms, the travel "demand" is the number of vehicles (drivers) wanting to use the roads and the "supply" is the volume of vehicles that a road can carry in the peak period. The highway system provides exceptional mobility until it starts to break down because of daily congestion at choke points or irregular incidences such as crashes. Congestion then is compounded because as demand increases in the peak periods, supply declines when speeds are reduced.

When freeways reach capacity, they lose up to thirty percent of their ability to move traffic efficiently. For example, a 10-lane freeway can carry about 21,000 vehicles going at a speed of 60 miles per hour. When the situation degrades to an average speed around 20 mph, the 10-lane freeway can only carry about 15,000 vehicles. Transit, and carpooling, on the other hand can be expanded by adding passenger cars to peak hour trains without reducing the service speed. Regional transit is better suited to the peak hour travel demand and will best succeed where access, travel time, convenience, cost and comfort are attractive when compared with congested auto travel.

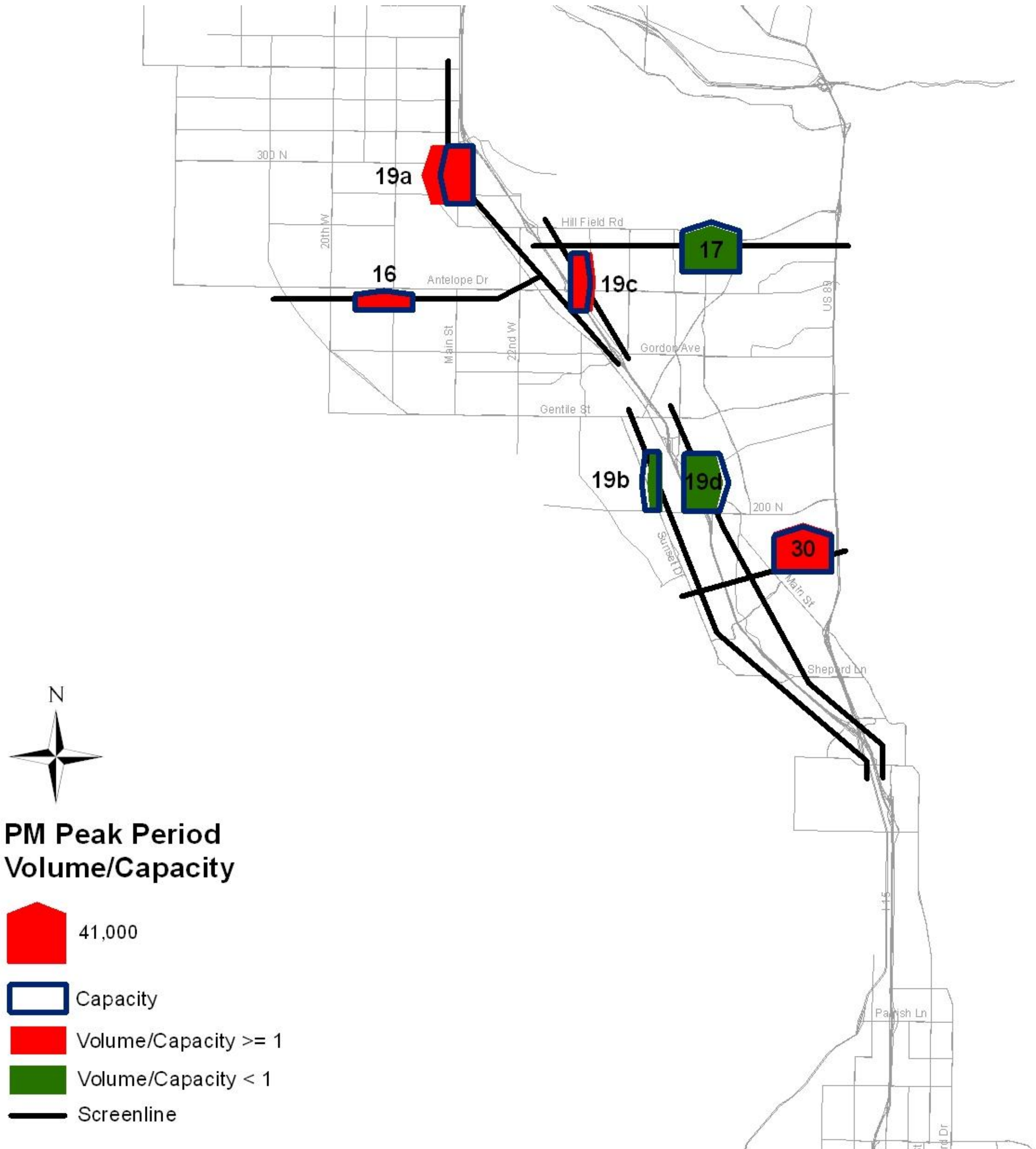
The auto / highway system will remain the dominant mode in the Region through 2040 but creative strategies are needed to avoid compounding highway congestion. At its most fundamental level, highway congestion results



ScreenID	Volume	Capacity	V/C
21	33744	40998	0.82
22	1237	2559	0.48
23	37967	42154	0.90
24	12375	11905	1.04
25	31000	41728	0.74
26a	16200	15368	1.05
26b	5233	4653	1.12
31	8049	5633	1.43
32	17754	18275	0.97

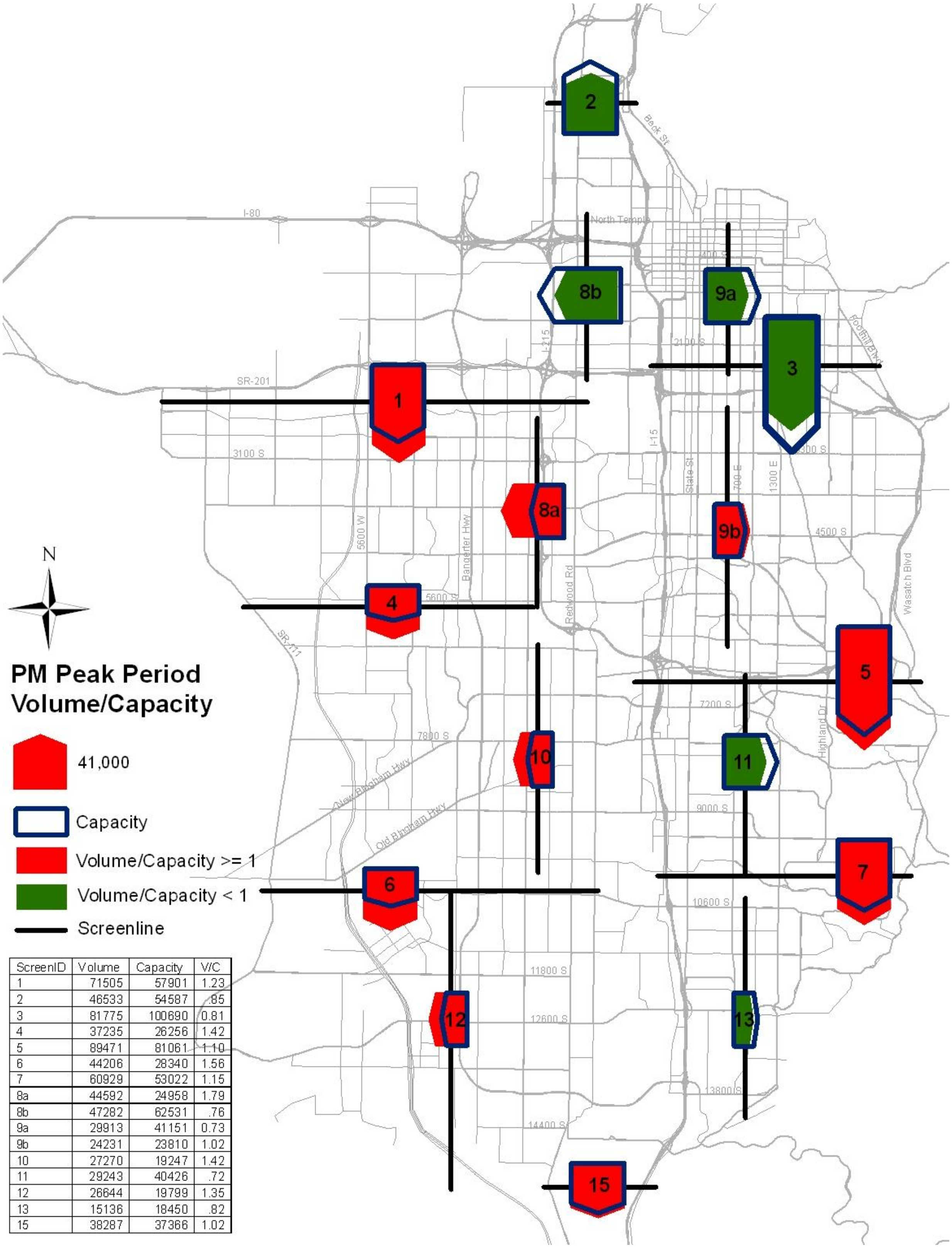
Fig. 3-2, WEBER COUNTY 2040 PM PEAK PERIOD VOLUME / 2016 CAPACITY

Fig. 3-3, DAVIS COUNTY 2040 PM PEAK PERIOD VOLUME / 2016 CAPACITY



ScreenID	Volume	Capacity	V/C
16	13423	13380	1.00
17	31371	34562	0.91
18	44671	47755	0.94
19a	33038	23286	1.42
19b	9364	11979	0.78
19c	14113	13563	1.04
19d	24643	30492	0.81
30	31835	30990	1.03

Fig. 3-4, SALT LAKE COUNTY 2040 PM PEAK PERIOD VOLUME / 2016 CAPACITY



ScreenID	Volume	Capacity	V/C
1	71505	57901	1.23
2	46533	54587	.85
3	81775	100690	0.81
4	37235	26256	1.42
5	89471	81061	1.10
6	44206	28340	1.56
7	60929	53022	1.15
8a	44592	24958	1.79
8b	47282	62531	.76
9a	29913	41151	0.73
9b	24231	23810	1.02
10	27270	19247	1.42
11	29243	40426	.72
12	26644	19799	1.35
13	15136	18450	.82
15	38287	37366	1.02

from the lack of mechanisms to efficiently manage use of highways. Therefore, this needs analysis will consider new policy choices and innovative solutions including congestion pricing measures and intelligent transportation systems (ITS) to manage the peak period demand (see system management review, page 68).

The Role of Regional Growth Principles

The growth principles adopted by the Regional Council, and described in more detail in the Wasatch Choices 2040 report, are important for protecting the quality of life in this Region, even with respect to relieving congestion. For example, when regional land use patterns foster closer proximity between housing and jobs, the origins of most work trips are less dispersed, trip lengths to work and shop are reduced, vehicle miles of travel decrease, and these all lead to less congestion and more opportunity for transit to offer a viable alternative.

The following sections in this chapter explore more specific needs in the greater Wasatch Front Region for highways, transit, and other modes of transportation. Managing the transportation system is also discussed further, including a review of safety and security conditions.

HIGHWAY SYSTEM REVIEW

As part of the Congestion Management Process (CMP), the WFRC reviewed future congestion conditions and identified a number of locations where congestion mitigation is or will be needed. The CMP involves an evaluation of Transportation System Management (TSM) strategies, such as signal coordination, intersection widening, and access management. 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. Corridors have been identified where TSM and TDM strategies can delay the need for new capacity (Refer to page 201 – Transportation System Improvements). Where these strategies cannot meet the travel demand, new capacity needs are noted. Whenever additional capacity is added, demand should be reduced, and the transportation system made as efficient as possible in order to maximize the effectiveness of the new capacity and minimize the need for future capital investments in highways.

For 2040 RTP development purposes, congestion is considered to occur when level of service (LOS) “E” conditions are reached. Traffic operating at LOS “E” is characterized by operations that are very unstable at significantly reduced speeds and when there are virtually no gaps in the traffic stream. Level of service is based on volume to capacity ratios (V/C) in the case of freeways, and operating speeds in the case of arterials. The WFRC continues to support the actual design of facilities to meet a LOS “D” in urban areas when reasonably possible. Traffic operating at LOS “D” is characterized by reduced speeds and restricted ability to maneuver within the traffic stream. Any incident disrupting the traffic flow at LOS “D” will immediately result in LOS “E” conditions or worse. This CMP evaluation has been applied to the final phase of the 2040 RTP. For a more complete discussion of level of service, see Sections 15-II and 23-II of the Highway Capacity Manual.

The process for identifying congestion needs for the 2040 RTP begins with a computer model of existing highway and transit facilities plus projects in the Transportation Improvement Program (TIP), which are committed to be built. This transportation network is then assigned 2040 traffic demand and the resulting travel model is identified as the “2040 No Build” scenario. The “2040 No Build” scenario is further modified with a series of TSM and TDM strategies and the resulting modeled transportation network is identified as the

TABLE 3-1

Average Weekday Traffic Volume Guidelines

Number of Lanes Needed	Freeways (vehicles)	Arterials (vehicles)
4	<90,000	<20,000
6	90,000 - 140,000	20,000 - 40,000
8	>140,000	>60,000

"2040 CMP" (congestion management process) scenario. The specific TSM and TDM strategies applied in the 2040 CMP model are limited to signal coordination, access management, pedestrian and bicycle facilities, and a combined factor for flextime, telecommuting, and growth management.

The WFRC selected these specific strategies because reasonable quantitative assumptions can be made about the impact of these measures on speeds or capacity. The benefits of ITS, incident management and ramp metering are already included in model highway capacities. The mode choice algorithms in the model account for the trip reductions achieved by transit and rideshare. The Congestion Management Process (CMP) analysis for the 2040 RTP and the post-model adjustments used to measure the impacts of various TSM and TDM strategies are described in Appendix G – CMS Travel Model Analysis.

Once the TSM and TDM strategies are applied in the model, locations where LOS "E" conditions still remain in the PM peak period are evaluated. Average weekday traffic volumes for 2007 and 2040 are also considered. Table 3-1 identifies guidelines for Average Weekday Traffic (AWKDT) volumes, which also supplements the evaluation of LOS "E" conditions identified by the 2040 CMP model run. Since the travel model is regional in nature, individual facility volumes may reveal differences between modeled and observed base year volumes and these discrepancies should be considered when evaluating future traffic conditions. Historical growth rates can also provide reasonableness checks.

Congestion management strategies (TSM & TDM) were applied to all applicable facilities in the 2040 CMP model scenario. Even if additional capacity is warranted, TSM and TDM strategies still need to be incorporated with each new project in order to preserve the investment in this new capacity for as long as possible. The following paragraph summarizes the results of this CMP analysis. Several of the six corridors identified on page 56, have the most serious and readily recognizable mobility deficiencies.

CMP Identified Capacity Needs

An inspection of the "2040 CMP" scenario reveals a number of congestion problems. In southwest Weber and northwest Davis Counties, much of SR-108 is anticipated to operate at the LOS "E" level. East-west travel in this general area will also need congestion mitigation. Additional capacity will be required to alleviate congestion on I-15 in north Davis County. Congestion levels on I-15 and Bangerter Highway in Salt Lake County indicate a need for a freeway type facility in the Mountain View Corridor. Without new capacity, several east-west facilities in west Salt Lake Valley would operate at the LOS "E" level. A few congested locations east of I-15 will also require more lanes. Significant congestion levels are evident on a number of arterials scattered through the Region.

TRANSIT SYSTEM REVIEW

Transportation demand in the region has grown substantially in recent years and continues to grow at a pace exceeding expectations. In light of transit successes, it has become obvious that preservation and expansion of the transit system is essential to the Region's mobility and economy.

System Preservation

For all the focus in the Wasatch Front Region on new major transit investments, the vast majority of transit trips in the region currently takes place, and will continue to take place, on existing light-rail lines and local buses. Clearly preserving these existing services is essential to the success of transit in the region. Preservation for transit includes maintenance of capital facilities and continuation of existing transit operations.

The Utah Transit Authority, which provides public transit services in the region, is divided into five business units. These business units cover the following areas of responsibility: the Ogden - Layton Urbanized Area; the paratransit service in Salt Lake County; the bus service in Salt Lake and Tooele Counties; TRAX service in Salt Lake County; and Utah County bus service. Each of these business units and UTA's Strategic Planning Department were surveyed as to their preservation needs. The following paragraphs summarize their responses and select information from the most recent Transit Development Program.

Capital Facilities

UTA dedicates a significant proportion of its budget to the preservation of its rail lines, bus and rail vehicles, scattered passenger facilities, maintenance facilities and real properties. Most of the existing facilities are in need of expansion and some re-design / engineering to accommodate growth in the fleet, workforce, and activities. Some of these needs are described below.

- **Bus Maintenance Facility Improvements** - As the composition of the fleet continues to diversify, existing bus maintenance facilities will need to be modified or expanded.
- **Central Division Replacement** - As of September 2010, the UTA Central Bus maintenance facility is operating at 125 percent of its design capacity. UTA indicates that it needs to be replaced due to aging infrastructure and functional deficiencies.
- **Riverside Division Expansion** - The Riverside Division, home of UTA's Flextrans fleet, has an existing physical design capacity for 84 paratransit vehicles. The total active and expansion fleet operating from the facility is 110 vehicles. Therefore, additional storage canopies and an expanded maintenance facility are necessary in order to increase the effectiveness of the Flextrans vehicle fleet. The operations facility was designed and built to accommodate 70 operators; currently there are 135 operators working out of the Riverside Division.
- **New Division** - Due to the current and projected geographic distribution of bus service, it is recommended that the site for a new division be located in the southern part of the Salt Lake service area where bus service demand is projected to be greatest.
- **Bus Layover Facilities** - Having Tooele and Brigham City express trips originate in those cities in the AM and return there in the PM would save significant operational costs in each area. Adopting this schedule would likely necessitate capital investment for adequate infrastructure; either at a UTA acquired site, or at a joint use site such as a UDOT or school district facility. The operational savings would likely outweigh initial capital costs.

Preservation of Operations

All of UTA's bus service is impacted by highway congestion. In order to keep its current service schedule in the face of increasing vehicle delays, several improvements will need to be made to the highway system in order to preserve existing bus system operations. The techniques used for this preservation effort will likely require a combination of signal priority and queue jumper equipment and policies at select traffic signals. Table 3-2 lists existing candidates for preservation of operations improvements.

Capacity Issues

The recent success of transit in the Wasatch Front Region has begun to expose capacity issues in the UTA system. Capacity issues have been especially evident when fuel prices peak. A review of 2009 route characteristics revealed fourteen routes that may be candidates for capital improvements needed to enhance their operational characteristics. These routes have either a relatively high service frequency or high ridership. Unfortunately, they may also have either poor on-time performance, relatively slow speeds, and / or a high potential for standing loads.

Additionally, a survey of UTA business units reveals additional capacity needs on TRAX service, Tooele County service, service to the Cottonwood Canyons, and on Paratransit services. The current TRAX routes are the Sandy Line and the University Line. UTA indicates that full loads are common in peak periods on both lines. There is virtually no remaining capacity at most of the Sandy Line park and ride facilities. The opening of additional TRAX lines which operate on portions of the Sandy and University Lines has the potential to not only create more parking capacity on the individual lines but to

TABLE 3-2

Existing Candidates for Preservation of Operation Improvements

Route Number	Route Name	Issues and Opportunities
602	Ogden - Weber State University	High Ridership
603	Washington Boulevard	High Ridership
470	Ogden – Salt Lake Intercity	High Ridership, Low Reliability, Standing loads
2	“2 the U”	High Ridership, Standing Loads
200	State Street North	Highest Ridership, Standing Loads, Low Speed, Low Reliability
203	300 East	Low Reliability
205	500 East	Low Reliability
209	900 East	Low Reliability
217	Redwood North	High Ridership, Low Reliability
220	Highland Drive	Low Reliability
227	2700 West	Slow Speeds
232	3200 West	Low Reliability
240	4000 West / Dixie Valley	Slow Speeds, Low Reliability

create more demand on segments of the existing lines due to their increased frequency and broader coverage. Salt Lake to Tooele Valley transit service is provided by Routes 451, 453, and 454. Capacity shortfalls experienced on these routes are likely to increase as Tooele Valley continues its rapid growth. Furthermore, UTA indicates that the Region has a severe need for additional transit service in Big and Little Cottonwood Canyons.

UTA is finding it difficult to keep up with current paratransit demands. The impending ‘graying’ of the Regions’ baby boomers will aggravate this situation. As part of its response, UTA is attempting to move more of its riders with disabilities from paratransit to regular service to reduce the per-trip cost. This will enable UTA to provide more total service to disabled riders. Wide, barrier-free sidewalks and loading surfaces are important to providing the mobility needed by for these patrons.

Market Expansions

Market expansions for transit can take many forms. There may be expansion into a new area or, more likely, adding a new type of service to an existing transit corridor. The three basic types of transit are inter-regional, regional, and community. The popularity of express bus and TRAX in the Region has demonstrated the large number of riders receptive to inter-regional (long) and regional (medium) distance transit services. The key to continued successful transit system expansion will be to identify the home-end and destination-end markets for concentrations of inter-regional, regional, or community trips occurring at the same time of day. The highest probability for concentrated travel patterns exists with work, college, and selected other trips, such as to sports arenas.

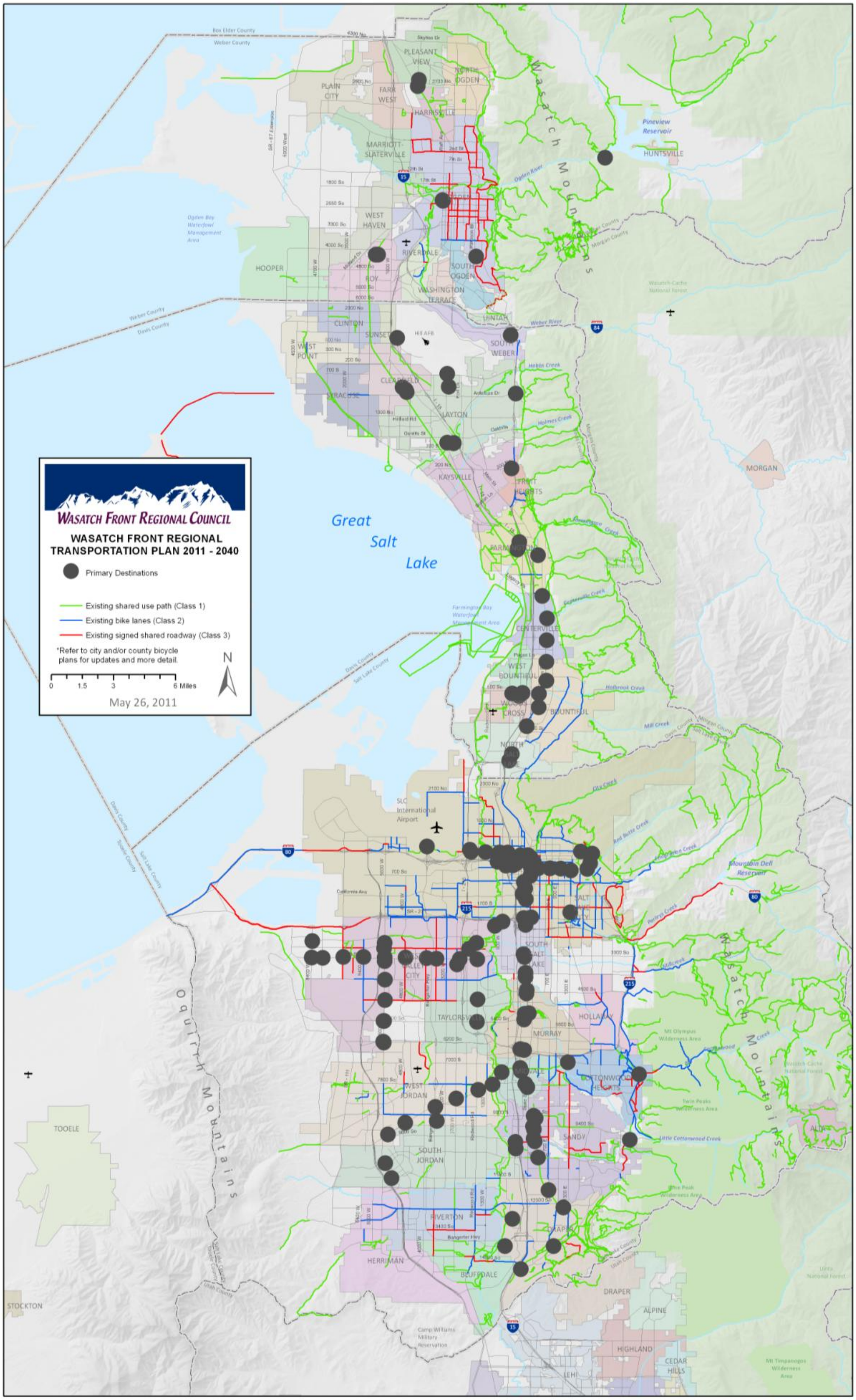
OTHER TRANSPORTATION MODE NEEDS

In addition to highways and transit, other modes are part of the Region’s transportation system. These other modes serve important functions, such as bicycle and pedestrian paths that provide alternative transportation choices and opportunities conducive to healthy life styles. Reliable movement of goods is addressed in part by the highway system, but railroads also play a vital role. The needs of these other modes, including trucks, are discussed in this section.

Pedestrians / Bicycles

According to the 2000 Census, about 1.8 percent of the work trips in the Region were made by walking, while about

Map 3-1, 2011-2040 RTP EXISTING BICYCLE ROUTES AND DESTINATIONS



0.4 percent were made through the use of bicycles. While these percentages are small, it is important to provide the option of walking and biking, particularly for short trips. The demand for appropriate bicycle and pedestrian facilities has been growing. To address the needs of growing numbers of bicyclists and pedestrians, the WFRC recommends that state and local governments focus the addition of new land and pathways on east / west routes, providing access across I-15 and other major roadways, connections to transit stations, and the connectivity of existing routes. Municipal and county governments in Salt Lake, Davis, and Weber Counties through their respective trails and bicycle committees have reviewed and updated the existing bicycle routes shown in Map 3-1 in order to identify additional routes needed to bridge gaps between existing bicycle facilities. Locations of TRAX stations, FrontRunner stations, future transit stations, and major college or university campuses have been included so that routes needed to reach these destinations can be identified. Other significant areas of greater than average bicycle and pedestrian travel are secondary schools, the Salt Lake Central Business District, and the Ogden Central Business District. For a more comprehensive picture of school locations, see Map 8-1 on Page 240.

One of the primary considerations in planning for the needs of pedestrians and bicyclists must be safety. To be safe, pedestrians need adequate sidewalks and street crossing opportunities. For bicyclists, a system of separated bikeways and designated routes on safe streets that allow free movement throughout the Wasatch Front Region is needed. School children represent a special class of pedestrians and bicyclists who require unique facilities to ensure their safety. SAFETEA-LU requires that states set up a "Safe Routes to School" program. UDOT has implemented this program.

FREIGHT NEEDS

Each year over 180 billion tons of freight is shipped to and from Utah with an estimated value of nearly $100 billion. Trucks account for almost 70 percent of Utah's freight tonnage, with railroads hauling approximately 25 percent. These numbers do not reflect the considerable freight tonnage passing through Utah. In discussions with trucking associations and others in the freight industry, the following trucking and railroad related needs have been identified.

Trucking

- Interchange and intersection improvements at key locations near warehouses, oil refineries and other truck facilities to provide turning radii sufficient for trucks to move through unimpeded
- Turn lanes of adequate length and signal timing at intersections with high truck volume
- Road widening near the largest concentrations of industrial parks and warehouses
- Advance signal warning systems on high speed expressways
- Improved access to industrial parks and oil refineries, including staging / parking facilities and signalization

Railroads

- Improvements to allow trains to move through the urban area more rapidly and decrease their adverse impact on vehicular mobility and neighborhoods
- Railroad crossing improvements, including grade separations to increase safety

Intermodal Freight Connectivity

- Address inadequate highway capacity on SR-172 (5600 West) serving the Union Pacific intermodal facility located between SR-201 and I-80
- Improve highway access to all Salt Lake Area oil refineries and the Pioneer Pipeline terminal for both standard and longer combination (LCV) oil tank trucks
- Improve access off 900 West in South Salt Lake City to the Union Pacific automobile transload facility at Roper Yard

AIR TRANSPORTATION NEEDS

This section relates aviation and the eight public-use airports in the region to the multi-modal transportation system of the Wasatch Front Region. Airports are essential transportation facilities similar in character to the Interstate Highway System. Like the highway system, the system of airports in the Wasatch Front region facilitates the quick and efficient movement of people and goods.

Airports are a key catalyst of economic activity by facilitating rapid passenger travel between distant locations. In addition to passenger travel, the air transportation system

Needs Assessment

is used to move high value, time sensitive goods such as documents and technical equipment to remote locations. Airports also often play a key role in facilitating the transportation of passengers and equipment during emergency medical and natural disaster situations. Airports play a key role in the Utah economy and must continue to be developed and protected in order for the region to preserve its quality of life and achieve maximum economic potential. Airports must be improved to take advantage of new technology and new facilities in order to continue to serve the air transportation and economic needs of the region, while minimizing impacts to surrounding communities.

System Planning

The information presented in this section of the plan is intended to identify current and future aviation related trends and the impact of those trends could have on the region's airports. The information also functions to bring aviation planning into congruence with other long range planning efforts. Long range system-wide planning is crucial for metropolitan airports because rapid growth and demand for services can quickly outgrow capacity. System plans assure efficient use of scarce airport resources and optimize the use of public funds. They complement individual airport plans and ensure the needs of all airport and airspace users are considered. System planning links individual airport plans with the state and national airport plans and local surface transportation plans. System planning prevents the unnecessary duplication of facilities within the airport system by ensuring that airports with similar roles serve geographically distinct regions.

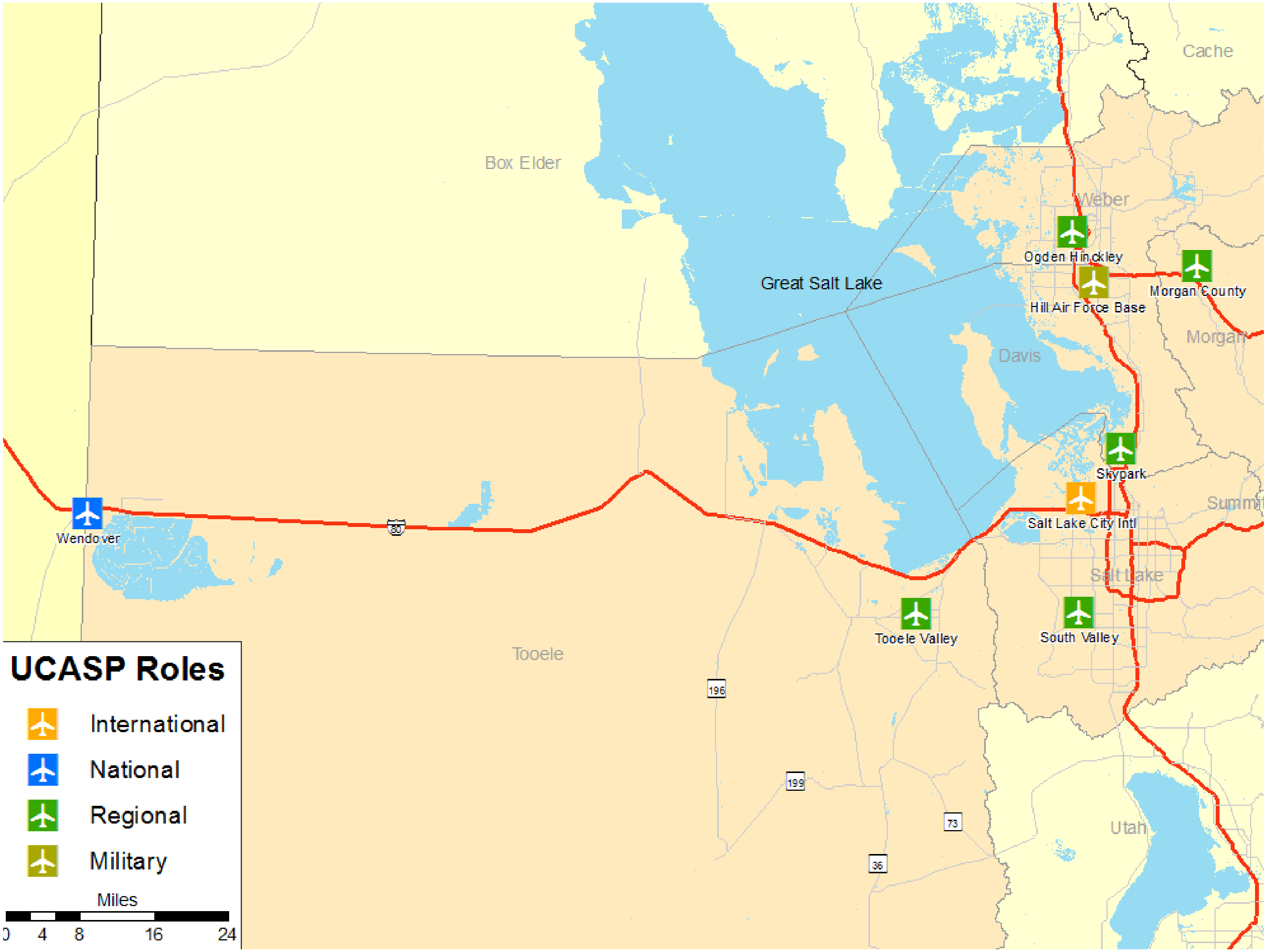
Previous System Planning Efforts

The Wasatch Front Regional Council prepared the 2003 Metropolitan Airports System Plan under the Federal Aviation Administration Planning Grant Program. The most recent update of the statewide system plan or UCASP (Utah Continuous Aviation System Plan) was completed in 2007.

In the UCASP, airport specific needs were assessed using a system of state-specific roles. Typically, state-specific roles are developed through consideration of many different factors including geography, demographic characteristics, economic development potential, and the demand for aviation services. A combination of these factors established what role each airport should play within the airport system, given existing and projected future demand for airport facilities. The roles established by the UCASP for the airports in the WFRC region are presented in the Map 3-2. For the purposes of this document, a new role (Military) has been added for Hill Air Force base.

Airspace, Air Traffic Control, and Flight Operations

Proper management of airspace in the region is critical to future growth and development of airports in the region. Since the Metropolitan Area is essentially surrounded by mountains, the available airspace for aircraft operations at the



Map 3-2, AIRPORT ROLES ESTABLISHED BY THE UTAH CONTINUOUS AVIATION SYSTEM PLAN region's airports is limited. The Class B or controlled airspace associated with Salt Lake City International Airport covers a substantial portion of the region, limiting airspace available for uncontrolled Visual Flight Rules (VFR) flying conducted by most smaller general aviation (GA) aircraft.

The FAA is in the process of implementing a new air traffic control system known as 'Next-Gen'. NextGen is transforming air traffic control from a ground-based radar system to a GPS satellite-based system. This advancement is anticipated to provide significant safety, efficiency and environmental benefits to the nations aviation system. It is anticipated that NextGen technologies and procedures will increase capacity and safety and reduce fuel burn, carbon emissions and noise by providing more efficient air routes and procedures.

Locally, the FAA is currently in the process of redesigning the Salt Lake City Class B airspace structure. This process is primarily being untaken to fully contain and protect existing operations arriving and departing the SLCIA. The proposed changes will create additional uncontrolled airspace increase the amount of navigable airspace available for GA users operating at airports surrounding SLCIA, particularly the South Valley Regional and Bountiful Skypark airports. It is expected that these improvements will enhance safety and access to these airports while having little or no effect on other airports in the local area.

Aviation Activity Projections

In order for the system to be developed to meet future demand, projections of future activity are prepared. These projections are used to determine infrastructure needs and evaluate the ability of the airport system to accommodate the needs of the region. Demand at individual airports was analyzed based aircraft FAA operations and based aircraft data from 2009 and county population growth rate projections. National aviation forecasts are based on the FAA national forecasts and considered a 20-year horizon. National projections indicate aviation activity will continue to grow over the long term despite the current economic downturn. Even with the numerous challenges the airline industry has faced over the last 10 years the number of passenger traveling has increased over the long term. The FAA's 20-year forecast for Fiscal Years 2010-2030 predicts domestic passenger enplanements will increase by 0.5 percent in 2010 and then grow an average of 2.5 percent per year during the remaining forecast period. Total operations at airports are forecast to decrease 2.7 percent to 51.5 million in 2010, and then grow at an average annual rate of 1.5 percent reaching 69.6 million in 2030. At the nation's 35 busiest airports, operations are expected to increase 60 percent from 2010 to 2030. Locally, aviation activity within the region is expected to continue to grow more quickly than the nation as a whole. Projections of aviation activity at individual airports can be found in Appendix H – Aviation Activity By Individual Airport.

SYSTEM MANAGEMENT REIVEW

In order to maximize the life and effectiveness of transportation systems, careful management is required. Pavement management facilitates extend the life of roadways. System management preserves the capacity of roadways. Demand management improves the effectiveness of the transportation system by reducing the number of vehicle miles traveled (VMT). These three management strategies are discussed in this section.

Pavement Management

One of the Regional Growth Principles is to "provide public infrastructure that is efficient and adequately maintained." This principle is in line with UDOT's strategic goal to "take care of what we have." One of the best ways to accomplish these objectives is through pavement management. UDOT and most cities and counties in the Region employ these effective techniques to maintain their roadways.

Pavements represent the largest capital investment in any modern highway system. Maintaining and operating pavements on a large highway system typically involves complex decisions about how and when to resurface or apply other treatments to keep the highway performing and operating costs at a reasonable level. Traditional methods left these decisions up to a road supervisor who would select treatments based on extensive knowledge and experience. This practice is still widely used and works well in low traffic areas or where repair / restoration funds are relatively unlimited. However, in most cases, this is not the situation. Rarely are there enough funds to complete all required road repairs. Secondly, high traffic volumes severely restrict when roads can be closed for maintenance. Pavement management brings more science

into this process. A pavement management system consists of three major components as shown below.

- A procedure to regularly collect highway condition data
- A computer database to sort and store the collected data
- An analysis program to evaluate repair or preservation strategies and suggest cost effective projects to maintain optimal highway conditions

In most agencies, these components are combined with needs identified in the planning process and political considerations to develop annual highway repair / preservation programs.

System Management / Demand Management

Part of providing efficient public infrastructure is to ensure that unnecessary obstacles to mobility are identified and removed from the transportation system. The congruence between the Regional Growth Principles and UDOT's four strategic goals is again reflected, as the second goal is to "make the system work better." By providing effective transit service, the UTA works to achieve this goal. Local governments also give vital support to both System Management and Demand Management.

Transportation System Management (TSM) strategies include incident management, ramp metering, High Occupancy Vehicle / Toll (HOV / HOT) lanes, signal coordination, access management, and ITS, which overlap several of the previous strategies. Most of these strategies are currently applied to some degree but need to be expanded or enhanced to ensure better performance of the transportation system. Implementing such congestion mitigation measures helps preserve the original design capacity of the facility so that it can accomplish its intended purpose of moving a certain volume of traffic. For example, a highway lined with a high density of heavily used driveways will experience diminished capacity due to side friction, accidents, and reduced speeds. This may lead to an apparent need for additional capacity, when in reality, if access management was in place, the roadway would function as intended.

Transportation Demand Management (TDM) strategies include transit service in all its forms (bus, light rail, commuter rail, bus rapid transit (BRT 3), and Enhanced Bus (BRT 1)), ridesharing, flextime, telecommuting, pedestrian and bicycle accommodations, growth management, and congestion pricing. Most of these strategies are currently utilized in the existing transportation network. Enhanced implementation of these strategies is needed to provide a full range of options to the traveling public, as well as to decrease congestion levels on highways. The environmental, social, and financial consequences of only building and widening highways further point to the need to reduce the demand for single-occupant vehicle travel.

TSM and TDM strategies offer many benefits to the transportation system at a relatively low cost when compared to adding more travel lanes or other new facilities. The benefits to the transportation system from TSM and TDM include improved operating efficiency, preserving design capacity of existing facilities, increased safety, reduced energy consumption, and reduced emissions. These benefits stem from the improved operation of existing facilities when TSM strategies are implemented and from the reduction in vehicle trips as TDM strategies are applied.

Intelligent Transportation Systems

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

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

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

If ITS applications are to be expanded in the Wasatch Front Region, more funding is needed. The majority of the existing system, known as CommuterLink, was funded as part of the major reconstruction of I-15 in Salt Lake County during the late 1990s. Original equipment is quickly becoming obsolete, reducing the potential effectiveness of the system. Consequently, a priority need for ITS is to update and maintain the existing systems already implemented in the Region. Without a continued effort to update signal timing plans and to keep equipment working, the ability to effectively move people on the transportation system by providing readily available information will suffer. A key component of these systems is the ability to disseminate both real-time and historical travel time information and other relevant highway and transit facts. The need to continue to improve and expand these capabilities will persist. As discussed above, there is a great need to reduce travel demand, and ITS improvements implemented in the transit system play an important role in meeting this need.

Congestion Pricing

The largest traffic volumes are found on freeways. As discussed in the General Needs Review, page 54, the need to manage freeways is vital because their ability to move traffic is dramatically reduced as volumes approach capacity and speeds plummet. Congestion pricing on freeways prevents speeds from dropping by increasing the cost to the traveler to use the facility. If fully implemented, congestion pricing will increase the cost to use the facilities, based on congestion during peak periods. In order for businesses to prosper and the regional economy to be sustained, impediments to freeway travel must be minimized. Congestion pricing can be an effective tool for addressing this need. Other facilities or locations can also benefit from congestion pricing. For example, establishing fees for travel in central business districts has proven effective for managing traffic in some large cities.

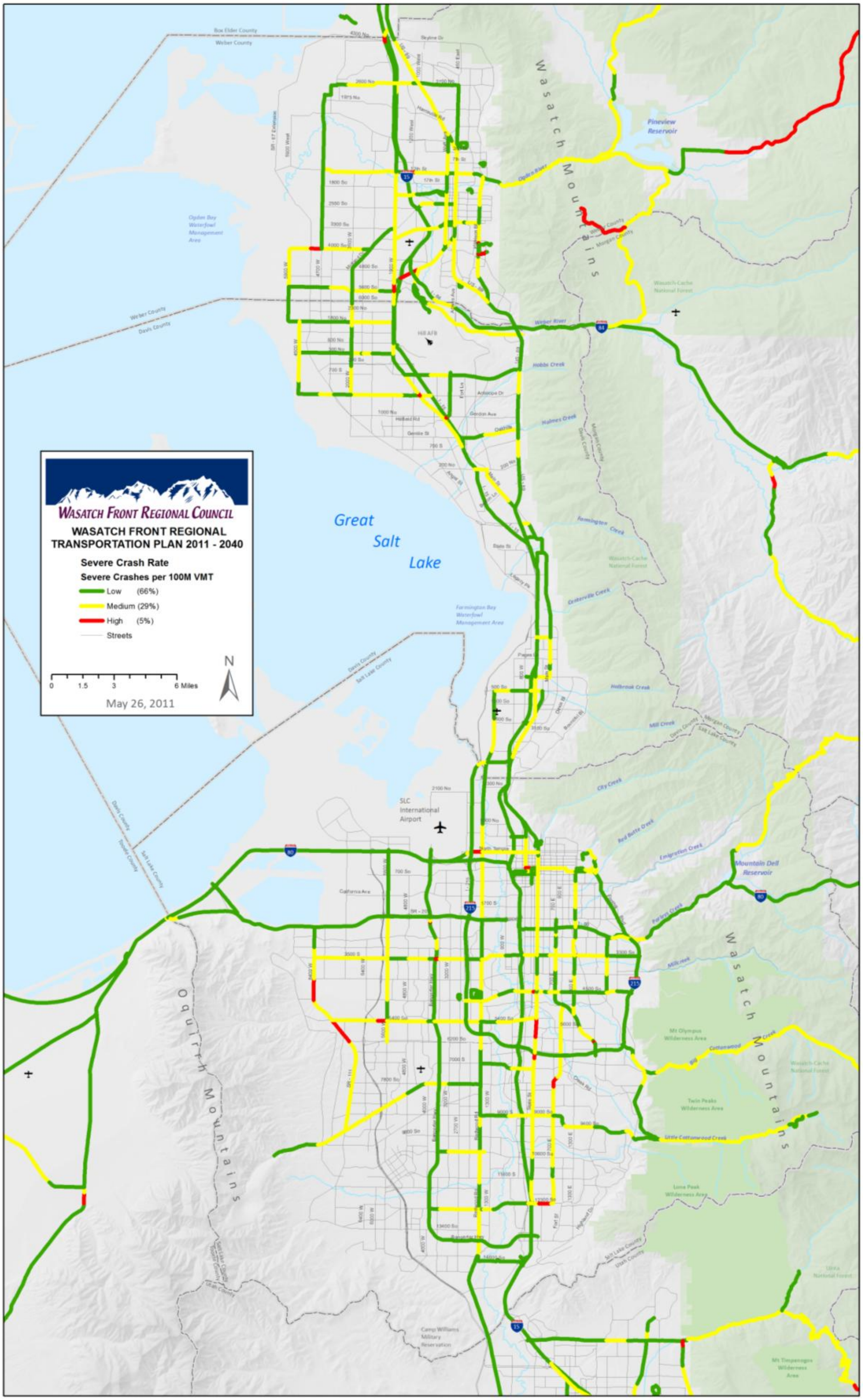
SAFETY AND HOMELAND SECURITY NEEDS

Safety

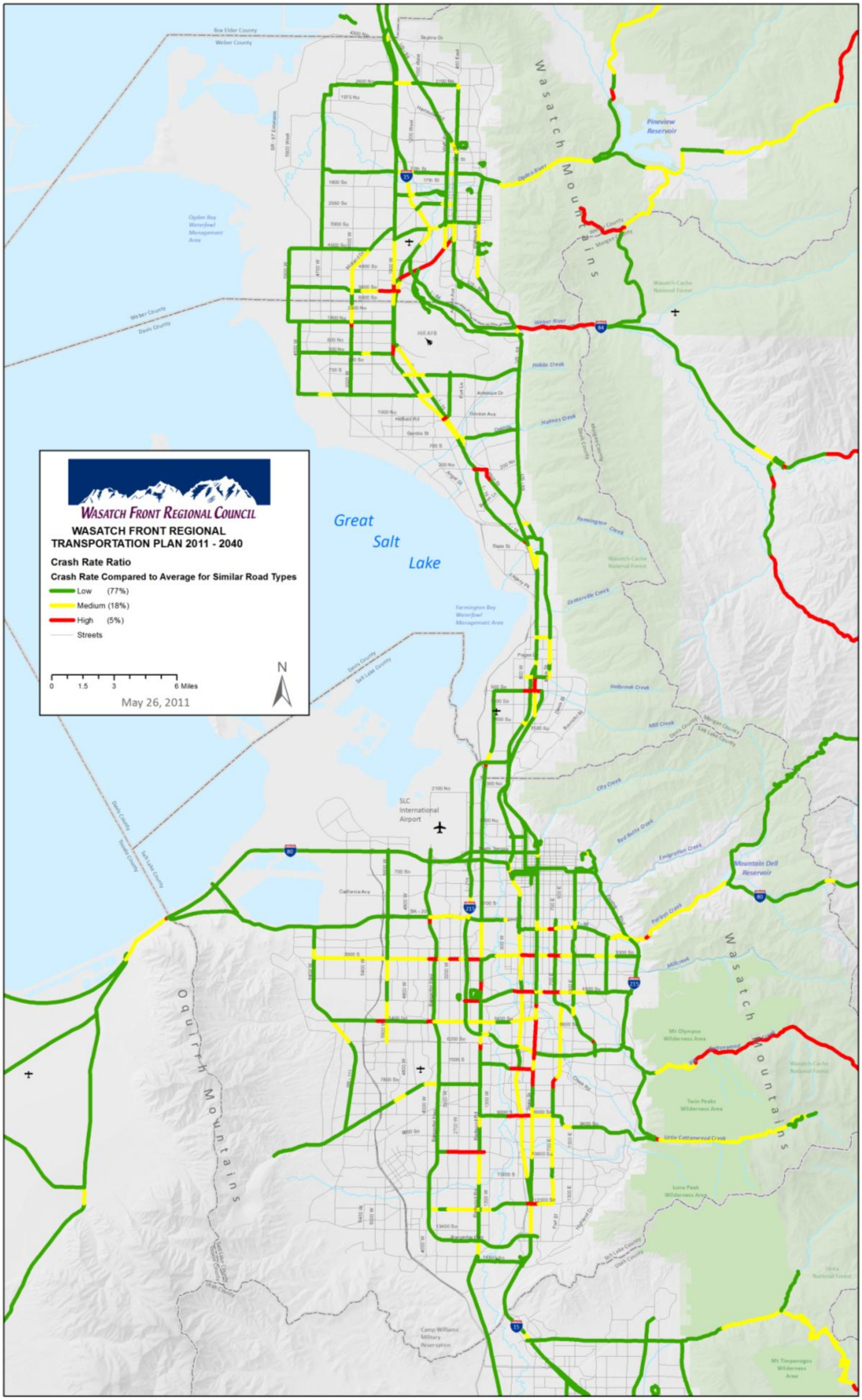
The WFRC is in the beginning stages of completing a 5-Year Regional Transportation Safety Plan. This plan is being coordinated with the Utah MPO Safety Initiative, UDOT, and the other MPO's in Utah. This initiative is a comprehensive program designed to improve safety integration and linkage to the UDOT's Strategic Highway Safety Plan (SHSP). The WFRC will continue work on the seventeen milestones developed to enhance the development of the regional safety plan. The Safety Index, and crash statistics discussed below will help identify areas of need, while the safety plan will help identify action steps, stakeholders, and performance measures and remediation measures for specific projects.

The Safety Index provides a starting point for identifying where safety improvements are needed. This index has been developed by UDOT to help identify locations where higher than normal severe crash rates and crash rate ratios exist throughout the state. Both rates use crash data from 2005 to 2007 reported for more than 2,200 individual segments along state-owned routes using the annual average daily traffic (AADT) segmentation.

Map 3-3, WASATCH FRONT URBAN AREA SAFETY INDEX SEVERE CRASH RATE



Map 3-4, WASATCH FRONT URBAN AREA SAFETY INDEX CRASH RATE RATIO



The severe crash rate covers a period of three years. The statewide severe crash rate is 12.48 per 100 million vehicle miles traveled (VMT). Map 3-3 shows all state-owned segments below the statewide value in green, any segment with a value over the statewide number in yellow, and the highest five percent of segments are displayed in red. The crash rate ratio is a comparison between historic crash rates and expected crash rates. The UDOT last published expected crash rate by type of area, functional class, and volume in 2005. The crash rate ratio is the actual crash rate divided by the expected crash rate. Map 3-4, shows all segments at or below the expected rate in green, any segment with an actual crash rate over the expected rate is displayed in yellow, and the highest five percent of state roads are shown in red.

The Utah Comprehensive Safety Plan identifies 17 crash type categories. Crash statistics were provided for the period 2006 - 2008 for "All Crashes" and "Serious Injury and Fatal Crashes." The data were provided for the WFRC area (Salt Lake, Tooele, Davis, Weber, and Morgan Counties) along with a Statewide total and an Urban Area total (Washington, Utah, Salt Lake, Davis, Weber, and Cache Counties). Crash type percentages are calculated comparing the number of crashes per type in the county to the county total. The top three categories of causes for All Crashes in Salt Lake, Davis, and Weber Counties were: Aggressive Driving / Speeding Crashes, Intersection Related Crashes, and crashes involving Younger Drivers (between 15 and 19 years old). The top three categories for Serious Injury and Fatal Crashes for Salt Lake and Davis Counties were Intersection Related Crashes, Aggressive Driving / Speeding Crashes, and Improper Use of Safety Equipment Crashes. The top three categories for Serious Injury and Fatal Crashes for Weber County were Intersection Related Crashes, Improper Use of Safety Equipment Crashes, and Roadway Departure Crashes. Appendix I – 3-Year Crash Statistics includes the complete table of 3-year Crash Statistics for all crashes and serious injury and fatal crashes.

Homeland Security

The Wasatch Front Region is often times referred to as the "cross roads of the west". Because the Rocky Mountains bisect the western portion of the United States (north-south), there are only five interstate facilities that allow east-west travel across that 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 and San Francisco. Similarly, I-15 is one of only three north-south interstate facilities west of the Mississippi River, which extends to the northern and southern borders of the United States. Designated the Canadian - Mexican (CanaMex) transportation corridor, I-15's regional impacts along the Wasatch Front are ever increasing. Paralleling the Rocky Mountains it too passes through the Wasatch Front Region intersecting I-80 in the Salt Lake Valley.

The aviation and railroad systems experience a convergence equivalent to that of the interstate highways. The Trans-Continental Railroad continues to be the major east-west rail connection across the United States. Aviation, like rail, targets a specific transportation market and has considerable influence on the Inter-Mountain Region. The Salt Lake City International Airport is a major hub for Delta Airlines and cargo airlines. It serves a major portion of the Intermountain West as the next closest major commercial service airport is over 300 miles away.

In developing a regional transportation plan, 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 topography. On the northern end of the Region, the I-15 transportation corridor narrows to one mile. This condition also occurs in the city of Centerville, in Davis County, and at the southern border of Salt Lake County. All three of these constrained locations include I-15, railroad lines, a power corridor, frontage road and one or two parallel arterials. The east-west corridors are similarly constrained by high mountain passes and the Great Salt Lake. Weber Canyon is located in east Weber County. At 400 feet wide it is constrained by rock cliffs and the Weber River, and is the route of I-84 and a railroad corridor. To the east in Salt Lake County is Parley's Canyon, which is 200 feet wide in places, constrained by cliffs and is the route of I-80. To the west in Salt Lake County at Lake Point Junction the corridor is one-quarter mile wide and constrained by the Oquirrh Mountains and the Great Salt Lake. This includes I-80, a railroad corridor, a power corridor and a frontage road.

The distinctive regional topography constraining the transportation network has a conspicuous impact on the entire Wasatch Front Region in the form of natural hazards.

Potential hazards include earthquakes, landslides, wildfires, dam failures, flood and severe weather. With a prominent geological fault paralleling the foothills of the Wasatch Mountains throughout the Region and extending through the Great Salt Lake and into north-central Salt Lake County, the effects of an earthquake or other natural disasters on the transportation system must also be taken into consideration. The Wasatch Front Region's geologic faults and areas with high liquefaction potential are identified in Map 8-8 on Page 271.

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

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

The national significance of this "cross roads of the west", coupled with the restrictive topography and demonstrated need for additional regional transportation facilities to serve increasing regional travel demands, bolsters the rationale for long range transportation planning, 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 metropolitan area to develop a consensus on what elements of security incident prevention and mitigation can and 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; and Emergency Operations Plans at local, regional and state levels. Conducting simulations and exercising these plans is needed to determine their operational benefits and shortfalls.

At the operational level, intelligent transportation systems (ITS) should be improved to facilitate the expansion and responsiveness of the UDOT Traffic Operation Center (TOC) and UTA Dispatch Operations. These major components would help to preserve the reliability, robustness, and resiliency of the transportation infrastructure system and to maintain essential services needed to preserve confidence in the transportation system in the event of a man caused or natural disaster.

Image by James Belmont

Overview of Process

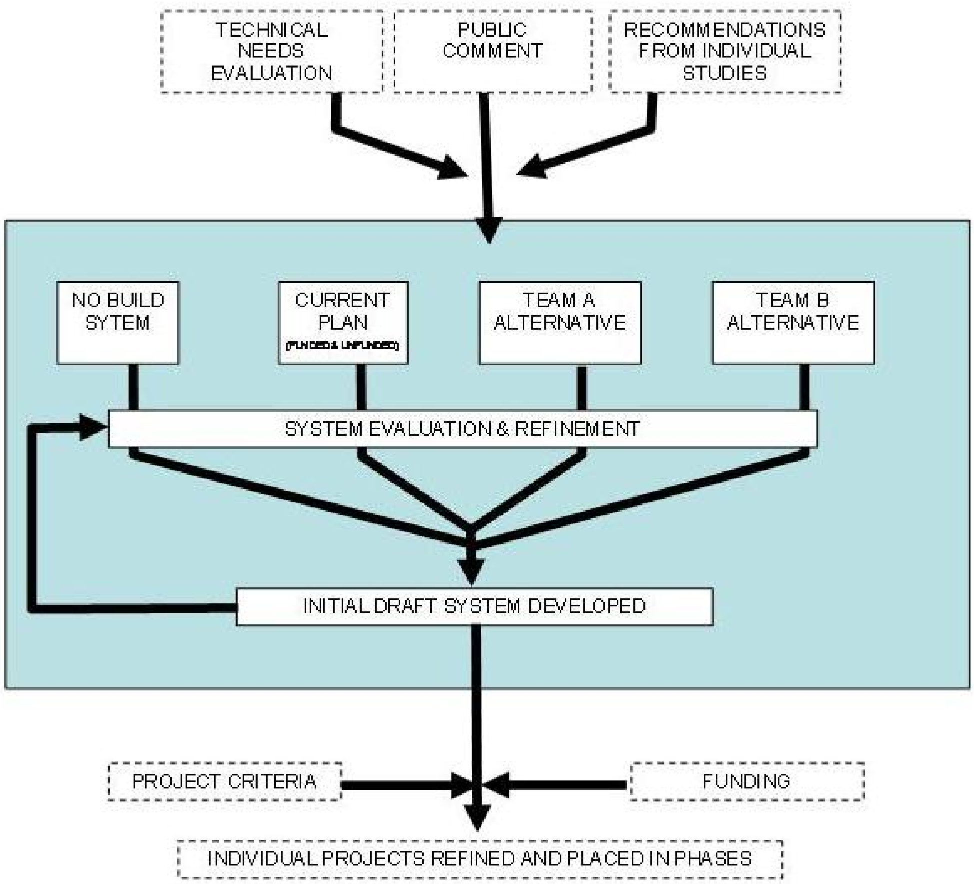
Chapter 4

In an effort to optimize the value of the Regional Transportation Plan for 2011-2040 (RTP), the WFRC derived its initial Draft Regional Transportation Plan from the best of four multi-modal alternative transportation system models. This process allowed the draft 2011-2040 Regional Transportation Plan to be evaluated not only in terms of individual projects but also in terms of its cumulative anticipated performance.

The four system alternatives were developed by drawing from Wasatch Choice for 2040 recommendations, the transportation needs assessment discussed in Chapter 3, recommendations from individual corridor and area-wide studies, and other public and policy-maker input. The system alternatives evaluation process used both quantitative and qualitative measures to assess the relative ability of each system to meet identified transportation needs of the Region and its primary travel corridors. Ultimately, a core highway and transit system was chosen and individual, well performing projects from the four system alternatives were selected for the initial Draft Regional Transportation Plan. The process used to develop the initial Draft RTP is outlined in the shaded portion of Figure 4-1.

Photo at Left: UTA TRAX stops at the Fort Douglas Station on the University (Red) Line in this photo captured by James Belmont. Effective systems planning evaluates various alternatives and is critical to selecting a preferred option which leads to successful transportation development throughout the region as exemplified in this image.

Figure 4-1, Initial Draft Regional Transportation Plan Selection Process



DEVELOPMENT OF SYSTEM ALTERNATIVES

Initially four transportation systems development alternatives were drafted for evaluation. A fifth blended alternative was later developed by WFRC Staff from the initial four alternatives. The blended alternative was the basis for the initial draft of the RTP.

The four initial transportation systems were labeled "No-Build", and "Current Plan"; and the "Team A" and "Team B" systems. The "No-Build" system included only those projects which were substantially completed or to which the Region is committed. The "Current Plan" system consisted of the funded and unfunded projects from The Wasatch Front Regional Transportation Plan: 2007-2030. The "Team A" and "Team B" systems were independently developed by select members of UDOT, UTA, and WFRC staffs. These four system alternatives were then submitted for public and policy-maker input. Modifications in the alternatives were made in an attempt to include all feasible projects recommended by the public, policy-makers, and in the corridor and area-wide studies carried out in the Region. This section briefly describes each of these four alternatives.

No Build

The No Build alternative, as stated above, consists of projects which were substantially completed or to which the Region is committed. It provides a base from which to access the relative ability of each system to meet the stated regional needs and primary travel corridors. All projects in the "No Build" system are included in each of the other transportation system alternatives. Table 4-1 lists the major highway and transit projects in this alternative. Map 4-1 shows the highway and transit improvements in this alternative.

Current Plan

The Current Plan alternative consists of both the funded and unfunded transit and highway projects from the 2007-2030 Wasatch Front Regional Transportation Plan. Given the level of evaluation and scrutiny previously given this system when it was developed in 2005 and 2006, it was assumed that this system would rate well and should be included as a system alternative. It was determined that unfunded projects from the 2007-2030 Regional Transportation Plan could be included, given that the end of the planning horizon for the new Regional Transportation Plan would be extended from 2030 to 2040 and more revenue would be available. Table 4-2 lists some of the larger projects in this alternative which were not part of the No Build Alternative. Map 4-2 shows all of the proposed projects in this alternative.

Team A and Team B Alternatives

The "Team A" and "Team B" Alternatives were developed independently by select teams consisting of transportation professionals from Utah Department of Transportation, Utah Transit Authority, and Wasatch Front Regional Council. In preparation for alternative development, each team was given needs data, the WFRC system evaluation criteria, and access to UDOT's Planning and Environmental Linkage (PEL) website which provides assembled maps of environmental resources.

As stated at the beginning of this Chapter, four multimodal system alternatives were originally developed and evaluated. Based upon that evaluation the Initial Draft Regional Transportation Plan was developed. The description of the initial Draft Regional Transportation Plan can be found at the end of this Chapter.

Improvements to Other Modes

The growth principles adopted by the Wasatch Front Regional Council encourage the promotion of alternative modes to highways and transit modes such as bicycling and walking, help reduce growth in vehicle travel and support healthy living. While many of the alternative modes opportunities are local and should be addressed by city and county officials, the 2011-2040 RTP recommends that bicycle and pedestrian facilities, where appropriate, be included on all highway and transit projects.

In addition, the WFRC has worked with community planners and officials, along with a number of special interest groups throughout the Region, to develop a Regional Bicycle Plan to serve not only a growing number of commuters, but also those individuals traveling by alternative modes to visit major destinations and attractions. The regional bicycle system was assumed to be in place in each of the alternatives. Map 3-1 in Chapter 3, System Needs Assessment, identifies the major destinations and the bicycle corridors that currently serve them.

After the teams had completed their respective system alternatives, their work was reviewed by the WFRC staff, jurisdictional technical staff, stakeholders, and the public at large. Modifications were then made to the alternatives to ensure that projects recommended in previous studies or by stakeholders were represented in at least one of the draft alternatives. Additionally, an effort was made to equalize the system alternative costs. Tables 4-3 and 4-4 lists the major highway and transit projects in each of the two alternatives. Maps 4-3 and 4-4 show all of the proposed projects in the alternatives.

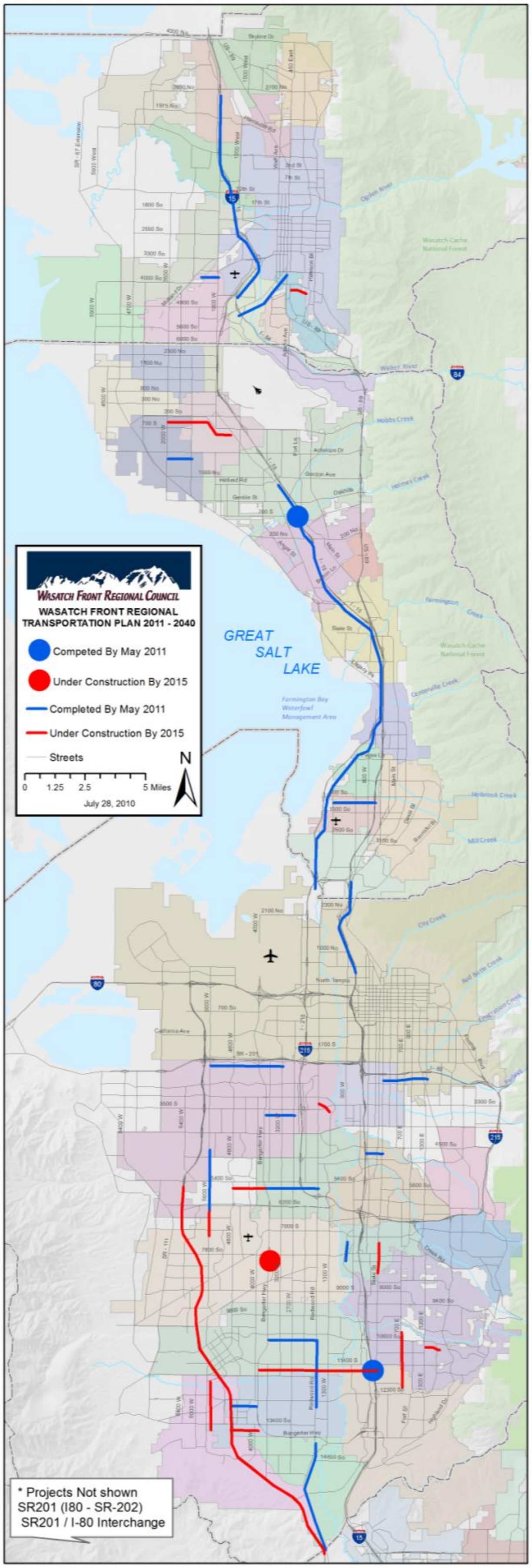
TABLE 4-1

Select No Build System Alternative Projects

Major Highway Projects
SR-193 Extension – Main Street to 2000 West
Mountain View Corridor Frontage Roads and Arterial – 5400 South to Redwood Road
11400 South Interchange
11400 South – State Street to Bangerter Highway
Redwood Road – Bangerter Highway to Utah County Line
5400 South Flex Lanes and Widening – Redwood Road to 4800 West
Riverdale Road – Washington Boulevard to I-84
I-15 – 2700 North to I-84
Major Transit Projects
Salt Lake City – Provo Commuter Rail
Airport Light-Rail
Draper Light-Rail to 12400 South
Mid-Jordan Light-Rail
West Valley Light-Rail

Map 4-1, NO BUILD ALTERNATIVE FOR HIGHWAY AND TRANSIT

ALTERNATIVE ONE
NO BUILD
HIGHWAY PROJECTS



ALTERNATIVE ONE
NO BUILD
TRANSIT PROJECTS

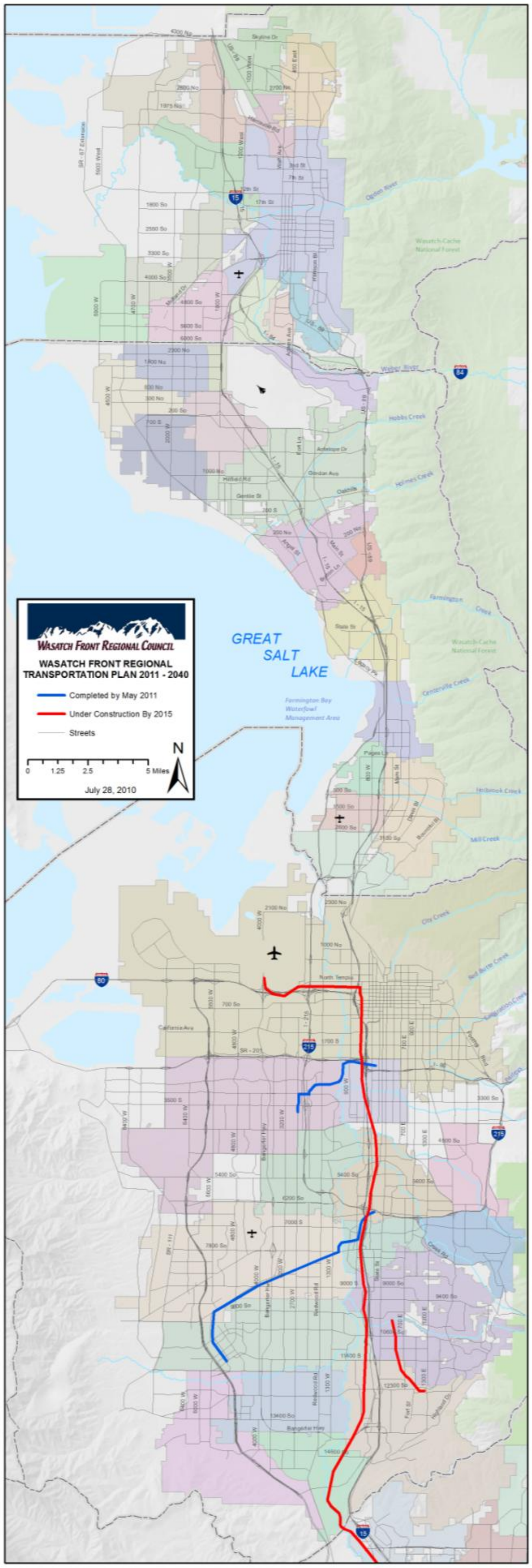


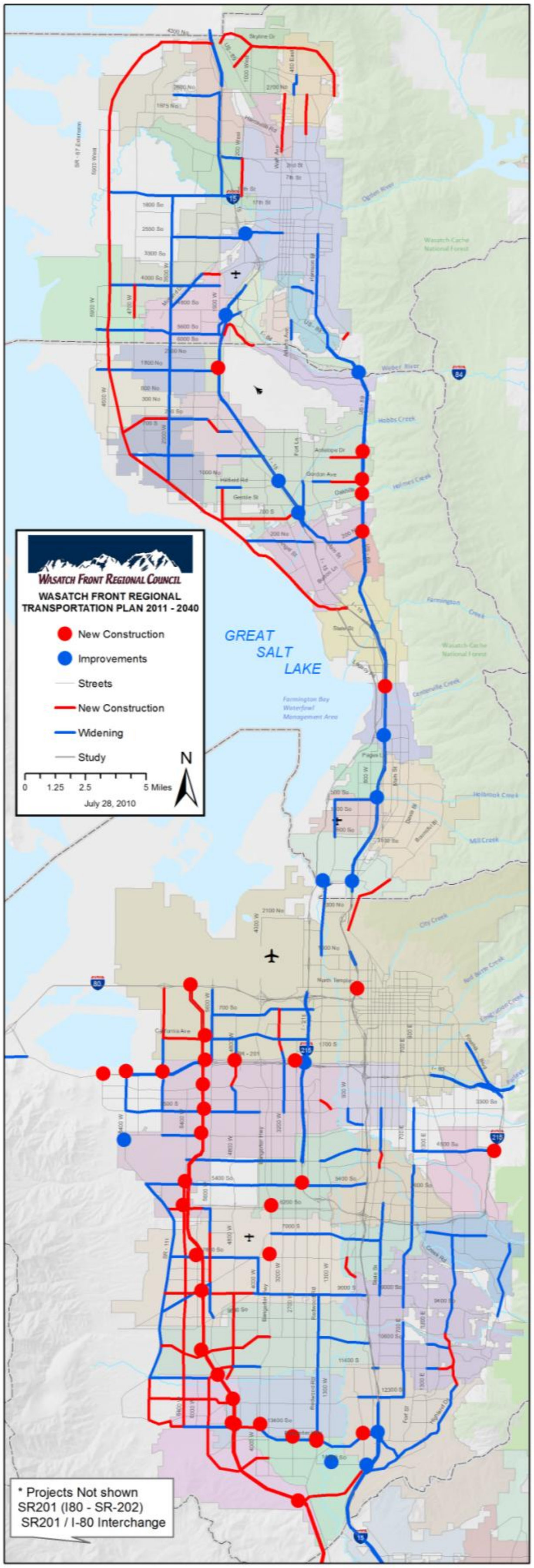
TABLE 4-2

Select Current Plan System Alternative Projects

Major Highway Projects	
West Davis Corridor – I-15 (North) to I-15 / US-89 (Farmington)	
I-15 – Weber, Davis, and Salt Lake Counties	
Mountain View Corridor – I-80 to Utah County Line	
I-215 – I-80 to 4700 South	
Bangerter Freeway – I-15 to 13400 South	
US-89 – Harrison Boulevard to I-15 (Farmington)	
2000 West / 3500 West / Midland Drive – Hinekley Drive to West Davis Corridor	
Redwood Road – 9000 South to Bangerter Highway	
I-80 – 1300 East to Parleys Canyon	
State Street – 6000 South to 9000 South	
900 / 700 South - Van Winkle Expressway to 9400 South	
9000 South I-15 to SR-111	
Highland Drive – Fort Union Boulevard to I-15	
Select Major Transit Projects	
Project Name	**Project Limits**
Draper (South) Light-rail	12400 South to Utah County
South Davis Bus Rapid Transit (BRT 3)	Centerville to Downtown Salt Lake
Redwood Road Bus Rapid Transit (BRT 3)	Downtown Salt Lake to Mid-Jordan TRAX
State Street Bus Rapid Transit (BRT 3)	Downtown Salt Lake to 5300 South TRAX
1300 East (North) Bus Rapid Transit 3	University of Utah to Fort Union
South Temple – Foothill—Fort Union BRT3	Downtown Salt Lake to Fort Union
5600 West Bus Rapid Transit (BRT 3)	Downtown Salt Lake to 11800 South
Sugarhouse Streetcar	2100 South TRAX Station—Highland Drive
400 South Direct TRAX Link (Light-rail)	University of Utah Direct to Salt Lake Central
1300 East (South) Bus Rapid Transit 3	5300 South TRAX to 12400 South TRAX
5400 South (West) Bus Rapid Transit 3	5300 South TRAX to 5600 West
Weber State Bus Rapid Transit (BRT 3)	Ogden Intermodal Center—Weber State University
3500 South Bus Rapid Transit (BRT 3)	3300 South TRAX to Magna

Map 4-2, CURRENT PLAN ALTERNATIVE FOR HIGHWAY AND TRANSIT

ALTERNATIVE TWO
CURRENT REGIONAL TRANSPORTATION PLAN 2030
HIGHWAY PROJECTS



ALTERNATIVE TWO
CURRENT REGIONAL TRANSPORTATION PLAN 2030
TRANSIT PROJECTS

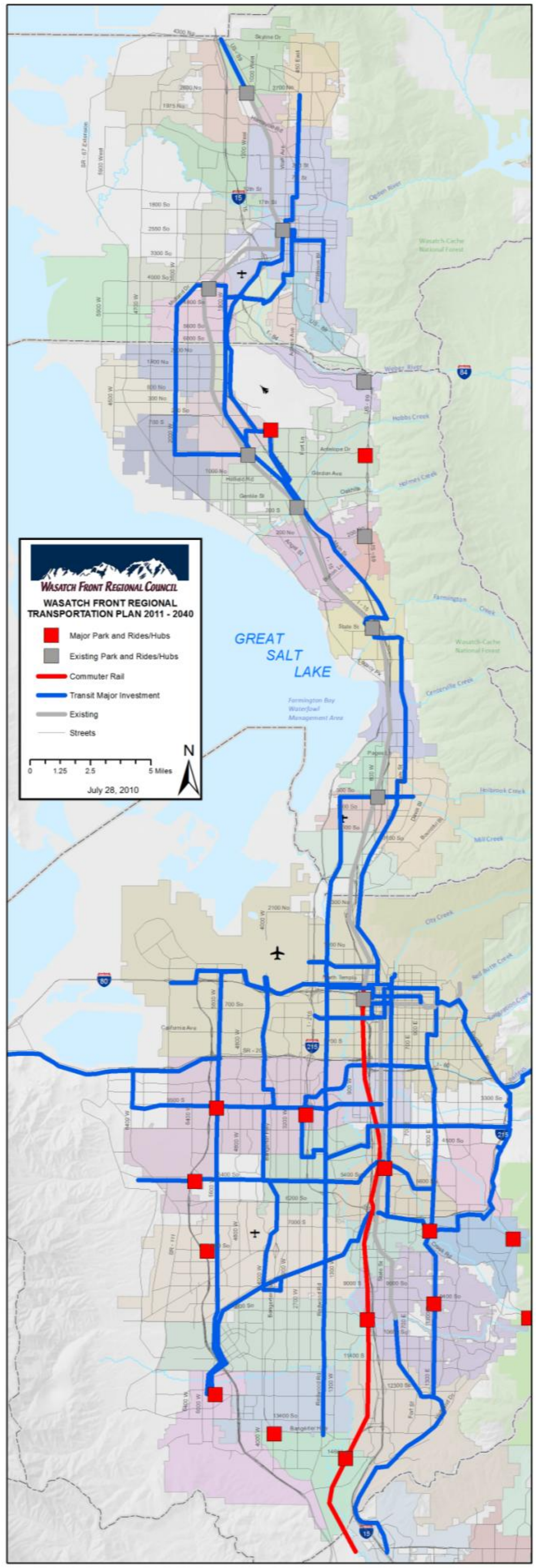


TABLE 4-3

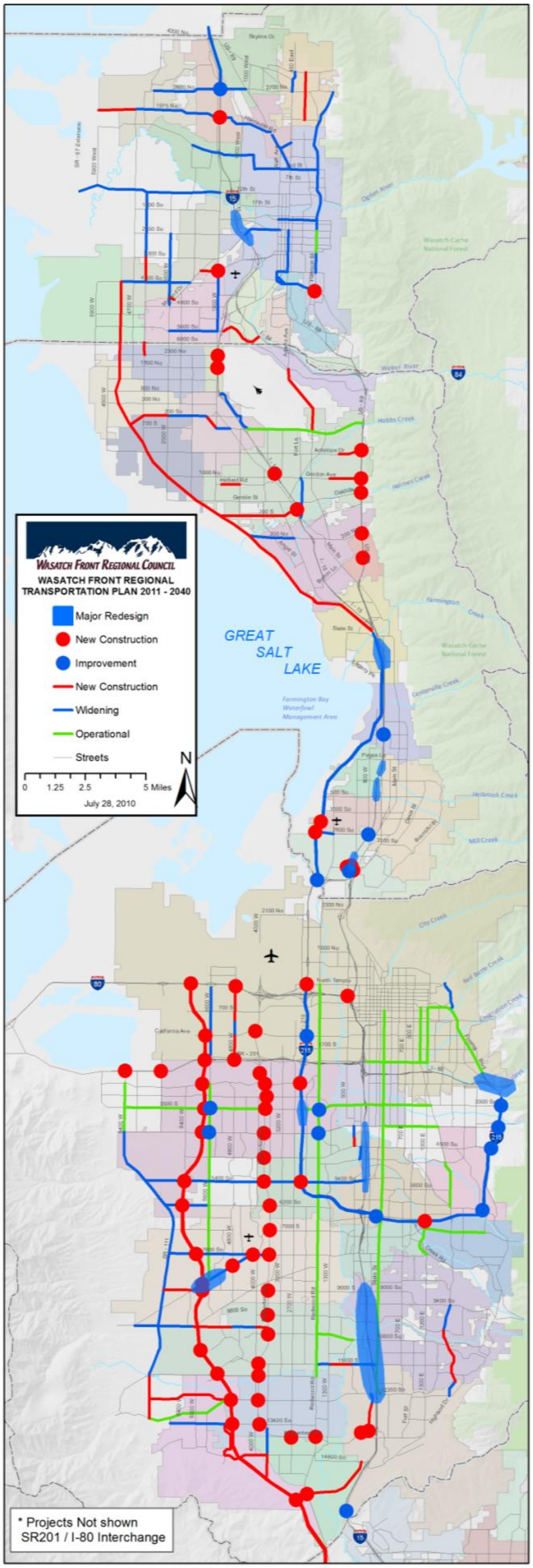
Select Team A System Alternative Projects

Major Highway Projects
West Davis Corridor – 4000 South to I-15 / US-89 (Farmington)
Mountain View Corridor – I-80 to Utah County Line
Bangerter Highway Interchanges – I-80 to I-15
Harrison Boulevard – 2600 North to 3600 South
I-215 – I-80 (West) to I-80 (East)
Pioneer Road – 3000 West to Harrison Boulevard
Legacy Parkway – I-15 / US-89 to I-215
SR-111 – SR-201 to Herriman Main Street
Highland Drive – 9400 South to 12400 South
Various Operational Projects

Major Transit Projects*	
Project Name	**Project Limits / Path**
Southwest Bench Bus Rapid Transit 3	Daybreak-Copperton-West Bench-Kearns-International Center-Airport-Salt Lake Central
Granery Bus Rapid Transit (BRT 3)	900 South TRAX Station-Southwest CBD-200 South-Salt Lake CBD
7000 South/Fort Union Bus Rapid Transit (BRT 3)	West Bench-Mid Jordan TRAX-Sandy TRAX-Cottonwood Corporate Center-Big Cottonwood Canyon
9000 South Bus Rapid Transit 3	Daybreak-Little Cottonwood Canyon
12300 South Bus Rapid Transit 3	Herriman-Draper-12300 South TRAX Station
North Davis Bus Rapid Transit 3	US 89-Hill Air Force Base-Clearfield FrontRunner Station-West Point
West Davis Bus Rapid Transit 3	Syracuse-Farmington FrontRunner-Bountiful-Salt Lake City CBD
*All in-street transit was initially evaluated in equal terms as a Bus Rapid Transit	

Map 4-3, TEAM A ALTERNATIVE FOR HIGHWAY AND TRANSIT

ALTERNATIVE THREE STAFF DEVELOPED (TEAM A) HIGHWAY PROJECTS



ALTERNATIVE THREE STAFF DEVELOPED (TEAM A) TRANSIT PROJECTS

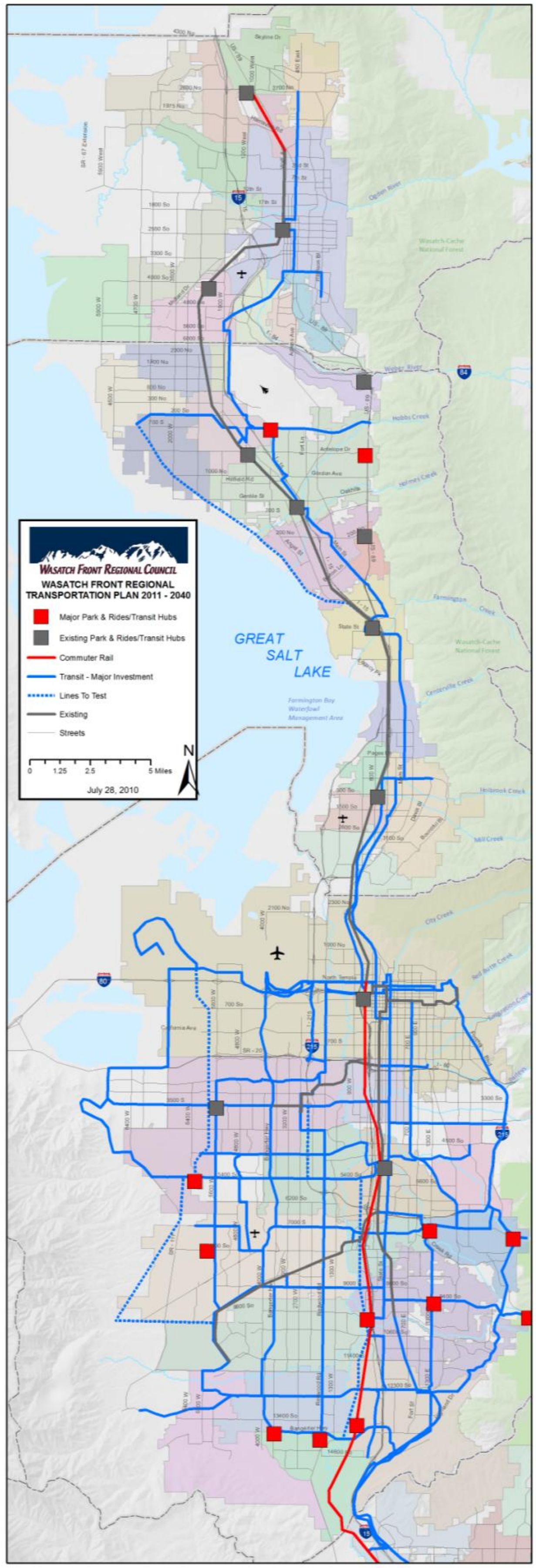
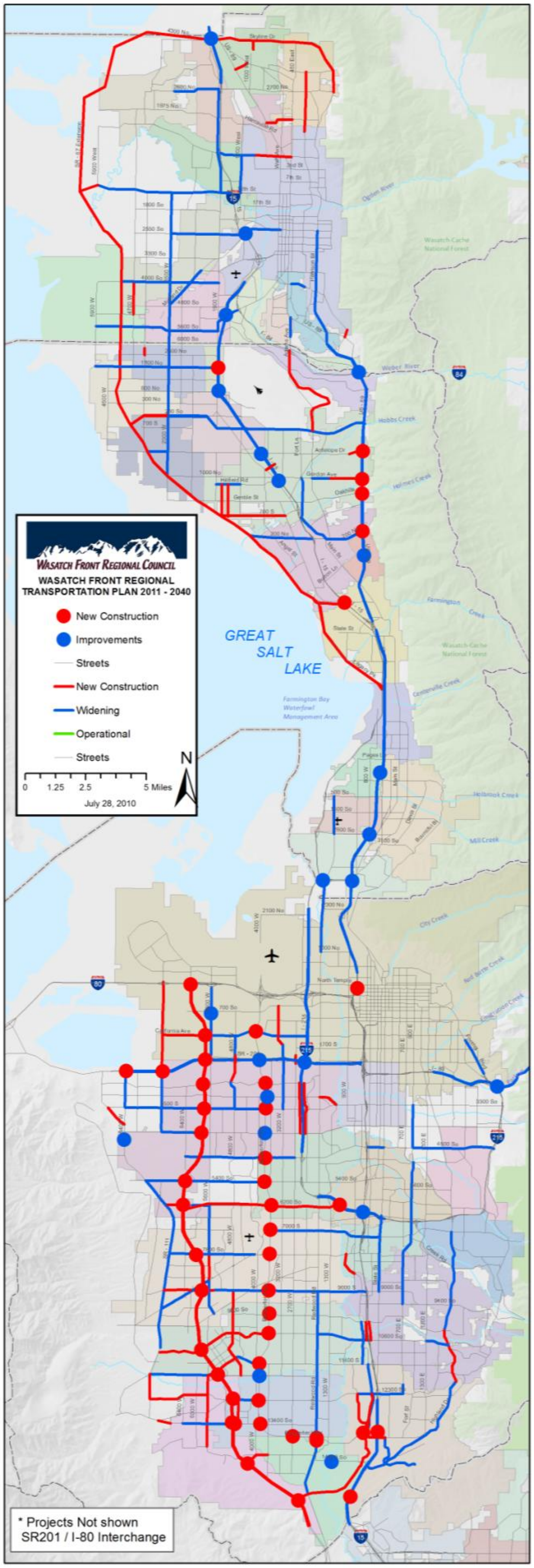


TABLE 4-4

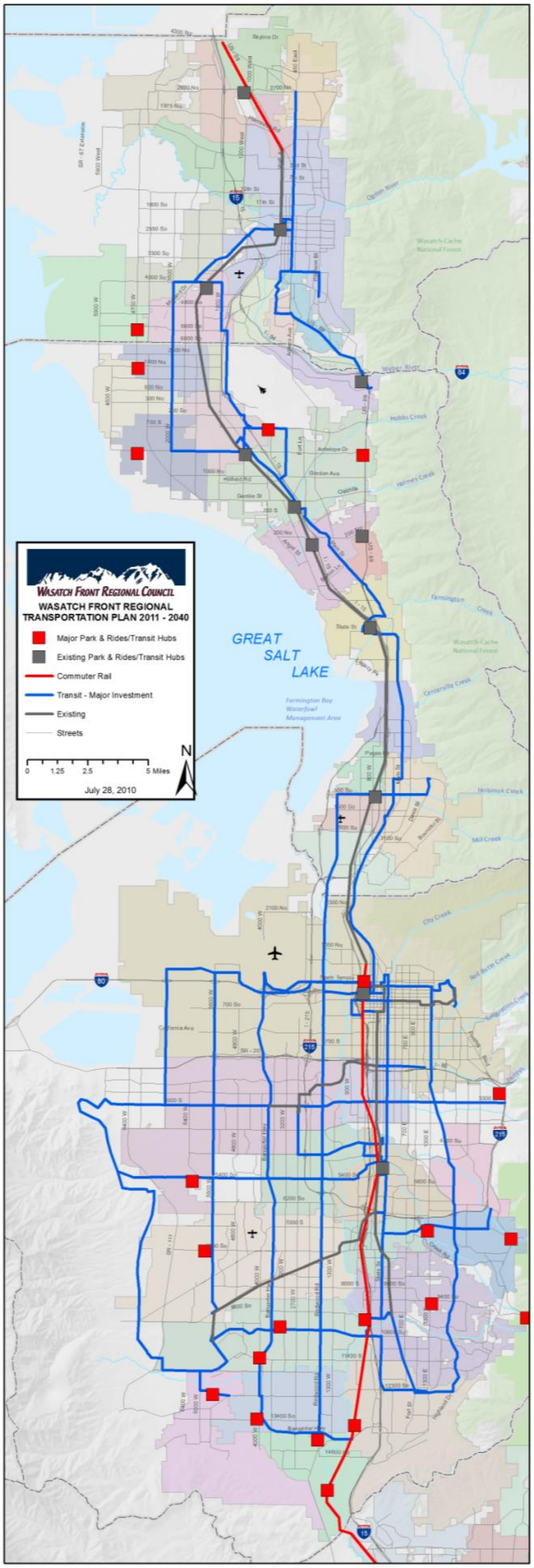
Select Team B System Alternative Projects

Major Highway Projects	
West Davis Corridor – I-15 (North) to I-15 / US-89 (Farmington)	
I-15 – Weber, Davis, and Salt Lake Counties	
US-89 – Harrison Boulevard to I-15 (Farmington)	
Harrison Boulevard – 24th Street to US-89	
SR-193 – West Davis Corridor to US-89	
1800 North – I-15 to 5900 West	
SR-201 – I-15 to SR-111	
6200 South Freeway – I-215 to Mountain View Corridor	
Highland Drive – Fort Union Boulevard to I-15	
9000 South – I-15 to SR-111	
I-215 – Redwood Road to I-15	
Mountain View Corridor – I-80 to Utah County Line	
Bangerter Highway Freeway Upgrade – I-80 to I-15	
I-215 – 2100 North to 4700 South	
I-80 - 1300 East to Summit County Line	
Major Transit Projects	
Project Name	**Project Limits / Path**
Bangerter Highway Bus Rapid Transit (BRT 3)	Airport TRAX Line-6200 South-Draper FrontRunner Station
Interstate 80 Bus Rapid Transit (BRT 3)	Salt Lake Central-7200 West
5400 South Bus Rapid Transit (BRT 3)	Murray FrontRunner Station-Mountain View Corridor
10400 South Bus Rapid Transit (BRT 3)	10000 South TRAX Station-South Jordan FrontRunner Station-Daybreak
Denver Rio Grande and Western Light Rail	400 South West Bountiful-3300 South (West Haven
Washington Boulevard-South Weber Bus Rapid Transit (BRT 3)	North Ogden-Harrisville-Ogden-South Ogden-South Weber

ALTERNATIVE FOUR
STAFF DEVELOPED (TEAM B)
HIGHWAY PROJECTS



ALTERNATIVE FOUR
STAFF DEVELOPED (TEAM B)
TRANSIT PROJECTS



Map 4-4, TEAM B ALTERNATIVE FOR HIGHWAY AND TRANSIT

EVALUATION OF SYSTEM ALTERNATIVES

In an effort to improve the RTP development process, a set of thirteen system evaluation criteria were adopted by the WFRC in the Spring of 2010. The thirteen planning criteria were used to assess each of the system alternatives for its relative system-wide functionality, responsiveness to corridor needs, fiscal prudence, social and economic value, and environmental costs. As shown in Table 4-5, each of these criteria is linked to the Wasatch Choices for 2040 Growth Principles. The Growth Principles are found in Chapter 2, Regional Visioning, Page 48.

TABLE 4-5

RTP Alternative Evaluation Criteria

Measures	Definition**	Supporting Growth Principles
Project Costs	Roadway construction costs and transit construction and operating costs.	Goal 1,6
Travel Time	Estimated 2040 auto and transit travel time through select travel corridors	Goals 1,3,6
Safety	The current average crash rate and severity index on state roads* in which roadway and public transit projects are proposed.	Goal 5
Corridor Specific Goals	How many needs, specific to the corridor or identified by staff and/or the general public, are met by the proposed alternative.	Goals 1,3,7,8,9
Auto Delay	Annual number of hours of vehicle delay caused by traffic congestion during the peak periods.	Goals 1,6
Vehicle Miles Traveled	Total daily vehicle miles traveled	Goals 2,5,6,9
Transit Ridership	Forecasted 2040 linked daily transit trips and passenger miles	Goals 1,2,3,5,6,8,9
Activity Center and Infill Area Access	Sum of all forecasted 2040 peak hour auto and transit commutes of 20 minutes or less to 130 selected activity centers and infill areas.	Goals 1,2,3,4,5,6,9
Economic Access for Disadvantaged Populations	Sum of all forecasted 2040 peak hour vehicle and transit commutes of 20 minutes or less from 37 selected areas with current high concentrations of disadvantaged populations.	Goals 2,4,5,6,8
Freight Access	The cumulative travel times from 17 selected freight centers to the freeway.	Goals 3,6
Environmental Impacts	The total and weighted potential direct impacts of the proposed system upon 49 categories of natural, urban, and demographic resources and constructability issues.	Goals 3,5,6,8,9
Air Pollutant Emissions	Estimated 2040 tons per day of five transportation related emissions	Goals 5,6,9
Non-motorized facilities	Miles of co-incident projects and proposed bike facilities.	Goals 1,2,3,5,8,9
*Crash statistics are only available on State facilities		
**All transportation statistics are for travel within Weber, Davis, and Salt Lake Counties		

Both direct measure and relative indicators were used to compare the systems. The process and findings for each of these criteria are discussed in this Chapter section. With a few exceptions, the scores in each of the tables accompanying the discussion of each criterion are based on a one to ten scale with five representing the average score for the four original and the Initial Draft Alternatives. A score greater than five for a given alternative always indicates that this alternative scored better than average for that measure. Appendix I contains tables with more detailed findings and with the raw values. Table 4-5 briefly describes these criteria.

In addition to the criteria listed in Table 4-5, WFRC staff used system cost as a guiding criterion and, in many cases, considered potential benefit compared with estimated roadway construction costs, and combined transit construction and operating costs.

that the Bus Rapid Transit (BRT 3) or Enhanced Bus (BRT 1) lines would not replace any of the current transit lines so the operation and maintenance costs were assumed to be additional costs to the system. The transit costs did not include the purchase of rights-of-way whereas roadway costs were increased 20 percent to account for rights-of-way purchases. The relative cost scores found in Table 4-6 are based upon a one to ten scale with five representing the average score for the four original and the initial Draft alternatives. A score greater than 5 for a given alternative indicated that this alternative scored better than average for that measure. Appendix I contains tables with the raw cost estimations.

The transit capital cost estimation for the No Build Alternative was $3.7 billion dollars and the original four build alternative costs ranged from $9.3 billion for the Current RTP Alternative to $12.7 billion for the Team A Alternative.

TABLE 4-6

Transportation System Alternative Cost Scores

	No Build	Current Plan	Team A	Team B	Initial Draft RTP
Transit Construction	8.2	4.8	2.8	4.3	4.9
Transit Daily Operating	6.1	5.2	4.6	5.0	4.0
Roadway Construction	9.1	4.3	4.6	3.5	3.5

*A 1 to 10 scoring method with 5 representing the average value and higher values representing a more favorable outcome

Project Costs

Both the Highway and Transit cost estimates were developed in conjunction with UDOT and UTA respectively. Cost estimations were based upon a per mile cost by project type and were inflated to 2025 dollars to reflect the mid-point of the planning horizon. All cost figures were considered drafts for the purpose of evaluating the various system alternatives and may be different from the values used to financially constrain the completed Plan. In the case of transit, Initially all transit projects operating upon public streets were assumed to be Bus Rapid Transit (BRT 3) until ridership and other factors could be used to justify implementation of an appropriate technology with each of the lines in question. The initial assumption was

The operating and maintenance costs of the original four build alternatives ranged from $2.3 million per day for the Current Plan Alternative to $2.6 million per day for the Team A Alternative. The initial Draft RTP was, in large part, a blend of the best performing Current RTP Alternative capital projects with many of the Team A operations. Its capital costs were estimated to be about $9.0 billion and its operating and maintenance costs were estimated to be $2.9 million dollars a day. It was assumed that further plan refinement would result in lower net operating and maintenance costs as the Bus Rapid Transit (BRT 3) and Enhanced Bus (BRT 1) lines could replace existing services in many cases.

The roadway construction costs for the No Build Alternative was estimated to be $3.7 billion and the original four build alternative construction cost ranged from $21.5 billion for the Team A Alternative to $26.2 billion for the Team B Alternative. The Team B alternative was the primary source of the initial Draft RTP Alternative which was estimated to cost $26.1 billion to build.

Travel Time

Year 2040 average weekday afternoon peak period auto and transit travel time was forecasted for each of the fourteen travel corridors using the Wasatch Front Travel Demand Model. The afternoon peak period is 3:00 pm through 6:00 pm. The guiding principles in the delineation of the fourteen travel corridors were to cover the entire Wasatch Front Region and to follow projected dominant travel patterns. Because it was important that the modeled trips serve the activity centers in each of the corridors, travel to economic centers in each of the corridors were included as part of the corridor travel path for both vehicles and public transit travel times. These fourteen corridors are illustrated in Maps 4-5.

The cumulative travel time scores for all the fourteen corridors by vehicle and by public transit are found in Table 4-7. The scores found are based upon a one to ten scale with five representing the average score for the four original and the Initial Draft Alternatives. A score greater than five for a given alternative always indicates that this alternative scored better than average for that measure.

The traverse times by mode corridor segment are found in Appendix I. Of important note is that public transit may not have been available to the public in all the alternatives to make the journey across the planning corridor. The public transit travel time for these segments where transit is not available is zero, which would falsely indicate a better score. Where public transit is not available to make the required trip the cell is highlighted and the number of "missing links" are identified along side of the score.

Of the four original alternatives, the cumulative corridor travel times for vehicles ranged from 600 minutes for the Team B Alternative to 687 minutes for the No Build Alternative. The Team B Alternative was the bases for the initial Draft RTP system. This refined system had a cumulative corridor travel time of 566 minutes for auto users.

