Transportation for Communities
Advancing Projects through Partnerships

Case Study

WASATCH FRONT REGION, UTAH:

REGIONAL TRANSPORTATION PLAN

A 10-Step Planning Process

SHRP 2
STRATEGIC HIGHWAY RESEARCH PROGRAM
Accelerating solutions for highway safety, renewal, reliability, and capacity

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The Transportation for Communities website provides a systematic approach for reaching collaborative decisions about adding highway capacity that enhance the environment, the economy, and the community and improve transportation. It identifies key decision points in four phases of transportation decision making: long-range transportation planning, corridor planning, programming, and environmental review and permitting.

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OVERVIEW

Project Overview

Since 1973, the Wasatch Front Regional Council (WFRC) (*1*) has been responsible for the transportation planning in the Salt Lake and Ogden/Layton Urbanized Areas. The council was designated as a metropolitan planning organization (MPO) responsible for developing areawide, long-range transportation plans for Salt Lake, Davis, and Weber Counties. The screening processes evaluated in this case study are those that were used in the development of the *Wasatch Front Regional Transportation Plan: 2007–2030* (2030 RTP) (*2*). This plan reflects a continuous effort by WFRC to identify, plan, finance, and implement a coordinated system of transportation improvements to serve existing and expected growth throughout the region between now and the year 2030.

The 2030 RTP was developed in close 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 2030 RTP also meets federal requirements that metropolitan areas with a population of 50,000 or greater adopt a long-range transportation plan with a minimum planning horizon of 20 years (23 CFR 450 and 49 CFR 100–300). The planning policies and recommendations of the 2030 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.

Screening Process Overview

The 2030 RTP supersedes the previous regional transportation plan that WFRC developed in 2004. Because of changes in federal requirements and guidelines since the development of the previous RTP and the availability of funding and resources from state and federal agencies, the council used the development of the 2030 RTP as an opportunity to apply innovative processes in public involvement and project selections.

WFRC used a 10-step planning process to guide preparation of the 2030 RTP. The 10 steps in this model are (1) overview or problem identification, (2) visioning, (3) system needs assessment, (4) system alternatives development, (5) evaluation of alternatives, (6) project selection and phasing, (7) financial plan, (8) recommended improvements, (9) plan impacts and benefits, and (10) plan implementation. This simple but effective model provides a straightforward approach to the complex task of planning for regional transportation growth and demand.

Of the 10 steps outlined above that were followed to develop the 2030 RTP, three used a screening process: (1) system needs assessment, (2) evaluation of alternatives, and (3) project selection and phasing. Figure 1 shows the flowchart representing the 2030 RTP planning process.

The 2030 RTP planning process started with a series of meetings with planners and engineers from UDOT (*3*) and UTA who helped identify areas of concern and made suggestions for specific transportation improvement projects. The information provided by these professionals was compiled and analyzed and was a factor in the determination of transportation needs. Additional meetings were scheduled with local elected officials and stakeholders. An extensive public outreach and visioning exercise was conducted with the help of planners at Envision Utah (*4*), which resulted in the adoption of a list of regional growth principles and a preferred land use and transportation network for the Wasatch Front. Formed in 1997, Envision Utah is a public-private partnership that guides the development of a broadly and publicly supported quality growth strategy—a vision to protect Utah's environment, economic strength, and quality of life for generations to come. The partnership is made up of 130 key stakeholders, including representatives from state and local governments, business leaders, developers, conservationists, landowners, and church and citizen groups from around the region. Their role is to provide the strength, knowledge, and visibility to help develop and implement a quality growth strategy for the Greater Wasatch Area. Utah's governor at that time, Michael Leavitt, and Spencer F. Eccles, chairman of the Wells Fargo Intermountain Banking Region, served as honorary co-chairs of the

