
TO SOUTH
Minuteman
NO
TURN
ON RED

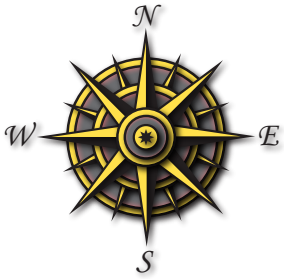
Refining the Preferred Alternative

Chapter 5

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.



Project Selection & Phasing

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

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 Avenue	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 (North Salt Lake)	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

Recommended Capacity Projects			
Route	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)			
12th 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 lanes
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 projected 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, on the section of roadway the project will improve. 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 section. 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 in a similar manner 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 Preparation

The degree to which a highway project is ready to be constructed 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 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) ridership. 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.

Project Selection & Phasing

Image by James Belmont

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 an 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, seniors, 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. A 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 are 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, 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 was a final criteria. Each County identified priority routes in conjunction with their respective bicycle and trails committees in coordination with UDOT, UTA, and 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