Safety

The Severe Crash Rate and the Crash Rate Ratio from UDOT's UPLAN data base were used to evaluate the value of each of the system transportation alternatives in terms of their potential safety benefits. The higher the crash rate and the severity of accidents on roads on which highway and transit projects are proposed in a system alternative, the better the safety score that alternative received. The premise behind using the crash rate and the accident severity index is that the projects will resolve many of the safety deficiencies as they reconstruct the roads for additional travel lanes, operational improvements, or for exclusive transit lanes. Enhanced Bus

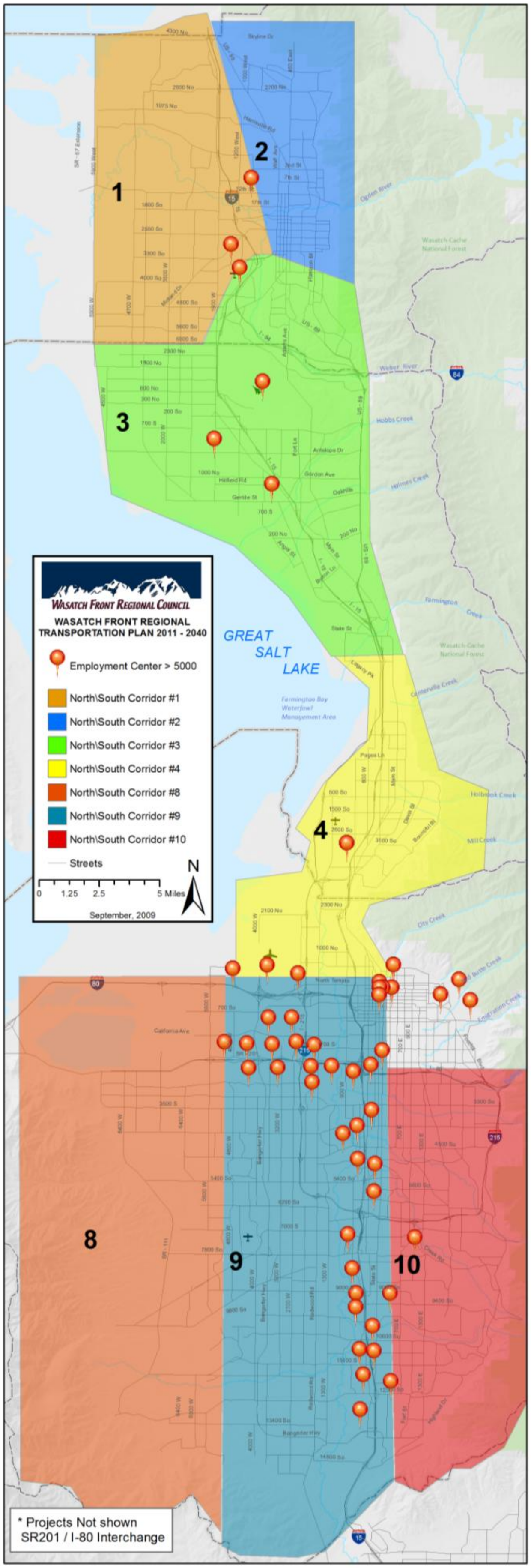
TABLE 4-7

Relative Corridor Traverse Time Scores

Planning Corridor	ALT 1 – No Build		ALT 2 – Current RTP		ALT 3 – Team A		ALT 4 – Team B		ALT 5 – Initial Draft RTP	
	Auto	Transit	Auto	Transit	Auto	Transit	Auto	Transit	Auto	Transit
TOTAL	4.4	5.3 score with 13 missing links	5.0	4.7 score with 2 missing links	5.0	5.1 score with 2 missing links	5.1	4.9 score with 0 missing links	5.4	5.0 score with 5 missing links
*A 1 to 10 scoring method with 5 representing the average value and higher values representing a more favorable outcome										

Map 4-5, SYSTEM ALTERNATIVE EVALUATION CORRIDORS

NORTH - SOUTH EVALUATION CORRIDORS



EAST- WEST EVALUATION CORRIDORS

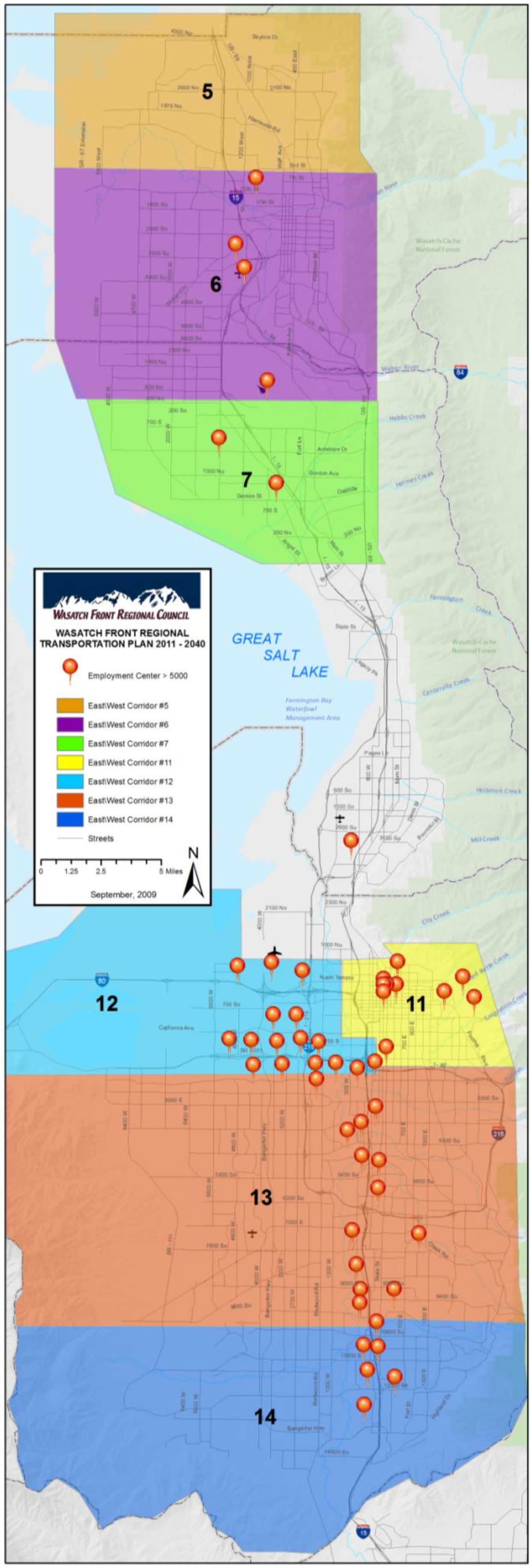


TABLE 4-8

Transportation System Alternative Safety Scores

	No Build	Current RTP	Team A	Team B	Initial Draft RTP
Crash Rate	1.4	4.6	5.6	6.7	6.8
Severity	1.1	4.7	6.0	6.4	6.3
*A 1 to 10 scoring method with 5 representing the average value and higher values representing a more favorable outcome					

(BRT 1) does not have exclusive transit lanes. Therefore it is not necessary to rebuild the roads and thereby remove road safety issues.

The crash rate (crashes per million vehicle miles traveled) is equal to the number of crashes multiplied by 1 million and divided by the AADT multiplied by 365 and multiplied by the length of the segment (crash rate = (crashes*1,000,000) / (AADT*365*length)). The severity score is based on the number of high severity crashes per segment. A high severity crash is a class 4 or 5, with a class 4 having broken bones and bleeding and a class 5 being a fatal accident. The Wasatch Front Urban Area Safety Index, Map 3-4, currently includes only state roads, due to inconsistency in the reported locations of accidents on either state routes or local roads. For purposes of relative comparison the safety scores reflect the total, cumulative, rates for all the highway segments and are not provided on a per mile basis. The raw safety scores can be found in Table I-X of Appendix I. The relative crash rate and crash severity rate scores found in Table 4-8 are based upon a one to ten scale with five representing the average score for the four original and the Initial Draft Alternatives. A score greater than five for a given alternative always indicates that this alternative scored better than average for that measure.

It appears that the initial Draft RTP Alternative would be effective at improving road safety issues given it has a higher Crash Rate score although it spends less on road and transit lane improvements. However, it has somewhat of a lower Severity score. This is more in-line with its somewhat

TABLE 4-9

General Corridor Issues

Category	Category
Avoiding Community Impacts	Incomplete Road Networks
Avoiding Indirect Ecological Impacts	Incomplete High-Occupancy Facilities
Avoiding Direct Ecological Impacts	Incomplete Non-motorized Networks
Non-motorized Safety	Incomplete Traffic System Management
Safety and Security Issues	Incomplete Transit Networks
Service to Economic Centers	Identification of Geographical Chokepoints
Service to Disadvantaged Populations	Highway Efficiency Improvements
Identification of Transit Markets	Transit Efficiency Improvements
Capacity Issues	Inadequate Transportation Design

diminished capital/construction spending. It may also reflect on, urban roads which generally have higher Crash Rates but lower Severity Rates because of lower speed limits.

Corridor Specific Goals

WFRC Staff identified and used both system-wide goals and the corridor specific goals for each of the thirteen corridors illustrated in Map 4-5 for the evaluation of each of the System Alternatives. These goals were derived from many different sources including UDOT, UTA, Wasatch Front Regional Council data sets and multiple stakeholder meetings. In total, 273 goals were identified, with most of these tied to one of the specific corridors. Stakeholders were encouraged to try and express their needs or issues or opportunities rather than as specific projects. It was explained that this would allow the transportation planners to propose different possible solutions to the problem or opportunities identified by the stakeholders. Ultimately, many contributors asked for specific projects. Although their requests for specific projects were noted, the WFRC staff attempted to derive the issues and opportunities generating their specific requests. Generally, the issues fell into the eighteen general categories listed in Table 4-9.

The WFRC Staff assessed whether each of the System Alternatives substantially met each goal in each corridor. Each goal substantially met was given one point and each goal substantially unmet received a zero. The full listing of Issues and Opportunities in found in Appendix I. The number of corridor specific goals met by each of the alternatives for each corridor are found in Appendix I. The corridor specific scores for each of the alternatives found in Table 4-10 are based upon a 1 to 10 scale with five representing the average score for the four original and the Initial Draft Alternatives. A score greater than five for a given alternative always indicates that this alternative scored better than average for that measure.

TABLE 4-10

Scores for Corridor Specific Goals

	No Build	Current Plan	Team A	Team B	Initial Draft RTP
Overarching/Region-wide	0	5.6	5.6	5.6	8.3
West Weber County North/South	0.6	5.8	5.8	5.8	7.0
East Weber County North/South	0.5	5.9	5.3	5.9	7.4
North Davis County North/South	0.7	6.3	4.2	6.3	7.6
South Davis County	0	5.5	7.0	5.9	6.6
North Weber County East/West	0	5.6	6.9	5.6	6.9
South Weber County East/West	0	5.9	5.9	6.4	6.9
North Davis County East/West	0	5.8	5.6	6.7	6.9
West Salt Lake County North/South	0.8	5.6	6.5	5.6	6.5
West Central Salt Lake County North/South	0	3.0	7.7	5.4	8.9
East Salt Lake County North/South	0	5.0	6.3	6.3	7.5
Salt Lake City Core (N/S and E/W)	0	6.3	6.3	3.1	9.4
North Salt Lake County East/West	0	6.7	5.8	4.8	7.7
Mid Salt Lake County East/West	0.5	4.2	5.7	6.1	8.5
South Salt lake County East/West	0	5.0	6.0	7.0	7.0
TOTAL	0.2	5.5	5.9	5.9	7.5

*A 1 to 10 scoring method with 5 representing the average value and higher values representing a more favorable outcome

In order to gain some perspective to the auto delay figures, Vehicle Miles Traveled (VMT) and change in auto delay per $1,000 spent on major roadway construction were paired with simple auto delay values.

Vehicle Miles Traveled is the total motorized vehicle miles (excluding transit) traveled each day. Reductions in the rate of growth in vehicle miles traveled are desirable for many reasons, especially for reducing energy consumption and relieving traffic congestion. In addition, VMT is directly associated with the level of fine particulate matter in the atmosphere.

Due in part to the fact that the lists of system-wide goals and corridor specific goals were given to each of the teams and developers of the initial Draft RTP, these system alternatives received the highest scores. The No-build alternative met only six goals and the Current RTP Alternative met 146 of the 273 goals. The Team A, Team B, and the initial Draft RTP alternatives met 157, 158, and 200 of the goals respectively.

Auto Delay and Vehicle Miles Traveled

"Daily auto delay" is the number of hours of auto delay caused by traffic congestion during the course of an average day. Daily peak period auto delay data was generated for the three WFRC counties and Utah County using the WFRC's Regional Travel Demand Model projections for the year 2040.

There are several factors that influence auto vehicle miles traveled. Among these factors are the directness of travel and the ease of driving, compared with using transit. Like transit passenger miles, each of the combined transit and highway system alternatives were analyzed by using the WFRC Regional Travel Demand Model. The model was used to project the number of motorized vehicle miles on major roads in Weber, Davis, Salt Lake, and Utah Counties each day in 2040. The vehicle miles traveled and time delay related scores found in Table 4-11 are based upon a one to ten scale with five representing the average score for the four original and the Initial Draft Alternatives. A score greater than five for a given alternative always indicates that this alternative scored better than average for that measure. The raw time delay data and

TABLE 4-11

Auto Delay and Vehicle Miles Traveled*

	No Build		Current RTP		Team A		Team B		Initial Draft RTP	
	Delay	VMT	Delay	VMT	Delay	VMT	Delay	VMT	Delay	VMT
TOTAL COST	1.3	4.7	6.0	5.1	5.2	5.1	6.4	5.0	6.0	5.1
COST EFFECTIVENESS SCORE	n/a		5.5		4.2		5.3		5.0	

*A 1 to 10 scoring method with 5 representing the average value and higher values representing a more favorable outcome

vehicle miles traveled forecasts are discussed below and found in Appendix I.

Image by James Belmont

The No Build Alternative had the highest amount of time delay and Vehicle Miles Traveled with 0.7 million hours of delay and 76.2 million vehicle miles traveled in the Weber, Davis, Salt Lake, and Utah Counties each day. The delay is increased because the existing roads are more congested and take longer to traverse. Increased VMT results from drivers traveling longer routes to get to their destinations in an attempt to avoid congestion. The total modeled delay for the build alternatives ranges from 0.3 million daily hours for the Team B Alternative to 0.4 million daily hours for the Team A Alternative. The total modeled vehicle miles traveled for the build alternatives ranges from 70.0 million miles a day in the Team A Alternative to 72.3 million miles a day in the Team B Alternative.

In terms of cost effectiveness, the build alternatives ranged from a savings of 12,100 hours of delay per day for every million dollars spent for the Current RTP Alternative to a savings of 9,300 hours of delay per day for every million dollars spent for the Team A Alternative, a 26% difference. The initial Draft RTP Alternative saved 11,100 hours of delay per day for every million dollars spent. It is important to note that no transportation improvements were made in Utah County so much of the build alternative delay may be occurring there. Thus, relative values are more important to review than total numbers.

Transit Ridership

Transit ridership can be assessed from many different perspectives. For the purposes of comparing system alternatives, the WFRC staff looked at peak period passenger miles for the entire transit system as well as at daily linked passenger trips. It also gathered this data for the proposed major investment projects, as well as on a cost effectiveness basis. Table 4-12 provides the scores for each of these measures. These are based upon a one to ten scale with five representing the average score for the four original and the initial Draft Alternatives. A score greater than five for a given alternative always indicates that this alternative scored better than average for that measure. The linked transit passenger trips and passenger miles for these measures are discussed below and are found in Table I-x of Appendix I.

The passenger miles and linked passenger trips were forecasted for 2040 using the WFRC Regional Travel Demand Model. Passenger miles are the number of miles traveled in the peak period on a transit vehicle by transit users. The morning peak period is 6:00 a.m. though 9:00 a.m. each weekday. The afternoon peak period is 3:00 p.m. through 6:00 p.m. A linked trip is a trip taken by a public transit passenger from their origin to their destination. An un-linked trip or boarding is a trip that starts when the passenger gets on a transit vehicle and ends when they get off a transit vehicle. A linked trip that, for example, starts with a bus and then requires a single transfer to a light-rail vehicle would register as two un-linked trips or two boardings. The values discussed and the scores in Table 4-12 are based upon Weber, Davis, and Salt Lake County ridership. Canyon transportation ridership was not forecasted.

The total modeled peak period passenger miles for the original four alternatives ranges from 2.2 million daily miles for the No Build Alternative to 3.4 million daily miles for the Team A Alternative, an increase of about 55 percent on a system-wide level in Weber, Davis, and Salt Lake Counties. The total modeled linked trips for the original four alternatives ranges from 0.2 million trips a day in the No Build Alternative to 0.4 million trips a day in the Team B Alternative, about a 60 percent increase. However, the change in ridership on the major investment system nearly doubles between the No Build and the Team A Alternatives.

TABLE 4-12

Relative Transit Ridership Scores**

	No Build		Current RTP		Team A		Team B		Initial Draft RTP	
	Miles	Trips	Miles	Trips	Miles	Trips	Miles	Trips	Miles	Trips
All Transit*	3.8	3.6	5.0	5.0	6.0	5.7	5.0	5.1	5.1	5.5
Major Investments Only*	n/a	3.1	n/a	5.1	n/a	6.0	n/a	5.2	n/a	5.6
Major Investment Trips / Cost*	n/a	6.4	n/a	4.7	n/a	5.3	n/a	4.3	n/a	4.3

*Amortized capital and operating costs assuming capital facilities would last 20 years
**A 1 to 10 scoring method with 5 representing the average value and higher values representing a more favorable outcome

In terms of the relative cost effectiveness of the original four alternatives, they were estimated using daily weekday linked trips, assuming daily operating costs and that capital costs would have a 20 year life-span. The actual life-span for the projects vary greatly by project type. For instance, a vehicle will last from 12 to 30 years, rights-of-way have an infinite life span. The most effective Alternative was the No Build as the No Build transit system that is existing and under construction already serves areas forecasted to be some of the most densely developed portions of the Wasatch Front Region by 2040. The next two most cost effective alternatives are the Team A and the Current RTP Alternatives. These Alternatives were chosen as the basis for the initial Draft RTP. However, the initial Draft RTP was not quite as cost effective as these two Alternatives because it had more daily operating costs. This is because it serves more of the suburban areas than the Team A or the Current RTP Alternatives. It is important to note that both projected ridership numbers and cost estimates were very preliminary at this point in the process and should only be used in comparing alternatives. The capital, operating, and total amortized costs per passenger trips can be found in Table I-x of Appendix I.

Economic Development as Criteria

As noted elsewhere in this document, urban development and transportation can have profoundly positive or negative effects upon each other. Transportation encourages development and development creates demand for transportation. Transportation that supports infill areas, activity centers, helps disadvantaged communities, and supports freight centers has a positive influence upon taxes, personal and business transportation costs, public health, supports a more attractive quality of life for business owners, employees, and their families, and ultimately strengthens the Region's economic future. A transportation system's ability to have a positive impact on these factors is the criteria used to judge the economic development benefits of each of the transportation system alternatives.

Activity Centers and Infill Areas

Activity Centers - In an effort to integrate local plans for activity center development with the regional transportation system, each alternative was evaluated by how well they served activity centers. The level of service was quantified by summing all home-based work trips within 20 minutes transit and auto travel time of each of the identified centers. WFRC staff identified the activity centers through a three step process. First, the activity of each 10 acre square in the region was assigned an activity value using employment and household forecasts. Employment was given a weight of 1.2 and each household was given a weight of 1.0 in this value. Next, clusters or islands of activity were identified in the region using a mapping technique which smoothed the values of these 10 acre blocks and then applied various value ranges to isolate "islands" of activity. Finally, activity centers such as entertainment venues and schools that are not dependent upon households or employment for their activity were identified.

Once each activity center was identified then one or more Traffic Analysis Zones was chosen to represent that activity center in the regional transportation demand model. The number of traffic activity centers chosen to represent each activity center was roughly correlated with the intensity and size of that activity center in order to more highly value large, intense centers over smaller centers of activity. The supportiveness of each of the transportation system alternatives to the region's activity centers was based upon how many commuters to all the activity centers lived within a 20 minute commute by auto or public transit to their respective centers.

Infill Areas - When this development is more central to the Region and already has a fully diversified and functioning transportation system, it is called infill development. Infill development makes the region more economically competitive by reducing the public costs of new infrastructure, by decreasing congestion and vehicle miles traveled which in turn limits the impact on other public resources such as good air quality. Each transportation system alternative was evaluated on how well it served infill areas in order to make these areas even more attractive to development and redevelopment.

As was the case with activity centers, the level of service was quantified by summing all home-based work trips within 20 minutes transit and auto travel time of each of the identified locations. The potential infill areas identified in Salt Lake County were those areas of 50 acres or larger which were both identified by the Salt Lake County Cooperative Plan as being vacant or areas of probable or possible change and within the area of the County which is largely built out. The built out area was roughly defined by WFRC Staff as the area east and north of the Bangerter Highway loop near the unincorporated communities of Kearns and Magna. In Davis and Weber Counties WFRC staff used aerial photos and personal knowledge to identify areas of 50 acres or larger which were either vacant or potential areas of change surrounded by development.

Once each infill area was identified, then a traffic analysis zone was chosen to represent that infill area in the regional transportation demand model. Frequently infill areas within a mile of one another were grouped and given one traffic analysis zone designation and large areas with infill potential covering several square miles were given multiple traffic analysis zones to represent them. The supportiveness of each of the transportation system alternatives to the region's activity centers was based upon how many commuters to all the activity centers lived with a 20 minute commute to their respective centers by auto and by public transit.

Maps 4-6 and 4-7 show the identified activity centers and infill areas. Appendix J lists the representative activity centers and infill area traffic analysis zones, and their approximate locations. Appendix I, provides a complete listing of raw scores each category received. Table 4-13 below shows the combined regional activity center and infill location scores for each system alternative. These composite scores are based upon a one to ten scale with five representing the average score for the four original and the Initial Draft Alternatives. A score greater than five for a given alternative always indicates that this alternative scored better than average for that measure.

TABLE 4-13

Activity Center and Infill Area Access Scores

	No Build		Current RTP		Team A		Team B		Initial Draft RTP	
	Auto	Transit	Auto	Transit	Auto	Transit	Auto	Transit	Auto	Transit
	4.5	3.8	5.2	5.1	4.9	5.4	5.2	5.4	5.2	5.3

*A 1 to 10 scoring method with 5 representing the average value and higher values representing a more favorable outcome

The number of peak period commutes of 20 minutes or less by auto to all the representative activity centers and infill areas for the original four alternatives ranges from 158,000 for the No Build Alternative to 181,000 for the Team B Alternative, a range of about 16 percent. The Team B Alternative was the basis for the initial Draft RTP Alternative for the auto. The initial Draft RTP Alternative further widened the 20 minute auto commute area to include another 2,000 commuters. The number of peak period commutes of 20 minutes or less by transit to all the representative activity centers and infill areas for the original four alternatives ranges from 49,000 for the No Build Alternative to 69,000 for the Team A Alternative, a range of about 41 percent. The initial Draft RTP Alternative for transit decrease the 20 minute transit commute area by about 1,000 commuters.

Economic Access for Disadvantaged Persons

Inadequate access to jobs is one of the most frequently cited obstacles to financial independence for disadvantaged populations. Transportation is the second largest expense for families with limited financial resources. In the year 2000, twenty percent of households with the lowest incomes spent about 39 percent of their income on transportation. For this reason, each transportation system alternative was also evaluated on how well it served concentrations of disadvantaged people.

The level of service to areas with concentrations of disadvantaged people was quantified by summing all employment within 20 minutes transit and auto travel time of each of the identified locations. The areas with concentrations of disadvantaged people were identified using the latest census information (2000) available for members of minority groups, persons with incomes below the poverty level, the elderly, and households who do not own vehicles. Thirty-seven Census Tracts were identified as having disproportionately high densities of disadvantaged persons.

All of these areas fell into three general locations. These areas are Ogden City, Salt Lake City, and west central Salt Lake County. A single Traffic Analysis Zone was selected to represent each selected Census Tract in the Travel Demand Model. Map 4-8 shows these locations. Appendix J provides a listing of these locations as well as the number of jobs within 20 minutes travel time of each of these areas in each alternative. Table 4-14 below shows the relative access to jobs scores for each of the alternatives. These scores are based upon a one to ten scale with five representing the average score for the four original and the Initial Draft Alternatives. A score greater than five for a given alternative always indicates that this alternative scored better than average for that measure.

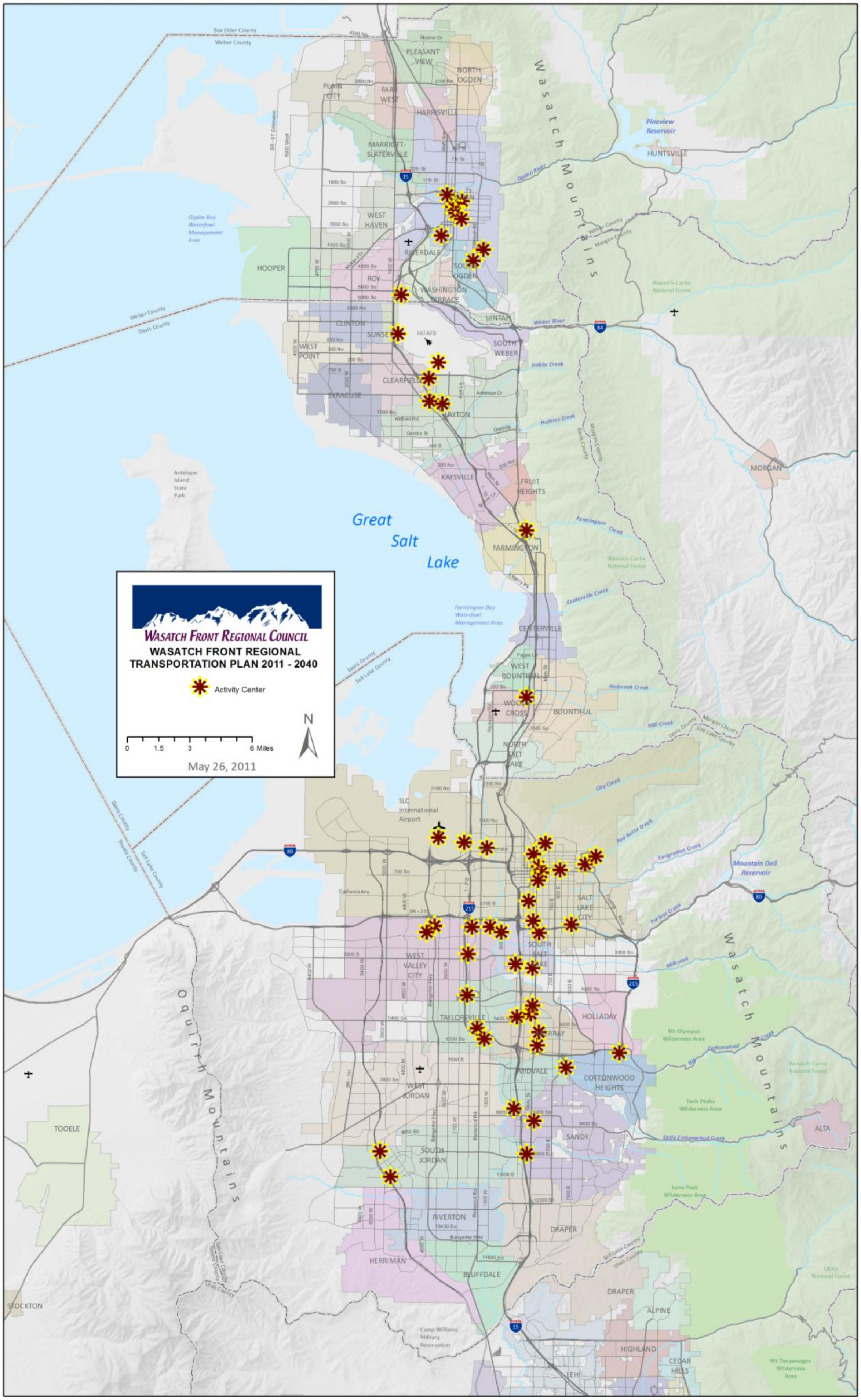
The raw scores found in Appendix I are the sums of all the employment within a 20 minute travel time of each of the areas with high concentrations of disadvantaged persons. For this reason a job that is within 20 minutes travel time of several areas with high concentrations of disadvantaged persons will be counted several times. The cumulative number of jobs within 20 minutes of these locations via auto for the original four alternatives range from 12.0 million for the No Build Alternative to 14.1 million for the Team B Alternative, a range of about 18 percent. The Team B Alternative was the basis

TABLE 4-14

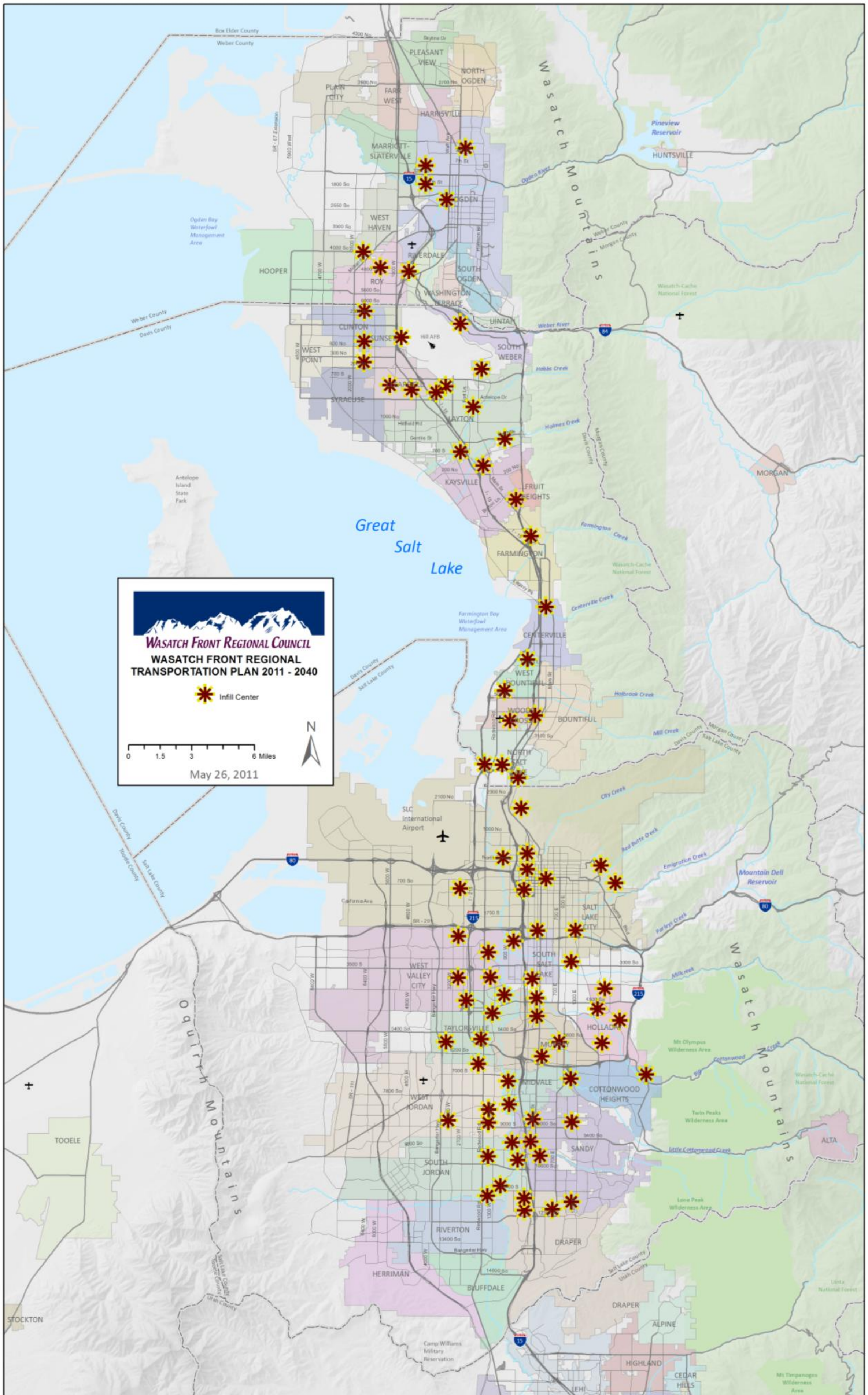
Disadvantaged Population Access to Job Scores

	No Build		Current RTP		Team A		Team B		Initial Draft RTP	
	Auto	Transit	Auto	Transit	Auto	Transit	Auto	Transit	Auto	Transit
	4.5	3.8	5.1	5.2	5.1	5.5	5.3	5.3	5.0	5.3
*A 1 to 10 scoring method with 5 representing the average value and higher values representing a more favorable outcome										

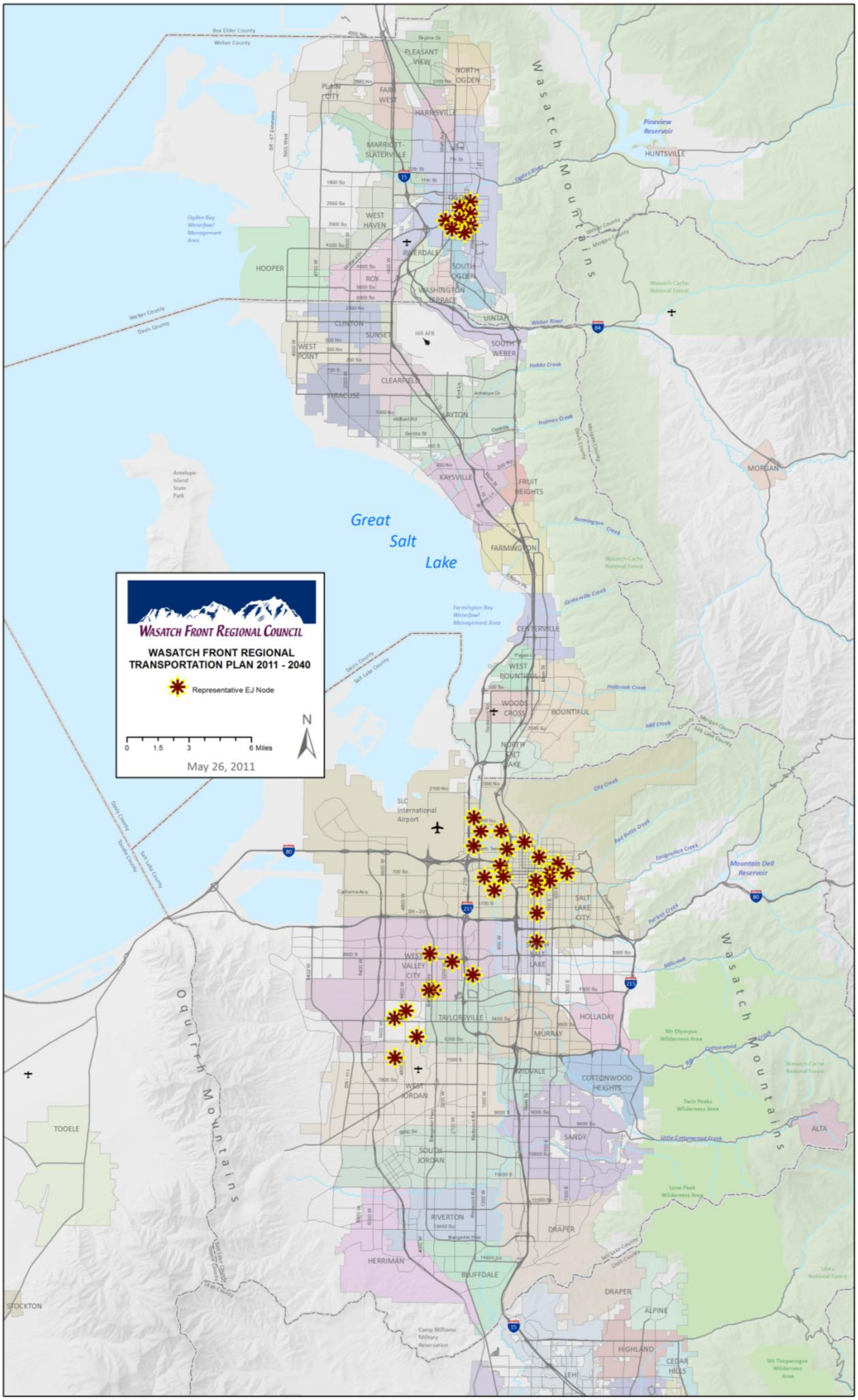
Map 4-6, ACTIVITY CENTERS LOCATIONS



Map 4-7, INFILL LOCATIONS



Map 4-8, AREAS WITH HIGH CONCENTRATIONS OF DISADVANTAGED PERSONS



for the initial Draft RTP Alternative for the auto. The initial Draft RTP Alternative auto projects decreased this value by 0.5 million to 13.6 million. The cumulative number of jobs within 20 minutes of these locations via public transit for the original four alternatives range from 4.0 million for the No Build Alternative to 5.7 million for the Team A Alternative, a range of about 43 percent. The Current RTP and Team A Alternatives were the basis for the initial Draft RTP Alternative for the auto. The Initial Draft RTP Alternative public transit projects decreased this raw value by 0.1 million to 5.6 million.

Freeway Center to Freeway Access

The ability to move freight is an important factor in the Region's ability to maintain and further develop a healthy business climate. Studies by the Federal Highway Administration indicate that about 84 percent of all freight nationwide is delivered via roads and that the demand for freight transportation services will increase 87 percent by 2020. Congestion has more than tripled since 1982 (Texas Transportation Institute) making the cost of doing business more expensive. The per hour cost of delay to a 5-axle combination truck in 2001 was calculated to be $34.08. Additionally, manufacturing is increasingly dependent upon a "just-in-time" delivery system, which is very susceptible to delay.

"Freight center to freeway access" is defined as the roadway travel time from the closest freeway to major freight terminals. A "Freight Center" is also identified by the density of freight related employment such as trucking, manufacturing, and warehousing and as confirmed for the purposes of the RTP by UDOT's freight planner. Once each freight center was identified, a traffic analysis zone was chosen to represent that freight center in the regional transportation demand model.

The supportiveness of each of the transportation system alternatives to the region's freight centers was based upon the travel time from the representative traffic analysis zone to the nearest freeway. The measured values are the sums, in minutes, of one afternoon peak period travel time from each freight center to the nearest freeway for each transportation system alternative. The major freight centers are identified in Map 4-9. Appendix J provides a listing of these freight centers and the estimated travel times to the nearest freeway. Table 4-15 below shows the relative combined freight access to freeway scores for each of the alternatives. These composite scores are based upon a one to ten scale with five representing the average score for the four original and the Initial Draft Alternatives. A score greater than five for a given alternative always indicates that this alternative scored better than average for this measure.

The cumulative travel times from the seventeen freight centers to the nearest freeway in the original four alternatives range from 164 minutes for the No Build Alternative to 79 minutes for both the Current Plan and Team B Alternatives. This is a range of about 110 percent. The Team B Alternative was the basis for the Initial Draft RTP Alternative for the auto. Freight center to freeway access was not a factor in the transit system alternative selection. The initial Draft RTP Alternative auto projects slightly increased this cumulative travel time to 82 minutes.

Environmental Impacts

Virtually all transportation projects present tradeoffs between derived benefits and impacts. The 2011-2040 Regional Transportation Plan system alternative development, evaluation and selection process included potential impacts considerations and criteria early in the process in an attempt

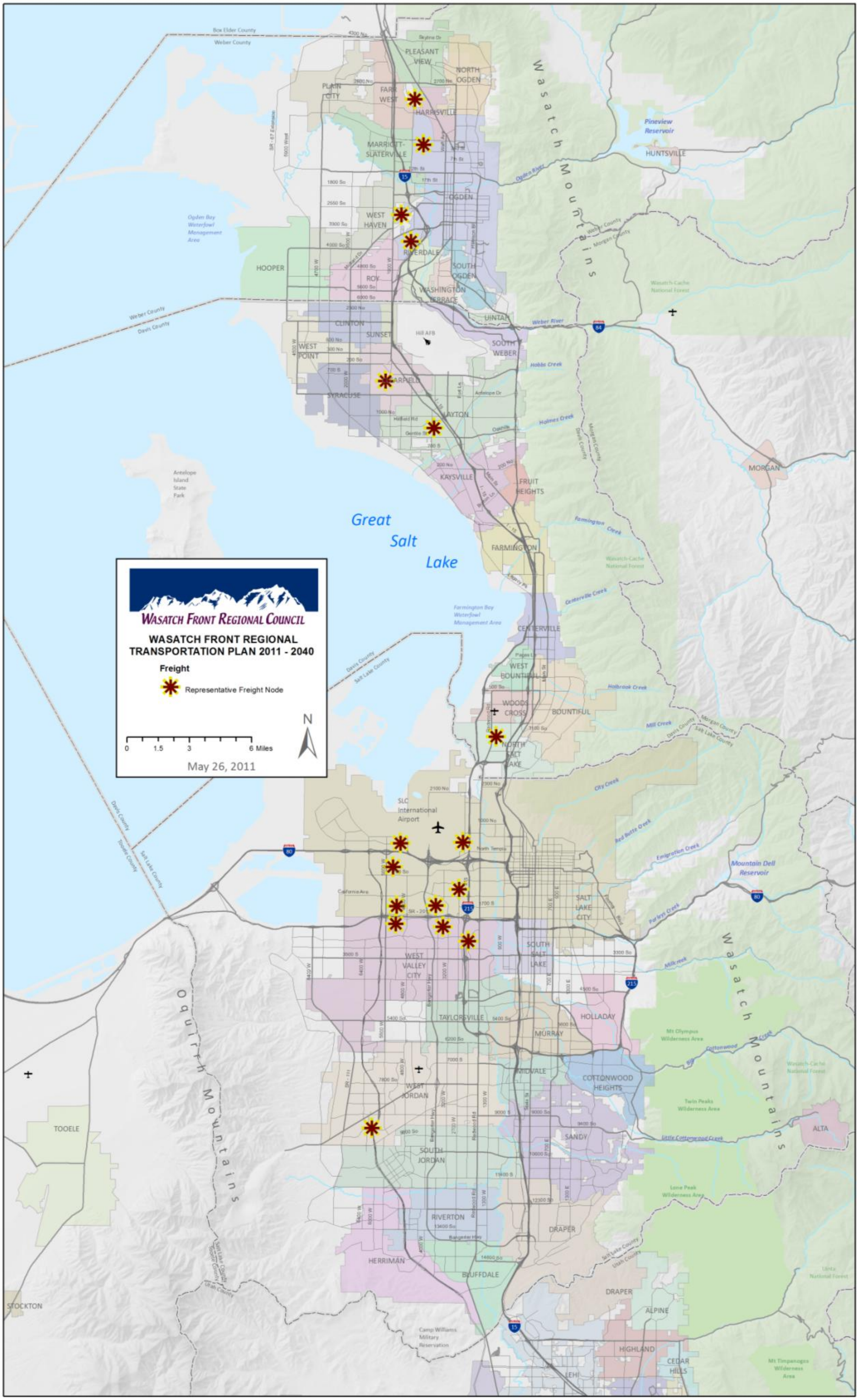
TABLE 4-15

Relative Freight Center to Freeway Access Scores

	No Build	Current Plan	Team A	Team B	Initial Draft RTP
	1.6	5.9	5.8	5.9	5.8

*A 1 to 10 scoring method with 5 representing the average value and higher values representing a more favorable outcome

Map 4-9, WASATCH FRONT FREIGHT CENTERS



to encourage planners to identify and balance both the potential impacts and potential benefits of the proposals. The environmental impact evaluation considered the total and weighted potential direct impacts of the proposed system upon 49 categories of natural, urban, and demographic resources and constructability issues. Air quality impacts were singled out as a separate category and will be discussed later in the document.

The identification of potential impacts was done through Utah Department of Transportation UPEL tool which is one aspect of UDOT's UPLAN process. UPEL stands for Utah Planning and Environmental Linkage. It is a computer based mapping tool and provides a planning level analysis which may be used to compare alternatives but not to certify nor rule out the existence of specific impacts. Impacts are calculated based upon the estimated project footprint. Therefore, only the direct project impacts were assessed. Additionally, because many of the projects are in the concept phase of the planning process, exact locations (and therefore direct impacts) are far from certain. Nonetheless, the WFRC staff attempted to approximate the location and widths of new proposed road and transit projects.

Project widths were estimated by calculating potential width based upon the number of travel lanes and regional averages of non-travel lane width by functional class. If the project was part of the 2007-2030 Regional Transportation Plan, the roadway width was then compared to the future roadway width estimation from the earlier plan and the wider of the two widths was chosen. If a 2011-2040 transit project was located in the roadway it was assumed that the combine project would require another 30 feet of width along its entire length. The following project types were not assessed for environmental impacts: Corridor Preservation, Operational Improvements, streetcars in mixed-traffic, and Enhanced Bus (BRT 1). The environmental impacts of Corridor Preservation are not typically assessed until a project is programmed for a specific corridor. Operational improvements, streetcar lines in mixed-traffic require little additional rights-of-way and the assessment carried out for the alternative is based primarily upon the impacts of additional rights-of-way.

As indicated above, both total potential impacts and weighted potential impacts were evaluated. Although weighting impacts based upon the value of the resource can be highly subjective, WFRC staff attempted to do so with some assistance from the environmental consultants that created UPEL, recognizing that not weighting impacts by value also comes with limitations. The relative weighted scores are found in Table 4-16 below. The scores in Table 4-16 are based upon a one to ten scale with five representing the average score for the four original and the Initial Draft Alternatives. A score greater than five for a given alternative always indicates that this alternative scored better than average for this measure. The raw un-weighted and weighted environmental evaluation scores for each of the 49 evaluated categories can be found in Appendix I. Appendix I also provides a discussion of how weighting was applied to each of the evaluated categories and Tables I-X through I-X of Appendix I list the weightings applied to each of the categories.

TABLE 4-16

Weighted Relative Environmental Scores

	No Build	Current Plan	Team A	Team B	Initial Draft RTP
Natural Environment	NA	4.6	4.6	4.9	5.9
Construction Environment	NA	5.0	4.1	7.0	3.9
Urban Environment	NA	4.5	4.6	6.5	4.3
Demographic Environment	NA	4.5	4.7	6.1	4.7
*All relative terms of measure					

As illustrated in the Table 4-16 above, the relative weighted scores for the natural environment ranged from 4.6 for the Current Plan and Team A Alternatives to 5.9 for the initial Draft RTP indicating that the initial Draft RTP had the fewest overall relative weighted impacts upon the natural environment. Although the Initial Draft RTP Alternative had the fewest overall potential natural environmental impacts, a review of the differences of 33 percent or more between the alternatives in terms of the ten subcategories of natural impacts is instructive. The most prominent differences are that the initial Draft of the RTP had a 60 to 68 percent lower impact upon ecological hot spot and high diversity locations. This is a highly weighted subcategory of the Natural Environment major category. Most of these locations are in northwest Weber County and the initial Draft of the RTP recommends fewer projects in that area compared to the other alternatives.

The initial Draft of the RTP has a 35 to 65 percent higher potential impact on waterways than any of the other alternatives. It also has higher potential impacts than Alternative B upon canals (77 percent), streams (65 percent), and water quality (55 percent). Although individual projects were not individually assessed at this stage of the RTP process, some of these differences may be due to several factors. First, they may be due to canyon/mountain located projects. The initial Draft Alternative recommends the widening of I-80 in Parley's Canyon, an exclusive lane transit project in Little Cottonwood Canyon, and the widening of US-89 in Davis County. These are projects that existed individually in the other alternatives but have been combined in the initial Draft RTP Alternative. Second, the difference between initial Draft of the RTP and Alternative B may be due in part to the amount of exclusive lane transit provided. The Team B alternative had significantly fewer transit projects and transit projects were always assumed to require 30 feet of right-of-way beyond the widest road requirement. This would not likely be the case when the transit projects are built as the transit lanes would get a portion of their rights-of-way from the center turn lanes. Lastly, the initial Draft RTP also added the widening of 10200 / 10400 South which may account for impact to streams (Jordan River) and canals. These environmental evaluations were conducted for the final draft RTP and most of its individual projects and can be found in Chapter 8.

Table 4-16 above also illustrates the relative weighted scores for the construction environment. The construction environment major category includes sub-categories such as engineering problems and waste sites. These problems can be overcome by planning and engineering but potentially at a higher cost to the projects. Overall, the initial Draft RTP Alternative scored the worst in this major category on a weighted basis. The most prominent differences between alternatives are that the Initial Draft of the RTP had an 84 to 271 percent higher exposure to steep slopes. Presumably this higher exposure to steep slopes is due in part to the widening of I-80 in Parley's Canyon; an exclusive lane transit project in Little Cottonwood Canyon; the widening of US-89 in Weber and Davis Counties; the new road and widening between SR-193 in Layton and South Ogden, and the extension of Highland Drive. These projects are also likely to increase the exposure of the initial Draft RTP Alternative to other construction environment subcategories such as engineering problems, fault lines, landslides, and Impaired Waters. Other prominent differences are primarily between the initial Draft RTP and the Team B Alternative. These may include additional exposure to hazard and solid waste sites, liquefaction potential, and fault lines. These prominent differences may also be due to the difference in the amount of exclusive lane transit. These environmental evaluations were conducted for the final draft RTP and most of its individual projects and can be found in Chapter 8.

The weighted potential impacts to the Urban Environment are also shown in Table 4-16 above. The Urban Environment Major Category assesses the types of lands taken for project rights-of-ways. These include an assessment of their open space characteristics, land use, development intensity, ownership, and if project sites have historical or archeological significance. Overall, the initial Draft RTP Alternative scored the worst in this major category on a weighted basis. The most prominent differences between the initial Draft of the RTP and all the other alternatives are that it had fewer potential impacts upon agricultural protection areas, open space, and conservation and mitigation areas and more potential impacts upon federal lands, cemeteries, historic sites, and archeological sites. The initial Draft also had more impacts than on Alternative B in terms of parks, commercial/industrial uses, residential uses, medium to high intensity development areas, and private property. Once again, some of the contributing factors to the reduction in impact by the initial Draft RTP Alternative are changes to northwest Weber County projects. Some of the contributing factors to the increase in potential impacts by the Initial Draft RTP Alternative are the mountain/canyon projects, the number of exclusive lane transit projects, and how the transit project impacts were assessed. Care will need to be taken in the project development stage to avoid or mitigate these potential impacts. The environmental evaluations conducted for the final draft RTP and most of its individual projects can be found in Chapter 8.

The weighted potential impacts to the Demographic Environment are also shown in Table 4-16. The demographic environment major category broadly assesses the potential impacts to disadvantaged households and communities. In some ways this is a difficult assessment to make on a system-wide level. Transportation projects clearly provide for disadvantaged populations potential benefits but can change neighborhoods in negative ways. Other planning criteria were developed to encourage serving disadvantaged communities. None-the-less, the analysis carried out for these alternatives indicate that the initial Draft RTP Alternative scores better than the Current RTP, about equal to the Team A Alternative, and somewhat less than the Team B Alternative. Care must be taken in the project development stage to balance serving these communities with better access while minimizing impacts of construction and potential barriers. These environmental evaluations were conducted for the final draft RTP and most of its individual projects and can be found in Chapter 8.

Air Quality

To compare the air quality impacts of the various system alternatives considered in developing the 2040 RTP, WFRC staff estimated the daily on-road mobile source emissions of nitrogen oxides (NOx), direct particulates smaller than 2.5 um (PM2.5), carbon monoxide (CO), volatile organic compounds (VOC), and carbon dioxide (CO2) for each alternative. Many of these tailpipe emissions are included among the criteria pollutants responsible for EPA's non-attainment and maintenance designations, based on the negative health impacts of these pollutants. Carbon dioxide emissions, while non-toxic and not a direct health hazard were included in this analysis for the purpose of documenting some of the major greenhouse gas emissions. The emissions comparison was intended to estimate the relative impact on emissions for each alternative. Winter conditions were used in the model because CO and NOx emissions are more severe in the Winter months. VOC emissions are lower in the winter but the relative VOC emissions for each alternative is still captured in this analysis.

TABLE 4-17

Air Quality Impact Scores

	No Build	Current Plan	Team A	Team B	Initial Draft RTP
Nitrogen Oxides (NOx)	5.0	5.0	5.0	5.0	5.0
Direct particulates <2.5um (PM 2.5)	4.9	5.0	5.0	5.0	5.0
Volatile Organic Compounds (VOC)	4.7	5.1	5.1	5.1	5.1
Carbon Monoxide (CO)	4.9	5.0	5.1	5.0	5.0
Carbon Dioxide (CO2)	4.9	5.0	5.0	5.0	5.0
Tons per day in emitted by mobile sources Weber, Davis and Salt Lake Counties					

By weight, carbon dioxide is by far the single largest tailpipe emission. Of the remaining pollutants, carbon monoxide is the next dominant emission comprising 94 percent of total tailpipe emissions. Emissions of CO have been substantially reduced in the past decades to levels well below the limits defined in the State (air quality) Implementation Plan (SIP). Localized or "hot spot" emissions of CO at sensitive receptor testing sites can be a concern and these impacts are examined in individual project studies. NOx emissions are perhaps the most critical emission to track because NOx contributes both to ozone (O3) pollution in the summer months and particulate matter (PM10 and PM2.5) pollution in the Winter months. VOC emissions also contribute to summer O3 conditions.

Table 4-17 shows the relative air quality emission scores for each of the transportation system alternatives. These composite scores are based upon initial Draft Alternatives. A score greater than five for a given alternative always indicates that this alternative scored better than average for this measure. You will note that the difference between these alternatives in terms of emissions is very small.

Table I-X in Appendix I provides the actual emissions expressed in tons of pollutants per day. In reviewing the results of the emissions analysis, it may be most helpful to look at the relative difference in each emission type for the various alternatives evaluated rather than focusing on the alternative with the lowest total emissions. As mentioned previously, CO and CO2 are the dominant emissions by weight but the greatest air quality challenges for the Wasatch Front Area, in terms of direct toxic impacts to human health, are not with CO2 or even with CO. An examination of the NOx emissions indicates a 0.39 tons/day difference between the three alternatives, a variation of about +/- one percent.

PUBLIC INPUT ON SYSTEM ALTERNATIVES

Pursuant to the requirements of SAFETEA-LU, the Wasatch Front Regional Council developed a set of alternatives for the 2040 RTP based on public involvement scoping and a transportation needs evaluation. These draft alternatives were then displayed at open houses in August 2010, to the respective county councils of governments, the WFRC's technical advisory committees, the Joint Policy Advisory Committee, the Regional Growth Committee, and the WFRC's Transportation Committee. In addition, scoping level and alternatives level comments were accepted from natural resource agencies, chambers of commerce, environmental groups, the local transit workers union, disabled rights groups, Native American groups, low income organizations, senior citizens committees, state, federal and local government agencies, and many other interested citizens and groups. Only a few comments were specifically directed towards the Transportation Systems as a whole; however, many comments were received regarding specific projects. The comments are summarized below.

General Comments

- The draft RTP should emphasize transit over highways
- An air quality analysis needs to be done for each alternative
- "We suggest an all new/expanded rail alternative with criteria pollutant analysis"
- The MOVES model should be used for the above suggested air quality analysis
- Add extensive walk/bike paths and connection nodes to each alternative
- Growth assumptions should be tested using recessionary estimates and optimistic economic forecasts as well
- "I would just recommend that the applicant involve the (Army) Corps (of Engineers) as early in their development plans as they can. This would help to expedite the Section 404 permitting process

Davis County

- 2000 West should be widened to four lanes
- East / West travel is rapidly becoming a problem
- The West Davis Highway should be in the first phase of the 2040 RTP
- Overpasses for I-15 and US-89 should be built to facilitate east / west travel
- Construct West Davis Highway with a Legacy Parkway connection
- The Enhanced Bus (BRT 1) line through Farmington City should be along the I-15 frontage road as agreed to in the Farmington City Master Plan
- A full interchange is needed at Legacy Parkway and Center Street
- Improve the congested I-15 Interchange at Hillfield Road
- Construct a new I-15 Interchange at 1800 North
- Add more bicycle lanes and wider shoulders
- "I feel the best route to move traffic east/west would be SR-193 because its already funded to 2000 West."
- Support a transit loop on SR-193/Hill AFB as noted on Alternative Four

Weber County

- East / West traffic is becoming increasingly congested
- The Weber County portion of the Legacy Highway should be identified and preserved
- Preserve the corridor for the eventual widening of 12th Street west of I-15
- "Monroe Blvd.: From 1300 North to 3100 North—Please Remove"
- Traffic on Harrison Blvd. near Weber State University is at "failure"
- Harrison Boulevard should only have operational improvements, no widening
- The freeway interchange at 24th Street needs improvement
- If the 24th Street Interchange is reconstructed, the 21st Street Interchange will have to be redone as well. "You will lose access to West Haven City"
- The intersection at Harrison Boulevard and U.S. 89 needs to be significantly improved
- There is strong support for a streetcar to Weber State University
- Ogden City should remain the transit hub of Weber County
- The Fairfield Road extension would relieve pressure on Harrison Boulevard
- Any north / south transit line through Ogden City should extend to 2700 North
- Bicycle lanes should be part of any highway or transit project
- A park and ride lot is needed in the Ogden Valley.
- FrontRunner should be shown as extending into Box Elder County
- FrontRunner extensions out to Pleasant View are running mostly empty
- Widen Pioneer Road in Weber County from 1200 West to I-15 as in Alternative 2

Salt Lake County

- Bingham Junction Boulevard south of 7800 South needs to stay in the first phase of the Regional Transportation Plan
- East / west travel, especially across Bangerter Highway, is a problem. The continuous flow intersections do help
- SR-111 needs to remain limited access similar to Bangerter Highway
- Expand 7200 West and 5600 West north of I-80. Connect 5600 West and 7200 West with 700 North in the northwest quadrant of Salt Lake City
- Widen State Street from 6200 South to 8800 South
- Add a major transit investment corridor to the northwest quadrant of Salt Lake City

- The widening of SR-201 west of 5600 West to Magna
- 14600 South west of I-15 needs the railroad bridge removed. However, the road should remain a two lane collector only west of the railroad bridge. BRT service on 5600 West should be provided
- TRAX should extend along 3500 South to 9200 West
- Porter Rockwell Boulevard is now part of Bluffdale City's General Plan.
- An intensive transit service is needed from the 10400 South FrontRunner station up 9400 South to the mouth of Little Cottonwood
- Extension of Highland Drive from 9800 South to Pioneer Road should be shown as new construction
- Add slip ramps to I-15 at 10000 South

SYSTEM EVALUATION SUMMARY

The system evaluation results were reviewed by the WFRC staff and presented to the Regional Growth Committee and the Wasatch Front Regional Council. Each are of the four system alternatives performed better according to some of the evaluation factors than the others. However, the initial *Draft* RTP performed well in some of the more important factors and seemed to emerge as the best overall alternative.

In terms of the highway system the initial *Draft* RTP provided the largest and most costly highway alternative but better addressed corridor travel times, safety, and corridor goals while having the least potential environmental impacts. Also, although not providing the best results, the initial *Draft* RTP Alternative scored well in terms of reducing delay and serving activity centers and infill areas. Care will need to be taken to avoid and mitigate impacts to the disadvantaged communities and to avoid costly alignment decisions. This is especially true for mountain and canyon transportation.

In terms of the transit system, one of the more important factors is ridership gained for the costs incurred. The initial *Draft* was the least expensive to construct but garnered the second highest ridership and second highest anticipated transit passenger miles traveled. This indicates that suggested placement of capital improvements is likely appropriate. However, its operations costs were high. Costs can be adjusted as the projects come to fruition. The initial *Draft* RTP Alternative was best in meeting corridor specific goals, many of which were transit related. It was also second best in meeting the access needs of the disadvantaged. The initial *Draft* RTP did not perform the best in terms of corridor travel time and it missed some activity centers. These weaknesses were noted and many were resolved in preparing the final *Draft* 2040 RTP. As was the case with the highway system, care should be taken to avoid and mitigate the impacts of transit on the disadvantaged communities and to avoid costly alignment decisions. This is especially true for mountain and canyon transportation.

The initial *Draft* RTP Alternative was gleaned from the first four alternatives. The Regional Growth Committee and the Wasatch Front Regional Council endorsed the initial *Draft* RTP Alternative as the best starting point for the 2040 RTP project selection and refinement process.

The Initial Draft RTP Alternative

The initial *Draft* RTP Alternative was developed after each of the four transportation systems were reviewed and evaluated. Sources were primarily from the 'No-build', "Current Plan", "Team A" and "Team B" Alternatives. Alternative 4 "Team B" was used as a base due to its low system delay and moderate project costs. Every highway project in Alternative 4 was reviewed, followed by every highway project in Alternative 2 and Alternative 3 using (1) the existing volumes for each alternative, (2) the 2040 volumes for each alternative, (3) referencing the Wasatch Choice for 2040, and (4) taking into consideration the comments received regarding the alternatives from the public, planners, engineers, elected officials, and UDOT.

The transit projects were selected and further defined primarily using two methods. First, each project segment was reviewed for average weekday ridership on that segment. Project segments falling under 2,000 riders per day were either eliminated as a 2011-2040 RTP project or redefined as an Enhanced Bus (BRT 1) project. Second, projects from the various alternatives that served the same broad corridor were compared and one of the projects was selected. Generally speaking ridership, environmental impacts, and direction from corridor studies were the primary considerations in this selection method. Table 4-18 lists the initial highway and transit projects for the draft 2040 RTP. Map 4-10 shows the initial highway and transit projects for the draft 2040 RTP.

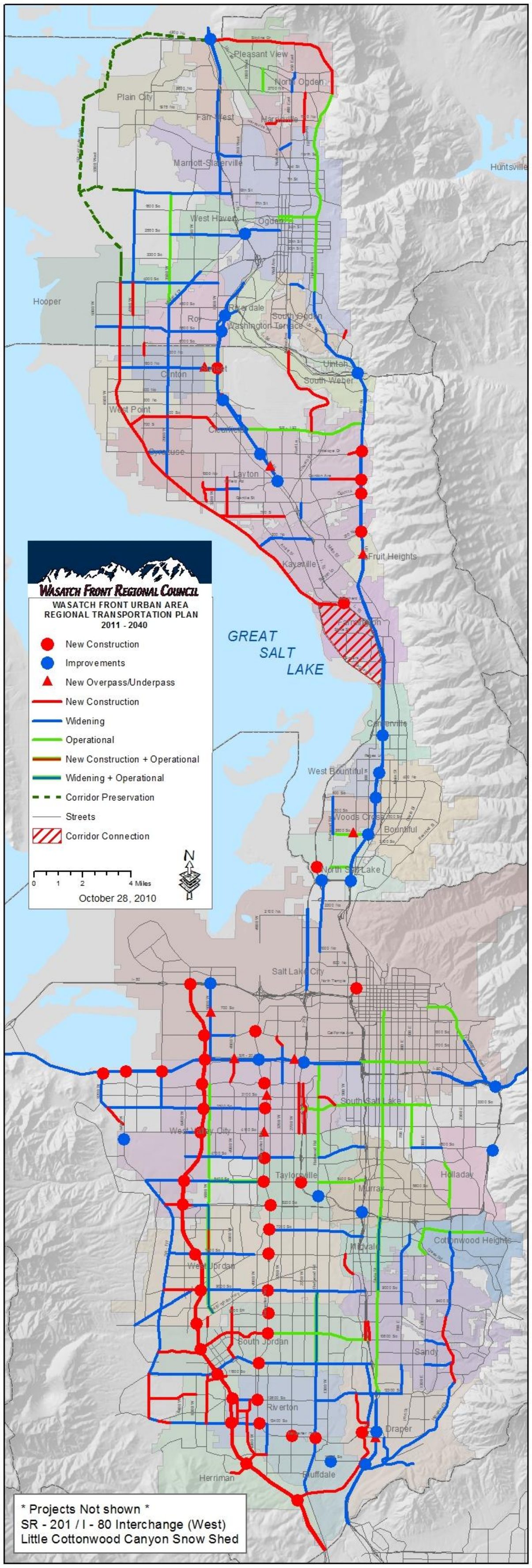
TABLE 4-18

Select Initial Draft 2011-2040 RTP System Alternative Projects

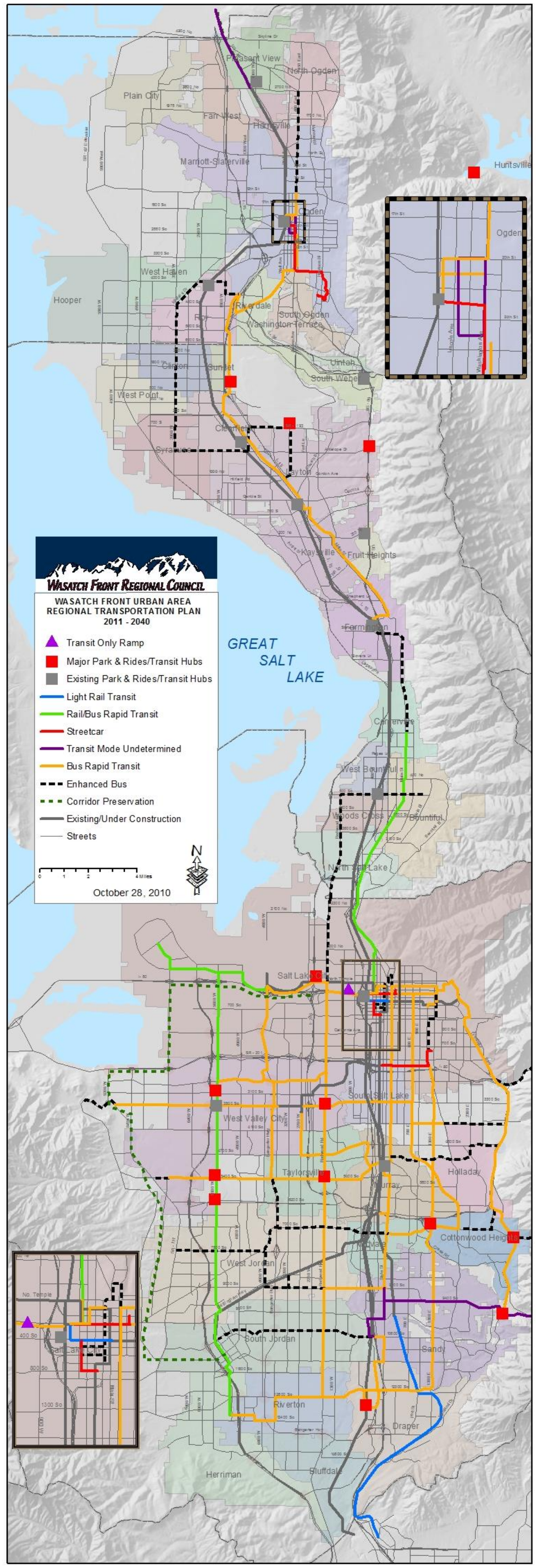
Major Highway Projects	
West Davis Corridor – 4000 South to I-15 / US-89 (Farmington)	
Mountain View Corridor – I-80 to Utah County Line	
Bangerter Highway Interchanges – I-80 to I-15	
Harrison Boulevard – 20th Street to US-89	
I-215 – 2100 North to 4700 South	
I-15 – I-84 to Hillfield Road	
US-89 – Harrison Boulevard to I-15 (Farmington)	
2000 West / 3500 West – West Davis Corridor to Hinkley Drive	
SR-111 – SR-201 to 13400 South	
Highland Drive – Fort Union Boulevard to I-15	
Redwood Road – 9000 South to Porter Rockwell Road	
SR-201 – I-80 (West) to I-15	
Major Transit Projects	
Project Name	**Project Path / Limits**
North Ogden – Salt Lake Enhanced Bus (BRT 1) / Bus Rapid Transit (BRT 3)	North Ogden – Ogden – Riverdale – Falcon Hill–Layton–Farmington–Bountiful–Salt Lake
Salt Lake City – Foothill Drive – Wasatch Drive Bus Rapid Transit (BRT 3) / Enhanced Bus (BRT 1)	- Salt Lake CentraL-University of Utah–Medical Center-Research Park–East Millcreek-Cottonwood Corporate Center–Cottonwood Canyons
700 East Bus Rapid Transit (BRT 3)	Salt Lake Central–South Salt Lake-Millcreek-Murray–Holladay–Cottonwood Heights–Fort Union
State Street Bus Rapid Transit (BRT 3)	State Street - Salt Lake Central–Capitol–South Salt Lake–Millcreek–Murray–Midvale–Sandy/South Jordan FrontRunner–Draper FrontRunner
Draper (South) Light-rail	12400 South to Utah County
Redwood Road Bus Rapid Transit (BRT 3)	Downtown Salt Lake–Airport East Hub–West Valley–Taylorsville–South Jordan–Draper FrontRunner
Bangerter Highway Bus Rapid Transit (BRT 3) / Enhanced Bus (BRT 1)	Airport TRAX Line-6200 South-Draper Front Runner Station
*Projects were designated as Light-rail, Bus Rapid Transit III, or Enhanced Bus (BRT 1) in this alternative	

Map 4-10, INITIAL DRAFT 2011-2040 RTP HIGHWAY AND TRANSIT PROJECT MAP

INITIAL REGIONAL TRANSPORTATION PLAN HIGHWAY PROJECTS



INITIAL REGIONAL TRANSPORTATION PLAN TRANSIT PROJECTS




TO SOUTH
Minuteman
NO
TURN
ON RED

Chapter 5

Refining the Preferred Alternative

The objectives of the project selection and phasing portion of the 2040 RTP development process were to refine the selected 'preferred alternative' to a list of defined projects, to identify the phase each project would be needed, and then place each selected project in one of three financially constrained phases, or "time horizons", within the RTP. The selected preferred alternative and how it was evaluated is discussed at length in Chapter 4 of this document. The potential projects were derived from this preferred alternative, from other alternatives evaluated in Chapter 4, and from suggestions made by state and local jurisdictions. A potential project is considered 'selected' when its individual characteristics such as length, width, and general alignment are defined.

A project is considered "phased" when its construction start is placed into one of the three funded 2040 RTP time horizons, or it is placed into the unfunded list of projects. The three phases of the 2040 RTP are as follows: Phase 1 is between the years 2011 to 2020; Phase 2 is between the years 2021 and 2030; and Phase 3 is from 2031 to 2040. The criteria and methodology used by the WFRC for project selection and phasing differed slightly by mode. For this reason highway and transit criteria and methodology will be discussed separately. Non-motorized facilities were not refined, ranked, or phased because no constrained funding source is identified for these projects.

Photo at Left: UDOT's first ThrU Turn intersection (TTI) at 12300 South and State Street in Draper eliminates all left turns at the intersection. Motorists now travel through the intersection, make a signalized U-turn and come back to the intersection, where they will make a right turn. The TTI reduces congestion and delay while improving safety.

HIGHWAY PROJECT SELECTION AND PHASING

Potential highway projects were first evaluated utilizing the WFRC Congestion Management Process (CMP). The CMP is designed to determine if the anticipated congestion on an individual facility can be resolved or delayed by incorporating TSM and TDM projects into the 2040 RTP, rather than constructing additional lanes. Potential highway projects which demonstrated the need for additional lanes in the CMP were then defined and refined for the 2040 RTP based on a combination of the following:

- individual project measures
- CMP findings
- WFRC developed criteria

Following the CMP process, the WFRC staff developed a quantifiable method which was used to rank and phase highway improvements. The following outlines the evaluation process used to rank potential highway projects.

Individual Project Measures

The individual project measures considered in defining the highway project characteristics are as follows:

- projected traffic volume to highway capacity ratios
- the extent to which the project promotes the use of interconnected streets
- any known regionally significant relocations or community impacts
- any serious known hazmat or natural disaster exposures
- any other known critical natural or cultural impacts
- access to regionally significant priority growth areas

The individual measures primarily helped to refine highway project width, length, functional class, general alignment, and interchange location.

Congestion Management Process (CMP)

The CMP applied a level of service approach to defining highway capacity needs based upon Regional Transportation Demand Model projections. The CMP applied Transportation System Management (TSM) and Transportation Demand Management (TDM) strategies to a “No Build” transportation network with estimated travel demand for the year 2040. The only highway facilities recommended for increased capacity were those that still showed an afternoon (PM) peak period level of service of “E” or “F” despite the TSM and TDM improvements.

The first priority of the CMP was to identify project recommendations for TSM improvements. Table 5-1 identifies CMP recommendations for operational improvements. Demand management strategies, or TDM, are also recommended throughout the Wasatch Front Region and include projects such as transit improvements (commuter rail, light rail, bus rapid transit (BRT 3), and bus), HOV/HOT lanes, park and ride lots, and pedestrian/ bicycle facilities.

TABLE 5-1

CMP Recommendations for TSM Improvements

Route	Recommended TSM Projects From	To	Improvement
SALT LAKE AREA			
2100 South	I-15	1300 East	Operational
3300 South / 3500 South	I-215 (West)	Highland Drive	Operational
5400 South	5600 West	Bangerter Highway	Operational
5400 South	Redwood Road	I-15	Operational
Fort Union Boulevard	Union Park Boulevard	3000 East	Operational
10600 South / 10400 South	Bangerter Highway	I-15	Operational
5600 West	2700 South	6200 South	Operational
5600 West	6200 South	New Bingham Highway	Operational
Redwood Road	SR-201	4700 South	Operational
Redwood Road	9000 South	11400 South	Operational
State Street	600 South	I-215	Operational
State Street	I-215	12300 South	Operational
900 East	3300 South	4500 South	Operational
Union Park Boulevard / 1300 East	Fort Union Boulevard	7800 South	Operational
Highland Drive	Murray Holladay Boulevard	Van Winkle Expressway	Operational
500 South / Foothill Drive	1300 East	2300 East	Operational
OGDEN / LAYTON AREA			
SR-193	I-15	US-89	Operational
2600 South / 1100 North	Redwood Road	I-15	Operational
Center Street	Redwood Road	US-89	Operational
20th Street	Wall Avenue	Harrison Boulevard	Operational
21st Street	Wall Avenue	Adams Avenue	Operational
3500 West	1200 South	Midland Drive	Operational
600 West	Elberta Drive	2600 North	Operational
Harrison Boulevard	2600 North	12th Street	Operational
Harrison Boulevard	12th Street	Country Hills Drive	Operational

The Congestion Management Process identified the projects in Table 5-2 based on the additional capacity needed to meet future demand. Exceptions to this level of service approach are discussed in the following paragraphs.

TABLE 5-2

CMP Recommendations for Capacity Improvements

Route	Recommended Capacity Projects From	To	Improvement
SALT LAKE AREA (NORTH / SOUTH)			
5600 W	SR-201	I-80	Widen to 4 lanes, RR grade separation
5600 W	6200 S	7000 S	Widen to 4 lanes
700 E	9400 S	Fort Union	Widen to 6 lanes
700 E	11400 S	12300 S	Widen to 4 lanes
7200 W	3500 S	SR-201	Widen to 4 lanes
9200 W	SR-201	3500 S	Widen to 4 lanes
Bangerter Hwy	I-15	I-80	Grade separated
Foothill Blvd	2300 E	I-80	Widen to 6 lanes
Highland Dr	Ft Union	9400 S	Widen to 6 lanes
Highland Dr	9400 S	9800 S	Widen to 4 lanes
Highland Dr	11800 S	Bangerter Hwy	Widen to 4 lanes
Highland Dr-connection	Highland Dr	13800 S	Widen to 4 lanes
I-215 (northwest)	I-80	2100 N	Widen to 8 lanes
Mountain View Corridor	6200 S	SR-201	New 8-lane freeway
Mountain View Corridor	SR-201	I-80	New 4-lane freeway
Mountain View Corridor	Utah Co. border	6200 S	Grade separated
Mountain View Corridor	Utah Co. border	6200 S	Widen to 8 lanes
Redwood Rd	9000 S	Bangerter Hwy	Widen to 6 lanes
Redwood Rd	Bangerter Hwy	Porter Rockwell	Widen to 6 lanes
SR-111	5400 S	11800 S	Widen to 4 lanes
State St	9000 S	I-215	Widen to 6 lanes
OGDEN / LAYTON AREA (NORTH / SOUTH)			
1900 W	12th Street	2700 N	Widen to 4 lanes
Harrison Blvd	Hwy 89	Country Hills	Widen to 6 lanes
Hwy-89	I-15	Harrison Blvd	Widen to 6 lanes
I-15	Hillfield Rd	I-84	Widen to 8 lanes
I-15	I-215	Farmington	Widen to 10 lanes
I-15	2700 N	Box Elder Co. Line	Widen to 6 lanes
Redwood Rd (North SL)	2600 S	500 S (Bountiful)	Widen to 4 lanes
Riverdale Rd	1900 W	I-84	Widen to 6 lanes
SR-108	Syracuse Rd	1900 W	Widen to 4 lanes

TABLE 5-2 (CONTINUED)

CMP Recommendations for Capacity Improvements

Recommended Capacity Projects			
Route	From	To	Improvement
SALT LAKE AREA (EAST / WEST)			
11400 S	Bangerter Hwy	I-15	Widen to 6 lanes
11800 S/11400 S	SR-111	Bangerter Hwy	Widen to 4 lanes
12300 S/12600 S	Redwood	700 E	Widen to 6 lanes
13400 S	8000 W	Mountain View Cor	Widen to 4 lanes
13400 S	Mountain View Corridor	4000 W	Widen to 6 lanes
3500 S	9200 W	Bangerter Hwy	Widen to 4 lanes
4500 S	I-15	Redwood	Widen to 6 lanes
4500 S	900 E	2300 E	Widen to 4 lanes
4700 S	6400 W	4000 W	Widen to 4 lanes
4700 S	4000 W	2700 W	Widen to 6 lanes
5400 S	SR-111	Bangerter Hwy	Widen to 6 lanes
7000/7200 S	Bangerter Hwy	I-15	Widen to 6 lanes
7800 S	SR-111	New Bingham Hwy	Widen to 4 lanes
9000 S	Bangerter Hwy	I-15	Widen to 6 lanes
9000 S	Mountain View Corridor	Bangerter Hwy	Widen to 6 lanes
I-80	1300 E	I-215 (east)	Widen to 8 lanes
Lone Peak Pkwy	11400 S	12300 S	Widen to 4 lanes
New Bingham	9000 S	Old Bingham	Widen to 4 lanes
SR-201	I-80	5600 W	Grade separated
SR-201	I-80	5600 W	Widen to 6 lanes
SR-201	5600 W	I-15	Widen to 8 lanes
OGDEN / LAYTON AREA (EAST / WEST)			
1200 S	4700 W	I-15	Widen to 4 lanes
1800 N	3000 W	Main St	Widen to 4 lanes
200 N, Kaysville	Flint	I-15	Widen to 4 lanes
24th Street	I-15	Lincoln	Widen to 4 lanes
4000 S	4700 W	1900 W	Widen to 4 lanes
5600 S	4700 W	1900 W	Widen to 4 lanes
Country Hills	Adams Ave	Gramercy Ave	Widen to 4 lanes
Larsen Ln (Harrisville)	Wall Ave	400 E	Widen to 4 lanes

TABLE 5-3

CMP Recommendations to "Complete the Network"

Recommended Projects to Complete the Network			
Route	From	To	Improvement
SALT LAKE AREA (NORTH / SOUTH)			
4150 W	12600 W	Riverton Blvd	2 lanes
4200 W/Riverton Blvd	13400 S	14400 S	2 lanes
4800 W	Parkway Blvd	SR-201	2 lanes
4800 W	Old Bingham Hwy	11400 S	2 lanes
5600 W	7000 S	7800 S	4 lanes
5600 W	Old Bingham Hwy	Bingham Creek Rd	2 lanes
5600 W	11800 S	13400 S	Widen to 2 lanes
8000 W	11800 S	13400 S	2 lanes
9200 W	3500 S	3900 S	4 lanes
Bingham Jct Blvd	700 W @8400 S	7800 S	2 lanes
Cottonwood St.	4500 S	Vine St.	2 lanes
Galena Park Blvd	12300 S	Lone Peak Pkwy	Access to commuter rail
Highland Dr	9800 S	11800 S	4 lanes
I-15 (southbound)	12300 S	Bangerter Hwy	(Lane balance)
Lone Peak Pkwy (500 W)	12300 S	Bangerter Hwy	4 lanes
Riverton Blvd	4570 W	13400 S	2 lanes
OGDEN / LAYTON AREA (NORTH / SOUTH)			
2700 W (Layton)	Gordon Ave	Layton Pkwy	2 lanes
3000 W (Clinton)	6000 S (Weber Co.)	2300 N	2 lanes
3650 W (Layton)	700 N	Gentile St	2 lanes
400 E (North Ogden)	2700 N	3100 N	4 lanes
4700 W	4600 S	4800 S	2 lanes
Fairfield Rd Extension	SR-193	South Weber Dr	2 lanes
Monroe	1300 N	3100 N	2 lanes
Skyline Dr	Fern Dr	4600 S	2 lanes
Skyline Dr	Ogden City limits	Eastwood Blvd	2 lanes
West Davis Corridor	Farmington	4000 S	4 lanes
West Davis Corridor	4000 S	12th Street	2 lanes

TABLE 5-3 (CONTINUED)

CMP Recommendations to "Complete the Network"

Recommended Projects to Complete the Network			
Route	**From**	**To**	**Improvement**
SALT LAKE AREA (EAST / WEST)			
10400 S	4800 W	Mountain View Corridor	4 lanes
10600 S	Mountain View Corridor	SR-111	4 lanes
10600 S	1300 E	Highland Dr	Widen to 4 lanes
11400 S	1300 E	Highland Dr	Widen to 4 lanes
12600 S/Herriman Pkwy	8000 W	6000 W	4 lanes
3100 S	Redwood Road	3300 S	4 lanes
4570 W	12600 S	13400 S	2 lanes
6200 S	Mountain View Corridor	SR-111	4 lanes
9000 S	5600 W	SR-111	4 lanes
Juniper Crest	4800 W	Mountain View Corridor	2 lanes
Juniper Crest/14400 S	Mountain View Corridor	3600 W	2 lanes
OGDEN / LAYTON AREA (EAST / WEST)			
12^{th} Street	West Davis Corridor	SR-126	Widen to 4 lanes
1700 N (Harrisville)	Hwy-89	400 E	2 lanes
1800 N	West Davis Corridor	SR-126	Widen to 4 lanes
2550 S	3500 W	I-15	Widen to 4 lanes
4000 S	West Davis Corridor	SR-126	Widen to 4 lanes
5500 S	5900 W	3500 W	Widen to 4 lanes
Antelope Dr	Oak Forest Dr	Hwy-89	2 lanes
Gordon Ave	Fairfield	1600 E	Widen to 4 lanes
Gordon Ave	1600 E	Hwy-89	4 lanes
Hill Field Road Extension	2200 W	3650 W	Widen to 4 lanes
Layton Pkwy (700 S)	West Davis Corridor	Flint St	4 lanes
Skyline Dr (Pleasant View)	2700 N	Hwy-89	2 lanes
SR-193 Extension	West Davis Corridor	Main St	4 lanes

The CMP allowed exceptions to this level of service approach for project recommendations based upon a project's potential role in one of three cases: completing the transportation network; the presence of high concentrations of truck traffic; or eliminating constrictions to traffic flow. A complete network is an important congestion management consideration since the Region's highway network is primarily a grid system. Gaps in that grid can lead to unbalanced traffic flows as the area grows. Filling in those transportation gaps, or "completing the network," is a valid strategy in the CMP even if modeled traffic volumes do not meet the LOS criteria for new facilities. The Congestion Management Process recommended "Complete The Network" projects are listed in Table 5-3.

TABLE 5-4

CMP Recommendations for Trucks

Recommended Projects for Trucks			
Route	From	To	Improvement
SALT LAKE AREA			
3200 W	Parkway Blvd	1820 S	Widen to 4 lanes
3200 W	1820 S	California Ave	Widen to 4 lanes
700 S	5600 W	2700 W	Widen to 4 lanes
California Ave	Mountain View Corridor	4800 W	Widen to 4 lanes
I-80	I-215 (east)	Summit of Parley's Canyon	Eastbound truck lane
OGDEN / LAYTON AREA			
None			

Other projects in the CMP have been identified on the basis of providing additional capacity in certain locations that experience a high concentration of truck traffic. Because of the size and operating characteristics of commercial trucks, traffic congestion can occur at much lower volumes when there is a high percentage of trucks in the traffic flow. Table 5-4 identifies projects from the CMP deemed necessary to accommodate higher truck volumes, even though the actual vehicle volume may be lower on these facilities than the threshold necessary to justify additional capacity for general traffic.

Finally, in some instances, the travel demand model does not adequately reflect the effects of traffic "choke points" or "bottlenecks." A bottleneck is typically a relatively short section of roadway with fewer lanes than the roadway sections on either side of the bottleneck. Similar to an incomplete transportation network discussed in the previous paragraphs, a bottleneck can lead to diverted traffic and a localized imbalance. This can result in a congested transportation network. Bottlenecks also represent a safety concern. Removing the bottleneck allows the existing transportation system to operate more efficiently with only a limited increase in capacity. Table 5-5 lists the highway projects that are recommended in the Congestion Management Process to mitigate congestion in these instances.

TABLE 5-5

CMP Recommendations for Bottlenecks or Queuing

Recommended Projects to Eliminate Bottlenecks			
Route	From	To	Improvement
SALT LAKE AREA			
4100 S	SR-111	Mountain View Corridor	Widen to 4 lanes
I-15	600 N	I-215	Widen to 10
OGDEN / LAYTON AREA			
2000 W	Syracuse Rd	West Davis Corridor	4 lanes
Adams Ave	Washington Terrace limits	Hwy-89	4 lanes
Syracuse Rd	West Davis Corridor	2000 W	4 lanes

The WFRC Developed Criteria

The WFRC developed criteria based on available data from vehicle hours of delay, safety, economic development, multimodal, benefit cost, and project preparation to provide a score for each proposed highway project. The vehicle hours of delay was worth 30 points, safety was worth 10 points, economic development was worth 20 points, multimodal was worth 10 points, benefit cost was worth 20 points, and project preparation was worth 10 points. Two separate vehicle hours of delay scores were calculated for the scoring method. The first was based on the projected 2020 transportation delay compared to the 2011 - 2016 Transportation Improvement Program (2016 TIP) network. This score helped place projects into the first phase of the plan. The second score was based on the project 2030 transportation delay compared to the initially selected Phase 1 needs (2020). This helped place projects into the second and third phase of the plan. Descriptions of the data used to provide evaluation scores are provided below. Appendix K provides the scoring for each of the highway evaluation criteria.

2020 Delay on the TIP Network

Projected 2020 delay on the 2016 TIP network data is the amount of delay, or total vehicle hours per day, the project will generate. The delay was calculated using the transportation model which ran the 2020 employment and population projections on the 2016 transportation network. The sum of the delay for the individual segments for each project was used to calculate the total delay for the project. Delay is calculated by taking the inverse of the PM peak speed from the model output and subtracting the inverse of the free flow speed, multiplied by the length of the project, multiplied by the PM peak period traffic volume. The total project delay was then divided by the project length and given a score. Scores for 2020 delay were assigned to each project ranging between zero and 30 points, where a score of 30 had the highest delay.

2030 Delay on 2020 Network

Projected 2030 delay on the 2020 network data used the same methodology as the 2020 delay on the 2016 TIP, but used the 2030 employment and population projections on the initial identified Phase I (2020) transportation network. Scores for 2030 delay were then assigned to each project ranging between zero and 30 points, where a score of 30 had the highest delay.

Safety

The safety score for each project was determined by the UDOT Traffic and Safety department. UDOT scoring ranged between one and five points, five having the highest potential to reduce crashes. Safety scores were then doubled when evaluating projects needs. Projects with crash data were scored, and projects on new alignments or non-numbered routes were given a neutral score of three. Projects at “spot” locations were all ranked together with the goal of equally distributing the scores. “Severity 4 & 5 Crashes” and “Total Crashes” were both used to rank projects. Projects on segments were all ranked together with the goal of equally distributing scores.

Economic Development

Economic Development areas were classified into four categories: 1) Activity Centers, 2) Infill Areas, 3) Freight Centers, and 4) Environmental Justice locations for traffic analysis zones (TAZ) within the WFRC urban boundaries. WFRC staff identified the activity centers through a three step process. First, the activity within each 10 acre square in the Wasatch Front Region was assigned an activity value using employment and household forecasts. Employment was given a weight of 1.2 and each household was given a weight of 1.0 in this valuation. Next, clusters or islands of activity were identified in the region using a mapping technique which smoothed the values of these 10 acre blocks and then applied various value ranges to isolate “islands” of activity.

Finally, activity centers such as entertainment venues and schools that are not dependent upon households or employment for their activity were identified. Infill areas were located similar to Activity Centers, the level of service was quantified by summing all home-based work trips within 20 minutes transit and auto travel time of each of the identified locations. The infill areas identified in Salt Lake County were those areas of 50 acres or larger which were: (1) identified by the Salt Lake County Cooperative Plan as being vacant or areas of probable or possible change; and (2) within the area of the County, which is largely built out. The built out area was roughly defined by the WFRC staff as the area east and north of the Bangerter Highway loop and Kearns and Magna. In Davis and Weber Counties, the WFRC staff used aerial photos and personal knowledge to identify areas of 50 acres or larger which were either vacant or with the potential to change if surrounded by development. Freight center locations were determined by comparing the freight related employment for an individual TAZ for 2007 to the total employment in the TAZ. Environmental Justice areas took into consideration minority groups, concentrations of persons over 65 years old, income levels below poverty, and households without vehicles. These population totals were divided by the TAZ acreage and the Environmental Justice areas identified had over 6 persons per acre. The connectivity to the economic development areas were scored 1 point if a project was within three-quarters of a mile, 2 points if a project was within a half mile, and 3 points if it was within a quarter mile of identified economic development areas. These scores were totaled and divided by the project length. Economic Development scores for highway projects ranged between 0 and 20 points proportionally to their total score per mile.

Multimodal

Multimodal components include planned bicycle routes, identified priority bicycle routes, and preliminary transit. A project received two points if it had a planned bicycle route, four additional points if the bicycle route was also a priority route, and 4 points if a transit route was included in the corridor. Multimodal was given a maximum of 10 points towards the total project score.

Benefit Cost

A benefit cost score for each highway project was derived from totaling the amount of delay, safety, economic development, and multimodal scores for that particular project then dividing that total by the project's estimated cost. Benefit cost scores ranged between zero and 20 points, proportional to the actual benefit cost score.

Project Preperation

The degree to which a highway project is ready to be build was given up to 10 points in the evaluation. A project received 2.5 points for each of the following: (1) if it was part of a city's existing general development plan; (2) had a planning study completed or in progress; (3) had engineering completed or in progress; or (4) the corridor was preserved.

The highway evaluation criteria also benefited from the WFRC staff's understanding of the need for a particular project, overall planning and engineering judgment, and sound regional knowledge and experience. Phasing considerations included input from the 2016 TIP, the 2030 RTP, local officials, the Regional Growth Committee's TACs, and from UDOT engineers at Region One and Two.

Ultimately, the 2040 RTP did not rank projects but only placed them in phases. In establishing a phase for highway projects the WFRC weighed the results of the CMP, the WFRC evaluation criteria results, and other project specific factors to derive an understanding of the relative value of each project in each phase. Financial constraints were then applied in order to place the highway projects into the three funded phases or the unfunded phase. The other factors taken into account while phasing projects included: connectivity, local and regional support and input, and UDOT support and input. Each of these scoring methods will be discussed independently. The full list of CMP and WFRC criteria evaluated highways is in Appendix L. Table 7-3 in Chapter 7 lists all highway projects by phase.

TRANSIT PROJECT SELECTION AND PHASING

As discussed in the Development of System Alternatives section on page 78, the initial draft of the 2040 RTP was developed from the "No Build", "Current System," "Team A", and "Team B" Alternatives. Transit projects were initially selected from these System Alternatives; however, the characteristics or designations of some projects were changed based upon stakeholder input. Projects were then scored using a process similar to that of the highway scoring process. The scoring criteria adopted by the Wasatch Front Regional Council and interpreted by WFRC staff for transit is found in Table 5-6. In addition to the criteria listed below, WFRC staff used the scheduling of highway projects as a strong consideration in the phasing of projects as it is assumed that transit and road projects can achieve cost synergies by being constructed at the same time. Appendix K provides the scoring for each of the transit evaluation criteria.

Travel Time Reduction

Since a good transit service relies on the Region's roadways, the travel time reduction calculation is based

TABLE 5-6

CMP Recommendations for Bottlenecks or Queuing

Measures	Definition*	Weight
Travel Time Reduction	The amount of average auto delay on or adjacent to the transit project roads in each RTP phase	5%
Ridership	Forecasted boardings per project mile in each RTP phase	20%
	UTA's assessment of the corridor's demonstrated ability to support high frequency operations.	10%
Safety*	Current combined accident rate and accident severity rate on project roads.	5%
Economic Development	Project proximity to identified areas with concentrations of disadvantaged people, activity centers, and infill locations.	20%
Multi-modal Corridors	Miles of RTP transit and highway projects, priority bikeways, and bikeways sharing the project alignment.	10%
Cost Benefit	The composite cost score from the above criteria divided by the project capital cost.	20%
Project Preparation	If the project: is on city plans, corridor is being preserved, has been studied and/or has been the subject of an environmental study.	10%
*Crash statistics are only available on State facilities		

upon the total auto delay per roadway mile forecasted on the project road or adjacent roads without transit in each RTP phase. The regional travel forecasting model was used to estimate these values. The maximum score for this criterion is 5 points. The project in each phase with the most auto delay was given the full 5 points and all other projects proportional scores to the maximum score. Projects with exclusive lanes were not given points as they would not isolate transit from congestion.

Forecasted Ridership

The projected ridership in each phase was estimated using the regional travel forecasting model and post model adjustments. The regional travel model forecasts only commuter rail, light rail, bus rapid transit (BRT 3), express bus, and local bus. Because Enhanced Bus (BRT 1) is not expressly part of the model, local bus was modeled and given a 20 percent increase in ridership as a method of estimating Enhanced Bus (BRT 1). Twenty percent was used as it is a common result for Enhanced Bus (BRT 1) after adjusting for schedule improvements in areas such as Los Angeles, California, where Enhanced Bus (BRT 1) has been implemented. The maximum score for this criterion is 20 points. The project in each phase with the highest ridership was given the full 20 points and all other projects proportional scores to the maximum score.

Current Ridership Capability

In order to ascertain a corridor's capacity to support a major transit investment, UTA's service planners were asked to draw upon their combined experience to rate the ability of each corridor or corridor segment to produce enough riders to support a high frequency transit line. These planners openly discussed each line and collectively rated the corridor on a 1 to 10 scale. A score of 10 was possible only if a particular corridor demonstrated a high ability to support high frequency service. The highest score given a corridor or corridor segment was 9.

Safety

The combined "Severe Crash Rate" and the crash rate from UDOT's UPLAN data base were used to evaluate the value of each of the system transportation alternatives in terms of their potential safety benefits. The higher the crash rate and severity on roads, the higher the safety score, since such a facility requires additional attention to improve its overall safety. Only in-street, exclusive lane transit projects received a score whereas all other projects received a zero. The premise behind this scoring method is that the reconstruction of these highway facilities will resolve many of their safety deficiencies. Refer to the Evaluation of System Alternatives section beginning on page 88 for a more in-depth review of how crash and severity scores were calculated. The maximum score for this criterion is 5. The final scores were adjusted to give projects with the highest raw score the full 5 points, with all other projects receiving proportional scores.

Economic Development

Development and transportation must be carefully coordinated to achieve maximum positive results. On one hand, an urbanized area with inefficient transportation system will often languish economically. On the other hand, not all development will have a positive impact on the region's economic health. Some development, such as that which sprawls or leaps out into more rural areas for want of cheap land, shifts costs to the public in many forms including congestion, poor air quality, and inefficient use of scarce infrastructure dollars. These costs, in turn, damage the economic viability of a region through higher personal transportation costs, higher medical costs, higher taxes, and unattractive quality of life for business owners, employees, and their families. Wise transportation expenditures will enhance both local and regional economies by providing convenient access in direct support of existing and planned activity centers. A well-planned transportation system encourages the use of the regions' overlooked spaces, supports interregional and intraregional freight movement, and better connects the region's disadvantaged persons to jobs and services. These are the criteria used to judge the economic development benefits of each transit project.

In an effort to integrate local plans for activity center development with the regional transportation system, each transportation system alternative was evaluated according to how well it served activity centers, Infill locations, and areas with significant concentrations of disadvantaged persons. Disadvantaged persons include minority groups, people with incomes below the poverty level, the elderly, and those who do not own vehicles. Collectively, activity centers, infill locations, and areas with concentrations of disadvantaged persons are called "economic areas". (Please Refer to the Evaluation of System Alternatives section beginning on page 88 for an in-depth discussion of how these areas were identified.) Once the areas were identified, each transit project received a score based upon how close its alignment is to these locations. The project received three points for every economic area with one-quarter mile of its alignment and two points for every economic area within one half mile of its location. Because the maximum score for this criterion is 20, these raw scores were adjusted to give the project with the highest raw score the full 20 points and all other projects proportional scores to the maximum score.

Multimodal Corridors

The calculations for determining positive impacts on multimodal corridors was arrived by adding points for each project based on the following factors: (1) The total miles of other RTP transit projects that share this transit alignment. The premise is that there is cost savings in many transit lines sharing a single guideway investment. (2) The miles of alignment that is also shared with a first phase RTP highway project and a RTP highway project of any phase. (Note that a first phase highway project would be counted once as a first phase highway project and once as a highway project of any phase. A transit project that shares an alignment with a road project is more likely to be able to share costs and benefits with that road project.) (3) The miles shared with a proposed priority bike lane and shared with a proposed bike lane of any priority. (Note that a priority bike lane would be counted once as a priority bike lane and once as a bike lane as any priority.) Bike lanes do not have a dedicated funding source on a regional level and so it is assumed that a transit project on an alignment with a proposed bike lane would help build the proposed bike lane. Because the maximum score for this criterion is 10, these raw scores were adjusted to give the project with the highest raw score the full 10 points and all other projects proportional scores to the maximum score.

Cost Benefit

The composite cost score from the above criteria was divided by the project capital cost to determine this ranking. Because the maximum score for this criterion is 20, the raw scores were adjusted to give the project with the highest raw score the full 20 points and all other projects proportional scores to the maximum score.