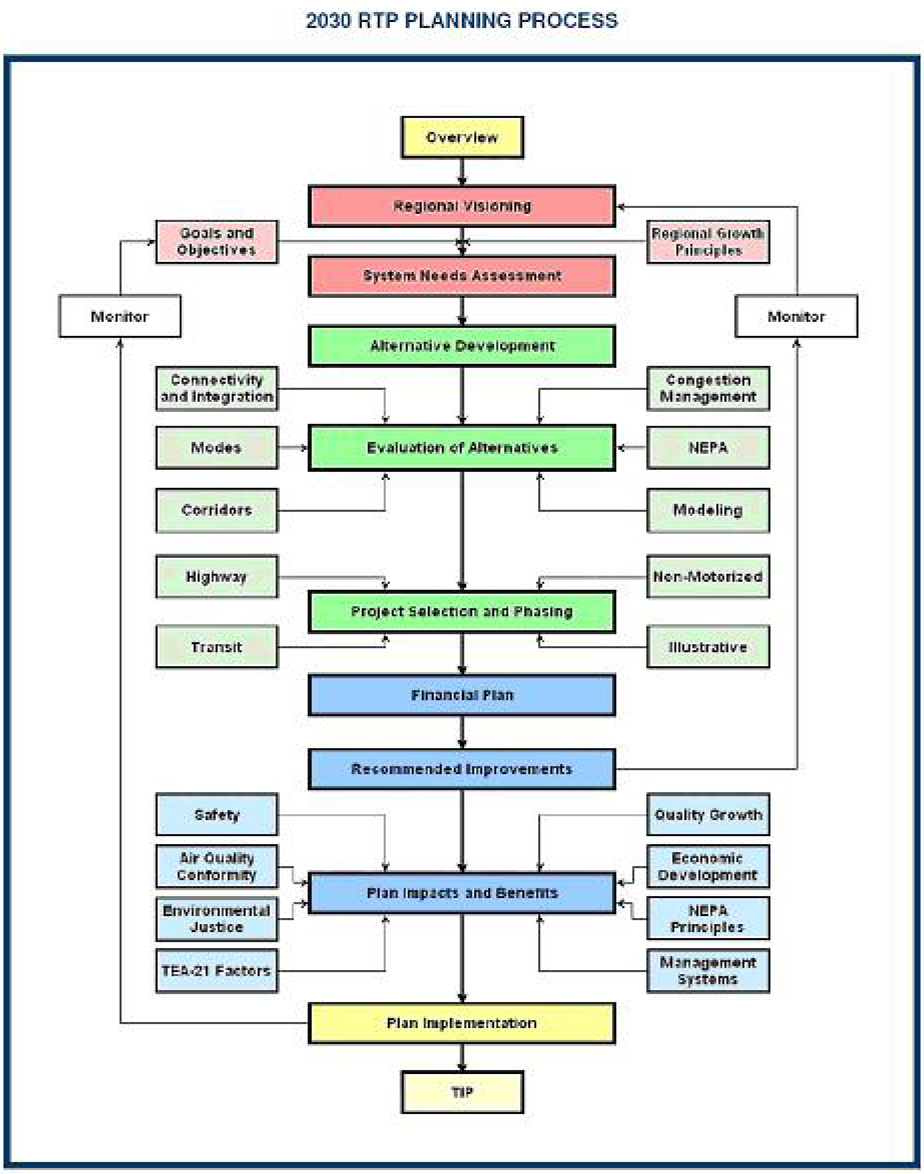

Figure 1. Flowchart of the 10-step process (*2*).

effort. Mayor Greg Bell of Farmington City is the active chair of Envision Utah. With Envision Utah's support, three transportation scenarios eventually led to the development and refinement of three transportation system alternatives designed to meet regional needs that were integrated into the RTP transportation needs. A quantifiable comparison of projects helped determine which performed the best. An ongoing effort to solicit public input continues to guide the 2030 RTP effort. Finally, a quantifiable means of identifying highway and transit projects that best meet regional needs was developed and tested. Once specific capacity improvements were identified, they were placed into one of three construction and funding phases according to their overall score.

KEY ASPECTS OF THE SCREENING PROCESS

Scope

The screening process occurs at multiple stages in the development of recommended projects from visioning to planning to programming. It is unique in this case in that there is integration from the visioning process through project development and that principles determined in the visioning process are actually applied in the later stages.

Before development of the 2030 RTP, WFRC partnered with Envision Utah, Federal Highway Administration (FHWA), UDOT, and other agencies to develop *Wasatch Choices 2040: A Four County Land-Use and Transportation Vision* (Vision document) (*5*). Through the visioning exercise, the screening process is integrated with other planning activities, specifically land use. The alternatives at this stage are scenarios and not project specific or even transportation specific. They reflect the "vision" of what the transportation system should be within the region.

Four scenarios were developed in the Vision document: (1) business as usual, (2) transit station villages, (3) interconnected network of complete streets, and (4) centers of employment. The scenarios were examined against the transportation network to determine what effect each would have on the system and the needs that would arise for each. Through extensive public involvement in this effort, regional growth principles were developed for integration into the 2030 RTP. Before the start of the 2030 RTP development, the Vision document had not been completed, but the workshops and the growth principles had been developed. The first solution screening effort to determine transportation needs was directly related to these growth principles as well as to other traditional transportation factors. It was the first stage in the screening process for the WFRC 2030 RTP.

Once the transportation needs were identified, three systemwide alternatives were developed:

- Vision alternative, a combination of the earlier 2004–2030 RTP and the results from the *Wasatch Choices 2040* visioning exercise;
- Freeway alternative, a transportation system emphasizing freeway and freeway-based bus rapid transit; and
- Arterial alternative, a system emphasizing arterials and arterial-based streetcars.

The alternatives were evaluated and scored against 19 measures (detailed in the Metrics and Data section). The vision alternative, endorsed by the Regional Growth Committee, was selected and became the base system and framework for refining the 2007–2030 RTP. Detailed information on the measures and the evaluation results can be found in Chapter 5 of the 2030 RTP (*2*).

The final stage of the screening process was the project selection and phasing. The objective in that stage was to refine the system concept into a list of defined projects and to place time horizons on each project. This was done for highway projects and transit projects, with each having separate selection and phasing criteria. For highway projects, traditional individual project measures were considered when defining a project characteristic and helped to define project width, length, functional class, general alignment, and interchange location. The congestion management process (CMP) was applied to determine if any needs could be resolved through travel system management (TSM) or travel demand management (TDM) strategies, such as signal coordination, access management, carpooling, and telecommuting. Projects that had needs that could not be satisfied by TSM or TDM strategies were advanced and evaluated by local and UDOT scoring criteria.

The local scoring method used data from cost per delay per day (need), traffic volumes, volume per capacity, and growth principle factors (*2*). Each factor was worth 25 points for a total of 100 points. The local criteria evaluation helped to refine projects and resulted in one of the set of rankings that were used to place the refined projects into the 2030 RTP phases. The UDOT scoring method consisted of scoring projects on the basis of average annual daily traffic, truck traffic, volume-to-capacity ratio, functional classification, growth rate, and the safety index. The rankings based on the UDOT scoring method were applied to all projects in the state, not just those in the WFRC region. These rankings would then be used by the Transportation Commission as guidance for project funding.

Communications

Agency Involvement

At the initiation of the 2030 RTP in August 2006 and again in March 2007, after project recommendations had been made, meetings were held with the government resource agencies and other interested parties. Representatives from each of the MPOs and UDOT attended the meetings.

The purpose of the initial meeting was to determine the needs and issues of each agency prior to the identification of the 2030 RTP's recommended projects. The meeting was well attended with broad representation from four school and two water districts, Bureau of Land Management, Bureau of Reclamation, U.S. Forest Service, Utah Division of Natural Resources, Utah Division of Water Quality, Utah Division of Solid and Hazardous Waste, Utah DAQ, U.S. Natural Resources and Soil Conservation Service, Utah State Department of Parks and Recreation, FHWA, Utah Trucking Association, and

Weber Pathways (representing the bicycle and pedestrian interests).

The purpose of the second meeting was to discuss possible or potential mitigation measures for identified/recommended projects. The same agencies that attended the first meeting were also at the second. Additional attendees included representatives of the Utah State Division of State History, Utah State Division of Wildlife Resources, Utah Division of Water Resources, Intermountain Health Care, and Salt Lake City Bicycle Committee, and Safe Routes to School Advisory Committee.