Project Preparation

A project that has full community support is more likely to be successful than a project that is being ignored or even opposed by the community. Projects that have gone through the planning process have more information available, thus allowing the jurisdictions to properly plan for the project. A project is likely to be less expensive when the right-of-way is being preserved, developers are active participants in accommodating the project, and local governments and UDOT are considering the ultimate needs for transit when infrastructure is constructed in the corridor. Proper placement of utilities alone can save as much as 20 percent of the costs of light-rail in a corridor. A project that has full community support is also more likely to encourage riders because local government officials are permitting higher residential densities next to future stations, properly orienting the openings to businesses and apartment complexes, and insuring that sidewalks and bike lanes are serving the project. The project is also less likely to have opposition the longer it has been on local master plans. As new property owners come into the area, they will know that a project is being planned and sensitive land uses can be steered away from properties adjacent to the project.

Projects received five points if the project was identified in the jurisdictions official planning documents, another 5 points if the jurisdiction was reserving rights-of-way for the project, and another 2 to 5 points depending on the level of study the project has received. A project could receive a total possible raw score of 15 points. Because the maximum score for this criterion is 10, these raw scores were adjusted to give the project with the highest raw score the full 10 points and all other projects proportional scores up to the maximum score.

Need Scores and Findings

The total scores for each of the assessed projects are found in Table 5-7. As is the case with the highway projects, the 2030 RTP did not ultimately rank transit projects but only placed them in phases or construction “time frames”. These scores were used as guidelines and many other considerations were also factors in the phasing decisions. Chief amongst the other considerations was funding availability and regional significance. Points for projects such as, transit hubs and park-and-ride lots were assessed separately because the evaluation criteria seemed to favor them.

TABLE 5-7

Transit Project Phasing Criteria Results

Transit Proposal Evaluated	Total 1st	2nd	3rd
SALT LAKE COUNTY LINES			
SLC - Foothill Dr. - Wasatch Dr. Corridor (East/West Segment)	58	55	59
University TRAX Line to SL Central TRAX Connection	32	50	54
Taylorsville Murray Corridor (Central)	42	39	49
Sugarhouse Streetcar (First Phase)	44	41	45
200 South Streetcar and Bus Rapid Transit (BRT 3)	39	40	40
State Street Bus Rapid Transit (BRT 3)	31	31	29
Redwood Road Bus Rapid Transit (BRT 3)	30	29	27
10200 / 10400 South Enhanced Bus (BRT 1)	24	23	27
Taylorsville Murray Holladay Extension, Enhanced Bus (BRT 1)	25	20	28
Taylorsville Murray Bus Rapid Transit (BRT 3) West Valley Extension	28	25	26
5400 South Corridor	28	25	25
3900 / 3500 South Corridor	24	23	22
1300 East (North) Bus Rapid Transit (BRT 3)	25	24	24
7000 South / 7800 South Enhanced Bus (BRT 1)	20	19	22
9000 South West Side Corridor	25	19	22
Fort Union Boulevard Corridor	22	19	20
700 East Bus Rapid Transit (BRT 3)	23	22	22
1300 East (South) Bus Rapid Transit (BRT 3)	23	22	22
Salt Lake - Foothill Dr. - Wasatch Dr. Corridor (North Segment)	20	19	19
Draper Line TRAX Extension (South)	18	21	18
12300 / 12600 South Bus Rapid Transit (BRT 3)	19	16	11
Parkway Boulevard Bus Rapid Transit (BRT 3)	19	18	17
5600 West Bus Rapid Transit (BRT 3)	17	16	16
Bangerter Highway Corridor	17	17	15
Salt Lake - Foothill Dr. - Wasatch Dr. Corr (S. Segment)	16	15	15
Big Cottonwood Canyon Corridor	14	14	15
Northwest Quadrant Bus Rapid Transit (BRT 3)	15	13	15
9400 South Corridor	14	13	13
Draper Line TRAX Extension (North)	14	14	14
Little Cottonwood Canyon Corridor	11	11	11
S.W. Downtown SLC Streetcar (Granary Line)	9	9	9
West Bench Corridor	3	3	3

TABLE 5-7 (CONTINUED)
Transit Project Phasing Criteria Results

Transit Proposal Evaluated	Total		
	1st	2nd	3rd
SALT LAKE COUNTY POINT PROJECTS			
Airport East Hub	50	50	52
Fort Union Transit Center	34	37	37
5400 South / Redwood Road Park and Ride	30	37	37
Little Cottonwood Canyon Transit Center	32	32	33
5400 South / 5600 West Park and Ride	28	30	31
3100 South / 5600 West Park and Ride	23	13	20
Interstate 80 Transit Only Freeway Ramps	18	17	21
6200 South / 5600 West Park and Ride	23	19	22
DAVIS COUNTY LINES			
North Ogden - Salt Lake Corridor (South Segment)	28	26	26
North Ogden - Salt Lake Corridor (Central Segment)	26	24	26
North Redwood Enhanced Bus (BRT 1)	20	20	22
North Ogden - Salt Lake Corridor (North Segment)	20	19	19
West Weber / West Davis Enhanced Bus (BRT 1)	15	15	16
DAVIS COUNTY POINT PROJECTS			
Hill AFB South Transit Center	30	30	29
Falcon Hill - Hill AFB West Transit Center	30	29	30
Antelope Drive Park and Ride	22	16	25
WEBER COUNTY LINES			
Ogden - Weber State University Streetcar	39	38	40
Ogden - Pleasant View Commuter Rail Improvements	32	34	30
Ogden Streetcar Circulator	25	24	25
Pleasant View - Brigham City Commuter Rail	17	16	18

NON-MOTORIZED SELECTION CRITERIA

The Regional Bicycle / Trails Planning Committee, made up of representatives from the Utah Department of Transportation (UDOT), the Utah Transit Authority (UTA), the Mountainland Association of Governments (MAG), Salt Lake County, Davis County, Weber County, and the Wasatch Front Regional Council (WFRC), developed criteria to prioritize routes. Tying bicycle routes to fixed guideway transit stations was the first criteria; keeping the routes spaced between two and three miles was the second criteria; and thirdly, identifying routes that not only spanned the three urbanized Counties of the Region both in an east / west direction, but also in a north / south direction. Each County identified priority routes in conjunction with their respective bicycle and trails committees in coordination with the UDOT, the UTA, and the WFRC. The 2040 RTP includes both a bicycle master plan and a priority routes plan, which are shown on Map 5-1. The WFRC recognizes that the 2040

RTP will be revisited in four years, although updates may take place at earlier dates. The WFRC recommends that any user of these plans refer to the County websites for updates to these master plans and priority routes maps. The updated Salt Lake County map can be found at www.slco.org, an updated Davis County map can be found at www.daviscountyutah.gov, and an updated Weber County map can be found at www.co.weber.ut.us.

Map 5-1, PRIORITY BICYCLE ROUTES

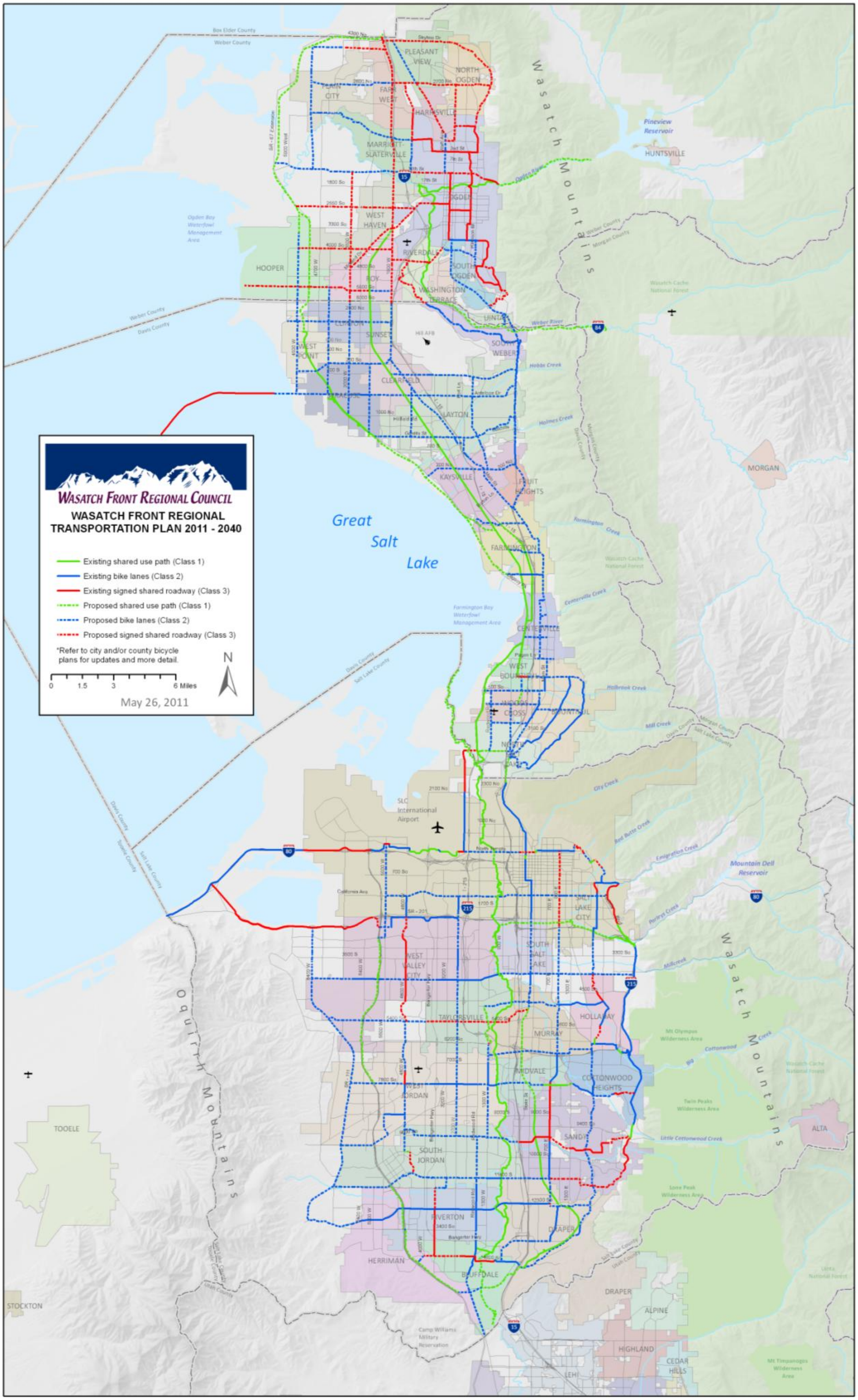


Image by James Belmont

Financially Constrained RTP

WFRC
2040 RTP
Salt Lake City

Chapter 6

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) was the first federal transportation act to require that long range transportation plans developed by Metropolitan Planning Organizations (MPO) include a financial plan to fund recommended highway and transit facility improvements. ISTEA also required that long range plans be fiscally constrained, meaning only those new facilities and recommended improvements which could be funded using existing and reasonably available projected revenue streams could be included in MPO long range transportation plans. The Transportation Equity Act for the 21st Century (TEA-21), and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the most current federal transportation legislation, also requires that a financial plan be part of the overall long range transportation plan for a region. The purpose of this requirement is to ensure that planned improvements included in the RTP can be paid for and that air quality benefits assumed for the implementation of the plan are realistic. These realistic estimates of emissions reductions are needed for the air quality conformity analysis required by SAFETEA-LU and the Clean Air Act Amendments of 1991.

Federal guidelines on preparing financial plans state: "The financial plan should compare the annual revenue from existing and proposed funding sources that are dedicated to transportation uses, and the annual costs of constructing, maintaining and operating the transportation system over the period of the Long Range Plan. The annual revenue by existing revenue source (at the local, State, and Federal level) dedicated to transportation improvements should be calculated and any shortfalls identified. Proposed new revenues should cover all forecasted capital, operating, and maintenance costs. All cost and revenue projections should be based on the best available data and trends. This requirement does not preclude MPO's and states from also developing unconstrained 'needs' plans."

Photo at Left: New UTA Siemens S70 low floor light rail vehicles provide improved access for alighting and disembarking TRAX trains. These vehciles are featured in this photo, captured by James Belmont, of TRAX running along the University (Red) Line between the University Medical Center and Fort Douglas Stations.

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For the Wasatch Front Urban Area, this requirement means that many of the projects recommended in previous Long Range Transportation Plans can no longer be included in a financially constrained 2040 RTP. Long range transportation plans prepared before 1991 were based on need and identified facilities to serve projected transportation demand of the Area in the future. These pre-1991 long range transportation plans did not always identify the means to pay for their recommended facility improvements. At the most, these previous efforts estimated how much additional revenue would be needed and listed some potential sources to meet these needs. However, the long range transportation plans did not include a commitment to actually pursue these funds, and in many cases, the additional funds required could not reasonably be expected.

Finally, SAFETEA-LU allows for illustrative highway and transit projects to be included as part of a regional long range transportation plan. These illustrative projects are those which cannot be included in a fiscally constrained long range plan, but which would be included if a viable future funding sources could be identified. The 2040 RTP includes a number of unfunded (illustrative) projects that are not covered by current funding sources identified in this financial plan. However, if prospective regional funding sources can be identified for the financing of these projects in the future, they will then be included as part of future regional transportation plans.

Potential revenue sources are summarized in this chapter and estimates of future revenues from these sources are made for the 2040 RTP. Estimates are made of costs to meet the projected needs of the Regional Transportation Plan through the year 2040. Costs include what will be required to meet the needs identified in the 2040 RTP as well funding required for general administration and the operation and maintenance of the existing transportation system. Appendix M contains more detailed information on revenue and cost assumptions and projections used to determine the resources available to implement the 2040 RTP.

OVERVIEW OF REVENUE ASSUMPTIONS

Po Earlier in the plan preparation process the Wasatch Front Regional Council (WFRC), the Utah Department of Transportation (UDOT), the Utah Transit Authority (UTA), the Mountainland Association of Governments (MAG), the Dixie Metropolitan Planning Organization (Dixie-MPO), and the Cache Metropolitan Planning Organization (Cache-MPO) formed a financial committee to developed estimates of available revenues based on projected sources that will be available for transportation improvements through the year 2040. Included in these revenue estimates are federal, state and local sources authorized for highway and transit improvements. Assumptions were made concerning revenue growth and new or increased sources of funds. The projections and assumptions used are discussed in the balance of this section. A more detailed description of potential federal, state, and local revenue sources for the Wasatch Front Regional Transportation Plan: 2011-2040 has been provided in Appendix M.

HIGHWAY REVENUE SOURCES

It has been assumed that federal, state, and local government revenues will, in fact, be available for the recommended highway improvements found in the Wasatch Front Regional Transportation Plan: 2011-2040. These revenues were estimated for the years 2011 through 2040. Separate estimates have been made for funds that will be available to UDOT and funds that will be available for local jurisdictions.

Revenue sources for UDOT estimates include federal funds and state funds. It is assumed that federal funds grow by two percent a year. Based on historic trends it is assumed state motor fuel tax revenues will increase at a two and a half percent rate per year. It is assumed that state special fuel tax revenues will increase at a five percent rate per year. In addition, it is assumed that a five cent per gallon increase in the fuel tax will be adopted in 2014, 2024, and 2034. It is assumed that state vehicle registration revenue will be increased by $10 per year in 2018, 2028, and 2038.

The Transportation Investment Fund / Centennial Highway Fund (TIF/CHF) is currently funded with state auto-related sales tax (approximately 8.3 percent) and general fund monies. The TIF was created and funded by the Utah State Legislature in 2005. The CHF was enacted in 1997 and funded in part with appropriations from state and federal money set aside for use in building capacity-increasing transportation projects. These two programs were combined into one program in 2010. The TIF/CHF bond is projected to be paid off by 2020. The remaining portion of the state auto-related sales tax, totaling approximately 17 percent, is assumed to be allocated by the Utah State Legislature by 2017 to fund future TIF/CHF bonding programs. The source of revenue for the Critical Highway Needs Fund (CHNF) is currently the State General Fund. The CHNF was created in 2008 and funded by an appropriation from the Utah State Legislature. The bond used to fund the CHNF is projected to be paid off by 2027. Revenue for the Highway Construction Program (HCP) and Transportation Investment Fund $55 (TIF$55) are currently provided from the State General Fund monies and funding transfers from the TIF/CHF programs. Both the HCP and TIF$55 programs will expire in 2015.

The main sources of assumed revenue available for regional and local road projects are:

- Federal funds from the Salt Lake Area and Ogden – Layton Area Surface Transportation Programs (STP) and the Congestion Mitigation / Air Quality Programs (CMAQ);
- Class B and C Funds allocated to municipalities and counties from state highway user revenues;
- Salt Lake County's 1/4 of 1/4 cent sales tax, less .0125 percent (.05 percent);
- Salt Lake County's Proposition 3 sales tax (.0675 percent);
- Weber County's third quarter local option sales tax (.125 percent)
- $10 vehicle registration fees for corridor preservation in Salt Lake, Davis and Weber Counties in effect since 2006 and 2007;
- Allocations from the general funds of local governments;
- Future increases in local option sales taxes for transportation projects in Salt Lake (.1375 percent in 2017), Davis (.125 percent in 2013, and .125 percent in 2017), and Weber (.125 percent in 2017) Counties;
- Future $5 vehicle registration fees in Salt Lake, Davis, and Weber Counties anticipated for adoption in 2020, 2030, and 2040; and
- Future adoption of five cent ($.05) local option fuel taxes in 2027.

STATEWIDE HIGHWAY REVENUES

Working with WFRC staff, the joint Finance Committee developed estimates of projected revenues that will be available to UDOT between 2011 and 2040. These revenues come from general federal and state transportation funds and revenue, the TIF/CHF, and CHNF, as discussed below. Further information regarding these projections are included in Appendix M.

Federal Revenue

The Intermodal Surface Transportation Efficiency Act (ISTEA), adopted in 1991, established several spending programs for the use of federal funds for highway improvements sponsored by UDOT. TEA-21, the federal transportation bill enacted in 1998, and SAFETEA-LU continued these programs at higher funding levels. These programs include the Interstate Maintenance, National Highway System, Any Area Surface Transportation, STP Safety and Enhancement, and Bridge Replacement programs. A modest growth of two percent per year for each program was assumed for the period 2011 through 2040. UDOT administered, and special programs including the state match, will provide approximately $9,919,000,000 statewide. This amount does not include federal funding administered by the metropolitan planning organizations or the Joint Highway Committee.

State Funds

The state of Utah's revenues allocated for transportation are primarily generated through highway user fees. These fees include motor fuel and special fuel taxes, vehicle control fees, motor vehicle registration, proportional registration, temporary permits, special transportation permits, highway use taxes, safety inspection fees, and miscellaneous fees. In addition, the Utah Legislature has programmed state general funds to support UDOT projects. To project future revenues, historical growth rates of about 3 percent were used for each of the sources listed above, with the exception of 2.5 percent for motor fuel tax, 5 percent for special fuel tax, and about 2 percent for vehicle registration. The state will generate about $29,657,000,000 from these sources between 2011 and 2040.

State revenue projections also assume future increases in state fuel and special fuel tax. The state gasoline and special fuel tax has increased a total of five times from seven cents per gallon in 1978, to 24.5 cents per gallon in 1997. The latest increase was five cents per gallon, approved in 1997, dedicated to the CHF program. In 2005, the State Legislature approved the use of approximately half of the state sales tax associated with auto-related sales, approximately 8.3 percent of total sales tax revenues, for highways. These funds initially were to be used to pay off the CHF bonds.

Current trends indicate that it is reasonable to expect the State Legislature to continue to raise revenues for highways every five to ten years. The 2040 RTP assumes the equivalent of a five cents per gallon of gasoline and special fuel tax increase in the years 2014, 2024, and in 2034. The 2040 RTP also assumes that by 2017 the remaining half of the auto-related sales tax will be designated for highways.

In establishing the Centennial Highway Fund in 1996, the State Legislature demonstrated its commitment to transportation by greatly increasing the amount of state general fund revenue going to UDOT. The CHF program initially assumed general fund revenues up to $145,000,000 per year, but it was reduced to approximately $60,000,000 per year due to State Budget constraints. The fund was increased to approximately $150,000,000 per year in 2005 with the addition of half of the auto-related sales tax. A growth rate of about five percent per year means TIF/CHF funding is now close to initial funding projections. The Finance Committee assumed that after the TIF/CHF bonds are paid for, the auto-related and general funds dedicated to that purpose will be available for future TIF/CHF and CHNF programs. These funds will generate $18,878,000,000 and $1,900,000,000 respectively statewide.

TABLE 6-1

Projected Statewide Highway revenue 2011-2040

Source	Amount
FEDERAL REVENUE	
Highway Trust Funds	$9,919,000,000
STATE REVENUE	
Highway User Funds	$29,657,000,000
Transfers Appropriated to Other State Agencies	($10,173,000,000)
Transportation Investment Fund / Centennial Highway Fund (TIF/CHF)	$18,787,000,000
Centennial Highway Needs Fund (CHNF)	$1,900,000,000
TOTAL STATEWIDE REVENUE AVAILABLE	
	$50,090,000,000

Transfers Appropriated to Other State Agencies

Not all of the highway user revenues are available to UDOT. In the past, approximately three percent of these funds have been diverted to other agencies, such as the Highway Patrol, Driver's License Division, and the Utah State Tax Commission. Funding is also diverted to the Corridor Preservation Fund and the State Parks Access Roads Program (from a 1/16th of a cent sales tax allocation). Of the remaining amount, 30 percent (as of 2008) is transferred to cities and counties in the form of Class B and C funds. UDOT estimates that the future amount of diversions to other agencies will continue at the same rate as in previous years. The total amount of transfers and diversions from 2011 through 2040 statewide is approximately $10,173,000,000. Table 6-1 summarizes the amount of statewide highway revenue projected through the year 2040.

LOCAL HIGHWAY REVENUES

The main sources of local revenues for transportation projects are: (1) federal funds allocated for the Salt Lake Area and Ogden – Layton Area Surface Transportation Program and the Congestion Mitigation / Air Quality Program; (2) Class B and C Funds from state highway user revenues for Counties and Cities, including the 1/16th cent sales tax for park access, and corridor preservation; (3) locally general funds; and (4) local option taxes. In addition, innovative sources will need to be used in the future to help finance specific highway improvements recommended in the 2040 RTP. The following section describes the various funds that are available to local cities and counties within the region. Further information regarding these projections are included in Appendix M.

Federal Funds

ISTEA established new or reformulated federal spending programs which WFRC administer, to fund highway improvements in urban areas. TEA-21 and SAFETEA-LU continued these programs at higher funding levels. These programs are the Salt Lake Area and Ogden - Layton Area Surface Transportation Programs (STP) and Congestion Mitigation / Air Quality Programs (CMAQ). As with the other federal program revenues, a modest growth rate of two percent per year for each program was assumed for the period between 2011 and 2040. These funds can be used for projects on the state highway system, as well as on local streets. Based on past trends, the RTP assumes that approximately 60 percent of STP funds will be used for state facilities and the other 40 percent will be used for locally owned facilities. The CMAQ funding in the RTP is assumed to be split with 50 percent being used for state facilities, 10 percent for local facilities, and the remaining 40 percent for UTA transit facilities.

Class B and C Funds

Class B and C road funds are allocated from the state's highway user fees revenues collected by the State. Currently 70 percent of the highway user fees are directed to UDOT and 30 percent are diverted to the Class B and C Fund. Class B and C funds are then divided between counties and municipalities based on a formula using population and road miles. Based on the current allocation formula, the Wasatch Front Urban Area currently receives approximately 39.6 percent of the Class B and C funds. Although the allocation formula may change in the future, the current percentage was used for the projection of future funding available from this category. Approximately $3,583,000,000 is projected to be generated between 2011 and 2040 for the municipalities and counties in the WFRC urban area.

General Funds

Municipalities and counties along the Wasatch Front program a significant amount of locally general funds for highway maintenance and improvement. Current and past general fund spending on highways by municipalities and counties was examined to project future revenues. Based on the information provided in a survey of Wasatch Front communities, local governments are projected to spend about $104,000,000 on highway improvements in 2011. These local expenditures are projected to grow by three percent a year through 2040 for a total of approximately $4,960,000,000.

Innovative Sources

In the future local governments will need to consider new and innovative highway funding programs. Many already levy transportation impact fees on new developments. In addition, developers are a source of funding for major projects which benefit their development. These and other unique and innovative sources will provide funding over the next thirty years for local highway projects. It is assumed that a total of approximately $600,000,000 will be provided from the revenue.

Local Option Funds

The Utah Department of Transportation was to have received a one-quarter of the one-quarter cent share of the transit sales tax in Salt Lake County in perpetuity, as approved by the electorate in November of 2000. The one-sixteenth of a cent (.0625 percent) local option sales tax was designated for state highway projects in Salt Lake County by earlier action of the Legislature. However, UDOT's portion was reduced to .05 cent in 2006 to compensate for the loss of sales tax on food to transit. WFRC is estimating that this sales tax levy will generate approximately $516,000,000 between 2011 and 2040. The State Legislature authorized the use of local option sales taxes for both highways and transit. Based on the Salt Lake County Council of Governments (COG) ranking and rating process for the third quarter sales tax, UDOT will receive a portion of the one-quarter cent sales tax approved in Salt Lake County in 2006. Approximately a quarter of the one-quarter percent (.0625 percent) sales tax is projected to be used for state highways from this local option sales tax. Weber County passed their third quarter local option sales tax in 2008, but local officials have not designated an amount or percentage that will be spent on highway or transit projects.

TABLE 6-2

Local Option Sales Tax – Split by Mode

Quarters	Year	Transit	Highway	Total
SALT LAKE COUNTY				
1st, 2nd, 3rd	Current	0.50 +.05+ 0.1375 = 0.6875	0.1125	0.80
4th, 5th	2017	0.3625	0.1375	0.25
Total		1.05	0.25	1.30
DAVIS COUNTY				
1st, 2nd	Current	.50 + .05 = 0.55	0.00	0.55
3rd	2013	0.125	0.125	0.25
4th, 5th	2017	0.375	0.125	0.50
Total		1.05	0.25	1.30
WEBER COUNTY				
1st, 2nd, 3rd	Current	.50 + .05+.125 = 0.675	0.125	0.80
4th, 5th	2017	0.375	0.125	0.50
Total		1.05	0.25	1.30

WFRC has made an assumption that about half of the one-quarter percent (.125 percent) sales tax will be used for roadway projects. The 2040 RTP predicts this trend to follow in Davis County in 2013 and about half of the one-quarter percent (.125 percent) will also be used for roadways projects. The 2040 RTP also assumes that an additional 1/2 cent sales tax will be approved in all three Counties in 2017, with about .1375 percent for highways available in Salt Lake County, .125 percent for highways in Davis County, and .125 percent for highways in Weber County. The remaining increases in local option sales taxes would go towards transit. Table 6-2, gives a more detailed allocation of the local option sales tax. Sales tax was projected to grow at five percent per year after 2015, and incrementally increase between 2011 and 2015 in anticipation of a recovering economy.

TABLE 6-3

Projected Regional and Local Highway Revenue 2011 - 2040

Source	Amount
REGIONAL REVENUE	
Surface Transportation Program (STP) (60%)	$503,000,000
Congestion Mitigation / Air Quality (CMAQ) (50%)	$160,000,000
Salt Lake County ¼ of ¼ percent sales tax less .0125% (.05%)	$516,000,000
Salt Lake County Prop 3 Sales Tax (.0675%)	$645,000,000
$10 Vehicle Registration Fee – Salt Lake County	$357,000,000
$10 Vehicle Registration Fee – Davis County	$101,000,000
$10 Vehicle Registration Fee – Weber County	$82,000,000
Salt Lake County Vehicle Registration Fee (2020, 2030, 2040 - $5)	$221,000,000
Davis County Vehicle Registration Fee (2020, 2030, 2040 - $5)	$63,000,000
Weber County Vehicle Registration Fee (2020, 2030, 2040 - $5)	$51,000,000
Salt Lake County Sales Tax (2017- .1375%)	$1,274,000,000
Davis County Sales Tax (2013 - .125%, 2017- .125%)	$416,000,000
Weber County Sales Tax (2008 -.125%, 2017- .125%)	$385,000,000
Salt Lake County Local Option Fuel Tax (2027-$.05)	$852,000,000
Davis County Local Option Fuel Tax (2027-$.05)	$251,000,000
Weber County Local Option Fuel Tax (2027-$.05)	$158,000,000
TOTAL REGIONAL HIGHWAY REVENUE	
	$6,035,000,000
LOCAL REVENUE	
Class B and C Program Funds	$3,583,000,000
Surface Transportation Program (STP) (40%)	$335,000,000
Congestion Mitigation / Air Quality (CMAQ) (10%)	$32,000,000
Local General Fund Contributions	$4,960,000,000
Innovative Funding Sources	$600,000,000
TOTAL LOCAL HIGHWAY REVENUE	
	$9,510,000,000

Additionally, a portion of the $10 vehicle registration fee for corridor preservation, approved in Salt Lake County in 2006 and approved in Davis and Weber Counties in 2007, could be used for state facilities. Vehicle registrations were projected to grow at about two percent per year through 2040, existing local option vehicle registrations will generate approximately $357,000,000 in Salt Lake County, $101,000,000 in Davis County, and $82,000,000 in Weber County. The local option vehicle registration is assumed to increase by $5 per vehicle in 2020, 2030, and 2040. This new local option vehicle registration will generate approximately $221,000,000 in Salt Lake County, $63,000,000 in Davis County, and $ 51,000,000 in Weber County. It is assumed that a local option fuel and special fuel tax will be imposed in Salt Lake, Davis, and Weber Counties in 2027. The local option fuel tax is projected to be levied at five cents per gallon. This new local option fuel tax would generate approximately $852,000,000 in Salt Lake County, $251,000,000 in Davis County, and $158,000,000 in Weber County.

Table 6-3 summarizes the amount of regional and local highway revenue projected through 2040.

TRANSIT REVENUE SOURCES

The Utah Transit Authority operates and maintains a substantial system of buses and rail within the Wasatch Front Region. The UTA has undertaken an extensive expansion of its rail system that will continue for several years. UTA maintains a master financial spreadsheet which it uses for annual budget preparation, to demonstrate its financial capacity to the Federal officials for New Starts Projects, and to prove its credit worthiness to bond rating agencies. This spreadsheet was expanded and used for estimating revenue and costs associated with the 2040 Regional Transportation Plan.

Much of the existing revenue flows for transit are dedicated to current construction and operations. It is anticipated that about 10 to 20 percent of the revenues required to build and operate the 2011-2040 RTP projects will come from funds currently anticipated in the UTA long-range budget. The transit system expansion envisioned by the 2011-2040 Regional Transportation Plan will require significant new revenue sources. The primary new revenue sources for the transit services proposed in the Regional Transportation Plan are an equalization of the local option sales taxes across all three counties at one percent dedicated to transit, bonding, discretionary federal funds, and project related passenger fares.

Transit in the Wasatch Front Region has been very successful and has garnered strong support. Continued growth of the transit system is a regional priority. The Regional Transportation Plan anticipates that about 36 percent of the revenue required to build and operate the 2011-40 RTP projects will come from new local option revenues. Weber County dedicates a 0.55 of a cent local option sales tax to transit and has an additional 0.25 of a cent local option sales tax dedicated to transportation. Davis County has a 0.55 of a cent local option sales tax dedicated to transit. Salt Lake County has a 0.8 cent local option sales tax with 0.6825 of a cent dedicated to transit. The last decade has seen much growth in transit revenues. This increase in revenue demonstrates transit support amongst local governments, the business community, citizens, and the State Legislature. The 2040 Regional Transportation Plan anticipates that support will continue to accelerate in step with the region's population growth and increasing needs for alternatives to single passenger vehicles.

The Region has also seen substantial success in competing for New Starts funding. New Starts is the premiere discretionary federal funding source for new projects. Regional growth initiatives such as Wasatch Choice for 2040, the ability of the Region to select cost effective projects, and the ability of UTA to construct these transit projects within budget and on schedule has encouraged the Federal Transit Administration to invest further in the Region. The Regional Transportation Plan envisions that UTA's ability to attract New Starts Funding will continue and priority will continue to be given to funding transit over the next 30 years. It is anticipated that that 25 percent of the revenue required to build the 2011-40 RTP projects will be derived from federal discretionary funding. Funding of this magnitude is the equivalent to 25 percent of the construction costs or 16 percent of all RTP project construction and operating costs.

In 2008, when UTA issued its bonds for the TRAX and FrontRunner expansions, the Fitch [bond] Rating Service gave UTA a 'AA' rating noting that that the rating reflects "the strength and diversity of the authority's service area in

Utah's economic epicenter… and the demonstrated record of successfully and conservatively managing transit service operations and expansion." (Mar 13, 2008 Deseret News) The company representative also stated that Fitch "hasn't given any higher rating than 'AA' to any municipal transit agency in the country." UTA has been able to maintain these good bond ratings and was, as late as October 2010, able to maintain its senior lien bonds at an AAA level. Currently UTA has bonds that extend to 2050. Unfortunately, UTA has little bonding authority available through 2025 with its current revenue streams. However, more bonding authority will become available as additional revenues anticipated in the RTP are realized and current bonds are paid down. The RTP anticipates that about 20 percent of the RTP funding will come from bonding retired after 2040, all while staying within UTA's current bonding authority.

Finally, amongst the primary revenues sources are the fares paid by the transit users for the new services provided in the RTP. A conservative approach to estimating these fare revenues was taken using the WFRC travel model, UTA ridership elasticity values, and UTA assumptions regarding fare increases. The net increase in ridership to the UTA system due to the projects proposed in the Regional Transportation Plan is estimated to be 114,000 each weekday in 2040. In terms of fare increases, UTA projects that it will need to increase fares by around 50 percent in the first phase of plan implementation in order to keep up with inflation and to achieve its goal of getting thirty percent of operating costs from fares. UTA will need to raise fares around 30 percent in the second and third phases in order to keep up with inflation. In total it is forecasted that the fares from people using projects to be constructed over the life the RTP will net $1.1 billion through 2040. Fare revenues from the RTP project are anticipated to make up about 8 percent of all RTP revenues.

Local Sales Tax Revenue

A portion of local sales tax revenues is used to support transit services. With the dramatic success of the Sandy and the University TRAX lines, pressure from the general public, business, and policy makers has increased to make more serious strides in building a robust transit system. Many community leaders have embraced transit for their communities and have passed resolutions in favor of an additional tax increases to support transit. The amount of funding available for the new projects in the RTP depends upon the sales tax rate applied and the growth in taxable sales.

In November 2000, residents in Salt Lake, Weber, and Davis Counties voted to raise their local option transportation sales tax rate from 0.25 to 0.50 cent. In 2006, Salt Lake County and in 2007 Weber County again raised their local option transportation related sales tax rate to 0.75 cent with 0.62 in Salt Lake County dedicated to transit and an undetermined amount in Weber County dedicated to transit. The 2007 State Legislature removed local option sales tax from food. However, to offset reductions in transit revenue, the Legislature increased the transit dedicated local option sales tax rate on non-food items by 0.05 in Weber and Davis Counties and 0.0625 in Salt Lake County. Although the Davis County referendum did not pass in 2007 discussions are beginning regarding another attempt at a transportation dedicated 0.25 percent local option sales tax ballot measure in 2012. The RTP assumes that half the Weber County local option revenues approved in 2007 will go to transit; that Davis County will approve the 0.25 percent local option in 2012 with half going to transit; and that all three counties will obtain permission from the State Legislature and win voter approval to bring the transportation dedicated local option sales to tax up to 1.25 percent. This would increase the transit dedicated portion by 0.3125 to 0.325 percent to a full one percent in 2017. No other local option revenue dedications are anticipated through 2040. The local option sales tax rates assumed to be dedicated to transit are shown in Table 6-2, entitled "Local Option Sales Tax – Split by Mode."

Growth in taxable sales is generally a function of population growth, inflation, and growth in real income. From 1978 through 2009 (31 years) the average annual growth in taxable sales in the three counties was 5.9 percent. In the 20 years prior to 2009 the growth rate was 5.8 percent and in the 10 years prior to 2009 the growth rate was 3.2 percent. However, since 2008 when the Great Recession began to 2010 which is the base year for the Regional Transportation Plan sales tax revenues in the WFRC Region have declined by a UTA estimated 10.4 percent. The plan assumes that the growth rate will start off slowly with a a 2.88 percent increase in 2011, a 4.14 percent increase in 2012, and other gradual increases until 2016 when it is assumed to plateau at 5.25 percent through 2040. The total sales tax revenue derived from the existing sales tax levels through 2040 is projected to be $10,100,000,000. Future receipts from the increased sales tax rates are projected to be $4,900,000,000 by 2040 (34 percent of all RTP revenue).

Federally Discretionary Transit Funds

Discretionary federal funds are competed for on a nationwide basis. These funding programs, financed through the federal gasoline tax as well as the federal general fund, are made available through the Federal Transit Administration (FTA). New Starts is the primary discretionary federal funding source for new projects. Recently FTA has sectioned out a subsection of New Starts, called Small Starts, which is dedicated for small, new projects. This application and selection process is expedited. Other discretionary and non-discretionary federal funding sources are more oriented to maintenance of the existing system and are briefly discussed in the "other funds" portion of the financial chapter.

The New Starts Program provides funds for construction of new fixed guideway systems or extensions to existing fixed guideway systems. The Small Starts Program provides funds to capital projects that either: (a) meet the definition of a fixed guideway for at least 50 percent of the project length in the peak travel period or, (b) are corridor-based bus projects with 10 minute peak/15 minute off-peak headways or better while operating at least 14 hours per weekday. Federal assistance provided under Section 5309(e) must be less than $75 million and the project must have a total capital cost of less than $250 million, both in "year of expenditure" dollars.

The FTA is guided in the selection of projects by a rigorous planning process and a set of selection criteria. All projects to be nominated for New Starts must undergo a four step preparation process. First, it must be approved as an element of the Regional Transportation Plan. The RTP will have identified general corridors for future major transit investments and generally described cost, alignment, and design of the project. Next, it must be the subject of a FTA certified Alternatives Analysis process. The Alternatives Analysis examines all of the different project options within a given corridor and allows decision makers to reach consensus on the best option. Third, the project must go through preliminary engineering and one of several levels of environmental study. The level of study required depends upon potential environmental impacts or level of controversy. Last, the project is the subject of final design. After these steps are taken, the sponsoring entity may submit a formal request for funding.

After completion of the Alternatives Analysis, the FTA decides whether or not the project is ready to enter each of the next project steps. FTA also reviews and rates the project according to criteria established in federal law. Criteria include cost effectiveness, land use policies, anticipated economic development impacts, environmental benefits, mobility improvements, and operating efficiencies. The project must be rated "medium" or higher by the FTA in order to move to the next stage of project development. Typically, congressional authorizes about $1.5 billion each budget year for the New Starts Program. Historically the New Starts program has been fully earmarked. Small Starts received its first allocation in 2007 and has received $200 million each year. The current maximum FTA participation in a project is 60 percent, although 50 percent is much more common. The Regional Transportation Plan anticipates the receipt of 25 percent of the capital costs of all 2011-2040 New Start and Small Start eligible projects. This equates to $2.1 billion over the course of 30 years.

Project Construction bonds

UTA has the authority to bond, provided that its total anticipated net revenues available for debt service and capital purchases exceed the bond payments by at least 14.5 percent. Additionally, UTA requires that its debt load not exceed three percent of its total asset value. Bonding is an attractive option for the Wasatch Region as it allows projects to be constructed earlier than they could otherwise be constructed. During inflationary times, bonding can make a project less expensive to build. The cost of bonding is dependent upon how attractive a bond offer is to investors. The municipal bond market traditionally offers low risk, tax free income to investors. UTA has received excellent bond ratings in the past and has been able to obtain favorable interest rates for its bonds issues.

The 2040 RTP assumes that UTA will bond for a total of $2.7 billion over the course of the Plan. The assumed interest rate for this bonding is 5 percent and interest payments amount to $789 million. Since some of the existing bonds from the 2015 program extend beyond 2040 and because it is assumed that $2.5 billion in 15 year bonds will be issued to construct the third phase of the Regional Transportation Plan, it is anticipated that in 2040, there will be an outstanding balance of $2.3 billion. Bond revenue will provide 20 percent of fully implementing the cost restrained portion of the Regional Transportation Plan.

Fares

The UTA receives additional revenue through user fees from the daily operation of its bus and rail system. The total revenues it receives are based upon the average fare per boarding and the number of boardings per year. In 2010 UTA estimated that it received an average of $0.92 per boarding and 37,770,000 boardings resulting in $34,883,000 in fare revenues from its services across its entire region. Between 1996 and 2009, the average fare per boarding increased by an average of 5.8 percent per year and its ridership increased by an average four percent per year giving it average farebox revenue of $20,000,000 and an average annual farebox revenue growth of 10.1 percent. Between 2011 and 2040 UTA anticipates increasing its average fare per boarding by an average of 3.6 percent per year. It anticipates total ridership on its existing and committed system will increase by 3.4 percent per year for a total annual growth in fare revenues of 7.0 percent on its existing and committed system. Most of this funding is allocated to the operations and maintenance of the existing and committed system.

Fare revenues that could be used for the RTP projects are the net revenues anticipated from new and future patrons. A conservative approach to estimating fare revenues was taken using the WFRC travel model, UTA ridership elasticity values, and UTA assumptions regarding fare increases. The travel model estimates that if all the projects were built in the first phase, about 113,000 people would ride them on an average weekday. By 2040 forecasted demographic factors would increase average daily ridership system-wide by 46 percent. UTA assumes that about 25 percent of these riders would be patrons moving from one UTA type of service to another and would not increase fare revenues. UTA only counts weekday ridership in its farebox revenue estimates. In terms of fare increases, UTA assumes that it will need to increase fares by around 50 percent in the first phase in order to keep up with inflation and achieve its goal of getting thirty percent of operating costs from fares. It will need to raise the fares by around 30 percent in the second and third phases in order to keep up with inflation. It is assumed these fare increases will reduce the 2040 ridership growth rate from 45 percent to 35 percent. In total, it is forecasted that fare revenue from patrons of the RTP projects will net $1.1 billion over the course of the RTP.

Other Revenues

UTA derives additional revenue from a myriad of relatively small sources and from sources that are dedicated to the preservation of the existing transit system. Other Federal sources include Section 5309 Discretionary Bus and Bus Facilities Grants which are allocated for specific projects on the basis of merit. Section 5307 Formula Grants are distributed annually to the Ogden-Layton Urbanized Area, the Salt Lake Urbanized Area, and to the Region in support of Commuter Rail. The formula used to distribute these funds

TABLE 6-4

Projected Transit Capital and Operating Revenues 2011 - 2040

Revenues	2011-2020	2021-2030	2031-2040	Total
Balance from existing revenues	$ -	$ 223,000,000	$ 1,657,000,000	$ 1,880,000,000
Sales tax rate increases	$ 480,000,000	$ 1,639,000,000	$ 2,734,000,000	$ 4,853,000,000
Federal New, Small, & Very Small Starts	$ 102,000,000	$ 585,000,000	$ 1,427,000,000	$ 2,114,000,000
New Project Fares	$ 52,000,000	$ 342,000,000	$ 673,000,000	$ 1,067,000,000
New Bonds	$ -	$ 240,000,000	$ 2,500,000,000	$ 2,740,000,000
TOTAL TRANSIT REVENUES				
	$ 634,000,000	**$ 3,029,000,000**	**$ 8,991,000,000**	**$ 12,654,000,000**

is based on total population, population density, bus, and rail transit revenue miles of service. The 5309 Fixed Guideway Modernization Program is another important source of funding for maintenance. Each project becomes eligible for this funding after seven years in service. Congestion Management/Air Quality and the Surface Transportation Program grants administered by the WFRC and still other smaller grants are available for various purposes. Non-federal sources include interest from bank accounts, bus advertising, local contributions, and "joint development". All of these revenues are accounted for in the 10 to 20 percent of RTP total funding discussed at the beginning of this section. Table 6-4 summarizes the funds that will pay for the RTP's recommended transit improvements through 2040.

PROJECTED COSTS OVERVIEW

The costs for making the needed improvements for both highways and transit as identified by the 2040 RTP were analyzed by the WFRC, UDOT, UTA and the other local MPOs. Costs include those required to meet the needs identified in the Plan, as well as cost estimates for general administration and the operation, maintenance, and preservation of the existing transportation system. Projected costs for highway improvements have been adjusted at an annual four percent inflation rate, while the projected costs for transit operations and maintenance have been adjusted at an annual 3.75 percent until 2017 and then at a 3.5 percent rate after 2013.

HIGHWAY COST ESTIMATES

For purposes of this Plan, the Utah Department of Transportation has estimated its current funding levels to operate, maintain, preserve, and administer the state highway system. In addition, through their Asset Management Program, UDOT has estimated the additional revenues, beyond the current levels, needed to maintain its system. Unmet funding levels were estimated for safety, bridge preservation, and pavement preservation. UDOT assumes that future construction projects will include some system maintenance and preservation.

UDOT Operations

The Utah Department of Transportation operation costs include UDOT staff, planning and preliminary engineering, maintenance, snow plowing, and other potential cost centers. UDOT estimated their administrative costs based on past budgets. In 2009, UDOT's budget for Operations was approximately $203,000,000 statewide. The operations costs are expected to grow at two percent per year. A total of $8,574,000,000 has been estimated for UDOT operations expenses through the year 2040 statewide.

Contractual Maintenance

"Contractual maintenance" costs are the costs associated with short season maintenance projects that are contracted out. These include such activities as: slurry seals, chip seals, and striping. UDOT estimated its contractual maintenance costs based on past budgets. In 2005, UDOT's budget for contractual maintenance was $45,000,000 statewide. These costs are projected to grow at five percent per year, including four percent for construction inflation and one percent for growth in the roadway system. A total of $4,007,000,000 has been estimated for UDOT's contractual maintenance costs through the year 2040 statewide.

Signals, Spot Improvements, Lighting, and Barriers

Signals, spot improvements, lighting, and barriers activities include signing, marking, and signal installation and maintenance. UDOT's signal, spot improvement, lighting and barriers costs for 2006 were $12,500,000 statewide. These costs are projected to grow at five percent per year, including four percent for construction inflation and one percent for growth in the roadway system. Based on these assumptions, UDOT will allocate $1,060,000,000 for signals, spot improvements, lighting and barriers between 2011 and 2040 statewide.

Bridge Preventative Maintenance

UDOT estimated its statewide costs for bridge preventative maintenance activities in 2005 totaled $10,000,000. These costs are projected to grow at five percent per year, including four percent for construction inflation and one percent for growth in the roadway system. Based on UDOT assumptions, about $848,000,000 will be set aside for bridge preservation for the years 2011 through 2040 statewide.

Highway Rehabilitation / Replacement

UDOT estimated highway rehabilitation and replacement costs for 2011 through the year 2040, based on the 2006 budget, of $16,000,000 statewide. These costs are projected to grow at five percent per year, including four percent for construction inflation and one percent for growth in the roadway system. Based on UDOT assumptions, $1,357,000,000 will be used for highway rehabilitation and replacement for the years 2011 through 2040 statewide.

Hazard Elimination, Safety, Enhancements

"Hazard elimination, safety, and enhancements" include hazard elimination, intersection upgrades, railroad crossing improvements, other similar projects; and the development of pedestrian facilities, bicycle facilities, and landscaping projects. UDOT estimated their statewide costs for these activities in 2005 at $12,000,000. These costs are projected to grow at five percent per year, including four percent for construction inflation and one percent for growth in the roadway system. Based on UDOT assumptions, it will spend $1,068,000,000 for hazard elimination, safety and enhancement expenses between 2011 and 2040 statewide.

Region / Department Contingencies

UDOT Region and Department contingencies are used for project overruns, spot improvements and other immediate

Bridge Rehabilitation / Replacement

UDOT estimated its bridge rehabilitation and replacement costs for 2011 through 2040 based on the $10,500,000 budgeted for this activity statewide in 2005. These costs are projected to grow at five percent per year, including four percent for construction inflation and one percent for growth in the roadway system. Based UDOT assumptions, $935,000,000 will be used for bridge rehabilitation and replacement for the years 2011 through 2040 statewide.

but unanticipated needs. UDOT estimated their statewide costs for these activities in 2005 at $3,500,000. These costs are projected to grow at five percent per year, including four percent for construction inflation and one percent for growth in the roadway system. Based on UDOT assumptions, it will make $312,000,000 available for region and department contingency expenses between 2011 and 2040 statewide.

Unmet Safety Needs

UDOT estimated the amount of funds currently allocated to safety, as noted above. Through the Asset Management Program, UDOT has estimated a shortfall in needed safety funding. UDOT estimates that there was a shortfall of safety funding in 2006 of approximately $7,400,000. These costs are projected to grow at five percent per year, including four percent for construction inflation and one percent for growth in the roadway system. UDOT estimates that between 2011 and 2040 an additional $627,000,000 in safety funding will be needed statewide.

Unmet Bridge Preservation Needs

UDOT estimated the amount of funds currently allocated to bridge preservation as noted above. Through the Asset Management Program, UDOT has estimated a shortfall in bridge preservation funds. UDOT estimates that there was a shortfall of bridge preservation funding in 2006 of $33,475,000. The costs are projected to grow at five percent per year, including four percent for construction inflation and one percent for growth in the roadway system. UDOT estimates that between 2011 and 2040, the additional bridge preservation fund will need a total $2,839,000,000 statewide.

Unmet Pavement Preservation Needs

UDOT estimated the amount of funds currently allocated through the asset management program to pavement preservation listed above. In 2006, UDOT estimated that there was a shortfall of pavement preservation funding of $64,075,000. These costs are projected to grow at five percent per year, including four percent for construction inflation and one percent for growth in the roadway system. UDOT estimates that between 2011 and 2040 the additional pavement preservation fund will need a total of $5,433,000,000 statewide. Table 6-5 summarizes the projected state highway costs for 2011 through 2040 for each of the eleven expenditure categories.

TABLE 6-5

Projected Statewide Highway Operating and Preservation Costs 2011 - 2040

Expenditures	Amount
UDOT Operations	$ 8,574,000,000
Contractual Maintenance	$ 4,007,000,000
Signals, Spot Improvements, Lighting, Barrier	$ 1,060,000,000
Bridge Preventive Maintenance	$ 848,000,000
Bridge Rehabilitation / Replacement	$ 935,000,000
Highway Rehabilitation / Replacement	$ 1,357,000,000
Hazard Elimination, Safety, Enhancements	$ 1,068,000,000
Region / Department Contingencies	$ 312,000,000
Unmet Safety Needs	$ 627,000,000
Unmet Bridge Preservation Needs	$ 2,839,000,000
Unmet Pavement Preservation Needs	$ 5,433,000,000
TOTAL STATEWIDE HIGHWAY OPERATING AND PRESERVATION COSTS	
	$ 27,060,000,000

Local Highway Cost Estimates

Estimates were made for six local cost categories. Estimates included administration, maintenance, pavement preservation, traffic operations and safety, and enhancements. The total estimated for the various types of costs are discussed below. These assumptions are based on a survey of local agency highway expenses. Growth and inflation assumptions were applied to these cost totals for the period from 2011 through 2040.

Administration

Administration costs are expenditures associated with managing transportation agencies, and the transportation divisions of larger public works departments. These costs include expenditures for staff, planning activities, preliminary engineering, etc. Municipalities and counties along the Wasatch Front are estimated to spend 15 percent of their transportation revenues on administration. It is estimated that approximately $1,427,000,000 will be used for administration purposes as defined above through the year 2040.

Maintenance

Maintenance activities include snow removal, sweeping, weed control, crack sealing and pothole repair. Estimates of local spending for maintenance are based on municipal and county financial reports. In 2001, local maintenance costs were estimated to be approximately $1,500 per lane-mile. These costs were estimated to have increased by four percent per year, while the number of lane-miles is estimated to have increased by one percent annually. Municipalities and counties in the Wasatch Front Region were responsible for approximately 8,875 lane-miles in 2001. It is estimated that approximately $1,690,000,000 will be used for local maintenance activities through 2040.

Pavement Preservation

Pavement preservation actions are treatments for streets and highways, which are more extensive than maintenance. These treatments range from chip seal work to full reconstruction. Local pavement preservation costs were calculated, based on experience, from municipal and county financial reports. In 2001 local agency costs for pavement preservation were estimated, on average, at about $4,100 per lane-mile per year for collector, arterial and local streets. These costs were estimated to have increased by four percent a year. The Wasatch Front Urban Area had 8,875 lane-miles of collector, arterial and local streets in 2001. The number of lane-miles was assumed to grow at one percent a year. It is estimated that a total of $4,566,000,000 will be used by local governments for local pavement preservation through 2040.

Traffic Operations and Safety

Traffic operations activity includes signing, marking, and signal installation and maintenance. Safety improvements include hazard elimination, intersection upgrades, railroad crossing improvements, and similar projects. In 2001, local agency costs for traffic operations and safety were estimated, on average, to be about $2,100 per lane-mile per year for

TABLE 6-6

Projected Local Highway Operating and Preservation Costs 2011 - 2040

Expenditures	Amount
Administration	$ 1,427,000,000
Maintenance	$ 1,690,000,000
Pavement Preservation	$ 4,566,000,000
Traffic Operations and Safety	$ 2,292,000,000
Enhancements	$ 456,000,000
TOTAL LOCAL HIGHWAY COSTS	
	$ 10,431,000,000

collector, arterial and local streets. These costs were estimated to have increased by four percent a year, while the number of lane-miles was estimated to increase by one percent annually. In 2001, municipalities and counties along the Wasatch Front were responsible for approximately 8,875 lane-miles. It is estimated that a total of $2,292,000,000 will be used for local traffic operations and safety costs through 2040.

Enhancements

Enhancements include development of pedestrian facilities, bicycle facilities, and landscaping projects. In 2001, local enhancement costs were estimated to be approximately $400 per lane-mile. These costs were estimated to have increased by four percent a year, while the number of lane-miles is estimated to increase by one percent annually. In 2001, municipalities and counties along the Wasatch Front were responsible for approximately 8,875 lane-miles. It is estimated that a total of $456,000,000 will be spent for local enhancement costs through the year 2040. Table 6-6 summarizes the projected local highway costs for 2011 through 2040 for each of the five expenditure categories discussed above.

TRANSIT COST ESTIMATES

The UTA maintains a master financial spreadsheet which it uses for annual budget preparation, to demonstrate its financial capacity to Federal officials for New Starts Projects, and to prove its credit worthiness to bond rating agencies. This spreadsheet was expanded and used in tracking revenue and costs for the 2011-2040 Regional Transportation Plan. Given that Utah Transit Authority operates and maintains a substantial transit system and is now undergoing an extensive expansion of its rail system with its existing revenue sources, the focus of this document will only be RTP related costs. These costs can be directly compared to the new revenues discussed in the Revenues section. UTA's Transit Development Program discusses the revenues and cost associated with the current and committed transit system.

Costs were estimated for transit related projects in the 2011-2040 Regional Transportation Plan including new construction, operations and maintenance, maintenance facilities, and debt service. The WFRC worked with UTA to estimate capital as well as operating and maintenance costs to implement the 2040 RTP's recommended transit improvements. Recommended major investment costs include commuter rail, light rail transit, streetcar, Bus Rapid Transit (BRT 3), Enhanced Bus (BRT 1) lines. Built into the costs for each new service are the proportional costs of the required maintenance facility. Other RTP capital investments include the purchase of replacement BRT and rail vehicles and the construction of transit hubs, transit ramps, and park and ride facilities. Project costs were derived from study estimates where possible but were otherwise estimated on a per unit basis if a study had not been completed. The cost estimation methodology is discussed below.

All direct project costs are discussed below in 2010 dollars. Bonding costs and the costs summary below are in year of expenditure dollars. The annual inflation rate assumed for RTP projects was 4 percent for capital costs and 3.75 percent for Operating and Maintenance costs. Project by project costs are found in Appendix I.

Direct Project Costs

Right-of-Way

Right-of-way costs were estimated using two generally accepted general methods of calculation. The first method is to use a simple $1.0 million per mile charge where an existing rail corridor is involved or a $0.15 million per mile charge when the line is traversing a large development with a partner developer. A second method is used when widening a street to make way for a transit project. This method uses estimated current curb to curb and building front to building front distances, estimated future road rights-of-way widths, and predominant land use type to calculate right-of-way and building acquisition costs by project segment. Only a 30 foot wide transit way is assumed where a continuous exclusive lane is required, unless specific studies have given more direction. Per square foot costs are assumed to be $18 for commercial areas, $12 for mixed residential/commercial and for industrial areas, and $9 for residential areas. Buildings are assumed to be required if the full width road plus transitway width would exceed the building face to building face width by twelve or more feet. Otherwise it is assumed that adjustments to the street or the transit project could eliminate the need to take the building. Building costs were estimated at $10 million a centerline mile for commercial areas, $7.5 million per centerline mile for industrial or mixed residential/commercial areas, and $5 million per mile for residential areas.

Commuter Rail

Typical Commuter Rail capital costs are estimated by UTA to be $17.7 million a mile. A break out of each of the unit costs is in provided in Appendix I. Because only one Commuter Rail construction project is planned for in the RTP and because it is a rebuild project, the only non-right-of-way costs calculated for this project were utilities, structures, design/management/bonds, and contingency/escalation. Therefore, construction costs were estimated at $9.2 million per mile. The typical right-of-way cost for this type of facility is $1.0 million a mile. In total, the project cost was $and estimated 62.8 million at $10.2 per mile. Operating costs were estimated at $2.6 million per year for the 2.1 mile project.

Light Rail

Typical Light rail capital costs are estimated to be $52.8 million a mile. A break out of each of the unit costs is provided in Appendix I. Only three light rail transit projects are proposed in the RTP and two different approaches to construction cost were used to develop the cost estimates. The first two projects are the Draper Line TRAX Extension North and South segments. The vast majority of the Draper Line TRAX Extension has undergone preliminary engineering and this figure was used directly for the segments south to 14600 South. The per-mile figure from the studied Draper Line TRAX Extension was then used to estimate the cost of the segment south of 14600 South. The third segment is the University TRAX Line to Salt Lake Central TRAX Connection. The typical cost figure of $52.8 million mile plus the cost of right-of-way was used to calculate the cost of the one mile segment between 400 South/Main Street and Salt Lake Central. Operating and Maintenance costs for light rail are calculated as $112,449 per track mile plus $78.93 per Revenue Hour plus $2.94 per vehicle mile. Three vehicles per train were assumed.

Streetcar

Typical capital cost for Streetcar lines are estimated to be $37.94 million a mile. A more detailed explanation of each of the unit costs is provided in Appendix I. Only four streetcar transit projects are proposed in the RTP, and two different approaches to construction cost were used to develop the cost estimations. The Sugarhouse Streetcar (First Phase) and Ogden-Weber State University Streetcar lines have undergone studies and the cost estimations in the studies were used for these projects. The Ogden Downtown Streetcar Circulator and Sugarhouse Streetcar Westminster Segment lines used the $37.94 million per mile charge and no right-of-way costs were assumed. Operating and Maintenance costs for streetcar are the same as light rail ($112,449 per track mile plus $78.93 per Revenue Hour plus $2.94 per vehicle mile). However, one car trains were assumed.

Bus Rapid Transit (BRT 3) and Enhanced Bus (BRT 1)

Typical Bus Rapid Transit (BRT 3) and Enhanced Bus (BRT 1) capital costs are estimated to be $16.4 million and $3.4 million per mile respectively. A break out of each of the unit capital costs is provided in Table 6-7. The per-unit capital costs for these two transit types are very similar with the exception of exclusive lanes. Adjustments were made to these per-unit costs for some common project circumstances such as: Bus Rapid Transit (BRT 3) projects built in conjunction with major road projects were assumed to have half the lane construction costs and Enhanced Bus (BRT 1) built in conjunction with major road projects were assumed to have none of the traffic signal priority improvement costs and only half of the queue jumper costs.

TABLE 6-7

Bus Rapid Transit Summary

		Bus Rapid Transit (BRTIII)		Enhance Bus (BRT!)	
	Base	Qty / Mile	Cost / Mile	Qty / Mile	Cost / Mile
Stations	$ 400,000	2.00	$ 800,000	2.00	$ 800,000
Parking Lots	$ 1,800,000	0	$ 0	0	$ 0
Vehicles	$ 1,000,000	0.54	$ 540,000	0.54	$ 540,000
Transit System Priority	$ 200,000	4.00	$ 800,000	4.00	$ 800,000
Queue Jump	$ 150,000	2.00	$ 300,000	2.00	$ 300,000
Lane Construction	$ 10,000,000	1.00	$ 10,000,000	0	$ 0
Maintenance Facility	$ 250,000	0.54	$ 135,000	0.54	$ 135,000
Subtotal			$ 12,575,000		$ 2,575,000
Contingency	30%		$ 3,772,500	30%	$ 772,500
Summary Cost Per Mile (rounded)			$ 16,348,000		$ 3,348,000

Operating and Maintenance costs for Enhanced Bus (BRT 1) and Bus Rapid Transit (BRT 3) were estimated using $1.95 per vehicle mile and $50 per vehicle hour, the same as a local bus. The BRT lines are designed to replace the existing local service with half mile station spacing and so only the net operating costs were charged against these projects.

Other Capital Costs

The 2011-2040 Regional Transportation Plan also call for several small projects and eventually the replacement of the Bus Rapid Transit (BRT 3) and Enhanced Bus (BRT 1) vehicles that were purchased for the projects in the first phase of the Plan. The small projects called for are three park and

TABLE 6-8

Projected Major Transit Capital and Operating Costs 2011 – 2040 **

Expenditures	2011-2020	2021-2030	2031-2040	Total
Construction	$ 452,000,000	$ 2,405,000,000	$ 6,715,000,000	$ 9,572,000,000
Operations and Maintenance	$ 82,000,000	$ 572,000,000	$ 1,497,000,000	$ 2,151,000,000
Debt Service	$ -	$ 38,000,000	$ 751,000,000	$ 789,000,000
TOTAL MAJOR COSTS				
	$ 534,000,000	**$ 3,015,000,000**	**$ 8,963,000,000**	**$ 12,512,000,000**

*Includes debt service through 2040
*Excludes non-RTP expenditures and ‘other’ small RTP capital purchases
**$2,306,000,000 in debt still outstanding at the end of 2040

ride lots that are not associated with a RTP transit line, a transit only freeway ramp, and four transit hubs. The unit costs for these three facility types are $2.0 million, $20 million, and $2.0 million respectively in 2010 dollars. The cost of a Bus Rapid Transit (BRT 3) and Enhanced Bus (BRT 1) vehicle are $1.0 million and $0.54 million respectively in 2010 dollars. Projects that start in the first phase as Enhanced Bus (BRT 1) but are scheduled to become BRT 3 would receive specialized Bus Rapid Transit (BRT 3) replacement vehicles. It is estimated that about 70 Bus Rapid Transit (BRT 3) and 30 Enhanced Bus (BRT 1) replacement vehicles will be required.

Bonding Costs

The 2040 RTP recommends an aggressive project schedule which, in turn, requires incurring debt and debt payments. The financial assumptions include the repayment of most bonded debt by 2040 and the remainder of it by 2050. The debt service for the RTP in each phase is anticipated to be as follows: Nothing in the first phase, $38 million in the second phase, and $751 million in the third phase for a total of $789 million in year of payment dollars. An additional $2,306 million in debt is outstanding at the end of 2040 and interest payments after 2040 will amount to $760 million.

Cost Summary

The Utah Transit Authority operates a large transit system of carpools, vanpools, regular buses, Enhanced Bus (BRT 1), Bus Rapid Transit (BRT 3), Light rail, and Commuter Rail. This system incurs many regular and on-going costs. The UTA will significantly expand the Region's rail facilities and service in the next few years. The Transit Development Program tracks the transit system costs and revenues. For the 2011-2040 Regional Transportation Plan, the costs associated with the RTP proposed projects are summarized in Table 6-8.

Conclusion

Statewide funding available to UDOT for capacity improvement projects is assumed to be divided among the MPOs of the state based on each organization's share of the state's populations. The 2040 RTP assumes that Wasatch Front Regional Council will receive 54.3 percent of the available funding available between 2011 and 2020, 51.1 percent of the available funding between 2021 and 2030, and 48.5 percent of the available funding between 2031 and 2040. The assumption is that approximately $15,923,000,000 of the $31,929,000,000 total new capacity funds available to UDOT over the life of the RTP will be used in the Wasatch Front Region. The region also will receive approximately $325,000,000 for Transportation Investment Fund (TIF) / Centennial Highway Fund (CHF) projects between 2011 and 2013, $244,000,000 for Centennial Highway Needs Fund (CHNF) projects for 2011 and 2012, and about $27,000,000 from the Highway Capacity Program

TABLE 6-9

Statewide, Regional, and Local Highway Revenue Allocation 2011 - 2040

Source / Expenditure	Amount
WFRC's Available Funds for Capacity Improvements from State Funds	$ 16,518,000,000
Regional Revenue Available	$ 6,035,000,000
Local Revenue Available	$ 9,511,000,000
Local Highway Operating Costs	($ 10,430,000,000)
WFRC's Available Funds for Capacity Improvements from Local Funds	($ 920,000,000)
WFRC Bond Interest and Costs	($ 1,456,000,000)
TOTAL WFRC AVAILABLE FUNDS FOR CAPACITY IMPROVEMENTS	**$ 20,177,000,000**
TOTAL WFRC HIGHWAY PROJECT COSTS 2011-2040	**$ 20,065,000,000**
WFRC UNMET PRESERVATION NEEDS	**$ 4,485,000,000**

(HCP) and TIF$55 program available for 2011 and 2012. This brings the total amount available to program for capacity projects from UDOT to approximately $16,518,000,000. The WFRC also estimates that approximately $6,035,000,000 will be available from regional revenue sources. The Wasatch Front Regional Council's total resources available for capacity improvement projects are anticipated to be approximately $20,177,000,000.

The WFRC assumes a bond offer for highways projects totaling approximately $1,639,000,000 will be made available in 2017, and another bond offer in 2025 for $865,000,000. These bonding assumptions, if they become a reality, still leave the state with remaining bonding capacity. These bonds will allow additional projects to be constructed in Phases 1 and 2. However, interest payments will reduce total available funding in later phases. It should be noted that other MPOs within the State have been included in discussions regarding proposed bonding to ensure adequate coordination. If bonding is implemented as discussed above, the total cost will be $1,456,000,000.

For the highway portion of the 2040 RTP, cost estimates were calculated for new capacity improvements on collector and arterial streets needed to meet future transportation demands. These costs for the Wasatch Front Urban areas are approximately $20,065,000,000. The cost for local street construction is not included in these estimates. It is assumed that private developers will construct these streets.

UDOT's statewide Unmet Preservation (Safety, Bridge, and Pavement) Needs is assumed to be divided among the MPOs based on each agency's share of the state's populations. The Wasatch Front Regions share of the costs is approximately $4,485,000,000 of the total of $8,899,000,000. Table 6-9 shows projected revenues for highways, both statewide and regional; the costs required to administer, operate, and preserve the system; the funding available for adding capacity; and the projected cost of the RTP recommended projects.

The proposed 2011-2040 Regional Transportation Plan transit program is fiscally constrained. The existing revenue streams as outlined in UTA's Transit Development Program can construct, operate, and maintain the existing and committed transit system and contribute a limited amount of funds to the RTP program. The bulk of new projects will need to be funded through new revenue sources. The 2011-2040 RTP makes reasonable assumptions about what these new revenue sources might be, and the revenues they would produce. It also makes reasonable estimations about what the 2011-2040 RTP program of projects would cost. Table 6-10 shows projected revenues and cost estimations for the 2040 RTP.

TABLE 6-10

Total Major Projected Transit Revenues and Costs 2011 - 2040

Expenditures	2011-2020	2021-2030	2031-2040	Total
Total RTP Revenues	$ 634,000,000	$ 3,029,000,000	$ 8,991,000,000	$ 12,654,000,000
Total RTP Costs	$ 534,000,000	$ 3,015,000,000	$ 8,963,000,000	$ 12,512,000,000

*Includes debt service through 2040
*Excludes non-RTP expenditures and 'other' small RTP capital purchases
**$2,306,000,000 in debt still outstanding at the end of 2040

Image by James Belmont

A Comprehensive List

The purpose of the 2040 RTP is to document a comprehensive list of planned improvements to the regional transportation system designed to meet the travel needs of Wasatch Front Region residents for the next 30 years. The planning process evaluated long-range capacity needs and developed a list of planned highway, transit, and other improvements needed by the year 2040. The process considered the Wasatch Front's travel demand, examined various transportation alternatives, designated transportation improvements, and provided proper construction phasing. The 2040 RTP relied on extensive public review and input that helped generate recommended projects that can be implemented using estimated available funding between 2011 and 2040. The 2040 RTP also recommends general policy for transportation systems, enhancements, regional freight movement, bicycle routes, pedestrian amenities, multi-purpose trails, safety, and homeland security.

Chapter 7

Photo at Left: Light rail construction of the new Airport Line at the new North Temple bridge illustrates a significant planned improvement in the region's transportation system. North Temple, along the Airport line, is being reconstructed as a grand boulevard and gateway into Salt Lake City.

OVERVIEW OF PLANNED IMPROVEMENTS

The WFRC staff developed, refined, and tested three transportation system alternatives, along with a "no-build alternative. These system alternatives helped identified needed capacity improvements for the Wasatch Front Region's highways, arterial streets, and transit network. The alternatives also helped form the basis for the recommended transportation improvements found in the 2040 RTP. Once the preferred alternative was selected, as discussed in Chapter 5, the WFRC staff further refined recommended improvements to the region's transportation system by selecting those projects that best meet projected travel needs. This planning process focused on individual highway and transit projects, their type, length, width, class, phasing, technology, corridor alignment, station spacing, and other important characteristics.

In January 2011, the WFRC staff presented the draft 2040 RTP phased highway and transit projects lists, along with their corresponding maps, to the Regional Growth Committee and the Wasatch Front Regional Council for review and comment. Project lists and maps were also distributed to other elected officials, regional planners and engineers, and interested members of the general public. Briefings on the draft 2040 RTP projects were presented to the WFRC Transportation Coordination Committee and its Technical Advisory Committees, the Regional Growth Committee and its Technical Advisory Committees, the Salt Lake, Davis and Weber County Councils of Governments, and individual city planners and engineers. As a result of this effort, the WFRC staff received comments regarding the recommended capacity improvements for the highway and transit networks. In a number of cases, changes to the draft 2040 RTP projects list and maps were made to include facilities that needed to be part of the region's overall plan.

Highway Improvements

Programmed highway improvements in the 2040 RTP include a balance of freeway, highway, arterial and collector road projects. The projects add needed capacity through the construction of new facilities or the widening of existing roads. Two new freeways, the Mountain View Corridor and West Davis Corridor are proposed to serve the growing travel demands in the Region. The need for approximately 75 miles of additional capacity improvement on existing freeways, such as I-15, SR-201, I-215, I-80, and US-89 is also recognized and recommended.

The 2040 RTP includes new or widened arterial streets and freeway improvements identified as needed to serve the existing and developing areas of the Wasatch Front Region. Approximately 1,071 lane miles of capacity improvements are planned for the next 30 years. Highway facilities that will be constructed or improved include approximately 354 lane miles of freeway, 318 lane miles of principal arterials, 256 lane miles of minor arterials, and 143 lane miles of collector roads. Major projects in the 2040 RTP include the construction of the West Davis Corridor / North Legacy Corridor through Davis and Weber Counties, the widening of US Highway 89 in Davis County, portions of I-15 in Salt Lake, Davis, and Weber Counties, the Mountain View Corridor in Salt Lake County, and the reconstruction of I-80 from 1300 East to the Summit County Line. Due to financial constraints, not all of the new capacity needs recommend for construction by 2040 can be met by the 2040 RTP. By identifying expected highway revenue and expected construction and maintenance costs, the WFRC staff developed a list of new capacity highway projects for which funding will likely be available beginning in 2011 and continuing through 2040.

Transit Improvements

Major WFRC transit improvements recommended and proposed for funding by the 2040 RTP include an extensive Bus Rapid Transit (BRT 1 and 3) network, several streetcar lines, an upgrade of the existing Commuter Rail line and the extension of the North/South TRAX line to Utah County. In total, recommended improvements amount to approximately 161 additional miles of Bus Rapid Transit (BRT 3), 106 miles of Enhanced Bus (BRT I), 12 miles of additional Light Rail, 11 miles of Streetcar, and 6 miles of Commuter Rail reconstruction.

Additionally, it is recommended that local bus service be increased by at least 25 percent over the next 30 years, and four miles of corridor be preserved for a potential extension of Commuter Rail into Box Elder County, and Enhanced Bus (BRT 1) be upgraded to BRTIII. The proposed increase in transit will translate into greater service coverage, more frequent service, and longer hours of operation. The 2040 RTP also identifies locations and funding for needed transit hubs, park-and ride lots, and calls for additional paratransit service.

Highway and Transit Project Phasing

In March of 2010, the RGC and the WFRC reviewed and approved specific evaluation criteria for the phasing of recommended projects. These criteria were used to evaluate and rank each project and help identify their proper phase in the RTP. The criteria for highway projects included (1) vehicle hours of delay, (2) safety data, (3) economic development, (4) complete streets, (5) benefit cost, and (6) project preparation. In addition to much of the above, transit projects also took into consideration current ridership, forecasted ridership, and travel time reduction. Other important phasing considerations for both highway and transit projects included whether or not the project is part of the current 2011-2016 Transportation Improvement Program, the previous 2007-2030 Regional Transportation Plan, and input from local officials, UDOT and UTA representatives, and Technical Advisory Committee members. Finally, ranked highway and transit projects were placed into one of four different phases to coincide with the availability of anticipated financing and revenue sources.

- Phase 1 (2011-2020)
- Phase 2 (2021-2030)
- Phase 3 (2031-2040)
- Unfunded Needs or “Illustrative Projects”

During December 2010, the WFRC staff focused on further refining recommended highway and transit projects with input provided by local planners, engineers, elected officials, and the general publc. The 2040 RTP was developed within the constraints of financial feasibility. Thus, the list of highway and transit facility improvements contains only those projects that can be funded over the next 30 years. Reasonable assumptions were made concerning both future revenues for transportation improvements and the estimated costs of programmed highway and transit facilities as discussed in Chapter 6, Financial Plan.

PROJECTS COMPLETED OR UNDER CONSTRUCTION

During the 4-years since the previous 2007 -2030 LRP Update was adopted, a number of highway projects have been completed or are currently underway. These projects include SR-201 from the Jordan River to 3200 West, Legacy Parkway through Davis County, portions of I-215, and I-15 from 10600 South to the Utah County Line. Highway improvement and new construction projects within the Wasatch Front Region that have been completed, deleted, modified, or are currently under construction are listed in Table 7-1.

Transit

In a similar manner to the highways projects listed above, the status of several of major transit projects recommended in the previous Regional Transportation Plan: 2007-2030 have changed. Of particular note, construction is complete on the Salt Lake to Weber County Commuter Rail and the Salt Lake Central lines, and underway on the Airport, West Valley, Mid-Jordan, and the Commuter Rail South lines. The first phase of the 3500 South BRT line construction was also completed. Table 7-2 lists the transit projects from the 2007-2030 RTP that are under construction, have been completed or have been deleted or significantly modified in the 2011-2040 Regional Transportation Plan.

TABLE 7-1

Highway Projects Completed, Deleted, Modified or Under Construction From the 2007 – 2030 RTP

County	ID	Project	Description		Status
SALT LAKE AREA PROJECTS FROM THE 2030 RTP – COMPLETED, DELETED, MODIFIED OR UNDER CONSTRUCTION					
Salt Lake	4	California Avenue I-215 to Bangerter Highway	Widening – 4 to 6 Lanes ROW: 2006 – 110 ft. / 2030 – 110 ft.	M. Arterial / 2.1 Miles / Local Bike Class - 2	Deleted
Salt Lake	5	California Avenue Bangerter Hwy to 4800 West	Widening – 4 to 6 Lanes ROW: 2006 – 110 ft. / 2030 – 110 ft.	M. Arterial / 0.8 Miles / Local Bike Class - 2	Deleted
Salt Lake	7a	I-80 State Street to 1300 East	Widening – 6 to 8 Lanes ROW: 2006 – 260 ft. / 2030 – 26o ft.	Freeway / 1.8 Miles / UDOT Bike Class - 0	Completed
Salt Lake	233	I-80 Interchange East Bound @I-215 (West Side)	Upgrade – 1 to 2 Lanes ROW: 2006 – 260 ft. / 2030 – 260 ft.	Freeway / 0.6 Miles / UDOT Bike Class - 0	Completed
Salt Lake	9	SR-201 3200 W. Mountain View Corr.	Widening – 4 to 6 Lanes ROW: 2006 – 300 ft. / 2030 – 300 ft.	Freeway / 3.4 Miles / UDOT Bike Class – 2,3	Completed
Salt Lake	234	SR-201 SR-202 to I-80	Widening – 4 Lanes ROW: 2006 – 300 ft. / 2030 – 300 ft.	Freeway / 3.3 Miles / UDOT Bike Class – 0 / Transit Project	Under Construction
Salt Lake	295	Western East / West Study SR-201 to Utah County Line	Study	UDOT	Completed
Salt Lake	14	3500 South 2700 West to 4000 West	Widening – 4 to 6 plus Transit Lanes ROW: 2006 – 100 ft. / 2030 – 106 ft.	P. Arterial / 1.5 Miles / UDOT Bike Class – 0 / Transit Project	Completed
Salt Lake	18	4500 South 2700 East to 2300 East	Widening – 2 to 4 Lanes ROW: 2006 – 80 ft. / 2030 – 106 ft.	P. Arterial / 2.7 Miles / UDOT Bike Class – 0	Deleted
Salt Lake	297	4500 South I-215 to 2700 East	Re-stripe – 2 to 4 Lanes ROW: 2006 – 80 ft. / 2030 – 106 ft.	P. Arterial / 0.7 Miles / UDOT Bike Class 2	Deleted
Salt Lake	19	4500 South I-15 to State Street	Widening – 4 to 6 Lanes ROW: 2006 – 150 ft. / 2030 – 150 ft.	P. Arterial / 0.7 Miles / UDOT Bike Class – 0	Completed
Salt Lake	239	5400 South I-15 to Bangerter Highway	Widening – 4 to 6 plus Transit Lanes ROW: 2006 – 86-110 ft. / 2030 – 110 ft.	M Arterial / 6.8 Miles / UDOOT Bike Class – 0.3 / Transit Project	Deleted
Salt Lake	300	7000 South / 7200 South State Street to I-15	Widening – 4 to 6 Lanes ROW: 2006 – 90 ft. / 2030 – 106 ft.	M. Arterial / 2.6 Miles / Local Bike Class – 2	Deleted
Salt Lake	27	7800 South Bangerter Hwy to New Bingham	Widening – 2 to 4 Lanes ROW: 2006 – 66 ft. / 2030 – 116 ft.	M. Arterial / 2.8 Miles / /UDOT/Local Bike Class - 2	Completed
Salt Lake	25	New Bingham Highway 5600 West to 9000 South	Widening – 2 to 4 Lanes ROW: 2006 – 66 ft. / 2030 – 106 ft.	M. Arterial / 2.3 Miles / UDOT Bike Class – 2	Deleted
Salt Lake	243	10600 South/10400 South I-15 to Redwood Road	Widening – 4 to 6 Lanes ROW: 2006 – 106 ft. / 2030 – 106 ft.	M. Arterial / 2.2. Miles / UDOT Bike Class – 3.2	Completed
Salt Lake	34	10400 South/10800 South Bangerter Hwy to 4800 West	New Construction – 0 to 4 Lanes ROW: 2006 – 0 ft. / 2030 – 110 ft.	M. Arterial / 5 Miles / Local Bike Class – 2	Completed
Salt Lake	37a	11400 South State Street to 700 West	Widening – 4/2 to 6 Lanes ROW: 2006 – 50 ft. / 2030 – 106 ft.	M. Arterial / 1 Miles / Local Bike Class – 2	Completed
Salt Lake	38	11400 South 700 West to Redwood Road	Widening/New Const. – 2/0 to 4 Lanes ROW: 2006 – 20 ft. / 2030 – 106 ft.	M. Arterial / 2.3 Miles / Local Bike Class – 2	Completed
Salt Lake	39	11400 South Redwood Rd. to Bangerter Hwy	Widening – 2 to 4 Lanes ROW: 2006 – 80 ft. / 2030 – 106 ft.	M. Arterial / 2.4 Miles / Local Bike Class – 2	Completed
Salt Lake	40a	11400 South Bangerter Hwy to 4800 West	Widening – 2 to 4 Lanes ROW: 2006 – 80 ft. / 2030 – 106 ft.	M. Arterial / 4.9 Miles / Local Bike Class – 0	Completed
Salt Lake	40b	11400 South 4800 W. to Valdania St (5200 W)	New Construction – 0 to 4 Lanes ROW: 2006 – 0 ft. / 2030 – 110 ft.	M. Arterial / 1 Miles / Local Bike Class – 0 / Transit Project	Completed
Salt Lake	43	12600 South 4800 West to 6000 West	New Construction – 0 to 4 Lanes ROW: 2006 – 0 ft. / 2030 – 106 ft.	P. Arterial / 3.5 Miles / Local Bike Class – 2	Completed
Salt Lake	44	MVC / Bangerter Hwy Connector Mountain View to Bangerter	New Construction – 4 to 6 Lanes ROW: 2006 – 60 ft. / 2030 – 150 ft.	Freeway / 0.9 Miles / UDOT Bike Class – 0 / Transit Project	Deleted
Salt Lake	251	14400 South 4800 West to 5600 West	New Construction – 0 to 4 Lanes ROW: 2006 – 0 ft. / 2030 – 106 ft.	Collector / 2.1 Miles / Local Bike Class – 0	Completed
Salt Lake	84	8400 West SR-201 to 3500 South	Widening – 2 to 4 Lanes ROW: 2006 – 66 ft. / 2030 – 106 ft.	P. Arterial / 1.5 Miles / UDOT Bike Class – 2	Deleted

TABLE 7-1 CONTINUED

Highway Projects Completed, Deleted, Modified or Under Construction From the 2007 – 2030 RTP

County	ID	Project	Description		Status
SALT LAKE AREA PROJECTS FROM THE 2030 RTP – COMPLETED, DELETED, MODIFIED OR UNDER CONSTRUCTION					
Salt Lake	25 5b	6400 West 13000 South to 13400 South	New Construction – 0 to 2 Lanes ROW: 2006 – 0 ft. / 2030 – 80 ft.	M. Arterial / 1 Miles / Local Bike Class – 1	Completed
Salt Lake	77	5600 West 4400 South to 6200 South	Widening – 2 to 4 plus Transit Lanes ROW: 2006 – 66 ft. / 2030 – 106 ft.	M. Arterial / 3.5 Miles / UDOT Bike Class – 2.0 / Transit Project	Completed
Salt Lake	25 9	5600 West 13400 South to 14400 South	New Const. – 0 to 2 plus Transit Lanes ROW: 2006 – 0 ft. / 2030 – 86 ft.	M. Arterial / 3.2 Miles / UDOT Bike Class – 0 / Transit Project	Completed
Salt Lake	26 0	4800 West California Avenue to SR-201	Widening – 2 to 4 Lanes ROW: 2006 – 50 ft. / 2030 – 86 ft.	Collector / 1 Miles / Local Bike Class – 3	Deleted
Salt Lake	26 2	4800 West Parkway Blvd (2700 S) to 3500 S.	Widening – 2 to 4 Lanes ROW: 2006 – 86 ft. / 2030 – 86 ft.	Collector / 1.1 Miles / Local Bike Class – 2	Deleted
Salt Lake	26 3	4800 West 9000 S. to Sky Drive	New Construction – 0 to 4 Lanes ROW: 2006 – 0 ft. / 2030 - 86 ft.	Collector / 3.5 Miles / Local Bike Class - 2	Completed
Salt Lake	75	Gladiola (3400/3200 W) 500 South to California Avenue	New Construction – 0 to 4 Lanes ROW: 2006 – 0 ft. / 2030 – 84 ft.	Collector / 1.2 Miles / Local Bike Class – 2	Deleted
Salt Lake	26 5	3200 West Parkway Blvd to 3500 South	Widening – 2 to 4 Lanes ROW: 2006 – 66 ft. / 2030 – 66 ft.	Collector / 1.3 Miles / Local Bike Class – 2	Deleted
Salt Lake	54 a	I-215 SR-201 to 4700 South	Widening – 6 to 8 Lanes ROW: 2006 – 300 ft. / 2030 – 300 ft.	Freeway / 4 Miles /UDOT Bike Class – 0	Completed
Salt Lake	10 1a	Redwood Road Bangerter to Porter Rockwell Rd	Widening – 2 to 4 Lanes ROW: 2006 – 80 ft. / 2030 – 106 ft.	P. Arterial / 2.3 Miles / UDOT Bike Class – 2	Completed
Salt Lake	10 1b	Redwood Road Porter Rockwell to Utah Co. Line	Widening – 2 to 4 Lanes ROW: 2006 – 86 ft. / 2030 – 106 ft.	P. Arterial / 2.5 Miles / UDOT Bike Class – 2	Completed
Salt Lake	71	900 West/Fine St. 3300 South to 700 West	Widening – 2 to 4 Lanes ROW: 2006 – 0 ft. / 2030 – 80 ft.	Collector / 0.9 Miles / Local Bike Class – 2.0	Deleted
Salt Lake	70	Bingham Junction Boulevard. 7000 South to 7800 South	New Construction – 0 to 4 Lanes ROW: 2006 – 0 ft. / 2030 – 106 ft.	M. Arterial / 2.8 Miles / Local Bike Class – 2	Completed
Salt Lake	88	I-15 I-215 to Beck Street	Widening – 6 to 6 plus HOV Lanes ROW: 2006 – 200 ft. / 2030 – 200 ft.	Freeway / 1.1 Miles / UDOT Bike Class – 0	Completed
Salt Lake	50	I-15 Beck Street to 600 North	Widening – 6 to t plus HOV Lanes ROW: 2006 – 200 ft. / 2030 – 200 ft.	Freeway / 2.9 Miles / UDOT Bike Class – 0	Completed
Salt Lake	29 2	I-15 (Northbound) @ 10600 Interchange	Widening–3 plus HOV to 4 plus HOV Lanes ROW: 2006 – 260 ft. / 2030 – 260 ft.	Freeway / UDOT Bike Class – 0	Completed
Salt Lake	36	I-15 Interchange @ 11400 South	New Construction ROW: 2006 – 260 ft. / 2030 – 260 ft.	Freeway / UDOT Bike Class – 0	Completed
Salt Lake	59 a	700 East Carnation Dr (10142 S) to 11400 S	Widening – 2 to 4 Lanes ROW: 2006 – 80 ft. / 2030 – 106 ft.	P. Arterial / 2.9 Miles / UDOT Bike Class – 2	Completed
Salt Lake	61	900 East Van Winkle to Fort Union Blvd	Widening – 4 to 6 Lanes ROW: 2006 – 80 ft. / 2030 – 106 ft.	P. Arterial / 3 Miles / UDOT Bike Class – 2	Deleted
Salt Lake	68	Wasatch Boulevard 7000 S to N. Little Cottonwood	Widening – 2 to 4 Lanes ROW: 2006 – 100 ft. / 2030 – 150 ft.	P. Arterial / 2.2. Miles / UDOT Bike Class – 2 / Transit Project	Deleted
Salt Lake	69	Wasatch Boulevard N. Little Ctnwd to Little Ctnwd	Widening – 2 to 4 Lanes ROW: 2006 – 60 ft. / 2030 – 80 ft.	Collector / 1.1 Miles / Local Bike Class – 2 / Transit Project	Deleted
Davis	30 4	North Davis East / West Study Weber County Line to Syracuse Rd	Study	UDOT	Completed
Davis	12 9	1800 North (Clinton) WDC to 5000 West	Widening – 2 to 4 Lanes ROW: 2006 – 80 ft. / 2030 – 84 ft.	M. Arterial / 3 Miles / UDOT Bike Class – 3	Deleted
Davis	27 2	Syracuse Road (SR-108) I-15 to Main Street (Clearfield)	Widening – 4 to 6 Lanes ROW: 2006 – 106 ft. / 2030 – 106 ft.	M. Arterial / 2 Miles / UDOT Bike Class – 2,3 / Transit Project	Deleted
Davis	13 5	Syracuse Road (SR-108) 1000 West to 2000 West	Widening – 2 to 4 Lanes ROW: 2006: - 66 ft. / 2030 – 106 ft.	M. Arterial / 2 Miles / UDOT Bike Class – 3 / Transit Project	Completed
Davis	14 4	700 South / 900 South (Layton) I-15 to Flint Street (Layton)	New Construction – 0 to 4 Lanes ROW: 2006 – 0 ft. / 2030 – 84 ft.	M. Arterial / 3.1 Miles / Local Bike Class – 2	Completed

TABLE 7-1 CONTINUED

Highway Projects Completed, Deleted, Modified or Under Construction From the 2007 – 2030 RTP

County	ID	Project	Description		Status
SALT LAKE AREA PROJECTS FROM THE 2030 RTP – COMPLETED, DELETED, MODIFIED OR UNDER CONSTRUCTION					
Davis	90a	Parrish Lane (Centerville) I-15 to 1250 West	Widening – 2 to 4 Lanes ROW: 2006 – 100 ft. / 2030 – 100 ft.	M. Arterial / 0.3 Miles / Local Bike Class – 0	Completed
Davis	92a	500 South I-15 to Redwood Road	Widening – 2 to 4 Lanes ROW: 2006 – 66-80 ft. / 2030 – 106 ft.	M. Arterial / 1.8 Miles / UDOT Bike Class – 2 / Transit Project	Completed
Davis	294	North Legacy Connector Study N Legacy Corridor to Legacy Pkwy	Study	P. Arterial / 2.5 Miles / UDOT Bike Class – 1	Underway
Davis	156	2700 West (Layton) Layton Pkwy to N Legacy Corridor	New Construction – 0 – 4 Lanes ROW: 2006 – 0 ft. / 2030 – 106 ft.	M. Arterial / 1.4 Miles / Local Bike Class – 1	Deleted
Davis	304	Sheep Road Parrish Lane to Glovers Lane	Study	Collector / 3.1 Miles / Local Bike Class – 0	Deleted
Davis	169	I-15 Hill Field Road (SR-232) to US-89	Widening – 6 to 6 plus HOV Lanes ROW: 2006 – 240 ft. / 2030 – 240 ft.	Freeway / 7.5 Miles / UDOT Bike Class – 0	Completed
Davis	148	I-15 Interchange @South Layton Interchange	Upgrade ROW: 2006 – 200 ft. / 2030 – 200 ft.	Freeway / UDOT Bike Class – 0 / Transit Project	Completed
Davis	150	Main Street 400 West to 200 North	Re-stripe – 2 to 4 Lanes ROW: 2006 – 100 ft. / 2030 – 100 ft.	M. Arterial / 1.5 Miles / Local Bike Class – 3 / Transit Project	Completed
Davis	151	Fort Lane (Layton) Main St to Gordon Ave (1000 N.)	Widening – 2 to 4 Lanes ROW: 2006 – 80 ft. / 2030 – 80 ft.	Collector / 1.6 Miles / Local Bike Class – 0	Completed
Davis	91	Bountiful Boulevard. Eaglewood to Beck Street	New Construction – 0 to 2 Lanes ROW: 2006 – 0 ft. / 2030 – 72 ft.	Collector / 3.1 Miles / Local Bike Class – 0	Deleted
Weber	306	Western Weber E / W Study 1200 South to Davis County Line	Study	UDOT	Completed
Weber	186a	Hinckley Drive 1900 W (SR-126) to Midland Dr	New Construction – 0 to 4 Lanes ROW: 2006 – 0 ft. / 2030 – 110 ft.	P. Arterial / 0.7 Miles / UDOT Bike Class – 0 / Transit Project	Completed
Weber	189	5600 South Connection I-15 to South Weber Drive	New Construction – 0 to 2 Lanes ROW: 2006 – 0 ft. / 2030 – 66 ft.	M. Arterial / 1.2 Miles / Local Bike Class – 0	Deleted
Weber	298	North Legacy Corridor 1200 South to I-15	New construction – 0 to 2 Lanes ROW: 2006 – 0 ft. / 2030 – 220 ft.	P. Arterial / 8.5 Miles / UDOT Bike Class – 1	Deleted
Weber	170a	North Legacy Corridor 1200 South to 4000 South	New Construction – 0 to 2 Lanes ROW: 2006 – 0 ft. / 2030 – 220 ft.	P. Arterial / 6.5 Miles / UDOT Bike Class – 1	Deleted
Weber	286	1100 West (Pleasant View) Skyline Drive to 4000 North	New Construction – 0 to 2 Lanes ROW: 2006 – 0 ft. / 2030 – 60 ft.	Collector / 1 Miles / Local Bike Class – 3	Deleted
Weber	291	1100 West (Pleasant View) Pleasant View Drive to US-89	New Construction – 0 to 2 Lanes ROW: 2006 – 0 ft. / 2030 – 66 ft.	Collector / 0.6 Miles / Local Bike Class – 3	Deleted
Weber	204	Riverdale Road (SR-26) I-84 to Washington Boulevard.	Widening – 4 to 5/6 Lanes ROW: 2006 – 99 ft. / 2030 – 120 ft.	P. Arterial / 3.7 Miles / UDOT Bike Class – 3 / Transit Project	Completed
Weber	201	Wall Avenue 2700 North to US-89	New Construction – 0 to 2 Lanes ROW: 2006 – 0 ft. / 2030 – 66 ft.	Collector / 2.4 Miles / Local Bike Class - 0	Deleted
Weber	203	Harrison Boulevard. 24th Street to Country Hills	Widening – 4 to 6 plus Transit Lanes ROW: 2006 – 99 ft. / 2030 – 99 ft.	P. Arterial / 4.8 Miles / UDOT Bike Class – 3 / Transit Project	Deleted

TABLE 7-2

Transit Projects Completed, Deleted, Modified or Under Construction From the 2007 – 2030 RTP

County	ID	Project		Description	Status
Salt Lake	SL20	Bangerter Highway / 4000 West Airport TRAX Line - Mid-Jordan TRAX Line	Enhanced Bus	Bangerter Highway / 4000 West Airport TRAX Line - Mid-Jordan TRAX Line	Unfunded Phase
Salt Lake	SL16	4700 South Line (Taylorsville-Murray) 3900 S. TRAX Station – SLCC - Valley Fair Mall	Bus Rapid Transit (BRT 3) / Enhanced Bus (BRT 1)	4700 South Line (Taylorsville-Murray) 3900 S. TRAX Station – SLCC - Valley Fair Mall	Modified
Salt Lake	SL21	1300 East (North) Line University of Utah - Fort Union	Bus Rapid Transit (BRT 3)	1300 East (North) Line University of Utah - Fort Union	Modified
Salt Lake	CBD1	Southwest Downtown Line 9th South TRAX Station – Salt Lake Intermodal Center	Streetcar / Light-rail Transit	Southwest Downtown Line 9th South TRAX Station – Salt Lake Intermodal Center	Unfunded
Salt Lake	COR3	FrontRunner (South) Line Salt Lake Commuter Rail Transit Station - Utah County Line	Commuter Rail Transit	FrontRunner (South) Line Salt Lake Commuter Rail Transit Station - Utah County Line	Under Construction
Salt Lake	COR1	Airport Line Energy Solutions Arena – Salt Lake International Airport	Light Rail Transit	Airport Line Energy Solutions Arena – Salt Lake International Airport	Under Construction
Salt Lake	COR4	Mid-Jordan Line 6400 South TRAX Station - Daybreak	Light Rail Transit	Mid-Jordan Line 6400 South TRAX Station - Daybreak	Under Construction
Salt Lake	COR5	West Valley Line 2100 South TRAX Station – Valley Fair Mall	Light Rail Transit	West Valley Line 2100 South TRAX Station – Valley Fair Mall	Under Construction
Salt Lake	P&R1	Mountain View Park-and-Rides 3500 South, 5400 South, 7800 South, Herriman City, and Bangerter Highway / 3600 West	Park-and-Rides	Mountain View Park-and-Rides 3500 South, 5400 South, 7800 South, Herriman City, and Bangerter Highway / 3600 West	Deleted
Davis	TC1	Hill AFB Transfer Center SR-193 / University Avenue in Clearfield	Transfer Center	Hill AFB Transfer Center SR-193 / University Avenue in Clearfield	Modified
Weber	CP5b	Bamburger Line (HAFB – Wall) West HAFB, Roy, East Ogden Airport – Wall Avenue	Corridor Preservation	Bamburger Line (HAFB – Wall) West HAFB, Roy, East Ogden Airport – Wall Avenue	Modified

Existing Plus Committed Projects

Projects on the 2040 RTP are implemented through the programming of federal, state, local, and other highway and transit funds as part of the Transportation Improvement Program (TIP). The TIP is a short-range, six year plan that directly matches funding sources with Phase 1 projects. During the TIP development process, projects from the current regional transportation plan are evaluated, along with projects from various management systems, such as pavement and congestion management systems. As part of the TIP process, the State Air Quality Implementation Plan (SIP) is reviewed for recommended Traffic Control Measures which need to be implemented.

Eligible projects are identified for each of the highway and transit funding categories. Projects are evaluated and priorities are set within each funding source. The projects receiving the highest priority are identified in each category. These separate categories are then combined to form the TIP. The WFRC, in consultation with UDOT and UTA, is responsible for developing the Salt Lake and Ogden / Layton Urbanized Area Transportation Improvement Program.

The current 2011-2016 TIP is a compilation of projects from the various federal, state, and local funding programs for all the municipalities and counties in the urbanized portion of the Wasatch Front Region, as well as for the UDOT and UTA. Projects included in the TIP will implement the planned improvements in the 2040 RTP, help meet the short range needs of both Urbanized Areas, and provide for the maintenance of the existing transportation system.

Planned Improvements

HIGHWAY SYSTEM IMPROVEMENTS

The 2040 RTP includes both new or widened freeway and arterial streets throughout the Wasatch Front region. Selected major Salt Lake County east-west major facilities include the widening and new interchange improvements to SR-201, the widening of 700 South, California Avenue,I-80, 3300/3500 South, 4500/4700 South, 5400 South, 7000 South, 7800 South 9000 South, 10400/10600 South, 11400 South, 11800 South, 12600 South, 13400 South, and the construction of Porter Rockwell Boulevard. The north-south corridors in Salt Lake County include new construction or improvements to I-15 from 12300 South to the Utah County line, SR-111 (8400 West), 7200 West, the Mountain View Corridor, 5600 West, interchanges on Bangerter Highway, Redwood Road, Bingham Junction Boulevard, State Street, 700 East, 2000 East and Highland Drive, and Foothill Boulevard.