The agency participation in these meetings was successful; however, the information from the agencies apparently did not have much influence on project selection. The focus of their involvement in this regard was more on mitigation opportunities, specific comments on which are recorded in Chapter 9 of the 2030 RTP; this listing can be referenced when project-specific studies are initiated (*2*).

Public Involvement

WFRC solicited public participation and integrated oral and written comments into the planning process. Through media outlets, e-mail blasts, and website notifications, input for the 2030 RTP was requested from various groups. These groups included freight hauling organizations, Native American groups, advocates for low-income people, minority organizations, senior citizen groups, community councils, city councils of governments, other government agencies (at a stakeholders' meeting organized by WFRC), environmental groups, advocates for the disabled, chambers of commerce, state legislators, and the general public. WFRC considered comments received from these groups and individuals in both the draft and final documents. A summary of the public review process and record of public involvement can be found in Appendix A of the 2030 RTP (*2*).

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 2030 RTP document.

WFRC, in partnership with the Mountainland Association of Governments and Envision Utah, engaged the public in an 18-month visioning process to establish a vision of the future for the Wasatch Front. The data achieved from this visioning effort were then used in the first phase of the selection screening process, the development of transportation needs. This was an extensive process with 13 workshops, four open houses, and more than 1,000 participants from all parts of the community and government. The result of the process was a set of growth principles that have been adopted by WFRC and most of its member entities. These growth principles, developed through an extensive public process, now guide the development of the RTP and are an excellent example of how the public involvement process influences policy.

Two series of open houses regarding the RTP update process were held in Salt Lake, Davis, and Weber Counties. The first series was for the alternatives phase of the RTP and was held during November 2006. The second series, for the draft 2030 RTP, was held during April and May 2007. Both series of public open houses were announced through notices and advertisements in local newspapers. Many local newspapers also ran news articles announcing the open houses and some sent reporters to the open houses to cover the event. Additionally, approximately 2,000 e-mails were sent to the interested stakeholders on the WFRC mailing list to provide electronic notice of the upcoming open houses with an invitation to attend. The public open houses to review and receive input on the three regional transportation alternatives were held in October and November 2006 and were well attended. These open houses served to gauge public opinion on the three draft alternatives that were developed as part of the 2030 RTP planning process. The staff carefully summarized and responded to all comments. The last series of open houses, held during April and May 2007, presented the draft 2030 RTP for public review and comment. 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. The comments were considered during the project selection process if the agency and public input provided direct information regarding a specific project.

All documents and maps regarding the RTP were made available on the WFRC website. Interested parties were invited to visit the website and review all comments on the documentation. Many e-mails received as comments on the draft 2030 RTP were from this source. In addition, as noted above, thousands of e-mails were sent out soliciting public review and comment.

By regularly including the local news media in WFRC actions, a number of articles about WFRC transportation planning efforts were published. Regional Council Chairman Denis Nordfelt and several WFRC staff members were quoted in news articles during the 2030 RTP development process.

WFRC prepared draft project lists and maps of the *Wasatch Front Regional Transportation Plan: 2007-2030* in February 2007 for distribution to interested public agencies, elected officials, local communities, and the general public. A formal public review period was held during April and May 2007. Interested persons and groups were invited to review and offer comments on the draft 2030 RTP in either formalized public open houses, or individually at their convenience. WFRC reviewed and approved the finalized document on May 24, 2007. Copies of the *Wasatch Front Regional Transportation Plan: 2007–2030* are available through the WFRC office, the WFRC website, and select area libraries (*2*).

Technology

Four software tools were used in the process, in addition to the common word-processing, spreadsheet, and communication tools of Microsoft Office. The tools are described below.

Wasatch Front Regional Council Website

WFRC's website provides information about the council, its contacts, activities, projects, schedule and accomplishments, and other general organizational information (*1*). The principal function of the WFRC website is to serve as the WFRC public calendar, announcement board, contact sheet, and document repository. It also provides links to partner organizations, MPOs, and other web resources and makes public project documents digitally available. The public website has a built-in search engine and a Google Earth location function.