Selected highway improvements in Davis County include 1800 North (Clinton), the SR-193 Extension (Clearfield), interchange improvement along US-89, I-15 from Farmington to I-215 (North Salt Lake), I-15 from the Weber County Line to Hill Field Road, and the West Davis Corridor. Weber County freeway and arterial street improvements include 1200 South, 2550 South, 4000 South, 5500/5600 South, 24th Street, Skyline Drive (North Ogden and Pleasant View), Harrison Boulevard. (Ogden), Monroe Boulevard, SR-67 Extension (North Legacy Corridor), 1900 West, and 4700 West, and the widening of sections of I-15.

The region's two major metropolitan centers of Salt Lake City and Ogden City attract a growing number of work, shopping and entertainment related trips from Davis County. Travel between Salt Lake City and Ogden City is channeled through a geographically constricted area bordered by the Great Salt Lake on one side and the Wasatch Mountains on the other. Salt Lake, Davis and Weber Counties continue to experience considerable population growth and the need for improved north-south transportation capacity will become more apparent over the next 30 years. Upgrades of existing highways and the construction of new facilities will be needed to meet anticipated demand.

Highway Projects List

The 2040 RTP's Highway Project List provides details on which sections of corridors will require new construction and which sections of roadways will need capacity improvements or new construction by 2040. Each project description includes the type of improvement, number of lanes, current right-of-way width, proposed 2040 right-of-way width, functional classification, length of improvement, class of bicycle lane, sponsor for the improvement, and indicates if the project includes a provision for a transit way of some type. The 2040 RTP Highway Projects List is shown as Table 7-3. Each highway project is further described in Appendix O.

Highway Project and Phasing Maps

The 2040 RTP identifies highway improvement projects that increase capacity to meet travel demand through either adding new travel lanes to existing roads or the construction of new highways. These improvements projects are graphically illustrated as Map 7-1. Illustrative projects, shown as yellow lines on the map, represent proposed facilities that meet identified regional travel demand needs, but remain unfunded for the period of 2011-2040. The 2040 RTP would include these highway projects if adequate funding sources could be identified.

The recommended phasing of 2040 RTP highway improvements and new construction is shown as Map 7-2. Highway improvements fall into one of three categories. Highway improvement projects with an identified funding source that will best satisfy the Wasatch Front Region's immediate travel demand, are scheduled in Phase 1, or between the years 2011 and 2020. Phase 2 highway projects and improvements are those scheduled between 2021 and 2030. Finally, Phase 3 improvements are those which will be constructed between 2031 and 2040. Phase 1 highway improvements include projects listed on the current Wasatch Front Regional Council's Transportation Improvement Plan for 2011-2016. Phase 2 and Phase 3 projects also have identified funding sources. Non funded projects are included as part of the recommended phasing map.

TABLE 7-3
2040 RTP Highway Project List

ID	Project	Description		Phase
SALT LAKE COUNTY: EAST – WEST FACILITIES				
S-1	Sports Complex Boulevard (2400 North) I-215 East Frontage Rd. to Redwood Rd.	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 66 ft	COL / 0.5 miles / Local Bike Class: None	1
S-2	700 South / 500 South 5600 West to 2700 West	Widening: 2 to 4 lanes ROW: 2007 - 50 ft / 2040 - 99 ft	COL / 3.6 miles / Local Bike Class: 2	3
S-3	California Avenue Mountain View Corridor to 4800 West	Widening: 2 to 4 lanes ROW: 2007 - 110 ft / 2040 - 110 ft	MA / 1 miles / Local Bike Class: Priority 2	3
S-4	I-80 1300 East to I-215 (East)	Widening: 6 to 8 lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 3.5 miles / UDOT Bike Class: Priority 1	2
S-5	I-80 I-215 (East) to Summit County Line	Widening: 3 EB to 4 EB lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 11 miles / UDOT Bike Class: 3	3
S-6	2100 South I-15 to 1300 East	Operational	MA / 2.7 miles / Local Bike Class: 2	1
S-7	SR-201 I-80 (West) to SR-111 Bypass	Widening: 4 to 6 lanes ROW: 2007 - 300 ft / 2040 - 300 ft	FWY / 6.6 miles / UDOT Bike Class: Priority 1 and None	3
S-8	SR-201 SR-111 Bypass to Mountain View Corridor	Widening: 4 to 6 lanes ROW: 2007 - 300 ft / 2040 - 300 ft	FWY / 4 miles / UDOT Bike Class: Priority 1	2
S-9	SR-201 Mountain View Corridor to I-15	Widening: 6 to 6+HOT lanes ROW: 2007 - 300 ft / 2040 - 300 ft	FWY / 7 miles / UDOT Bike Class: None	2
S-10	Parkway Boulevard (2700 South) 7200 West to 5600 West	Widening: 2 to 4 lanes ROW: 2007 - 80 ft / 2040 - 86 ft	COL / 2 miles / Local Bike Class: 2	3
S-11	3300 South / 3500 South I-215 (West) to Highland Drive	Operational	PA / 2.7 miles / UDOT Bike Class: 1, 2, and None	1
S-12	3500 South SR-111 Bypass to 7200 West	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 100 ft	PA / 1.3 miles / Local Bike Class: 2 and 3	3
S-13	3500 South 7200 West to Mountain View Corridor	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 100 ft	PA / 1.7 miles / Local Bike Class: None	2
S-14	3500 South Mountain View Corridor to 4000 West	Widening: 2/4 to 6 lanes ROW: 2007 - 80 ft / 2040 - 100 ft	PA / 2.3 miles / UDOT Bike Class: None	1
S-15	4100 South SR-111 to Mountain View Corridor	Widening: 2 to 4 lanes ROW: 2007 - 76 ft / 2040 - 99 ft	MA / 4.3 miles / Local Bike Class: Priority 2	3
S-16	4700 South 6400 West to 4000 West	Widening: 2 to 4 lanes ROW: 2007 - 80 ft / 2040 - 110 ft	PA / 2.3 miles / Local Bike Class: 3	2
S-17	4700 South 4000 West to 2700 West	Widening: 4 to 6 lanes ROW: 2007 - 110 ft / 2040 - 110 ft	PA / 1.5 miles / Local Bike Class: 3	1
S-18	4500 South / 4700 South Redwood Road to I-15	Widening: 4 to 6 lanes ROW: 2007 - 150 ft / 2040 - 150 ft	PA / 2 miles / UDOT Bike Class: 3 and None	3
S-19	4500 South 900 East to 2300 East	Widening: 2 to 4 lanes ROW: 2007 - 80 ft / 2040 - 110 ft	PA / 2.2 miles / UDOT Bike Class: 2 and 3	3
S-20	5400 South SR-111 to Mountain View Corridor	Widening: 2 to 4 lanes ROW: 2007 - 70 ft / 2040 – 99 ft	MA / 2.4 miles / UDOT Bike Class: Priority 2	2
S-21	5400 South SR-111 to Mountain View Corridor	Widening: 4 to 6 lanes ROW: 2007 - 70 ft / 2040 - 123 ft	MA / 2.4 miles / UDOT Bike Class: Priority 2	3
S-22	5400 South Mountain View Corridor to Bangerter Highway	Widening: 4 to 6 lanes ROW: 2007 - 65 ft / 2040 - 110 ft	MA / 2.5 miles / UDOT Bike Class: Priority 2 and 3	1
S-23	5400 South 5600 West to Bangerter Highway	Operational	MA / 2.3 miles / UDOT Bike Class: Priority 2 and 3	1
S-24	5400 South Redwood Road to I-15	Operational	MA / 2 miles / UDOT Bike Class: Priority 3 and None	1
S-25	6200 South SR-111 to Mountain View Corridor	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 110 ft	MA / 1.6 miles / Local Bike Class: 1 and 2	1

TABLE 7-3 CONTINUED

2040 RTP Highway Project List

ID	Project	Description		Phase
SALT LAKE COUNTY: EAST – WEST FACILITIES				
S-27	6200 South Mountain View Corridor to 5600 West	Widening/New Construction: 2/0 to 4 ROW: 2007 - 0 ft / 2040 - 110 ft	MA / 0.3 miles / Local Bike Class: 2	1
S-28	7000 South Bangerter Highway to Redwood Road	Widening: 3 to 4 lanes ROW: 2007 - 56 ft / 2040 - 99 ft	MA / 1.9 miles / Local Bike Class: 2	2
S-29	7000 South / 7200 South Redwood Road to Bingham Junction Boulevard	Widening: 4 to 6 lanes ROW: 2007 - 90 ft / 2040 - 110 ft	MA / 2 miles / UDOT Bike Class: 1 and 2	3
S-30	7000 South / 7200 South Bingham Junction Boulevard to I-15	Widening: 4 to 6 lanes ROW: 2007 - 90 ft / 2040 - 110 ft	MA / 0.6 miles / UDOT Bike Class: 1	1
S-31	Fort Union Boulevard Union Park Boulevard to 3000 East	Operational	MA / 2.8 miles / Local Bike Class: 2	1
S-32	7800 South SR-111 to New Bingham Highway	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 120 ft	MA / 3.7 miles / Local Bike Class: Priority 2	1
S-34	9000 South SR-111 to 5600 West	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 110 ft	PA / 1.7 miles / Local Bike Class: 2	1
S-35	9000 South 5600 West to Bangerter Highway	Widening: 4 to 6 lanes ROW: 2007 - 106 ft / 2040 - 123 ft	PA / 2.5 miles / UDOT Bike Class: Priority 2	3
S-36	9000 South Bangerter Highway to I-15	Widening: 4 to 6 lanes ROW: 2007 - 106 ft / 2040 - 123 ft	PA / 4 miles / UDOT Bike Class: 1 and 2	2
S-37	10200 South SR-111 to Mountain View Corridor	Widening: 2 to 4 lanes ROW: 2007 - 82 ft / 2040 - 110 ft	COL / 2.6 miles / Local Bike Class: 2	1
S-38	10400 South / 10800 South SR-111 to Mountain View Corridor	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 110 ft	MA / 2 miles / Local Bike Class: None	2
S-39	10400 South / 10800 South Mountain View Corridor to 4800 West	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 110 ft	MA / 1.2 miles / Local Bike Class: 1 and None	1
S-40	10600 South / 10400 South Bangerter Highway to I-15	Operational	MA / 4.2 miles / UDOT Bike Class: 2 and None	1
S-41	10600 South 1300 East to Highland Drive	Widening: 2 to 4 lanes ROW: 2007 - 86 ft / 2040 - 86 ft	MA / 0.9 miles / Local Bike Class: 1	1
S-42	11800 South SR-111 to 5600 West	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 99 ft	MA / 2.4 miles / Local Bike Class: Priority 2	2
S-43	11400 South 11800 S. / 5600 W. to Valdania St. (5200 W.)	Widening: 2 to 4 lanes ROW: 2007 - 80 ft / 2040 - 110 ft	MA / 1 miles / Local Bike Class: Priority 2	1
S-45	11400 South 1300 East to Highland Drive	Widening: 2 to 4 lanes ROW: 2007 - 80 ft / 2040 - 99 ft	MA / 1.2 miles / Local Bike Class: Priority 3 and None	3
S-46	Herriman Parkway (12600 South) 8000 West to 6000 West	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 110 ft	PA / 1.5 miles / Local Bike Class: 1 or 2	3
S-47	12600 South Mountain View Corridor to Bangerter Highway	Widening: 4 to 6 lanes ROW: 2007 - 100 ft / 2040 - 100 ft	PA / 1.6 miles / Local Bike Class: Priority 2	2
S-48	12300 South / 12600 South Redwood Road to 700 East	Widening: 4 to 6 lanes ROW: 2007 - 100 ft / 2040 – 100 ft	PA / 2 miles / UDOT Bike Class: Priority 2	2
S-49	Riverton Boulevard 4570 West to 13400 South	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 89 ft	COL / 0.6 miles / Local Bike Class: None	1
S-50	13400 South 8000 West to Mountain View Corridor	Widening/New Const.: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 100 ft	COL / 3 miles / Local Bike Class: 2, 3, and None	3
S-51	13400 South Mountain View Corridor to Bangerter Highway	Widening: 4 to 6 lanes ROW: 2007 - 66 ft / 2040 - 100 ft	COL / 1.7 miles / Local Bike Class: 2	1
S-52	Juniper Crest 4800 West to Mountain View Corridor	New Construction: 0 to 6 lanes ROW: 2007 - 0 ft / 2040 - 110 ft	MA / 1 miles / Local Bike Class: 2	1
S-53	Juniper Crest / 14400 South Mountain View Corridor to 3600 West	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	COL / 0.9 miles / Local Bike Class: Priority 2 and 3	1

TABLE 7-3 CONTINUED
2040 RTP Highway Project List

ID	Project	Description		Phase
SALT LAKE COUNTY: EAST – WEST FACILITIES				
S-54	Traverse Ridge Road Highland Drive to Mike Weir Drive	Widening: 2 to 4 lanes ROW: 2007 - 89 ft / 2040 - 99 ft	COL / 1.3 miles / Local Bike Class: 2	3
S-55	Porter Rockwell Road Redwood Road to 14600 South	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 167 ft	PA / 3 miles / Local Bike Class: Priority 1 and 2	1
SALT LAKE COUNTY: NORTH – SOUTH FACILITIES				
S-56	SR-111 Bypass SR-201 to SR-111	Widening/New Const.: 0/2 to 4 lanes ROW: 2007 - 55 ft / 2040 - 150 ft	PA / 2.5 miles / UDOT Bike Class: 3 and None	3
S-57	SR-111 5400 South to 11800 South	Widening: 2 to 4 lanes ROW: 2007 - 106 ft / 2040 - 106 ft	PA / 8.5 miles /Local-UDOT Bike Class: Priority 2	2
S-58	8000 West 11800 South to 13400 South	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 106 ft	COL / 1.8 miles / Local Bike Class: None	3
S-59	7200 West SR-201 to 3500 South	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 86 ft	MA / 2.5 miles / Local Bike Class: 3	1
S-61	Mountain View Corridor SR-201 to 4100 South	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 328 ft	PA / 3 miles / UDOT Bike Class: Priority 1 and None	1
S-62	Mountain View Corridor 4100 South to 5400 South	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 328 ft	PA / 2.2 miles / UDOT Bike Class: Priority 1	1
S-63	Mountain View Corridor 5400 South to Redwood Road	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 328 ft	PA / 14.4 miles / UDOT Bike Class: Priority 1 and None	1
S-64	Mountain View Corridor Redwood Road to Utah County Line	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 328 ft	PA / 2.9 miles / UDOT Bike Class: None	2
S-66	Mountain View Corridor SR-201 to 4100 South	Widening & Interchanges: 4 to 6 lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 3 miles / UDOT Bike Class: Priority 1 and None	2
S-67	Mountain View Corridor 4100 South to 5400 South	Widening & Interchanges: 4 to 6 lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 2.2 miles / UDOT Bike Class: Priority 1	2
S-68	Mountain View Corridor 5400 South to 9000 South	Widening & Interchanges: 4 to 6 lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 4.5 miles / UDOT Bike Class: Priority 1 and None	2
S-69	Mountain View Corridor 9000 South to 10200 South	Widening & Interchanges: 4 to 6 lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 1.5 miles / UDOT Bike Class: None	3
S-70	Mountain View Corridor 10200 South to Redwood Road	New Construction & Ints: 0 to 6 lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 8.4 miles / UDOT Bike Class: Priority 1 and None	3
S-71	Mountain View Corridor Redwood Road to Utah County Line	Widening & Interchanges: 4 to 6 lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 2.9 miles / UDOT Bike Class: None	2
S-72	Mountain View Corridor SR-201 to Utah County Line	Widening: 6 to 6+HOV lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 22.5 miles / UDOT Bike Class: Priority 1 and None	3
S-73	5600 West I-80 to SR-201	Widening: 2 to 4 lanes ROW: 2007 - 86 ft / 2040 - 150 ft	MA / 3.1 miles / UDOT Bike Class: Priority 2	1
S-74	5600 West 2700 South to 6200 South	Operational	PA / 5 miles / Local-UDOT Bike Class: 2 and None	1
S-75	5600 West 6200 South to New Bingham Highway	Widening/New Const.: 0/2 to 4 lanes ROW: 2007 - 0 ft / 2040 - 100 ft	MA / 3.1 miles / Local Bike Class: 2	1
S-76	5600 West 6200 South to New Bingham Highway	Operational	MA / 3.1 miles / Local Bike Class: 2	2
S-77	5600 West New Bingham Hwy to Old Bingham Hwy	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 100 ft	COL / 1.5 miles / Local Bike Class: Priority 2	2
S-78	5600 West Old Bingham Highway to 10400 S. / 10800 S.	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	COL / 1.7 miles / Local Bike Class: None	1
S-79	5600 West 11800 South to 13100 South	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	COL / 3.2 miles / Local Bike Class: 2	1

TABLE 7-3 CONTINUED

2040 RTP Highway Project List

ID	Project	Description		Phase
SALT LAKE COUNTY: NORTH – SOUTH FACILITIES				
S-80	5600 West Connection 5600 West to 11800 South	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 66 ft	COL / 0.7 miles / Local Bike Class: 2 and None	1
S-81	4800 West SR-201 to Lake Park Boulevard (2700 South)	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	COL / 0.9 miles / Local Bike Class: Priority 3	2
S-82	4800 West Skye Drive to Mountain View Corridor	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	COL / 2.7 miles / Local Bike Class: Priority 2 and None	1
S-83	4570 West 12600 South to 13400 South	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 89 ft	COL / 1 miles / Local Bike Class: None	1
S-84	4200 West / Riverton Boulevard 13400 South to 14400 South	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 89 ft	COL / 1.5 miles / Local Bike Class: None	1
S-85	4150 West 12600 South to Riverton Boulevard	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 66 ft	COL / 0.6 miles / Local Bike Class: None	1
S-86	3600 West 13400 South to 14400 South	Widening: 2 to 4 lanes ROW: 2007 - 73 ft / 2040 - 86 ft	COL / 1.3 miles / Local Bike Class: Priority 3	3
S-87	3200 West California Avenue to 1820 South	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 99 ft	COL / 0.7 miles / Local Bike Class: 2	2
S-88	3200 West 1820 South to Parkway Boulevard (2700 South)	Widening: 2 to 4 lanes ROW: 2007 - 0 ft / 2040 - 110 ft	COL / 1.3 miles / Local Bike Class: 2	2
S-89	I-215 2100 North to I-80	Widening: 6 to 8 lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 3.3 miles / UDOT Bike Class: None	3
S-90	I-215 Frontage Road 2700 South to 4100 South	New Construction: 0 to 1 lanes ROW: 2007 - 0 ft / 2040 - 66 ft	COL / 2.1 miles / Local Bike Class: None	1
S-91	Redwood Road I-215 (North) to 1000 North	Widening: 2 to 4 lanes ROW: 2007 - 110 ft / 2040 - 110 ft	MA / 3 miles / UDOT Bike Class: 2	3
S-92	Redwood Road SR-201 to 4700 South	Operational	PA / 3.9 miles / UDOT Bike Class: 1 and None	1
S-93	Redwood Road 9000 South to Bangerter Highway	Widening: 4 to 6 lanes ROW: 2007 - 66 ft / 2040 - 100 ft	PA / 6 miles / UDOT Bike Class: Priority 2 and None	3
S-94	Redwood Road 9000 South to 11400 South	Operational	PA / 3 miles / UDOT Bike Class: Priority 2 and None	1
S-95	Redwood Road 12600 South to Bangerter Highway	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 100 ft	PA / 1.5 miles / UDOT Bike Class: Priority 2	1
S-96	Redwood Road Bangerter Highway to Porter Rockwell Road	Widening: 4 to 6 lanes ROW: 2007 - 100 ft / 2040 - 100 ft	PA / 2.7 miles / UDOT Bike Class: Priority 2	3
S-97	1200 West 3100 South to 3300 South	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	COL / 0.5 miles / Local Bike Class: 3	1
S-98	Bingham Junction Boulevard 7800 South to 8400 South	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	MA / 2.8 miles / Local Bike Class: 2	1
S-99	Galena Park Boulevard 12300 South to 13490 South	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 89 ft	COL / 1.8 miles / Local Bike Class: 1 and 3	1
S-100	Lone Peak Parkway 11400 South to 12300 South	Widening: 2 to 4 lanes ROW: 2007 - 65 ft / 2040 - 99 ft	COL / 1.2 miles / Local Bike Class: 2	3
S-101	Lone Peak Parkway 12300 South to Bangerter Highway	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 99 ft	COL / 2 miles / Local Bike Class: 2	1
S-103	I-15 Collectors 10000 South to 10600 South	Collector/Distributor: 0 to 1 lanes ROW: 2007 - 0 ft / 2040 - 66 ft	COL / 0.7 miles / Local Bike Class: None	2
S-104	I-15 12300 South to Bangerter Highway	Widening: 7+HOV to 8+HOV lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 1.6 miles / UDOT Bike Class: None	1
S-105	I-15 Bangerter Highway to Utah County Line	Widening: 6/7+HOV to 8+HOV lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 3.9 miles / UDOT Bike Class: None	1

TABLE 7-3 CONTINUED
2040 RTP Highway Project List

ID	Project	Description		Phase
SALT LAKE COUNTY: NORTH – SOUTH FACILITIES				
S-106	I-15 Bangerter Highway to Utah County Line	Widening: 8+HOV to 10+HOV lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 3.9 miles / UDOT Bike Class: None	2
S-107	Cottonwood Street 4500 South to Vine Street	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 89 ft	COL / 0.9 miles / Local Bike Class: None	2
S-108	State Street 600 South to I-215	Operational	MA / 8.6 miles / UDOT Bike Class: 2 and None	2
S-109	State Street I-215 to 12300 South	Operational	MA / 7.2 miles / UDOT Bike Class: None	1
S-110	State Street 6200 South to 9000 South	Widening: 4 to 6 lanes ROW: 2007 - 100 ft / 2040 - 100 ft	MA / 3.3 miles / UDOT Bike Class: None	1
S-111	900 East 3300 South to 4500 South	Operational	COL / 1.7 miles / Local Bike Class: Priority 2	1
S-112	900 East / 700 East Fort Union Boulevard to 9400 South	Widening: 4 to 6 lanes ROW: 2007 - 106 ft / 2040 - 123 ft	PA / 3 miles / UDOT Bike Class: Priority 2 and 3	3
S-113	700 East 11400 South to 12300 South	Widening: 2 to 4 lanes ROW: 2007 - 80 ft / 2040 - 110 ft	PA / 1.2 miles / UDOT Bike Class: Priority 2	1
S-114	Union Park Boulevard / 1300 East Fort Union Boulevard to 7800 South	Operational	MA / 1.2 miles / Local Bike Class: 1 and None	1
S-115	Highland Drive Murray Holladay Blvd to Van Winkle Expwy	Operational	PA / 2 miles / Local Bike Class: None	2
S-116	2000 East Fort Union Boulevard to 9400 South	Widening: 4 to 6 lanes ROW: 2007 - 106 ft / 2040 - 123 ft	PA / 3.1 miles / Local Bike Class: Priority 2	3
S-117	Highland Drive 9400 South to 9800 South	Widening: 2 to 4 lanes ROW: 2007 - 106 ft / 2040 - 114 ft	PA / 0.5 miles / Local Bike Class: Priority 2	2
S-118	Highland Drive 9800 South to Draper City Limit	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 114 ft	PA / 2.8 miles / Local Bike Class: Priority 2	3
S-119	Highland Drive Draper City Limit to 14600 South	Widening: 2 to 4 lanes ROW: 2007 - 106 ft / 2040 - 114 ft	PA/MA / 5.8 miles / Local Bike Class: Priority 2	3
S-120	Highland Drive Connection Traverse Ridge Road to 13800 South	Widening: 2 to 4 lanes ROW: 2007 - 106 ft / 2040 - 114 ft	PA / 1.8 miles / Local Bike Class: 2 and None	3
S-121	500 South / Foothill Boulevard 1300 East to 2300 East	Operational	PA / 2.4 miles / UDOT Bike Class: 2	1
S-122	Foothill Boulevard 2300 East to I-80	Widening: 4 to 6 lanes ROW: 2007 - 100 ft / 2040 - 100 ft	PA / 2.4 miles / UDOT Bike Class: 2, 3, and None	3
SALT LAKE COUNTY: SPOT FACILITIES				
S-123	SR-201 Interchange @ I-80	Upgrade	FWY / UDOT Bike Class: Priority 2	2
S-124	SR-201 Interchange @ SR-111 Bypass	New Construction	FWY / UDOT Bike Class: Priority 3	3
S-125	SR-201 Interchange @ 8400 West	New Construction	FWY / UDOT Bike Class: Priority 2 and 3	2
S-126	SR-201 Interchange @ 7200 West	New Construction	FWY / UDOT Bike Class: Priority 3	2
S-127	SR-201 Interchange @ I-215	Upgrade	FWY / UDOT Bike Class: None	3
S-128	SR-111 Rail Road Structure @ 4300 South	Widening: 2 to 4 lanes	PA / UDOT Bike Class: Priority 2	1
S-130	5600 West Rail Road Crossing @ 750 South	New Construction: 2 to 4 lanes	PA / UDOT Bike Class: Priority 2	1

TABLE 7-3 CONTINUED

2040 RTP Highway Project List

ID	Project	Description		Phase
SALT LAKE COUNTY: SPOT FACILITIES				
S-131	4800 West Overpass @ SR-201	New Construction: 0 to 2 lanes	COL / Local Bike Class: Priority 2 and 3	2
S-133	Bangerter Highway Interchange @ SR-201	Upgrade	FWY / UDOT Bike Class: None	3
S-140	Bangerter Highway Interchange @ 6200 South	New Construction	FWY / UDOT Bike Class: 2	3
S-141	Bangerter Highway Interchange @ 7000 South	New Construction	FWY / UDOT Bike Class: 2	3
S-142	Bangerter Highway Interchange @ 7800 South	New Construction	FWY / UDOT Bike Class: Priority 2	1
S-143	Bangerter Highway Interchange @ 9000 South	New Construction	FWY / UDOT Bike Class: 2	3
S-144	Bangerter Highway Interchange @ 9800 South	New Construction	FWY / UDOT Bike Class: Priority 2	3
S-145	Bangerter Highway Interchange @ 10400 South	New Construction	FWY / UDOT Bike Class: 2	3
S-146	Bangerter Highway Interchange @ 11400 South	New Construction	FWY / UDOT Bike Class: Priority 2	3
S-147	Bangerter Highway Interchange @ 12600 South	New Construction	FWY / UDOT Bike Class: Priority 2	3
S-148	Bangerter Highway Interchange @ 13400 South	New Construction	FWY / UDOT Bike Class: 2 and 3	2
S-149	Bangerter Highway Interchange @ 2700 West	New Construction	FWY / UDOT Bike Class: None	3
S-150	Bangerter Highway Interchange @ Redwood Road	New Construction	FWY / UDOT Bike Class: Priority 2	3
S-151	Bangerter Highway Interchange @ 600 West	New Construction	FWY / UDOT Bike Class: None	1
S-152	Bangerter Highway Interchange @ I-15	Upgrade	FWY / UDOT Bike Class: None	2
S-154	I-215 Interchange @ 5400 South	New Construction	FWY / UDOT Bike Class: Priority 3	3
S-155	I-215 Interchange @ Redwood Road (South)	Upgrade	FWY / UDOT Bike Class: None	3
S-156	I-15 Interchange @ 100 South (HOV Ramps)	New Construction: 0 to 2 lanes	FWY / UDOT Bike Class: None	3
S-157	I-15 Interchange @ I-215 (South)	Upgrade	FWY / UDOT Bike Class: None	3
S-158	13800 South Overpass @ I-15	New Construction: 0 to 2 lanes	COL / Local Bike Class: Priority 2	3
S-160	I-15 Interchange @ 14600 South	Upgrade	FWY / UDOT Bike Class: Priority 2	2
S-161	I-80 Interchange @ I-215 / Foothill Drive	Upgrade	FWY UDOT Bike Class: Priority 1 and 3	2
S-163	Avalanche Snow Shed Little Cottonwood Cyn Rd. @ Whitepine Chutes	New Construction	MA UDOT Bike Class: 2	3
DAVIS COUNTY: EAST – WEST FACILITIES				
D-1	1800 North West Davis Corridor to 2000 West	Widening: 2 to 4 lanes ROW: 2007 - 80 ft / 2040 - 100 ft	MA / 2 miles / UDOT Bike Class: Priority 2	2

TABLE 7-3 CONTINUED

2040 RTP Highway Project List

ID	Project	Description		Phase
DAVIS COUNTY: EAST – WEST FACILITIES				
D-2	1800 North 2000 West to SR-126	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 100 ft	MA / 2 miles / UDOT Bike Class: Priority 2	1
D-3	SR-193 Extension West Davis Corridor to 2000 West	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 110 ft	MA / 2.2 miles / UDOT Bike Class: Priority 2	2
D-4	SR-193 Extension 2000 West to State Street	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 110 ft	MA / 2.9 miles / UDOT Bike Class: Priority 2	1
D-6	SR-193 I-15 to US-89	Operational	MA / 5 miles / UDOT Bike Class: Priority 2	1
D-7	Syracuse Road (SR-127) West Davis Corridor to 2000 West	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 110 ft	MA / 1 miles / UDOT Bike Class: Priority 2	1
D-8	Antelope Drive Oak Forest Drive (2500 East) to US-89	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	MA / 0.3 miles / Local Bike Class: Priority 2	1
D-9	Gordon Avenue (1000 North) Fairfield Road to 1600 East	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 86 ft	COL / 0.7 miles / Local Bike Class: None	2
D-10	Gordon Avenue (1000 North) 1600 East to US-89	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	COL / 1.3 miles / Local Bike Class: None	2
D-11	Hill Field Road Extension 3650 West (Layton) to 2200 West (Layton)	Widening: 2 to 4 lanes ROW: 2007 - 60 ft / 2040 - 110 ft	MA / 1.5 miles / Local Bike Class: None	3
D-12	Layton Parkway West Davis Corridor to Flint Street	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	MA / 2.6 miles / Local Bike Class: None	1
D-13	200 North (Kaysville) West Davis Corridor to I-15	Widening: 2 to 4 lanes ROW: 2007 - 60 ft / 2040 - 99 ft	MA / 2.1 miles / Local Bike Class: Priority 2	3
D-14	2600 South / 1100 North Redwood Road to I-15	Operational	MA / 1.4 miles / Local Bike Class: Priority 2	1
D-15	Center Street Redwood Road to US-89	Operational	COL / 1.1 miles / Local Bike Class: Priority 1	1
DAVIS COUNTY: NORTH – SOUTH FACILITIES				
D-16	West Davis Corridor Weber County Line to Syracuse Road	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 320 ft	FWY / 4.8 miles / UDOT Bike Class: Priority 1	2
D-17	West Davis Corridor Syracuse Road to I-15 / US-89 / Legacy Parkway	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 320 ft	FWY / 11.8 miles / UDOT Bike Class: Priority 1	1
D-18	West Davis Corridor Weber County Line to Syracuse Road	Corridor Preservation ROW: 2007 - 0 ft / 2040 - 320 ft	FWY / 4.8 miles / UDOT Bike Class: Priority 1	1
D-19	3000 West 6000 South (Weber County) to 2300 North	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 75 ft	COL / 0.5 miles / Local Bike Class: Priority 2	1
D-20	2000 West (SR-108) Weber County Line to Syracuse Road (SR-108)	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 110 ft	MA / 4.4 miles / UDOT Bike Class: Priority 2	1
D-21	2000 West Syracuse Road (SR-108) to West Davis Corridor	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 99 ft	COL / 1.5 miles / Local Bike Class: Priority 2	3
D-22	3650 West (Layton) 700 North to Gentile Street	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 66 ft	COL / 0.7 miles / Local Bike Class: None	3
D-23	2700 West (Layton) Gordon Avenue to Layton Parkway	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 99 ft	COL / 1.8 miles / Local Bike Class: None	3
D-24	Redwood Road 500 South to 2600 South	Widening: 2 to 4 lanes ROW: 2007 - 100 ft / 2040 - 110 ft	MA / 1.7 miles / UDOT Bike Class: Priority 2	2
D-25	I-15 Weber County Line to Hill Field Road (SR-232)	Widening: 6 to 6+HOV lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 6.3 miles / UDOT Bike Class: None	1
D-26	I-15 US-89 (Farmington) to I-215	Widening: 8 to 8+HOV lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 10.6 miles / UDOT Bike Class: None	1

TABLE 7-3 CONTINUED

2040 RTP Highway Project List

ID	Project	Description		Phase
DAVIS COUNTY: NORTH – SOUTH FACILITIES				
D-28	US-89 I-84 to Antelope Drive	Widening: 4 to 6 lanes ROW: 2007 - 120 ft / 2040 - 150 ft	FWY / 3.2 miles / UDOT Bike Class: Priority 2	2
D-29	US-89 Antelope Drive to I-15 (Farmington)	Widening: 4 to 6 lanes ROW: 2007 - 120 ft / 2040 - 150 ft	FWY / 7.4 miles / UDOT Bike Class: Priority 2 and None	3
DAVIS COUNTY: SPOT FACILITIES				
D-30	1800 North Overpass @ 500 West Rail Road Crossing	New Construction: 2 to 4 lanes	MA / UDOT Bike Class: Priority 2	1
D-31	I-15 Interchange @ 1800 North	New Construction	FWY / UDOT Bike Class: Priority 2	1
D-32	I-15 Interchange @ 650 North	Upgrade	FWY / UDOT Bike Class: None	3
D-33	I-15 Interchange @ Syracuse Road	Upgrade	FWY / UDOT Bike Class: Priority 2	3
D-35	I-15 Interchange @ Hill Field Road	Upgrade	FWY / UDOT Bike Class: None	2
D-36	I-15 Interchange @ Shepard Lane	New Construction	FWY / UDOT Bike Class: Priority 2	1
D-37	I-15 Interchange @ Parrish Lane	Upgrade	FWY / UDOT Bike Class: Priority 2	3
D-38	I-15 Interchange @ 400 North / 500 West	Upgrade	FWY / UDOT Bike Class: Priority 2 and 3	3
D-39	I-15 Interchange @ 500 South	Upgrade	FWY / UDOT Bike Class: Priority 2	3
D-40	I-15 Interchange @ 2600 South	Upgrade	FWY / UDOT Bike Class: Priority 2	3
D-41	2600 South / 1100 North @ 1150 West Rail Road Crossing	New Construction	MA / Local Bike Class: Priority 2	2
D-42	Legacy Parkway Interchange @ Center Street	New Construction	FWY / UDOT Bike Class: Priority 1	3
D-45	US-89 Interchange @ Antelope Drive	New Construction	FWY / UDOT Bike Class: Priority 2	1
D-46	US-89 Interchange @ Gordon Avenue	New Construction	FWY / UDOT Bike Class: Priority 2	2
D-47	US-89 Interchange @ Oakhills Drive (SR-109)	New Construction	FWY / UDOT Bike Class: Priority 2	2
D-48	US-89 Interchange @ 400 North (Fruit Heights)	New Construction	FWY / UDOT Bike Class: Priority 2	1
D-49	Nicholl's Road Overpass @ US-89	New Construction: 0 to 2 lanes	COL / Local Bike Class: None	3
WEBER COUNTY: EAST – WEST FACILITIES				
W-1	Skyline Drive (North) US-89 to 450 East	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	COL / 3.6 miles / Local Bike Class: Priority 3	1
W-2	Skyline Drive (North) 450 East to 2600 North	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	COL / 3.1 miles / Local Bike Class: Priority 3	2
W-3	1700 North US-89 to 400 East	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 66 ft	COL / 1.2 miles / Local Bike Class: 1	3
W-4	Larsen Lane US-89 / Wall Avenue to 400 East	Widening: 2 to 4 lanes ROW: 2007 - 60 ft / 2040 - 89 ft	MA / 0.5 miles / Local Bike Class: None	3
W-5	Pioneer Road (400 North) I-15 to 1200 West	Re-stripe: 2 to 4 lanes ROW: 2007 - 110 ft / 2040 - 110 ft	COL / 1 miles / Local Bike Class: Priority 2	1

TABLE 7-3 CONTINUED

2040 RTP Highway Project List

ID	Project	Description		Phase
WEBER COUNTY: EAST – WEST FACILITIES				
W-6	1200 South SR-67 (North Legacy Corridor) to 4700 West	Widening: 2 to 4 lanes ROW: 2007 - 55 ft / 2040 - 110 ft	COL / 2.1 miles / UDOT Bike Class: Priority 2	3
W-7	1200 South 4700 West to I-15	Widening: 2 to 4 lanes ROW: 2007 - 92 ft / 2040 - 110 ft	PA / 4.8 miles / UDOT Bike Class: Priority 2	2
W-8	20th Street Wall Avenue to Harrison Boulevard	Operational	MA / 1.6 miles / Local Bike Class: None	1
W-9	21st Street Wall Avenue to Adams Avenue	Operational	COL / 0.6 miles / Local Bike Class: None	1
W-10	24th Street I-15 to Lincoln Avenue	Widening: 2 to 4 lanes ROW: 2007 - 86 ft / 2040 - 110 ft	MA / 1.6 miles / UDOT Bike Class: Priority 3	2
W-11	2550 South I-15 to 3500 West	Widening: 2 to 4 lanes ROW: 2007 - 60 ft / 2040 - 86 ft	COL / 3 miles / Local Bike Class: Priority 3	3
W-12	Country Hills Drive Adams Avenue to Gramercy Avenue	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 99 ft	MA / 1 miles / Local Bike Class: Priority 2	1
W-13	4000 South (SR-37) SR-67 (North Legacy Corr.) to 1900 W. (SR-126)	Widening: 2 to 4 lanes ROW: 2007 - 86 ft / 2040 - 110 ft	MA / 3.9 miles / UDOT Bike Class: Priority 3	2
W-14	Midland Drive (SR-108) 3500 West to 1900 West (SR-126)	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 110 ft	MA / 2.9 miles / UDOT Bike Class: Priority 3	1
W-16	Riverdale Road (SR-26) 1900 West (SR-126) to I-84	Widening: 4 to 6 lanes ROW: 2007 - 99 ft / 2040 - 120 ft	PA / 1 miles / UDOT Bike Class: 3	1
W-17	5600 South / 5500 South 5900 West (Hooper) to 3500 West	Widening: 2 to 4 lanes ROW: 2007 - 68 ft / 2040 - 86 ft	MA / 3.1 miles / UDOT Bike Class: Priority 3	2
W-18	5600 South 3500 West to 1900 West (SR-126)	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 99 ft	MA / 2 miles / UDOT Bike Class: Priority 2 and 3	2
WEBER COUNTY: NORTH – SOUTH FACILITIES				
W-19	SR-67 (North Legacy Corridor) I-15 (North) to 4000 South	Corridor Preservation ROW: 2007 - 0 ft / 2040 - 220 ft	FWY / 15.6 miles / UDOT Bike Class: Priority 1	1
W-20	SR-67 (North Legacy Corridor) 4000 South to Davis County Line	Corridor Preservation ROW: 2007 - 0 ft / 2040 - 220 ft	FWY / 3.3 miles / UDOT Bike Class: Priority 1	1
W-21	SR-67 (North Legacy Corridor) 4000 South to 5500 South	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 220 ft	FWY / 2.5 miles / UDOT Bike Class: Priority 1	3
W-22	SR-67 (North Legacy Corridor) 5500 South to Davis County Line	New Construction: 0 to 4 lanes ROW: 2007 - 0 ft / 2040 - 220 ft	FWY / 0.8 miles / UDOT Bike Class: Priority 1	2
W-23	4700 West 1200 South to 4000 South	Widening: 2 to 4 lanes ROW: 2007 - 82 ft / 2040 - 110 ft	MA / 3.8 miles / Local Bike Class: 1, 2, and None	3
W-24	4700 West 4600 South to 4800 South	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 66 ft	COL / 0.3 miles / Local Bike Class: None	1
W-25	3500 West 1200 South to Midland Drive	Operational	COL / 4.6 miles / Local Bike Class: Priority 3	2
W-26	3500 West (SR-108) Midland Drive to Davis County Line	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 110 ft	MA / 1.6 miles / UDOT Bike Class: Priority 3	1
W-27	1900 West / 2000 West (SR-126) 2700 North to 1200 South	Widening: 2 to 4 lanes ROW: 2007 - 66 ft / 2040 - 120 ft	MA / 4.3 miles / UDOT Bike Class: Priority 3	3
W-28	1900 West (SR-126) Riverdale Road to 5600 South	Widening: 4 to 6 lanes ROW: 2007 - 100 ft / 2040 - 113 ft	MA / 0.4 miles / UDOT Bike Class: Priority 3	1
W-29	I-15 Box Elder County Line to 2700 North	Widening: 4 to 6 lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 2.2 miles / UDOT Bike Class: None	3
W-30	I-15 I-84 to Davis County Line	Widening: 6 to 6+HOV lanes ROW: 2007 - 328 ft / 2040 - 328 ft	FWY / 2.8 miles / UDOT Bike Class: None	1

TABLE 7-3 CONTINUED

2040 RTP Highway Project List

ID	Project	Description		Phase
WEBER COUNTY: NORTH – SOUTH FACILITIES				
W-31	600 West Elberta Drive to 2600 North	Operational	COL / 0.9 miles / Local Bike Class: 3	2
W-32	Adams Avenue US-89 / Washington Boulevard to Washington Terrace City Limits	Widening: 2 to 4 lanes ROW: 2007 - 86 ft / 2040 - 99 ft	MA / 0.6 miles / Local Bike Class: None	2
W-33	450 East / 400 East 3300 North to 2600 North	Widening: 2 to 4 lanes ROW: 2007 - 68 ft / 2040 - 89 ft	COL / 0.8 miles / Local Bike Class: 3	1
W-34	Monroe Boulevard 3100 North to 1300 North	New Construction: 0 to 2/4 lanes ROW: 2007 - 0 ft / 2040 - 86 ft	MA / 2.3 miles / Local Bike Class: 3 and None	3
W-35	Harrison Boulevard 2600 North to 12th Street	Operational	PA / 3.8 miles / Local Bike Class: Priority 3 and None	2
W-36	Harrison Boulevard 12th Street to Country Hills Drive	Operational	PA / 4.7 miles / UDOT Bike Class: Priority 2 and None	1
W-37	Harrison Boulevard Country Hills Drive to US-89	Widening: 4 to 6 lanes ROW: 2007 - 99 ft / 2040 - 123 ft	PA / 4.8 miles / UDOT Bike Class: Priority 2 and None	3
W-38	US-89 Harrison Boulevard to I-84	Widening: 4 to 6 lanes ROW: 2007 - 120 ft / 2040 - 120 ft	FWY / 2 miles / UDOT Bike Class: Priority 2	2
W-39	Skyline Drive 1. Fern Drive / 2. Ogden City Limits to 1. 4600 South / 2. Eastwood Boulevard	New Construction: 0 to 2 lanes ROW: 2007 - 0 ft / 2040 - 80 ft	COL / 0.6 miles / Local Bike Class: Priority 3	1
WEBER COUNTY: SPOT FACILITIES				
W-41	I-15 Interchange @ 24th Street	Upgrade	FWY / UDOT Bike Class: Priority 3	2
W-42	I-15 Interchange @ Riverdale Road (SR-26)	Upgrade	FWY / UDOT Bike Class: None	1
W-43	I-15 Interchange @ 5600 South	Upgrade	FWY / UDOT Bike Class: Priority 2 and 3	3
W-44	US-89 Interchange @ I-84	Upgrade	FWY / UDOT Bike Class: Priority 2	3

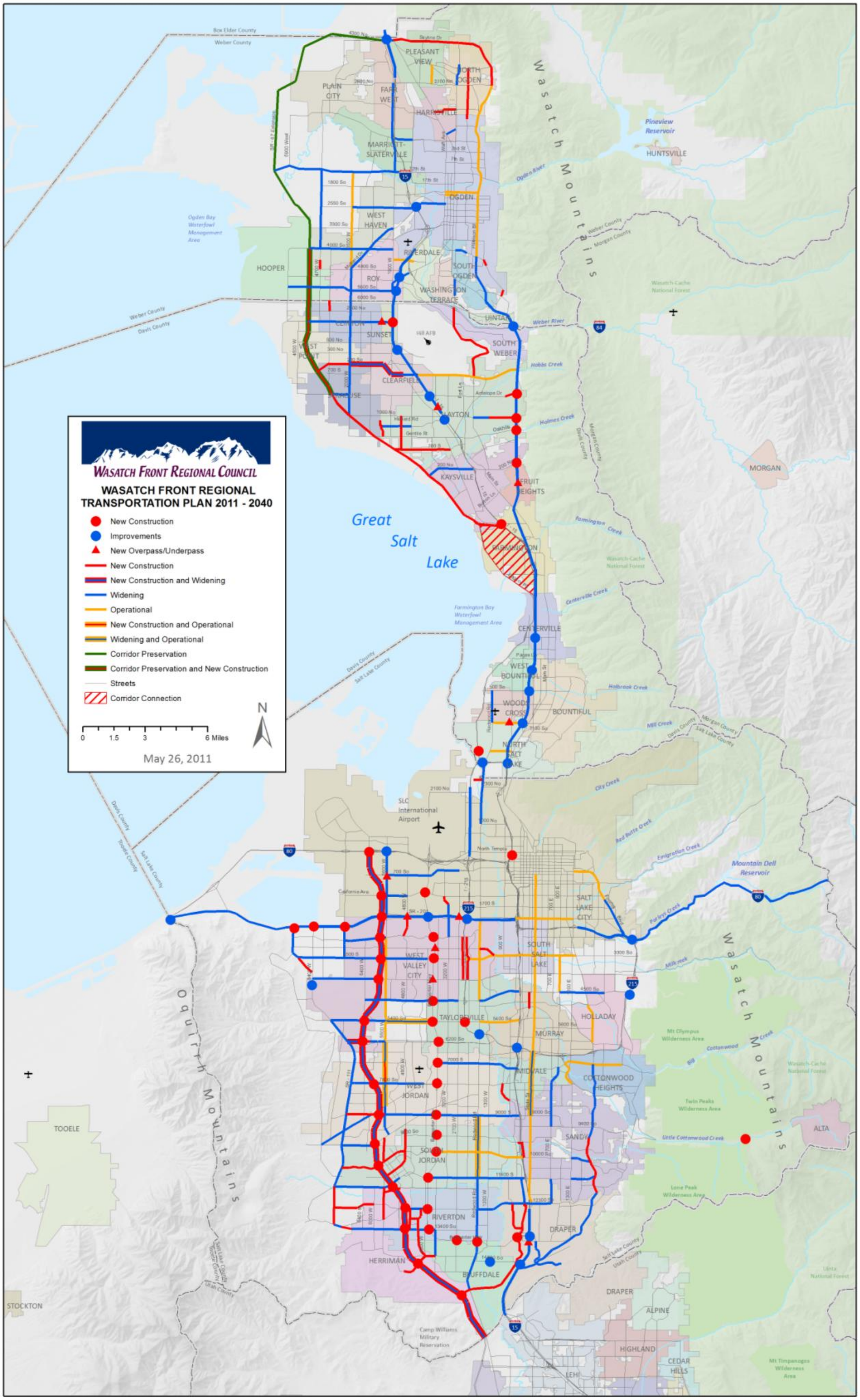
Future Right-of-way Map

The 2040 RTP also identified a future right-of-way street and highway system that will serve the anticipated travel demand of the Wasatch Front Region beyond the year 2040. The comprehensive plans of individual municipalities and counties along the Wasatch Front were gathered and reviewed to obtain information concerning existing and future highway and street networks within their jurisdictional boundaries. This information was compiled and mapped by the WFRC staff and presented in graphical form. The 2040 RTP includes recommendations of future right-of-way widths for all existing and proposed freeway, principal arterials, minor arterials, and collector streets. Recommended right-of-way widths vary from community to community and are shown as a range. For example, principal arterials are identified as facilities that will eventually be widened to widths of 126 to 150 feet. The Wasatch Front's future right-of-way information is presented on Map 7-3.

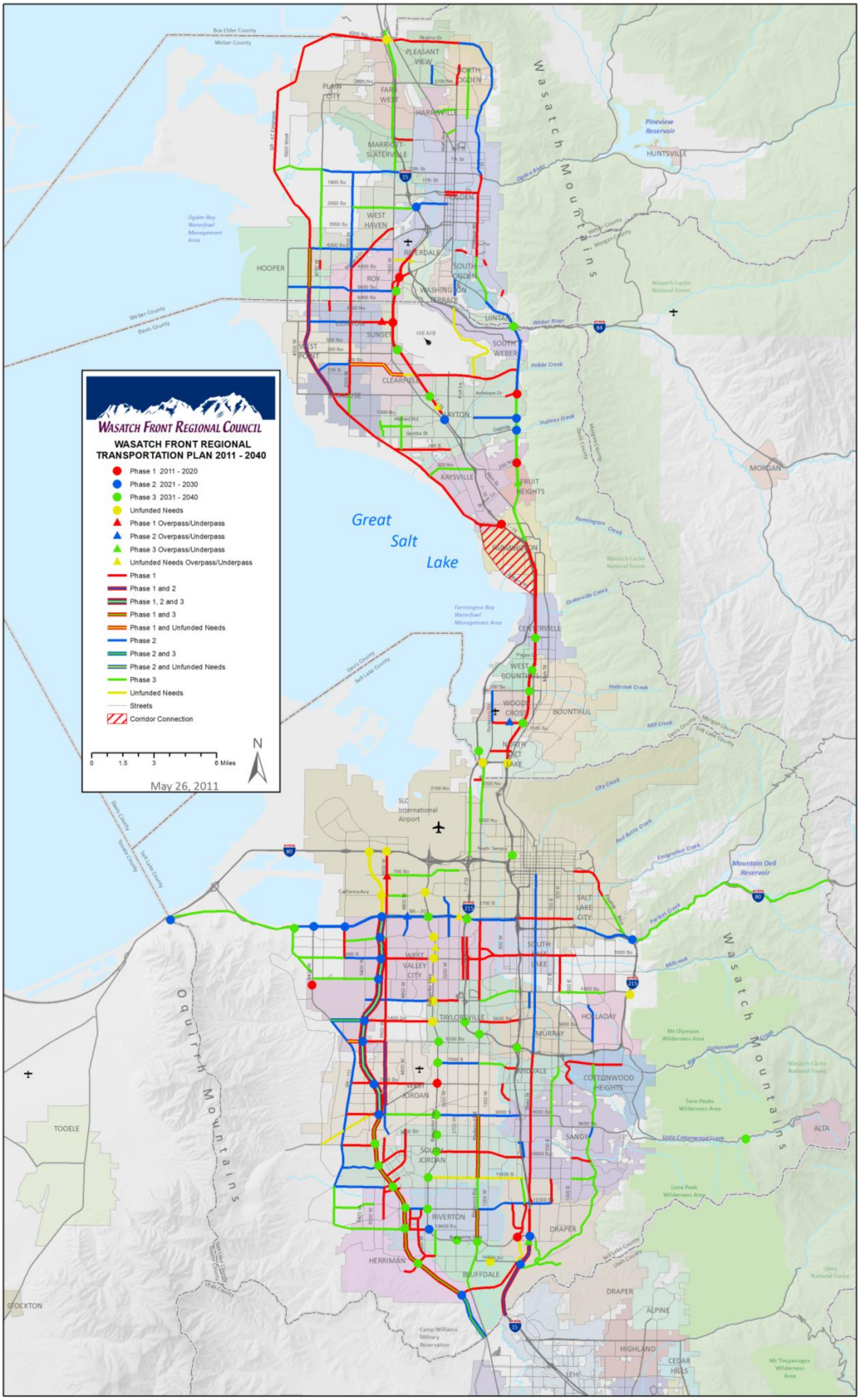
Highway Functional Classification Map

The 2040 RTP's "Wasatch Front Urban Area Future Functional Classification," shown as Map 7-4, graphically illustrates the Wasatch Front Region's (1) freeways, (2) principal arterials, (3) minor arterials, and (4) collector streets. Freeway systems are the largest traffic facilities built with complete control of access and high design speeds and provide the greatest mobility for regional traffic. Principal arterial streets serve the major centers of activity of a metropolitan area and the longest projected trips. Minor arterials interconnect with

Map 7-1, 2040 RTP HIGHWAY PROJECT TYPE



Map 7-2, 2040 RTP HIGHWAY PHASING



and augment the urban principal arterial system and provide for trips of moderate length at a somewhat lower level of travel mobility than principal arterials. These facilities place more emphasis on land access to adjoining or nearby properties than freeways or major aterials, and offer movement within communities. However, ideally they should not penetrate identifiable neighborhoods. Finally, collector streets provide for both land access service and movement for local traffic within residential, commercial, and industrial areas. This particular road classification may penetrate neighborhoods distributing trips form 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. A more complete description of various highway and street functional classifications can be found in Appendix P.

TRANSIT SYSTEM IMPROVEMENTS

A variety of transit system improvements and accompanying types or technologies, are included in the 2040 RTP. Recommended system improvements and new construction will help extend service and increase transit use. These planned improvements to the Wasatch Front Region's transit system can be summarized in five general areas.

- BRT and rail transit improvements in the most heavily used bus corridors served by UTA
- Creation of a Bus Rapid Transit (BRT 3) and Enhanced Bus (BRT 1) network
- Rail capacity improvements in downtown Salt Lake City and in Weber County
- Extension of light rail to Utah County
- Continued growth of bus service

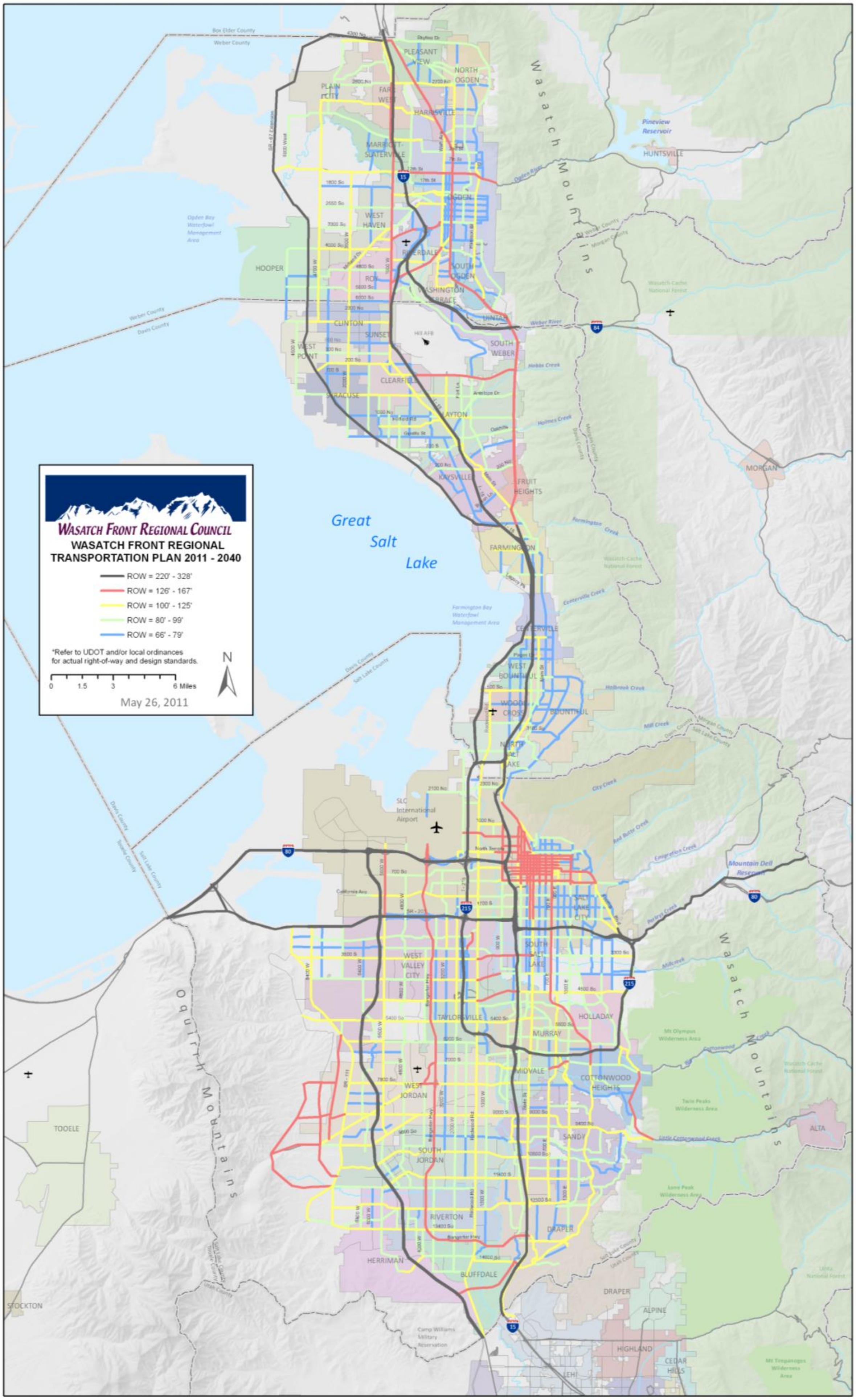
More specifically, the recommendations call first for transit improvements in the most heavily used bus corridors served by the UTA system. Among the targeted corridors for first phase improvements are services to Weber State University, Washington Boulevard, Davis County Main and State Streets (Route 470), the University of Utah/Research Park, State Street, Redwood Road, Sugarhouse, 3500 South, and Taylorsville-Murray. First and foremost among the improvements should be the addition of a full schedule of service, followed by the addition of capital services as finances permit.

Planned transit improvements, whether bus or rail, would include new specialized vehicles, enhanced transit stops, traffic signal priority, and exclusive lanes or queue jump lanes where feasible. These improvements are designed to add comfort, reliability, visibility, and speed to these routes increasing ridership, attracting economic development, and making services in these corridors more cost effective.

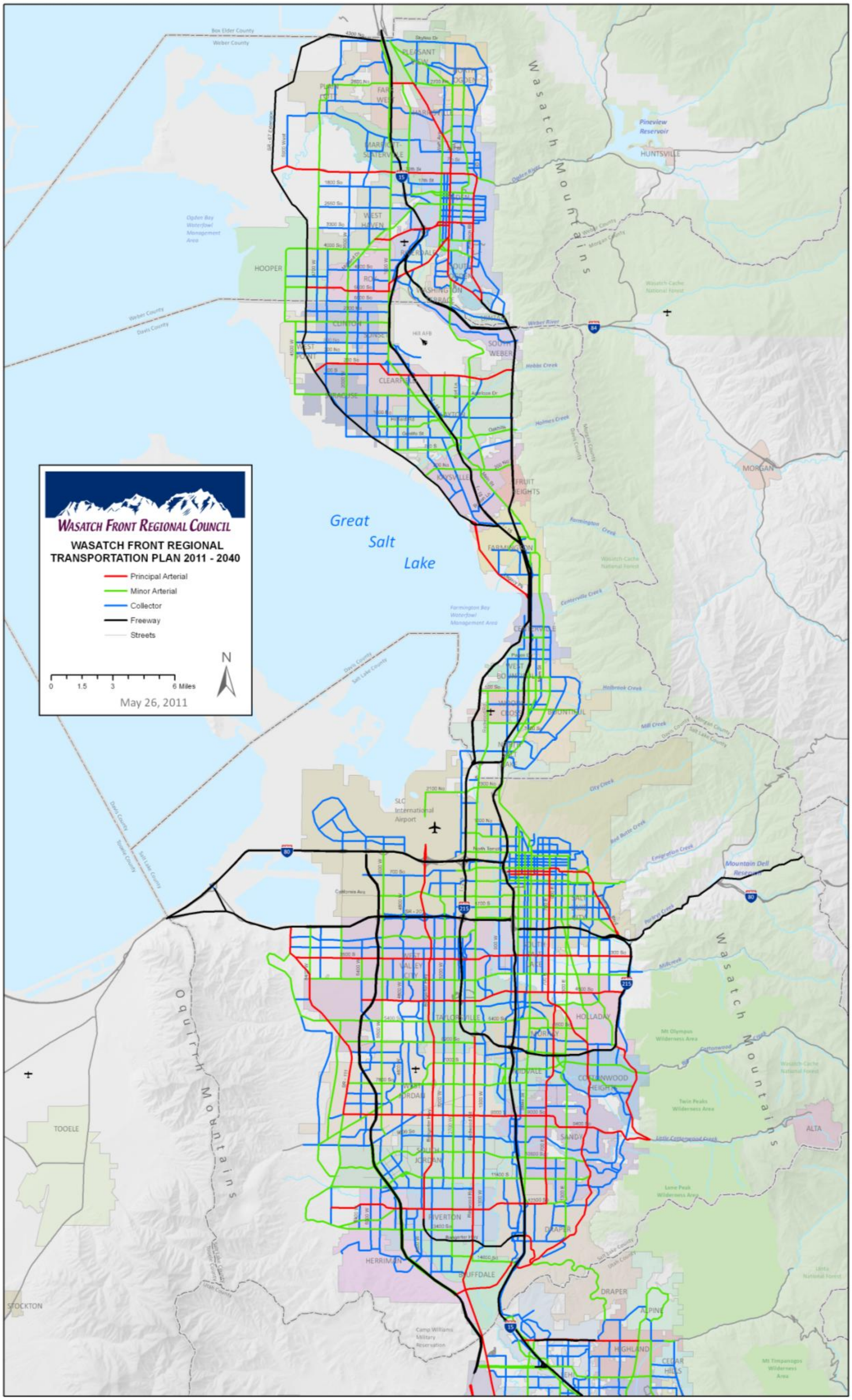
Next, it is proposed that feeder services and other corridors that show promise be developed to funnel ridership to the core rail and BRT routes. Where warranted, financially prudent, and physically feasible these routes should also be provided with full amenities, including new specialized vehicles, enhanced transit stops, traffic signal priority, and exclusive lanes or queue jump lanes. Generally, those corridors thought most likely to warrant exclusive lanes are shown in their ultimate incarnation as Bus Rapid Transit (BRT 3). Those thought less likely to warrant exclusive lanes are shown as Enhanced Bus (BRT 1). In many cases the construction of these improvements are built in stages as sufficient finances become available or in coordination with street projects. For example a project ultimately desired as BRT may first go through an incarnation as high frequency bus (not shown in the RTP maps) and Enhanced Bus (BRT 1) before exclusive lanes are built and they become Bus Rapid Transit (BRT 3). Care will need to be taken to build upon each successive stage of development.

Additionally, the RTP calls for capacity improvements on the existing rail transit network. More specifically, the rerouting of the University TRAX line and the reconstruction of the Ogden to Pleasant View portion of the FrontRunner Line are planned. The rerouting of the University TRAX Line would reduce the number of trains using the congested Main Street/South Temple corridor through downtown to create a more direct route between Salt Lake Central. The reconstruction of the Ogden to Pleasant View segment of the FrontRunner Line would permit more trains to service this portion of the Line. The current northern segment of the FrontRunner service utilizes the Union Pacific freight tracks. Because it shares the tracks with freight service the Commuter Rail service is limited to only a few trips per day. More service will be warranted in the future and the RTP provides for construction of a new line to serve FrontRunner patrons adjacent to existing shared freight tracks.

Map 7-3, WASATCH FRONT URBAN AREA FUTURE RIGHT-OF-WAY



Map 7-4, WASATCH FRONT URBAN AREA FUTURE FUNCTIONAL CLASSIFICATION



Finally, The RTP calls for the extension of the north/south TRAX line south into northern Utah County. Northern Utah County is a high growth area. Its Metropolitan Planning Organization, the Mountainland Association of Governments, proposes that a TRAX line be constructed sometime between 2030 and 2040 to serve this high growth area.

In total, approximately 160 miles of Bus Rapid Transit (BRT 3), 130 miles of Enhanced Bus (BRT 1), 12 miles of Light Rail Transit, 12 miles of Streetcar, nine independent park and ride lots, and four transit hubs will be constructed. Additionally, six miles of Commuter Rail will be reconstructed and eight miles of transit right of way will be preserved. The transit recommendations in the 2040 RTP are based upon the existing Wasatch Front's transit system; appropriately expanding community, regional, and inter-regional services,

FIGURE 7-1

Wasatch Front Urban Area Transit Plan Objectives for the 2040 RTP

Provide a full, high frequency transit service in high demand corridors as soon as practicable and provide capital improvements in these high demand corridors as funding becomes available. Achieve transit operational savings through strategic use of capital investments to streamline transit operations.

Create a network of rail, Bus Rapid Transit (BRT 3), and Enhanced Bus (BRT 1) transit corridors where service is of clearly superior quality based on convenient hours of operation, frequency of service, high level reliability, competitive travel time, comfort, a good safety record, and aesthetic urban design.

Connect regional activity centers in support of the Wasatch Choice for 2040.

Minimize congestion delay upon the rail, Bus Rapid Transit (BRT 3) and Enhanced Bus (BRT 1) network through the extensive use of Traffic Signal Priority and the use of transit lanes at major intersection approaches or continuous exclusive lanes.

Provide for maximum transit system interoperability, avoiding forced transfers.

Establish fixed transit corridors so local governments can prepare for a major transit investment by preserving rights-of-way, communities can focus on transit oriented, economic development efforts commensurate with the anticipated transit investment.

Coordinate transit and roadway projects to minimize construction costs and community disturbance.

By 2030, expand local bus service by 25 percent

Preserve the rail operations capacity of the Main Street/South Temple TRAX line in downtown Salt Lake City

Expand FrontRunner operations capacity between Ogden City and Pleasant View.

Extend TRAX operations to Utah County

Grow local bus service by 25 percent by 2030

Maintain the financial health of UTA and its partners.

Continue to improve access to the bus and rail transit system for persons with disabilities. Also, provide expanded paratransit service for those who cannot access regular transit service.

as well as providing the transit hubs necessary to narrow the convenience gap between transit and the private auto. Figure 7-1 identifies the transit plan objectives for the 2040 RTP.

Transit Project Modes

Various forms of transit are planned in the 2040 RTP. For planning purposes, each type of transit has a specific definition, package of amenities, and costs. However, in practice, both rail and Bus Rapid Transit offer a broad continuum of characteristics and each individual project will be tailored to fit the individual circumstances. This section outlines broad definitions of each transit technology type. The specific amenities that were assumed to be part of the various forms of transit technologies are listed in the Financial Chapter.

Streetcar

- ¼ mile station spacing
- Dedicated platforms and shelters, real-time vehicle arrival notification, ticket vending machines, potential for park-and-ride lots near key stations
- Electric rail based vehicles
- 10-15 minute headways
- Potential traffic signal priority and/or queue jumping lanes at major traffic signals
- $30-40 million cost per mile

Enhanced Bus (BRT 1)

- ½ mile
- Dedicated platforms and shelters, real-time vehicle arrival notification, ticket vending machines, potential for park-and-ride lots near key stations
- Branded Bus
- 15-30 minute headways
- Potential traffic signal priority and/or queue jumping lanes at major traffic signals
- $2-4 million cost per mile

Bus Rapid Transit (BRT 2)

- ½ to 1 mile station spacing
- Dedicated platforms and shelters, real-time vehicle arrival notification, ticket vending machines, potential for park-and-ride lots near key stations
- Specialized Vehicles
- 10-20 minute headways
- Potential for roadway improvements including exclusive-shared HOV lanes, peak hour shoulder lanes, traffic signal prioritization, potential queue jumping lane at major traffic signals
- $7-10 million cost per mile

Bus Rapid Transit (BRT 3)

- ½ to 1 mile station spacing
- Center rail-style platforms and shelters, real-time vehicle arrival notification, ticket vending machines, potential for park-and-ride lots near key stations
- Branded buses
- 10-20 minute headways
- Fully dedicated, center running, transit only right-of-way for bus operations, traffic signal prioritization/ coordination
- $10-30 million cost per mile

Light Rail Transit (LRT)

- 1 mile station spacing
- Dedicated platforms and shelters, real-time vehicle arrival notification, ticket vending machines, park-and-ride at most stations
- Electric rail based vehicles
- 10-15 minute headways
- Traffic Signal Priority and exclusive lanes with potential gated crossings
- $40-70 million cost per mile

Commuter Rail

- 5 mile station spacing
- Dedicated platforms and shelters, real-time vehicle arrival notification, ticket vending machines, park-and-ride at most stations
- Diesel rail vehicles which can operate with freight rail trains
- 20-60 minute headways
- exclusive lanes or freight shared track with gated crossings
- $10-30 million cost per mile

The 2040 RTP recommends a variety of transit services providing different types of travel choices in much the same way as freeways, arterials, collectors, and local streets serve different types of travel choices for the automobile traveler. However, more critical to the user of transit than for the automobile traveler are efficient transitions from one system to another. Smooth transitions are facilitated in transit through intermodal centers, transit hubs, and intercept park-and-ride lots. When fully implemented, transit riders will be able to identify specific facilities where they can make quick and easy transfers from one type of transit mode, such as commuter rail, to another. Transit hubs, intermodal centers, and park-and-ride lots allow for greater flexibility of destination and increased convenience to system patrons. The RTP recommends the construction of transit hubs, transfer centers, and regional park-and-rides facilities not associated with a major investment line.

Transit Hubs

Transit hubs are specifically designed to connect regional and inter-regional transit services with passengers originating from areas with lower trip densities but with collector and local transit services. Transit hubs provide passengers with scheduled transfers to express or limited stop transit modes not otherwise directly available to them. Unlike park-and-ride lots or other transit connections, local buses serving each hub would be scheduled to depart when all of the scheduled buses have arrived. Logical places for transit hubs are commuter rail stations, light rail stations, large employment centers, and major commercial nodes. Potential transit hub locations in the Wasatch Front Region include each of the FrontRunner commuter rail stations as well as the South and West Hill Air Force Base Transfer Centers, the Airport East Transfer Center, and the Fort Union transit hub. The purpose of these Centers is described in more detail in Appendix J.

Transit Park and Ride System

A number of park-and-ride lots are currently in use throughout the Wasatch Front Region. The Utah Transit Authority's current park-and-ride lots allow transit riders to park their automobiles and commute to their destination. Nearly all of the FrontRunner and TRAX stations are provided with park-and-ride facilities and UTA has shared use agreements with several lot owners including the Church of Jesus Christ of Latter-day Saints which owns many lots not in use during the work week. Additional park-and-ride lots, will need to be identified, contracted for, or constructed as opportunity arises. Most park-and-ride lots are generally not regionally significant and need not be identified in the Regional Transportation Plan. However, additional park-and-ride lots should be sought out along major investment corridors and expanded as needed. This is especially true in outlying areas where densities do not justify regular transit route coverage. Such locations include the outer fringes of the developing urban area and smaller, distant towns. General locations for three park-and-ride lots have been identified in the 2040 RTP. These include Ogden Valley near the entrance to Ogden Canyon and in southeast Salt Lake County near the mouths of Big and Little Cottonwood Canyons. The two proposed Salt Lake County park-and-ride lots would be separate and apart from the lots that currently serve the winter sports industry in the two Cottonwood Canyons.

Typical Cross Sections

A typical cross section for transit facilities with exclusive rights-of-way would be about 30 feet of right-of-way width between stations flaring out to about 44 feet of right-of-way width at stations. Station structures would be 8 feet in width. An additional 11-foot wide lane to the curb side of each station would allow for both through and right hand turning vehicular traffic flow. This type of transit station and lane configuration would accommodate a BRT, light-rail line or a streetcar line. For a BRTII line, this width of right-of-way would accommodate two 11.5-foot transit lanes and allow 8 feet for curbs, gutter and landscaping as shown in Figures 7-2 and 7-3. For a streetcar or light-rail transit line, about 30 feet of right-of-way width would accommodate two rail lanes, curbs and space for the electrical catenary poles with two feet to spare as shown in Figures 7-4.

Transit Projects Lists and Maps

The 2011-2040 RTP Transit Project List is separated into three phases. A single transit line may be found in more than one RTP phase, as the project may be built in phases. The project header provides the name of the transit line, the number of phases or stages in which the line is constructed and the general corridor the line is to serve. Underneath the header is information about each segment of the placeholder project alignment. The information includes the "needed mode", "funded mode", and the extent of the alignment segment. The needed and funded mode represents the type and level of transit investment that is desired and funded in that phase of the 2040 RTP. Map 7-5 through Map 7-8 show the 2011-2040 transit capital projects funded through the end of each phase. Map 7-8 also shows those line segments that remain unfunded in part or in whole when compared to the needed modes. The RTP phases are Phase 1, 2011-2020, Phase 2, 2021-2030, Phase 3, 2031-2040, and the Unfunded Phase in which projects that have no identified funding are placed. The 2040 RTP Transit Projects List is shown as Table 7-4. Each transit project is further described in Appendix Q. The in-street right-of-way width required for these projects outside of a station area are included as part of Map 7-3, the Wasatch Front Urban Area Future Right-Of-Way.

Although not specifically identified in the 2040 RTP project list or maps, the regional transportation plan calls for a full schedule, high frequency bus to initiated as part of each line, in conjunction with capital improvements anywhere on that line. UTA proposes that the number of local bus service miles increased by at least 25 percent by 2030, and that paratransit services be held at current levels. The levels of local and paratransit services are not defined by the WFRC's regional transportation plan, but rather are determined by the UTA Board of Directors.

FIGURE 7-2

Typical Transit Facility Configuration

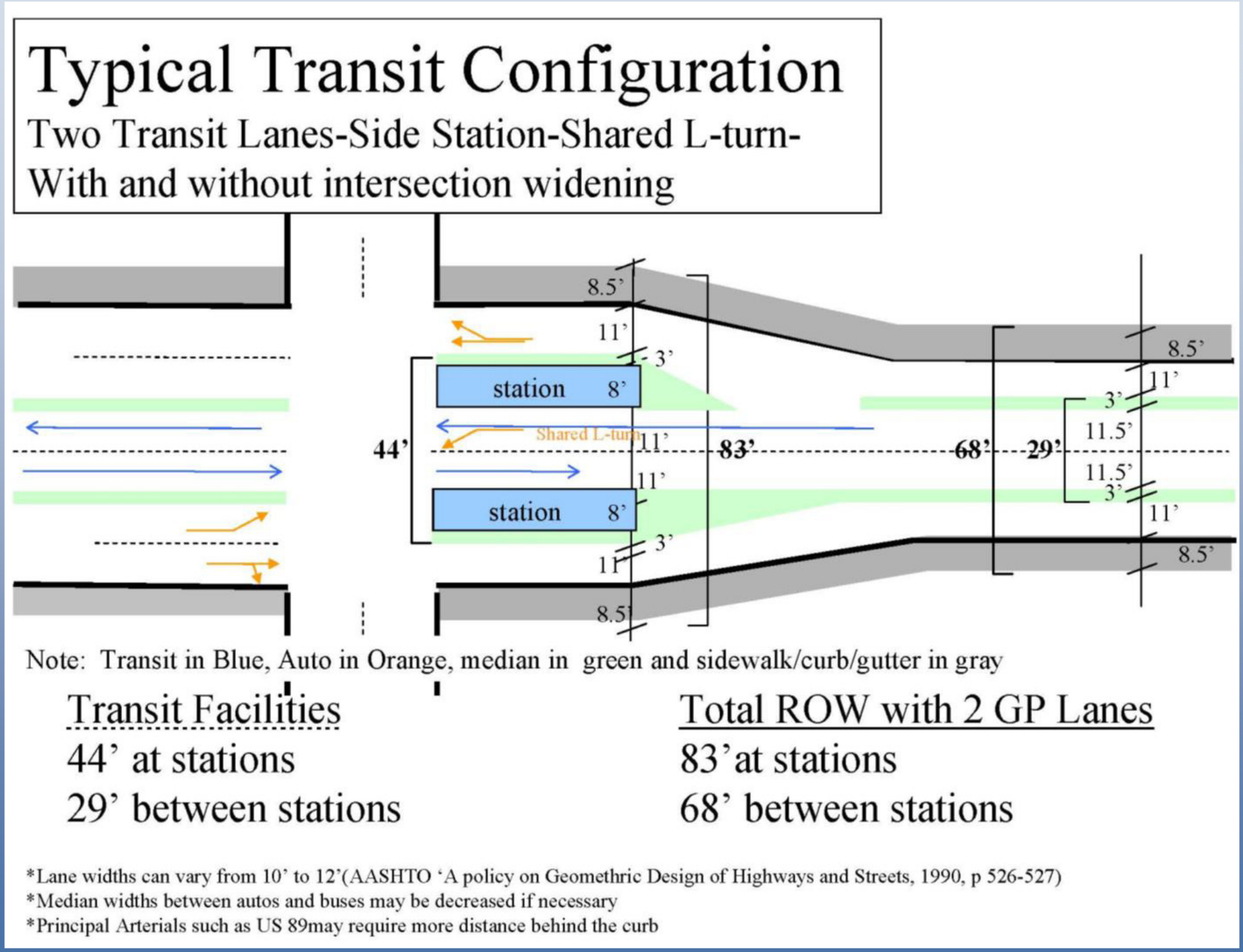


FIGURE 7-3

BRT Transit Facility, Vancouver, British Columbia

FIGURE 7-4

Typical Minor Arterial With In-Street Light Rail Cross Section

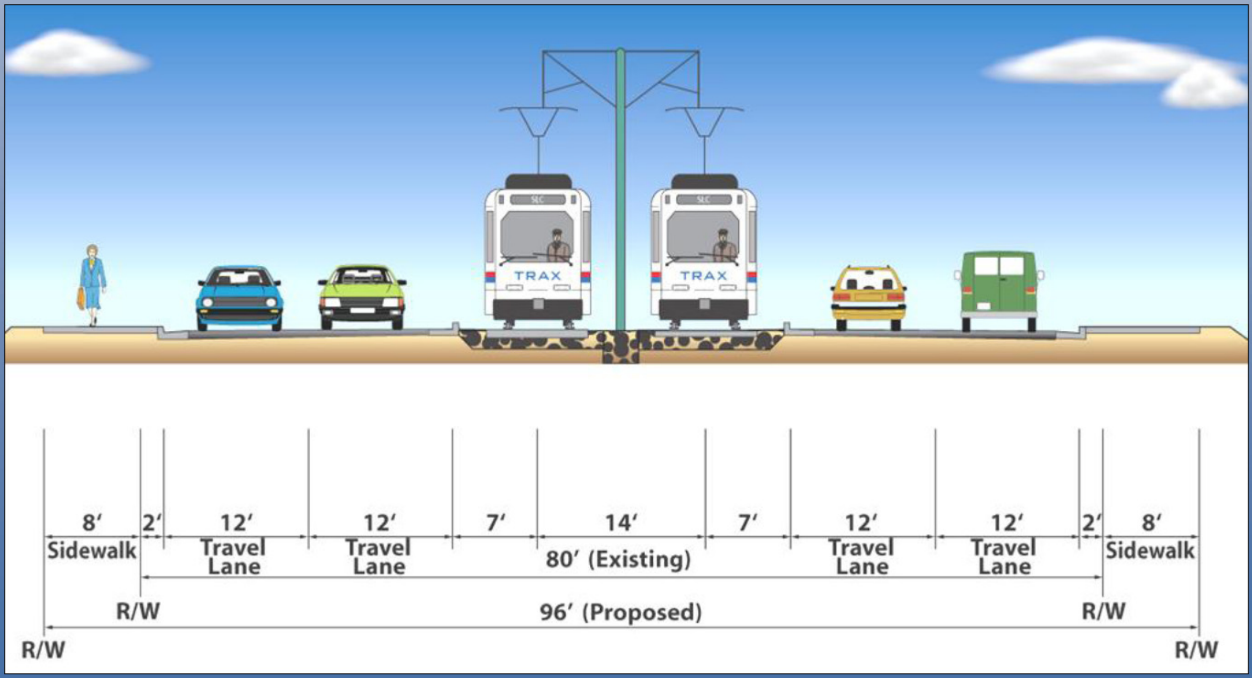


TABLE 7-4
2040 RTP Transit Project List

PROJECT		LOCATION	
Needed Mode	Funded Mode	From	To
PHASE 1			
NORTH OGDEN – SALT LAKE CORRIDOR (NORTH): FIRST OF THREE PHASES			
North Ogden - Ogden Intermodal Center - Ogden CBD - Newgate Mall - Riverdale - Clearfield - Hill Air Force Base - Layton FrontRunner Station - Farmington FrontRunner Station			
Bus Rapid Transit 3	Corridor Preservation	4400 S. (Roy)	Davis County Line
Bus Rapid Transit 3	Corridor Preservation	Davis County Line	651 N./SR-126
Bus Rapid Transit 3	Bus Rapid Transit 3	HAFB West Gate	200 N./SR-126
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	200 N./SR-126	Clearfield FrontRunner
NORTH OGDEN – SALT LAKE CORRIDOR (SOUTH DAVIS): FIRST OF TWO PHASES			
Farmington FrontRunner Station - Centerville - Bountiful - Woods Cross – NS L - Downtown SLC			
Rail/Bus Rapid Transit	Enhanced Bus (BRT 1)	Main St/Parrish Lane	3800 S. Bountiful/US-89
Rail/Bus Rapid Transit	Bus Rapid Transit	3800 S. Bountiful/US-89	US-89/Eagleridge Dr
OGDEN – WEBER STATE UNIVERSITY STREETCAR: FIRST OF TWO PHASES			
Ogden Intermodal Center - Ogden - South Ogden - Weber State University - McKay Dee Hospital			
Streetcar	Enhanced Bus (BRT 1)	Ogden Intermodal Center	Washington/27th St
Streetcar	Bus Rapid Transit 3	Washington/27th St	Washington/36th St
Streetcar	Enhanced Bus (BRT 1)	Washington/36th St	Harrison Boulevard/Edvalson
Streetcar	Bus Rapid Transit 3	Harrison Blvd/Edvalson Ave	McKay-Dee Hospital
WEST WEBER – WEST DAVIS ENHANCED BUS (BRT 1)			
Ogden Intermodal Center - Ogden CBD - Newgate Mall - Riverdale - Roy FrontRunner Station - West Haven - Clinton - West Point - Syracuse - Clearfield - Hill Airforce Base - Layton FrontRunner Station			
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	3500 W./Midland Dr	Davis County Line
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	Weber County Line	2000 W./Antelope Dr
OGDEN VALLEY PARK AND RIDE			
Near Pineview Dam			
Park-and -Ride	Park-and-ride	Near Pineview Dam	
FALCON HILL – HILL AFB WEST TRANSIT CENTER			
Falcon Hill - Hill AFB West Gate			
Transit Hub	Transit Hub	New Hill AFB West Gate	
SLC – FOOTHILL DRIVE – WASATCH DRIVE CORRIDOR: FIRST OF THREE PHASES			
Salt Lake Central - Salt Lake City - University of Utah - Medical Center - Research Park - Parley's Canyon - Interstate 215 - Cottonwood Corporate Center - Big Cottonwood Canyon - Little Cottonwood Canyon			
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Salt Lake Central	Medical Dr./ Research Rd
Bus Rapid Transit 3	Bus Rapid Transit 3	Medical Dr./ Research Rd	New Rd at Wakara Way
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	New Rd at Wakara Way	Arapeen Dr/Chipeta Way
PARK CITY CORRIDOR			
Salt Lake Central - 200 South - University of Utah - Medical Center - Foothill - Interstate 80 - Summit County Line			
Enhanced Bus (BRT 1)	Operations only	Salt Lake Central	Summit County Line
STATE STREET BUS RAPID TRANSIT: FIRST OF THREE PHASES			
Salt Lake Central - Capitol – South Salt Lake - Millcreek - Murray FrontRunner Station - Midvale - Sandy/South Jordan FrontRunner Station - Draper FrontRunner Station			
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	200 S./State St	State St/Winchester St
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	State St/Winchester St	9000 S.
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	9000 S.	Draper FrontRunner

TABLE 7-4 CONTINUED

2040 RTP Transit Project List

PROJECT		LOCATION	
Needed Mode	**Funded Mode**	**From**	**To**
REDWOOD ROAD BUS RAPID TRANSIT: FIRST OF THREE PHASES			
Downtown Salt Lake - Salt Lake Central - Interstate 80 - Airport East Hub - West Valley - Taylorsville - West Jordan - South Jordan - Riverton - Draper FrontRunner Station			
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	N. Temple/Redwood Rd	SR-201
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	SR-201	4700 S.
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	4700 S.	9000 S.
Bus Rapid Transit 3	Corridor Preservation	9000 S.	12600 S.
Bus Rapid Transit 3	Corridor Preservation	12600 S./Redwood Rd	12300 S./Pony Express
DRAPER LINE TRAX EXTENSION (NORTH)			
10000 South TRAX Station - 12600 South TRAX Station			
Light Rail	Light Rail	10000 S. TRAX Station	12600 S. TRAX
5600 WEST CORRIDOR: FIRST OF TWO PHASES			
Downtown Salt Lake - Salt Lake Central - Interstate 80 - Airport East Hub - International Center - West Valley - Kearns - West Jordan - Daybreak Station			
Rail/Bus Rapid Transit 3	Corridor Preservation	Salt Lake International Airport	5600 W./2700 S.
Rail/Bus Rapid Transit 3	Bus Rapid Transit 3	5600 W./2700 S.	5600 W./6200 S.
Rail/Bus Rapid Transit 3	Corridor Preservation	5600 W./6200 S.	11800 S.
200 SOUTH STREETCAR AND BUS RAPID TRANSIT			
Salt Lake Central - Downtown Salt Lake – Harmons Grocery			
Streetcar/BRT	Streetcar/Enhanced Bus	600 W./200 S.	200 S./200 East
SUGARHOUSE STREETCAR: FIRST PHASE			
Sugarhouse - South Salt Lake – North/South TRAX Line			
Streetcar	Streetcar	2100 S. TRAX	Highland Dr/Sugarmont
3900 / 3500 SOUTH CORRIDOR: FIRST OF THREE PHASES			
East Millcreek - Holladay - Millcreek - South Salt Lake - West Valley West Bench			
Bus Rapid Transit 3	Bus Rapid Transit 3	3500 S./3600 W.	3500 W./6000 W.
TAYLORSVILLE MURRAY CORRIDOR (CENTRAL SEGMENT): FIRST OF TWO PHASES			
Downtown Murray - Murray FrontRunner Station - Sorensen Research Park - SLCC Redwood Campus			
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Box Elder St/4800 S.	SLCC Redwood Campus
TAYLORSVILLE MURRAY CORRIDOR (WEST VALLEY EXTENSION): FIRST OF TWO PHASES			
Salt Lake Community College Redwood Campus - American Express - West Valley Intermodal Center			
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	4500 S./Redwood Rd	W. Valley Intermodal Ctr
WEST BENCH CORRIDOR PRESERVATION (11400 SOUTH)			
Daybreak – 8400 West			
Corridor Preservation	Corridor Preservation	Daybreak S. Station	11400 S./8400 W.

TABLE 7-4 CONTINUED
2040 RTP Transit Project List

PROJECT		LOCATION	
Needed Mode	Funded Mode	From	To
PHASE 2			
OGDEN – PLEASANT VIEW COMMUTER RAIL IMPROVEMENTS			
Downtown Ogden - Pleasant View			
Commuter Rail	Commuter Rail	Ogden Intermodal Center	Pleasant View FrontRunner
OGDEN – WEBER STATE UNIVERSITY STREETCAR: SECOND OF TWO PHASES			
Ogden Intermodal Center - Ogden - South Ogden - Weber State University - McKay Dee Hospital			
Streetcar	Streetcar	Ogden Intermodal Center	Washington/27th St
Streetcar	Streetcar	Washington/27th St	Washington/36th St
Streetcar	Streetcar	Washington/36th St	Harrison/Edvalson Av
Streetcar	Streetcar	Harrison Boulevard/Edvalson Av	McKay-Dee Hospital
NORTH OGDEN – SALT LAKE CORRIDOR (NORTH): SECOND OF THREE PHASES			
North Ogden - Ogden Intermodal Center - Ogden CBD - Newgate Mall - Riverdale - Roy FrontRunner Station - West Haven - Clinton - West Point - Syracuse - Clearfield - Hill Air Force Base - Layton FrontRunner Station - Farmington FrontRunner Station - Centerville - Bountiful - Woods Cross - North Salt Lake - Salt Lake Central - Downtown Salt Lake			
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	2700 N./Washington Boulevard	12th St/Washington Boulevard
Bus Rapid Transit 3	Bus Rapid Transit 3	12th St/Washington Boulevard	Ogden Intermodal Ctr
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Washington Boulevard/36th St	4400 S./UP-HAFB ROW
Bus Rapid Transit 3	Bus Rapid Transit 3	4400 S./UP-HAFB ROW	Davis County Line
Bus Rapid Transit 3	Bus Rapid Transit 3	Davis County Line	HAFB West Gate
Bus Rapid Transit 3	Bus Rapid Transit 3	200 N./State St	Clearfield FrontRunner
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Clearfield FrontRunner	Farmington FrontRunner
NORTH OGDEN – SALT LAKE CORRIDOR (SOUTH DAVIS): SECOND OF THREE PHASES			
Farmington FrontRunner Station - Centerville - Bountiful - Woods Cross – NS L - Downtown SLC			
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	Farmington FrontRunner	Parrish Lane/Main St
Rail/Bus Rapid Transit 3	Bus Rapid Transit 3	1500 S./Main St	3800 S. Bountiful/US-89
Rail/Bus Rapid Transit 3	Bus Rapid Transit 3	US-89/Eagleridge Dr	Salt Lake County Line
Rail/Bus Rapid Transit 3	Bus Rapid Transit 3	Salt Lake County Line	Salt Lake Intermodal Center
HILL AFB SOUTH TRANSIT CENTER			
Hill AFB South Gate			
Transit Hub	Transit Hub		
ANTELOPE DRIVE PARK AND RIDE			
Antelope Dr/US-89			
Park-and –Ride	Park-and-Ride		
NORTH REDWOOD ENHANCED BUS (BRT 1): FIRST OF TWO PHASES			
East Bountiful - West Bountiful - Woods Cross FrontRunner Station - N. Salt Lake - North Temple - Downtown Salt Lake			
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	500 S./Orchard Dr	500 S./Redwood Rd
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	500 S./Redwood Rd	2600 S. Redwood Rd
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	2600 S. Redwood Rd	Salt Lake County Line
SLC – FOOTHILL DRIVE – WASATCH DRIVE CORRIDOR: SECOND OF THREE PHASES			
Salt Lake Central - Salt Lake City - University of Utah - Medical Center - Research Park - Parley's Canyon - Interstate 215 - Cottonwood Corporate Center - Big Cottonwood Canyon - Little Cottonwood Canyon			
Bus Rapid Transit 3	Bus Rapid Transit 3	Salt Lake Central	200 S./200 East
Bus Rapid Transit 3	Bus Rapid Transit 3	200 East/200 S.	Medical Dr./Research Rd
Bus Rapid Transit 3	Bus Rapid Transit 3	New Rd/Wakara Way	Arapeen Dr/Chipeta Way
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Arapeen Dr/Chipeta Way	I-80/I-215/Foothill Dr

TABLE 7-4 CONTINUED

2040 RTP Transit Project List

PROJECT		LOCATION	
Needed Mode	Funded Mode	From	To
STATE STREET BUS RAPID TRANSIT: SECOND OF THREE PHASES			
Salt Lake Central - Capitol - South Salt Lake - Millcreek - Murray FrontRunner Station - Midvale - Sandy/South Jordan FrontRunner Station - Draper FrontRunner Station			
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	200 S./300 W.	600 S./State St
Bus Rapid Transit 3	Bus Rapid Transit 3	600 S./State St	Interstate 80
Bus Rapid Transit 3	Bus Rapid Transit 3	Interstate 80	Winchester St
REDWOOD ROAD BUS RAPID TRANSIT: SECOND OF TWO PHASES			
Downtown Salt Lake - Salt Lake Central - Interstate 80 - Airport East Hub - West Valley - Taylorsville - West Jordan - South Jordan - Riverton - Draper FrontRunner Station			
Bus Rapid Transit 3	Bus Rapid Transit 3	SR-201	5400 S.
Bus Rapid Transit 3	Bus Rapid Transit 3	5400 S.	9000 S.
Bus Rapid Transit 3	Bus Rapid Transit 3	9000 S.	12600 S.
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	12600 S./Redwood Rd	12300 S./Pony Express Rd
UNIVERSITY TRAX LINE TO SALT LAKE CENTRAL TRAX CONNECTION			
Medical Center - University of Utah - Salt Lake Downtown West - Salt Lake Central			
Light Rail	Light Rail	400 S./Main St	Salt Lake Central
3900 / 3500 SOUTH CORRIDOR: THIRD OF FOUR PHASES			
East Millcreek - Holladay - Millcreek - South Salt Lake - West Valley West Bench			
Bus Rapid Transit 3	Bus Rapid Transit 3	3500 W./6000 W.	3500 S./9200 W.
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Millcreek TRAX	3900 S./Highland Dr
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	3900 S./Highland Dr	3900 S./Wasatch Dr
TAYLORSVILLE MURRAY CORRIDOR (HOLLADAY EXTENSION)			
Downtown Murray - Holladay - Wasatch Drive			
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	Box Elder St/4800 S.	3900 S./Wasatch Dr
TAYLORSVILLE MURRAY CORRIDOR (CENTRAL SEGMENT): SECOND OF TWO PHASES			
Downtown Murray - Murray FrontRunner Station - Sorensen Research Park - SLCC Redwood Campus			
Bus Rapid Transit 3	Bus Rapid Transit 3	Box Elder St/4800 S.	Murray-Taylorsville Rd/500 W.
Bus Rapid Transit 3	Bus Rapid Transit 3	Murray-Taylorsville Rd/500 W.	Murray-Taylorsville/Redwood
TAYLORSVILLE MURRAY CORRIDOR (WEST VALLEY EXTENSION): SECOND OF TWO PHASES			
Salt Lake Community College Redwood Campus - American Express - West Valley Intermodal Center			
Bus Rapid Transit 3	Bus Rapid Transit 3	4500 S./Redwood Rd	4400 S./Constitution
5400 SOUTH CORRIDOR: FIRST OF TWO PHASES			
Murray FrontRunner Station - Taylorsville - Kearns - USANA Amphitheater - West Bench			
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Murray Boulevard/Vine St	5400 S./6400 W.
Bus Rapid Transit 3	Bus Rapid Transit 3	5400 S./6400 W.	5400 S./7200 W.
7000 SOUTH / 7800 SOUTH ENHANCED BUS (BRT 1): FIRST OF TWO PHASES			
Murray FrontRunner Station - Bingham Junction - Jordan Landing - West Bench			
Enhanced Bus (BRT 1)	Corridor Preservation	State St/7200 S.	Redwood Rd/7000 S.
Enhanced Bus (BRT 1)	Corridor Preservation	Redwood Rd/7000 S.	Bangerter Highway/7000 S.
12300 / 12600 SOUTH BUS RAPID TRANSIT: FIRST OF THREE PHASES			
Draper TRAX Station - Draper FrontRunner Station - Riverton - Herriman - Daybreak TRAX Station			
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Daybreak S. TRAX	Redwood Rd/12600 S.
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	700 East	Draper TRAX
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	700 East	Pony Express Rd
Bus Rapid Transit 3	Corridor Preservation	700 East	Pony Express Rd

TABLE 7-4 CONTINUED

2040 RTP Transit Project List

PROJECT		LOCATION	
Needed Mode	**Funded Mode**	**From**	**To**
SALT LAKE DOWNTOWN BUS TRANSIT CENTER			
200 South ./ State Street			
Transit Hub	Transit Hub	200 S./State St	
EAST AIRPORT TRANSIT HUB			
1950 West Redwood Road Airport TRAX Line Station			
Transit Hub	Transit Hub	1950 W. Redwood Rd	
INTERSTATE-80 TRANSIT ONLY FREEWAY RAMPS			
About 900 West / Interstate 80			
Transit Only Ramps	Transit Only Ramps	Near 900 W. and 200 S.	Transit Only Ramps
PHASE 3			
PLEASANT VIEW – BRIGHAM CITY COMMUTER RAIL			
Downtown Ogden - Box Elder County Line			
Mode Undetermined	Corridor Preservation	Pleasant View FrontRunner	Box Elder County Line
WEST WEBER / WEST DAVIS ENHANCED BUS (BRT 1): SECOND OF TWO PHASES			
Ogden Intermodal Center - Ogden CBD - Newgate Mall - Riverdale - Roy FrontRunner Station - West Haven - Clinton - West Point - Syracuse - Clearfield - Hill Air Force Base - Layton FrontRunner Station			
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	4400 S./UP-HAFB Rail Line	3500 W./Midland Dr
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	2000 W./Antelope Dr	Hill Field Rd/Main St.
OGDEN DOWNTOWN STREETCAR CIRCULATOR			
Ogden Intermodal Center - Downtown Ogden			
Mode Undetermined	Streetcar	25th/Washington	20th/Lincoln
Mode Undetermined	Streetcar	20th/Lincoln	20th/Washington
Mode Undetermined	Streetcar	20th/Washington	23rd/Washington
NORTH OGDEN – SALT LAKE CORRIDOR (NORTH): THIRD OF THREE PHASES			
North Ogden - Ogden Intermodal Center - Ogden CBD - Newgate Mall - Riverdale - Roy FrontRunner Station - West Haven - Clinton - West Point - Syracuse - Clearfield - Hill Air Force Base - Layton FrontRunner Station - Farmington FrontRunner Station - Centerville - Bountiful - Woods Cross - North Salt Lake - Salt Lake Central - Downtown Salt Lake			
Bus Rapid Transit 3	Bus Rapid Transit 3	Washington Boulevard/36th St	4400 S./UP-HAFB ROW
Bus Rapid Transit 3	Bus Rapid Transit 3	Clearfield FrontRunner	Farmington FrontRunner
NORTH REDWOOD ENHANCED BUS (BRT 1): SECOND OF TWO PHASES			
East Bountiful - West Bountiful - Woods Cross FrontRunner Station - North Salt Lake - North Temple - Downtown Salt Lake			
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	Davis County Line	N. Temple/Redwood Rd
SLC – FOOTHILL DRIVE – WASATCH DRIVE CORRIDOR: THIRD OF THREE PHASES			
Salt Lake Central - Salt Lake City - University of Utah - Medical Center - Research Park - Parley's Canyon - Interstate 215 - Cottonwood Corporate Center - Big Cottonwood Canyon - Little Cottonwood Canyon			
Bus Rapid Transit 3	Bus Rapid Transit 3	Arapeen Dr/Chipeta Way	I-80/I-215/Foothill Dr.
Bus Rapid Transit 3	Bus Rapid Transit 3	I-215 Ramp/3300 S.	I-215 Ramp/3900 S.
Mode Undetermined	Bus Rapid Transit 3	6200 S./Interstate 215	Little Cottonwood Canyon
1300 EAST (NORTH) BUS RAPID TRANSIT			
Medical Center - University of Utah - Sugar House - Millcreek - Holladay - Murray - Fort Union - Cottonwood Heights – Midvale - Fashion Place West TRAX Station			
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	1300 East/200 S.	Ft Union Boulevard/Union Park
1300 EAST (SOUTH) BUS RAPID TRANSIT			
Murray FrontRunner Station - Fashion Place West TRAX Station - Midvale - Fort Union - Cottonwood Heights - Sandy – Draper			
Bus Rapid Transit 3	Bus Rapid Transit 3	Ft Union Boulevard/Union Park Av	1000 East Pioneer Rd

TABLE 7-4 CONTINUED
2040 RTP Transit Project List

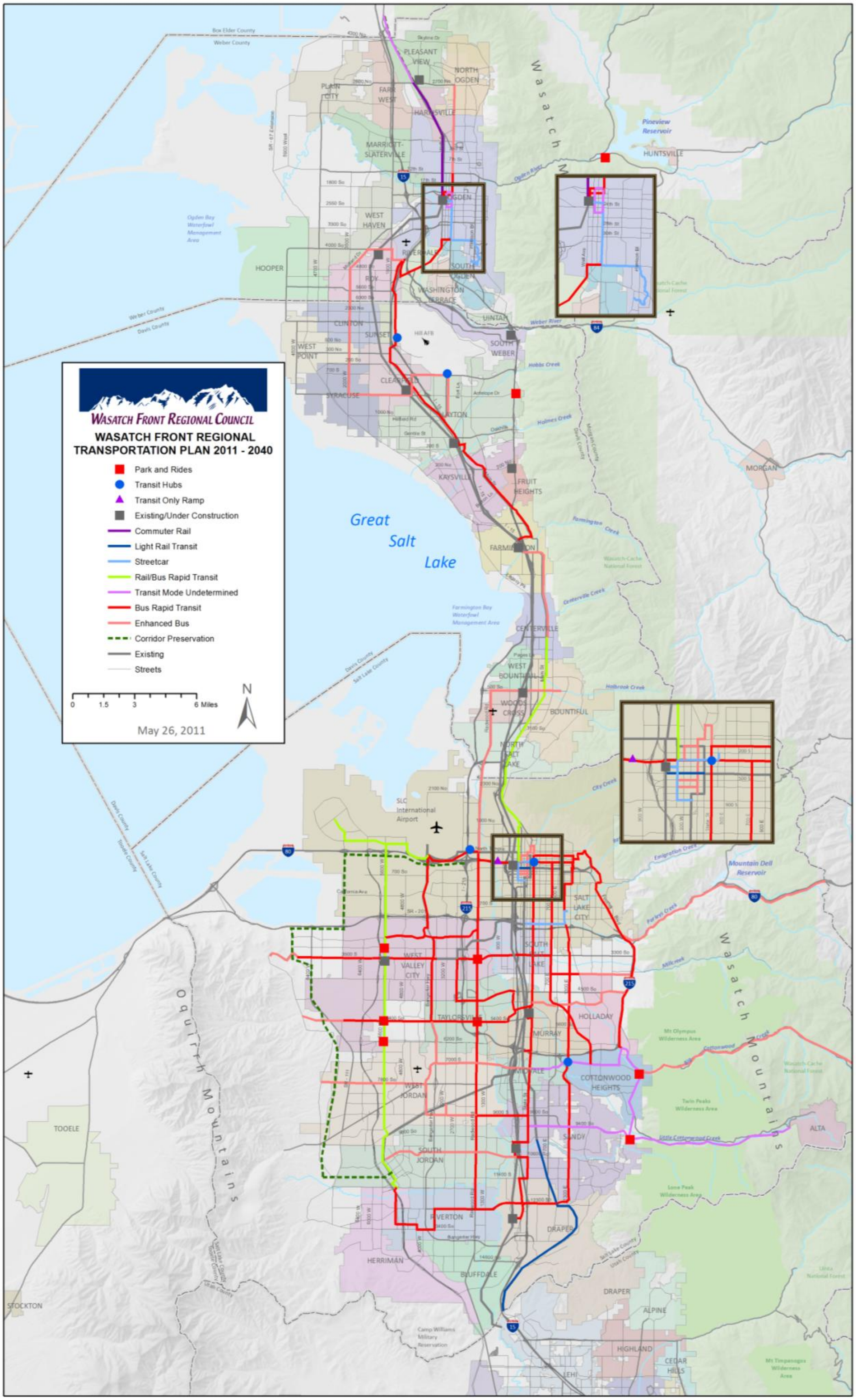
PROJECT		LOCATION	
Needed Mode	Funded Mode	From	To
700 EAST BUS RAPID TRANSIT			
Salt Lake Central – South Salt lake - Millcreek - Murray - Holladay - Cottonwood Heights - Fort Union			
Bus Rapid Transit 3	Bus Rapid Transit 3	200 S./200 East	Highland/Ft Union Boulevard
STATE STREET BUS RAPID TRANSIT: THIRD OF THREE PHASES			
Salt Lake Central - Capitol - South Salt Lake - Millcreek - Murray FrontRunner Station - Midvale - Sandy/South Jordan FrontRunner Station - Draper FrontRunner Station			
Bus Rapid Transit 3	Bus Rapid Transit 3	9000 S.	Draper FrontRunner
DRAPER LINE TRAX EXTENSION (SOUTH)			
Salt Lake Central - South Salt Lake - Millcreek - Murray FrontRunner Station - Midvale - Sandy - Draper - Utah County Line			
Light Rail	Light Rail	Draper TRAX	14600 S./Interstate 15
Light Rail	Light Rail	14600 S./Interstate 15	Utah County Line
REDWOOD ROAD BUS RAPID TRANSIT: THIRD OF THREE PHASES			
Downtown Salt Lake - Salt Lake Central - Interstate 80 - Airport East Hub - West Valley - Taylorsville - West Jordan - South Jordan - Riverton - Draper FrontRunner Station			
Bus Rapid Transit 3	Bus Rapid Transit 3	200 S./600 W.	Transit Ramp to I-80
Bus Rapid Transit 3	Bus Rapid Transit 3	I-80/Redwood Rd	East Airport Hub
Bus Rapid Transit 3	Bus Rapid Transit 3	I-80/Redwood Rd	SR-201/Redwood Rd
Bus Rapid Transit 3	Bus Rapid Transit 3	12600 S./Redwood Rd	12300S/Pony Exp Rd
5600 WEST CORRIDOR: SECOND OF TWO PHASES			
Downtown Salt Lake - Salt Lake Central - Interstate 80 - Airport East Hub - International Center - West Valley - Kearns - West Jordan - Daybreak Station			
Rail/Bus Rapid Transit 3	Bus Rapid Transit 3	East Airport Hub	N. Temple/I-80
Rail/Bus Rapid Transit 3	Bus Rapid Transit 3	I-80/Wright Brothers Dr	2700 S./5600 W.
Rail/Bus Rapid Transit 3	Bus Rapid Transit 3	6200 S./5600 W.	11800 S.
SUGARHOUSE STREETCAR (WESTMINSTER SEGMENT)			
Westminster College - Sugarhouse – South Salt Lake – North/South TRAX Line			
Streetcar	Streetcar	Highland Dr/Sugarmont Dr	1700 S./1100 East
PARKWAY BOULEVARD BUS RAPID TRANSIT			
Downtown Salt Lake - Salt Lake Central - Interstate 80 - Airport East Hub - Decker Lake - Lake Park - West Valley City – Kearns			
Bus Rapid Transit 3	Bus Rapid Transit 3	Redwood Rd/Parkway Boulevard	5600 W./Parkway Boulevard
3900 / 3500 SOUTH CORRIDOR: FOURTH OF FOUR PHASES			
East Millcreek - Holladay - Millcreek - South Salt Lake - West Valley West Bench			
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	9200 W./3500 S.	Little Valley
Bus Rapid Transit 3	Bus Rapid Transit 3	3500 S./Constitution Boulevard	3500 S./Redwood Rd
Bus Rapid Transit 3	Bus Rapid Transit 3	3500 S./Redwood Rd	Millcreek TRAX
Bus Rapid Transit 3	Bus Rapid Transit 3	Millcreek TRAX	3900 S./Highland Dr
5400 SOUTH CORRIDOR: SECOND OF TWO PHASES			
Murray FrontRunner Station - Taylorsville - Kearns - USANA Amphitheater - West Bench			
Bus Rapid Transit 3	Bus Rapid Transit 3	Murray Boulevard/Vine St	7200 W.
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	7200 W.	8400 W.
FORT UNION BOULEVARD CORRIDOR			
Big Cottonwood Canyon - Cottonwood Corporate Center - Fort Union - Midvale - Fashion Place West TRAX Station			
Mode Undetermined	Bus Rapid Transit 3	State St/Fort Union Boulevard	Little Cottonwood Canyon

TABLE 7-4 CONTINUED

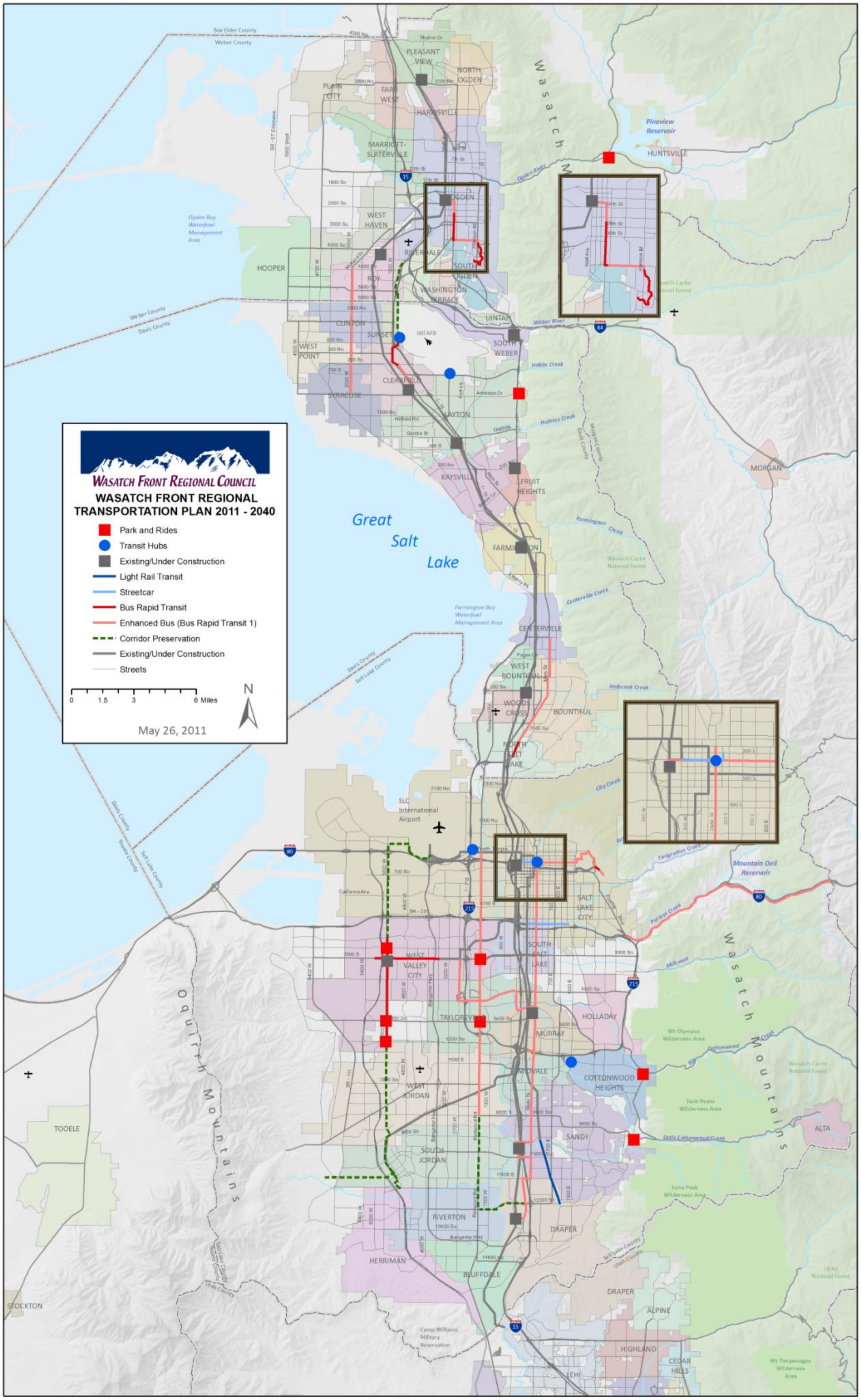
2040 RTP Transit Project List

PROJECT		LOCATION	
Needed Mode	Funded Mode	From	To
7000 SOUTH / 7800 SOUTH ENHANCED BUS (BRT 1): SECOND OF TWO PHASES			
Murray FrontRunner Station - Bingham Junction - Jordan Landing - West Bench			
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	State St/7200 S.	Redwood Rd/7000 S.
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	Redwood Rd/7000 S.	Bangerter Highway/7000 S.
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	Bangerter Highway/7000 S.	8400 W./7800 S.
9000 SOUTH WEST SIDE CORRIDOR			
Sandy/South Jordan FrontRunner Station - Mid-Jordan TRAX Station			
Bus Rapid Transit 3	Bus Rapid Transit 3	9000 S./State St	9000 S./Redwood Rd
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	9000 S./Redwood Rd	Mid-Jordan TRAX
9400 SOUTH CORRIDOR			
Mouth of Little Cottonwood Canyon - Sandy - Sandy/South Jordan FrontRunner Station			
Mode Undetermined	Bus Rapid Transit 3	9400 S./State St	Little Cottonwood Canyon
10200 / 10400 SOUTH ENHANCED BUS (BRT 1)			
South Jordan FrontRunner Station - Daybreak TRAX Station			
Enhanced Bus (BRT 1)	Enhanced Bus (BRT 1)	Jordan Gateway/S Jordan Parkway	Daybreak North TRAX
12300 / 12600 SOUTH BUS RAPID TRANSIT: THIRD OF THREE PHASES			
Draper TRAX Station - Draper FrontRunner Station - Riverton - Herriman - Daybreak TRAX Station			
Bus Rapid Transit 3	Bus Rapid Transit 3	Daybreak S. TRAX	Redwood Rd/12600 S.
Bus Rapid Transit 3	Bus Rapid Transit 3	700 East	Draper TRAX
3500 SOUTH REDWOOD ROAD PARK AND RIDE			
3500 South/Redwood Rd			
Park- and-Ride	Park-and-Ride	3500 S./Redwood Rd	
5400 SOUTH REDWOOD ROAD PARK AND RIDE			
5400 South/Redwood Rd			
Park- and-Ride	Park-and-Ride	5400 S./Redwood Rd	
3100 SOUTH / 5600 WEST PARK AND RIDE			
3100 South/5600 West			
Park-and-Ride	Park-and-Ride	3100 S./5600 W.	
6200 SOUTH / 5600 WEST PARK AND RIDE			
6200 South/5600 West			
Park-and-Ride	Park-and-Ride	6200 S./5600 W.	
5400 SOUTH / 5600 WEST PARK AND RIDE			
5400 South/5600 West			
Park-and-Ride	Park-and-Ride	5400 S./5600 W.	
FORT UNION TRANSIT CENTER			
Union Park Avenue/Fort Union Boulevard			
Transit Hub	Transit Hub	Union Park Ave/Ft Union Blvd	
LITTLE COTTONWOOD CANYON PARK AND RIDE			
Wasatch Boulevard - Mouth of Little Cottonwood Canyon			
Park-and-Ride	Park-and -Ride	Little Cottonwood Canyon	
BIG COTTONWOOD CANYON PARK AND RIDE			
Wasatch Boulevard - Mouth of Big Cottonwood Canyon			
Park-and-Ride	Park-and-Ride	Big Cottonwood Canyon	

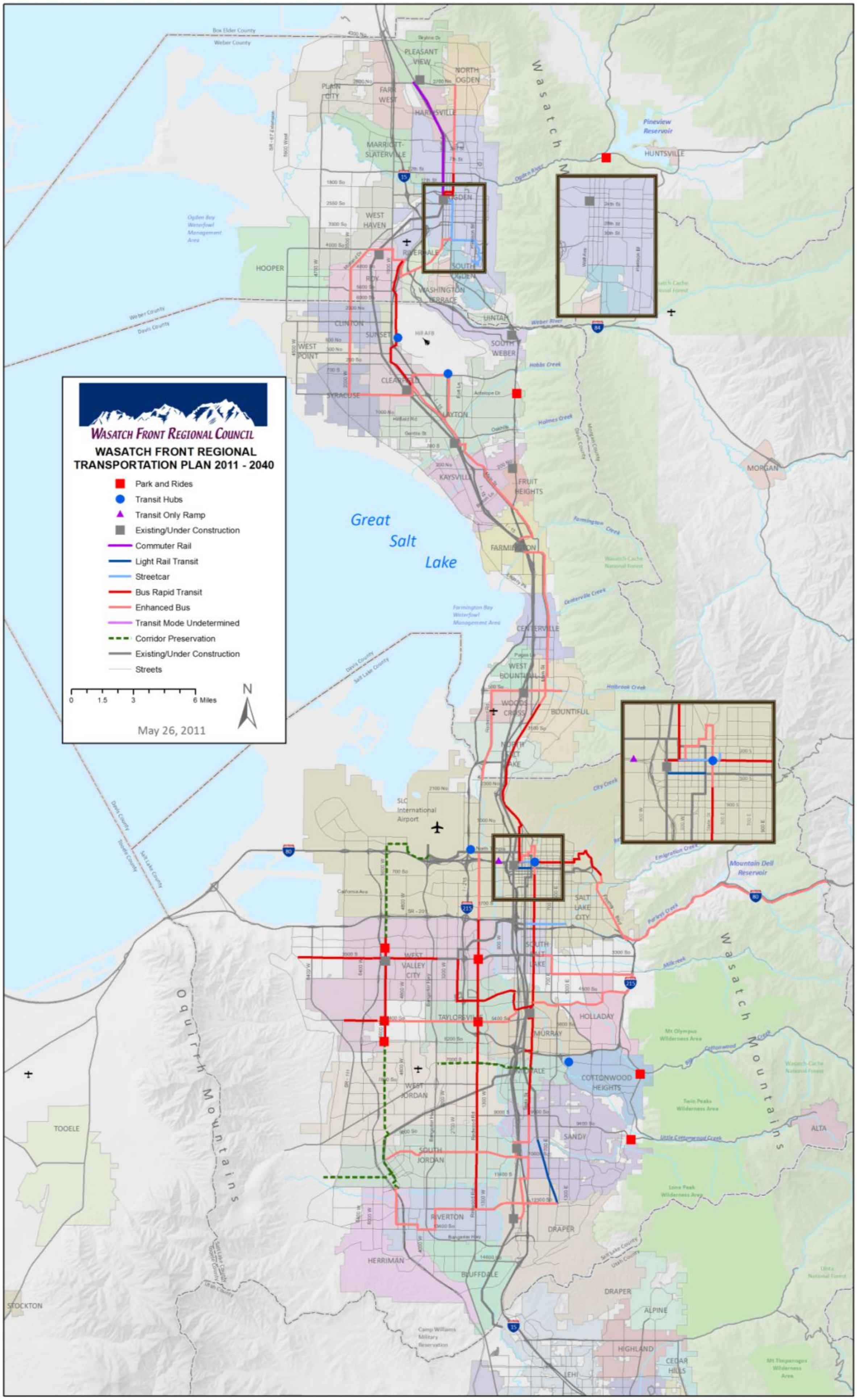
Map 7-5, 2040 RTP DESIRED TRANSIT PROJECT NETWORK BY TYPE



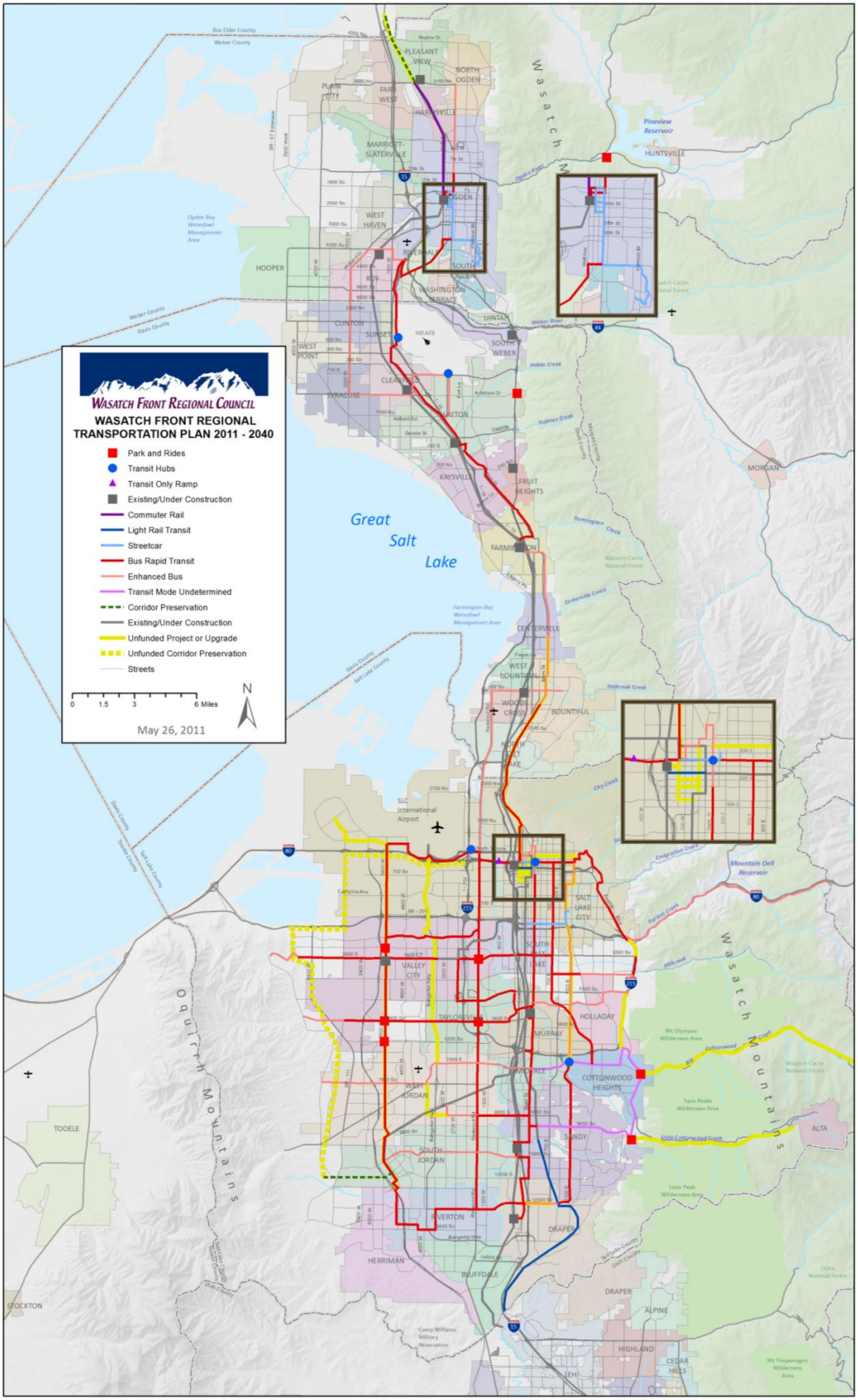
Map 7-6, 2040 RTP TRANSIT CAPITAL PROJECTS IN 2020



Map 7-7, 2040 RTP TRANSIT CAPITAL PROJECTS IN 2030



Map 7-8, 2040 RTP TRANSIT CAPITAL PROJECTS WITH UNFUNDED PROJECTS



OTHER TRANSIT SYSTEM IMPROVEMENTS

Wasatch Front Mobility Management Project

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

Federal transit law, as amended by SAFETEA–LU, requires that projects funded from the Elderly Individuals and Individuals with Disabilities (Section 5310), Job Access and Reverse Commute (JARC, Section 5316), and New Freedom (Section 5317) programs be derived from a locally developed, coordinated public transit-human services transportation plan ("coordinated plan"). A coordinated plan should maximize the programs' collective coverage by minimizing duplication of services. Further, a coordinated plan should be developed through a process that includes representatives of public, private and non-profit transportation and human services providers, and participation by the public. Federal transit law further states that Sections 5311 and 5307 also require coordination with transportation assistance under other Federal programs.

The WFRC partnered with MAG and UTA in 2009 to develop a coordinated plan that included the entire UTA service area (Davis, Morgan, Salt Lake, Tooele, Utah, and Weber counties, and the southern portion of Box Elder County). The coordinated plan was titled the "Wasatch Front Mobility Management Project." The purpose of the Mobility Management Project was to improve mobility for the transportation disadvantaged and to meet the requirements for a locally developed coordinated public transit-human services transportation plan. The planning process included extensive public outreach and collaboration with coordination planning partners including transportation providers, passengers and advocates, human service providers, and representatives from local/regional governments. In collaboration with

the planning partners, existing transportation resources and consumer origins/destinations were identified through interviews, planning sessions, focus groups, and a service provider survey.

Through detailed study, analysis, and collaboration, the unmet needs for the region were identified as availability and accessibility of services, access to Information, extended service hours, expanded geographic coverage, expanded capacity, expanded client/program eligibility, expanded trip purpose, affordable services, funding gaps, centralized collaboration, efficient operations, and consistent service quality. As a result of the Coordinated Plan, the Wasatch Regional Coordination Council for Community Transportation (RCC) was created in 2010 to foster, organize, and guide local and regional coordination efforts that directly or indirectly improve access and mobility for seniors, persons with disabilities and/or persons with low income throughout Davis, Morgan, Salt Lake, Tooele, and Weber counties.

The WFRC hired a mobility manager in 2010 to provide staff to the RCC, to help implement the Coordinated Plan, to provide ongoing mobility management services for the region, and to collaborate with statewide coordination efforts through participation in the Utah United We Ride Workgroup and the

Utah Urban Rural Specialized Transportation Association (URSTA). United We Ride defines Mobility management as an innovative approach for managing and delivering coordinated transportation services to the transportation disadvantaged. Changes in demographics, shifts in land use patterns, and the creation of new and different job markets require new approaches for providing transportation services, particularly for customers with special needs. Mobility management focuses on meeting the needs of individual customers through the selection of the appropriate mode of travel a wide range of transportation options and service providers. It also focuses on coordinating these services and providers in order to achieve a more efficient transportation service delivery system as designed by public policy makers and the taxpayers who underwrite the cost of service delivery.

The RCC is developing coordinated transportation programs to address the strategies identified and prioritized in the Coordinated Plan. These strategies include:

- development of regional/local coordinating councils
- sharing resources and support services through interagency agreements
- providing mobility management outreach, operational support, and training
- centralized resource directory
- improved traveler information
- a travel voucher program
- taxi rider subsidy
- eliminating environmental barriers
- a volunteer service structure
- job access strategies including late-night vanpools
- accessible taxi services
- a trip planner for riders
- real-time transit information
- use of ITS technologies to improve coordination
- co-sponsoring local transportation services
- broker transportation operations

The Coordinated Plan and the full report of the Wasatch Front Mobility Management Project are included in Appendix R. The Coordinated Plan was adopted by the Wasatch Regional Coordination Council for Community Transportation (RCC) on 8 September 2010.

Route Deviation Flex Routes

UTA's route deviation flex route service, called "The Lift," has been designed and implemented to help meet transportation service gaps in lower density areas. The system allows bus drivers, upon request, to deviate from the published route by up to ¾ mile, upon request, to provide curb-side pick-up or drop-off service. UTA currently operates The Lift in American Fork/Alpine, Brigham City, Draper, Grantsville, Herriman, Riverton, Sandy, Syracuse/Hooper, and Tooele City. The Lift is available to all UTA passengers and provides paratransit riders with an additional transportation option. Building on the successes of existing routes, UTA will continue to expand The Lift to help meet transportation service gaps.

Paratransit System

For eligible riders who have a transportation disability that prevents them from making some or all of their trips on UTA's fixed route buses and TRAX light rail services, the UTA offers a comparable, curb-to-curb paratransit service which in the Salt Lake Area is referred to as Flextrans. This service is compliant with provisions found in the American with Disabilities Act of 1990 (ADA) and is provided as part of UTA's efforts to meet the requirements of this Act.

Paratransit service must be reserved at least one day in advance. The service can be provided using either ramp-equipped minibuses, lift-equipped vans, a 15-passenger van or by a taxi service that has been scheduled through UTA's paratransit office. Paratransit service operates in the same areas and during the same days and hours as local all-day fixed route bus and TRAX light rail services. The service can be used for any trip purpose. All of UTA's existing vehicles and facilities are ADA accessible. All future vehicles and facilities will also be ADA accessible. UTA's paratransit system will expand in parallel with the transit system improvements defined by the 2040 RTP, creating broader coverage for persons with disabilities.

UNFUNDED PROJECTS

Recognizing that a financially constrained plan will not address all new capacity needs, SAFTEA-LU allows for illustrative or non-funded projects and facilities to be identified in regional transportation plan documents. These programmed highway and transit projects will be added to the funded list if

TABLE 7-5

2040 RTP Unfunded Highway Project List

ID	Project	Description		Phase
SALT LAKE COUNTY, EAST – WEST FACILITIES				
S-26	**6200 South** SR-111 to Mountain View Corridor	Widening: 4 to 6 lanes ROW: 2007 - 0 ft. / 2040 - 110 ft	MA / 0.3 miles / Local Bike Class: 1 and 2	Unfunded
S-33	**New Bingham Highway** 10200 South to 9000 South	Widening: 2 to 4 lanes ROW: 2007 - 66 ft. / 2040 - 110 ft	MA / 2.9 miles / UDOT Bike Class: None	Unfunded
S-44	**11400 South** Bangerter Highway to I-15	Widening : 4 to 6 lanes ROW: 2007 - 106 ft. / 2040 - 123 ft	MA / 4.7 miles / UDOT Bike Class: Priority 2	Unfunded
SALT LAKE COUNTY, NORTH – SOUTH FACILITIES				
S-60	**Mountain View Corridor** I-80 to SR-201	New Construction: 0 to 4 lanes ROW: 2007 – 0 ft / 2040 – 328 ft	PA / 3.3 miles / UDOT Bike Class: None	Unfunded
S-65	**Mountain View Corridor** I-80 to SR 201	Widening and interchanges: 4 to 6 lanes ROW: 2007 – 328 ft / 2040 – 328 ft	FWY / 3.3 miles / UDOT Bike Class: None	Unfunded
S-102	**600 West** Bangerter Highway to 14600 South	New Construction: 0 to 2 lanes ROW: 2007 – 0 ft / 2040 – 70 ft	COL / 1.4 miles / Local Bike Class: None	Unfunded
SALT LAKE COUNTY, SPOT FACILITIES				
S-129	**I-80 Interchange** @ 5600 West	Upgrade	FWY / UDOT Bike Class: Priority 2	Unfunded
S-132	**Bangerter Highway Interchange** @ California Avenue	New Construction	FWY / UDOT Bike Class: Priority 2	Unfunded
S-134	**Bangerter Highway Interchange** @ Lake Park Boulevard (2700 South)	New Construction	FWY / UDOT Bike Class: 1	Unfunded
S-135	**Bangerter Highway Interchange** @ 3100 South	New Construction: 4 to 6 lanes	FWY / UDOT Bike Class: 3	Unfunded
S-136	**Bangerter Highway Interchange** @ 3500 South	New Construction: 4 to 6 lanes	FWY / UDOT Bike Class: None	Unfunded
S-137	**Bangerter Highway Interchange** @ 4100 South	New Construction: 4 to 6 lanes	FWY / UDOT Bike Class: Priority 2	Unfunded
S-138	**Bangerter Highway Interchange** @ 4700 South	New Construction: 4 to 6 lanes	FWY / UDOT Bike Class: 3	Unfunded
S-139	**Bangerter Highway Interchange** @ 5400 South	New Construction: 4 to 6 lanes	FWY / UDOT Bike Class: Priority 3	Unfunded
S-153	**2700 West Overpass** @ SR-201	New Construction: 0 to 2 lanes	COL / Local Bike Class: Priority 2	Unfunded
S-159	**14600 South Rail Road Structure** @ D&RGW	Upgrade: 1 to 2 lanes	MA / UDOT Bike Class: Priority 2	Unfunded
S-162	**I-215 Interchange** @ 4500 South (East)	Upgrade	FWY / UDOT Bike Class: 2	Unfunded
DAVIS COUNTY, EAST – WEST FACILITIES				
D-5	**SR-193 Extension** 2000 West to I-15	Widening: 4 to 6 lanes ROW: 2007 – 0 ft / 2040 – 120 ft	MA / 3.4 miles / UDOT Bike Class: Priority 2	Unfunded
DAVIS COUNTY, NORTH – SOUTH FACILITIES				
D-27	**Fairfield Road Extension** I-84 to SR-193	New Construction: 0 to 2 lanes ROW: 2007 – 0 ft / 2040 – 66 ft	MA / 2.4 miles / Local Bike Class: 2 and None	Unfunded
DAVIS COUNTY, SPOT FACILITIES				
D-34	**1200 North Overpass (Layton)** @ I-15	New Construction: 0 to 4 lanes	COL / Local Bike Class: None	Unfunded
D-43	**I-215 Interchange** @ Legacy Parkway	Upgrade	FWY / UDOT Bike Class: Priority 1	Unfunded
D-44	**I-215 Interchange** @ I-15 / US-89	Upgrade	FWY / UDOT Bike Class: None	Unfunded

TABLE 7-5 CONTINUED

2040 RTP Unfunded Highway Project List

ID	Project	Description		Phase
WEBER COUNTY, EAST – WEST FACILITIES				
W-15	**4400 South** 1900 W. (SR-126) to Cozy Dale Dr. (1300 W.)	Operational	COL / 0.7 miles / Local Bike Class: Priority 3	Unfunded
WEBER COUNTY, SPOT FACILITIES				
W-40	**I-15 Interchange** @ US-89 (Pleasant View)	Upgrade	FWY / UDOT Bike Class: Priority 2	Unfunded

TABLE 7-6

2040 RTP Unfunded Transit Project List

	PROJECT		LOCATION	
Needed Mode	Funded Mode	Unfunded Mode	From	To
PLEASANT VIEW – BRIGHAM CITY COMMUTER RAIL				
Downtown Ogden - Box Elder County Line				
Mode Undetermined	Corridor Preservation	Commuter Rail	Pleasant View FrontRunner	Box Elder County Line
NORTH OGDEN – SALT LAKE CORRIDOR (SOUTH DAVIS)				
Centerville - Bountiful - Woods Cross – North Salt Lake - Salt Lake Central - Downtown Salt Lake City				
Rail/Bus Rapid Transit 3	Enhanced Bus	Streetcar	Parrish Lane/Main St	1500 S./Main St
Rail/Bus Rapid Transit 3	Bus Rapid Transit 3	Streetcar	1500 S./Main St	3800 S. Bountiful/US-89
Rail/Bus Rapid Transit 3	Bus Rapid Transit 3	Streetcar	US-89/Eagleridge Dr	Salt Lake County Line
Rail/Bus Rapid Transit 3	Bus Rapid Transit 3	Streetcar	Salt Lake County Line	Salt Lake Intermodal Ctr
SLC – FOOTHILL DRIVE – WASATCH DRIVE CORRIDOR				
Salt Lake Central - Salt Lake City - University of Utah - Medical Center - Research Park - Parley's Canyon - Interstate 215 - Cottonwood Corporate Center - Big Cottonwood Canyon - Little Cottonwood Canyon				
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Bus Rapid Transit 3	I-80/ I-215/Foothill Dr.	I-215 Ramp/3300 S.
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Bus Rapid Transit 3	I-215 Ramp/3900 S.	6200 S./I-215
1300 EAST (NORTH) BUS RAPID TRANSIT				
Medical Center - University of Utah - Sugar House - Millcreek - Holladay - Murray - Fort Union - Cottonwood Heights – Midvale - Fashion Place West TRAX Station				
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Bus Rapid Transit 3	1300 East/200 South	1300 East/Fort Union
STATE STREET BUS RAPID TRANSIT				
Salt Lake Central - Capitol - South Salt Lake - Millcreek - Murray FrontRunner Station - Midvale - Sandy/South Jordan FrontRunner Station - Draper FrontRunner Station				
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Bus Rapid Transit 3	200 S./State St	600 S./State
BANGERTER HIGHWAY CORRIDOR				
Downtown Salt Lake - Salt lake Central - Interstate 80 - Salt Lake International Airport - Lake Park - West Valley - Taylorsville - Jordan Landing - West Jordan - Mid-Jordan TRAX Station				
Bus Rapid Transit 3	None	Bus Rapid Transit 3	I-80/Bangerter Hwy	Bangerter Hwy/5400 S.
Enhanced Bus (BRT 1)	None	Enhanced Bus (BRT 1)	Bangerter Hwy/5400 S.	Mid-Jordan TRAX Line

TABLE 7-6 CONTINUED

2040 RTP Unfunded Transit Project List

Needed Mode	PROJECT Funded Mode	Unfunded Mode	LOCATION From	To
5600 WEST CORRIDOR				
Downtown Salt Lake – Salt Lake Central – Interstate 80 – Airport East Hub – International Center – West Valley – Kearns – West Jordan – Daybreak Station				
Rail/Bus Rapid Transit 3	Bus Rapid Transit 3	Light-rail	Salt Lake International Airport	11800 South
NORTHWEST QUADRANT CORRIDOR				
Downtown Salt Lake - Salt Lake Central - Interstate 80 - Airport East Hub - International Center - N.W. Quadrant				
Rail/Bus Rapid Transit 3	None	Bus Rapid Transit 3	5600 W./Amelia Earhart	N.W. Quadrant
DOWNTOWN SALT LAKE CITY BRANDED BUS				
200 West, 400 South, 500 South				
Enhanced Bus (BRT 1)	None	Enhanced Bus (BRT 1)	Various Locations	Various Locations
SOUTHWEST DOWNTOWN SLC STREETCAR (GRANARY LINE)				
Granary District - Salt Lake Central				
Streetcar	None	Streetcar	800 S./400 W.	Salt Lake Central
BIG COTTONWOOD CANYON CORRIDOR				
Mouth of Big Cottonwood Canyon				
LITTLE COTTONWOOD CANYON CORRIDOR				
Mouth of Little Cottonwood Canyon – Alta				
Undetermined	None	Bus Rapid Transit 3	Mouth of Canyon	Governors Bypass Rd
WEST BENCH CORRIDOR PRESERVATION (NORTH OF 11400 SOUTH)				
East Airport Transit Hub – Northwest Quadrant - Little Valley – Daybreak				
Corridor Preservation	None	Corridor Preservation	11400 S./Daybreak	Airport East Transit Hub
12300 / 12600 SOUTH BUS RAPID TRANSIT				
Draper TRAX Station - Draper FrontRunner Station - Riverton - Herriman - Daybreak TRAX Station				
Bus Rapid Transit 3	Enhanced Bus (BRT 1)	Bus Rapid Transit 3	Pony Express Rd	700 East

viable funding sources can be identified. Illustrative highway and transit projects for the 2040 RTP are shown in Tables 7-5 and 7-6, and on Maps 7-2 and 7-8 respectively.

It should be noted that there are two ways that a transit project can be unfunded: the mode can be unfunded and the project can be unfunded. If the mode is unfunded then the project alignment continues to be funded for a future type of major transit investment but at a level less than is warranted. An example of this is the proposed 12300/12600 South project. A Bus Rapid Transit (BRT3) is desired for the line segment between Pony Express Road and 700 East. However, insufficient funding was found to build a Bus Rapid Transit (BRT3) line. Instead, an Enhanced Bus (BRT 1) line was funded in the plan. If the project is unfunded, then no major transit investment is anticipated for that area.

TRANSIT COST ESTIMATES

In addition to highway and transit system improvements, the 2040 RTP also encourages the further development of other transportation modes for moving people throughout the Wasatch Front Region. Other transportation modes, such as bicycle and pedestrian travel, are an integral part of the 2040 RTP recommendations. The seamless interfacing of other modes with highway and transit services will be a key element of the future transportation system.

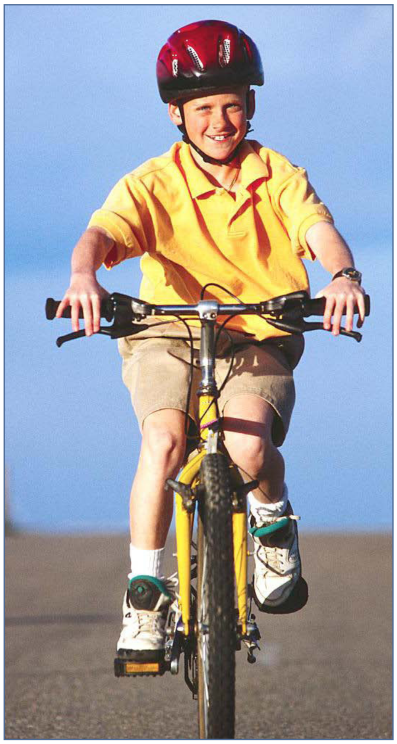
Residents are more likely to walk in areas with sidewalks. Unfortunately, much work has yet to be done to equip streets with adequate facilities for pedestrians, bicyclists, or transit users. The WFRC is working to create a continuous network of sidewalks that are wide enough for pedestrians to share with bikes, to accommodate transit users or their way to stations or stops, and that are accessible to those in wheelchairs. Also of concern are streets that are too wide to be safely crossed.

These "alternative modes" of transportation have the potential to yield large congestion and air quality benefits. Given that much of the mobile source pollution we experience comes from the first few minutes of vehicular travel when catalytic converters are not fully functioning, it follows that shifting short trips to walking and biking could significantly improve air quality.

Although specific design decisions about the cross section of streets and highways are made during project development, broad decisions such as right-of-way width, functional classification, and the desirability of bikeways and transit lanes can be made early in the planning process. Deciding which of the elements to include and selecting the appropriate dimensions within these ranges should reflect the needs of the Region and be in line with relevant federal guidelines. The most appropriate design of a public right-of-way balances the mobility needs of the people using the facility (motorists, pedestrians, bicyclists, or transit) with the physical constraints of the corridor within which the facility is located.

Highways should operate as truly multimodal transportation facilities, particularly in large urban areas. Accommodating public transit and other high-occupancy vehicles (HOVs) is an important consideration. Management of the local public transit operator should be consulted during the planning stage, if possible, so that public transportation can be accommodated by the design from the beginning.

The 2040 Regional Bicycle Plan was developed cooperatively for each County (Weber, Davis, and Salt Lake) by city and county planners, engineers, parks and recreation departments, planning commissions, and local bicycle advisory committees and groups. The Regional Bicycle Plan incorporates many individual community plans and identifies facilities for bicycle travel within street rights-of-way (ROW). It also acknowledges separate paths or trails that will need to be considered when designs for street and other improvements are constructed. Bicycle facilities are primarily local in nature. However, the WFRC coordinates between communities to ensure continuity and where other Regional needs exist. The 2040 Regional Bicycle Plan identifies an integrated regional network of bicycle routes from Herriman City in southern Salt Lake County to Pleasant View City in northern Weber County.



Many existing and new collector and arterial streets have been identified as bicycle routes where highway "shoulders" are, or are planned to be, wide enough to accommodate bicycle travel. The routes in the Plan are intended to serve major activity centers, such as Salt Lake City's Central Business District, the University of Utah, Weber State University, the Salt Lake Community College's several campuses, major employment centers, transit stations, and, on a more local level, numerous public schools. Legally defined as vehicles, bicycles are allowed on all streets except where specifically prohibited, such as urban interstate highways and some high speed principal arterials (Bangerter Highway). Therefore, all streets, other than those types described above, should be designed to accommodate the bicycle mode of travel where possible. Also, the Regional Bicycle Plan identifies other bicycle trails or paths that have their own ROW.

The 2040 Regional Bicycle Plan identifies several specific facility improvements. Class I bicycle facilities provide for bicycle travel on a ROW completely separated from the travel lanes and shoulders of any street or highway. Class I facilities may be paved or unpaved, could have steep grades, and can be shared with pedestrians. Class II bicycle facilities provide a striped and signed lane for one-way bike travel on a street, usually one with a wider shoulder to accommodate the bicycle lane. Finally, Class III bicycle facilities provide a "sign only" for designated bicycle travel on a roadway shared with motor vehicles. It is recommended that the AASHTO Guide for the Development of Bicycle Facilities, 1999, be referenced when designing a bicycle path or trail. An updated AASHTO Guide for the Development of Bicycle Facilities should be available in 2011. A draft version is available for review. The 2040 Regional Bicycle Plan is shown as Map 7-9.

The Regional Bicycle / Trails Planning Committee, made up of representatives from the Utah Department of Transportation (UDOT), the Utah Transit Authority (UTA), the Mountainland Association of Governments (MAG), Salt Lake County, Davis County, Weber County, and the Wasatch Front Regional Council (WFRC), developed criteria to prioritize routes. The first criterion calls for coordinating bicycle routes to fixed guideway transit stations. The second criterion call for spacing routes between two and three miles. The third criterion involves identifying routes that spanned the Counties both in an east / west and north / south direction. Each County planning group identified priority routes in conjunction with their respective bicycle and trails committees and in coordination with UDOT, UTA, and the WFRC staff. The 2040 RTP includes both a bicycle master plan and a priority routes plan which is shown as Map 7-9. The WFRC recognizes that the 2040 RTP will be revisited in four years, although updates may take place sooner. The WFRC recommends that interest individuals refer to the County websites for updates to these master plans and priority routes maps. The updated Salt Lake County map can be found at www.slco.org, an updated Davis County map can be found at www.daviscountyutah.gov, and an updated Weber County map can be found at www.co.weber.ut.us.

As with bicycle facilities, pedestrian facilities, primarily sidewalks, are also local in nature. Pedestrians should be accommodated by providing sidewalks on all local, collector and arterial streets. Where neighborhood pedestrian travel patterns have been or could be disrupted by busy arterial streets, expressways, and freeways, grade separated pedestrian walkways and/or other facilities should be considered. Pedestrian facilities should be designed with safety in mind, especially for facilities that are heavily used by both pedestrian and vehicular traffic.

Program Policies

As the result of previous bicycle planning efforts, policies were recommended to help with establishing priorities. These policies provide a basis for describing the role of bicycle facilities and trails in the 2040 RTP. As part of the 2040 RTP, these policies were recently reviewed to determine their relevance, considering current and projected needs and conditions. The bicycle and trails policies are as follows:

- Bicycle paths and pedestrian facilities will be included in the Transportation Plan;
- Regional planning should focus on a continuous regional system of trails, bikeways or paths, bicycle routes and lanes;
- Wherever possible, projects must be consistent with local trails plans, general plans, and AASHTO design guidelines, whenever possible. Planning and project funding should recognize as a primary goal safety for pedestrians, bicyclists, and motorists;
- Projects will be prioritized and implementation phased over the period of the 2040 RTP based on need, safety, funding, and other considerations. Projects will be coordinated with local governments, the WFRC, UTA, and UDOT;
- Major activity centers, such as shopping centers, office and industrial employment centers, transportation centers, parks, community centers and libraries, and schools and universities, should be accessible to bicyclists and pedestrian from surrounding residential areas;
- Sidewalks providing pedestrian access to transit vehicles should be available along all transit routes within the urbanized area;
- Barrier crossings (rivers, railroads, expressways, freeways, etc.) within urbanized areas should have provisions for both bicycle lanes and pedestrian sidewalks;
- Priority consideration within the “congested corridors” should be given to implementing bicycle and pedestrian projects and programs that most clearly increase the potential benefits from these facilities and activities and that combine well with related congestion management strategies;
- Priority consideration for bicycle and pedestrian facilities should also be directed to areas of the Wasatch Front Region experiencing the early stages of urbanization in order to ensure that adequate provisions for non-motorized travel are incorporated in the transportation system as facilities are constructed or upgraded;
- The public should become better informed of the

beneficial effects and personal well-being resulting from non-motorized travel;

- Provisions for bicycle and pedestrian travel will be incorporated into congestion management programs where feasible and appropriate; and
- The reasons and concerns members of the public expressed for lack of interest in using non-motorized modes, such as safety, traffic, barriers, lack of facilities, and other concerns, should be addressed in order to encourage higher usage of these modes.

Specific pedestrian facilities were not identified as part of the 2040 RTP. However, general pedestrian friendly land use and development policy recommendations for pedestrian facilities and amenities are being proposed as a guide for local governments within the Wasatch Front Region to consider as transportation facilities are planned and implemented. These policy recommendations are oriented towards local government officials who control the regulation of land use and development for their communities. Local governments are encouraged to follow pedestrian friendly urban design, site planning and subdivision design principles in evaluating new development proposals, and to incorporate pedestrian facilities in existing developments wherever practicable. Neighborhood pedestrian access can be enhanced by creating trails, connecting cul-de-sacs with walkways, and providing other pedestrian facilities.

Statewide and Pedestrian Bicycle Plan

In February of 2001, UDOT adopted the Statewide Pedestrian and Bicycle Plan, as an element of the Statewide Long Range Transportation Plan. This plan was prepared in compliance with the federal guidelines of TEA-21 enacted in 1998, and subsequently supported by SAFETEA-LU in 2005. The latter Act requires state transportation agencies to develop transportation plans and programs which will provide for the development of transportation facilities, including pedestrian and bicycle facilities, for all areas of Utah. The purpose of the Statewide Plan is to "provide a framework to guide UDOT and other public agencies in developing opportunities for walking and bicycling as clean, safe, convenient, cost-effective, and efficient modes of transportation."

Recommendation

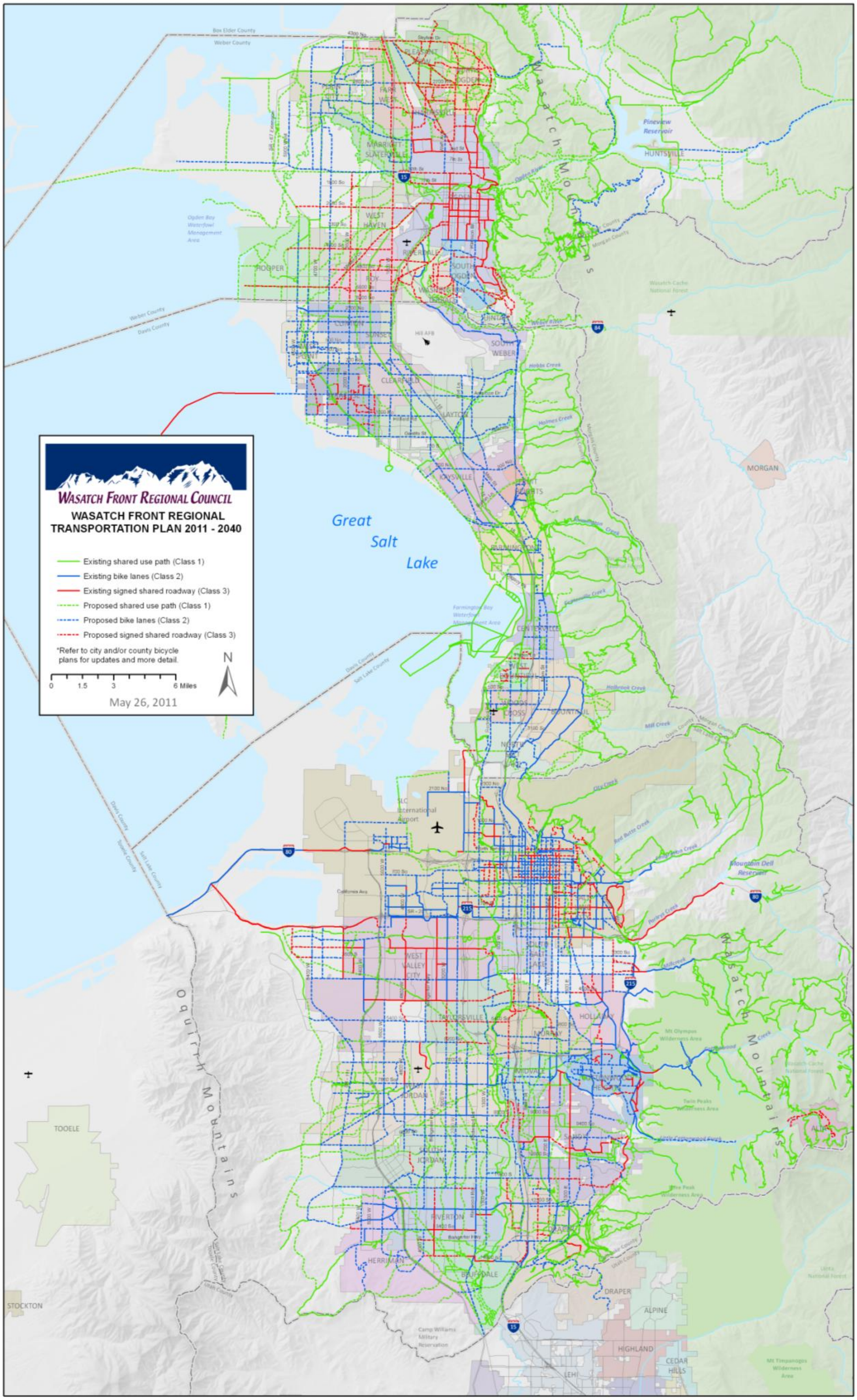
The Statewide Pedestrian and Bicycle Plan includes recommendations regarding assessment of needs, project planning and implementation. The recommendations are as follows:

- Pedestrian Inventory - UDOT should compile and maintain a comprehensive inventory to assess pedestrian planning needs. "The inventory should include existing facilities, areas with sidewalk discontinuity, and areas needing new sidewalks, rehabilitation or replacement of existing sidewalks, or retrofitting for greater accessibility;"
- Bicycle Inventory - A highway bicycling suitability characteristics map has been developed for touring cyclists who use rural highways. The map serves as the beginning point for a detailed inventory of needed improvements for safe bicycling on Utah highways." Bicycle facility needs, or deficiencies of various kinds, are the focus of the inventory. The recommendation to inventory bicycling conditions resulted in development of a Bicycle Suitability Map that identifies shoulder width on state routes, rest areas statewide, and provides links to other travel and traffic data maps. A restrictions map was also developed that identifies the locations on urban interstate highways and principal arterials, such as the Bangerter Highway, where bicyclists and pedestrians are prohibited; and

Funding - Adequate funding is a key factor for successful implementation of pedestrian and bicycle projects. Traditionally, pedestrian and bicycle improvements have been required to compete with other projects that may have a higher priority. In many instances, whenever there is a widening, reconstruction, or some other street improvement, provisions for pedestrian and bicycle facilities are considered and funded as a part of the street improvement. In other instances, the project may only be a pedestrian and/or a bicycle facility. All federal funding programs created under SAFETEA-LU include pedestrian and bicycle facilities as eligible activities. Also, the Utah State Legislature appropriates funds for pedestrian and bicycle facilities through the Centennial Non-motorized Paths and Trail Crossings Program and the Safe Sidewalk Program.

UDOT Policy Issues for Design, Construction, Maintenance, and Operations: During the development of the Statewide Pedestrian and Bicycle Plan, a number of issues were identified to serve as the basis

Map 7-9, 2040 RTP REGIONAL BICYCLE PLAN



> for further discussions relative to policy development within UDOT. These policy issues are currently being evaluated for possible adoption as policies by UDOT, or for use in developing standard procedures for planning, identification of facility needs, project concept development, environmental review, design, construction, and maintenance of state transportation facilities. These policies are intended to provide "guidance for ensuring the development of a viable pedestrian and bicycle transportation system."

The Statewide Pedestrian and Bicycle Plan provides some guidance relative to projects in which local governments and UDOT have a mutual interest, as noted in the statement below:

> Projects should consider potential impacts to pedestrian and bicycle connections shown in approved local and regional master plans and evaluate reasonable accommodations that can be incorporated into the project, where the master plan has:
>
> - considered options and feasibility;
> - included consultation with UDOT in the planning process; and
> - demonstrated a financial commitment to construct local walkways and bikeways connecting the requested project.
>
> Requested accommodations beyond the reasonable scope of a state transportation project may be incorporated with funding participation by the local agency.

The Statewide Pedestrian and Bicycle Plan provides specific design, construction, maintenance, and operations guidance relative to the following categories: (A) Walkways, (B) Bikeways, (C) Combined Pedestrian/Bicycle Shared Use Paths, (D) Multi-use Trails and Equestrian Use of Trails and Shared Use Paths, (E) Designation of Bikeways and Bicycle Suitability Evaluation, (F) Bicycle and Pedestrian Travel on Interstate Freeways and other Controlled-Access Highways, (G) Railroad Crossings, (H) Construction Zones, (I) Destination Facilities and Support Services, (J) Snow Removal, and (K) In-line Skaters.

TRANSPORTATION SYSTEM IMPROVEMENTS

Transportation System Management and Transportation Demand Management

The Congestion Management Process involves an evaluation of Transportation System Management and Transportation Demand Management strategies as potential mitigation to congestion instead of increasing highway capacity. Corridors have been identified where TSM and TDM strategies can delay the need for new capacity. Where these strategies cannot meet the travel demand, new capacity recommendations are made (page 160). TSM and TDM strategies are also recommended for incorporation into new capacity projects in order to maximize the effectiveness of the new capacity as well as to minimize the need for even more highways.

A comparison of level of service with and without implementing TSM and TDM strategies have been made in the travel demand model to identify any roadways where these strategies could be applied to delay the need for new highway capacity. These facilities are listed in Table 7-7. The objective was to improve LOS from "E" or "F" to "D" or better by applying TSM and TDM. Instances where this could be accomplished were limited. Rather than successive links in a corridor showing improvement, TSM and TDM benefits as measured by the model tend to be in isolated segments. This is not to suggest TSM and TDM should be ignored. On the contrary, there are real benefits to be gained and the costs in most cases are marginal, but there is a need to be realistic with expectations about the resulting improvements in transportation system performance. Rapid growth along the Wasatch Front makes it difficult for highway capacity to keep up with demand by pursuing TSM and TDM alone.

The modeling only included those TSM and TDM strategies that are readily quantifiable. The modeled TSM strategies include signal coordination, ramp metering, incident management, the use of other intelligent transportation systems, and access management. Strategies that were not modeled are traditional intersection and interchange improvements, as well as more innovative approaches, such as single point urban interchanges and continuous flow intersections. Application of all of these strategies is recommended where appropriate system-wide. For the new

capacity projects in the RTP, TSM strategies are provided in writing during concept development as specific project improvements.

Modeled TDM strategies include ridesharing, vanpools, public transit service in its various modes; plus flextime, telecommuting, and growth management. Other TDM strategies recommended for use throughout the Region include park-and-ride facilities, HOV lanes, car sharing, and adding pedestrian and bicycle facilities. Much of the new capacity identified in the RTP is needed to address peak period demand. At other times this additional capacity is underused. Managing peak period demand can be a cost effective solution to address the imbalanced use of the transportation system.

Intelligent Transportation Systems

As discussed briefly on page 69, valuable tools to preserve capacity of highway and transit facilities involve the usage of intelligent transportation systems (ITS). These tools include technologies such as ramp metering, incident management, signal coordination, automated transit vehicle location, and passenger counting. As demand for transportation facilities continues to outpace the ability to provide them, it becomes more and more critical to implement ITS strategies. Additionally, in order to responsibly operate facilities that are constructed and maximize their usefulness, it is essential to plan for ITS. This section will review benefits of current ITS technologies, discuss potential future technology, and provide recommendations for implementing ITS strategies.

As indicated in Table 7-8, significant savings have been achieved by implementation of CommuterLink, Utah's major example of ITS. The delay reduction benefits value the time saved conservatively at about $12 per hour. The accident reduction benefits are based on Federal Highway Administration estimates. Incident Management Teams (IMT) in the Salt Lake and Ogden-Layton Urbanized Areas are able to reduce incident blockages by 15 to 35 minutes, with time savings generally increasing with the severity of the accident. Dynamic Message Signs (DMS) help alert drivers to traffic accidents as well as construction and inclement weather conditions. Traffic lights at freeway on-ramps improve the traffic flow on the freeways during peak periods.

While continuous green traffic lights are not possible, significant delay reduction results from coordinating and updating signal timings. Closed-circuit television cameras are also part of CommuterLink and support each of the other ITS components by facilitating real-time responses to changing conditions. In addition to the delay and safety benefits, annual savings in fuel consumption, vehicle stops, and pollutant emissions total about $35 million. The overall benefit to cost ratio is over 17:1, which translates to a very cost-effective investment.

The benefits cited above are from the ITS system in Salt Lake County. Proportional benefits are already accruing in Davis, Utah, and Weber Counties where ITS has more recently been deployed and the system is not as mature. In all of these counties, local government, UTA, and UDOT have worked cooperatively so that CommuterLink is a seamless, integrated statewide system. The systems described above benefit not only private vehicles but also bus riders. There are also intelligent transportation systems that even more directly benefit transit system users. Automated Vehicle Location (AVL), smart card systems, and other communications improvements are among ITS applications designed specifically for the transit system. Studies have demonstrated 10 to 90 percent improvements in on-time schedule performance resulting from implementing AVL. Significant decreases in fare evasion and revenue

TABLE 7-7
TSM and TDM Strategy Recommendations to Delay New Capacity Additions

RECOMMENDED TSM PROJECTS			
Route	From	To	Improvement
SALT LAKE AREA			
2100 South	I-15	1300 East	Operational
3300 South / 3500 South	I-215 (West)	Highland Drive	Operational
5400 South	5600 West	Bangerter Highway	Operational
5400 South	Redwood Road	I-15	Operational
Fort Union Boulevard	Union Park Boulevard	3000 East	Operational
10600 South / 10400 South	Bangerter Highway	I-15	Operational
5600 West	2700 South	6200 South	Operational
5600 West	6200 South	New Bingham Highway	Operational
Redwood Road	SR-201	4700 South	Operational
Redwood Road	9000 South	11400 South	Operational
State Street	600 South	I-215	Operational
State Street	I-215	12300 South	Operational
900 East	3300 South	4500 South	Operational
Union Park Boulevard / 1300 East	Fort Union Boulevard	7800 South	Operational
Highland Drive	Murray Holladay Boulevard	Van Winkle Expressway	Operational
500 South / Foothill Drive	1300 East	2300 East	Operational
OGDEN – LAYTON AREA			
SR-193	I-15	US-89	Operational
2600 South / 1100 North	Redwood Road	I-15	Operational
Center Street	Redwood Road	US-89	Operational
20th Street	Wall Avenue	Harrison Boulevard	Operational
21st Street	Wall Avenue	Adams Avenue	Operational
3500 West	1200 South	Midland Drive	Operational
600 West	Elberta Drive	2600 North	Operational
Harrison Boulevard	2600 North	12th Street	Operational
Harrison Boulevard	12th Street	Country Hills Drive	Operational

TABLE 7-8
ITS "Commuter Link" Cost Saving Benefits

COMMUTER LINK COMPONENT	ANNUAL DELAY BENEFIT	ANNUAL SAFETY BENEFIT	ANNUAL ENVIRONMENTAL BENEFIT
Incident Management Team	$7,400,000	$700,000	$0
Dynamic Message Signs	$2,900,000	$0	$0
Ramp Metering	$5,800,000	$3,300,000	$0
Signal Coordination	$100,000,000	$23,300,000	$0
Sub Total	$116,100,000	$27,300,000	$35,000,000
TOTAL		**$178,400,000**	
Source: UDOT; values are approximate			

increases results from the use of smart card systems. These and other transit ITS improvements lead to increases in ridership by making transit more efficient and convenient.

Another benefit not quantified above is the ability of ITS to provide travel information via means other than dynamic message signs. For example, even before leaving for a trip, a traveler can learn about congestion levels, transit travel times, road conditions, or construction activity through the CommuterLink website, via cell phone alerts, or by calling 511. Individual travel times can thus be reduced by obtaining travel information through these various technologies.

Turning attention to technologies becoming available for broader implementation in the near future, the federal government is expected to decide in the next few years whether to make a commitment to support "Vehicle Infrastructure Integration" (VII). This public-private initiative would provide roadside and in-vehicle technology to enable drivers to receive route guidance needed to avoid congestion. In addition, their vehicles would be equipped with crash avoidance systems. Some of these technologies are currently available on a limited basis. Within a decade or so, wide spread use of these technologies could render some existing ITS technologies, such as dynamic message signs, obsolete.

Given that intelligent transportation systems are very cost-effective and essential to reducing both recurring and non-recurring congestion, thus making both transit and highway systems more reliable, it is recommended that more funding be provided to achieve the following objectives:

- Upgrade equipment and increase numbers of trained personnel to sustain and improve maintenance and operation of ITS along the Wasatch Front;
- Include the potential for Vehicle Infrastructure Integration in ITS project plans and designs;
- Continue steady, sustainable expansion of ITS, such as;
    - Connecting more signals and CCTVs to CommuterLink
    - Equipping more buses and trains with AVL
    - Improving accessibility of real-time and historical travel information, and
    - Increasing freeway management abilities in proportion to traffic growth.

Enhancements

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Efficiency Act for the 21st Century (TEA-21) both included a requirement that 10 percent of federal surface Transportation Program funding be dedicated to Transportation Enhancements (TE) activities. This program continued with enactment of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005. This legislation stresses mobility and protection of the environment, community preservation, sustainability and livability.

Enhancement projects provide opportunities to improve the transportation experience throughout local communities. Transportation Enhancement projects and activities are a means of creatively and sensitively integrating surface transportation facilities into the communities. Projects may provide a means of further protecting the environment as well as a more aesthetic, pleasant and improved interface between the community transportation system and residents located adjacent to transportation facilities.

Federal Transportation Enhancement funds are to be used for transportation-related capital improvement projects that enhance the quality of life, in or around transportation facilities. Projects must be over and above required mitigation of normal transportation projects, and the project must be directly related to the transportation system. The projects should have a quality-of-life benefit while providing the greatest benefit to the greatest number of people. Projects must accomplish one or more of the following.

- **Provision of facilities for pedestrians and bicycles**
  New or reconstructed sidewalks, walkways, or curb ramps; wide paved shoulders for non-motorized use, bike lane striping, bike parking, and bus racks; construction or major rehabilitation of off-road shared use paths (non-motorized transportation trails); trailside and trailhead facilities for shared use paths; and bridges or underpasses for pedestrian, bicyclists or other trail users.

- **Provision of safety and educational activities for pedestrians and bicyclists**
  Educational activities to encourage safe walking and bicycling.

- **Acquisition of scenic easements and scenic or historic sites**
  Acquisition of scenic land easements, vistas, and landscapes; acquisition of buildings in historic districts or historic properties, including historic battlefields.

- **Scenic or historic highway programs (including tourist and welcome center facilities)**
  For projects related to scenic or historic highway programs: Construction of turnouts, overlooks, and viewing areas; construction of visitor and welcome centers; designation signs and markers.

- **Landscaping and other scenic beautification**
  Landscaping, street furniture, lighting, public art, and gateways along highways, streets, historic highways, trails, and waterfronts.

- **Historic preservation**
  Preservation of buildings in historic districts; restoration and reuse of historic buildings for transportation-related purposes.

- **Rehabilitation and operation of historic transportation buildings, structures, or facilities**
  Restoration of historic railroad depots, bus stations, ferry terminals and piers, and lighthouses; rehabilitation of rail trestles, tunnels, and bridges; restoration of historic canals, canal towpaths, and historic canal bridges.

- **Preservation of abandoned railway corridors**
  Acquiring railroad rights-of-way; planning, designing, and constructing multiuse trails; developing rail-with-trail projects (including the conversion and use of the corridor for pedestrian or bicycle trails).

- **Inventory, control, and removal of outdoor advertising**
  Billboard inventories and removal of illegal and nonconforming billboards. Inventory control may include, but not be limited to, data collection, acquisition and maintenance of digital aerial photography, video scan imaging, logging of data, developing and maintaining an inventory and control database, and hiring of outside legal counsel.

- **Archaeological planning and research**
  Research, preservation planning, and interpretation of archaeological artifacts; curation for artifacts related to surface transportation and artifacts recovered from locations within or along surface transportation corridors.

- **Environmental mitigation**
  Address water pollution due to highway runoff; or reduce vehicle-caused wildlife mortality while maintaining habitat connectivity. For existing highway runoff: soil erosion controls, detention and sediment basins, and river clean-ups. Wildlife underpasses or other measures to reduce vehicle caused wildlife mortality and/or to maintain wildlife habitat connectivity.

- **Establishment of transportation museums**
  Construction of new transportation museums; additions to existing museums for a transportation section; conversion of railroad stations or historic properties to museums with transportation themes.

Approximately $2.5 million in federal funds will be available annually for locally sponsored projects to enhance Utah's transportation system. The Transportation Enhancements Program is a reimbursement program and the actual dollar amount will be dependent upon congressional and state appropriations. UDOT collects and administers all funds.

The Wasatch Front Regional Council has indicated its strong interest in including transportation enhancements as part of the 2040 RTP by serving on the Enhancement Advisory Committee (EAC) and by encouraging eligible agencies or organizations to actively pursue federal transportation enhancement funding. The WFRC will continue to encourage diverse modes of travel, increase awareness of community benefits that can be obtained through transportation investment, strengthen partnership between state and local governments, and promote citizen involvement in transportation decisions. The WFRC recommends that enhancement funding be primarily used for bike and pedestrian facilities, and landscaping around transportation related projects.

Pavement Management

The existing street and highway system is a critical asset to the communities of the Wasatch Front Region and must be maintained in a serviceable condition. Failure to do so results in significant additional private vehicle maintenance costs to the traveling public and can compromise safety. A pavement management system is defined as a set of tools or methods that assist decision makers in finding cost effective strategies for maintaining the state roadway system in serviceable condition. The detailed structure of a pavement management system is separated into two levels: (1) system or network; (2) and project levels.

Network level management (administrative) decisions affect the programs for the entire roadway system. The management system considers the needs of the network as a whole and provides information for a Region-wide program of new construction, maintenance, and rehabilitation. The goal of the network level is to optimize the use of funds over the entire system. The managers at this level compare the benefits and costs for several alternative programs and then identify the program/budget that will have the greatest benefit/cost ratio over the analysis period. Project level pavement management makes technical decisions for specific projects. At this level, detailed consideration is given to alternative design, construction, maintenance and rehabilitation activities for specific projects. This is accomplished by comparing benefit / cost ratios of several design alternatives, and selecting the alternative that provides the desired benefits for the least total cost over the projected life of the project. Since system level analysis provides targets for maintenance, rehabilitation, reconstruction treatments, and costs, it is necessary for the project level management system to provide additional information before designs are finalized.

Pavement maintenance is a planned program of treating pavement to maximize its overall useful life. A renewed emphasis on pavement preservation calls for privates industries and federal, state and local agencies to work together to provide highway users with an increased level of quality and cost-effectiveness. Pavement preservation takes the maintenance process one step further by carefully prioritizing and coordination maintenance activities to extend the life of a pavement. It includes preventive maintenance, corrective maintenance, and both minor and major rehabilitation. Figure 7-5 shows the relationship between the costs and benefits of a pavement preservation program. Figure 7-6 demonstrates the strategies of a pavement preservation program and the relationship between the serviceability over time of a section of pavement utilizing a preservation program.

All pavements require some form of maintenance due to the effects of traffic and the environment on the exposed materials. Applying a surface treatment to a pavement under light to moderate distress can greatly increase the life of that pavement. Active pavement preservation program benefits will include the following benefits

- The extension of the life of the pavement;
- Lower costs over time - Studies have shown that for every additional dollar spent on preventive maintenance treatments, up to $4, $6, or even $10 may be saved, if more drastic rehabilitation is required at a later date due to delays;
- More predictable costs - If regular treatments are scheduled and pavements maintained, planners will be better able to predict and budget future expenditures;
- Better utilization of resources - Planning and regularly scheduling treatments allows better use of resources, including the efficient scheduling of contractors and equipment;
- Fewer premature pavement failures - Many premature pavement failures are caused by pavement damage that goes untreated, such as water seeping into open cracks;
- Better pavement conditions – Regularly scheduled monitoring and pavement treatments keep pavements in better overall condition than random or insufficient maintenance; and
- Reduced user delays and user costs - The more extensive damage a pavement has been subjected to, the longer drivers will be delayed due to repair or reconstruction. Pavements that are in good condition reduce daily “wear and tear” on vehicles.

The Wasatch Front Regional Council, in cooperation with the Utah Department of Transportation and its member local governments, have estimated funding amounts to maintain the existing pavement system. The WFRC will continue to work with UDOT and local agencies to identify a process to obtain the most accurate information (pavement, safety/ crash, access, etc.) available to make the best use of the limited amount of

FIGURE 7-5

Pavement Preservation Program Cost Benefit

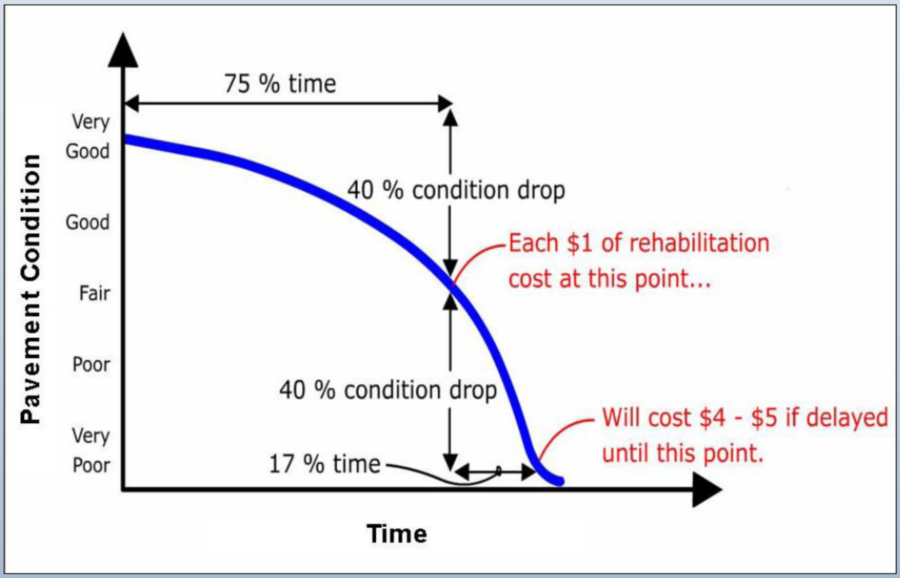
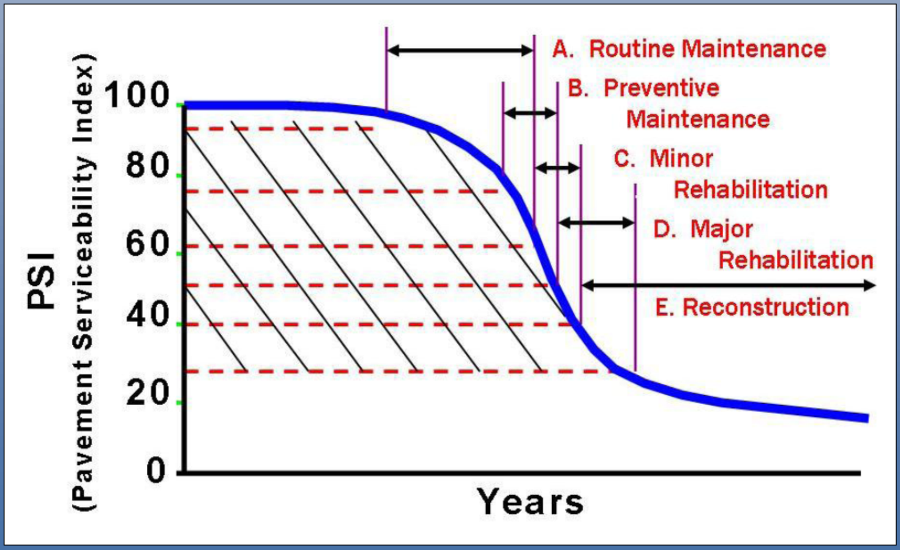


FIGURE 7-6

Pavement Serviceability Index



available funding. The pavement data will be used by the WFRC to identify and evaluate projects for urban Surface Transportation Program (STP) funding. The next step will be to determine what data is available and the type of future data that collection is necessary as to ensure a useful process.

Access Management

Roads serve two primary purposes. The first is to provide mobility. The second is to provide access. Mobility is defined as the efficient movement of people and goods. Access is moving people and goods to specific properties. Access management is a comprehensive approach to the regulation of driveways, medians, median openings, traffic signals, and freeway interchanges. The goal of access management is to limit and separate traffic conflict points. By reducing conflict, managers can increase the levels of safety and traffic operations.

With fewer new arterial roadways being constructed, the need for effective systems management strategies is greater than ever before. Improving access management is particularly attractive to planners as it offers a variety of benefits to a broad range of stakeholders. By managing roadway access, government agencies can increase public safety, extend the life of major roadways, reduce traffic congestion, support alternative transportation modes, and even improve the appearance and quality of the urban environment. Without adequate access management, the function and character of major roadway corridors can deteriorate rapidly. Failure to manage access is associated with the following adverse social, economic, and environmental impacts.

- An increase in vehicular crashes
- More collisions involving pedestrians and cyclists
- Accelerated reduction in roadway efficiency
- Unsightly commercial strip development
- Degradation of scenic landscapes
- More "cut-through" traffic in residential areas, due to overburdened arterials
- Homes and businesses adversely impacted by a continuous cycle of widening roads
- Increased commute times, fuel consumption, and vehicular emissions as numerous driveways and traffic signals intensify congestion and delays along major roads

Not only are these adverse impacts costly for government agencies and the public, but they also negatively impact businesses located in corridors with poor access management. Closely spaced and poorly designed driveways make it more difficult for customers to safely enter and exit businesses. Access to corner businesses may be blocked by queuing traffic. Customers begin to patronize businesses with safer, more convenient access and avoid businesses in areas with poor access design. Gradually the older developed areas begin to deteriorate, in part due to access and aesthetic problems, and investment moves to newer and better managed corridors.

After access problems have been created, they are difficult to solve. Reconstructing an arterial roadway is costly and disruptive to the public and abutting homes and businesses. Shallow property depth, multiple owners, and rights-of-way limitations common to older corridors generally preclude effective redesign of access and site circulation. In some cases, new arterial or bypass roads must be constructed to replace functionally obsolescent roadways and the process begins again in a new location. Better access management can help stop this cycle of functional obsolescence, thereby protecting both public and private investment in major roadway corridors.

REGIONAL FREIGHT MOVEMENT

The efficient movement of freight is a critical component of a healthy economy and a key indicator of a well-planned transportation system. As a crossroads area for several modes of transportation, the Wasatch Front Region plays a major role in the movement of freight across the United States. Each year, approximately 96.4 million tons of freight valued at $42.3 billion is shipped from Utah via all modes of freight transportation. Conversely, a total of 87.7 million tons of freight arrives in Utah annually with a value of $54.4 billion. This makes for a yearly total of 184.1 billion tons of freight shipped to and from Utah valued at $96.7 billion. Trucks account for almost 70 percent of the Region's freight tonnage, with railroads hauling approximately 25 percent. Pipelines move about 4 percent of the remainder. Air cargo, including parcel and courier service, accounts for less than one percent of the total freight volume moved to and from Utah. Map 7-10 shows the location of major freight terminals and railroad lines in the Wasatch Front Region.

Trucking

The trucking industry is the dominant mover of regional freight. This dominance is the result of the State's highway system, the CANAMEX Corridor, and the many freight distribution centers found at the crossroads of three Interstate highways in the northern Wasatch Front Region. Truck transportation works in conjunction with railroads, pipelines and air freight to provide efficient multi-modal transportation to Utah shippers. The Wasatch Front region is impacted by the following conditions.

- 100 percent of air cargo shipments to and from the Salt Lake City International Airport enter and leave the airport by truck. Trucking gives high-speed air cargo and next-day parcel shipments the flexibility to reach markets across the state.
- Each day 160,000 barrels of crude oil and 42,000 barrels of finished product (gasoline, diesel, etc.) arrive via pipelines at the Wasatch Front Region's five oil refineries. Of this daily total of 202,000 barrels, 95,000 barrels leaves the oil facilities in the North Salt Lake and Woods Cross area by truck each day. This amounts to about 500 truckloads of petroleum products being transported daily on Utah's highways.
- 100 percent of the 400 to 600 intermodal containers and "piggyback" trailers which arrive and depart daily by train at the Union Pacific Railroad's Beck Street Intermodal Facility in Salt Lake City are transported by truck to and from their points of origin and destinations in Utah. Union Pacific provides the "long haul" service while trucks provide the door-to-door pick-up and delivery service.
- Nearly 80 percent of all Utah communities depend exclusively on truck transportation to supply their goods.
- In 2001, 44 million tons, or 72.3 percent of all manufactured freight was transported to and from Utah by truck.
- In 2000, trucking and truck-related warehousing employed 61,844 people in Utah: this employment accounts for one out of every 17 jobs in the state.
- In 2000, the trucking industry activity contributed 4.5percent to the State Gross Product.
- Truck usage accounted for 2.6 billion miles on Utah's public roads in 2000. This figure amounts to about 12 percent of all roadway use in the State.

Recommendations

Trucking industry representatives are quick to point out that roads designed primarily for automobile traffic will rarely be adequate for moving freight by truck. However, highways designed to move freight safely and efficiently will successfully meet the needs of motorists. Representatives of the trucking industry have identified the following specific design, recommendations to facilitate the movement of freight through the Wasatch Front Region.

- Install advanced warning for signal changes on US Highway 89 between I-15 and I-84.
- Upgrade interchanges on I-15 in North Salt Lake, Bountiful, and Woods Cross to better accommodate truck traffic.
- Install a traffic signal at Redwood Road and North Pointe Drive to better accommodate truck traffic.
- Widen 5600 West to five lanes between SR-201 and I-80.
- Reconfigure the right turn radii at California Avenue and I-215.
- Lengthen merge / acceleration lanes on I-84 eastbound to I-80 westbound.
- Construct additional truck parking and staging areas in Salt Lake City's Westside industrial parks.

Railroad

Since the completion of America's first transcontinental railroad at Promontory, Utah, on May 10, 1869, railroads have played a major role in the transportation of freight in Utah and along the Wasatch Front. By 1909, when the last major segment of the nation's east/west rail infrastructure was completed, the Western Pacific and Rio Grande Railroad line between Salt Lake City and San Francisco, Utah was firmly established as the logistical "Crossroads of the West." Although still an important rail center in the 21st Century, the Wasatch Front's overall position as the west's premier rail crossroads has been greatly diminished by changes in the rail industry including the mergers of Western America's once-numerous railroad companies into two large systems. The continuing impact of this transition in Utah's rail industry on the state's economy and transportation systems is considerable.

An almost complete lack of rail competition is the most serious problem facing Utah rail service and those who depend on it. The railroad industry's inability to meet its own capital

needs is a nation-wide challenge affecting rail service. As a result of these, and other rail-service-related issues, a number of key Utah industries have been diverting an increasing amount of their freight traffic away from rail and onto trucks. This rail-induced increase in truck traffic is beginning to impact a number of key highway segments across the state. The advantages of railroad transportation are fuel efficiency, labor costs, privately owned and maintained infrastructure, a good safety record, and relatively low cost, especially for bulk commodities. The Wasatch Front Region has been and will continue to be impacted by the following railroad related factors.

- The average freight train carries 6,000 tons. Assuming an average carrying capacity of 35 tons for trucks, it would take 171 trucks to equal one standard freight train.
- Unit trains (i.e. one commodity trains, that are not broken up to be switched en route), which are common in Utah, can carry up to 12,000 tons of coal, not counting the weight of the cars and locomotives. The largest coal truck on Utah highways has a total carrying capacity of 43 tons; therefore it would take 279 of those oversize coal haulers to equal one unit train .

Pipelines

Pipelines work in conjunction with trucking and railroad tank car service and have a major positive impact on Utah's economy. Pipelines primarily carry liquid commodities such as crude oil and refined petroleum products. These products include gasoline, diesel, and jet fuel. Solid materials, such as phosphate, can be mixed with water and also transported via slurry pipelines. Like the railroads, the pipeline industry owns, operates, and maintains its own infrastructure, with no state or federal involvement in the construction and maintenance thereof. However, they are subject to regulations regarding safety, environmental protection, etc. Important issues relative to the pipeline industry in the Wasatch Front region are as follows.

- Crude oil pipelines converge in the Wasatch Front Region and supply five oil local petroleum refineries from oil fields as far distance as Alberta, Canada. Major source of production are from fields in Colorado, Wyoming, Montana, and eastern Utah.
- Finished petroleum products also link Wasatch Front energy facilities with refineries as far away as Wyoming and Montana.
- Refined fuel products leave the Wasatch Front refineries via a pipeline extending northwest through Idaho and Oregon, terminating in Spokane, Washington. A second pipeline is nearing completion between Salt Lake City and Las Vegas.
- Pipelines, working with railroad tank car service, eliminate the need for nearly 2,100 trucks that would otherwise be traveling daily on some of Utah's busiest highways. The pipelines support the state's industrial economy and tax base.

Air Freight

Air cargo is the smallest component of the freight transportation system serving the Wasatch Front Region. The Salt Lake City International Airport (SLCIA) is a major hub for Delta Airlines. Service is also provided by nine other scheduled airlines as well as three air freight/cargo carriers. In calendar year 2001, a combined total of 238,798 tons of mail and cargo enplaned and deplaned at the SLCIA.

There are two terminals designated for air cargo. One is nearly co-located with the US Post Office at the southern end of the SLC International Airport. The north terminal is accessed via Interstate 215, while the main cargo and mail terminal at the south end of the airport is accessed via Interstate 80. The primary users of these facilities are United Parcel Service at the north terminal. Federal Express and the United States Postal Service maintain operations at the south terminal. Air freight/parcel traffic to and from the SLCIA is concentrated during the Monday to Friday work week, with far less traffic on weekends and holidays.

Air freight's primary advantage is speed. Therein lies the reason why Salt Lake City, with its abundant room for terminal expansion, is not a far larger air freight center. Most of the major air freight/air parcels distribution facilities are in the Central or Eastern Time Zones because most parcel movements are between the major cities in the eastern third of the nation. FedEx shipments must travel to and from their distribution center in Memphis, Tennessee each night, while UPS operates out of a hub in Louisville, Kentucky. Salt Lake City is in the wrong time zone to be attractive to air freight/air parcel shippers desirous of centralizing their operations close to major markets.

- UPS averages 30 trucks per day to and from their SLC Airport facility via Exit 25 on I-215
- Federal Express and the United States Postal Service, together, average 110 trucks to and from the SLC International Airport via Exit 115 on Interstate I-80
- Daily truck traffic to and from the Salt Lake City International Airport averages 140 trips each weekday.

Intermodal Freight Connectivity

The transferring of different types of commodities from one transportation mode to another is an important activity of the Wasatch Front Region's freight movement system. Known as "break-of-bulk" points, these locations are where goods are transferred from one type of carrier to another, such as trailers loaded off flat cars to be pulled by trucks to their final destinations. The efficient intermodal connectivity of freight within the Wasatch Front Region will continue to increase in importance throughout the period of time considered in the RTP (2011-2040). Suggested improvements to freight connectivity facilities are expressed in the following recommendations.

Recommendations

- Increase highway capacity on 5600 West serving the Union Pacific Intermodal Facility located between SR-201 and I-80.
- Improve highway access to all Wasatch Front oil refineries and the Pioneer Pipeline terminal for both standard and long combination (LCV) oil tank trucks.
- Improve access off 900 West in South Salt Lake City to the Union Pacific automobile transload facility at Roper Yard.

METROPOLITAN AIRPORTS SYSTEM

The Salt Lake City Metropolitan Airports System covers approximately 14,200 square miles, encompassing eight counties, approximately 18 percent of the land area, and 82 percent of the State's population. The system is composed of 13 airports that are home to 83 percent of the active pilots and 74 percent of the State's General Aviation airplanes. This section of the RTP provides recommendations for both the Wasatch Front Regional Aviation System (WFRAS) as a whole, and for individual airports within the WFRAS. Within the context of the 2040 RTP process, this section documents aviation related policy and regulatory recommendations for compatible development.

Compatible Development

The primary responsibility for integrating airport considerations into the local land use planning process rests with local land use planning agencies and local governments. Coordination across multiple jurisdictions to achieve airport land use compatibility is vital for successful protection and promotion of compatible development surrounding the regions airports.

As airports grow, aircraft operations increase in frequency, and the types of operations diversify. Airports grow and develop in response to increases in demand for aviation facilities and services. Airports expand to the limits of their historic boundaries, so there is less distance between aviation uses and adjacent development. At the same time, the metropolitan area has continued to grow and demand for land has resulted in previously rural uses being converted into urban level of development, so that an airport previously located near farm fields may suddenly be adjacent to a housing development or other incompatible use.

Map 7-10, WASATCH FRONT URBAN AREA MOTOR FREIGHT FACILITIES AND RAILROADS

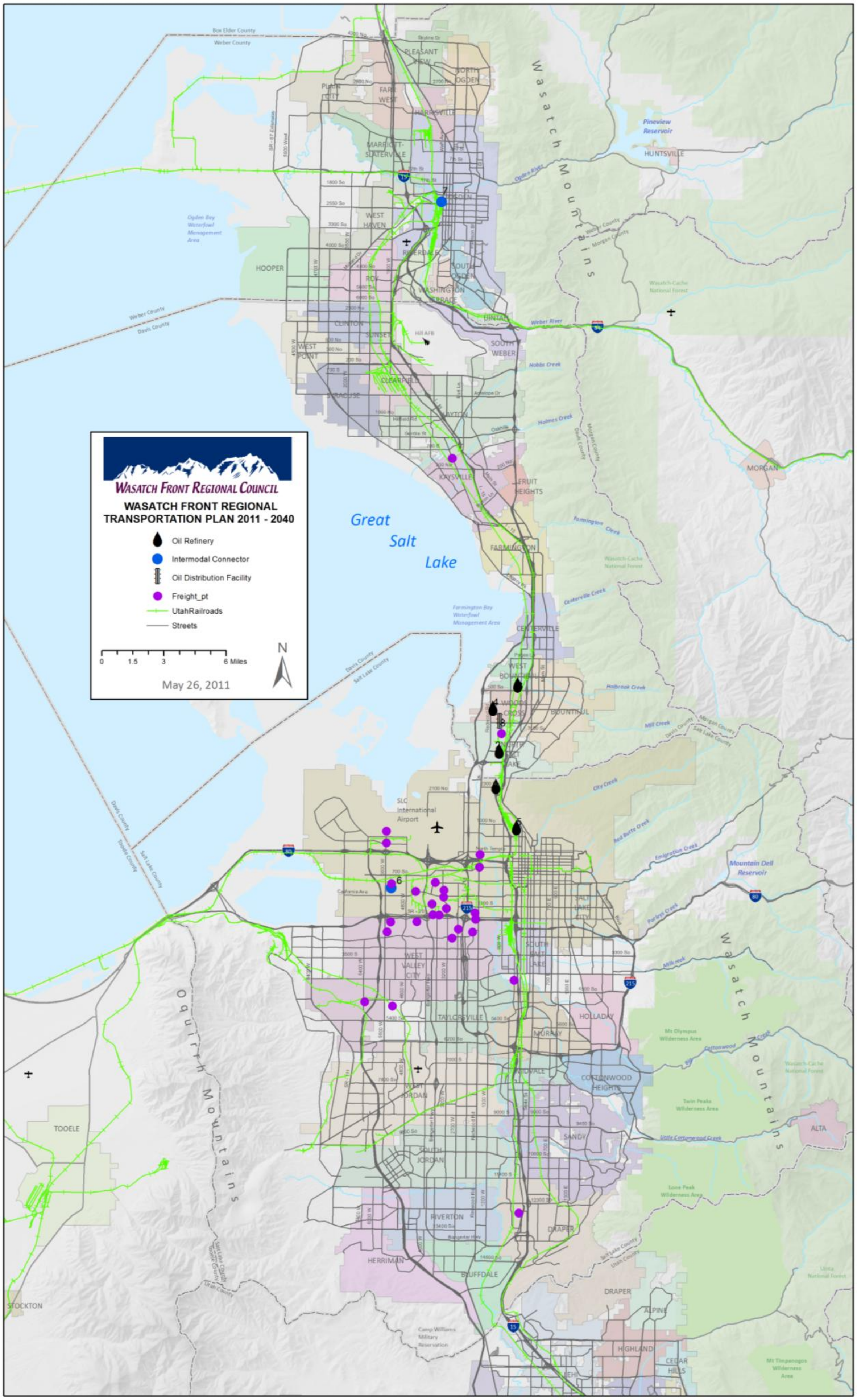
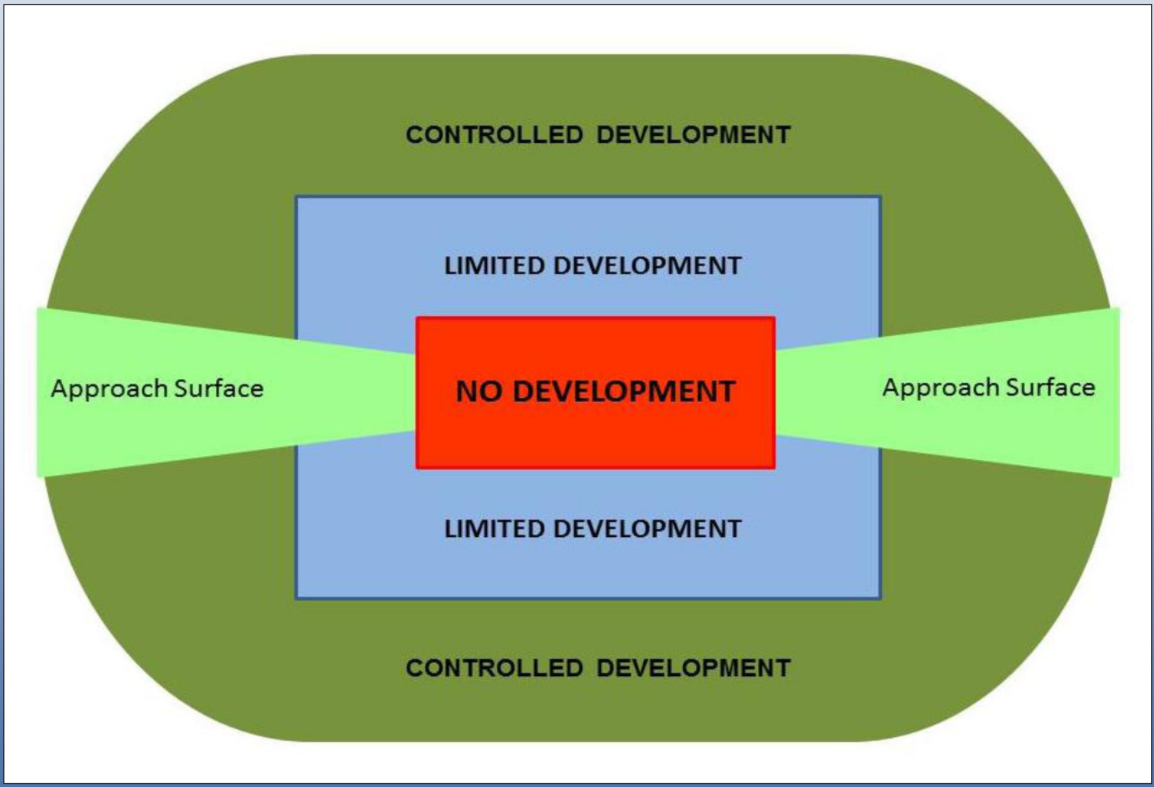


FIGURE 7-7

Airport General Planning Diagram



Planning and development authority for airports in the region is distributed between a large variety of participants, ranging from rural county governments to the Department of Defense. Most airports are publicly owned and operated by a local city or county who have the authority over local land use and control of the types of development possible. Notable exceptions include Bountiful Skypark and Hill Air Force Base. Both Tooele and South Valley Regional are extra-territorial parcels owned by the Salt Lake City Department of Airports. As a result, establishing compatible land uses can be a complicated inter-jurisdictional process. It is recommended that airport sponsors and entities with landuse control around airports engage in cooperative aviation planning as part of the general regional planning process.

In the "Compatible Land Use Planning Guide Utah for Airports", a planning template was developed to aid identification of sensitive lands near the airport. The 'General Planning Diagram' from that report has been reproduced here as Figure 7-7.

The 'Approach Surface', depicted in light green, is the FAA Part 77 approach surface, an imaginary ramp that designates the slope aircraft follow when approaching or departing the runway. The 'No Development' area, depicted in red, extends to the end of the runway protection zone (RPZ) and is the width of the Approach Surface at its intersection with the horizontal surface. The 'Limited Development' area, depicted in blue, extends either 3,200 feet, 5,300 feet, or 7,700 feet depending on approach type, beyond the end of the runway. The width is the length of the airports longest runway. The 'Controlled Development' area, depicted in dark green, is the area inside the FAR Part 77 Horizontal Surface for each airport. It extends 5000 feet from small airports or 10,000 feet from large airports.

Further detail regarding the geometry for each zone can be found in the "Compatible Land Use Planning Guide Utah for Airports" prepared by the Wasatch Front Regional Council. Maps for each airport in the region based these zones are presented in Appendix S.

Compatible Land Use

Ideally, airports should have fee simple ownership of all areas in the 'No Development' zone, However at many airports in the region this not possible or practical. In these cases airports rely on local zoning ordinances to provide protection from incompatible development.

While zoning is the least effective way to ensure airport compatible land use, it is also the least expensive. When zoning for airport compatible land use, best practices include the use of a specific 'Airport Overlay' zone as well as changing the underlying zoning to an airport compatible use. When developing airport compatible zoning, the potential for airport expansion should also be considered. The most severe land use conflicts emerge between airports and incompatible uses when airport facilities are expanded.

It is strongly recommended that airport compatible zoning be established within the 'Limited Development' area, with a focus on providing airport compatible land uses—either uses affiliated with the airport, or uses not sensitive to airport noise. Residential uses should be avoided within this zone, with a strong preference to limiting the number and size of structures developed in the area along the extended runway center-line.

The area represented by the 'Controlled Development' overlay exceeds that which can reasonably regulated to be aviation compatible, and is provided largely as an indication of the relative extent of an airports traffic pattern airspace. In addition, FAA regulations strictly limits the development of structures over 150' tall in this area, such as cell phone towers or wind-mills.

Individual Airport Recommendations Summary

To ease coordination with other transportation planning activities, the existing conditions, planned improvements, and projected outlook has been summarized for each airport in the WFRAS below. Each individual airports entry begins with a short description of the airport. This includes the location, owner, and basic facility description. Current aviation activities are described, including estimates of based aircraft and aircraft operations. Planned and recommended improvements have been summarized. Each airport has then been assessed in terms of surface transportation access, future ability to grow/ expand, land use compatibility, and general outlook. Changes in aviation uses have been predicted.

Salt Lake City International Airport

An international commercial service airport, Salt Lake City International Airport (SLCIA) is located approximately five miles west of downtown Salt Lake City near the intersection of I-215 and I-80. SLCIA is owned by Salt Lake City and is operated by the Salt Lake City Department of Airports. It has two four runways—two used primarily for air carrier operations, one used primarily for GA operations, and an infrequently used crosswind runway. The SLCIA serves the commercial air services needs of the majority of Utah and portions of the surrounding states of Nevada, Idaho, Wyoming, and Colorado. SLCIA also serves as an air cargo hub and accommodates a significant number of General Aviation business aircraft operations. It also has substantial business GA activity.

According the FAA 5010 data, as of 2010 SLCIA has about 366 based aircraft, of which 250 are single engine aircraft, 55 multi-engine aircraft, 46 jets, and 15 helicopters. In 2009 there were 383,838 operations, about half of which were air carrier operations. There were only 8,468 local GA operations, compared to 58,352 itinerant GA operations.

Airport surface access is easy and efficient for a large hub airport. SLCIA is served by I-80 for commercial flights and by I-215 for general aviation activities. Transit service to the airport is being improved with the extension of light rail to the airport along North Temple and I-80, this project is anticipated to be complete in early 2013. UTA currently provides bus service to SLCIA with two commuter buses to Tooele and Grantsville (453 & 454), an hourly bus to Salt Lake City Inter-modal Center (Route 550) and an hourly bus to the planned West Valley Inter modal center (Route 236).

At present, cargo facilities at the SLCIA exist on both the north and south ends of the airport. Access for air cargo facilities on the south is via the same access points as air passengers. Access to the air cargo facilities on the north is via I-215 and 2200 North. All future expansion of cargo facilities at the SLCIA is planned for the north end of the airport, and roadway access to this area of the airport is excellent. The majority of air cargo passing through the airport does not have a local origin or destination and is transferred from aircraft to aircraft. As a result increases in air cargo volume have a limited impact on the surface transportation system.

SLCIA's ability to grow and expand to meet future demand remains good. Future growth will be fueled by continued growth of the regions local population, tourism, and its role as a regional and international hub for Delta airlines.

Ogden Hinckley Airport

The Ogden Hinckley Airport is a Regional GA airport It is located approximately two miles southwest of the Ogden City center and directly alongside I-15. The airport is owned and operated by the City of Ogden. The Ogden Hinckley Airport is a regional airport that provides direct access to nearby manufacturing and recreational sites, and it is a popular refueling stop for cross country flight. The airport's service area includes Ogden and surrounding Weber and Davis Counties. It also serves as a reliever for Salt Lake City International Airport. The Ogden Hinckley Airport has three runways and an air traffic control tower which make it an ideal location for recreational, training and business flying. Finally, it supports Williams International, a firm that designs and manufactures small turbine engines for a variety of purposes, including aircraft.

According the FAA 5010 data, as of 2010 Ogden Hinckley has 289 based aircraft, of which 231 are single engine aircraft. There are an estimated 33 multi-engine, and 9 jet aircraft based at Ogden, as well as 13 helicopters and 3 gliders. Kemp Aviation recently completed a private airport along the south side of the airport, which has significantly expanded basing capacity. In 2009, there were an estimated 88,300 aircraft operations. The majority of these operations were conducted by GA aircraft.

Surface access to the airport is excellent. I-15 runs adjacent to the airport, and direct access is provided via Hinckley Drive. The Ogden Hinckley Airport can also be accessed easily from a number of arterial streets in the area, including 1900 West in Roy and Riverdale Road. Planned surface transportation improvements in the area include I-15 widening, and extending Hinckley Driver between 1900 West and Midland drive.

Ogden has excellent capability to continue to grow and expand. There is sufficient available property for the development of additional apron and hangers. The area beyond the runway for the Ogden Hinckley Airport are located over roadways and interchanges, as well as some light industrial. The Monte Vista development is near the south end of Runway 3-21, and may begin to suffer noise issues if jet traffic increases.

Hill Air Force Base

A military airport, Hill Air Force Base (HAFB) is a major United State Department of Defense facility located in Davis County, approximately 20 miles north of Salt Lake City. Hill AFB is operated by the United States Air Force as a major Air Logistics Center, which is dedicated to the maintenance, repair, and testing of aircraft, including both fighter jets and transportation aircraft. It makes heavy use of the the Utah Test and Training Range for these purposes. Hill AFB is the center of Utah's $1.4 Billion defense industry, and among its top five employers, with an estimated 10,000 to 15,000 employees.

Because of HAFB's role as a maintenance and repair depot, both basing and operations fluctuate in response to the need for repair and testing. There about 85 F-15's assigned to its current tenant units, some of which are currently deployed. There were an estimated 40,000 operations in 2009.

Planned Improvements

HAFB has been experiencing increasingly severe congestion over the past few years. As a secure facility, there are only a limited number of access points to the base, concentrating traffic onto roads leading to these points. As a result, there are significant roadway improvements planned near HAFB. These include operational improvements along SR-193 to the south, a new North-South road to the east of the base connecting 3000 N with I-84, and substantial widening along I-15 to the west. The I-15 widening includes an interchange connecting the base to I-15 at 1800 N. An enhanced bus service connecting the Clearfield Front Runner Station and the Layton Front Runner station to the south gate has also been planned.

A private developer has broken ground on the Falcon Hill aerospace research park, a new commercial facility constructed on 550 acres of leased based property. When completed, it will include new facilities for over 6,000 of HAFB's employees, and include over 2 million square feet of new office and commercial space.

HAFB is forecast to continue to be the Air Forces ' repair garage' for the foreseeable future. It enjoys strong local support and access to an almost unparalleled amount of military airspace. In 2010, the United States Air Force has selected HAFB as one of the preferred sites for 3 squadrons of the new F-35 Lightning. The base has sufficient property to be able to continue to grow and expand, and a continued mission to provide training and testing facilities for combat aircraft.

Military jet aircraft are significantly louder than civilian jet aircraft. Beyond the north end of the runway, there is still significant base property, and the extended flight path extends over the Weber River and I-84. In contrast, the blast zone at the south end of the runway is near the edge of base property. However, the Layton City General plan map shows it as an easement area, and the zoning map shows it as zoned for agricultural uses.

Bountiful Skypark Airport

Bountiful Skypark Airport is a privately owned, public-use Regional GA airport, located on Redwood Road in Woods Cross City. The airport is located six miles north-northeast of SLCIA. It has a single runway and serves the general aviation needs of northern Salt Lake County and Davis County. Skypark Airport provides an economical and convenient niche for a large number of single engine GA aircraft, relieving congestion at other WFRAS airports. It has become a major center for business GA. Training, business basing, helicopter operations and aircraft maintenance are also present.

According the FAA 5010 data, as of 2010 Bountiful Skypark had over 200 based aircraft, including 12 multi-engine aircraft and 10 helicopters. In 2009, there were an average of 135 operations a day, (about 50,000 annual operations). Barring 500 military operations, all were performed by GA aircraft. Approximately 60% of operations are by transient GA aircraft. If local business development continues in this area of Davis County, basing demand at Bountiful Skypark Airport could exceed airport capacity within the next 10 years.

Primary access is via Redwood Road, which connects to I-215 south of the Skypark Airport, and can be easily accessed by the recently constructed Legacy Highway. It can also be accessed from I-15 via the 2600 South exit in Woods Cross. Access to the east side of the airport is supplied by 1560 West, by way of 1100 N.

Planned surface transportation improvements near the airport include widening the nearby I-15 throughout Davis County, and widening Redwood Road from 1100 North in North Salt Lake to 500 South in West Bountiful. UCASP recommendations for Bountiful Skypark include the installation of Medium Intensity Runway Lighting (MIRL), and the construction of 50 additional Tie-downs.

Bountiful Skypark has limited potential to expand. It is hemmed in on all sides by urban development. The proximity of hangers and other development to the runway limit the airport ability to expand to accommodate larger aircraft. Wetlands issues constrain its ability to build additional hangers on the west side of the runway. However, the aiports proximity to a large metropolitan population suggests that demand for its facilities will continue to grow. Because of the constraints, no changes in aviation uses are predicted.

South Valley Regional Airport

South Valley Regional is a Regional GA airport located in West Jordan, approximately nine miles south of SLCIA, and is an FAA designated Reliever airport. It is a publicly owned, public use airport managed by the Salt Lake City Department of airports. It has a single North-South runway.

Existing aviation uses include business-related flying, law enforcement/fire/rescue flying services, recreational flying, flight training, and air charters. The Utah Army National Guard Aviation support facility is based at the airfield, and has expanded and become more active in recent years. According the FAA 5010 data, as of 2010 there were 240 based aircraft. In 2007, this included 20 multi-engine planes, 5 jet aircraft, 5 helicopters, and 24 military aircraft. According to the Salt Lake City Department of Airports, there are currently four corporate hangars, 18 'twin' hangars, 95 'single' hangars, and 42 shade hangars.

Surface access to the airport is improving. 7800 South, congested during peak times is currently under construction and is being widened. 6200 South remains highly congested, and due to significant resident opposition, seems likely to continue to be for the near future. However, the intersections of Banger and both 6200 South and 7800 South are being converted to Continuous Flow Intersections (CFI), which should substantially improve traffic flow along and across Bangerter Highway.

Recommended development identified in the UCASP include additional hangers, a runway extension, substantial taxiway development, and perimeter fencing. The 2007 Airport Layout Plan calls for a future Runway protection zone easement, a future MALSR (Medium-intensity Approach Lighting System with Runway alignment indicator lights), and future hangers on the west side of the airport, north of the existing corporate hangers. Future surface transportation improvements are limited.. Future development plans also include general maintenance and rehabilitation of existing pavements and expansion of aircraft basing facilities to accept more general aviation airplanes from SLCIA. The WFRC draft LRTP includes additional widening for 7000 South as it connects into Jordan Landing Boulevard. Enhanced bus service is planned along 7800 South.

South Valley Regional is suffering from urban encroachment. It is surrounded by residential subdivisions on all sides. The massive Jordan Landing commercial development located east of the airport buffers the southernmost extent of the airport, but there are large parcels of developable land on all sides of the airport. Similar parcels have been developed at higher than normal density.

As demand for Air Carrier runway capacity at SLCIA increases, so does the need to separate GA aviation from commercial air carriers. The Salt Lake City Department of Airports has been meeting this need by increasing GA capacity at South Valley Regional. Because of it's proximity to users, there is strong demand for aviation services at South Valley Regional.

The air carrier approach to SLCIA overlays South Valley Regional, making business jets ability to use its GPS approach uncertain. On this basis, South Valley Regional is unlikely to expand as a business jet center, and can be expected to continue as a non-jet GA airport.

Wendover Airport

Wendover Airport is a National GA airport located along I-80, approximately 1 mile south east of the city of Wendover. It is a former WWII era military base which maintains two functional runways. Wendover serves as a stopover point for cross-country aircraft. West Wendover Casinos also charter Casino Express flights.

According the FAA 5010 data, as of 2010 there were 7 based aircraft, including 5 jet aircraft. There were an estimated 5,482 aircraft operations, of which Itinerant GA composed about 65%, Local GA another 20%, and Air Taxi about 13%.

The City of Wendover is located just off I-80, and the Wendover airport can be reached almost directly by following Airport Way. The condition of the surface access road to the airport (Airport Way) is an issue of concern, and likely to require reconstruction. According the UCASP, in order to fulfill its role in the Utah Airport System, Wendover needs a runway extension, a full parallel taxiway, a MALSR, and GVGIs. Planned development is listed in the UCASP as as a precision approach, a new terminal, full perimeter fencing, and extensive taxiway construction.

Wendover Airport is anticipated to continue to be able to meet increasing demand for aviation facilities as West Wendover continues to grow as a vacation and resort destination. The airport has sufficient property to grow and develop. There are currently no land use conflicts off the end of either runway.

Morgan County Airport

Morgan County Airport is a Regional GA airport located approximately 8 miles north west of Morgan city. It is a publicly owned and operated airport, with a single runway. Morgan County serves as a regional center for gliders and ultralight aircraft.

According the FAA 5010 data, as of 2010, the Morgan airport had 76 based aircraft, including 2 multi-engine aircraft and 19 gliders. Many of the based aircraft registered at Morgan County are kit-built and experimental aircraft. There were an estimated 13,258 operations in 2009, for an average of 36 operations a day, of which 75% of which were local GA operations. There is also extensive glider and ultra-light activity at the airport. Surface access is provided by Cottonwood Canyon Road (5700 N) and by Willow Creek Road. Both roads reach I-84 via SR-30. As the nearby Mountain Green area continues to grow and develop, SR-30 will probably become increasingly congested, interfering with airport access. A rebuild is included in the 2011-1016 Utah Department of Transportation Surface Transportation Improvement Plan, but not widening.

UCASP recommended improvements for Morgan County Airport to match its designated role were a runway extension, a runway widening, an increase in pavement strength, a parallel taxiway, GVGI's and REILs. Recommended improvements consistent with Morgan County Airports UCASP role are not consistent with its actual development potential. Due to surrounding terrain and development, expansion of airside facilities is not feasible. Geographic constraints limited the potential approach speed (and thus size) of aircraft using that facility. As a result, the airports ability to develop and handle larger planes is limited. As a result, Morgan County Airport is expected to continue as a local GA airport specializing in recreational flying.

Planned improvements included additional tie-downs and additional fencing. The airport has recently developed additional hangers south of the runway on the west end of the airport.

Morgan County is experiencing increasingly severe land-use conflicts are the previously rural area becomes a desirable location for second homes. Development in the foothills along Willow Creek Road includes several a low density residential subdivision in close proximity to the runway. Continued expansion in airport operations in conflict with expanding residential development in nearby area. The Runway Protection Zone for the south end of the runway cross the road, requiring a displaced threshold. There is existing storage and light industrial off the south end of the runway.

Tooele Valley Airport (Bolinder Field)

Tooele Valley is a Regional GA airport located five miles

TABLE 7-9

2007 Air Cargo Tons By Commodity (Utah)

COMMODITY	INBOUND TONS	OUTBOUND TONS	TOTAL TONS	% OF TOTAL
Mail \ Contract Traffic	18,706	23,249	41,956	21%
Chemical Products	7,157	20,990	28,146	14%
Misc Mixed Shipments	9,517	13,051	22,568	11%
Machinery	12,569	7,650	20,219	10%
Transportation Equipment	5,023	11,327	16,350	8%
Electrical Equipment	3,635	10,679	14,313	7%
Farm Products	1,438	8,130	9,568	5%
Pulp\Paper Products	1,672	9,008	10,680	5%
Instruments, Photo\Optical Equipment	1,558	6,717	8,275	4%
Printed Matter	3,042	5,544	8,586	4%
All Other	8,178	9,651	17,829	9%
Totals	**72,495**	**125,996**	**198,490**	**100%**

TABLE 7-10
Projected 2040 AIRP Cargo Tons By Commodity (Utah)

COMMODITY	INBOUND TONS	OUTBOUND TONS	TOTAL TONS	% OF TOTAL
All Other	14,479	19,258	412,603	50%
Machinery	67,947	15,774	83,721	10%
Misc Mixed Shipments	32,318	48,279	80,597	10%
Chemicals Or Allied Products	14,475	35,301	49,777	6%
Electrical Equipment	24,543	23,224	47,768	6%
Instruments, Photo Equip, Optical Equip	8,482	34,641	43,123	5%
Mail Or Contract Traffic	14,329	20,834	35,163	4%
Pulp, Paper or Allied Products	2,202	20,729	22,931	3%
Transportation Equipment	10,564	11,824	22,389	3%
Farm Products	0	13,878	13,878	2%
Printed Matter	7,200	6,057	13,257	2%
Total	**196,539**	**249,799**	**825,207**	**100%**

north-west of Tooele, Utah, south of Highway 138. It is a public-use airport owned and operated by the Salt Lake City Department of Airports. It has a single North-South runway.

Located outside the Salt Lake City Class B airspace, it is heavily used for training flights. Tooele also serves as a fuel stop for itinerant aircraft. Significant skydiving activity is also present. According the FAA 5010 data, as of 2010 there were 24 based aircraft, including one multi-engine aircraft. There were an estimated 18,744 operations in 2009, of which 2/3 were Itinerant GA, and another 1/3 were local GA, for an average of about 51 operations a day.

Surface access is provided off airport road via Erda Way via Highway 36. In the future surface access to the airport may be improved with a connector from Highway 138 north of the airport. The Tooele Valley has become the preferred location for exurban development spilling over from the Wasatch Front. As a result, there has been a substantial and growing need for transportation improvements, and extensive new construction is planned.

UCASP recommended improvements for Tooele Valley Airport to match its designated role were a runway extension, a rental or courtesy car, upgraded terminal and pilots lounge, and a FBO (Fixed Base Operator). Programmed capital development includes a taxi-lane, T-hangers and associated infrastructure. The airport has sufficient property to continue to grow and expand, including sufficient room for hanger development.

As demand for Air Carrier capacity at SLCIA increases, so does the need to separate GA aviation from commercial air carriers. The Salt Lake City Department of Airports has been meeting this need by increasing GA capacity at Tooele Valley. In addition, facilities have been developed to accommodate larger GA aircraft, including the installation of an ILS (Instrument Landing System).

While Tooele Valley airport lies within the SLCIA Mode-C veil, it is outside the Class B airspace. The less congested airspace and ILS approach procedure make the airport an excellent location for pilot training, and thus flight training and related touch-and-go operations will likely remain a regular aviation use for the foreseeable future.

Air Cargo

While Air Cargo carries only a fraction of a percent of the total freight tonnage, it fills a special niche in Utah's freight system. Air cargo's primary advantage is speed. Air cargo makes it possible to get mail and cargo to distant locations in a matter of hours rather than in days. From urgently needed replacement parts for mining equipment to fresh fish, air freight is a key component in Utah's supply chain. According to the

Economic Development Corporation of Utah (EDCU), Utah air cargo volumes have been growing at an average annual rate of 9%.

According the Federal Aviation Administration (FAA) data domestic air cargo Revenue Ton Miles declining over 17 percent in 2009, partially as a result of new security restrictions. However, the FAA forecasts air cargo demand to continue to grow in synch with economic growth. According to the FAA Forecast Fact Sheet (FY '10-'30), the cargo fleet increases from 854 aircraft in 2009 to 1,531 aircraft in 2030, an average increase of 2.8 percent a year. However, this increase is contingent, assuming that the shift from air cargo to truck relay has stopped. In response to increased security measures for air cargo, a specialized system of ground transportation based on truck relays has become an important cargo mode, one that is nearly as fast as air cargo, but at a lower price.

Utah Air Cargo Commodities

In addition to mail and contract traffic, air cargo includes a wide variety of additional commodities. According Utah Department of Transportation's 'Freight Report' an estimated total of 198,490 tons of air cargo transited to or from Utah airports in 2007. Of this cargo 125,995 tons were outbound (exports from the state) while 72,494 tons were inbound (imports to the state). The tons of air cargo inbound to the state is 58 percent higher of the tons of air cargo leaving Utah. Only three tons of cargo are estimated to travel within the State of Utah by air. The following table shows air cargo tonnages for Utah in 2007. Percentage totals may not total 100% due to rounding. Table 7-9 lists the inbound, outbound, and total tons of air cargo commodities by type for Utah in 2007.

In 2007, the 'Mail or Contract Traffic' commodity constituted the largest tonnage for both inbound and outbound traffic. 'Machinery' was the only category where inbound tons exceeded outbound tons. The 'Pulp\Paper Products' commodity had the highest ratio of inbound to outbound tons. Table 7-10 shows projected changes in commodity tonnages for the State of Utah and the projected percent of total tonnages in 2040.

Air cargo transported within Utah is projected to grow at an average rate of over 4 percent annually. The types of commodities carried by air cargo are expected to become more varied. In 2007, the top three commodities were estimated to account for 46 percent of air cargo, while in 2040 they are projected to account for only 26 percent. The percent of air cargo falling under the 'All Other' category is projected to increase from 9 percent in 2007 to 50 percent in 2040. 'Mail or Contract Traffic' made up 21 percent of Utah air cargo tonnage in 2007, while in 2040, it is project to fall to only 4% of the total. The inbound tonnages of 'Instruments, Photo Equipment, Optical Equipment' and 'Machinery' are projected to grow over 400%, and over 500% for 'Electrical Equipment'. The 'Instruments, Photo Equipment, Optical Equipment' commodity is projected to increase outbound tons by a much larger percentage than any other commodity.

Salt Lake City International Airport Air Cargo

Convenient air freight service from the Salt Lake City International Airport puts shippers within hours of any point in the nation, Canada and Mexico. The FAA 'All-Cargo Data' shows the SLCIA handled over 449,267 tons of cargo in 2009.

Currently within the US, the majority of parcel movements are between the major cities in the eastern third of the nation. As a result, major air freight/parcels shippers located distribution centers in close proximity to their markets. For example, FedEx shipments must travel to and from their distribution center in Memphis, Tennessee each night, while UPS operates out of a hub in Louisville, Kentucky. However, as mountain west and west coast cities continue to grow and develop, it is likely that the demand for air cargo facilities in the west, including the SLCIA will continue to increase.

There are two terminals designated for air cargo, one at the south end of the airport, and one at the north end of the airport. The southern air cargo terminal serves is primarily devoted to air mail and serves Federal Express (Fed-Ex) and the United States Postal Service (USPS). Federal Express and the United States Postal Service, together, average 110 trucks to and from the SLCIA via Exit 115 on Interstate I-80. The northern terminal is primarily used by the United Parcel Service (UPS). It is accessed by I-215. UPS averages 30 trucks per day via Exit 25 on I-215. The vast majority of air freight/parcel traffic to and from the SLCIA is concentrated during the Monday to Friday work week.

FUTURE TECHNOLOGIES

It is safe to say that trying to predict the future is a tricky errand at best. However, because transportation is so important to commerce and quality of life, it behooves the WFRC to attempt to look into the future in a way that allows, as much as possible, the accommodation of the future impact of trends that are discernable at present. History teaches that those communities and broader urban areas that fail to quickly adapt are bypassed as new circumstances remake the economy and the landscape.

What seems to be clear is that future changes in transportation related technology continue to be governed by three basic principles: First, large scale change must meet a large scale need; second, change is a product of overall technological trends; and third, transportation changes are generally adopted only after public entities support them financially.

Meeting a Need

Some of the more pressing transportation relate, needs appear to be as follows: air quality, accommodation of commerce, climate stabilization, energy independence, and accommodation of population growth. It can be argued that each of these needs is growing in importance and is likely to drive changes in transportation technology.

Air quality affects the Wasatch Front resident to regional health in several ways. As the senior population grows so does the percentage of residents who are most susceptible to poor air quality. This growing senior population will enjoy considerable political power and may increase the pressure to resolve air quality concerns. Additionally, advances in health research are further delineating the links between pollutants at lower concentrations and poor health. The Wasatch Front Region, with its unique geographic conditions, will need to respond to pressures to improve air quality, using the best management practices and technologies available.

Accommodation of existing and future commerce will be very important to the Wasatch Front Region. Business requires movement of people and goods. Modern business requires the ability to attract talent. Talented people are highly mobile and are frequently free to relocate, based upon quality of life issues. Beyond the air quality needs noted above, a reasonable commute is essential to a good quality of life. Modern business is also more reliant upon "just in time" delivery which is, in turn, dependent upon the ability to cheaply and reliably move freight.

Climate change is a fast growing concern. Reductions in carbon dioxide and other green house gas releases is steadily becoming a global and business concern and is even starting to drive the economy. Energy independence is an increasing National concern. Many of the Nations petroleum sources are beyond peak performance. New oil resources are expensive to develop, difficult to retrieve and environmentally damaging. Increasing reliance upon foreign oil runs counter to national interests. It can be assumed that more effort will be made to develop alternative energy resources. Utah will play an important role as alternative resources are developed.

Utah has a particular need to accommodate rapid population growth. Utah has a perennially high growth rate and much of that growth is centered on the Wasatch Front. In 2006, Utah had the highest fertility rate in the Nation, the third longest life expectancy rate, and the sixth highest rate of population growth. By 2050 it is anticipated that the Wasatch Front will have about 5 million residents. This is over twice its current population and about the current size of Philadelphia, Pennsylvania. Much of the region's highway infrastructure is in place and is unlikely to be doubled. Even more congestion can be expected, resulting in less road throughput or capacity.

Overall Technological Trends

Among the most influential technological factors driving changes in the economy are those involving information, containerization, and materials engineering. Information technologies applied to transportation include, but are not limited to, parking and transit locator services, demand-activated transit systems, computer assisted driving, those that aid telecommuting, and the provision of goods and services via the internet. This segment of the nation's economy continues to increase as technology occupies an increasingly important role in providing transportation demand solutions.

Parking and transit locator services provide direct, real-time communication between operators of transit vehicles and the user. These services could allow for demand-activated transit systems in lower density areas to provide door-to-door service and optimized routing. Computer assisted driving would improve safety and allow for more road capacity by shortening the gaps between vehicles. Telecommuting and the provision of goods and services via the Internet may ultimately eliminate many trips altogether.

Containerization, the concept of allowing trunk line and collector-distributor functions to share a single container or vehicle, has revolutionized the freight industry. A single container of goods is transported in mass by ship, downloaded to a train traveling to a large common destination, and then downloaded to a tractor trailer for delivery to a specific destination. Applications of this technology in the movement of people would involve personal rapid transit and various types of bus rapid transit. Personal Rapid Transit (PRT) generally consists of small vehicles, each carrying about the same number of persons as an automobile. These vehicles would travel over an exclusive right-of-way or guideway network, either over standard routes, or else automatically routed individually from origin to destination at network stations.

Bus rapid transit can operate in much the same way as PRT but with larger passenger capacities. Currently several BRT lines include line-haul and collector-distributor segments. A line in England operates driverless on a fixed-guideway and then with a driver added as a collector-distributor. In Boston and Seattle the fixed-guideway portion of the lines are located in tunnels. Los Angeles has a BRT with its fixed-guideway portion on a rail line that previously served as freight haulage. In France, the fixed-guidway portion is reversible, allowing only the bus in the peak direction to use the guideway. In Korea, a bus line that was to debut in 2009, was to operate on both magnetic railways and asphalt roads.

The use of newly engineered composite materials holds huge promise for transportation. As lighter and stronger materials become more economically viable, vehicles will emit fewer pollutants, use less energy, and potentially take up less space. Thus far, transit has been one of the first industries to adopt some of these materials in vehicles. These materials are also finding a place in highway construction. For example, specialty wraps have been introduced to prolong the life of bridge support structures.

High Speed Rail

The International Union of Railways (UIC) defines high-speed rail as services that regularly operate at or above 155 mph on new tracks, or 125 mph on existing tracks. A number of characteristics are common to most high-speed rail systems. Most are electrically driven via overhead lines, although this is not necessarily a defining aspect. For instance, other forms of propulsion, such as diesel locomotives, may be used, as on Britain's HST services. A definitive aspect of high-speed trains is the use of continuous welded rail. Welded rail reduces track vibrations and discrepancies between rail segments sufficiently to allow trains to pass at speeds in excess of 125 mph.

The current Federal Administration envisions a network of high-speed rail corridors across America. The proposal is to transform the nation's transportation system by rebuilding existing rail infrastructure while launching new high-speed passenger rail services in 100 to 600 mile corridors connecting U.S. communities. The idea is similar to how the Interstate system and the U.S. aviation system were developed in the 20th century. That is a partnership consisting of public sector and private industry, will construct the system when strong federal leadership providing a national vision.

The Western High Speed Rail Alliance (WHSRA) has been formed under the leadership of the Denver Regional Council of Governments, Maricopa Association of Governments, the Regional Transportation Commission of Southern Nevada, the Regional Transportation Commission of Washoe County and Utah Transit Authority. The Alliance was founded for the purpose of determining the viability of developing and promoting a high-speed rail network that would provide high-speed rail connections throughout the Intermountain West, with possible future connections to the Pacific Coast and other areas of the United States. The members of the alliance agree to work jointly to acquire funding for studies of high-speed rail options, to develop plans for high-speed rail infrastructure, and to construct high-speed rail facilities throughout the Intermountain West. The Western High Speed Rail Alliance shares a common vision for a future high-speed rail infrastructure connecting Denver, Reno and Las Vegas, with links to other regions. This high speed rail system would provide efficient, cost-effective rail operations for passenger and freight customers, and enhance economic growth through reduced air, rail and highway congestion. It is felt that

HSR would promote economic expansion, including new manufacturing jobs; would create new choices for travelers in addition to flying or driving, would reduce national dependence on oil, and fosters urban and rural community development.

SAFETY AND HOMELAND SECURITY RECOMMENDATIONS

Safety Recommendations

Enhanced safety is an objective of the 2040 RTP and in the growth principles guiding its development. The Wasatch Front Regional Council recommends and encourages all projects in the RTP to be planned, designed, and implemented, with the safety of future users given high priority. As required by SAFETEA-LU, safety is a key component in transportation planning. The Federal Highway Administration (FHWA) in cooperation with the National Highway Carrier Safety Administration (NHCSA), the Federal Motor Carrier Safety Administration (FMCSA), the Federal Transit Administration (FTA), and the Federal Railroad Administration (FRA) provided guidance for local planning efforts in the form of a document titled the *"Strategic Highway Safety Plans: A Champion's Guide to Saving Lives, Interim Guidance to Supplement SAFETEA-LU Requirements."* This guide proposed that a Strategic Highway Safety Plan (SHSP) be developed to identify the State's key safety needs and guide investment decisions to reduce highway fatalities and serious injuries. The SHSP is a statewide coordinated safety plan that will establish statewide goals, objectives, and key emphasis areas developed in consultation with Federal, State, local, and private sector safety stakeholders.

The Utah Safety Leadership Team, led by UDOT, has completed an initial SHSP called the *"Utah Comprehensive Safety Plan (UCSP), Working Together, Achieving Success, Zero Fatalities"*. The contributing members of the Utah Safety Leadership Team included UDOT, FHWA, FMCSA, the Utah Department of Public Safety, and the Utah Local Technical Assistance Program Center (LTAP). The WFRC also participated on the Utah Safety Leadership Team. The UCSP will be continuously reviewed, revised, and updated.

The adopted UCSP is comprised of three separate and distinct areas. Each part has a different overall direction while maintaining the ultimate goal of reducing serious injury crashes and fatalities. The first section identifies "Emphasis Areas", where it is felt added attention and emphasis from safety organizations is needed for the next five years. Emphasis areas identified include reducing roadway departure crashes, increasing the use of safety restraints, reducing impaired driving, and reducing aggressive driving. The second area is the "Continuing Safety Area", where continued support and enhancement of current programs is needed. These areas include improving intersection safety, improving pedestrian safety, enhancing child safety, increasing work zone safety, promoting safer truck travel, improving motorcycle safety, enhancing railroad crossing safety, enhancing safety management systems, and improving the crash data system. The third area is the "Special Safety Area" and contains new and innovative programs or programs that have received minimal attention in the past. Special safety areas include reducing fatigued driving, improving young driver safety, enhancing older driver safety, promoting bicycle safety, and enhancing emergency services capabilities.

The WFRC can directly contribute to many of the programs identified in the UCSP. These programs include improving intersection safety, improving pedestrian safety, promoting safer truck travel, enhancing railroad crossing safety, improving the crash data system, and promoting bicycle safety. Examples of projects within the RTP that address some of these areas of concern include the following.

- SR 201 Interchanges at 7200 West and 8400 West in Salt Lake County – Improve intersection safety
- BRT and Enhanced Bus – Improve pedestrian safety
- 24th Street Interchange in Ogden – Promote safer truck travel.
- 1800 North in Clinton – Includes a grade separation at the Union Pacific Railroad crossing
- Commuter Rail South – Includes improvements to at-grade railroad crossings
- The Bicycle Plan – Promotes bicycle safety

Homeland Security Recommendation

Similar to safety, security plays a significant role in the development of a regional transportation plan. While many improvements to the transportation system will impact both safety and security the Regional Transportation Plan more directly addresses security of the transportation system in several ways. The recommended plan includes improvements at choke points, increased multimodal redundancies within the system, capacity expansion, enhancement of the Intelligent Transportation System program and continued coordination, and training and exercising of regional emergency preparedness plans. The 2040 RTP recommends choke point improvements on I-80 and SR-201 in Salt Lake County and on the I-15 corridor in Weber, Davis and Salt Lake Counties. In Weber County the RTP calls for two additional freeway lanes to be added to I-15 at the Box Elder County line and an additional HOV lane to be added in the Centerville area of Davis County. In Salt Lake County, as well as adding to three freeway lanes to I-15 at the Utah County line, it is recommended that capacity improvements be implemented on eastbound I-80 and westbound SR-201.

To increase the redundancy and multimodal aspect of the transportation system the RTP recommends a considerable increase in transit. High capacity transit is extended north from Ogden to Brigham City, streetcar service is planned for Ogden, Salt Lake City, and the Sugarhouse Corridor and, an LRT extension proposed for Draper City. Bus Rapid Transit lines are included in the RTP for the Ogden Central Business District, and extend south from Weber County through Davis County to Salt Lake County. The BRT lines will connect growth centers, employment areas and residential neighborhoods. BRT is also planned to serve several other major corridors throughout the Region.

System capacity expansions have also been recommended in the RTP. As mentioned above, capacity has been added to the system with the expansion on I-15 throughout Davis County and on the southern end of I-15 in Salt Lake County. Freeway capacity improvements are also included for State Route 201 and I-80 in Salt Lake County and US-89 in Davis County. A new four lane north-south facility paralleling I-15 is planned for the west side of Weber and Davis Counties, as is an eight lane facility (Mountain View Corridor) for the west side of Salt Lake County. Additionally, improvements are recommended for 20 significant east-west corridors and 10 north-south corridors in the Region.

Planned improvements for the Intelligent Transportation System (ITS) program are certainly a vital component to maintaining and improving the security of the regional transportation system. The RTP recommends expansion of variable message signs and closed-circuit television (CCTV) coverage across the Region and includes continued improvements to ITS communications networks for both highway and transit. In addition to the physical transportation infrastructure the 2040 Plan recommends continued collaboration with the State Department of Public Safety Division of Homeland Security, UDOT, UTA, municipalities and counties, and private sector organizations throughout the Wasatch Region in the development, coordination, refinement, training and exercise of emergency preparedness plans.

ACTIVE LIVING PRINCIPLES

The urban centers, transit oriented developments, corridor communities, and livable neighborhoods promoted by the WFRC Growth Principles and the Wasatch Choice for 2040 Vision are designed to help increase walkability and active living principles. A report, developed in 2006 and entitled Public Health and Transportation: Planning for Active Modes Along Utah's Wasatch Front was presented this year to the Wasatch Front Regional Council. This study considered the people of the Wasatch Front relative to their general health, travel behavior, existing infrastructure for walking and bicycling and the influence on active living, the role of urban form, specific programs, community design, and funding sources.

Recommendations

Various national studies have found that communities that provide for more walking and biking improve the overall health of residents. The active living report makes several recommendations for policy approaches that were adopted by the Wasatch Front Regional Council in 2006. These policy approaches are designed to increase physical activity in local settings, as well as to help people adopt healthier life styles. The following policy approaches and specific recommendations have been carried over from the 2007-2030 RTP and are incorporated as part of the 2040 RTP.

- Promote complete street designs and adopt ordinances which provide adequate infrastructure for all modes of transportation when building new or reconstructing existing streets.
- Encourage provision of adequate active links to new

transit stations/stops as well as improved access for existing transit, including safe convenient bike paths and pedestrian routes.

- Incorporate bicycle parking and storage in key transit oriented locations.
- Recommend a four foot paved shoulder along new or improved shared roadways to improve the safety and convenience of bicyclists and motorists.
- Designate connected bicycle routes throughout the Region that are distinctly separate from the automobile rights-of-way to serve as arterials for active modes.
- Recommend that new sidewalks provide at least a 3-foot buffer in all urban areas to separate pedestrians from faster moving vehicles, such as bikes and automobiles. Where providing a 3-foot buffer may not be possible, a 6-foot sidewalk next to the curb and gutter would be sufficient.
- Identify appropriate locations to incorporate shared use paths along rivers, canals, utility rights-of-way, railroad or freeway corridors, within or between college campuses, parks and cul-de-sacs, and anywhere else natural barriers exist.
- Incorporate proper signage, as well as specific surface treatments for active trails, to clearly separate them from vehicle rights-of-way.
- Through the implementation of the Wasatch Choice for 2040 Vision and Growth Principles, encourage municipalities and counties to designate land uses that enhance active living and to make provisions for active transportation choices in their general plans.

MULTI-MODAL APPROACH TO ROADWAY INVESTMENTS

The streets of cities and towns are an essential part of the communities. They allow children to access school and parents to travel to work. They bring together neighbors and draw visitors to neighborhood stores. Communities are asking their planners and engineers to build roads that are safer, more accessible, and easier for pedestrians, bicyclists, and public transit patrons of all ages and abilities to use, as well as the vehicle operators. In the process, they are creating better communities for people to live in, play, work, and shop. Facilities that attempt to balance the needs of all modes and the communities in which they are located have been called Complete Streets and Context Sensitive Solutions. In March, 2010 Secretary of Transportation Ray LaHood issued a new policy statement that calls for the full inclusion of pedestrians and bicyclists in transportation projects, with particular attention paid to transit riders and people of all ages and abilities. Amongst statement details are the following:

- A "well-connected walking and bicycling design should be a part of Federal-aid project developments."
- "Legislation and regulations exist that require inclusion of bicycle and pedestrian policies and projects into transportation plans and project development. Accordingly, transportation agencies should plan, fund, and implement improvements to their walking and bicycling networks, including linkages to transit."

- 'United States Code and the Code of Federal Regulations in Title 23-Highways, Title 49-Transporation, and Title 42-The Public Health and Welfare. These sections, describe how bicyclists and pedestrians of all abilities should be involved throughout the planning process, should not be adversely affected by other transportation projects, and should be able to track annual obligations and expenditures on non-motorized transportation facilities.'

There is no singular design prescription for streets that meet all needs of a community. However, streets all have two things in common: 1. every investment in streets start with early attention to the community context and multi-modal potential; and, 2. streets are designed to balance safety and convenience for all users.

The Benefits of Investing With All Users in Mind

The benefits of investing in our public rights-of-way with all the users in mind can be far reaching. Doing so facilitates our regional visioning efforts, it improves public health and safety, it empowers the disadvantaged among us, and allows us all to live more financially and ecologically sustainably. Extensive information from the CompleteStreets.org and the US Department of Transportation was used in this discussion.

The Wasatch Choice for 2040 Visioning Process has singled out areas for urban, mixed use, rural, and open space land uses and has for a major objective reducing vehicle miles traveled per capita. However, the vision cannot accomplish its objectives without a supportively designed road system. Appropriate land uses, regardless how well planned, will not reduce single occupant vehicle trips unless the road system serves not only vehicle drivers but the potential pedestrian, cyclists, and transit patrons. Density without good pedestrian and bicycle access to transit does not alleviate congestion and complementary land uses separated from each other by a nearly un-crossable street are of little benefit.

The 2001 National Household Transportation Survey finds that 50 percent of all trips in metropolitan areas are three miles. In addition, 28 percent of all metropolitan trips are one mile or less – distances easily traversed by foot or bicycle. About 44 percent of morning peak hour vehicle trips are not work related. Instead, these trips are for shopping, going to school or the gym, or running errands. Parents cite traffic as a primary reason for driving children to school. However, in choosing to drive they add 7 to 11 percent to the total of non-commuting vehicle traffic during morning rush hour.

Many local trips could be made by walking, bicycling, or taking transit if people were provided with attractive, safe facilities to utilize. Shifting even a small portion of travelers out of single occupancy vehicles can have a big effect on congestion. In 2008, when national vehicle miles traveled (VMT) dropped by 3.6 percent, congestion plunged 30 percent in the nation's 100 most congested areas. Currently, short bicycling and walking trips account for 23 billion miles traveled annually. For typical U.S. cities with populations over 250,000, each additional mile of bike lanes per square mile is associated with a roughly one percent increase in the share of workers commuting by bicycle. Streets that are well designed for transit can encourage more people to get out of their cars and onto the bus. Such streets provide accessible bus stops and assist buses in moving through traffic. Since 2000, Enhanced Bus (BRT 1) service in Los Angeles has used a priority signal system that allows buses to extend green lights or shorten red ones. Within the first year of operation, travel time on transit buses decreased by 25 percent and ridership increased by more than 30 percent. Additionally, the California Center for Innovative Transportation found a 7 percent increase in traffic flow during morning rush hour and a 14 percent decrease in total time spent in congestion since the Orange Line Bus Rapid Transit line (BRTIV) began operating.

The participants in the extensive Wasatch Choices public involvement process recognized how essential multi-modal streets are to this vision. Eighty-four percent of participants named Transit Oriented Emphasis as their first or second ideal mix of transportation facilities and eighty-one percent named the Walkable Boulevard Emphasis whereas only 23 percent named Decentralized Employment Center and 20 percent Business As Usual as their first or second choices for transportation mix.

In 2007, there were 4,654 pedestrian deaths and 70,000 reported pedestrian injuries nationally. Pedestrian injury is a leading cause of unintentional, injury-related death among children, age 5 to 14. In 2008 over 175,000 pedestrians and cyclists were killed or injured. Facility design seems to be critical aspect of these tragic events. Pedestrian crashes are more than twice as likely to occur in places without sidewalks. Streets with sidewalks on both sides have the fewest crashes. More than 40 percent of pedestrian fatalities occurred where no crosswalk was available. One study found that geographically designing for pedestrian travel by installing raised medians and redesigning intersections and sidewalks reduced pedestrian risk by 28 percent. Riding bicycles on sidewalks, especially against the flow of adjacent traffic, is more dangerous than riding in the road due to unexpected conflicts at driveways and intersections. On-road bicycle lanes reduced these accident rates by about 50 percent.

The latest data show that 32 percent of adults are obese, the number of overweight or obese American children nearly tripled between 1980 and 2004. Childhood obesity also tripled during this timeframe. Health experts agree that a big factor is inactivity – 55 percent of the U.S. adult population falls short of recommended activity guidelines, and approximately 25 percent report being completely inactive. Inactivity is a factor in many other diseases, including diabetes, heart disease, and stroke. Streets lacking pedestrian, bike, and transit facilities can mean that many people lack safe opportunities to be active. A comprehensive study of walkability has found that people in walkable neighborhoods had about 35-45 more minutes of moderate intensity physical activity per week and were substantially less likely to be overweight or obese than similar people living in low-walkable neighborhoods. Unlike a gym membership, walking requires no more than a pair of suitable shoes and a safe route away from heavy traffic congestion.

Streets within communities must provide safe and comfortable travel for everyone, including the young, the elderly and people with disabilities. In total, the young, the elderly and people with disabilities make up around half of the population of Utah and many of these people do not drive. Yet, our public rights-of-way put them at a disadvantage by not accommodating them. All too frequently this leads to lost economic opportunities, isolation, health and safety issues, higher transportation costs, and more reliance upon society for the less fortunate among us.

In 1990, those under 18 years of age accounted for about 31 percent of all Utahans'. Many of these people are unable to drive or do not have access to an automobile. For our youth that do not have good pedestrian, bike, or transit facilities, this can lead to isolation and inactivity. For the very youngest this lack of perspective on the part of road planners is a personal safety issue. As indicated above, pedestrian injury is a leading cause of unintentional, injury-related death among children, age 5 to 14. For our older low income youth it can be a serious impediment to getting to much needed work.

Senior citizens are a quickly growing segment of our society. In 1990, senior citizens accounted for about 9 percent of all Utahans' and the US Census forecasts that the number of seniors will more than double with some of the most significant changes coming in the older segments of the senior citizen population. Those with disabilities account for 13 percent of Utah's population. Many of the elderly and disabled also are unable to drive or do not have access to an automobile. Yet, often our roadways are difficult to navigate for people who use wheelchairs, have diminished vision, can't hear well, or for people who move more slowly. Unpaved surfaces and disconnected, narrow, or deteriorated sidewalks discourage wheelchair travel and the lack of a curb ramp can force a pedestrian into the street. Wide intersections designed to quickly move motorized traffic may not provide enough time for someone with a disability to cross safely. Pedestrian signals that use only visual cues can lead to dangerous situations for those with low vision.

Many older adults will continue to drive for most of their trips, but some will face physical and cognitive challenges that must be addressed to enable their continued mobility and independence. In 2008, older pedestrians were overrepresented in fatalities; while comprising 13 percent of the population, they accounted for 18 percent of the fatalities. Designing a street with pedestrians in mind – sidewalks, raised medians, better bus stop placement, traffic-calming measures, and treatments for travelers with disabilities – may reduce pedestrian risk by as much as 28 percent.

In 2009 nearly twelve percent of all Utahan's lived under the federal poverty level. To put that into perspective a family of four would need to make less than $23,000 a year to be considered impoverished by federal standards. About one-third of these people and more than twice the proportion of those newly impoverished in the last ten years live in the more auto dominated suburbs. Transportation is the second largest expense for American households, costing more than food, clothing, and health care. Even prior to the recent run-up in gasoline prices, Americans spent an average of 18 cents of every dollar on transportation, with the poorest fifth of families spending more than double that figure. Much of this household transportation expense is pumped directly into the gas tank. The United States uses 20 million barrels of oil per day and over 40 percent of American oil consumption goes to passenger cars. Using public transportation helps the United States save 1.4 billion gallons of fuel annually, which is 3.9 million gallons saved every day. That translates into family savings. In fact, a two-person adult household that uses public transportation saves an average of $6,251 annually compared to a household with two cars and no public transportation accessibility. Improving access to transit also reduces the dependence of those who are disadvantaged on more costly alternatives, such as paratransit or private transportation services.

In short, the USDOT Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations may say it best. "The establishment of well-connected walking and bicycling networks in an important component for livable communities, and their design should be a part of project developments. Walking and bicycling foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use."

Recommendations for WFRC Actions

Federal, State, Regional and Local governments need to

FIGURE 7-8

Recommended WFRC Actions to Accommodate Multiple Modes in Public Rights-of-Way

- Adopt a Wasatch Front Regional Council Complete Streets Policy
- Expand the Wasatch Choice for 2040 vision to include a functional classification system for the existing and future road network which recognizes land use, development type; existing and future modal mix; trip type; and regional and community objectives as a guide to amenity placement.
- Encourage jurisdictions to adopt pedestrian, bicycle, and transit elements in their General Plans, internal policies and ordinances.
- Encourage the use of the best currently available standards and guidelines such as the AASHTO Guide to AASHTO's A Policy on Geometric Design of Highways and Streets; the Institute of Transportation Engineers "Design and Safety of Pedestrian Facilities", and the U.S. Departmentof Transportation sponsored Designing Sidewalks and Trails for access Part II: Best Practices Design Guide.
- Develop a best practices manual for the region.

work in concert to apply multi-modal accommodations across jurisdictional boundaries and to all roads regardless of which government agency "owns" them. Nineteen States have established internal policies and/or legislation to guide the accommodation of multiple modes in the public rights-of-way including our neighboring state, Colorado. Nearly 200 local or regional jurisdictions including Salt Lake City and Salt Lake County have adopted express policies and processes for the accommodation of multiple modes in their public rights-of-way. With regard to the role of Metropolitan Planning Organizations, the Federal Highway Administration states that "MPOs hold the greatest responsibility for adopting livability goals and promoting concepts such as complete streets in an urban region." Some of the things that MPOs can do include:

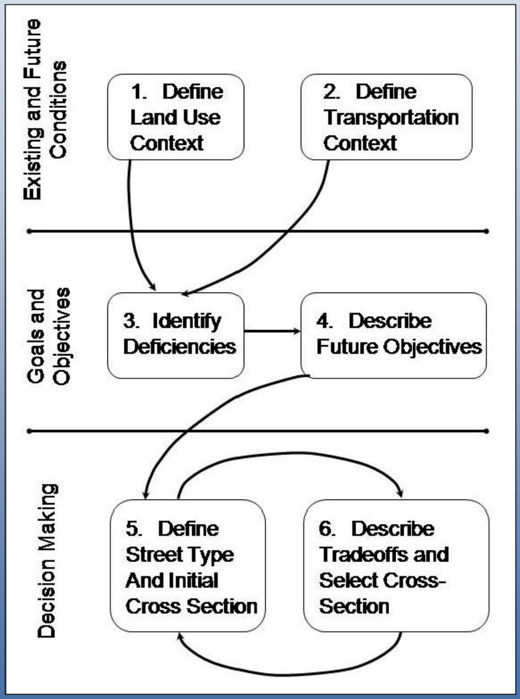
1. Setting regional goals and commitments (San Antonio MPO);
2. Including multimodalism in determining funding priorities (Bloomington MPO);
3. Ensuring that a robust public involvement process includes key stakeholders, interest groups, and the public; and,
4. Coordinating regional planning with local transportation and comprehensive plans to include not only roadways but also facilities and systems related to transit and non-motorized traffic (Cheyenne MPO).

The Regional Transportation Plan recommends that WFRC develop a set of policies and planning efforts to support the federal and local efforts to better accommodate pedestrian, bike, and transit uses on our public rights-of-way. The specific recommendations are in Figure 7-8, on the following page:

One of the most cited local efforts to include consideration of all modes into the public rights-of-way is that of Charlotte, NC. Charlotte uses a road functional classification system which recognizes land use, community character; existing and future modal mix; trip type; and regional and community

FIGURE 7-9

The Charlotte Road Designation Process



objectives as a guide to road design. Each facility segment is broadly assessed for its needs using the six step process outlined Figure 7-9.

Appendix T briefly describes the state of the region to include a city by city survey of sidewalks and bike lanes, a survey of pedestrian and bike facilities on bridges and other crossings, and Salt Lake City and Salt Lake County's Complete Street Efforts. It also provides information how a jurisdiction may go about accommodation of multiple modes in their public rights-of-way to include excerpts from Charlotte, North Carolina's nationally recognized urban street guidelines; brief discussions of potential roadway treatments; and financing possibilities.

TOOELE COUNTY

In November, 2004 Grantsville City, Tooele City, and Tooele County established the Tooele Valley Rural Planning Organization (RPO) in order to cooperatively plan transportation system improvements and priorities for the eastern portion of the County. UDOT has funded most of the work of the WFRC staff in assisting the local jurisdictions in developing plans and establishing priorities. Both UDOT and UTA have been active participants in the RPO process. One of the principal products of this effort is the *Tooele Valley Regional Long Range Transportation Plan*, completed in October, 2006. This plan addresses highway and transit capacity needs and also contains recommendations related to bicycle facilities, safety, and intelligent transportation system improvements. An extensive needs assessment was conducted, including input from the general public and elected officials. Also, several alternatives were evaluated in determining how best to serve traffic moving to and from Salt Lake County. Map 7-11 on the following page includes both project type and phase of the highway projects recommended in the *Tooele Valley Regional Long Range Transportation Plan*.

Recommendations

The Tooele Valley Plan includes the following specific recommendations:

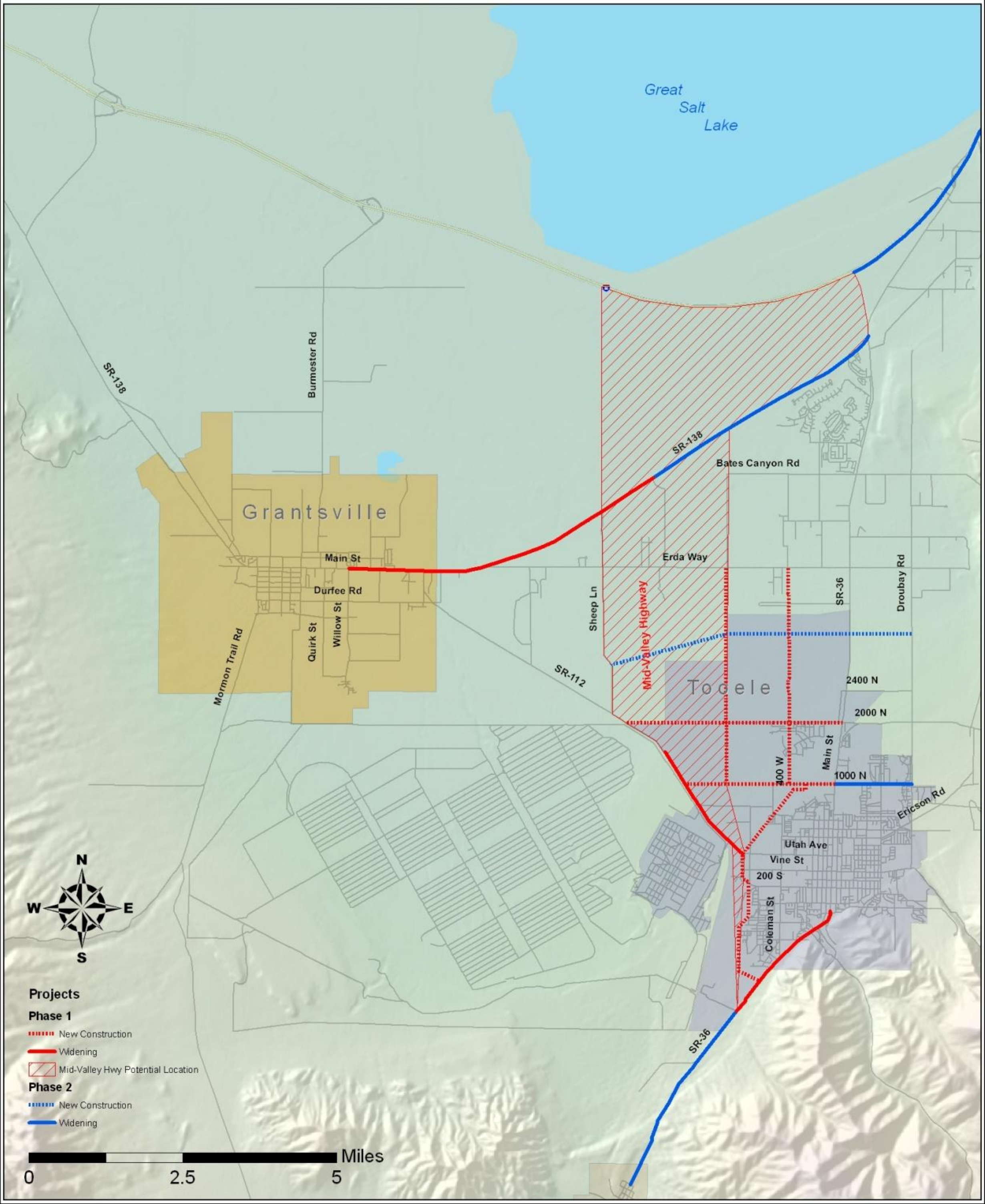
- Construct an additional north-south high-speed facility in the Tooele Valley to address the demand for travel to and from Salt Lake County. An environmental study of the preferred corridor is currently underway
- Triple peak period transit service between the Tooele Valley and Salt Lake County
- Construct several other highway capacity improvements called for in the Plan to address travel demand within the Valley
- As population and employment reach sustainable thresholds within Tooele Valley, increase local bus service

MORGAN COUNTY

With the support of the Morgan County Council and the Morgan City Council, the Regional Council began a study of transportation needs in Morgan County in July 2006. With the assistance of City, County and UDOT staff, the Regional Council prepared a comprehensive review of transportation needs and proposed improvements. Since that time, the Regional Council has helped fund, and provided staff support for a visioning process to help guide growth in Morgan County. Subsequently, in 2010, the Regional Council gave financial

Map 7-11, PLANNED 2030 HIGHWAY IMPROVEMENTS FOR TOOELE COUNTY

Recommended 2030 Highway Improvements



support for an update of the Morgan County Master Plan, based on the visioning process completed earlier. The following is a list of recommendation from the Morgan Visioning Study.

Recommendations

- Maintain a long-term, regional perspective to ensure quality of life for future generations.
  - Prioritize and coordinate implementation activities
  - Measure the progress of Envision Morgan implementation
  - Update county and city general plans to ensure consistency with Envision Morgan
  - Develop specific ordinances to implement the Vision
  - Guide growth into preferred locations, specifically in already established town centers
  - Work toward focused resort centers that make the most of Morgan County's natural amenities without unduly sacrificing them
- Guide growth into efficient patterns emphasizing complete streets and walkable communities
  - Create water efficient landscaping standards
  - Require an impact analysis of proposed real estate development projects.
  - Determine acceptable impact standards
- Conserve open lands for future generations through the creation of a complete data set identifying existing open lands, soils, wetlands, geologic hazards, historically or culturally significant areas, the proximity to land already preserved by federal, state or local or other conservation agencies, and other significant evaluation criteria
- Focus growth in mixed-use neighborhoods and communities
  - Create zoning ordinances that encourage blending a variety of uses and housing types in Morgan City and the unincorporated community of Mountain Green
  - Create neighborhood centers and focus growth around them
- Create a variety of housing options to meet the needs of people of all income levels, family types and stages of life
  - Create flexible zoning codes that encourage a range of housing sizes and types
  - Replace minimum lot sizes requirements with net density standards
  - Consider incentivizing major developments to provide affordable housing
- Use growth tools that allow for real estate development while permanently preserving open lands
  - Adopt a policy encouraging conservation easements
  - Adopt zoning codes that allow clustering of development while retaining overall density requirements
  - Implement a program to facilitate the appropriate transfer of development rights.
- Expand economic and educational opportunities. Seek out, embrace and invest in opportunities for economic growth
  - Conduct an economic baseline analysis
  - Develop a method for measuring progress toward achieving desired outcomes
  - Identify and prioritize sites that should be reserved for employment uses
- Provide recreational opportunities for residents and tourists alike
  - Provide public access to land for a range of recreational uses
  - Create strategies to work with private landowners envisioning resort development or other recreational land uses

PUBLIC INPUT ON PLANNED IMPROVEMENTS

In addition to the comment by comment summary included in Appendix D to the Regional Transportation Plan: 2011-2040, a brief summary is included here describing the primary comments and responses received during the formal public comment period for the 2040 RTP which ran from February 16, 2011through March 18, 2011. It should be noted that there were other comments not addressed in this document directed mostly to individual projects. A complete record of these comments are noted and answered in the comment by comment summary in Appendix D to the 2040 RTP. There are many comments that are not reflected in this section.

The Regional Council received hundreds of comments through the scoping, alternatives financially unconstrained draft, and the financially constrained final draft. As noted above, the vast majority concerned individual highway and transit projects. This section is primarily for region wide issues, not individual projects.

Issue Financial resources should be re-directed from highways to public transit.

Answer The Regional Council seeks a 'balanced' transportation system which incorporates the best features of each mode. Therefore, even though current transit usage is a small proportion of all trips, transit investment accounts for 31 percent of capital expenses. Other, larger urban areas within the country have sought such a balance and portions of the Wasatch Front are beginning to reach that threshold where a more mature, urban transportation system is necessary.

Also, financial resources are assigned to transit or highways by federal, state or local legislative bodies and, generally, may not be re-directed by the Regional Council. The United States Congress appropriates money through the federal transportation program which proscribes the end usage of the money granted. With some small exceptions, these funds are earmarked for highways or transit and may be redirected by state or local agencies only in very limited circumstances. Certain funding designated for the Interstate Maintenance Program could be redirected to transit at the request of the Governor. However, given the needs for maintenance within the Interstate System, this possibility should be considered unlikely.

The Regional Council chooses to fund numerous transit projects with the federal funding it does control, such as the Sandy 10000 South transit oriented development project, various park-and-ride lots and the van pool program. The Utah State Constitution requires all taxes on liquid motor fuels be dedicated to highway construction, maintenance and operation. Any redirection of these funds to transit would require a constitutional amendment. The Utah State Legislature has appropriated certain general sales tax monies to the transportation fund for the purpose of accelerating selected high priority highway projects. Any changes in the use of those funds would require approval from the Legislature.

The Utah State Legislature has allowed the county councils of governments to pursue sales tax increases for highway or transit projects. To date, transit has received the lion's share of those funds available for local prioritization, especially in Salt Lake County. Additionally, transit is contemplated to receive a large percentage of future local sales tax monies in plans adopted by the Davis County and Weber County Councils of Governments.

Lastly, the draft RTP calls for a heavy investment in new BRT lines across the entire region and new streetcar lines in downtown Salt Lake City and downtown Ogden.

Issue Air Quality concerns would suggest that most future road building be curtailed and future expansion of transportation facilities be mostly transit.

Answer Air quality is better today than it was 20 years ago. The Air Quality Conformity Memorandum 27 accompanying the 2040 RTP demonstrates that mobile source pollution will continue to decrease and that total vehicular emissions 20 years from now will be less than they are today. These improvements are mostly the result of improved engine and pollution control technology, particularly in diesel engines. A small portion of this improvement will be due to increased transit usage and reduced congestion. Also, while the introduction and growth of plug-in hybrid and electric vehicles have not been programmed into the air quality model, it is anticipated that as they become an ever larger portion of the vehicle fleet, the air quality benefits will be significant.

The Wasatch Front Region has met air quality conformity targets for several years and projected mobile source pollutants within the current 2040 RTP will also be met. Even with the tighter standards for PM 2.5, the 2040 RTP meets all air quality conformity tests.

Issue The 2040 RTP commits a grossly disproportionate 31 percent of capital construction funding to transit when it represents only 1.5 percent of all passenger miles traveled in the Region.

Answer The Regional Council understands that the 2040 RTP proposes a very large transit plan relative to current usage. This is because the Regional Council is seeking for a 'balanced' transportation system that incorporates the best features of each mode. For example, in certain highly congested corridors, capacity cannot easily be increased. However, TRAX or commuter rail cars could be added at much less cost than building more capacity. In addition, in larger, more urbanized areas of the country, it has been shown that while free flow on a freeway lane may collapse under demand of more than 2200 vehicles per hour, a fixed guideway transit system will keep moving, even when it is packed with patrons. The Wasatch Front Region has begun to reach that threshold in certain areas and, therefore, need the transit program as outlined.

Issue The sequencing of transit on 5600 West after the construction of the Mountain View Corridor (MVC) is contrary to the vision agreement in the MVC EIS.

Answer The agreement calls for the Bus Rapid Transit 3 facility to be built in the same phase of the RTP as the freeway portion of the MVC. Both those facilities are in Phase II of the RTP.

Issue Highways will only induce more demand and sprawl.

Answer Highway construction generally follows rather than precedes demand due to funding constraints. Were new highways to be built into lightly populated areas they could indeed induce demand. Growth projections show demand keeping well ahead of future highway construction.

In order to help reduce sprawl and the growth in vehicle miles traveled (VMT), the Regional Council has adopted a vision for growth and development, the Wasatch Choice for 2040. and the associated growth principles. Those growth principles, which have become the foundation for the 2040 RTP, include such elements as the creation of regional centers served by high capacity transit, encouraging contiguous development, and the shifting of employment toward residential areas to minimize the need for travel.

The Regional Council is a partner in a consortium that received a $5 million grant from the U.S. Dept. of Housing and Urban Development to promote the Wasatch Choice for 2040. The Regional Council is now actively participating in efforts to further implementation of that "Vision".

Issue The model used to predict transit ridership is "notoriously unable to predict transit ridership."

Answer The travel models have recently been upgraded with 2006 data from UTA's On Board Survey. Generally, models are used only as a tool among others and are compared to actual data as it becomes available. Also, the 1993 Home Interview Survey has been updated with information from the 2000 Census and the 2001 National Household Travel Survey. Lastly, the Regional Council, in partnership with UDOT, UTA and the other MPOs will conduct a new Home Interview Survey in 2011 to further validate the model.

Issue The plan does not specify the importance of sidewalks for pedestrian, and bike lanes. The importance of bike lane and sidewalk design, especially around transit stops, cannot be over stated.

Answer The Regional Council agrees on the need for additional non-motorized transportation improvements. To this end, the bicycle portion of the 2040 Plan includes a "complete streets" provision meaning all highway projects should provide for non-motorized travel needs.

Issue East/west travel capacity is sorely needed in all three urban counties.

Answer The Regional Council has long been aware of the need for additional east/west capacity. To meet this growing need, the 2040 RTP calls for a dramatic expansion of east/west capacity in the form of multiple bus rapid transit lines, several improved arterial streets and two freeways (the western portion of SR 201 and the southern portion of the Bangerter Highway) within the western portion of Salt Lake County. East/west arterial and transit improvements in Davis County and Weber County are also a central element of the 2040 RTP.

Issue There were a number of comments supporting the construction of a streetcar from the Ogden intermodal center to Weber State University, and limiting expansion of Harrison Boulevard with the exception of operational improvements.

Answer The Regional Council agrees, based on the latest data and ridership estimates including the ongoing EIS, that the streetcar project to Weber State University should proceed in Phase I of the 2040 RTP. After consultation with the Ogden City Council, the Mayor and UDOT, it was agreed that the widening of Harrison Boulevard will occur only south of 40th Street.

Issue The West Davis Highway, in its projected configuration as a freeway, will induce sprawl and is beyond what is needed for the area. Construction of the road as an arterial street with at-grade intersections would meet needs and not induce sprawl.

Answer The project level EIS being conducted by UDOT has recommended a freeway level of service based on the Tier I analysis and that grade separated interchanges would be necessary to meet the purpose and need for the highway.

Issue The Regional Council has not incorporated ‘green’ infrastructure elements into the RTP.

Answer The Regional Council has funded and carried out a study on the need for ‘green’ infrastructure and possible implementation of recommendations. The study is still ongoing. Nevertheless, many of the findings have been incorporated into the RTP.

Plan Impacts & Benefits

Chapter 8

A Carefully Evaluated Plan

The 2040 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 2040. The goals and objectives for the RTP, as discussed in the “Goals and Objectives” section of Chapter 1, helped form the basis for this evaluation. The 2040 RTP was also analyzed with regard to its conformity with state air quality plans, potential mitigation measures to minimize project impacts, and other factors.

The emphasis of these evaluations was to identify issues that could prevent the implementation of recommended projects or would need to be addressed further in the preliminary engineering phase of project development. In addition, the evaluation considered locations where congestion is still expected to exist in 2040, even with the recommended 2040 RTP highway capacity improvements. This facet of the evaluation process is important in that it will encourage planners to continue pursuing strategies that could be considered for reducing or eliminating congestion at these locations.

Photo at Left: 9000 South / 9400 South in Sandy at the Quarry Bend Development. Once a gravel pit, this 100-acre mixed use development includes townhomes, retail, trails, and 8-acres of parks / greenspace. The Quarry Bend Development is a classic example of the many dynamics that influence planning.

SOCIAL IMPACTS AND BENEFITS

Transit, highway, and other projects and facilities identified in the 2040 RTP are socially beneficial. Such improvements help reduce congestion in the short term, while providing enhanced land access to improve the quality of life. On the other hand, poorly planned projects can have adverse social effects on existing urban areas and on future development. Negative social impacts include increased noise, neighborhood disruption, and residential and commercial dislocations. This section discusses the 2040 RTP's potential impacts on land use, relocations and neighborhood disruption, housing goals and strategies, school safety, cultural resources, and disadvantaged groups.

Land Use

The connection between land use and transportation has been studied by planners and engineers for many years. Traditionally, extending a region's transportation network opens up additional land for eventual development. In turn, newly developed land with its increase in travel demand may require improvement of the existing transportation network. It is evident in the Wasatch Front Region that transportation improvements are not keeping up with the growth in travel demand. The rapid growth of the suburbs during the past several decades has created very significant changes in urban travel patterns. One of those changes is an increase in suburb-to-suburb travel. The trend to further decentralization and the attendant dispersal of population and employment, gives rise to the emergence of significant suburban commercial / industrial traffic generating activity nodes. This trend is expected to continue for the foreseeable future. New development has occurred without the supporting transportation improvements needed to serve it. This situation will place even further demands on the transportation system that, without huge future investments, will not keep up with demand. This situation may result in continued congestion in the growing parts of the Wasatch Front Region.

In order to avoid or mitigate the effects of congestion, it will become increasingly important to coordinate local government land use plans and zoning ordinances with the regional transportation planning process. Local planners must carefully consider the transportation implications of their land use recommendations. Concurrently, regional transportation planners must strive to match recommended transportation investments to changing land use patterns. Implementation by local governments of the Wasatch Choice for 2040 Vision for land use and transportation will help reduce congestion through the establishment of additional activity nodes, corridors of mixed use, and transit oriented development. This approach will bring jobs, housing and transportation facilities closer together. Adopting policies needed to implement the Vision will reduce the need for vehicular travel and the resulting congestion.

The Wasatch Front Regional Council, in cooperation the local governmental jurisdictions, continues to coordinate transportation planning with local land use planning. The process used in the development of the 2040 RTP gave significant consideration to the location of future population, employment, and other variables that are factors used in estimating transportation demand. Both population and employment projections were correlated with the land use provisions of each local government's General Plan, the Wasatch Choice for

2040 Vision, and the Growth Principles, which were first developed in the Wasatch Choices 2040 visioning effort. The Wasatch Choice for 2040 land use Vision and land use and transportation planning information from the Region's local jurisdictions' general plans, were inputs to the transportation planning process. During the planning process, the WFRC made considerable efforts to create a Plan that would best support the Wasatch Choice for 2040 Vision and the official land use and transportation policies of its member entities.

Relocations, Neighborhood Disruption, and School Safety

Relocation and neighborhood disruption impacts vary with the type of transportation project proposed. Generally, relocation impacts are determined by the distance structures are "set back" from the existing street rights-of-way and the amount of right-of-way required for the project. Neighborhood disruption impacts occur when homes, businesses, or community institutions are physically removed from the neighborhood or when the roadway becomes a barrier to neighborhood interaction.

Relocation of homes and businesses may result of from the implementation many of some projects in the 2040 RTP. Most relocations will be relatively minor. The projects on the 2040 RTP will require the acquisition of an additional 7,200 acres of rights-of-way from an estimated 22,000 parcels. Freeways, expressways, and six and eight-lane principal arterials have the greatest potential to disrupt neighborhoods and create barriers.

Mitigation - During project design, relocations may be avoided by shifting the highway alignment to limit impacts. Relocation impacts can also be mitigated by following federal relocation guidelines, which provide for relocation assistance and other benefits. Neighborhood disruptions may be minimized by providing pedestrian and bicycle crossing facilities, maintaining local street inter-connectivity, depressing the roadway to limit visual intrusion and/or providing impacted neighborhoods with other resources to mitigate losses.

School Safety

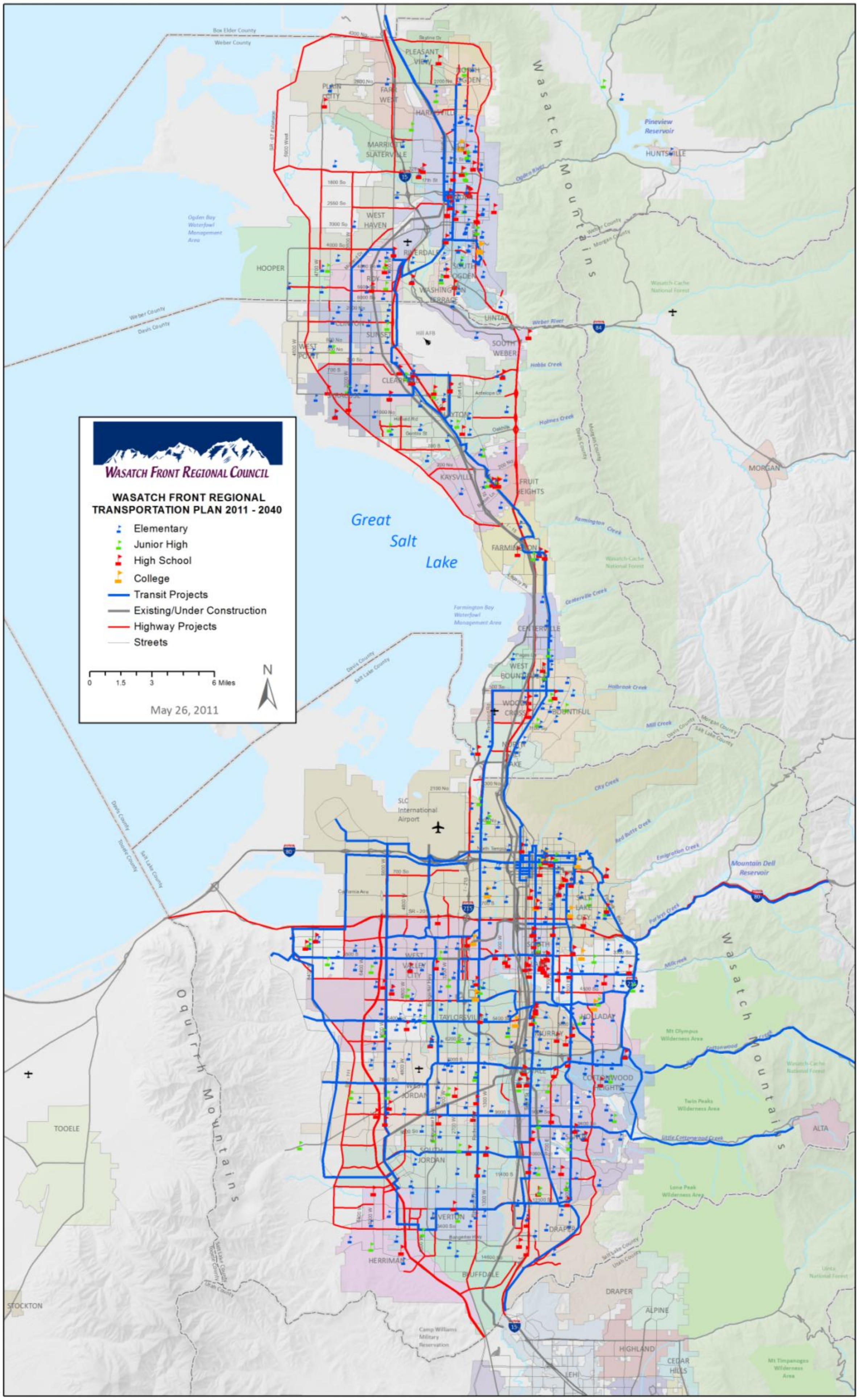
School safety impacts resulting from roadway projects vary according to the nature of the roadway change, the type of school involved, and the traffic exposure student pedestrians may be subjected to. For this report, projects with potential for unusual or major impacts on safety are those involving the widening of an existing road from 4 or less lanes to 6 or more lanes within the designated "walk-to-school" area of an elementary or junior high school. Local school districts were contacted to identify these walk-to-school areas. The state does not provide for the busing of students living within 1.5 miles of an elementary school or two miles of a secondary school. Projects on the 2040 RTP project list are estimated to be in immediate proximity to 476 schools. The average concentration of children in census block groups impacted by the projects is 30 percent of the total population within these block groups. Map 8-1 shows the location of elementary schools, junior high schools, high schools, colleges and universities within the urbanized area in relation to the proposed projects.

Mitigation – Mitigation strategies for schools may include adjustment of project rights-of-way requirements in proximity to schools, provided adequate temporary or permanent pedestrian facilities adjacent to new or widened highways. Additional safety improvement would include adequate crossings with signals and air quality monitoring stations in proximity to schools that are adjacent or in close proximity to major highways.

Housing Goals and Strategies

The Wasatch Front Region has experienced tremendous growth in the past several years. As a result of this growth, the housing market in the Region has been very dynamic. While housing construction during this time period has generally kept pace with population growth, concerns have been expressed about the type, location, cost and other issues associated with new housing. The overall cost of housing is an issue that has been receiving much attention in recent years. Increases in housing costs within the urbanized area have been some of the steepest in the Nation. Volatility in housing prices due to general economic conditions is another factor that must be considered as well. In response to concerns about escalating housing costs, the State Legislature in its 1996 General Session passed a law requiring local jurisdictions to update the housing elements of their general plans. Specifically, local government plans must include an analysis of the need for moderately priced housing within their jurisdiction and a description of realistic programs and strategies aimed at promoting this type of housing. Many local governmental jurisdictions in the Wasatch Front area have completed the required housing element update. However, others are still in the process of addressing this requirement.

Map 8-1, WASATCH FRONT URBAN AREA SCHOOLS



At the regional level, housing needs have been evaluated through a number of studies needed to generate comprehensive housing affordability strategies. More recently, broad based consolidated plans, largely concerned with housing and supporting infrastructure, have been required by the Department of Housing and Urban Development (HUD) in order for states and local jurisdictions to make use of various funding programs. These processes have identified general housing needs and have led to the creation of plans and strategies aimed at meeting these needs.

In addition to impacts on housing location, transportation projects can have direct impacts when relocations are required. Improvements proposed in the 2040 RTP have been reviewed to determine if there are potential conflicts with local and regional housing goals and strategies. Generally, there appear to be few projects that would present such conflicts. Most new highway construction or widening projects included in the 2040 RTP may require a very limited number of dwelling units to be removed. However, two major highway projects will likely require more extensive removal of existing residences. These are the Mountain View Corridor (MVC) in western Salt Lake County, and the West Davis Highway (WDH) in Davis and Weber Counties. Any projects requiring the removal of homes and relocation of families would be subject to, and in accordance with, all applicable relocation and replacement policies.

Mitigation - As might be expected, in the current climate of relatively high housing costs, meeting the basic housing needs of those with very low incomes, or in need of specialized housing opportunities, is a significant concern. Expansion and coordination of area social service programs will likely be required to help meet affordable and specialized housing needs. The Wasatch Choice for 2040 envisions future centers for development in the region providing for mixed use and a variety of housing options to address the need for moderate and low-income housing. These centers will be designed as walkable communities served by transit to provide for improved access between future housing and employment opportunities. WFRC is also part of a consortium that has received a Sustainable Communities grant from the US Department of Housing and Urban Development (HUD). This grant will be used to assist in implementing the Wasatch Choice for 2040, part of which is to develop a regional housing plan. Transportation improvement projects proposed in the 2040 RTP would have little direct impact on housing goals or strategies aimed at meeting these needs. However, additional transit services can provide long term benefits such as improved access to social service providers, employment opportunities, etc. Lastly, when dwelling units need to be relocated, the state and federal governments can provide assistance through established relocation assistance programs.

Cultural Resources

Highway and transit projects can have positive impacts by improving access to cultural resources. However, potential negative impacts include noise, the need to relocate housing and other structures, etc. The evaluation of the 2040 RTP also considered potential impacts on historic districts.

The Wasatch Front Region has a number of national and locally registered historic districts, including University, Exchange Place, South Temple, Avenues, Central City, and Capitol Hill, located in Salt Lake City. Four additional Salt Lake City historic districts: Highland Park; Gilmer Park; Warehouse; and Northwest, are nationally registered. Ogden City has two national and locally registered historic districts: 25th Street and Eccles Avenue. The Jefferson Historic District is nationally registered, and Ogden City planners are considering the creation of the East Central Bench District. Farmington City has a single state registered historic district, Clark Lane. Copperton City, an unincorporated community in Salt Lake County, is listed on the national registry. West Bountiful, Riverton, Midvale, Murray, and Sandy City have older residential and commercial areas that might qualify as historic districts.

The evaluations of potential highway or transit projects in the 2040 RTP with regard to impacts on cultural resources are site specific. Evaluations show that there are approximately 100 historic sites comprising about 16 acres in size or larger, that may be impacted by proposed projects.

Mitigation - Specific impacts on all cultural resources will be identified and mitigation measures determined during the environmental analysis phase of the project development process. If unknown cultural resources are encountered during project development or construction, appropriate investigation and mitigation will take place. Efforts will be made, subject

TABLE 8-1

Summary of Comments Received From Environmental Justice Groups

Group	Summary of Concerns
Community Action Program	UTA's route deviation procedure for impacted populations is working well and should be continued. A three-quarter mile distance away from transit stop is too far for many people to walk and that is especially true for senior citizens. Workforce Services needs better transit connections especially for those needing jobs. We should be more helpful for those unemployed. There are real health concerns within the Salt Lake Valley and air quality issues need to be addressed. More TODs are needed and should be planned now especially since the cost of land continues to climb.
Disability Rights Action Coalition	Limited transportation options for disabled. Our people ride buses. We cannot handle any more fare increases. Transit service is spotty on the eastside, especially south of 8000 South. "UTA is killing its own ridership by moving routes around and then saying there is no ridership." " Flex-Trans seems to be working adequately for now." New money should be spent on buses first, then on fixed guide way projects. The bus shelters along FrontRunner are not ADA accessible.
Indian Walk-In Center	North / south transit in general and TRAX in particular are adequate. More East-west transit service is needed. West Salt Lake County is where the focus needs to be. Don't cut the background bus system any more. More evening and weekend bus service is needed. The emphasis of the Vision on transit oriented developments is good.
NAACP	Our transportation plans funnel everything through Salt Lake City. We need to spread out our urban centers and employment. Many low income workers have to work Sunday shifts and the lack of transit is a problem.
Coalition de la Raza	Separate rights-of-way for buses and auto traffic. Public / private partnerships. Outreach in Spanish. There are few North/South bus routes on the west side. Bus patrons must go east to catch a north/south route and then go back out west. Buses are more flexible than TRAX. Buses should serve human service locations such as food banks, community medical clinics and Utah State Department of Workforce Services offices. Buses often drive right past people wanting to ride to stop a half-mile away.
Salt Lake Area Authority on Aging Board	More East-west transit service. Plan transit around concentrations of seniors.
Future Moves Coalition	Reduce VMT. Integrate the transportation system. Integrate land use and transportation planning. Transit first
Amalgamated Transit Workers Union	Don't put so much money into capital projects that operational budgets are sacrificed.

to federal and state policy, to provide mitigation measures that are easily accessible to the general public. Such mitigation measures might, for example, include the placement of historical information markers, in addition to providing standard documentation.

ENVIRONMENTAL JUSTICE

Environmental Justice embraces the principle that all people and communities are entitled to equal protection under national environmental, health, employment, housing, transportation, and civil rights laws. On February 11, 1994, President Clinton signed Executive Order 12998; Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This order augments Title VI of the Civil Rights Act of 1864, which states in part that, “No person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.” Recipients of federal aid are required to certify compliance with Title VI of the Civil Rights Act of 1864. The United States Department of Transportation must ensure nondiscrimination under Title VI and other applicable laws, regulations, and policies. Federal transportation authorities and the courts have held that Title VI applies to the transportation planning process and all citizens should receive the benefits of, and not be adversely impacted by, regional transportation plans.

Transportation Needs of Target Population

The WFRC conducted a series of outreach meetings with the leadership of local organizations and non-profit groups representing low-income, minority, Native American, disabled, and elderly populations within the Urban Area. The purpose of the 2040 RTP was presented and specific transportation related issues were discussed. A summary of the concerns raised by each group has been provided in Table 8-1. More detailed documentation of these meetings can be found in Appendix U.

Regional Target Population Distribution

As part of its efforts to ensure region-wide environmental justice in the development and implementation of the 2040 RTP, the WFRC documented the distribution of specific, target population groups. Target populations along the Wasatch Front are defined as members of minority groups, Hispanic persons, low-income persons, persons with disabilities, and the elderly, as well as households without cars, as defined in the 2000 Census. Regional non-target populations are those individuals who are not members of the groups listed in the Table 8-1.

Geographic Information System (GIS) technology was applied to compare and map the data as target populations provided by the Census Bureau. Census data at the “block group” level was used for a spatial comparison and for the mapping of target and non-target populations. Those block groups that contain a higher percentage of target populations than the regional averages are identified in Map 8-2. The percentage of the six target categories was calculated for each block group and compared to the regional average. If a block group was below the regional average it was scored with 0 points in the category. If it was greater than the regional average, but less than twice the regional average, it was scored with one point. If it scored higher than two times the regional average, it received two points. With six categories, a total of 12 points is possible. The block groups were categorized as having Low (0-4 points), Medium (4-8 points), and High (8-12 points) concentrations of the target populations. The definition of each target population category is found below.

- **Minority Population** - A member of a minority population is defined as a person that did not check “white” on the 2000 U.S. Census form, which represents a departure from previous censuses. Beginning with the 2000 U.S. Census, individuals were allowed to check more than one race category on the form. Persons who checked white and some other race were not included in the white population. Unfortunately, changes in the 2000 Census make it difficult to compare racial statistics with previous censuses.

- **Hispanic Population** – Hispanic population includes anyone, of any race, who indicated being of Hispanic origin in the 2000 Census.

- **Low-Income Population** - Low-income population is defined as living below the nationally defined poverty level as recorded in the 2000 Census.

- **Disabled Population** – Members of the disabled

Map 8-2, WASATCH FRONT URBAN AREA ENVIRONMENTAL JUSTICE TARGET POPULATIONS

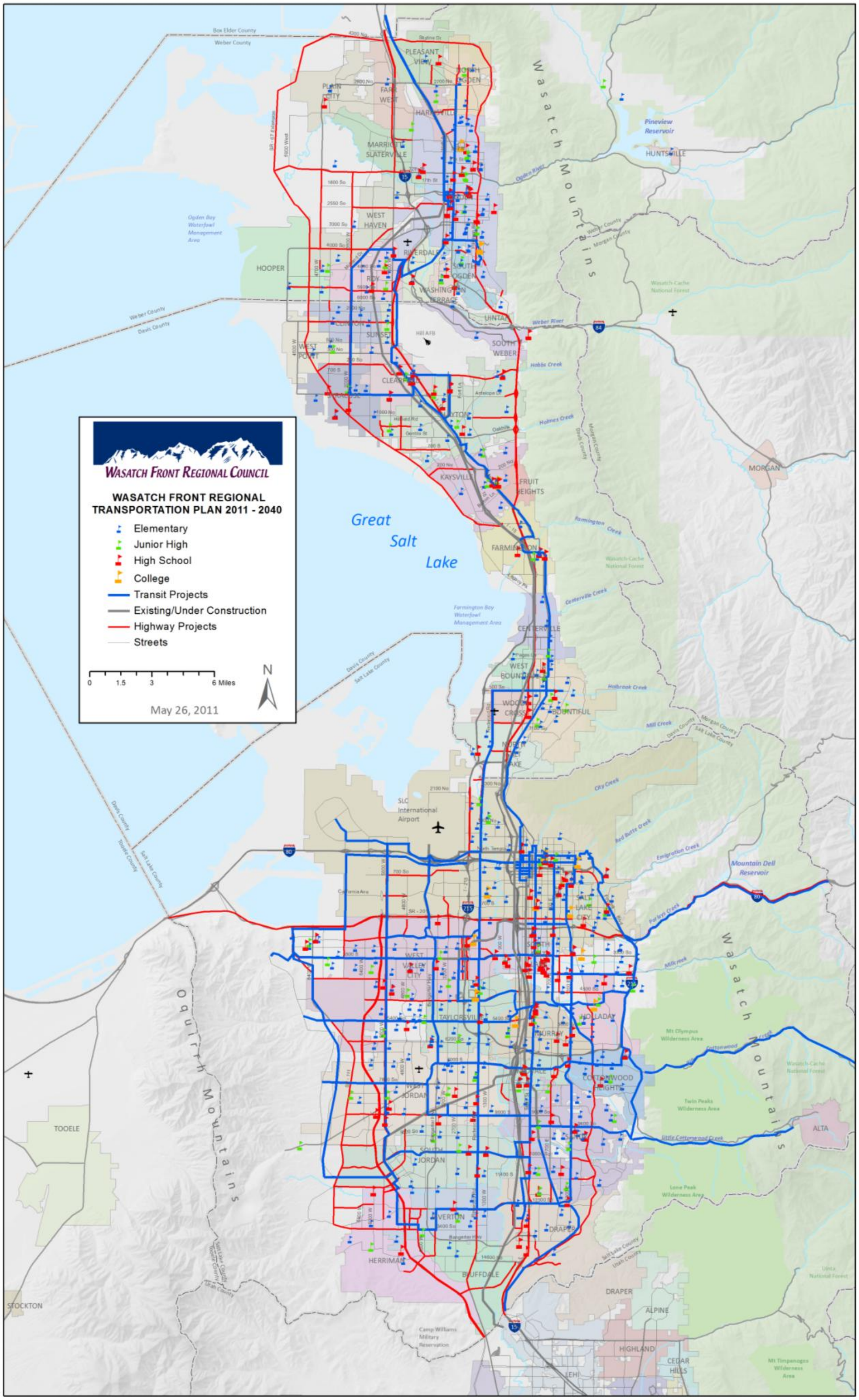


TABLE 8-2

Block Groups Impacted by RTP Projects

Target Populations	Block Groups
Minority	298
Poverty	128
Disability	190

population are persons that indicated that they had a work disability or self-care or mobility limitation in the 2000 Census. The universe that this sample is drawn from is the population of persons over age 16.

- **Elderly Population** - The elderly population is defined as those persons over age 65 in the 2000 U.S. Census.
- **Zero Vehicle Households** – Total households that reported no vehicles available in the 2000 Census is included in the target populations. While the WFRC was not required to analyze this population, it is included because members of this group are transit dependant.

Impacts of 2040 RTP on Target Populations

This comparison, summarized in Table 8-2, evaluated the potential impacts of recommended widening, rights-of-way acquisition, and new construction projects on minority, low-income, and disabled populations. The table shows the number of block groups in each target population category. Note that many of these block groups may fall into more than one category. The potential impacts of planned highway and transit projects on affected targeted populations throughout the Wasatch Front Urban Area is significantly lower than that on non-target groups.

Benefits of RTP for Target Populations

The 2040 Plan provides a number of transit related benefits which will positively impact members of the target populations. The Plan recommends continued growth in rail service and other enhancements funded, in part, by the November 2006 transit tax referendum approved in Salt Lake County. By 2040, the increase in transit service will equal approximately 125 percent of the 1997 bus system.

High frequency bus corridors are planned for the region's most heavily used arterial streets and collector roads. These facilities include 3500 South, 1300 East, North Temple, and Foothill Drive in Salt Lake City, as well as 24th Street, Harrison Blvd, and Washington Blvd in Ogden. Additional light rail corridors are planned, including the Salt Lake International Airport and Draper lines. Regional commuter rail service between Salt Lake City and Utah County is currently under construction.

The Utah Transit Authority continues to upgrade its bus fleet and transit stops to meet the requirements of the Americans with Disabilities Act (ADA). All new buses are equipped with wheelchair lift ramps and secured tie-down positions for disabled patrons. Approved ADA curb cuts, better asphalt maintenance, improved site drainage at bus stops and shelters, and increased time for pedestrians to cross streets will benefit both patrons with disabilities and / or the elderly, as well as the general public.

Safety and Homeland Security

The WFRC does not perceive any social impacts from any of the safety projects, or projects which include specific safety features. Safety projects, and projects including safety features, will provide a direct social benefit to target populations. These benefits will include pedestrian safety, the improvement of intersection safety, the promotion of safer truck travel, the enhancement of railroad crossing safety and bicycle safety.

Similar to safety, security is also considered in the development of a regional transportation plan. The MPO is continuing the coordination effort with regional and local transportation planners as well as its more security oriented partners. In an effort to enhance the security of transportation infrastructure, the WFRC staff requested representatives of the two major regional security organizations the Utah State Division of Emergency Services and Homeland Security and the Utah Local Government Association of Emergency Services / Security, to coordinate with the MPO in their efforts through participation on its Regional Growth Committee. Likewise the MPO is represented on the Utah State Division of Emergency Services and Homeland Security Governing Committee. The State of Utah continues to update the Utah Emergency Operations Plan (EOP), which includes emergency operations procedures for all departments in state government including UDOT. The communications portion of the EOP is essential and includes links to all state, local and federal agencies as well as private industry. The WFRC has also reviewed the Utah Energy Shortage Contingency Plan and UTA's recently published Public Transit Emergency Management Operations and Recovery Plan to ensure proper coordination with the WFRC's on-going planning processes.

The 2040 RTP's recommendations address the security of the transportation system in a number of ways. With increases in the number of lanes at choke points on I-15, I-80 and other facilities in Weber, Davis and Salt Lake Counties, the likelihood of traffic congestion decreases as does the security vulnerabilities at these locations. Similarly, the capacity of the over-all system has been increased and needed redundancy features enhanced with the inclusion of high capacity transit and new and expanded highway facilities. These projects include Light Rail, Streetcar and Bus Rapid Transit lines; and highway projects such as the West Davis Corridor (SR-67 Extension) in Weber and Davis Counties, the expansions of I-15 and US-89 in Davis County, the expansions of SR-201, I-80 and I-15, and the initial construction work on the Mountain View Corridor in Salt Lake County. In summary, these projects decrease congestion by providing drivers with alternative routes and modes, and will increase the security of the transportation system by adding redundancy and decreasing the likelihood of a catastrophic system failure.

Recommended improvements for the Intelligent Transportation System (ITS) program will also enhance the security of the transportation system. Significant portions of the "Commuter Link" system, a computer-controlled system designed to monitor and manage traffic flow on freeways and surface streets, are in operation with information available to the public through the internet. ITS will continue to be improved with the addition of more closed-circuit television cameras, electronic roadway signs, coordinated traffic signals, ramp meters, traffic speed and volume sensors, pavement sensors, weather sensors, and the continued use of the 511 Travel Information Line. Integrally linked to the ITS system, the UDOT Traffic Operations Center monitors and manages traffic flow on surface streets and freeways. UDOT's TOC is connected to smaller traffic control centers in Salt Lake City and Salt Lake County, as well as UTA's three radio control centers. All of these agencies work closely together to improve travel and security along the Wasatch Front.

QUALITY GROWTH

In May 2005, Envision Utah issued a publication titled: Thinking and Acting Regionally in the Greater Wasatch Area: Implications for Local Economic Development Practice. Section V of the publication includes a discussion on economic development and quality growth. Much of what follows is derived from this section of the Envision Utah publication.

Over the past several decades, the economic development equation has changed dramatically. Traditionally, the state attempted to lure manufacturing companies by promising a low-cost business environment. Also, tax breaks and access to "cheap labor, cheap land and cheap money" were driving forces. Geographic location was also an important ingredient to the mix of factors. As the nation has changed from an "industrial economy" to an "information economy," the factors that corporate site selectors consider have also changed. With skills at a premium in knowledge-intensive industries such as biotechnology, software and advanced manufacturing, a good location is now considered one that has, and can attract, a critical mass of educated people.

In this modern age, skilled labor is the single most important input for many companies. While the costs of doing business still matter, companies are often more concerned about locating in a region that will be attractive to the highly skilled employees they seek. The Brookings Institution issued a working paper (Natalie Cohen) wherein a strong connection is made between education and quality of life issues in the business-location decision. Essentially, "quality of life" has become a key competitive advantage in the fierce competition to recruit and retain firms and talent.

Company location determines how far residents must travel to work, and it influences the form of transportation they use to for commuting. Company location also impacts the character of community growth. A company that locates in a central, downtown facility spawns additional retail and service industry growth, contributing to a vital town center. In contrast, a company that builds a new facility on vacant land near a highway interchange reinforces a decentralized growth pattern and dependence on automobiles as the exclusive means of employee transportation.

Business location and expansion decisions need to be coordinated with land use, transportation and housing policies in order for the greater Wasatch Front Region to develop in ways that are efficient, equitable, environmentally-sound and attractive. Economic development officials also need to work together to determine which locations across the Region should be developed and / or preserved for future employment sites. Thinking, planning, and acting as a Region will help preserve the high quality of life that residents value. In contrast, unplanned and uncoordinated job site development has the potential to undermine the attractiveness and competitiveness of the entire Wasatch Front Region.

To achieve quality job growth, consideration should be given to the following factors: (1) labor force, (2) land supply, (3) infrastructure, and (4) community amenities. If all other factors are equal, community amenities often make the difference in a business location decision. Thoughtful municipal planning and coordination and steadfast cooperation between public and private actors is necessary to integrate high-impact, quality growth principles into economic development practice on a region-wide scale. Thus, while it is important to think and act regionally in terms of overall business expansion and recruitment, it is also very important to think about how to prepare the Region's communities to be attractive destinations for high-skill, high-wage companies.

ECONOMIC IMPACTS AND BENEFITS

Ecomonic Development and Redevelopment

The WFRC staff held meetings with representatives of the Governor's Office of Economic Development (GOED) to gather input for the 2040 RTP's Project Lists and to receive insights on the implications for regional economic development. In addition, UDOT, in conjunction with the development of its Statewide Plan, requested input from GOED on the same subject. In response to UDOT's request, GOED prepared a memorandum that identified the most important projects in the state in terms of economic development, using the following criteria: (1) Alignment with industry clusters; (2) alignment with anticipated location of future economic activity; and (3) alignment with planning efforts.

Using GOED's memorandum to UDOT and the results of the WFRC staff's own meeting with GOED personnel as resources, existing and potential sites in the Region that are expected to experience significant future economic activities, are identified below. The transportation facilities that serve or are needed to serve these sites are also identified.

Weber County

Pleasant View Area Industrial Park - The area is located near 2700 North between US-89 and SR-126. There are about 200 acres that could be developed for light industrial and other uses. I-15 is fairly close to the west. The number of future jobs this development could accommodate is estimated at a few thousand. Direct access is provided by either 2700 North, US-89, and / or SR-126. The northern terminus of the FrontRunner commuter rail is located in the area on 2700 North, which in service during peak hours.

Transportation Access - Overall road capacity in the area will be an important factor in its development. The I-15 / 2700 North Interchange, the adjacent roads, and commuter rail will play an important role in making this site successful.

Business Depot, Ogden (BDO) - This facility was previously known as Defense Depot, Ogden. It was a military installation for many years. In 1997, Ogden City acquired the Depot and since then the City has expended considerable effort to convert the area into a business park. The City has granted the Boyer Company a 70-year lease for the facility. The company is making good progress toward filling the former depot with businesses of all kinds. The facility consists of 1,200 acres of land and has about 6 to 7 million square feet of floor space. About 75 percent of this space is under lease. There are about 500 acres available for new construction. During the past five years, ten new buildings have been constructed with a combined floor space of 1.5 million square feet. Some of the companies currently located in the BDO are Rossignol, Scott, USA, LK Stainless, Lofthouse Foods, Icon Health and Fitness, and Kimberly-Clark. Currently, there are about 3,000 employees. By 2025, about 10,000 employees are expected to be working at the BDO.

Transportation Access - The BDO facility's major access is via I-15, located about one mile to the west. The road that provides the most direct access to the BDO is 400 North. This road connects to I-15 via the 400 North-Pioneer Road / I-15 interchange. Other roads that serve the facility are 12th Street, 2nd Street (from the east), and 1200 West. Currently, because of surface deterioration, there are restrictions on the use of 1200 West by trucks heavier than 10,000 lbs. Marriott-Slaterville is planning a street widening from 2 to 4 lanes, with a turning median, and a reconstruction project for 1200 West, from 1000 North to 12th Street. The improvements to 1200 West and 400 North are important to the BDO's economic well being. Restrictions on 1200 West are a detriment to the BDO's leasing prospects. Current users of the facility are forced to detour on less convenient roads for access to and from the facility. Correction of these problems as soon as possible will help the BDO be more competitive and successful.

Davis County

Hill Air Force Base West Side Development (Falcon Hill) – Hill Air Force Base (HAFB) has begun construction of a 570-acre business and technology park next to I-15. The land is proposed for lease to private interests, and is located on the west side of the Base near the West Gate. This development is a very high priority for the state's economic development programs. The site offers an opportunity for a large-scale project which private land developers under normal conditions could not afford to develop. The general concept involves relocating the security fence away from I-15 to allow businesses to locate adjacent to the Base. The five million square feet of space being proposed for development over a 20-year period translates into 10,000 to 20,000 jobs. However, most of these jobs will relocate to Falcon Hill from existing locations in the Region. It is expected that this project will form one of two core locations for the defense / aerospace / advanced composites industry cluster (the other being at the Ogden-Hinckley Airport).

Transportation Access – In order to facilitate development of this project at I-15 and 1800 North, an interchange needs to be constructed, since it will provide significantly improved access to the site. It will be important for the interchange to function properly with ample capacity. A link to the FrontRunner commuter rail station in Clearfield would enhance the site.

Freeport Center / Freeport Center West (Clearfield) - The Freeport Center had its beginnings during World War II when it was established as a United States Navy defense installation. In the 1970s, the installation was closed and the property sold to private interests. It has redeveloped into a significant warehousing and manufacturing facility.

The Freeport Center is comprised of 680 acres of land. The Center consists of 78 buildings (ranging in size between 4,000 to 400,000 square feet) and employees approximately 7,000 people. About 7 million square feet of building space is available for the 70 companies located at the Center. Some of these companies include ATK-Thiokol, Lifetime Products, Futura Steel Manufacturing, Fram Oil, and U.S. Foods. The Center is essentially fully leased, with a vacancy rate of less than one percent. The facility is serviced by rail, and there is some room to expand on 40 vacant acres. There is also potential for redevelopment.

The Freeport Center West facility was established in 1991 and is located adjacent to the Freeport Center on the southwest side. It is comprised of about 85 acres with 10 buildings totaling about one million square feet. Two recently renovated buildings are available for lease at the facility each having about 120,000 square feet of available space.

Transportation Access - This facility is primarily served by I-15, which is located about one mile to the east and SR-126, which is located about one-half mile to the east. Both of these routes to the east of the Freeport Center are oriented in a north / south direction. Access from these two roads is provided via two I-15 interchanges. One is located at 1700 South (Antelope Drive) and the other at 700 South (SR 193) in Clearfield. Both of these east / west routes lead directly to the Freeport Center.

There are several transportation improvements currently underway and planned in the area that could serve the Freeport center. It will be important to provide some linkage to the FrontRunner commuter rail station which is located just to the east of the Freeport Center. Also, the 2040 RTP has identified east / west roads in need of improvements. These improvements enhance access in the area where the Freeport Center is located. These are the 200 / 700 South connection, and improvements to 200 South and 1700 South (Antelope Drive). Currently, internal traffic and parking presents some problems for the facility. Employees parking their vehicles at the buildings where they work may impede trucks serving the facility. The Freeport Center's property management organization has stated that they would like to construct a central parking lot for employees from which a shuttle, using vans or buses, would service the various businesses.

Salt Lake County

Northwest Quadrant - There is currently little specific information available for this area. However, several plans have been developed in the past year. A visioning process sponsored by Salt Lake City was completed in 2009. Formal action by the City is pending. The Northwest Quadrant as identified by Salt Lake City covers a large area (from SR-201 to about 3000 North, and from Bangerter Highway on the east to about 7400 West on the west). A considerable amount of light industrial and other development already exists on the west side of Bangerter Highway, with a potential for substantial expansion. North of I-80 and west of the Salt Lake International Airport is the International Center, which could also expand into a large amount of acreage to the west and north. In addition, there are trucking and railroad (Union Pacific Intermodal Terminal) complexes emerging in the 5600 West corridor both west and south of the International Center. As noted, there is considerable potential for growth in the Northwest Quadrant. The biggest drawback for the area has been the lack of water, sewer, and other infrastructure. There is also the presence of hazardous wastes, operating solid waste facilities, and environmental (wetland) issues.

Transportation Access – I-80, SR 201, and 5600 West, as well as Mountain View Corridor will play a vital role in serving the area. I-80, SR-201, Bangerter Highway, 5600 West, California Avenue / 1300 South, 6400 West, 700 South, 4800 West are the existing roads that primarily serve the area. North of I-80 and west of the airport there are few developed roads. A sub-regional transportation plan will need to be created and implemented, as well as other master plans, before the area can be developed. A future extension of the TRAX line from the airport, as well as a BRT system is expected to serve the area.

Murray - There are still several hundred acres available for development and / or redevelopment in Murray located near the Intermountain Health Care center at about 5300 South and 200 West. It is still undetermined precisely what type and scale of development will occur in this area over the next 10 or 15 years. Murray's central location and the nearby major transportation facilities make it an attractive location.

Transportation Access - I-15, I-215, 5300 South, State Street, Main Street, TRAX and FrontRunner commuter rail provide the bulk of the access to this site. If these facilities are fully functional, then Murray will have excellent access. Murray will need to develop and implement a good neighborhood traffic circulation master plan to facilitate access to and from the site.

Midvale - Midvale's central location in the Salt Lake Valley, good freeway access, the existing TRAX line, and the

Mid-Jordan TRAX line make Midvale an attractive area for future development / redevelopment. There are over 200 acres on the slag site near the former Sharon Steel Plant, (now called Bingham Junction), which have been cleared for development. The site is directly served by the Jordan River Boulevard, an extension of 7200 South, and connects to 7000 South in West Jordan. There is potential to develop this site into a major office park, which could possibly become the center for the state's life sciences industry cluster. There are already potential tenants with solid interest in leasing and / or building over 250,000 square feet of office space.

Transportation Access - The Jordan River Boulevard leads directly to the site. The site is bounded on the east by 700 West (Main Street). I-15 and the I-15 / 7200 South Interchange are close by for easy access to the Midvale site. Other streets that could indirectly provide access to the site are 7800 South, 7000 South and 1300 West in West Jordan. The existing and future TRAX stations are removed from the site by several blocks. One station is just west of State Street on 7800 South. The FrontRunner commuter rail line will be located just east of I-15. Midvale and UTA officials should jointly consider how best to link this site to transit services.

Mid-Jordan Tech Corridor - Located between the New and Old Bingham Highways in West Jordan at about 6000 West are hundreds of acres of vacant land with the potential for a high tech center. Specific plans have not been prepared for this area. A high rate of residential development is occurring in both West Jordan and South Jordan, and complement the site from a jobs / housing balance standpoint.

Transportation Access - The Mid-Jordan TRAX line is currently under construction with the start of operations anticipated in August 2011. Providing an LRT line will make the site available to high capacity transit service. Roadways that will serve the area are the Old Bingham Highway, the New Bingham Highway, 5600 West, 6400 West, 8000 South, and Mountain View Corridor.

Daybreak - This development is in South Jordan. It is located just west of the Bangerter Highway and the main entrance is located at about 11400 South. There are 300 acres, or more available for new office space and other uses. The area is a master planned development created by Kennecott Land Company. Because it is a planned community, the area presents a special attractiveness, especially to out-of-state people who are more accustomed to this type of development. Master planned communities generally provide prospective customers greater assurance about the type and quality of future development that may emerge around them. The development is using concepts of "new urbanism" in its layout, design, and architecture.

Transportation Access – Currently, access to the area is provided by the Bangerter Highway, 11400 South, and 11800 South. The Mid-Jordan TRAX line will terminate at Daybreak. The Mountain View Corridor, as well as the TRAX line, will be needed in the near future in order for Daybreak to realize its development potential.

Point of the Mountain Area - This area includes property that is located within Draper and Bluffdale west of I-15. There could be two discrete subareas identified for this area. The first is the Utah State Prison property (Draper), which is generally bounded by the Bangerter Highway to the north, 14600 South to the south, and the D & RG Railroad line to the west. The other subarea could be called the turf farm property, which is bounded by 14600 South to the north, the proposed Porter Rockwell Blvd. and the D&RG Railroad line to the west. The two areas combined exceed 1000 acres. The Point of the Mountain area is strategically located on the boundary of Salt Lake and Utah Counties. The northern portion of Utah County and southern portion of Salt Lake County, are currently experiencing rapid growth.

The economic importance of the prison property has been validated by IKEA's decision to locate at the north end of the area, and Sorenson Development's announced office development at the southeast end. Preliminary plans for the vacant, state-owned property near the Utah State Prison envision a mixed-use development with two million square feet of office space; and major retail, hotel, and residential components. Based on anticipated property values, relocating the State Prison could well become economically viable in the future, thus doubling the size of the area available for development. There is some political support for moving the Utah State Prison to a location in Tooele County.

Extensive development of Bluffdale City's turf farm property is probably a long-term prospect, even though a few office / warehouse type buildings have already been constructed in the area. In any event, there is a considerable amount of land available for development at this location that potentially could generate thousands of jobs.

The US National Security Agency is currently building a major data center at Camp Williams. This center, when complete, however, will only employ a couple hundred employees.

Transportation Access - I-15 is currently the primary transportation facility providing access to the area. The Bangerter Hwy / I-15 and 14600 South / I-15 Interchanges provide the land access from the freeway. The West Frontage Rd. also serves the area. A strong advantage for both of the subareas identified above will be the south extension of the FrontRunner Commuter Rail project, which is planned for completion in 2014. A station is planned in Draper. The construction of a rail station may create a need for an exit from Bangerter Highway, as will overall growth. A need may emerge for a north / south arterial west of I-15 connecting 14600 South to the IKEA area located north of Bangerter Highway. If the nearby segment of the Bangerter Highway is converted to a freeway, land access will need to be maintained and enhanced. The planning agencies responsible for this area should consider general traffic circulation plans for these locations.

Energy Analysis - Tranit Projects

Transportation improvements can help promote economic growth and activity by reducing user operating costs and providing access to employment and retail opportunities. This section discusses the energy savings of the 2040 RTP recommended transit projects. The 2040 RTP includes a variety of transit projects and programs that encourage alternatives to the use of single occupant automobiles. Public transit alternatives include commuter rail, light rail, bus rapid transit, and local bus service. Rideshare programs and incentives include park and ride lots, freeway HOV lanes, UTA vanpools, and UTA rideshare matching service. To estimate the energy impacts of these transit projects, WFRC staff modified the travel demand model to eliminate transit and rideshare options from the available modes. The trips formerly served by transit and rideshare modes were then re-assigned to single occupant vehicles. A comparison of travel model results with and without transit modes was then made to estimate the impact of the transit projects in the 2040 RTP on reducing congestion, measured in vehicle hours traveled (VHT). The resulting energy savings provided by transit projects in the 2040 RTP are summarized in the Table 8-3.

The 2040 RTP transit improvements reduce energy consumption in two ways: 1) the number of vehicle trips are reduced, and 2) (to a far lesser degree) the remaining vehicle trips experience less congested conditions, so less time is lost to delay. The VHT figures in the Table 8-3 reflect both aspects of energy savings resulting from the RTP transit improvements. Using an hourly fuel consumption rate per vehicle of 1.27 gallons per hour, the RTP transit improvements save about 156,000 gallons of fuel per day in the year 2040.

Energy Analysis - Highway Projects

The 2040 RTP also reduces congestion, vehicle hours of travel (actually delay or "non-travel), and the corresponding fuel consumption through improvements to the highway network. By implementing operational improvements, providing new or wider facilities in congested locations, and

TABLE 8-3

Energy Savings – 2040 RTP Transit Projects

Vehicle Hours Traveled	123,100
Gallons of Fuel*	156,300
*CAFE standard 27.5 mpg for passenger vehicles at 35 mph yields 1.27 gallons per hour	

TABLE 8-4

Energy Savings – 2040 RTP Highway Projects

Vehicle Hours Traveled	125,100
Gallons of Fuel*	158,900
*CAFE standard 27.5 mpg for passenger vehicles at 35 mph yields 1.27 gallons per hour	

eliminating "choke point" conditions, the RTP can significantly reduce traffic congestion compared to an unimproved highway network subject to ever increasing traffic demand. Table 8-4 below summarizes the benefits of these 2040 RTP highway improvements. In the year 2040, an estimated 159,000 gallons of fuel per day is saved as a result of implementing these improvements.

In addition to new capacity, the 2040 RTP also recommends a variety of Transportation System Management strategies to reduce congestion including signal coordination, Intelligent Transportation Systems, incident management, ramp metering, more efficient interchange and intersection configurations (such as single point urban interchanges and continuous flow intersections), and access management. These strategies also eliminate vehicle delay and result in fuel conservation and reduced emissions. Quantifying the VHT reductions from TSM efforts is difficult due to the diverse nature and application of these strategies and the challenge of isolating the benefits of one particular strategy when all the strategies are employed together. From the assumptions made in the travel model testing of region wide applications of TSM strategies, an overall reduction of VHT on the order of 3% is reasonable. If these assumptions are valid then a daily VHT reduction of 70,000-80,000 is possible from maintaining and increasing applications of TSM strategies in the Wasatch Front Region. This VHT reduction is the equivalent of 95,000 gallons of fuel saved each day.

Fuel Price Impacts

A number of lessons can be learned from the gasoline price spikes of 2008. The average price for a gallon of unleaded gasoline rose from $2.96 in July 2007 to $4.09 in July 2008, an increase of 38%. At this price, changes in travel behavior became noticeable with a nationwide decrease in annual vehicle miles traveled (VMT) of 3.5%. *{Dan Brand, "Impacts of Higher Fuel Costs"}. Utah experienced similar declines in VMT in 2008 due to the elevated fuel prices. The question is, "What happened to all that VMT?"

Perhaps the most important lesson from the 2008 fuel price spike is that traveler behavior began to change as gasoline prices reached the $4.00 threshold. But the nature of the changed travel behavior remains a critical question.

In a short term price spike, commuters have limited options. People still need to get to work and other essential activities. Buying a more fuel efficient vehicle may be a sound long-term response to higher fuel prices, but this is not a remedy immediately available to most consumers. National transit statistics for 2008 indicate that only about 5% of the reduced VMT diverted to public transit. Locally, the number of passengers using Utah Transit Authority services increased 12.5% from 2007 to 2008. But for 2009 UTA passenger volumes decreased 4.2% to volumes very close to 2006 levels. Other possibilities are that travelers reduced discretionary travel, took advantage of flexible work schedules such as four-day work weeks, joined carpools, or they may have opted for telecommuting opportunities. Still others may offset the increased commuting costs with decreases in discretionary spending.

In a study of fuel price elasticity, it was concluded that "motorists do find ways of economizing on their use of fuel, given time to adjust. Raising fuel prices will therefore be more effective in reducing the quantity of fuel consumed than in reducing the volume of traffic." * Daniel J. Graham and Stephen Glaister, "The Demand for Automobile Fuel: A Survey of Elasticities," Journal of Transport Economics and Policy, Volume 36, Part 1, January 2002. But even small reductions in traffic volumes can produce noticeable improvements in traffic congestion. As noted in the Brand article cited above, peak-period congestion can be relieved to a large degree with only minor reductions in traffic volume.

A related lesson from the fuel price experience of 2008 is the impact this can have on transportation funding. The primary source of highway construction and maintenance funds is fuel tax. If travelers respond to increased fuel prices with less traveling and less fuel consumption, then the revenues from fuel sales will also be reduced. This is an important consideration as the Wasatch Front faces increased demand for transportation in the future, while current instability in the Middle East raises serious questions about the cost and availability of fuel.

TRANSPORTATION IMPACTS AND BENEFITS

Statistics regarding vehicle hours of delay further quantify the mobility impact of the 2040 RTP. Without these projects, total vehicle hours of delay during the evening commute would be over 370,000. With implementation of the RTP, the vehicle hours of delay would decrease by more than a third, totaling about 220,000. Maps 8-3 and 8-4 show congestion levels in 2040 without and with implementation of the Regional Transportation Plan, respectively. Roadways colored red are expected to have significant levels of congestion. Those colored green are expected to have moderate or no congestion. By comparing these maps, it can be observed that the projects in the 2040 RTP will improve traffic mobility substantially over not implementing the Plan, especially in Davis County, Weber County, and southwest Salt Lake County.

In addition to improving traffic mobility, the RTP will provide increased accessibility to transit. Ridership is forecast to increase from 90,000 linked trips per day in 2009 to over 220,000 in 2040. Approximately five percent of peak period commuter trips are now taken by bus or rail. This figure is forecasted to increase to nearly seven percent if the RTP is fully implemented.

PUBLIC HEALTH AND TRANSPORTATION

Obesity among the population is also of concern to officials responsible for public health. These conditions are the result of the lack of physical activity, among other contributing factors. Reliance on personal vehicle use, along with work in employment sectors that require little or no physical activity, is contributing to more sedentary lifestyles. Although Utahans are better off than many people, the state still faces repercussions caused by these conditions. Nationally, for example, physical inactivity accounts for about 2.4 percent of health care costs, or approximately $24 billion per year.

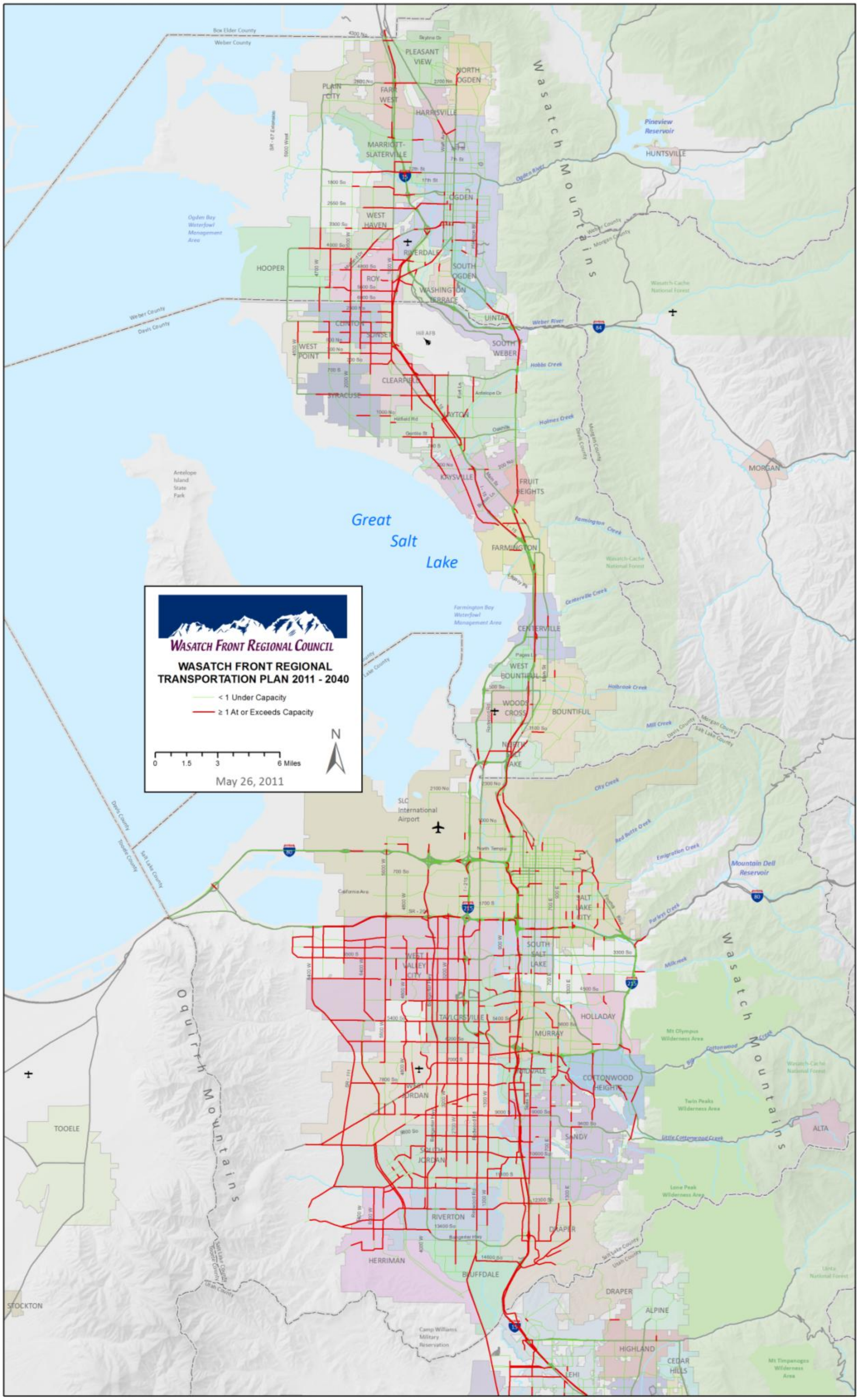
In 2006, the WFRC commissioned a study on active living / transportation for the Wasatch Front Region. The study recommends incorporating physically active mode opportunities into the existing regional transportation system. The study report covered subjects ranging from funding options to policy guidelines and design elements. With the adoption of these active transportation policies by the Regional Council and by making them a critical component of the regional transportation system, the WFRC is encouraging local governments and other organizations to accommodate more pedestrian and bicycle options in their transportation planning products.

The WFRC adopted the policy approaches / recommendations in 2006 because of the benefits that could be realized when these policies are implemented. The policy recommendations, which are listed and discussed in Chapter 7, under "Active Living Principles," essentially call for the following.

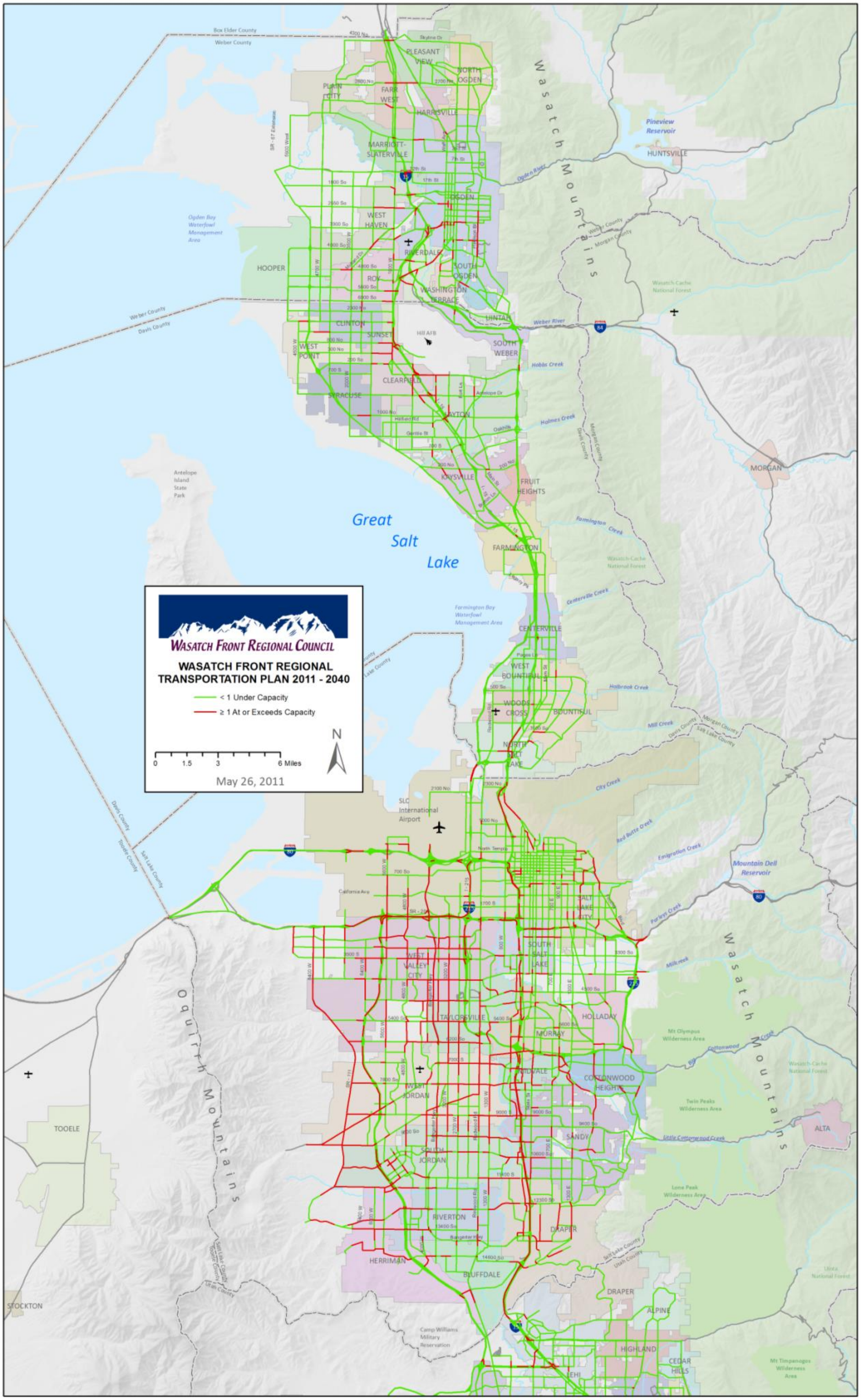
- Provide adequate, safe, and appropriately located infrastructure for all modes of transportation
- Provide active links (sidewalks and bike paths) to existing and new transit stations and stops.
- Provide bicycle parking and storage in transit oriented locations.
- Plan and implement land use and transportation choices that provide for and encourage active transportation modes.

A variety of benefits can result from following active living / transportation policies. Recent studies have shown that if active mode infrastructure is provided and is convenient,

Map 8-3, WASATCH FRONT URBAN AREA 2040 TRAFFIC ON 2016 TRANSPORTATION SYSTEM VOLUME / CAPACITY



Map 8-4, WASATCH FRONT URBAN AREA 2040 VOLUME / CAPACITY



people who would not normally seek out these types of facilities will use them. Linking mass transit facilities with active mode transportation facilities encourages people to use both modes of transportation. Providing mixed and transit oriented land uses, makes communities more walkable and friendly toward non-motorized or active modes of transportation. If active living / transportation infrastructure is implemented in new developments, and more opportunities for active living are provided in the urban environment, it is more likely people will make choices about modes of transportation that do not include the automobile. The resultant benefit would not only improve the physical health of those who walk, ride bicycles, use transit, etc., but it will also reduce the amount of VMT and traffic congestion, improve air quality, and improve the overall quality of life.

ENVIRONMENTAL IMPACTS AND BENEFITS

New transportation projects and improvements to existing facilities will address the anticipated needs for greater highway and transit capacity in the Salt Lake and Ogden - Layton Urbanized Areas. However, these projects can have negative environmental impacts as a result of construction and operation. The effects of the 2040 RTP on various aspects of the environment were examined. In particular, the 2040 Plan's effect on general air quality, noise, water quality, wetlands, water bodies and floodplains, cropland and sensitive species are examined and evaluated. Site specific impacts will need to be investigated in detail as NEPA (National Environmental Policy Act) principles are applied to the planning processes. Most new construction and transit improvement projects that receive federal funding require, at a minimum, a detailed environment assessment (EA), which outlines the social, economic and environmental impacts of the various project alternatives considered. The approval of a draft and a final EIS (Environmental Impact Statement) are required if environmental and social impacts for a specific transportation project are deemed "significant". This section will provide an overview of the possible environmental impacts from the Planning and Environmental Linkages reports from uPLAN. Project specific impacts can be found in Appendix V.

Air Quality

Emissions from cars and trucks traveling on public highways have been declining since the 1990's, even with increases in the overall amount of vehicle travel. This trend for the past and projected into the future is depicted graphically below in Figures 8-1, 8-2, and 8-3. The emission reduction from vehicles can be attributed mainly to substantial improvements in vehicle emission technology required by federal vehicle standards. Local emission testing and repair programs have also played a lesser but important role in reducing overall vehicle emissions.

In the future time frame of the RTP, as vehicles with the latest vehicle emission technology replace older vehicles with greater emissions, the overall emissions from vehicles will be less than vehicle emissions observed today. The latest emission standards for cars and light trucks have eliminated over 85% of the emissions compared to vehicles manufactured in the 1970's. In addition, large diesel trucks beginning with model year 2007 are now subject to much stricter emission standards than in the past and this will also contribute significantly to an overall decrease in future vehicle emissions.

Other contributing factors to reduced vehicle emissions include the 2040 RTP recommendations for expanded transit service and highway improvements strategically planned to alleviate congestion and corresponding emissions. Congested traffic is responsible for excess emissions for two reasons. First, the additional load to vehicle engines operating in stop and go conditions; and second, the inefficiency of congested traffic that generates emissions but produces no movement of people or goods. The Energy Analysis contained in Section 8.4 of this document estimates that by 2040 the RTP transit projects eliminate approximately 194,100 daily vehicle trips which is the equivalent of about 123,100 vehicle hours or 2,219,000 vehicle miles. In addition, RTP highway projects eliminate 120,000 daily vehicle hours of travel. These reductions in congestion and delay amount to reductions of CO, NOx, and VOC emissions of about 35.5, 0.7, and 1.0 tons per day respectively due to transit improvements in the 2040 RTP; and reductions of 47.6, 1.1, and 1.4 tons per day respectively due to congestion relieving highway improvements in the RTP.

Much of the Wasatch Front Urbanized Area has been designated as a non-attainment area by the Environmental Protection Agency for certain types of air borne pollutants. Exhaust emissions from automobiles, trucks, and buses contribute to three of these pollutants: carbon monoxide

FIGURE 8-1

Salt Lake County Vehicle Emission Trends - NOx

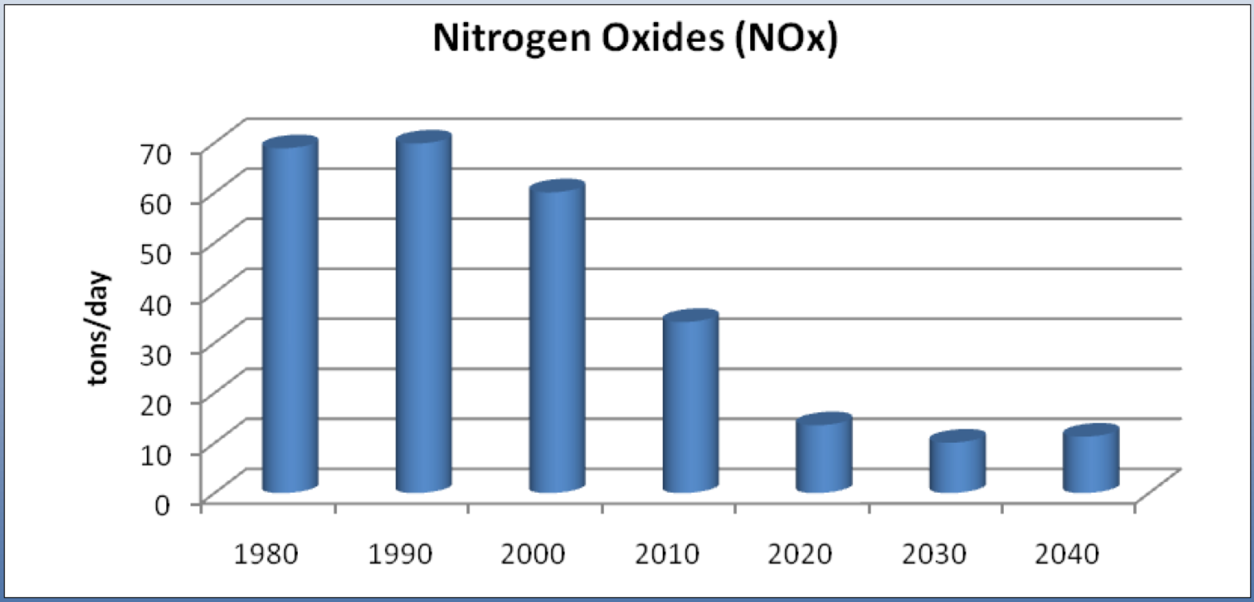


FIGURE 8-2

Salt Lake County Vehicle Emission Trends - CO

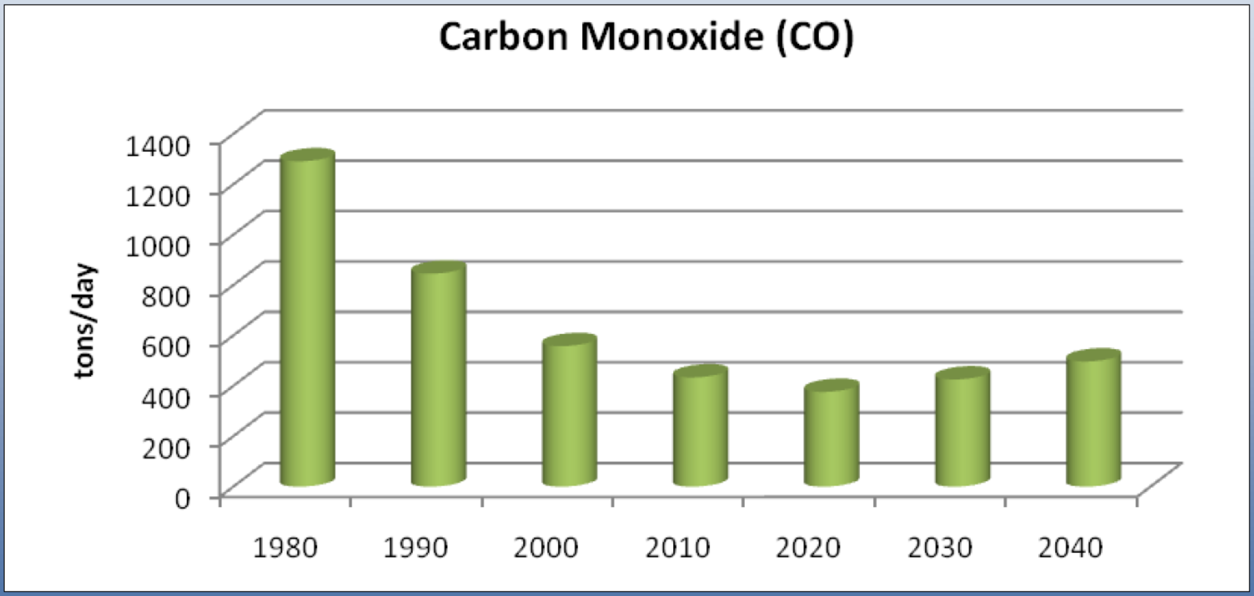
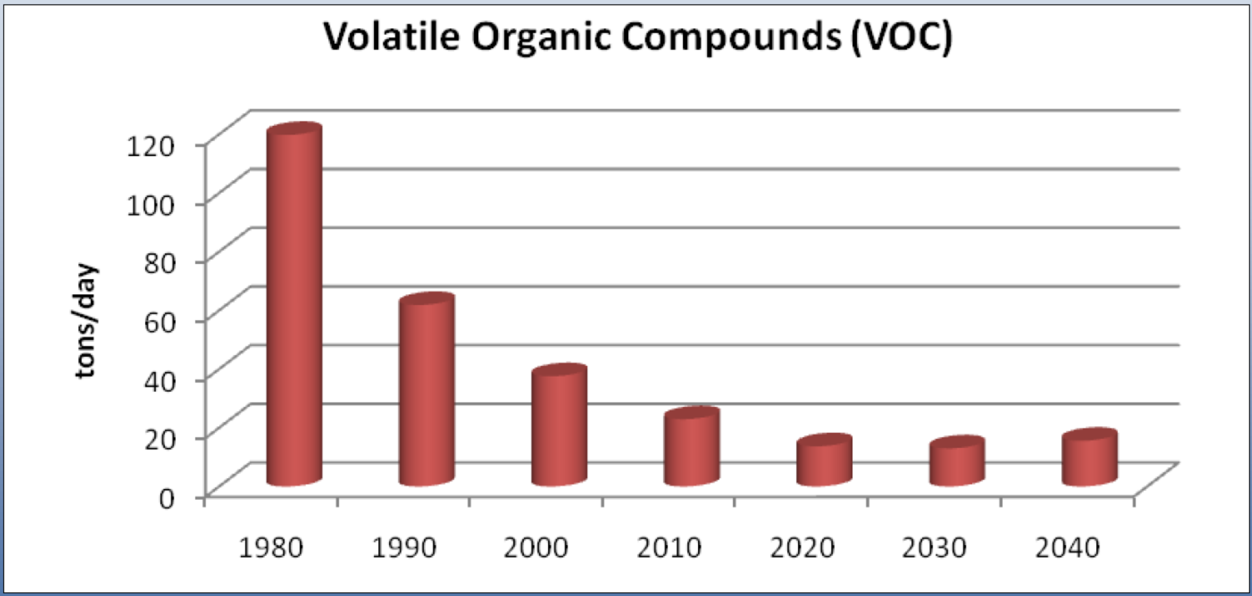


FIGURE 8-3

Salt Lake County Vehicle Emission Trends - VOC



(CO), ozone (O3), and particular matter (PM2.5 and PM10). The impact of the 2040 RTP on emissions of each of the mobile source related pollutants was examined and evaluated. The WFRC determined that the 2040 RTP is consistent with and conforms to state air quality plans (for more information on air quality, please refer to the Air Quality Conformity Determination section of this chapter, page 284)

Noise

Roadway noise impacts vary, based on traffic, the nature of the road, and adjacent land use characteristics. Relevant traffic characteristics are volume, speed, and vehicle mix. The roadway characteristics affecting noise include grades and the presence or absence of noise barriers. Also important are adjacent land use characteristics, including the noise sensitivity of adjacent land uses, the distance between the roadway and the land use, and the design and construction of affected buildings.

A majority of projects in the 2040 RTP will have relatively minor or no impact on existing developed areas. However, the projects listed in Tables 8-5 and 8-6, primarily interstate highways and principal and minor arterials, have the greatest potential for noise impacts on adjacent communities. These roads pass through identified residential areas and are relatively high-speed, high-volume facilities.

TABLE 8-5

Salt Lake Urbanized Area Projects With Potential Noise Impacts

(table includes both funded and unfunded projects)

Street	From	To
I-80	1300 East	Parley's Canyon
SR-201	I-15	I-80
3500 South	4000 West	8400 West
4100 South	Mountain View Corridor	4000 West
4500 South	2300 East	900 East
4700 South	2700 West	6400 West
5400 South	I-15	SR-111
6200 South	5600 West	SR-111
Fort Union Blvd.	1300 East	3000 East
7000 South	Redwood Road	Bangerter Highway
7800 South	Bangerter Highway	SR-111
New Bingham Highway	5600 West	SR-111
8000 South	Bangerter Highway	New Bingham Highway
10400 South	Redwood Road	Bangerter Highway
11400 South	I-15	Bangerter Highway
11400South / 11800 South	Bangerter Highway	SR-111
12600 South	Bangerter Highway	9000 West
13400 South	Bangerter Highway	Mountain View Corridor
8400 West	SR-201	3500 South
6400 West	12600 South	13400 South
Mountain View Corridor	I-80	Utah County Line
5600 West	4400 South	14400 South
Redwood Road	8000 South	Bangerter Highway
Main Street	3300 South	Vine Street
700 East	Carnation Drive	12300 South
900 East	3300 South	Fort Union Blvd.
Highland Drive	8400 South	13800 South

Mitigation - Specific project noise impact assessments and mitigation measures will be determined during project design. Noise effects may be mitigated by shifting the highway alignment away from noise sensitive land uses, depressing the roadway, or installing noise barriers between the highway and the sensitive areas. In addition to the highway projects, light rail and commuter transit systems also have the potential for noise impacts.

Noise barriers are most frequently incorporated into limited access highways. Noise mitigation is less effective or not effective for non-limited access, since land access roads,

TABLE 8-6

Ogden – Layton Urbanized Area Projects With Potential Noise Impacts

(table includes both funded and unfunded projects)

Street	From	To
1800 North (Clinton)	Main Street	5000 West
200 South	500 West	North Legacy Corridor
Syracuse Road (SR-108 / 127)	1000 West	North Legacy Corridor
Hill Field Road Extension	2200 West	3200 West
700 South / 200 South (Clearfield)	I-15	2700 West
Antelope Drive	Oak Forest Drive	US-89
500 South (West Bountiful)	I-15	Redwood Road
West Davis Corridor	Weber Co. Line	I-15 / US-89
2000 West	Weber Co. Line	Syracuse Road
2700 West	Hill Field Road Extension	North Legacy Corridor
US-89	I-15 (Farmington)	I-84
Skyline Drive (North)	2600 North	US-89
2600 North / 2700 North	I-15	3500 West
Midland Drive	Hinckley Drive	3500 West (Roy)
5600 South	1800 West	3500 West
5600 South / 5500 South	3500 West	5800 West
North Legacy Corridor	Davis County Line	I-15
3500 West	1200 South	Weber Co. Line
Monroe Boulevard	1300 North	2700 North

such as driveways, would largely negate mitigation efforts. As a matter of UDOT policy, noise mitigation measures will not be incorporated into certain sections of these projects where proposed development has not been approved by the local government authorities at the time highway facilities are under construction. Therefore, the affected local governments should require developers to consider the noise effects of existing adjacent and planned highway facilities during the development approval process. These considerations include proper setback distances from the noise source, and walls or berms between the noise source and receptor.

Water Quality

The National Clean Water Act, the State's Non-point Source Management Plan, and various other governmental regulations require the monitoring of water resource impacts and management in the urbanized areas. Water quality impacts resulting from a highway improvement project generally depend on traffic volumes, pavement width additions, and the aquifer recharge capability of the surrounding soils.

Water quality is affected by oil and other hazardous materials deposited by vehicles on the roadway and subsequently washed into ground water or open bodies of water. The amount of pavement added roughly correlates with increased road salt and other solvents used during the winter months. The aquifer recharge capability of the soils surrounding the project and the project's proximity to a well recharge area is indicative of the likelihood of roadway runoff contaminating drinking water. The 2040 RTP is expected to require approximately 17,000 acres of right-of-way in ground water recharge zones and an additional 1,500 acres in close proximity to surface water and potential wetlands.

Mitigation - Specific project water quality impact assessments will be made, and mitigation measures based on best management practices will be determined during the environmental phase of the individual project development process. During project design, settling ponds or storm water removal facilities may be used to limit the introduction of hazardous material seepage into important aquifers. Map 8-5 shows the surface water features located within the Wasatch Front Urban Area.

Wetlands

Wetlands are areas able to support vegetation adapted for life in water- saturated soils. Wetlands can be generally defined as vegetated aquatic areas, such as bogs, marshes, swamps, and prairie potholes. Jurisdictional wetlands are those wetlands, which are within the extent of the Corps of Engineers' regulatory overview. Large, intact wetlands serve critical environmental functions, including flood control, water purification, and the provision of habitat for fish and wildlife. The significance of roadway wetland impacts varies, based on wetland characteristics such as the size of the wetlands area, the level to which the wetlands have already been disturbed by human development, and jurisdictional status.

A project may impact wetlands by providing a barrier between adjacent wetland areas or by encroaching upon a single wetland area.

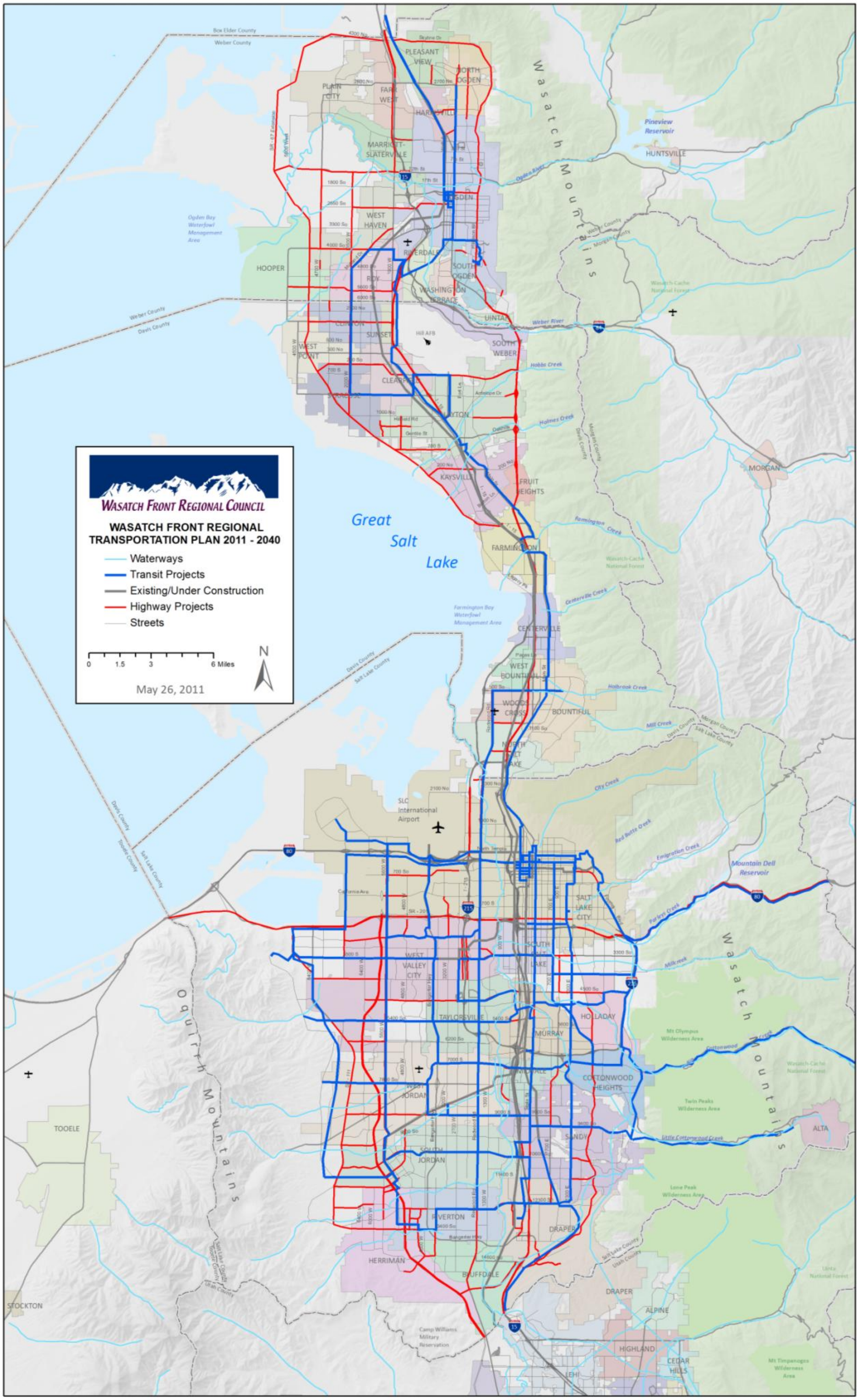
The projects in the 2040 RTP that were deemed to have potential impacts on wetlands were those involving new construction or a widening of two or more lanes, and that would traverse, or be in close proximity to, the wetlands identified by the U.S. Fish and Wildlife Service's National Wetlands Inventory. The National Wetlands Inventory, which is based on aerial photography and did not include site sampling, includes both jurisdictional and non-jurisdictional wetlands in Utah and throughout the United States. The degree of impact for the projects listed as potentially affecting wetlands will depend on the amount of right-of-way required. Thus, projects requiring a considerable amount of right-of-way would have more impact than those requiring minimal or no new right-of-way.

Mitigation – Regarding the projects included in the 2040 RTP, consideration should first be given to impact avoidance. Specific jurisdictional wetland impact assessments will be made during the project development stage, and mitigation measures will be determined during the environmental evaluation and review phase. Strategies to mitigate impacts to wetlands should include: avoidance by shifting the alignment away from wetlands, replacing lost wetlands, banking wetlands, and / or using "no access" lines to restrict accompanying land development. Potential wetland areas within the Wasatch Front Urban Area are shown on Map 8-6.

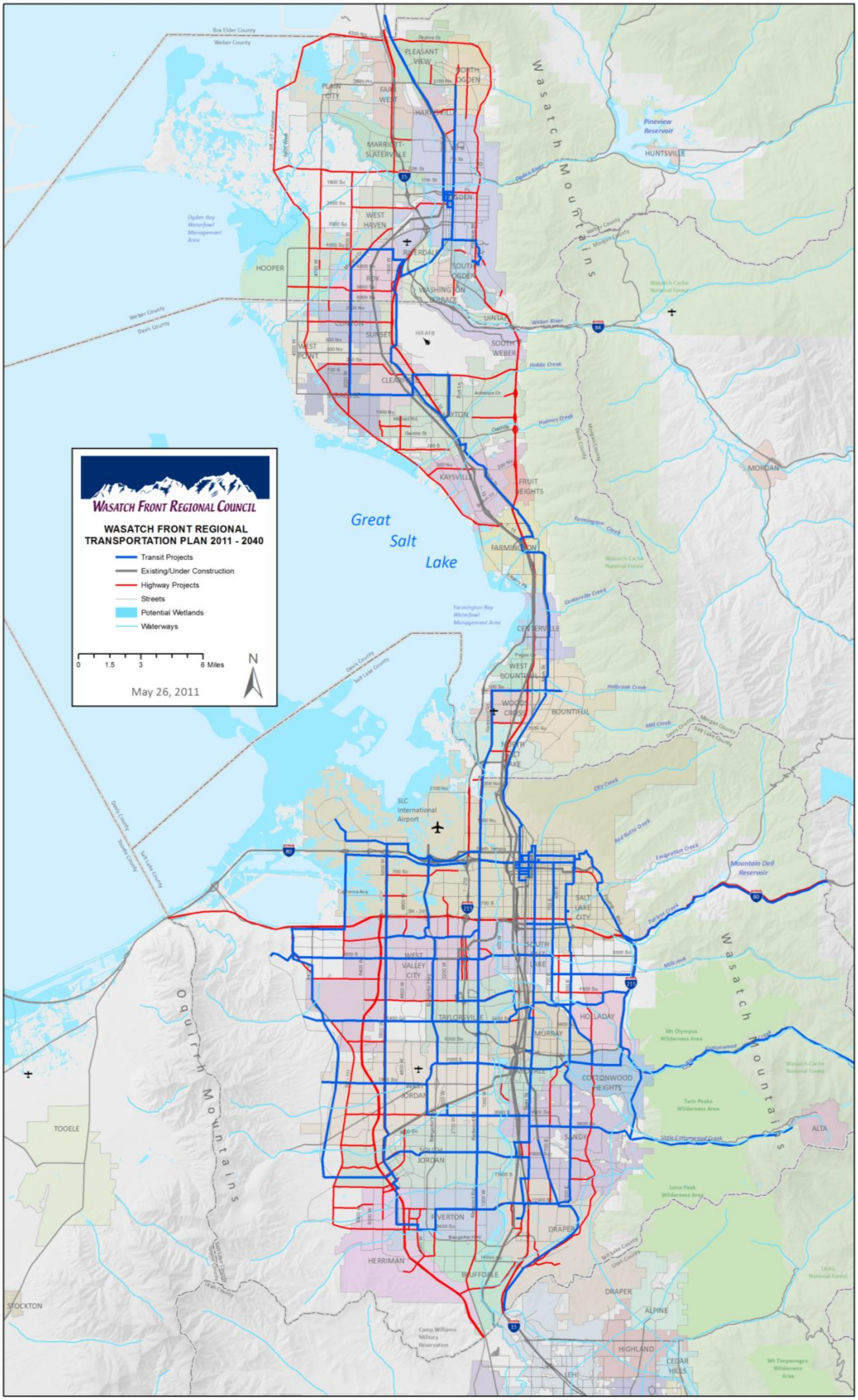
Farmland

The 2040 RTP's recommended improvements will impact farmland by acquiring rights-of-way through active agricultural areas. In the urbanized areas, much of the prime farmland and farmland of statewide importance has already been developed, or is planned for urban uses. Examples of this are properties in Salt Lake County located between SR-111 on the west and the Union Pacific Railroad tracks on the east. These farmlands were designated in 1978 as prime farmland or farmland of statewide importance. In southern Davis County, a 1978 Soil Conservation Service map designated much of Centerville, west Farmington, and parts of West Bountiful as prime agricultural

Map 8-5, WASATCH FRONT URBAN AREA SURFACE WATER



Map 8-6, WASATCH FRONT URBAN POTENTIAL WETLAND AREAS



land. Much of this land has been, or is under consideration for development. In Weber County, a considerable amount of the prime agricultural land is located between I-15 and the wetlands of the Great Salt Lake. Much of this land has already been converted to urban use, and the agricultural lands that remain are currently under substantial development pressure. In both Weber and Davis Counties, several farms have received the designation “Agricultural Protection Zones” which gives the land special status and makes it more difficult for local and state governments to use condemnation procedures to acquire property for a public purpose.

Prime farmlands of the Wasatch Front are generally those with relatively high quality soil, reliable water, and fewer than 30 dwelling units per 40-acre area, which are not currently designated for urban use. Lands currently within a municipality, which are used, but not zoned for agricultural or open space preservation, are presumed to be urban or designated for future urban use.

With the exception of new roadway construction and rights-of-way acquisition projects, the extent of direct impacts by the 2040 RTP improvements on farmlands is relatively minor. New roadways often require larger amounts of rights-of-way than past projects and have the potential for greater direct impacts on farmland. Also, new roadways have the indirect impact of making farmlands more attractive for urban land uses.

Farmland in Salt Lake County, has over the years, been largely consumed by urban development. Forty or more years ago, there were still large tracts of land in agricultural use, particularly in the southwestern part of Salt Lake County. Today, much of that farmland has been converted to residential and other uses, and the balance has been planned for urban development. Farmland that remains in Salt Lake is mostly destined for development, since there are no local government policies in place that would specifically provide for the preservation of farmland.

There are some parcels in Salt Lake County that are used for pasture, growing of hay, and turf farming. The communities that still have some agricultural lands are Herriman, Bluffdale, West Jordan, and Salt Lake City. In Salt Lake City, there are several parcels of farmland on the west side, and in the Northwest Quadrant.

Most of Davis County’s remaining farmlands are located west of the West Davis Highway, or west of Bluff Road. Davis County’s farmland is also being converted to urban uses, similar to the pattern of Salt Lake County.

Weber County, of the three urbanized counties, has the most remaining farmlands. Most of this farmland is located in western Weber County, west of 1900 West, between the communities of Roy and Plain City. There are still large tracts of land that produce a variety of crops, including hay, corn, and onions. There is also a considerable amount of pastureland, as well as a few dairy operations in the area. A number of area farmers have expressed a desire to continue to farm the land as long as possible. They do not welcome urban type development and the construction of transportation infrastructure in the area. The 2040 RTP is estimated to impact 46 acres of Agricultural Protection Area and an additional 953 acres of agricultural land.

Mitigation – Farms which have been officially designated as part of an “Agricultural Protection Zone”, along with other productive farmlands in the Region, need to be avoided. If avoidance is impossible, due to the absence of other reasonable alternatives, care should be taken in the planning of the transportation facilities to limit the disruption of farm operations to the least extent possible. Local government planning and zoning regulations can play a vital role in preserving viable farmlands.

Wildlife Habitat / Sensitive Species

The 2040 RTP was evaluated to determine potential impacts on wildlife habitat and endangered and threatened species known to exist in Salt Lake, Davis, and Weber Counties. Bald eagles are known to feed near the Great Salt Lake. The proposed West Davis Highway could possibly affect this habitat. Endangered and threatened plants include Ute Ladies'-tresses and Deseret Milkvetch. It is not known if these plants and animals would be adversely impacted by projects listed in the 2040 RTP. A survey of sensitive species will be conducted during the Environmental Impact Statement phase of project development.

The three urbanized counties of the WFRC contain significant wildlife habitat areas for a variety of species. The Great Salt Lake and associated wetlands provide an internationally significant migratory bird habitat. Many streams provide habitat for fish, mammals, reptile, and amphibian habitats. A portion of the foothills have been converted for urban use, which interfaces with the native grass, sage, and scrub oak-covered habitat. Mule deer, elk, mink, and snowshoe hare winter and at times spend their entire life cycles in these areas. Also, several species of birds use the foothills for year-round habitat, such as the California Quail, Ring Neck Pheasant, and Ruffed Grouse.

Mitigation - The best method of mitigation is avoidance. If this is not possible, then plans are needed to minimize and / or mitigate unavoidable impacts. There are a variety of measures that can be taken, such as providing wildlife corridors if a transportation facility creates a barrier to wildlife movement or migration. It will be important to coordinate very closely with the U.S. Fish and Wildlife Service and the Utah Department of Wildlife Resources during the various phases of project development.

Water Body / Floodplain Modification

Natural water bodies and floodplains help to moderate flooding and accommodate erosion in a river. Projects can impact a water body by disturbing ground within 20 feet of natural or semi-natural rivers and streams, realigning or channeling meandering waterways, placing obstructions in floodplains, and utilizing unstable floodplain crossings.

The Army Corps of Engineers District Office has indicated in the past that the Jordan River in Salt Lake County was of particular concern, and urged that new crossings of the river be avoided, or minimized whenever possible. One project in the 2040 RTP that will affect the Jordan River is Porter Rockwell Blvd. This project will necessitate the construction of bridges. The numerous smaller streams flowing from the surrounding mountains were not considered in the evaluation, as they will be evaluated at a later time in more detail during the Environmental Impact Statement phase of project development. Map 8-5, shows the distribution of surface water bodies within the Wasatch Front region.

Mitigation - Transportation facilities should, wherever possible, avoid floodplains. If a project must be located in a floodplain, the facility will need to have the proper vertical elevation to prevent flooding. As a way to mitigate the natural hazard of flooding, alternative routes should be identified if the project is determined to be essential to the Region's overall transportation network. Stream crossing should be at right angles to minimize impacts. The channelization of streams and rivers should be minimized or avoided so that the natural channel and the habitat it provides can be preserved. If a watershed management plan exists for an area under consideration for a project, care should be taken to carefully coordinate efforts with watershed planner. Lastly, pre-construction meetings should be held with public officials, contractors, and others to discuss floodplain protection and how the project can be best designed to maintain natural drainage patterns and any existing runoff measures.

Hazardous Waste

The potential for the discovering of hazardous waste deposits buried in project rights-of-way is a concern. The purchase of a contaminated site, or possibly even the purchase of property sub-divided from a contaminated parcel, may result in the public agency that purchased the property becoming financially liable for a hazardous waste site clean-up process. This liability, if it falls to the transportation agency, could create significant financial burdens and project delays.

To identify projects that could be affected by hazardous waste sites, WFRC compared the location of proposed 2040 RTP projects with the location of "Superfund" sites listed in the Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS). CERCLIS is the database used by the EPA to track the status of potential and confirmed hazardous waste sites. (Inclusion in CERCLIS simply means EPA has been notified of the possibility of some release of hazardous substance to the environment, thereby triggering the need for a preliminary assessment.) The distribution of CERCLIS National Priority List Superfund Sites is shown in Map 8-7.

Besides the National Priority List Superfund Sites for the three urbanized counties of the Wasatch Front Region noted above, there are between one and two hundred other CERCLIS sites that have the potential of becoming EPA Superfund Sites. It has not been determined definitively that the sites are contaminated, but that there is the potential that they may be. These sites have been identified and mapped by the State Department of Environmental Quality (DEQ), Division of Environmental Response & Remediation (DERR). The database and map should be consulted prior to, or during the EIS preparation phase of project development.

The 2040 RTP projects are in immediate proximity of approximately 5,000 acres of hazardous waste sites. Additionally, there are another 49 acres of solid waste sites that are impacted.

Mitigation – The existence of hazardous waste or Superfund sites could significantly affect the feasibility of a transportation projects. Disturbance of a site could present a significant hazard and could cost millions of dollars to mitigate before construction of a transportation project could begin. Therefore, it is very important for transportation agencies to be aware of where these sites are located so that decisions about the proposed transportation facility can be made in light of this information. It may be prudent to avoid hazardous waste sites if added costs and time are important. On the other hand, while increasing costs, a transportation project can be the catalyst for removing a negative environmental condition and spur further mitigation of property for development. Planning for the possible mitigation and use of sites impacted by hazardous waste for transportation project and other infrastructure should involve the closest possible collaboration with local planning authorities, current property owners, and other community representatives.

Geologic Hazards

It is important to consider geologic and other physical constraints when evaluating transportation projects. In this case, the concern is not only what impacts transportation projects may have on the environment, but what impacts the environment may have on the projects and the safety of the people who will use them. The geologic hazards chosen for this evaluation were: (1) Steep slopes; (2) faults; and (3) liquefaction potential.

Steep slopes present a host of problems to transportation projects, including slope failure due to water saturation of soils, that would greatly increase maintenance costs. Faults are problematic from the standpoint of potential movement along a fault line.

Such slippage due to earthquakes could range from "gradual" to "catastrophic". In any case, building on a fault line is risky and should be avoided. Liquefaction is associated with fine soils or clays that are not well drained. They can become highly unstable during an earthquake event and may take on quicksand-like properties. Liquefaction tends to increase earthquake damage.

Urbanized area transportation projects subject to potential problems from earthquake fault zones are noted below in Tables 8-7 and 8-8. Projects in areas with high liquefaction potential are listed in Tables 8-9 and 8-10. These areas of concern are depicted graphically in Map 8-8.

Mitigation - Liquefaction can disrupt transportation networks, and destroy or severely damage residential, commercial, and other structures. When transportation infrastructure is planned in high liquefaction areas, it will be important to consider design and construction guidelines that will mitigate or minimize the effects of liquefaction. It is equally important to consider design guidelines to minimize the destructive effects of liquefaction for residential and other structures. A variety of measures can be incorporated into the design of a structure so that it can better withstand the effects of liquefaction. Information regarding preventive actions that can mitigate the potential efforts of liquefaction can be obtained from the relevant county Hazard Mitigation Plan and from hazard mitigation planners. With regard to faults, it is important to be aware of the areas where movement along a fault could damage transportation infrastructure. Measures can be taken that can minimize the effects of fault movement. The most important preventive measure is to avoid building on a fault, which is particularly applicable to urban development. Among other measures, transportation structures can be reinforced and designed to better withstand earthquakes.

TABLE 8-7

Salt Lake Urbanized Area Projects With Potential to Conflict With Faults

(table includes both funded and unfunded projects)

Street	From	To
500 South / 700 South	Surplus Canal	5600 West
I-80	1300 East	Parleys Canyon
SR-201	3200 West	Mountain View Corridor
4500 South	I-215	2700 East
Highland Drive	Draper City Limits	Traverse Ridge Road
Wasatch Blvd.	7000 South	Little Cottonwood Road

TABLE 8-8

Ogden – Layton Urbanized Area Projects With Potential to Conflict With Faults

(table includes both funded and unfunded projects)

Street	From	To
US-89	I-15 (Farmington)	I-84
Skyline Drive (North)	2600 North	US-89
1100 West (Pleasant View)	Skyline Drive	4000 North

TABLE 8-9

Salt Lake Urbanized Area Projects in Areas of High Liquefaction Potential

(table includes both funded and unfunded projects)

Street	From	To
500 South / 700 South	Surplus Canal	5600 West
California Avenue	I-215	7200 West
SR-201	3200 West	Mountain View Corridor
3500 South	2700 West	4000 West
4500 South / 4700 South	I-15	Redwood Road
5400 South	I-15	Mountain View Corridor
7000 South	State Street	Redwood Road
9000 South	I-15	Bangerter Highway
10600 South / 10400 South	I-15	Redwood Road
Bangerter Highway Interchange	@ Redwood Road	
14600 South	D&RGW Railroad Structure	
8400 West	SR-201	3500 South
7200 West	I-80	3500 South
Mountain View Corridor	SR-201	6200 South
5600 West	I-80	SR-201
4800 West	California Avenue	3500 South
Redwood Road	Davis Co. Line	1000 North
Bingham Junction	7000 South	8400 South
I-15 Interchange	@ 100 South	

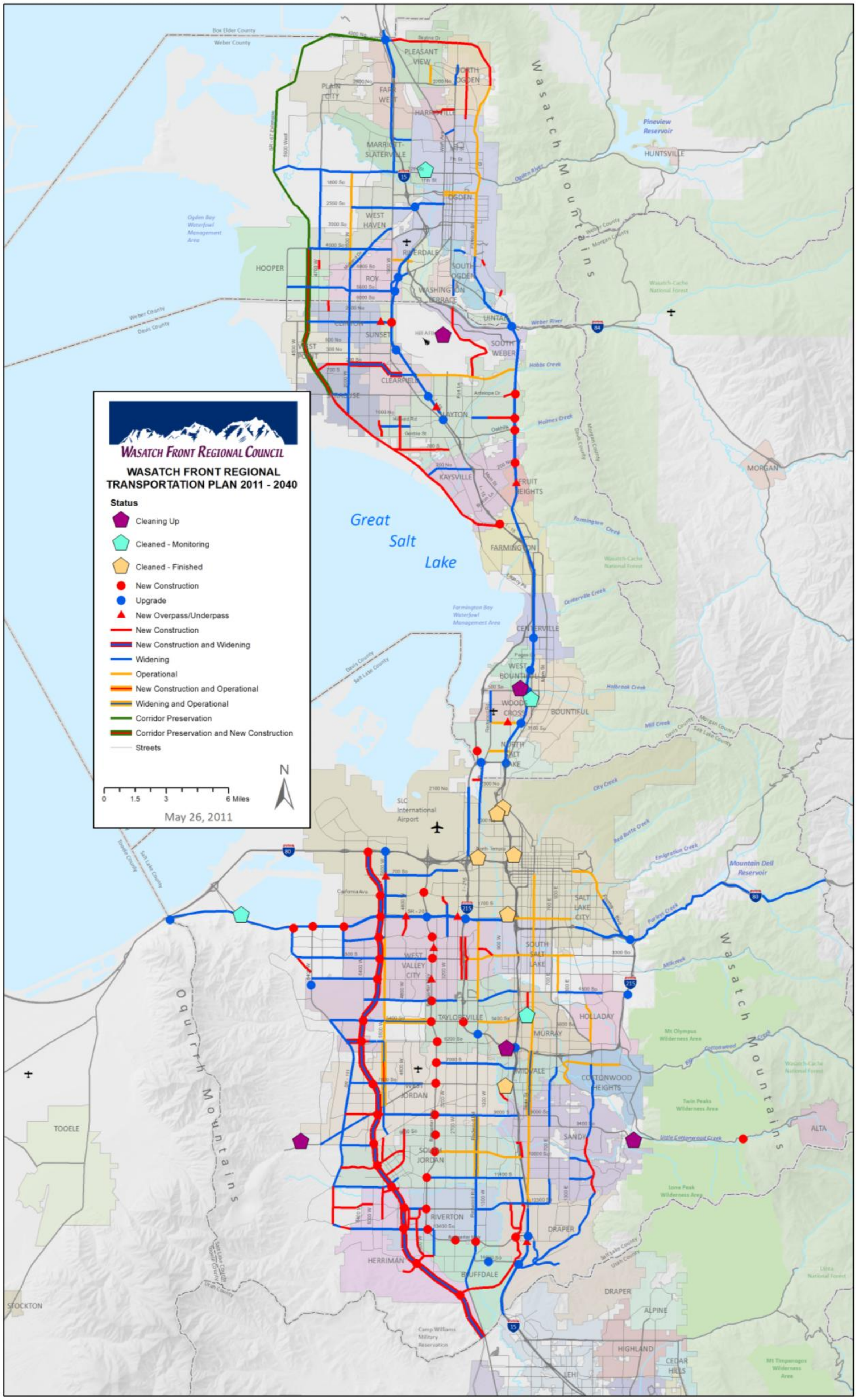
TABLE 8-10

Ogden – Layton Urbanized Area Projects in Areas of High Liquefaction Potential

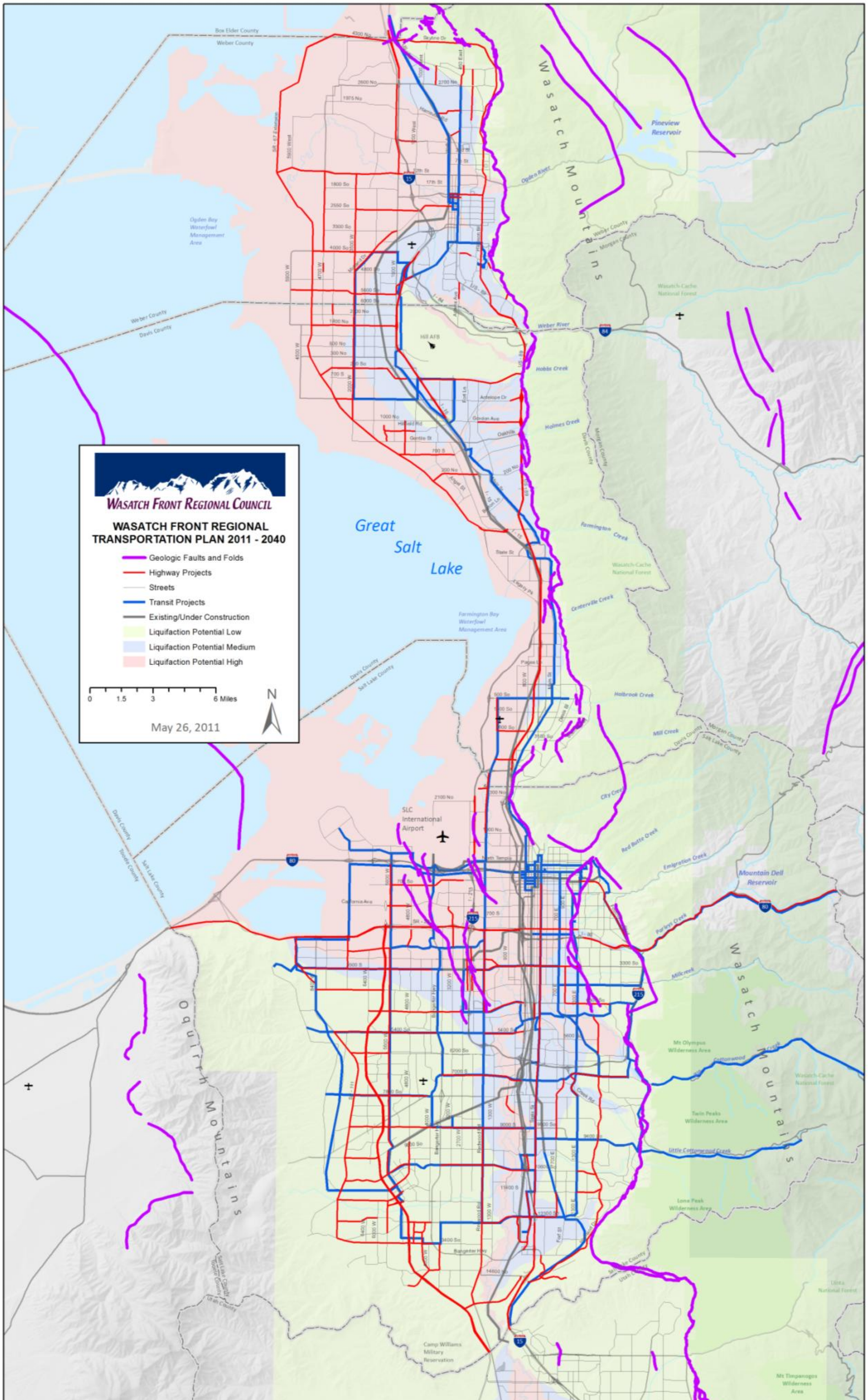
(table includes both funded and unfunded projects)

Street	From	To
1800 North	200 West	5000 West
200 South (Syracuse)	2000 West	North Legacy Corridor
Syracuse Road	1000 West	North Legacy Corridor
Hill Field Road	2200 West (Layton)	3200 West (Layton)
700 South / 800 South	I-15	2700 West
Parrish Lane (Centerville)	I-15	1250 West
I-215 Interchanges	@ Legacy Parkway	@ I-15
North Legacy Corridor (Davis Co.)	Weber Co. Line	I-15 / US-89
2000 West	Weber County Line	North Legacy Corridor
2700 West (Layton)	Hill Field Road Extension	North Legacy Corridor
Redwood Road	500 South (Davis Co.)	2600 South
I-15	US-89	I-215
I-15 Interchanges	@ Lund Lane	@ Parrish Lane
2600 North / 2700 North	I-15	3500 West
1200 South	I-15	North Legacy Corridor
24th Street	I-15	Wall Avenue
Hinckley Drive	1800 West	Midland Drive
40th Street	Adams Avenue	Gramercy Avenue
4000 South	1800 West	North Legacy Corridor
Midland Drive	Hinckley Drive	3500 West
5600 South	1800 West	3500 West
5500 South / 5600 South	3500 West	5800 West
North Legacy Corridor (Weber Co.)	Davis County Line	1200 South
4700 West	4000 South	5100 South
3500 West	1200 South	Davis County Line
1800 West	1200 South	2700 North
I-15	Box Elder County Line	2700 North
I-15 Interchange	@ 24th Street	
1200 West	Pioneer Road	12th Street
1100 West (Pleasant View)	Skyline Drive	4000 North

Map 8-7, WASATCH FRONT URBAN AREA NATIONAL PRIORITIES SUPERFUND SITES



Map 8-8, WASATCH FRONT URBAN AREA FAULTS AND LIQUEFACTION POTENTIAL



NEPA PRINCIPLES AND REQUIREMENTS

During the preparation of the 2011-2040 RTP, certain aspects and principles derived from the National Environmental Policy Act were considered and incorporated into the planning process. In total these actions meet and exceed the federal planning and environmental requirements found in 23 CFR Part 450.316 & 318. A number of the 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 the RTP were evaluated for their potential impact on the environment. Indices considered included air quality, noise, impact on wetlands, water bodies and flood plains, existing and planned land use, etc.

In 2004 a "Coordinating Committee" was organized to consider the linking of the Regional Transportation Plan planning process and NEPA. The Coordinating Committee is comprised of representatives from UDOT, WFRC, FHWA, and UTA. The Committee developed a list of actions to pursue. The action items were summarized, along with the status of their implementation in a "memorandum to the file," dated May 21, 2007, titled "Integration of NEPA into the RTP Planning Process." This memorandum has been included in the RTP as Appendix W. The 2040 RTP benefited by the pursuit of many of these actions whether conducted for the 2030 RTP or for previous regional transportation plans. Of particular note, the 2040 RTP has benefited from the updating of the Wasatch Front visioning process and the development of the uPEL tool. The uPEL tool is a web based environmental tool used for assessing the direct environmental impacts of transportation actions.

PURPOSE AND NEED CONSIDERATIONS

A brief "purpose and need statements" for each of the highest cost, first phase projects in the 2040 RTP are included in the section below. The premise behind the development of these purpose and need statements is that they will help inform the corridor level analysis for each project when it is conducted. Any project that cost $100 million or more, and is either partially or wholly in the first phase of the planning horizon, is provided a brief purpose and need statement. The purpose and need statements are organized as follows: Problems, Needs, and Deficiencies; Solutions; and Expected Outcomes.

Davis and Weber County Projects

North Ogden - Salt Lake (Three Stages)

Problems, Needs, and Deficiencies: Utah Transit Authority Routes 612 and 470 are high performing routes that could perform even better with capital and operating improvements. Current service is relatively slow, moderately unreliable (13 percent), and has a high potential for standing loads.

The Falcon Hill Development in the northern portion of the alignment offers huge ridership potential and will, if it develops to its full potential, require significant transit service in order to avoid large increases in area emissions and congestion. Hill Air Force Base has about 30,000 workers but no transit service. Southeast and south central Davis County provide a large commuter shed into Downtown Salt Lake City, which requires more direct, convenient service than can be offered by Commuter Rail. 30th Street and Washington Boulevard has a large disadvantaged population. Higher density activity centers include Ogden CBD, the Cosydale area, and Roy near the Ogden Airport. Larger infill areas include Washington between 20th and 25th Streets, the Cosydale area, and Falcon Hill.

Solutions:

- Reconfigure UTA Routes 612 and 470 into a continuous route and provide with a more robust schedule of service including high frequency service and extended hours of operation, much like TRAX.
- Construct a transit center near the relocated West Gate of Hill Air Force Base which permits cross fence transfers between the North Ogden – Salt Lake transit line and a Hill Air Force Base shuttle.
- Preserve and eventually move to an exclusive right-of-way through Falcon Hill.
- Incrementally consolidate and add full amenities to transit stations along the alignment.
- Incrementally add reliability and speed improvements such as transit signal priority, queue jumpers, and exclusive transit lanes to the line as funding permits.

Expected Outcomes: The expected outcomes of this project would include the following: vastly improved ridership in the corridor; improved economic development opportunities, reduced vehicle miles traveled and congestion associated with Hill Air Force Base and Falcon Hill; more reliable service and reduced potential for standing loads throughout the alignment; greater transit operational efficiencies in the corridor for UTA, support for transit oriented development being proposed in the corridor; and, higher transit participation in the South Davis to Salt Lake Commute.

Ogden - Weber State University (Two Phases)

Problems, Needs, and Deficiencies: UTA Route 603 is a high performing route that could perform even better with capital improvements. Relatively high levels of congestion are evident in the area of Weber State University and McKay-Dee Hospital. The East Central Community and the area near 30th Street and Washington Boulevard includes high concentrations of disadvantaged people. Washington between 21st and 33rd Streets is a regional activity center. Plans for economic expansion in this area are significant, but potential for road improvements are minimal. Growth of the Weber State University area as a regional activity center will be limited without improved transit services. Congestion in the area is projected to hamper transit with slow speeds and increased schedule unreliability. Two project alignments continue to be under review for this project.

Solutions:

- Initiate a robust schedule of local bus service, to include high frequency service and extended hours of operation much like TRAX, on the proposed alignment as soon as practical.
- Construct an exclusive right-of-way with full amenity stations on Washington Avenue and through Weber State University, including as many streetcar elements, as is financially practical. Imbedded rail would seem to be a very practical addition at this point in those areas where the road/transit lanes are rebuilt.
- Incrementally add overhead electrical power, etc. and purchase rail vehicles to permit streetcar use as soon as sponsors are financially able.
- Continue to use bus service on streetcar lanes and at stations on this alignment.

Expected Outcomes: The expected outcomes of this project would be the following: improved transit visibility and accessibility especially on the WSU campus; long term maintenance of transit schedules for Washington Boulevard and WSU transit lines; facilitation of the growth of Downtown Ogden and the WSU/McKay-Dee area regional activity centers. Improved FrontRunner ridership.

North Legacy Corridor

Problems, Needs, and Deficiencies: As the western portions of both Davis and Weber County grow, there will be an increased demand for travel and transportation capacity. Many north-south (I-15) and east-west facilities are already severely congested and motorists are experiencing significant delays. More regional capacity is needed in closer proximity to accommodate new demand. In addition, there are few existing alternative north-south routes that could be used by commuters and emergency response vehicles in the event of an incident on I-15.

Solutions: Construction of a north-south limited access principal arterial, or parkway type facility from Farmington to the Box Elder / Weber County line would provide part of the solution to traffic growth in the area. In addition, the corridor is planned to be wide enough to allow for future options, such as mass transit and non-motorized facilities to be incorporated, as needed, into the corridor.

Expected Outcomes: The expected outcomes of this project would be the following: (1) additional north-south transportation capacity to help meet 2040 travel demand: (2) a single, continuous alternate north-south route that could reduce congestion and increase safety when I-15 is congested, under reconstruction or closed because of accidents; and (3) an additional route for emergency vehicle response.

Salt Lake County Projects

Salt Lake City - Foothill Drive - Wasatch Drive (Three Phases)

Problems, Needs, and Deficiencies: UTA Route 2, “2 the U”, is a high performing route. It could perform even better it was extended to Research Park and given operating and capital improvements. Increasing congestion in the corridor, and high potential for standing loads on this line, may become a deterrent to further ridership growth. Much of the area between Salt Lake Central and the University has a large population of disadvantaged people. The area between Salt Lake Central and 700 East constitutes a Regional Activity Center. The eastern portion of the University campus, the medical center, and Research Park constitute large infill opportunities.

Foothill Boulevard is a congested corridor through which run several transit lines including a proposed transit service to Park City. Foothill Boulevard is the most heavily used access corridor to the University of Utah area from the east side of the Salt Lake Valley. The University of Utah area is the second largest transportation destination in the Salt Lake Valley and is growing quickly. The area near Parley's Way is forecasted to become an activity center. Preserving transit speeds and schedule reliability on Foothill Boulevard is essential.

Wasatch Boulevard in the East Millcreek, Cottonwood Corporate Center, Cottonwood Heights areas provides access to large residential communities and several popular canyons. Efforts are continuing to preserve these popular canyons that also serve the Region as vital watersheds. It is anticipated that the gravel pits in this area will become a significant activity center. Transit has been suggested as a premier tool in these preservation and development efforts.

Solutions:

- Expand the hours of service on UTA's "2 the U" bus line and extend that service to Research Park.
- Add a transitway connection between Mario Capecchi Drive near Pollock Road and Arapeen Drive, if feasible, to provide a more direct transit connection between the University of Utah Medical Center and Research Park.
- Extend the service to Park City.
- As funding becomes available, incrementally add reliability and speed improvements by implementing transit signal priority, queue jumpers, and transit lanes to the line out to Parley's Way / Foothill Boulevard.
- Create a second service on the line for Millcreek, Cottonwood Corporate Center, and the Cottonwood Canyons.
- Incrementally implement reliability and speed improvements such as transit signal priority, queue jumpers, and transit lanes to the line.

Expected Outcomes: The expected outcomes of this project would be the following: a high visibility transit mall east/west through Downtown Salt Lake City; large ridership gains in the corridor; reduced vehicle miles traveled and congestion associated with Research Park, the Medical Center, and Cottonwood Corporate Center; the preservation of transit travel speeds and schedule reliability throughout the corridor; new, high quality recreational and worker service to and from Park City; and, reduced traffic impacts to the Cottonwood Canyons and potentially Millcreek Canyon.

State (Three Phases)

Problems, Needs, and Deficiencies: Route 200 in the northern portion of State Street has the highest bus ridership in the UTA system despite having relatively low travel speeds, a moderate probability of standing loads, and a somewhat unreliable schedule (10 percent). Both Routes 200 and 201 could perform even better with capital and operating improvements. The neighborhoods near State Street between about 300 North and about 2100 South have dense concentrations of disadvantaged people. High activity areas include the stretches of State Street between downtown and 3900 South, at 5400 South, near Fashion Place Mall, between 9400 and 11800 South, and west of Interstate 15 between 11800 and 12300 South. The Corridor also has many locations ready for infill development including large areas near downtown, between 2100 and 5400 South, near Fashion Place Mall, between 8000 and 10000 South, and between 11800 and 12300 South.

Solutions:

- Expand the schedule of operations on Route 201.
- Incrementally consolidate and add full amenities to transit stations along the State Street alignment.
- Incrementally add reliability and speed improvements such as transit signal priority, queue jumpers, and exclusive transit lanes to the line as funding permits.

Expected Outcomes: The expected outcomes of this project would be the following: greater transit operational efficiencies in the corridor; improved ridership in the corridor; more reliable service; increase economic development; and support for transit oriented development being proposed for the corridor.

Draper Line (North)

Problems, Needs, and Deficiencies: TRAX does not extend to Draper City. Draper is a growing community with increasing congestion. Draper proposes to encourage development of property near 12400 South and wants transit support for that area. The property near 12400 South is a current infill area and is forecasted to become an activity center.

Solutions:

- Extend TRAX south to 12300 South.

Expected Outcomes: Increased TRAX ridership. Improved land use densities and greater ridership in the 12400 South area.

Redwood (Three Phases)

Problems, Needs, and Deficiencies: UTA Route 217 on the northern segment of Redwood Road is a high performing route that could do even better with capital investments and improvements in operations. Current serviced operates at acceptable speeds, but is moderately unreliable, and has a high potential for standing loads. Redwood Road near North Temple and between 800 and 1300 South has high densities of disadvantaged people. The area near North Temple, between 2100 and 3100 South, and at 5400 South and the Mid-Jordan Line have regionally significant economic activities. The corridor also offers infill opportunities at nearly every major intersection.

Solutions:

- Expand the schedule of operations on Route 218.
- Incrementally consolidate and add full amenities to transit stations along the Redwood Road alignment.
- Incrementally add reliability and speed improvements such as transit signal priority, queue jumpers, and exclusive transit lanes to the line as funding permits.

Expected Outcomes: The expected outcomes of this project include: enhanced transit operational efficiencies within the corridor; increased transit ridership; more reliable service; improved service for disadvantaged populations, and support for the transit oriented development being proposed in the corridor.

3900 / 3500 South (Three Phases)

Problems, Needs, and Deficiencies: Route 35M (MAX) in the western segment of the corridor is Utah's first Enhance Bus (BRTI) line with a small segment of Bus Rapid Transit (BRTIII) near Valley Fair Mall. It is felt that this route could perform even better if extended east across the Salt Lake Valley, allocated more capital, and by improving opera. The Millcreek and Valley Fair Mall areas have moderate densities of disadvantaged people. Existing or forecasted activity centers in the corridor include Downtown Magna, 5600 West, the Valley Fair Mall, West Millcreek area, St. Marks Hospital, and the Highland Drive area. The Valley Fair Mall, the area between Redwood Road and the Jordan River, West Millcreek, and the Cottonwood Mall are identified as large infill areas.

Solutions:

- Expand the schedule of operations on 35M.
- Expand the exclusive transit lane as 3500 South undergoes improvement. Incrementally consolidate and add full amenities to transit stations along 3300 South and 3900 South.
- Incrementally add reliability and speed improvements such as transit signal priority, queue jumpers, and exclusive transit lanes to the line as funding permits.

Expected Outcomes: The expected outcomes of this project would be the following: greater transit operational efficiencies in the corridor; increased ridership; more reliable service; improved service for disadvantaged populations, and support for the transit oriented development being proposed in the corridor.

5600 West (Two Phases)

Problems, Needs, and Deficiencies: The northern corridor segment includes the Salt Lake City International Airport, the third largest activity center in Salt Lake County, and the International Center which is a moderate density employment center. 5600 West provides access from a large suburban and exurban areas. A freeway with a transit line is proposed in this corridor. However, it is proposed that transit come first to support lessen auto dependence in the corridor. The area near 5400 South has a significant density of disadvantaged people. Areas near 3500 South and the Daybreak development on the south end of the corridor are forecasted to become activity centers.

Solutions:
- Initiate a Bus Rapid Transit (BRTIII) line and make operational improvements between 2700 South and 6200 South.
- Make capital improvements north and south.

Expected Outcomes: Provide faster, more-reliable public transportation services with the corridor; increase travel choices; and, support local government land-use objectives.

I-80

Problems, Needs, and Deficiencies: This section of I-80 was constructed nearly 40 years ago and has essentially exceeded its anticipated lifespan. There are areas in the corridor where the facility is deteriorating. It is subject to heavy traffic congestion during peak hours, and has a higher than expected accident rate. There are 12 bridge structures that are structurally deficient. There are 10 bridge structures that are functionally obsolete. Most of the bridges were not designed to meet current earthquake standards. The pavement needs to be completely replaced. The safety problems are, to a large degree, rooted in its design. Current travel speeds and traffic volumes are higher than what the facility was designed for in the 1960s. The facility is plagued with numerous drainage problems. Culverts tend to be partially filled with dirt, storm drains are deteriorating, etc.

Solutions: The following project objectives have been identified that would either minimize or eliminate problems: (1) preserve the infrastructure in the corridor by providing adequate drainage and structurally adequate pavement and bridges; (2) provide a multi-modal system that accommodates future travel demand and improves operations; (3) implement measures designed to improve highway safety where economically justified; (4) optimized capacity through the utilization of TSM and TDM; (5) provide for multi-modal transportation opportunities where feasible; and (6) improve transit operations in the corridor.

Expected Outcome: The expected outcomes of the improvements in the corridor would include the following: structurally adequate pavement, bridges, and other infrastructure; increased capacity and improved operations; enhanced safety, retaining of I-80 as a significant link in the trans-continental transportation system; increased use by multi-modal and transit patrons; and preservation and enhancement of the economic viability of the area that I-80 serves.

SR-201

Problems, Needs, and Deficiencies: This corridor contains several sections, and facilities between I-215 and the Tooele / Salt Lake County boundary that are proposed for various improvements. The primary needs in this corridor are greater capacity, improved operational efficiencies, and increased safety, particularly at existing intersections / Interchanges. Much of the growth that will add to the need for greater capacity comes from the industrial employment centers that are anticipated for the areas that the corridor serves. In particular, there is a trend for transportation-oriented or trucking companies to locate near the corridor with the potential of greatly increasing truck traffic and movement of goods. There is a need to replace at-grade intersections with interchanges to: (1) meet safety concerns; (2) permit travel at design speeds; (3) increase capacity; and (4) to add an overpass at 4800 West.

Solutions: The addition of two auxiliary lanes (one in each direction), in conjunction with the upgrade of the Interchange, an over pass at 4800 West, new interchanges at 7200 West and 8400 West, the upgrade of the interchange at I-80, and other proposed projects will provide the improvements needed to enhance the function of this important highway.

Expected Outcome: The expected outcome of planned improvements is to provide greater east / west capacity for anticipated traffic in the corridor. In particular, the movement of goods should be greatly facilitated, and add to the economic competitiveness of the Wasatch Front Region. This facility is intended to compliment and augment I-80, which is located about two and one-half miles to the north and provides one of the most significant east / west transcontinental interstate routes in the Nation.

11400 / 11800 South

Problems, Needs, and Deficiencies: Current and projected rapid growth in the 11400 / 11800 South corridor is creating a need to increase capacity on existing sections, as well as construct new sections of roadway. Along with population growth, a substantial increase of business activity and employment opportunities is also expected. In the southwest part of Salt Lake County, there is a need to complete the transportation network in both north-south and east-west directions. This corridor will play a significant roll in providing added capacity in the east-west direction between SR-111 and I-15. Several intersections and two I-15 interchanges in the study area are, or will be operating at above capacity during the peak hours by 2040. This congestion is expected to cause difficulties and delays for commuters and local travelers, as well as increases in emergency service response times. In addition, without the capacity improvements, economic development will suffer, adversely affecting employment opportunities and local government finances.

Solutions: In order to relieve congestion the I-15 interchanges in the study area that are expected to be over capacity by 2040, a new I-15 Interchange at 11400 South is proposed. In addition, the existing facility is proposed for widened to six lanes. A new river crossing and the linking of the existing sections of 11400 / 11800 South with new roadway sections will complete the highway from I-15 to SR-111. Intersection improvements at the Bangerter Hwy., and Jordan Gateway / Lone Peak Parkway, as well as improvements to 10600 South and 12300 / 12600 South are assumed.

Expected Outcome: The expected outcomes include: (1) increased capacity and improved operations at several intersections and ramps on I-15 in or near the corridor study area: (2) economic stimulation due to an improved development environment, giving rise to increased employment opportunities and sales tax revenues; (3) the addition of a much needed east-west route contributing to the completion of the arterial network in the southwestern part of Salt Lake County; and (4) minimized impact to the natural and social environments.

10400 / 10600 South

Problems, Needs, and Deficiencies: Congestion on east-west roadway facilities is becoming a more difficult problem each year. It is hampering mobility in the area as heavy growth continues in the southwestern part of Salt Lake County. Travel demand is growing at a rapid rate and capacities need to be increased, particularly on 10400 / 10600 South. The two lanes are unable to meet current demands of an arterial; lack paved shoulders; have only partial curb, gutter, and sidewalk; and have insufficient sight distances in some areas. Consideration needs to be given to geometric design, signal operations / coordination, transit, and non-motorized facilities deficiencies. Lastly, new residential and commercial growth does not have adequate access to a minor arterial street, which limits access to the regional transportation system.

Solutions: Add capacity and extend the corridor further to the west to connect with SR-111, in order to complete the regional transportation system. Some specific solutions would include the following: (1) widening of the corridor to a consistent cross-section with additional travel lanes, shoulders curb and gutter, park strips, and sidewalks; (2) adding bicycle lanes to the corridor, in accordance with regional and local master plans; (3) widening and improving intersections along the corridor to provide dedicated right and / or left turning lanes, and upgraded traffic signals; (4) implementing additional raised center-island medians at locations along the corridor for access control and access management purposes; and (5) accommodating transit service along the corridor by providing 10-foot shoulders that can be used for bus loading and unloading.

Expected Outcome: The proposed action is intended to ensure that existing and future traffic is adequately accommodated. Other objectives of the proposed action include: (1) enhanced operational characteristics; (2) improved operation of the major signalized intersections; and enhanced opportunities to incorporate multi-modal facilities within the corridor.

4500 / 4700 South

Problems, Needs, and Deficiencies: This facility essentially traverses most of the Salt Lake Valley in the east / west direction starting at I-215 (east) and ending at 6400 West. It is classified as a principal arterial and as such plays a significant role as a roadway facilitating traffic in the east / west direction. Residential and commercial development in the corridor area has added to the considerable traffic congestion evident on this facility. Many adjacent commercial developments have compromised the proper functioning of the roadway and better access management is needed. Often during the peak hour there is a complete breakdown of the traffic flow from I-15, particularly westbound at the major intersections, such as Redwood Road, I-215 (west), and Bangerter Highway. There is a need to add two lanes throughout the entire corridor, along with other improvements, in order to increase roadway capacity. Also, there is a need for more transit facilities in the corridor.

Solutions: The 2040 RTP calls for the addition of two travel lanes (two lanes in each direction). In addition, operational and safety improvements at the major intersections, bicycle / pedestrian improvements, ITS, TDM, and TSM type measures need to be implemented. Public transit in the form of a Bus Rapid Transit II (BRT II) is also being proposed to serve a portion of the corridor, between about 600 West and Redwood Road.

Expected Outcome: Overall, planned improvements are expected to provide increased capacity within the 4500 / 4700 South Corridor, improved operations at the intersections / interchanges, improved safety, and improved bicycle and pedestrian facilities. Also, improved transit service in a portion of the corridor, particularly at employment / activity nodes can be expected.

3500 South

Problems, Needs, and Deficiencies: Traffic volumes in the 3500 South corridor already exceed capacity, particularly at intersections. In the corridor there are variations in the shoulder widths and medians, and inconsistencies in the number of travel lanes. In addition, poor access control to the adjacent properties has greatly compounded the traffic congestion. Travel times are expected to double by 2040 if improvements are not made. Adding to the problems in the corridor is poor pavement condition, which hampers the roadway's operational efficiency. Mass transit is also being hampered by slow speeds and lack of transit support facilities (waiting areas, sidewalks, crosswalks, etc.). Lastly, pedestrian and bicycle use is being discouraged because of the lack of adequate facilities. Beside the transportation related problems, there are also issues relating to land use, aesthetics and urban design, and street infrastructure.

Solutions: Consideration should be given to strategies that include spot improvements, better management of signal operations at intersections, and implementing general upgrades to improve traffic flow, such as access management. Improving transit facilities and service would reduce congestion by attracting more transit riders. Improvement would include more safe, accessible, and easily identifiable bus stops and informational kiosks, increasing transit frequency, timeliness, and reliability, and providing express bus service with signal prioritization during peak hours. Vehicle, pedestrian, and bicycle safety improvements at intersections and mid-block should be considered.

Expected Outcome: It is expected that implementing planned capacity and other improvements would provide an efficient and safe transportation arterial; allow safe and convenient access to the local businesses adjacent to and close by the corridor; and would accommodate the needs of multi-modal travel, including transit, pedestrian and bicycle modes.

12600 South

Problems, Needs, and Deficiencies: The southwestern part of Salt Lake County is growing at a very rapid rate. As growth continues, ever increasing number of vehicles are using the east-west roadway facilities, of which 12600 South, categorized as a principal arterial, is a part. Future residential and commercial development will dramatically increase travel demand and exceed the existing capacity of 12600 South and its intersections with other roads. In addition, there is a need to extend 12600 South to the west, from 4800 West to 8000 West. This action will allow urban development along this corridor to be served, and a portion of the regional transportation system to be completed. The

12600 South corridor has several problems that affect its ability to accommodate current and future travel demand. These deficiencies include: narrow, unimproved two-lane roadway sections; some sections not meeting design standards, inefficient signalization at intersections; and poor access to other principal arterials.

Solutions: Add capacity in the form of additional travel lanes, turning lanes and medians. Improve the operational characteristics of intersections, including channelization, signal cycle, and other improvements that will increase the roadway's functionality. Enhance safety by adding medians, shoulders, curb and gutter, park strips, and sidewalks. Increase capacity to accommodate inter-modal facilities within the corridor, including buses, bicycles, pedestrians, trails, and other non-motorized modes.

Expected Outcome: The expected outcomes would include improved east-west regional travel, enhanced functionality and safety, improved operations at the various intersections, corrected design deficiencies, more choice with regard to modes of transportation, and improved access to a principal arterial and the regional transportation system.

Mountain View Corridor

Problems, Needs, and Deficiencies: Needs in the Mountain View Corridor area result from a rapidly growing population and employment opportunities. The existing roadway network in the area consists of minor arterial streets and is not well suited to accommodate high volume and longer-distance traffic. Existing transit consists of local bus and some express bus service. Existing deficient transportation conditions, which will worsen in the future, have resulted in the following problems: lack of adequate north-south transportation capacity in western Salt Lake County; lack of adequate transportation capacity in northwest Utah County; increased travel time and lost productivity; lack of transit availability; reduced safety due to increased roadway congestion; and lack of continuous pedestrian / bicycle facilities.

Solutions: The problems noted above can be addressed with the following improvements. First, build a freeway between I-80 and SR-201 with a total of four lanes (two lanes in each direction. Second, build a freeway from SR-201 to the Salt Lake / Utah County line with a total of six lanes (three lanes in each direction). Third, implement congestion management programs, such as HOV lanes (one in each direction), ramp metering, and Intelligent Transportation System (ITS) measures that would manage traffic flow. Fourth, build interchanges so that various arterial streets can be interconnected with new facilities in the Mountain View Corridor. In addition, provide transit facilities in the form of express bus in the Mountain View Corridor, and in the 5600 West Corridor, from 12600 South to I-80, provide transit facilities, such as bus rapid transit, or other transit service as demand warrants. Additional facilities for non-motorized modes are planned for the Mountain View Corridor to accommodate both pedestrian and bicycle travel.

Expected Outcome: The expected outcomes from this major improvement are increased mobility resulting from reduced congestion, increased availability of transit and other travel modes, increased economic opportunities, improved access to adequate transportation facilities for residential areas and improved regional mobility.

I-15

Problems, Needs, and Deficiencies: The problems and needs associated with this project affect both Salt Lake and Utah Counties. Currently, there is significant traffic congestion in the I-15 corridor in southern Salt Lake County (from 10600 South to the County line) as well as in Utah County from the Salt Lake / Utah County line to Santaquin. There are segments within the described termini of this major freeway improvement project that do not meet current safety standards. Because of rapid population and employment growth, the corridor is fast approaching capacity. Conditions will worsen by 2040, resulting in unacceptable levels of service. Projected growth is expected to double the traffic volumes on I-15 by 2040, resulting in increased travel time and crash rates, which will adversely affect the quality of life in the region.

Solutions: The following improvements are being proposed in the corridor in an effort to solve the pressing problems of capacity, safety and other needs: Expand the freeway from six to ten lanes (five lanes in each direction) in Salt Lake County and expand lanes as needed (to a maximum of nine lanes) in Utah County. There are also traffic management options, including TSM, TDM, and ITS programs, that are proposed for improving the project's operating efficiency, reducing the vehicular demand during peak travel times, and improving safety and efficiency through the application of advanced technology. Public transit alternatives such as commuter rail, light rail, and bus service will play an important role in reducing traffic on I-15.

Expected Outcome: The project is expected improve national, regional, and intra-county mobility for people and goods, provide multi-modal transportation choices as part of the overall transportation network, provide cost effective transportation solutions, minimize and mitigate impacts to the natural and cultural environments, to be a part of a transportation system that is compatible with locally adopted growth and development policies and land use plans; and to eliminate design deficiencies that hamper operations and create safety concerns.

Highland Drive

Problems, Needs, and Deficiencies: Due to the rapid population and employment growth in southeast Salt Lake County (Cottonwood Heights, Sandy, and Draper), transportation demands have increased significantly. Existing roadways are becoming increasingly congested, necessitating increasing roadway capacities in the area. Specifically, there are needs for: improved mobility for both longer and shorter distance travel; improved access within the transportation corridor area; and policies to keep the transportation corridor open, or free from additional development so that it will be feasible to provide more capacity. In addition, there is a need to extend the Highland Drive Corridor southward in an effort to complete an interconnected regional transportation network. Highland Drive has been functionally classified as a principal arterial and, therefore, is intended to play a significant role in providing north-south mobility.

Solutions: Add capacity by widening existing sections of Highland Drive from 2 to 4 lanes, build new sections of 4-lane roadway, and improve existing intersection operations. Where appropriate, provide pedestrian, bicycle, and mass transit (express and local bus) facilities throughout the Corridor, as appropriate.

Expected Outcome: Completion of planned improvements in the Highland Drive Corridor is expected to ameliorate severe traffic congestion (peak hour) on certain sections of 1300 East and 700 East; minimize or eliminate the use of local streets for through traffic (for the lack of an alternative route); and generally improve access / mobility in the southeastern part of Salt Lake County.

Redwood Road

Problems, Needs, and Deficiencies: The projected 2040 peak hour traffic demand exceeds available transportation capacity. Redwood Road must be improved in order to provide a more safe transportation facility for existing commercial and residential development and to more adequately move traffic. Currently, bicycle and pedestrian facilities are deficient and do not adequately accommodate users. There is some conflict with wildlife in the corridor.

Solutions: Increase the number of lanes from 2 (sometimes 3 lanes) to 5-lanes with two through lanes in each direction. This will increase the capacity of Redwood Road to accommodate existing and anticipated 2040 traffic, reduce congestion along the project corridor; and enhance transportation safety for all users. Redwood Road will be improved in accordance with current design standards. Bicycle lanes and shoulders will be added where necessary, intersections will be upgraded, medians will be added in some locations, and wildlife corridor connectivity will be addressed. Plans call for wildlife crossings to be constructed at three locations along Redwood Road.

Expected Outcome: Planned improvements should accomplish the following: improve connectivity between existing and proposed transportation arterials and highways; provide a transportation infrastructure that meets current roadway standards and that will be an asset to the communities the facility serves; provide a transportation facility that operates an acceptable level of service and meets UDOT's goal of a level of service "D"; maximize long-term roadway capacity by managing access concurrent with UDOT policies and existing and planned land uses; improve emergency response time and availability of emergency response teams; and reduce conflicts with wildlife living near or crossing Redwood Road.

SR-111

Problems, Needs, and Deficiencies: Residential and commercial growth will mean substantially more traffic volumes on SR-111 and other roads in the area. There is room to develop an additional 200,000 housing within the area served by the highway, with a population of close to 600,000 people. Currently, SR-111 is a two-lane facility. As the west side of Salt Lake County continues to grow, capacity, safety, and other deficiencies will need to be addressed. Since SR-111 is planned to function as a principal arterial and is expected to carry relatively high speed and high volume traffic, there is a need to increase the number of lanes from two to four lanes. Principal arterial roadways are spaced about every two or three miles. The SR-111 corridor is needed on the west side of Salt Lake County to help complete the principal arterial roadway network.

Solutions: The proposed solutions to the needs outlined above are as follows: Provide two additional travel lanes (one in each direction); Improve the operations and safety of the existing and future SR-111 intersections by providing turning lanes and other improvements; implement ITS, TDM, and TSM strategies; and accommodate non-motorized travel, such pedestrian and bicycle facilities.

Expected Outcome: With the planned improvements for the project, the following outcomes are expected: Improved capacity to accommodate increased traffic demand traveling at relatively high speed; the construction of efficient and safe intersections; implementation of ITS, TDM and TSM strategies; accommodation of non-motorized modes of transportation; and TDM, and TSM strategies; and reduced conflicts with wildlife living in proximity to the corridor.

SAFETEA-LU PLANNING FACTORS

The Safe, Accountable, Flexible, Efficient Transportation Equity Act–A Legacy for Users requires regional and metropolitan planning organizations to assure that the transportation planning process provides for the consideration of projects and strategies in accordance with eight general planning factors. These factors are designed to assist planners in developing comprehensive solutions to area transportation needs. The SAFETEA--LU planning factors for improving transportation system management, operation, efficiency and safety are consistent with the goals and objectives of the 2040 RTP. The following paragraphs list the eight SAFETEA-LU planning factors and describe how the 2040 RTP has considered each requirement. Appendix X provides a brief summary of federal guidance on interim SAFETEA-LU provisions.

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

The 2040 RTP provides a network of improved transportation facilities, both highway and transit, which are essential to the economic vitality of the region. The 2040 RTP calls for the modernization of a critical portion of the local interstate freeway system, an improved regional highway network, Bus Rapid Transit, enhanced bus service, the extension of the light rail system, regional commuter rail, and increased attention to intermodal center locations and development. The facilities improvements recommended by the 2040 RTP would provide increased accessibility to regional employment opportunities for both individuals who rely on private automobiles and for persons using public transportation. Improved local and regional accessibility and connection to large employment centers, business districts, commercial developments, industrial parks, educational institutions, shopping malls, neighborhoods, and area airports will promote the Wasatch Front Region's competitiveness, productivity, and efficiency in the 21st Century.

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

The 2040 RTP incorporates the recommendations of the Utah Comprehensive Safety Plan developed by UDOT with a goal of reducing crashes and eliminating fatalities on streets and highways. The WFRC participates on UDOT's Safety Leadership Team and is a sponsor of UDOT's "Zero Fatalities" campaign.

The highway and transit facilities proposed in the 2040 RTP will increase the safety of motorized and non-motorized users through new construction and other improvement projects. While safety related improvements, because of their relatively small scale, are not specifically listed or mapped, safety issues will be given due consideration through the WFRC's Transportation Improvement Plan (TIP) project selection criteria. Controlling facility access, expanding freeway capacity, and putting traffic on streets that are designed to adequately accommodate demand improves overall network safety. Major highway improvements, widening projects, and facility access control through congestion management systems all combine to enhance travel safety. The 2040 RTP includes a Regional Bicycle Facilities Plan and suggested policies for enhancing pedestrian access through appropriate urban design, site planning, subdivision design, etc. These policies can serve as guidelines for local governments to consider in land use decisions. One of the goals of the regional Bicycle Facilities Plan is to identify improvements that enhance the safety of bicycle travel. The policies for pedestrian facilities and access will also help promote safety.

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 to identify security issues regarding the transportation system. Both UDOT and UTA have established plans that address emergency and security issues.

The highway and transit recommendations in the 2040 RTP will increase security for motorized and non-motorized users through new construction and improvement projects that provide alternative routes and modes, especially through area choke points. For UTA, security is an important consideration in designing and operating rail and bus services. UTA employs security personnel to ensure the personal safety of its patrons. Park-and-ride lots are well lit and frequently patrolled. Finally, telephone service is provided in the event of an emergency.

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

One of the goals of the 2040 RTP is to "Increase transportation mobility and accessibility for both persons and freight, thus promoting economic vitality in the region." The roadway and transit improvements recommended in the 2040 RTP will help reduce area congestion and enhance accessibility. Increased mobility is provided by a variety of travel options including new or widened highways and primary arterial streets, light rail transit, BRT, enhanced bus service, new regional commuter rail transit service, bus transit hubs, planned intermodal centers, and additional transit amenities, such as park-and-ride lots. The 2040 RTP anticipates an increase in the number of miles of bus service, including expansion of weekend and night routes, and additional paratransit service to major travel demand generators. Freight movement, both interstate and intrastate, will benefit from the reconstruction and modernization of the local freeway system, shifting a portion of trips to transit modes, improvements to the regional highway network, and other access enhancements. The region's highway system will continue to provide convenient access to air cargo facilities. Also, as part of UTA's recommended regional commuter rail project, several of the Union Pacific Railroad's intermodal facilities have been consolidated into an intermodal freight transfer center in Salt Lake City. This new hub will improve the movement of rail freight traffic.

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 for 2040 process, which developed a Vision for future growth and Growth Principles to guide development in the Wasatch Front Region, included 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. The WFRC developed 2040 RTP recommendations for highway and transit improvements consistent with the growth principles and in support of an overall high quality of life for those residing throughout the Region.

State and local plans for growth and economic development were part of the foundation of the 2040 RTP transportation recommendations. The WFRC staff met with officials of every municipal and county to ensure that socio-economic projections developed by the WFRC were consistent with local plans. In addition, the Utah State Economic Development Office reviewed the 2040 RTP recommendations and provided input on priorities as they affect further economic growth in the Wasatch Front Region.

Concern for the environment of the Wasatch Front Urban Area is an integral part of the 2040 RTP planning process. Recommended facilities are considered with respect to environment 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 are conducted by qualified individuals. By attempting to minimize travel delay, energy conservation is promoted through successful congestion management strategies, increased system capacity, and the provision of transit alternatives. The 2040 LRP Update provides a number of recommendations for improved regional transit, including an increased emphasis on promoting UTA's Rideshare Program. 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.**

The 2040 RTP recommends the development of intermodal centers and park-and-ride lots at optimum locations to improve connectivity of the regional transportation system. The 2040 RTP also promotes shared opportunities for multimodal transportation development including light rail transit, commuter rail, augmented bus service, and pedestrian and bicycle pathways. Identified park-and-ride lots are located near automobile, pedestrian and bicycle connections for access to bus service and carpools. Feeder bus service to the light rail system is provided for in the 2040 RTP, along with transit hubs where transfers can take place between different travel modes. Transit-to-transit connections are possible, as well as transit to aviation connections. Access to airport cargo facilities, railroad freight service, Amtrak passenger rail service and intrastate / interstate bus lines (i.e. Greyhound) is accommodated for at planned intermodal facilities. One of the 2040 RTP'S goals is to "Provide an equitable distribution of transportation modes, facilities and benefits to permit all geographic, economic and social groups to effectively participate in essential urban activities."

7. **Promote efficient system management and operations.**

The WFRC has both congestion management and pavement management processes. It also encourages implementation of transportation demand management and transportation system management strategies developed to promote efficient system management and operations. These strategies rely on specific recommendations to be implemented as existing highway facilities are improved or new facilities constructed. Each capacity widening project recommended in the 2040 RTP is accompanied by a list of specific methods to improve system efficiency. These lists include such advanced traffic management system strategies as access management plans, fiber optic cables for the implementation of the region's ITS, message signs, cameras and travel demand concepts designed to promote the efficient use and management of the existing and proposed transportation network. The WFRC, in cooperation with UDOT, UTA, and local communities, has prepared an ITS Architecture Plan to guide the implementation of ITS projects for both highway and transit.

8. **Emphasize the preservation of the existing transportation system.**

The financial analysis section of the 2040 RTP assures that adequate funding for maintenance, operation, and preservation of highway and transit facilities is provided. The 2040 RTP assumes adequate funding to preserve existing streets and highways. This is a priority of both UDOT and local governments. UDOT has recently updated its asset management program that identifies funding levels needed to maintain and preserve UDOT's pavements and structures, and to improve the safety of its system. These new estimates of funding needed to preserve the existing system, show an increase from previous estimates and were 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 2040 RTP also recommends the upgrading of transit facilities and the replacement of all vehicles on a regular schedule. The transit portion of the 2040 RTP assumes replacement of buses every 12 years and recommends the construction of additional maintenance facilities. Over the years, UTA has gained a very positive reputation for maintaining its facilities and is not expected to change its maintenance policies.

AIR QUALITY CONFORMITY DETERMINATION

Weber, Davis, and Salt Lake Counties, Salt Lake City, and Ogden City are designated as non-attainment (or maintenance) areas for one or more air pollutants. Specifically, there are four areas in the Wasatch Front region, which are subject to air quality conformity regulations. These areas are listed in Table 8-11.

An analysis of projected vehicle related emissions from the transportation network defined in the 2040 RTP shows that vehicle emissions will pass the conformity tests for each non-attainment area along the Wasatch Front. A summary of the mobile source emission budgets as defined in the State Implementation Plan is given in Table 8-12. The analysis demonstrating conformity is contained in "Air Quality Memorandum 27", a copy of which can be found in Appendix Y.

Vehicle Emission Modeling

Vehicle emissions were estimated using the EPA approved Mobile6.2 model. After March 2012, all conformity determinations will be required to use EPA's latest vehicle emissions model known as MOVES. Data from the WFRC travel model was used to describe the transportation network for the analysis years 2007, 2009, ,2016, 2020, 2030, , and 2040. The travel model provides data for VMT, hourly distribution of VMT, speed distribution of VMT, and highway facility type distribution of VMT, for each analysis year. Local data was prepared to determine the age distribution of the vehicle fleet using DMV data for 2007, and the vehicle type distribution using UDOT vehicle classification counts for 2007. Local emission inspection and maintenance programs for each county were also coded for input to the Mobile6.2 model.

OVERALL MITIGATION

Organizations involved in transportation planning have been encouraged by federal agencies, such as the Federal Highway Administration, Federal Transit Administration and others to be more sensitive to environment needs and to incorporate principles of the National Environmental Policy Act into their planning processes. With this encouragement in mind, efforts were made during the WFRC's current planning process to put more emphasis on resolving environment issues, and to seriously consider NEPA principles. Possible impacts, many of which are required to be considered by

TABLE 8-11

Wasatch Front Region Non-Attainment Designations

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

TABLE 8-12

Mobile Source Emission Budgets

Area	Pollutant	Years	SIP Budget (Tons/Day)
Salt Lake City	CO	2012 - 2040	278.60
Ogden City	CO	2012 - 2020	75.36
	CO	2021 - 2040	73.02
	PM_{10}*- NOx	2007 - 2040	4.57
	PM_{10} – Dust*	2007 - 2040	2.28
Salt Lake County	PM_{10} – NOx**	2012 - 2040	32.30
	PM_{10} – Dust	2012 - 2040	40.30
Salt Lake***	$PM_{2.5}$ - NOx	2015-2040	76.85
	$PM_{2.5}$ – Direct Particulates	2015-2040	1.16

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

NEPA, associated with the projects proposed in the 2040 RTP have, in a general way, been identified. In addition, possible mitigation actions that could be taken if environmental impacts could not be avoided were also addressed. General guidelines are listed here to be used as projects are advanced in the project development process. (Note: A document prepared by the Southeast Michigan Council of Governments' entitled, "Integrating Environmental Issues in the Transportation Planning Process: Guidelines for Road and Transit Agencies," was used as a resource in the preparation of this section of the 2040 RTP concerning mitigation of impacts.)

Federal transportation statues dictate a series of requirements for the regional transportation plan and Transportation Improvement Program. Current federal legislation - the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, or SAFETEA-LU, contains a requirement that the RTP include "a discussion of types of activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan. This discussion shall be developed in consultation with Federal, State, and tribal wildlife, land management, and regulatory agencies."

In essence, this process as applied to the Plan involves three-steps: (1) Defining and inventorying environmentally sensitive resources; (2) identifying and assessing likely impacts on these areas from RTP projects; and (3) addressing possible mitigation at the system-wide level. The process is designed to identify, early on, possible project impacts on environmentally sensitive resources and to provide this information to implementing agencies and elected officials for use in making transportation related decisions. The analysis was conducted on a regional level only. It was determined that the outcome of this analysis should alert the implementing agencies as projects are developed of environmental sensitivities and possible mitigation opportunities.

Mitigation measures can be identified in the planning process and are considered in the 2040 RTP. However, consideration of how impacts that are unavoidable can be mitigated should be undertaken in "corridor studies" and in the environmental impact statement preparation phase of project development. Thus, the discussion of mitigation in this document is just the beginning of a relatively long process of identifying impacts and mitigation measures as transportation projects are developed.

Regardless of the type of project or the resources that may be impacted, sound guidelines need to be considered and followed during the planning, design, construction, and maintenance of transportation projects. Good planning practices need to be followed to ensure a blending of sound construction techniques with desired environmental protection goals. There are two types of guidelines that need to be addressed during the development and implementation phases of projects. These guidelines are for planning / design and construction / maintenance. For the purposes of this discussion, guidelines relating to planning and design are the focus, and are presented below. As for construction and maintenance guidelines, the AASHTO Center for Environmental Excellence's "Environmental Stewardship Practices, Procedures, and Policies for Highway Construction and Maintenance" should be referred to and is recommended for use in minimizing impacts of transportation projects.

Government Resource Agency Coordination

In August of 2009, a meeting sponsored by the WFRC was held with government resource agencies and other interested parties. Representatives from each of the MPOs and UDOT attended the meetings. The purpose of the initial meetings was to determine the needs and issues of each agency prior to the identification of projects recommended for inclusion in the 2040 RTP. These meetings were well attended with broad representation from three metropolitan water districts, the Bureau of Land Management, the Bureau of Reclamation, the Utah State Historical Preservation Office, the Utah Division of Natural Resources, the Utah Division of Water Quality, the Utah Division of Solid and Hazardous Waste, the Utah Division of Air Quality, the U.S. Corps of Engineers, the Utah Department of Agriculture, the Utah State Division of Parks and Recreation, the Federal Highway Administration, the U.S. Fish and Wildlife Service, the U.S. Environmental Protection Agency, and Weber Pathways, representing the bicycle and pedestrian interests. A third meeting was held in October 2010 to discuss possible or potential mitigation measures and individual projects. This meeting was also well attended with most of the same agencies being represented. The comments of the agency representatives relating to mitigation are briefly summarized below.

Air Quality: "Transportation planners need to be aware that we are currently in non-attainment status and that current air quality standards are under re-consideration."

Agricultural Land Preservation: There is a concern about the loss of prime agricultural land. What are we doing to mitigate these losses? The Utah Department of Agriculture would like to be "at the table" when these issues are considered.

Bicycle Facilities: Does uPEL show where there are bicycle and pedestrian facilities? Can it be expanded? Interchanges and intersections need to be more bicycle-friendly.

Coordination of Transportation and Utility Infrastructure Plans / Corridors: Utility agencies and companies, and agencies responsible for constructing and maintaining roadways, need to improve coordination in planning. Thus, the scheduling of construction projects for utility lines can be coordinated, where possible, with the construction and / or maintenance activities of the transportation agencies. At a minimum, agency officials need to be aware of the development plans of all other agencies who share a right-of-way. Sufficient advance notice of future highway construction projects is encouraged so that mitigation efforts can be planned and implemented. The sharing of corridors for transportation and utilities infrastructure helps reduce the impacts on the natural environment, particularly critical lands.

Water Conservation: Corridor planning should include planning for differing types of needs in the corridor such as water, power, etc .

Preserving Streams, Rivers, and Lakes: The environs of navigable streams, rivers, and lakes need to be protected as bridges and other road infrastructure are constructed. Measures also need to be taken to minimize effects on floodplains. The earlier regulatory agencies, especially the Corps of Engineers, can be brought into the planning process, the easier it will be to avoid natural resource conflicts.

Water Quality: Does uPEL have a layer for water source protection areas? Such data should be considered prior to any major plans.

Hazardous Wastes: The Dept. of Solid and Hazardous Waste has an interactive map that shows hazardous waste sites and other useful planning information.

Fish and Wildlife: Officials are aware that there is a desire for corridor preservation. They should be contacted early in the process. An upfront environmental study before the corridor is set will have a positive impact and avoid conflicts.

Alternative Energy: Alternative fueling stations and re-charging stations for plug-in hybrids should be included in the various long range plans.

Sustainable Communities: EPA is working with HUD on sustainable communities grants and there will be more federal programs of this nature coming on-line. Transportation planners should begin coordinating with HUD on this issue.

Historic and Pre-Historic Resources: This Utah state office is mostly working on areas that have possible impacts from projects under consideration. They do not have funding to review other non-threatened areas at present. It would be helpful if they knew where to concentrate their efforts in order to fill data gaps, it would help.

PERFORMANCE MEASURES

Performance measures for the 2040 RTP were identified for the goals and objectives listed in Table 8-13. Each measure was selected based on readily available data, both current and future. These measures will allow the WFRC staff to track historical trends in performance and set goals accordingly. It will also be possible to make regular reports to the Council on system performance using these measures. Table 8-13 presents a comparison of performance measures for the years 2007 and 2040. The 2040 RTP performance measures are presented with and without the 2040 RTP recommended improvements.

The performance measures in Table 8-13 illustrate how traffic conditions will change in the future from current conditions (2007), and what those future conditions would look like with the 2040 RTP and without the improvements included in the 2040 RTP (2040 "No Build"). As can be expected, traffic conditions in 2040 will be characterized by greater traffic volumes with more delay and congestion than traffic conditions in 2007. But the delay and congestion in 2040 is dramatically improved by implementing the 2040 RTP compared to the "No Build" scenario. A discussion of each of the goals and corresponding performance measures is presented below.

Economic – The performance measures selected to reflect economic vitality is home to work travel time for commuters, and freight travel time from freight centers to the nearest freeway. Commuter times were estimated for travel by private automobile and public transit, and are displayed as the percentage of commuter trips that are 20 minutes or less in duration. Implementing the 2040 RTP improves commuter and freight times which will contribute to economic vitality in the future compared to the "No Build" scenario.

Safety – Data and tools to forecast traffic accidents were not available for this report. In the Accessibility and Mobility section below, there is a performance measure for the quality of traffic flow or "level of service" (LOS). The measure is the "Percentage of PM Peak Period Vehicle-Hours at LOS "D" or Better". LOS "D" refers to traffic conditions that are unstable with little or no opportunity to change lanes or pass, but traffic is still moving although at a reduced speed. This is the "rush hour" traffic condition most drivers are familiar with, but it is not the "stop-and-go" forced flow condition designated as LOS "E", or gridlock conditions designated as LOS "F". While the percentage of traffic operating at LOS "D" or better is not a measure of safety, it does indicate that it is reasonable to expect that improved traffic conditions as a result of implementing the 2040 RTP will result in fewer accidents.

Security – Similar to the Safety goal, data and tools to forecast security were not available for this report, indeed they are difficult to define. As discussed in the Safety section, the "level of service" measure in the Accessibility and Mobility section discussed below may also be a surrogate measure for security. Other congestion related measures listed in Table 8-13 such as "annual person-hours of delay/capita" or "percentage of commute times less than 20 minutes" also indicate that the 2040 RTP reduces

TABLE 8-13

Goals and Performance Measures

Goals and Performance Measures	2007 Current Conditions	2040 Without RTP	2040 With RTP
ECONOMIC			
Percentage of commute times less than 20 minutes by car	52%	36%	40%
Percentage of commute times less than 20 minutes by transit	21%	23%	27%
Freight center travel time to the nearest freeway (minutes)	4.5	5.7	4.9
SAFETY			
(See below "Percentage of PM Peak period VHT at LOS “D” or better")			
SECURITY			
(See below "Percentage of PM Peak period VHT at LOS “D” or better")			
ACCESSIBILITY AND MOBILITY			
Daily VMT per capita	25	27	28
Percentage of PM Peak period VHT at LOS “D” or better	93%	60%	75%
Select corridor PM peak travel times*			
Average travel time	19.4	23.1	21.1
Percent change in travel time from 2007	--	19%	9%
Daily linked transit trips	87,666	175,272	221,639
Transit mode share: Linked Transit Trips / Total Person Trips.			
All Trips	1.3%	1.6%	1.9%
Peak Period Commuter Trips	4.7%	5.9%	6.8%
Percentage of commute times less than 20 minutes by car in disadvantaged population zones	68%	56%	59%
ENERGY / ENVIRONMENT			
Gallons of fuel consumed for automobiles	2,131,020	3,506,711	3,698,804
Percent change from 2007 vehicle emissions - $PM_{2.5}$	--	-31%	-24%
Percent change from 2007 vehicle emissions - NOx	--	-77%	-75%
Percent change from 2007 vehicle emissions - VOC	--	-51%	-48%
Percent change from 2007 vehicle emissions - CO	--	-17%	-9%
Percent change from 2007 vehicle emissions - CO2	--	64%	73%
LIVABILITY			
(See above "Average travel time" and “Transit Mode Share”)			
EFFICIENCY			
Annual person-hours of delay/capita	10.3	53.1	26.4
PRESERVATION			
ROW Percentage: ROW owned or funded/ROW needed to implement the RTP	--	--	39%
*Estimated travel times for each of 23 corridors is given in Table 8-14.			

congestion. A transportation system with less congestion is a more secure transportation system that can more readily accommodate emergency vehicles or evacuations in case of a natural disaster or other event. The 2040 RTP also includes significant investments in alternate transportation modes such as public transit, pedestrian, and bicycle facilities all of which offer transportation alternatives in emergency situations.

Accessibility and Mobility – Six performance measures were defined for the Accessibility and Mobility goal related to the quantity and quality of travel. The first, vehicle miles traveled (VMT) per capita, is an indication of how the growth in vehicle travel corresponds to population growth. VMT per capita grows by 12% from 25 in 2007 to 28 in 2040. As the transportation network expands to previously unpopulated areas, overall travel increases accordingly.

The percentage of PM peak period vehicle hours at LOS "D" has been discussed in the previous two sections. Under the "No Build" scenario, only 60% of PM peak period traffic would experience travel free from forced flow "stop-and-go" conditions (LOS "E" and "F"). Implementing the 2040 RTP improves this condition significantly with 75% of peak period traffic free from forced flow "stop-and-go" conditions.

Select corridor travel times in the PM peak period were estimated using the travel demand model to give a meaningful indication of the amount of congestion and delay to be expected in the future. The estimated travel time for specific corridors in the Wasatch Front Region is given in Table 8-13 on the previous page. As an overall performance measure, the average of all the corridor travel times was calculated as an indication of future delay. Compared to current conditions, it would take 19% more time to traverse the corridors listed in Table 8-14 under the "No Build" scenario. By implementing the 2040 RTP the average travel time is reduced to just 9% greater than current conditions.

Several performance measures were identified for transit service in this section. The number of linked transit trips is estimated to grow from 88,000 in 2007 to 222,000 with the 2040 RTP. Of all the person trips made in the region, the percentage made by transit will grow from 1.3% in 2007 to 1.9% in 2040. Of all the peak period commuter trips (home to work), the percentage made by transit will grow from 4.7% in 2007 to 6.8% in 2040.

As an indication of mobility, the percentage of commute times less than 20 minutes by car from disadvantaged population zones was calculated. A disadvantaged population zone is defined by the socio-economic factors for that zone, namely age, income, and minority status. Without any improvements to the transportation system, 56% of the commuter trips from disadvantaged population zones would be 20 minutes or less in duration. By implementing the 2040 RTP this measure improves to 59%.

Energy / Environment – Automobile fuel consumption and reduction in emissions are the performance measures identified for the Energy and Environment goal. Daily fuel consumption for vehicle travel is estimated to increase from 2.1 million gallons in 2007 to 3.7 million gallons in 2040. These estimates are based on current fuel economy standards defined in Mobile6, the Environmental Protection Agency's vehicle emission model. These estimates do not reflect the latest proposal to improve Corporate Average Fuel Economy (CAFE) standards compared to current levels.

Vehicle emissions were also estimated using the Mobile6 model. Due to improved vehicle emission technology and vehicle emission testing, 2040 emissions of PM2.5, NOx, VOC, and CO from vehicles will be 24%, 75%, 48%, and 9% lower respectively than vehicle emissions in 2007 even though there will be more vehicle travel in the future. Emissions of CO2, a non-toxic greenhouse gas, are estimated in the Mobile6 model as a function of fuel consumption (which is a function of vehicle miles traveled) and are expected to increase by 73% compared to 2007 emissions of CO2. This projection does not consider the proposed CAFE standards discussed above or other vehicle technologies designed to reduce fuel consumption and resulting CO2 emissions.

Livability – Livability can be difficult to measure because it means different things to different people, and it often

TABLE 8-14

Select Corridor Travel Times

Select Corridor Travel Times	2007 Current Conditions	2040 Without RTP	2040 With RTP
NORTH / SOUTH			
SR-108: 3300 S (Ogden) to Syracuse Rd	19.1	25.2	19.1
I-15: 400 S (Salt Lake City) to 31st Street (Ogden)	41.1	49.8	43.1
SR-106: 500 S (Bountiful) to State St (Farmington)	15.0	16.1	15.5
Highway 89: I-15 (Lagoon) to Harrison Blvd	23.4	33.6	22.2
Bangerter Highway: I-80 (Airport) to 13400 S	35.5	41.9	36.3
5600 W: I-80 to 6200 S	21.9	23.7	23.2
1300 E: 500 S (University of Utah) to 12300 S	28.4	33.9	32.1
State Street: 500 S to 10600 S	24.6	28.3	27.8
Highland Dr: 6200 S to 9400 S	11.6	11.9	11.6
I-15: 500 S (Salt Lake City) to University Pkwy (Orem)	47.8	59.6	52.3
Average	**26.8**	**32.4**	**28.3**
EAST / WEST			
1200 S (Weber): SR-126 to Harrison Blvd.	9.9	12.1	11.6
SR-193: I-15 to Highway-89	17.3	19.0	18.7
SR-108 (Syracuse Rd): I-15 to 2000 W	15.0	15.8	15.6
200 N: I-15 to US-89	7.9	8.4	8.3
200 N: I-15 to Angel St	8.8	9.6	9.0
500 S: Redwood Rd to Orchard Dr	8.9	10.4	10.5
3300 S: I-15 to 5600 W (Magna)	19.7	22.4	21.4
5400 S: I-15 to 5600 W (Kearns)	20.0	21.6	23.0
7200 S: I-15 to Wasatch Blvd	18.4	23.8	23.4
9000 S: I-15 to 4000 W	14.9	22.4	19.1
9000/9400 S: I-15 to Highland Dr.	14.1	15.3	14.7
12600 S: I-15 to 5600 W	16.5	19.6	19.7
12600 S/12300 S: I-15 to 1300 E	6.8	7.6	7.1
Average	**13.7**	**16.0**	**15.5**

involves intangibles not easily quantified such as "quality of life". For the purpose of measuring livability for the RTP, the percentage of developed land within the urban boundary (as defined in the census) was considered as the performance measure. The weakness of this measure is that the urban boundary changes over time as the area develops.

Another weakness of the measure proposed above is that for some people lower density may be a preferred form of development, but in the interest of reducing infrastructure cost a higher density development (infill) has advantages. For this RTP analysis, the reader is directed to other performance measures documented in Table 8-13 that describe the transportation system. Future RTP documents will consider more effective measures for livability. One possibility is an inventory of available housing by housing type such as single-family, multi-family, and mixed use. Housing information was not available in such form at the time of this publication.

Efficiency – The amount of annual traffic delay, in person-hours per capita, was identified as the measure of efficiency for the RTP. Delay is defined as the additional time required for travel due to congestion compared to traveling under uncongested or "free flow" conditions. This measure represents how efficient the transportation system is at moving people. In 2007 it is estimated that annual traffic delays amount to 10.3 hours for every person in the Wasatch Front Region. By 2040 under the "No Build" scenario this annual delay per capita will have grown over 5 fold to 53.1 hours. Implementing the 2040 RTP substantially reduces this delay per capita to 26.4 hours.

Preservation – Implementing the 2040 RTP will require about 10,500 additional acres of right-of-way. Preserving this right-of-way is critical to the success of the RTP. The percentage of required right-of-way currently owned by the implementing agencies (city, county, or State) is a good indication of the preservation efforts of the transportation plan. For the 2040 RTP, 39% of the right of way needed is already owned by the implementing agencies

GREEN INSTRASTRUCTURE PLAN

Green Infrastructure Defined

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. Figure 8-4 illustrates the landscape features of green infrastructure.

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 be identified as infrastructure because they support essential ecosystem functions upon which all life depends. Large protected and connected areas are the foundation for a 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.

The Benefits of Green Infrastructure

Green Infrastructure provides clean air and water, and benefits a large number of people in the Wasatch Front in numerous ways. It enhances public health and safety through wildfire suppression, clean and safe drinking water, healthy food production, and mitigation of flood hazards.

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 expensive constructed gray infrastructure systems. The ecosystem benefits provided by green infrastructure have considerable financial value, if compared with the costs of generating equivalent benefits from gray infrastructure.

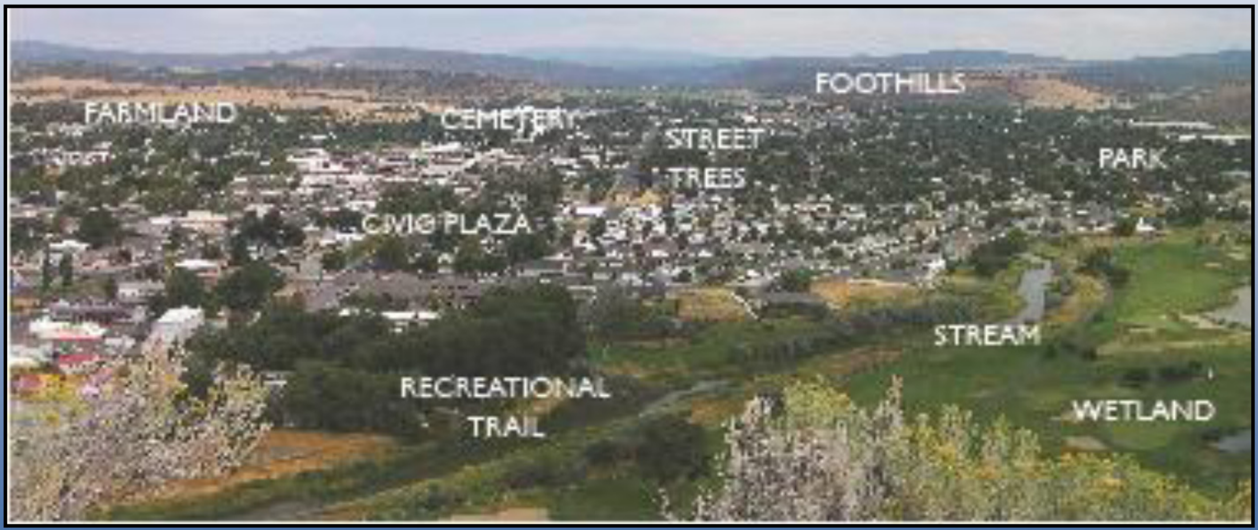
The Wasatch Front Green Infrastructure Plan

The Wasatch Front Region is characterized by considerable ecological and biological diversity, cultural richness, historical depth, and an abundance of recreational resources. All of these attributes and features are dependent upon the Region's geography and natural resources.

Population growth has led to widespread land use changes. Unfortunately, growth is reducing natural landscapes and

FIGURE 8-4

Green Infrastructure Features



affecting ecological systems. This, in turn can affect the Wasatch Front Region's economic health and resident quality of life. Taking a green infrastructure approach in the Wasatch Front requires identifying and understanding natural systems and protecting those systems, before development or degradation begins, as well as seeking to restore valued lands and connectivity in already developed landscapes.

The Wasatch Front Green Infrastructure Plan is the product of a collaborative effort with other agencies to identify and connect the region's green infrastructure. The Plan identifies valuable natural and developed areas, as well as potential connections between these areas. The Plan also helps determine which lands can accommodate growth and which lands are better suited for protection, preservation or conservation. It places a strong emphasis on implementation and identifies strategies that can be used by the Wasatch Front Regional Council, counties, cities, municipalities, transportation entities, other government entities, private foundations and the general public to ensure inclusion of green infrastructure planning in long range initiatives. The Plan establishes environmental priorities to guide planners in reviewing development applications, allocating funding, updating municipal general plans, and making acquisition decisions. The Wasatch Front Green Infrastructure Plan provides a valuable tool for guiding future conservation efforts and planning decisions. Figure 8-5 illustrates the type of GIS informational layers used to develop the WFRC Green Infrastructure Network Design.

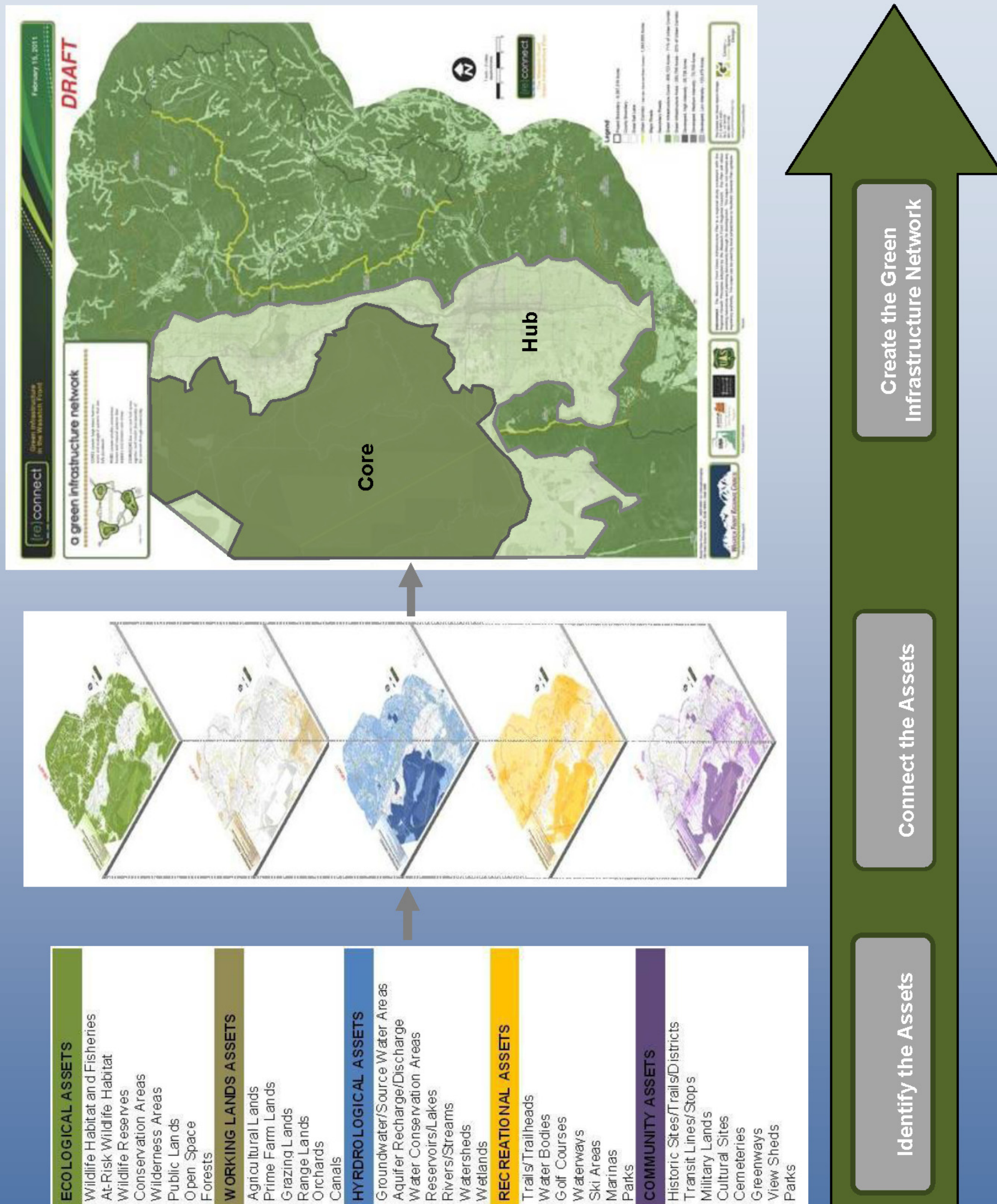
Green Infrastructure and Transportation Planning

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

The growth principles and objectives outlined in this Regional Transportation Plan are also fundamental to green infrastructure planning as well. Both plans seek to protect and enhance the environment, strengthen the sense of community,

FIGURE 8-5

Green Infrastructure Informational Layers



enhance the regional economy, promote regional collaboration, and ensure public health and safety. Working with transportation planners and others, the green infrastructure plan can help shape urban and suburban form and promote the best possible patterns of development.

CLIMATE CHANGE

The subject of climate change is a scientifically complex one, one that has recently generated significant discussion. Water, carbon dioxide and methane (and traces of other gases in lower proportions) are considered "greenhouse" gases (GHG), meaning that they reflect back some of the radiant heat energy that reaches the earth's surface that would otherwise return to space. Without the "greenhouse" effect of the earth's atmosphere, the mean temperature of the earth would be below freezing. Many scientists now suggest that mankind's activities are adding to the concentration of greenhouse gases in the atmosphere, resulting in potential changes in the earth's climate.

Even with this scientific research, there is still great uncertainty about the nature or degree of impact that increases to greenhouse gas concentrations will have on the climate. While an evaluation of mobile source emissions on climate change is not a required element of the RTP, WFRC management feels that it is important to begin to outline some of the issues related to the role of the RTP in addressing potential changes to the global climate.

In the context of the WFRC 2040 Regional Transportation Plan, the questions pertaining to climate are: **1) How does the 2040 RTP impact global climate change?**, and **2) How does global climate change impact the 2040 RTP?**

How does the 2040 RTP impact global warming?

The analysis of Performance Measures in Chapter 8 of this document shows that CO2 emissions from vehicle activity are expected to be 73% greater in 2040 than 2007. This forecast is based on results from the Mobile6 vehicle emissions model using vehicle activity described in the 2040 RTP. The Mobile6 model estimates CO2 emissions based on assumed fuel consumption rates for vehicles. The Mobile6 model is not sensitive to speed (congestion conditions) when it comes to CO2 rates.

New CAFÉ (Corporate Average Fuel Economy) standards aimed at improving vehicle mileage rates will have a significant impact on reducing future CO2 emissions. Also, new vehicle concepts such as hybrid electric or pure electric vehicles will have a part in reducing future CO2 emissions from vehicles. Producing more of the electricity needed for these new concept vehicles from sources other than coal such as nuclear power, wind energy, or geothermal sources would result in a net decrease in vehicle related CO2 emissions compared to vehicles relying on internal combustion engines. While expanding transit service and other transportation strategies may help reduce travel and greenhouse gas emissions, the improved emission standards for future vehicles will have the greatest impact on reducing mobile source emissions.

How does global warming impact the 2040 RTP?

The WFRC 2040 RTP did not make any special provisions for the potential impacts of global climate change. What those specific changes would be along the Wasatch Front Region of Utah is anyone's guess.

One possibility is a dryer, hotter climate. This scenario might be a benefit in terms of construction of transportation facilities as this would tend to extend the construction season. This could also reduce snow removal costs, winter weather delays, and weather related crashes. On the other hand, the negative economic impacts of a region chronically stricken with drought could significantly alter the population and employment forecasts currently found in the RTP.

The other extreme is a cooler, wetter climate. In contrast to the above scenario, this scenario would increase snow removal costs and shorten the construction season. Highway safety would be compromised and weather related delays would be more frequent and severe. A wetter Utah climate could also lead to springtime flooding from excessive runoff which could damage roads and bridges. Rising levels of the Great Salt Lake could threaten critical transportation facilities adjacent to the Lake such as I-15, I-80, and the Salt Lake City International Airport. Slope failures are another possibility, particularly in mountain passes critical to transportation such as Parley's Canyon (containing I-80), Ogden Canyon, Little Cottonwood Canyon, and Big Cottonwood Canyon. More frequent or more extreme freeze-thaw cycles can have a detrimental effect on pavement quality and service life. This possibility exists under either scenario – warmer or cooler.

In either climate scenario, Utah is already a four-season state with considerable experience adapting to both types of climate. The extreme to which the climate may shift - if at all - is the crucial question, and this can only be speculated at this time.

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A Continuous Process

Chapter 9

Regional transportation planning, to be effective, is a continuous process. The transportation system needs to be constantly monitored to determine its condition and operating efficiency. Short term measures to keep the system operating as effectively as possible need to be pursued. Projects recommended in the 2040 RTP need to be refined and evaluated for environmental and social impacts. Funding sources to implement the recommendations need to be identified and programmed. Finally, the Regional Transportation Plan needs to be updated every few years to consider changing development patterns, new technologies, and evolving goals and vision for the Wasatch Front Region. This chapter will describe how the recommendations of the 2040 RTP will be implemented and the work needed to update the Plan in the future.

Photo at Left: City Creek Center in downtown Salt Lake City is Utah's latest transit oriented development. A decade in the making, City Creek Center has revitalized Salt Lake City's downtown core by infusing it with urban mixed use development featuring office, retail, and condominium/apartment space. Additionally, the development incorporates open air plazas providing striking downtown vistas.

IMPLEMENTATION STRATEGIES

Implementation of the 2040 RTP is a cooperative effort of local, state, and federal officials. The Wasatch Front Regional Council has established a process to continuously monitor on-going development and the progress in implementing the recommendations of the Wasatch Front Regional Transportation Plan: 2011-2040. The WFRC also works with other agencies to address short-range congestion, pavement preservation, and bridge replacement and rehabilitation needs through management systems. In addition the WFRC helps conduct corridor and environmental studies for major highway and transit projects and assists local communities in master plan updates. These efforts help refine the recommendations in the 2040 RTP and encourage implementation.

Municipalities and counties of the Wasatch Front Region, UDOT, and UTA are responsible for the implementation of the projects in the 2040 RTP. The WFRC works with these agencies to encourage them to pursue the facility capital improvements recommended in the 2040 RTP and incorporates these projects in the short range Transportation Improvement Program (TIP). Each of the components of this continuous process is discussed in more detail in the sections that follow.

System Monitoring and Management Systems

The WFRC annually publishes a *Surveillance of Land Use and Socioeconomic Characteristics* report, which includes current population and employment data for the region. The development and adoption of the Wasatch Front Urban Area's TIP each year allows the WFRC to monitor the implementation of recommended 2040 RTP projects and to reevaluate the needs of the Wasatch Front Urban Area. The Utah Department of Transportation's highway traffic surveillance data, published every two years, along with periodic Utah Transit Authority ridership updates, also contribute information needed to update the 2040 RTP. In addition, as part of the continuing planning process, the WFRC and the Salt Lake and Ogden - Layton Area Transportation Advisory Committees will continue to identify and respond to issues which impact the Wasatch Front Regional Transportation Plan: 2011-2040.

The *Wasatch Front Regional Transportation Plan: 2011-2040* addresses the need to provide increased capacity to meet the growing travel demand in the region. Because of financial and other constraints, the recommendations of the 2040 RTP Update will not meet all of the demand in the year 2040. Travel demand management and transportation system management strategies will be needed to mitigate some of the continuing traffic congestion anticipated in the future. In addition to meeting increasing travel requirements, the transportation system needs to be maintained and preserved in order to provide current users with safe and secure travel. The WFRC addresses these congestion, preservation, and safety needs through several management systems developed in cooperation with, UDOT, UTA, and others. Funding to pay for the recommendations of the management systems is included in the Financial Plan for the 2040 RTP.

SAFETEA–LU requires that a Congestion Management Process be established in all Transportation Management Areas. Since October 1997 the Regional Council has had fully operational CMPs (congestion management plan) for the Salt Lake and Ogden - Layton Areas. The purpose of a CMP is to recommend actions to maximize the efficiency of the existing and future transportation system. The Salt Lake and Ogden - Layton Area Technical Advisory Committees work with WFRC staff to refine and implement the CMPs. The subcommittees monitor and provide input to implementation of congestion mitigation strategies on both a regional and a site-specific basis.

For all projects in the TIP that increase single occupant vehicle (SOV) capacity, the WFRC develops site-specific system management and demand management strategies that should be incorporated into each project. For all widening and new construction projects, the CMP also demonstrates that system management and demand management strategies by themselves will not meet the travel demand on a particular facility or, in other words, that additional SOV capacity is needed.

The Utah Department of Transportation uses a Pavement Management System and a Bridge Management System to develop its recommendations for pavement and bridge projects to include in the TIP. These systems identify the maintenance and preservation projects necessary to maintain the existing system. WFRC has worked with UDOT to develop a pavement management system for the Salt Lake and Ogden - Layton areas that recommends cost-effective and timely treatments. These recommendations have begun to be considered in the development of the TIP.

Safety and security are of increasing importance. UDOT also has established procedures for identifying high hazard locations and selecting cost-effective projects for the use of federal safety funds. UTA and UDOT are working with other state and federal agencies to address security needs.

REGIONAL TRANSPORTATION PLAN REFINEMENT

In addition to preparing the long range transportation plan, the WFRC works with UDOT, UTA, and local communities on alternatives analyses, environmental studies, corridor studies, and master plan updates to help refine the recommendations of the long range transportation plan as well as to assist in implementation of the Plan's recommendations. These studies help achieve several goals by better defining project scopes; identifying needed rights-of-way for projects to allow UDOT, UTA, and local communities to pursue corridor preservation; and identifying transit facility alignments and station locations, so that communities can begin planning for transit oriented development at specific locations to make the projects more competitive.

For many major highway and transit improvements, the WFRC in cooperation with state and local engineers and planners prepares an alternatives analysis or corridor study. The purpose of an analysis / study is to provide input when refining the long range transportation plan and allow for decisions to be made on the scope of the improvement(s) during the planning process, which is prior to project development and engineering. Several major corridor studies and / or alternatives analyses have been completed or are currently underway in the Wasatch Front Urban Area, for both highway and transit corridors. Each of the corridors for which an alternatives analysis is needed or underway, or for which a corridor study is completed is discussed below.

Downtown Ogden to Weber State University Transit Needs Analysis – The 2040 RTP recommends a BRT facility to connect the downtown Ogden Intermodal Facility to Weber State University. Ogden City, along with UTA and the WFRC, completed a study to identify the need for transit improvements in the corridor in 2005. The study recommended an alignment and either streetcar or BRT as the preferred mode to serve this corridor.

Ogden / Weber State Alternatives Analysis – The 2040 RTP shows as a place holder an Enhanced Bus (BRTI)/Bus Rapid Transit (BRTIII) transitioning to Streetcar within the alignment and with the guideway characteristics recommended by the Draft Alternatives Analysis. A feasibility study has been completed and an Alternatives Analysis has been drafted for this corridor. The studies have identified Streetcar as the preferred mode. The community has agreed upon the northern and southern segments of the alignment. The Draft Alternatives Analysis recommends a primary and secondary alignment for the central portion of the corridor.

Davis Weber East - West Transportation Study – In 2007 the Utah State Legislature appropriated funding to study east-west highway needs in several counties. The Davis – Weber East / West Study evaluated a wide range of options for improving east-west mobility in these counties and subsequently recommended a number of improvements to address these needs. The 2040 RTP includes many of the recommendations developed as part of this study.

US-89 from I-15 to Harrison Boulevard – The 2040 RTP recommends US-89 be upgraded to an expressway with interchanges. The recommendations are that a general-purpose lane be added in each direction to this section of US-89 and that interchanges are constructed at major cross streets. The recommendations were developed through a corridor study and an EIS.

I-15 from Layton to I-84 (Weber County) – The 2040 RTP recommends additional lanes be added in each direction, to this section of I-15. A corridor study completed in 2005 for this section of I-15 recommended these improvements along with some short term projects to improve traffic operations on I-15.

West Davis Corridor – SR 67 Highway (formerly the North Legacy Highway) from US-89/ Legacy Parkway/ I-15 in Davis County to I-15 in Weber County - The 2040 RTP recommends that a divided highway be built from US-89/ Legacy Parkway/ I-15 to 4000 South in Weber County. For the near term portion of this corridor from 4000 South to 12th Street the 2040 RTP recommends a four-lane arterial be constructed. However, the 2040 RTP recommends a project be constructed from 4000 South (Weber County) to I-15 near the Box Elder County line. This project could be either a divided highway or an arterial improvement, depending on future needs. At this time, the 2040 RTP recommends corridor preservation along the corridor identified in the 2009 Weber County North Legacy study and adoption into local municipal and Weber County Transportation Plans. Efforts to preserve the corridor are being made by the local municipalities, Weber County, UDOT, and WFRC.

SR-108 Environmental Impact Statement – The FHWA issued a Record of Decision regarding the SR-108 EIS on October 28, 2008, identifying the selected alternative from the environmental analysis as the five-lane section, which included two lanes in each direction with a center turn lane or raised median in some areas. However, because funding was not immediately available for the complete five lane project, UDOT proceeded with a three-lane expansion (one travel lane in each direction with a center turn lane) during 2009. This expansion was expected to provide some immediate relief to the growing congestion on this heavily used roadway from 1900 West and Midland Drive in Ogden to 1700 South in Syracuse. UDOT hopes to be able to complete the approved five-lane reconstruction project in the next 5-8 years.

South Davis County Transit Needs Analysis – The 2040 RTP recommends a BRT facility to connect downtown Salt Lake City to the South Davis County communities. The six cities in South Davis County (North Salt Lake, Woods Cross, Bountiful, West Bountiful, Centerville, and Farmington) along with Davis County, Salt Lake City, UTA, and the WFRC, completed a study in 2005 to identify the need for transit improvements in the corridor. The study identified BRT and Street Car as possible transit modes in the corridor and selected an alignment for the project. An environmental impact study for this project is currently underway.

South Davis Transit Corridor Environmental Impact Statement (see above paragraph) – The 2040 RTP recommends Bus Rapid Transit (BRTIII) and Enhanced Bus (BRTI) on the alignment recommended by the Alternatives Analysis. A feasibility study and an Alternatives Analysis have been completed for this corridor. These studies have identified an alignment for the project, as well as its guideway and station characteristics. Enhanced Bus (BRTI) has been selected for the northern portion of the project. The transit mode on the southern portion of the corridor has been narrowed to Bus Rapid Transit and Streetcar. Six cities in South Davis County (North Salt Lake, Woods Cross, Bountiful, West Bountiful, Centerville, and Farmington) along with Davis County, Salt Lake City, WFRC, UTA, and the UDOT are study partners in this corridor.

1800 North Environmental Impact Statement – The 2040 RTP recommends the widening of 1800 North in northern Davis County from 2000 West to Main Street, a railroad overpass on 1800 North, and a new interchange on I-15 at 1800 North. An environmental study of this corridor and the potential interchange was initiated in 2010. Several alternatives will be evaluated during 2011, with study completion anticipated in 2012.

SR-193 Extension – A draft environmental study on the extension of State Road 193 in Clearfield has been completed and is awaiting approval. The proposed improvements would begin at the intersection of 2000 West (SR-108) and 200 South and extend east to the intersection of 700 South and State Street (SR-126), connecting to the existing SR-193. The planned extension is a five-lane roadway (two lanes in each direction with a center turn lane) with a grade-separated railroad crossing over the FrontRunner and Union Pacific rail lines. Construction would take about a year to complete and could start as early as Fall 2011.

North Legacy Connection Study – An extension of Legacy Parkway into Weber County is included in the WFRC Regional Transportation Plan (RTP). A study was undertaken in 2001 to determine an alignment for this planned extension in North Davis County. However, a consensus on the proposed alignment could not be reached in Weber County. This study serves as a supplement to the WFRC 2001 Study and identifies an alignment to be preserved in Weber County for a planned extension of Legacy Parkway.

West Salt Lake County Transit Study – The Utah Transit Authority, Salt Lake County, Suburban Land Reserve, Kennecott Land Corporation, and the Wasatch Front Regional Council completed a study regarding future transit in August 2009. The study limits were from Bangerter Highway to the West Bench area and from the north to the south boarder of Salt Lake County. The study intended to provide supporting technical analysis for a future transit system, provide a basis for recommendations in the RTP, and provide information to the local land-use planners on how alternative development scenarios could affect public transportation usage in Salt Lake County. The study identified key Light Rail Transit projects, Bus Rapid Transit projects, and Interurban Rail projects. The 2040 Regional Transportation Plan currently includes many of these identified projects.

East Salt Lake County Transit Study – The East Salt Lake County Transit Study was a continuation of the West Side Study including many of the same stakeholders. Major stakeholders included the Utah Transit Authority, Salt Lake County, Suburban Land Reserve and Wasatch Front Regional Council. The study limits were from 2700 West to the East Bench and from the north to the south boarders of Salt Lake County. The purpose was to identify transit corridors in the eastern portion of Salt Lake County to complement the recommended transit plan for the west side, and to provide transit candidate corridors for consideration in the next RTP update. Following extensive review of municipal and county current and future land use patterns, the study identified numerous major north-south (State, 900 E. Van Winkle Ft. Union Blvd, 1300 East, I-215 Foothill and Redwood Road) and east-west (3300-3900 S., 5400 S., 9400 S. and 10600 S.) corridors that could be used for high capacity transit. Recommendations from this study were reviewed and evaluated in the development of the 2040 RTP with many of the projects included in the Plan.

Southwest Salt Lake County Transit Feasibility Study – Riverton City, Herriman City, South Jordan City, Draper City, the Utah Transit Authority, and the Wasatch Front Regional Council sponsored a study which included Bluffdale City, Property Reserve Inc., Rio Tinto, Salt Lake County, and the Utah Department of Transportation as stakeholders. The purpose of the Feasibility Study was to identify a realistic and suitable high frequency / high-capacity transit project that could serve the communities in the Southwest Salt Lake County. The project would also connect the end of the Mid-Jordan TRAX line at the Daybreak Subdivision in South Jordan City to the FrontRunner Station in Draper. The Draper Extension, from the Draper FrontRunner station to the future Draper TRAX station at approximately 14800 South, was also studied. The steering committee selected Bus Rapid Transit as the preferred alternative and connected the Herriman Towne Center, 3600 West and 12600 South. The 2040 Regional Transportation Plan currently lists most of this project in Phase 2, of the Plan, a portion in Phase 3, and some of the project in the Unfunded phase.

Taylorsville - Murray Transit Alternatives Analysis – A Draft Alternatives Analysis for this project has been completed and adopted by the community. The 2040 RTP follows the findings of this study.

West Davis Corridor Environmental Impact Statement – UDOT is now in the process of preparing a full environmental impact statement on the West Davis Corridor from the US-89/ Legacy Parkway/ I-15 in Davis County to 12th Street in Weber County. It is anticipated that the EIS will be completed by the end of 2012 with a record of decision (ROD) in the early part of 2013.

Draper Extension – An Environmental Impact Statement completed by UTA and WFRC has been adopted by the community and approval by FTA. The 2040 RTP follows the findings of this study.

Sugarhouse Transit Corridor Study – UTA and Salt Lake City have begun a study to look at the feasibility of a major transit investment in the corridor from UTA's Central Point TRAX station to Sugarhouse. UTA purchased a rail line in this corridor from the Union Pacific Railroad several years ago. The RTP recommends a streetcar system be implemented in this corridor. In addition, the Federal Government recently awarded UTA a grant to complete the project.

Sugarhouse Environmental Assessment – An alternatives analysis has been completed and an Environmental Assessment is underway for the Sugarhouse Streetcar. The Locally Preferred Alternative developed by the Alternatives Analysis is reflected in the 2040 RTP.

5600 West Transit Environmental Assessment – The 2040 RTP recommends Bus Rapid Transit (BRTIII) in this corridor.

This recommendation is consistent with the findings of the Mountain View Corridor Environmental Impact Study. FTA has requested that an Alternatives Analysis and Supplemental Environmental Analysis be completed for this project. These analysis are underway.

Salt Lake County East-West Transportation Study – The objective of the Salt Lake County East-West Transportation Planning Study stems from House Bill 108, adopted by the Utah State Legislature in 2007, that required UDOT to study the need for east-west transportation improvements in Salt Lake County. The study area runs from the Salt Lake County/Utah County boundary north to the SR-201 (2100 South) freeway; and from SR-111 east to the I-15 Corridor. The project focused on three primary goals: determine current and future east-west directional, transportation needs; Identify and evaluate possible transportation system improvements; and recommend transportation system improvement scenarios. The study team used data analysis, a considerable public involvement process with stakeholder input, and public feedback to identify options for improving transportation on the west side of the Salt Lake Valley. The study team analyzed the current transportation system, identified system improvement options, considered challenges related to those options and suggested a timeline coordinated with other planned transportation improvements.

The study proposed potential improvements beyond those already identified in the Wasatch Front Regional Council's 2030 Regional Transportation Plan. These improvements include capacity enhancements to nine east-west arterials, additional transit service, and near-term improvements of initial construction of continuous flow intersections at specific location along Redwood Road and the Bangerter Highway. Recommendations form this study were reviewed and evaluated in the development of the 2040 RTP with many of the projects included in the Plan.

Downtown Salt Lake City to the Salt Lake City International Airport – The WFRC completed the DEIS / FEIS for a light rail transit line from the Salt Lake International Airport to the University of Utah in 1997. With the east segment of this line already in place, construction of the segment going to the airport began in 2010 and is scheduled for completion in 2012.

West Valley City Corridor – Based on the approved EIS for the light rail transit project in this corridor completed by UTA and WFRC, UTA commenced construction in 2009. Construction will be complete and the line will be operational August 7, 2011.

Mid-Jordan Corridor – Based on the approved EIS for the light rail transit project in this corridor completed by UTA and WFRC, UTA commence construction in 2009. Construction will be complete and the line will be operational on August 7, 2011.

Salt Lake City Downtown Transportation Master Plan – UTA and Salt Lake City recently completed a master plan for transportation in the City's downtown area. This study made recommendations for bus and rail transit circulation, major transfer points within the downtown area, for pedestrian and bicycle facilities, and for roadway improvements.

Foothill Drive Corridor Study – The–UTA, UDOT, Salt Lake City, and the University of Utah sponsored a study of the Foothill Drive Corridor in Salt Lake City from the University to I-80. This study was completed in July 2008.

The purpose of the study was to develop recommendations for accommodating future travel demand in the corridor, with an emphasis on the greater use of transit and other high-occupancy modes. The study recommended an increase in express bus service to the University from South Salt Lake County; the implementation of a bus/HOV lane; intersection improvements, especially at the Sunnyside Drive intersection; bike and pedestrian improvements; and the continuation and expansion of travel demand management programs at the University and other major Foothill Drive area employers. The study also suggested that there is potential for bus rapid transit service in the corridor, if it is developed as part of a regional system.

600 West Bangerter Environmental Impact Statement – This study is in its alternatives selection phase. Three alternatives remain under evaluation. All three are variations upon the interchange recommendation made in the 2040 RTP.

5400 South / Interstate 215 Interchange – In 2010, UDOT launched a transportation study of the 5400 South and I-215 area to address traffic congestion and freeway access issues. The study is being conducted in two phases. The first phase of the study started in spring, 2010. This phase included scoping, determining project context, developing the purpose and need statement, and undertaking a high level assessment of potential solutions (alternatives). The first phase of the study was completed and submitted to UDOT for review in late fall, 2010. The assessments from phase 1 will help UDOT determine if it should move the study forward into Phase 2 of the EIS process.

Mountain View Corridor from I-80 to the Salt Lake / Utah County Line – Based on the completed Environmental Impact Statement, the 2040 RTP recommends the Mountain View Corridor (formerly the Western Transportation Corridor) be built as a freeway with HOV lanes from I-80 to the Utah County line. The portion of the highway from the Redwood Road connection in Bluffdale to 5400 South is under construction in a phased approach. The road will be built as an arterial in Phase I and upgraded to a freeway in Phase II.

Transit Development Program – As part of the 2040 RTP the Utah Transit Authority and the WFRC prepare on a regular basis, a five year, short range plan for service, operation costs, and capital facilities improvements.

TRANSPORTATION IMPROVEMENT PROGRAM

Continued funding is needed to implement the recommended highway and transit projects in the 2040 RTP. The WFRC works with UDOT, UTA, and local communities through the Transportation Improvement Program (TIP) to program funding for RTP projects. The WFRC, as the MPO for the Salt Lake and Ogden-Layton Urbanized Areas, is responsible for preparing and approving an annually updated TIP for the Wasatch Front Region. An MPO-approved TIP is required by federal legislation for a region to receive federal highway and transit funding. The purpose of the TIP is to list transportation projects for which funding will be sought over a four-year period. The TIP should reflect the region's priorities, represent a consensus among state and regional officials, show a direct relationship to the regional transportation plan, be financially constrained, and conform with federal air quality regulations as they relate to transportation. Finally, the TIP must be subjected to thorough public review during development and prior to adoption.

The WFRC develops the TIP, in cooperation with UDOT and UTA, for all highways, transit, and other transportation related projects in the Salt Lake and Ogden-Layton Urban Areas. The WFRC, UDOT, and UTA have worked together to develop methods and procedures for evaluating, selecting 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, as required by TEA-21 and reemphasized with SAFETEA-LU. SAFETEA-LU allows for four funded years in the TIP. The WFRC TIP includes four funded years plus two years of projects in concept development for a total of six years.

The WFRC staff is continuously reviewing and identifying methods to improve the evaluation and ranking of projects eligible for the urban Surface Transportation Program (STP) and Congestion Mitigation / Air Quality (CMAQ) programs. Criteria have recently been revised, so that the prioritization of urban STP projects consider system efficiency, benefits and costs, congestion relief, safety needs, economic benefits, system preservation, environmental impacts, and system and demand management strategies. The prioritization for CMAQ projects considers air quality benefits in terms of


Image by James Belmont

emission reductions, congestion relief, cost benefits, length of effectiveness, and degree of congestion.

For other federal aid and state highway funds, a series of workshops are held annually in each UDOT Region to review the progress being made on projects in the current program and to identify projects to add to the program. In preparations for these workshops, each region holds a monthly Pavement Management or Roadway Management committee meeting to discuss the needs, concerns, and priorities of the roadway network throughout their region. Pavement preservation and maintenance needs, safety, traffic operations, and new capacity needs are among the criteria UDOT uses to recommend priorities. WFRC staff members participate at the meetings and provide the regions with information and priorities for new capacity needs. UDOT's Programming Section and the Transportation Commission consider the recommendations of their regions in development of the programs.

The WFRC staff works with UTA to identify transit projects to include in the TIP. Projects are selected, based on the priorities and needs established in the Transit Development Program and the Regional Transportation Plan. The WFRC also compiles lists of projects funded by local governments and includes them in the TIP. Once the TIP is compiled, the WFRC conducts an analysis to determine if the TIP conforms with state air quality plans. This conformity analysis is made available to the State Division of Air Quality and the public for review and comment. The FHWA and FTA must concur in this finding.

A TIP, containing the recommended programs along with the conformity determination, is submitted to the Transportation Coordination Committee for the Regional Council annually for its review. The county councils of governments also have an opportunity to review and comment on the TIP. Appropriate adjustments are made and a final TIP is developed. The final conforming TIP is then recommended to the WFRC for its approval. Following the Wasatch Front Regional Council's approval, the Executive Director of UDOT, as the Governor's designee, must review and approve the TIP. Following UDOT's approval the Utah State Transportation Commission must include the TIP without modification in the Statewide Transportation Program.

FUTURE PLAN UPDATES

As mentioned above, transportation planning is a continuous process. Changing development patterns resulting from continued growth in the region, fluctuating economic conditions, and shifting energy and environmental concerns all impact transportation needs in the Wasatch Front Urban Area and the types of improvements required to meet those needs. In order to keep the Plan current, the WFRC reviews the recommendations in the long range transportation plan at least every four years and updates it as necessary. The next revision to the RTP will occur by May 2015.

During the next four years, the WFRC will build upon the work completed in development of the current Regional Transportation Plan. This process will include continued emphasis on understanding land use-transportation relationships and using that information to refine the future vision for the region. The WFRC will monitor changing land use patterns and major new developments. Future financial projections will depend on the action of Congress, the Legislature, local officials and voters. As always, the WFRC continues to update its planning capabilities through improvements to the Region's travel models. Incorporating National Environmental Protection Act provisions into the planning process will be another area the WFRC will pursue more fully during the next four years. Finally, the Wasatch Front Regional Council will continue to update the process used to develop the long range transportation plan and anticipate addressing new issues in future updates.

Visioning

As discussed in Chapter 2, the Wasatch Front Regional Council made a significant effort during 2010 to work with local officials and the general public to develop a refined vision for the future of the Region and to adopt growth principles to help guide future development. This effort included workshops, open houses, and meetings with municipal councils, planning commissions and county commissions and councils. These were the first steps to better understand the relationship between land use and transportation in the planning process.

Over the coming years, the Regional Council, in collaboration with key stakeholders, business and government officials and other interested parties will work to refresh the dialogue and increase the outreach effort with planning partners to support implementation of the Wasatch Choice for 2040 Regional Vision. The WFRC will work with its partners to convene workshops, community meetings, and other forums and develop tools and approaches to provide for greater discussion of how to implement the regional vision, and to determine how the transportation system can support local and regional development.

Changing Growth Patterns

The Wasatch Front Region will continue to grow, and the transportation system will need to address the consequences of this growth. Over the next few years, new development and redevelopment will take place that will need to be considered in future plans. Among the factors that will have the greatest impact are the redevelopment of downtown Ogden to promote employment as well as residential uses, the expansion at the Business Depot Ogden, Hill Air Force Base's plans to allow commercial and office development on the west side of the base, Weber State University's Davis County campus in Layton / Clearfield, redevelopment in downtown Salt Lake City, and Kennecott Land Company's planned development on the west side of Salt Lake County. In addition to these activities, new development is likely to occur around the light rail and commuter rail transit stations in the region.

Funding Sources

The WFRC will continue to monitor funding levels for transportation improvements. Over the past two years, the Utah Legislature has significantly increased state funding for highway improvements. In addition, the Legislature has authorized new local option sales taxes and vehicle registration fees for highway, transit, and airport improvements. These funds can be used for congestion mitigation, new capacity, and corridor preservation.

With the adoption of the 2040 RTP, members of the Wasatch Front Regional Council will work to make state and federal lawmakers aware that a significant need still exists for preserving and expanding the Wasatch Front Region's transportation system. The WFRC will also work with state and federal officials to pursue new, as well as increased funding sources for highway and transit projects.

Travel Demand Modeling

The WFRC uses travel forecasting models to project future highway traffic and transit ridership based on proposed transportation networks and forecasted land use characteristics. These travel forecasts are used to identify needed highway and transit improvements. These models are data intensive, and are recalibrated each RTP cycle based on the latest traffic counts, speeds, transit boardings, and travel behaviors.

The coordination between the land use model and the travel demand model is a critical link in the forecasting process. Over the next several years, the WFRC will be evaluating the current land use modeling process, and determining if there are enhancements that can be made to the current UrbanSim model, or if a different model may be more appropriate.

Because the travel demand model forecasts the travel behaviors of a variety of households, the WFRC must occasionally update and verify the assumptions used in the model. This is typically done through a household travel survey. The last full household travel survey was conducted nearly 20 years ago. Accordingly, the WFRC will be conducting a new household travel survey in the coming year(s). These surveys are performed by selecting a statistically significant sample of households throughout the region, and tracking their travel behaviors throughout a particular day- understanding each trip purpose, by time, how they traveled (car, bus, walk) and the start and finish points for each household. In addition to being used for the 2040 RTP, the WFRC staff uses the travel demand model to provide support to the sponsors of a variety of roadway, transit, and other projects of regional significance.

NEPA and Planning

By addressing National Environmental Protection Act issues in the planning process, the WFRC hopes to streamline the project development process for project sponsors. To address inherent issues, the WFRC will make a greater effort to identify and evaluate multi-modal alternatives in major transportation corridors, increase public involvement opportunities regarding these major corridors, address environmental factors in the evaluation process, and prepare a draft purpose and needs statement that could be used as a basis for the preparation of the necessary environmental studies. The WFRC hosted a workshop of state and federal transportation and resource agencies in 2005 to address NEPA and planning issues. The workshop developed an action plan with strategies for considering environmental issues in the planning process which was still valid for the 2040 RTP update. The WFRC, UDOT, and FHWA plan to pursue these strategies in the next four years.

Advance Construction (AC)

A plan whereby the State, Cities, or Counties may utilize their own funds to temporarily fund federal-aid projects when federal fund apportionment for a fiscal year has been expended. Funding is then converted to federal-aid when new apportionment is received at the beginning of a new fiscal year.

Americans With Disabilities Act (ADA)

A civil rights law enacted in 1990 that prohibits discrimination against people with disabilities in the areas of employment, transportation, telecommunications, and public accommodation. Special facilities to accommodate persons with disabilities, such as special low curb cuts at intersections for wheelchair traffic, are required by law.

Apportionment

Federal-aid funds appropriated to each state over a multi-year period as a result of an act of Congress. Current funding is authorized by the Transportation Equity Act for the 21st Century signed into law in June, 1998. Funds are allocated in a number of different categories and have certain restrictions for use within those categories.

Arterials

Include those classes of highways emphasizing a high level of mobility for the through movement of traffic. Land access is subordinate to this primary function. Generally, travel speeds and distances are greater on these facilities compared to the other classes. The highest classes of arterials, interstates and freeways, are limited access to allow the free flow of traffic.

Average Daily Traffic (ADT)

The average number of vehicles passing a given point on a roadway in a 24-hour day.

Bikeway

Any road, street, or path that is designated to accommodate bicycle travel. Bikeways do not have to be separated facilities and may be shared with other travel modes.

Bus Rapid Transit (BRT)

Bus Rapid Transit is a rubber wheeled self-propelled transit mode capable of operating in ordinary mixed traffic, limited purpose lanes, exclusive lanes, on aerial structures, and in subway. Bus Rapid Transit is characterized by, but not limited to, distinct vehicles using bus lanes, technology, and limited stops to combine light rail like speeds and convenience with bus flexibility. For the purpose of the 2030 LRP Update, Bus Rapid Transit includes modern, high-capacity buses; segments of bus lanes to avoid significant congestion; light-rail like stations, queue jumpers, and signal priority. Station spacing is generally at one-mile intervals outside of the Central Business District. Operating frequencies are assumed to mirror that of the current Salt Lake to Sandy TRAX Line.

Capacity Deficiency

Occurs when the number of vehicles on a roadway exceeds the desired level of service threshold volumes for that roadway.

Capital Funds

Funding dedicated to new projects or projects to improve or replace elements of the transportation system, including freeway widening, rail extensions, transit station improvement, new bicycle and pedestrian lanes, and so forth (Also see "Operating Funds.")

Carbon Monoxide (CO)

Is a colorless gas formed by incomplete combustion of fuel. Anywhere combustion takes place (i.e., industrial processes, home heating, etc.) high concentrations of carbon monoxide can develop.

Collectors

Roads and streets that collect traffic from the lower facilities and distribute it to the higher facilities. Collectors provide both mobility and land access. Generally, trip lengths, speeds, and volumes are moderate.

Commuter Rail

Commuter trains are typically electric or diesel propelled passenger trains operating on the general, freight railway network, within an urban area or between an urban center and it's outlying suburban communities. The principal passenger community is persons making single day return trips within an urban metropolitan area. For the purpose of the 2030 LRP Update, this includes diesel Push/Pull trains as well as Federal Railroad Administration Compliant Diesel Motorized Units with generally five mile station spacing outside of the Central Business District. It excludes electrified trains.

Congestion Management Systems (CMS)

A process of identifying congested locations, evaluating strategies to mitigate congestion, recommending prioritized mitigation projects, and determining their effectiveness. Required by ISTEA in air quality non-attainment areas.

Congestion Mitigation / Air Quality Program (CMAQ)

Is a categorical program created under the Intermodal Surface Transportation Efficiency Act. It directs funding to projects that contribute to meeting national air quality standards.

Corridor Studies

A typical highway or transit study focusing on a segment of a particular travel corridor. Land use, access issues, capacity, level of service, geometrics, impacts, and safety concerns are studied. Alternatives are developed and analyzed, and recommendations are made. Corridor studies are usually prepared with the participation of the affected communities and government agencies.

Delay

A unit of time measure reflecting increased travel time resulting from traffic congestion.

Draft Environmental Impact Statement (DEIS)

A document that provides a full description of the proposed project, the existing environment, and analysis of the anticipated beneficial and adverse environmental effects of all reasonable alternatives. (Also see "Final Environmental Impact Statement" (FEIS.).

Enhanced Bus System

Enhanced Bus, also known as Type I BRT, is a rubber wheeled self-propelled transit mode capable of operating in ordinary mixed traffic and limited purpose lanes but without significant exclusive lanes. Enhanced Bus is characterized by, but not limited to, standard vehicles using technology and limited stops to improve transit speeds. For the purpose of the 2030 LRP Update, Bus Rapid Transit includes standard articulated buses; light-rail like stations, queue jumpers, and signal priority. Station spacing is generally at one-mile intervals outside of the Central Business District. Operating frequencies are assumed to mirror that of the current Salt Lake to Sandy TRAX Line.

Environmental Assessments (EA)

A document prepared for federal actions where it is not clearly known how significant the environmental impact might be. If, after preparing an Environmental Assessment, it is determined that the project's impacts are significant, an Environmental Impact Statement is then prepared. If not, a "Finding Of No Significant Impact" (FONSI) is documented and issued by the FTA or FHWA. (Also see "Finding Of No Significant Impact.")

Environmental Impact Statement (EIS)

Written statement containing an assessment of the anticipated significant beneficial and detrimental effects which the agency decision may have upon the quality of the human environment for the purposes of: (1) assuring that careful attention is given to environmental matters, (2) providing a vehicle for implementing all applicable environmental requirements, and (3) to insure that the environmental concerns are successfully addressed.

Expenditure

In transportation terms, this is any allowable expense associated with particular project or program.

Federal Highway Administration (FHWA)

An administrative division of the United States Department of Transportation responsible for roadway programs throughout the country.

Federal Transit Administration (FTA)

Another branch of the United States Department of Transportation responsible for mass transit projects throughout the country.

Final Environmental Impact Statement (FEIS)

A document that provides a full description of the proposed project, the existing environment, and analysis of the anticipated beneficial and adverse environmental effects of all reasonable alternatives. (Also see "Draft Environmental Impact Statement.") A FEIS addresses comments submitted regarding a draft environmental impact statement.

Findings of No Significant Impact (FONSI)

A statement indicating that a project was found to have no significant impacts on the quality of the human environment and for which a full environmental impact statement will, therefore, not be prepared.

Flexible Funding

Unlike funding that flows only to highways or only to transit by a rigid formula, this is money that can be invested on a range of transportation projects. Examples of flexible funding categories include the STP and CMAQ programs.

Fixed Guideway

A system of vehicles that can operate only on its own guideway constructed for that purpose. Examples of fixed guideways systems include rapid rail, light rail transit, exclusive right-of-way bus operations, trolley coaches, and ferry boats.

Functional Classification

Is a grouping of roads, streets, and highways in a hierarchy based on the type of highway service they provide. Streets and highways do not operate independently. Instead, they are part of an interconnected network and each one performs service in moving traffic throughout the system. Generally, streets and highways perform two types of service. They provide either traffic mobility or land access. They can be ranked in terms of the proportion of service they perform. The functional classifications are respectively listed in order of traffic service and mobility; freeway, principal arterials, minor arterials, collectors, and local streets.

High Frequency Bus Service

High Frequency Bus is a standard bus transit mode capable of operating in ordinary mixed traffic. High Frequency Bus is characterized by approximately 15 minute headways covering at least the peak commuter period. For the purpose of the 2030 LRP Update, High Frequency Bus does not include special buses, stations, or technologies. Station spacing is varies by demand.

Illustrative Projects

A regionally significant project that has no identified funding that would be included in the 2030 LRP Update if additional resources could be identified or were to become available.

Intelligent Transportation System (ITS)

The development or application of technology (electronics, communications, or information processing) to improve the efficiency and safety of surface transportation systems. ITS is divided into five categories that reflect the major emphasis of application: (1) Advanced Traffic Management Systems, (2) Advance Traveler Information Systems, (3) Advanced Public Transportation Systems, (4) Automatic Vehicle Control Systems and (5) Commercial Vehicle Operations.

Intermodal Center

A transportation facility that is specially designed to accommodate several modes of passenger and freight movement including commuter rail, light rail transit, intercity bus, intra-city bus, airport limousine service, cargo container transfers, piggyback trailers, car rental facilities, taxis, private parking, and other transportation services.

Intermodal Surface Transportation Efficiency Act (ISTEA)

The past transportation act which changed many of the traditional methods and procedures of transportation planning. This act replaced many of the former federal-aid funding programs and increased the responsibility of the Metropolitan Planning Organization (MPO).

Glossary

Level Of Service (LOS)

A measure of highway congestion ranging from free flow to forced flow on a scale of A to F. Facilities are usually designed for levels C or D.

Linked Trip

A linked trip is a person's entire trip between an origin and destination, which may involve transferring between vehicles (e.g., bus and rail transit), or multiple stops, such as stopping at a daycare center or store along a commute trip. An unlinked trip is a passenger trip make on a single vehicle, such as a single automobile or bus ride.

Local Street And Roads

Their primary function is to provide land access. Travel speeds, distances, and volumes are generally low, and through traffic is usually discouraged.

Management Systems

A requirement of ISTEA to address short range needs. All states are required to have management systems in place. Metropolitan Planning Organizations have been delegated authority to maintain a Congestion Management System (CMS) only in urban areas designated as a Transportation Management Area (TMA). UDOT maintains pavement, bridge, and safety management systems.

Metropolitan Area

This area includes the existing urbanized area plus any contiguous area expected to become urbanized in the 20 year forecast period. The Metropolitan Area also must include all of the non-attainment areas for ozone and carbon monoxide pollutants.

Metropolitan Planning Organization (MPO)

Designated by the Governor under the provisions of the 1973 Federal Aid Highway Act. This organization shares responsibility with the State for developing long and short range transportation plans and programs. It provides a forum for discussion and consensus on issues which transcend jurisdictional boundaries. The Wasatch Front Regional Council is the MPO for the Salt Lake and Ogden/Layton Urbanized Areas.

Multimodal

Refers to the availability of multiple transportation options, especially within a system or corridor. A multimodal approach to transportation planning focuses on the most efficient way of getting people or goods from place to place be it by truck, train, bicycle, automobile, airplane, bus boat, foot or even telecommuting with a computer modem.

National Environmental Policy Act (NEPA)

Enacted in 1969, requires that any activity or project receiving federal funding or other federal approvals (including transportation projects) undergo analyses of potential impacts to see how the activity or project might impact the community, the natural environment, and the health and welfare of the citizens. These analyses include social, economic, and environmental (SEE) concerns ranging from community cohesion to threatened and endangered species.

National Highway System (NHS)

This approximate 160,000-mile network consists of the 42,500 miles of the Interstate system, plus other key roads and arterials throughout the United States. Designated by Congress in 1995 pursuant to a requirement of the Intermodal Surface Transportation Efficiency Act, the NHS is designed to provide an interconnected system of principal routes to serve major travel destinations and population centers. The NHS is also a funding category in TEA-21.

Operating Funds

Money used to fund general, day-to-day costs of running transportation systems. For highways, operating costs involve maintaining pavement, filling potholes, paying salaries, and so forth. For transit, operating cost includes salaries, insurance, administration, maintenance of vehicles and track, replacement parts, and fuel costs.

Ozone (O3)

Is a colorless gas associated with smog or haze conditions. Ozone is not a direct emission, but a secondary pollutant formed when precursor emissions, hydrocarbons and nitrogen oxides, react in the presence of sunlight.

Paratransit Service

Generally more flexible and personalized than regular bus route service, paratransit services use a variety of vehicles including large and small buses, vans, cars, and taxis. Paratransit can serve a particular population, such as persons with disabilities.

Park-And-Ride

An arrangement whereby people can drive to a transit hub, transfer station, or terminal, park their automobiles in designated lots and use public transportation or carpool to their destinations.

Particulate Matter (PM10)

Is any material less than 10 microns in size. Particulate matter can be caused by wind-blown soil, dust from paved and unpaved roads, and emissions from diesel engines. Particulate matter of this size is too small to be filtered by the nose and lungs. PM2.5 is even smaller material that measures 2.5 microns in size.

Peak Period

The time between 6:00 and 9:00 a.m. and between 3:00 and 6:00 p.m. on a weekday, when traffic is usually heavy and dominated by commuters.

Queue Jumper

Where a separate set of signals for transit are combined with either a short section of exclusive lane or transit exemptions to turning requirements are made to allow transit to by-pass a queue (line) of automobiles that develops at congested points such as intersections, interchange ramps, or bridge approaches.

Regional Transportation Plan (RTP)

A financially constrained, long range plan, with at least a 20-year time frame, of the anticipated highway and transit needs in a specific area. Transportation needs are based on projected socioeconomic and land use growth within the area. The Wasatch Front Regional Council is responsible for the Long Range Transportation Plan for both the Salt Lake and Ogden/ Layton Urbanized Areas. The current plan title is the Wasatch Front Urban Area Long Range Transportation Plan Update: 2004-2030.

Regionally Significant Project

A transportation project or facility which serves regional transportation needs, such as access to or from areas outside of the region, major activity centers, major planned developments, or transportation terminals. Included as regionally significant projects would be all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.

Ridesharing

Car and van pooling intended primarily to serve the commuter work trip. Formalized ridesharing programs are co-sponsored by the Utah Transit Authority.

Right-Of-Way (ROW)

Land, usually in public ownership, through which a transportation facility passes, including the area for shoulders, parking strips, sidewalks, multipurpose trails, bicycle paths, and other cross section elements. Right-of-way also includes rails and trackbeds for fixed guideway transit facilities.

Signal Prioritization

Existing traffic signals or a separate set of signals for transit are made to be activated by buses. Detector devices are installed on the bus or embedded in the approach lane to trigger a signal change or extend signal green time for transit vehicles. Activation of the device may be always available to the transit vehicle or may be limited to only late vehicles. In addition to transit use, emergency vehicles may use the same devices in a more aggressive way to decrease their response time.

State Implementation Plan (SIP)

A plan showing how the State will meet air quality standards as required by the 1977 Clean Air Act - Amended. Included are emission inventories and controls for industrial, area, and mobile sources of pollution.

Statewide Transportation Improvement Program (STIP)

A five-year program of highway and transit projects for the State. It is a compilation of projects utilizing various federal and state funding programs, and includes highway projects on the state, city, and county highway systems, as well as projects in National Parks, National Forests, and Indian Reservations.

Surface Transportation Program (STP)

One of the key funding programs in TEA-21. STP monies are "flexible," meaning they can be spent on roads and highways, as well as on pedestrian and bicycles facilities and mass transit.

3-C Planning Process (3-C)

Continuing, comprehensive and cooperative (3-C) transportation planning is conducted by Metropolitan Planning Organizations in urbanized areas. The existence of a certified process is a necessary condition for the use of federal transportation funds.

Traffic Control Measures (TCM)

Measures which can improve air quality through a reduction in travel or through a reduction in vehicle emission rates by improved traffic flow. Examples include ride sharing programs, transit service, and signal coordination.

Traffic Operations Center

The Utah Department of Transportation's central facility designed to operate and coordinate a variety of TSM and ITS systems, including a network of traffic signals, fiber optics links, traffic sensors, ramp meters, variable message signs, closed-circuit television cameras, and emergency response personnel.

Transit Hubs

Locations where transfer connections between transit modes is facilitated, usually at shopping centers or other high-pedestrian locations.

Transit Development Program (TDP)

A short-term (usually five years)plan of transit service and facility improvements to meet the transit goals of the region.

Transportation Demand Management (TDM)

TDM programs and methods designed to maximize the people-moving capability of the transportation system by increasing the number of persons in a vehicle, or by influencing the time of, or need to, travel. To accomplish these types of changes, TDM programs must rely on incentives or disincentives to make these shifts in behavior attractive.

Transportation Equity Act For The 21st Century (TEA-21)

Federal legislation authorizing highway, highway safety, transit, and other federal surface transportation programs through the year 2003. It continues and expands the programs established by the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991. Both acts placed greater emphasis on planning and identified several planning factors that must be addressed.

Transportation Improvement Program (TIP)

A five-year capital improvements program of highway and transit projects including operational and low cost projects to increase efficiency of the existing transportation network as well as capital intensive alternatives prescribed in the Long Range Transportation Plan.

Transportation Management Area (TMA)

An urbanized area with a population over 200,000 (as determined by the latest decennial census) or other area when TMA designation is requested by the Governor and the MPO (or affected local officials), and officially designated by the administrators of the FHWA and the FTA. The TMA designation applies to the entire metropolitan planning area(s).

Transportation System Management Strategies (TSM)

Programs and methods to improve the efficiency and effective capacity of the transportation system. Techniques that might be utilized are signalization, ramp metering, HOV ramps and lanes, one-way streets, and improvements to transit.

Urban Area

A city or group of cities with population in excess of 5,000. Boundaries are determined by local elected officials, but may not be less than urban area boundaries as defined by the U.S. Bureau of the Census. There are twelve urban areas in Utah.

Urbanize Area

A city or group of cities with population in excess of 50,000. Boundaries are determined by local elected officials, but may not be less than urbanized area boundaries as defined by the United States Bureau of the Census. There are currently five urbanized areas in Utah: Salt Lake, Ogden/Layton, Logan, Provo/Orem, and St. George.

Urban Transportation Planning Process (UTPP)

The UTPP includes the methodologies used in the development of the Long Range and Short Range Elements of the Transportation Plan. The process is intended to identify existing and projected transportation problems within an urban area.

Utah Transportation Commission

A seven-member commission whose members are appointed by the Governor with advice and consent of the Senate. Six of the members are selected to represent specific areas of the state, and one member represents the state at large. Duties of the commission are to determine priorities and funding, location and establishment of state highways and airports, hold public meetings and provide for public involvement in transportation matters, make rules on behalf of UDOT, and advise the department on statewide transportation policy.

Vehicles Per Day (VPD)

The total number of vehicles including buses and trucks which pass by a specific point during the day.

Vehicle Mile Traveled (VMT)

The amount of vehicle travel on a designated set of roadways multiplied by the total mileage of those roadways.

List of Acronyms

A

AA	Alternatives Analysis
AARC	Average Annual Rate of Change
AASHTO	American Association of States Highway and Transportation Officials
AC	Advanced Construction
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
AFB	Air Force Base
AGT	Automated Guideway Transit
AICP	American Institute of Certified Planners
AIP	Airport Improvement Program
AMPO	Association of Metropolitan Planning Organizations
AOG	Association of Governments
APC	Automated Passenger Counting
APE	Area of Potential Effect
APTA	American Public Transit Association
AQC	Air Quality Committee
AST	Above-Ground Storage Tanks
ATMS	Advanced Traffic Management Systems
ATV	All-Terrain Vehicle
AVL	Automated Vehicle Location
AWDT	Average Weekday Daily Traffic

B

BDO	Business Depot Ogden
BEA	Bureau of Economic Analysis
BMP	Best Management Practice
BMS	Bridge Management System
BRT	Bus Rapid Transit

C

CAA	Clean Air Act
CAT	Committee on Accessible Transportation
CBD	Central Business District
CCTV	Closed-Circuit Television
CDBG	Community Development Block Grant
CDSD	Central Davis Sewer District
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response Compensation & Liability Act
CERCLIS	Comprehensive Environmental Response Compensation & Liability Information System
CFR	Code of Federal Regulations
cfs	cubic feet per second
CHF	Centennial Highway Fund
CIB	Community Impact Board
CLG	Certified Local Government
CMAQ	Congestion Mitigation / Air Quality Program
CMC	Congestion Management Committee
CMP	Congestion Management Process
CMS	Congestion Management System
CO	Carbon monoxide
CO2	Carbon Dioxide
COE	Corps of Engineers
COG	Council of Governments - Counties
CPG	Consolidated Planning Grant
CR	Commuter Rail
CRIT	Commuter Rail Integration Team
CSS	Context Sensitive Solutions

D

DAQ	Division of Air Quality
D&RGW	Denver & Rio Grande Western
dB	Decibel
dBA	Decibels measured on the A-weighted system
DBE	Disadvantaged Business Enterprise
DEIS	Draft Environmental Impact Statement
DMU	Diesel Multiple Unit
DNR	[Utah] Department of Natural Resources
DOI	Department of the Interior
DOT	Department of Transportation
DSR	Design Study Report
DWR	[Utah] Division of Wildlife Resources

E

EA	Environmental Assessment
EEO	Equal Employment Opportunity

List of Acronyms

EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	[U.S.] Environmental Protection Agency
ESA	Endangered Species Act

F

FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FFGA	Full Funding Grant Agreement
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FONSI	Finding Of No Significant Impact
FPPA	Farmland Protection Policy Act
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FY	Fiscal Year

G

GIS	Geographic Information System
GOPB	Governor's Office of Planning and Budget
GPS	Global Positioning System

H

HAFB	Hill Air Force Base
HBW	Home-Based Work
HBC	Home-Based College
HBO	Home-Based Other
HCM	Highway Capacity Manual
HOT	High-Occupancy Toll
HOV	High-Occupancy Vehicle
HPMS	Highway Performance Monitoring System
HVAC	Heating, Ventilation, and Air Conditioning

I

ICEA	Indirect and Cumulative Analysis
ILS	Intensive Level Survey
IMACS	Intermountain Antiquities Computer System
IRCAA	Inter-Regional Corridor Alternatives Analysis
IRS	Internal Revenue Service
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation System

J

JPAC	Joint Policy Advisory Committee

L

Ldn	24 hour average sound weighted by time of day
Leq	Equivalent continuous sound level.
Lmax	Maximum sound pressure level
LRT	Light Rail Transit
LOA	Letter of Agreement
LONP	Letter of No Prejudice
LOS	Level of Service
LPA	Locally Preferred Alternative
LRP	Long Range Plan
LRTP	Long Range Transportation Plan
LTAP	Local Technical Assistance Program
LUST	Leaking Underground Storage Tank

M

MAG	Mountainland Association of Governments
MASP	Metropolitan Airports System Plan
MIS	Major Investment Study
mg/m3	Milligrams per cubic meter
mm/s	Millimeters per second
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MP	Milepost
MPO	Metropolitan Planning Organization
MOBILE	Mobile Source Emissions Model
mph	Mile(s) per hour
MRI	Magnetic Resonance Imaging
MVC	Mountain View Corridor

N

NAAQS	National Ambient Air Quality Standards
NAPL	Non-Aqueous Phase Liquid
NCHRP	National Cooperative Highway Research Program
NDSD	North Davis Sewer District
NEPA	National Environmental Policy Act of 1969
NFRAP	No Further Remedial Action Planned
NHB	Non Home-Based
NHCSA	National Highway Carrier Safety Administration
NHPA	National Historic Preservation Act
NHS	National Highway System
NHTSA	National Highway Traffic Safety Administration
NO	Nitrogen
NO2	Nitrogen Dioxide
NOI	Notice of Intent
NOx	Nitrogen Oxides [Oxides of nitrogen (NO and NO2)]
NPIAS	National Plan of Integrated Airport Systems
NPL	National Priorities List
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NTD	National Transit Database
NWI	National Wetlands Inventory

O

O3	Ozone
OATS	Ogden Area Transportation Technical Subcommittee
O-L	Ogden - Layton
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit

P

Pb	Lead
PAC	Policy Advisory Committee
PCB	Polychlorinated Biphenyls
PCE	Percholoethylene
PE	Preliminary Engineering or Professional Engineer
PM	Particulate Matter
PM2.5	Particulate Matter < 2.5 microns
PM10	Particulate Matter < 10 microns
PMS	Pavement Management System
ppm	Parts per million
PPV	Peak Particle Velocity
PRP	Potentially Responsible Party
PRT	Personal Rapid Transit
PS & E	Plans Specifications and Estimates
psi	Pounds per square inch
PTA	Parent-Teacher Association
PTO	Public Transit Officer

R

RCA	Recovery Act
RCR	Regional Commuter Rail
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery (Act) Information System
RD	Remedial Design
RD/RA	Remedial Design/Remedial Action
RDA	Redevelopment Area
RFP	Request for Proposals
RFQ	Request for Qualifications
RGC	Regional Growth Committee
RI/FS	Remedial Investigation/Feasibility Study
RMS	Root Mean Square
ROD	Record of Decision
ROW	Right-Of-Way
RTP	Regional Transportation Plan

S

SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SDSD	South Davis Sewer District
SEL	Sound Equivalent Level
SHPO	[Utah] State Historic Preservation Office
SHSP	Strategic Highway Safety Plan
SIP	State Air Quality Implementation Plan
SLATS	Salt Lake Area Transportation Technical Subcommittee

List of Acronyms

SLC	Salt Lake City
SO2	Sulfur dioxide
SOV	Single Occupancy Vehicle
SPUI	Single Point Urban Interchange
SR	State Route
STB	Surface Transportation Board
STIP	Statewide Transportation Improvement Program
STP	Surface Transportation Program
SWMU	Solid Waste Management Units

T

TAC	Technical Advisory Committee
TAZ	Trafic Analysis Zone
TCM	Trafic Control Mesure
TCP	Traditional Cultural Property
TDM	Transportation Demand Management
TDP	Transit Development Program
TEA-21	Transportation Equity Act for the 21st Century
TIP	Transportation Improvement Program
TMA	Transportation Management Area
TOC	Traffic Operations Center
TOD	Transit-Oriented Development
tpd	Tons per day
Trans Com	Transportation Coordinating Committee
TRB	Transportation Research Board
TSM	Transportation System Management

U

UAM	Urban Airshed Model
UCSP	Utah Comprehensive Safety Plan
UDAF	U.S. Department of Agriculture and Food
UDAQ	Utah Department of Air Quality
UDEQ	Utah Department of Environmental Quality
UDWR	Utah Department of Wildlife Resources
UDOT	Utah Department of Transportation
UMTA	Urban Mass Transportation Administration
UPRR	Union Pacific Railroad
UPWP	Unified Planning Work Program
UrbanSim	Urban Simulation Land Use Model
US or USA	United States of America
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
UTA	Utah Transit Authority
UTPP	Urban Transportation Planning Process
UVSC	Utah Valley State College

V

VdB	Vibration Decibels
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
VPD	Vehicles Per Day

W

WBWCD	Weber Basin Water Conservation District
WFRC	Wasatch Front Regional Council
WVC	West Valley City

µg/l	Micrograms per liter
$\mu g/m^3$	Micrograms per cubic meter

3-C	Continuing, Comprehensive and Cooperative Transportation Planning Process

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WFRC
2040 RTP
Salt Lake City

Charting Our Course

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