Geographic Information System

WFRC has an in-house Esri-based geographic information system (GIS), which has been used throughout the process. It is a core technology that provides geographic products, including maps, analyses, and processed data to internal users, other agencies, and the public upon request. The system is routinely used to create visuals and maps for presentations, meetings, and reports and to redline discussions.

GIS map layers have been purchased from commercial sources or acquired from Envision Utah's GIS for the state, from partnering MPOs, and through the web without cost. The WFRC GIS staff creates layers either from scratch using GIS software or from the UrbanSim model, which generates layers as part of its modeling output. GIS data, processed layers, and new layers resulting from GIS analysis runs have been exchanged among participating agencies, consultants, and the public. Maps have been shared and used in discussions to make decisions or show the results of urban and traffic growth projections.

The GIS is used to develop and present the cartographic and data representations of the urban and traffic demand model results on common base maps. Thus, alternative development and transportation scenarios can be depicted on a common base map for result comparison. In addition to graphically depicting the alternatives, the GIS can produce reports of the data for the alternatives, and can run any number of analysis exercises for any alternatives. For example, the system can be queried about the number of people who live within walking distance of a proposed transit stop, or it can be used to analyze the driving times of a new transportation network.

UrbanSim

UrbanSim is a software-based demographic and employment modeling tool for integrated planning and analysis of urban development, incorporating the interactions between land use, transportation, and public policy with demographic information. It is intended for use by MPOs and others needing to interface existing travel models with new land use forecasting and analysis capabilities. UrbanSim has many built-in GIS functions. It was customized and used during the RTP planning phase completed in May 2007.

Travel Model

Travel Model is software that determines trip generation, trip distribution, mode choice, and trip assignments from a source of population distribution and employment information. Trip-based models typically represent each trip, such as an employee's trips between home and work, so that projected demands on a transportation network can be estimated. WFRC uses Travel Model with UrbanSim and relies on GIS layers for the map data.

Overview of Tool Use

These three software tools are used concurrently in the screening process. The three tools pass information back and forth to each other; for example, modified GIS layers were provided to UrbanSim, which in turn could modify the layer and port it back into the GIS as a new layer depicting a specific urban scenario. This powerful and flexible technology package, although not unique to this planning effort, allows planners to model future land use patterns and populations, create a travel model for the future community, and depict the results in tables and maps. Thus, alternative solutions can be created and evaluated during the selection process.

There was a great deal of effort involved in gathering, cleaning up, and assembling the GIS and demographic data from the partnering organizations. Using a variety of sources, WFRC's staff assembled a base data set that serves the area of study and can be changed or updated in the future. This is an ongoing effort, and it must be completed before comprehensive modeling can begin.

UrbanSim and, to some extent, Travel Model require a dedicated, trained, medium- to high-level programming and modeler resource. It was estimated that the effort to prepare for the RTP modeling required two full-time-equivalent individuals for 2 years. In addition, each modeling run of UrbanSim took a week or more of programming and data preparation. The actual run time for an UrbanSim model was 72 continuous hours on one machine. Travel model runs took several hours to a day to run. This level of resource commitment and modeling time was acceptable, but did not allow for numerous runs or adjustments to the model.

Metrics and Data

Agency and public data were used mainly in the identification of transportation needs. Once the transportation needs were identified, the alternative travel systems were evaluated against the measures listed in Table 1.

After the selection of the transportation system, the following individual project measures were considered in defining a project characteristic:

- Ratio of project traffic volume to highway capacity;
- Extent to which the project promotes interconnected streets;
- Any known regionally significant relocations or community impacts;
- Any serious known hazardous material or natural disaster exposures;
- Any other known critical natural or cultural impacts; and
- Access to regionally significant priority growth areas.

Projects were further refined and measured against local and UDOT scoring measures, which are summarized in Table 2.

LESSONS LEARNED

Success Factors

There were several factors that contributed to the success of the WFRC process.

Public Participation

The process took into account the data obtained from the visioning effort, which included 13 separate workshops with more than 1,000 public participants. The information gained at these workshops and through other public involvement exercises through-

Table 1. Measures Used to Evaluate Alternative Travel Systems (*2*)

Measures	Definition[a]
Construction costs	Estimated 2006 highway construction and major transit capital costs
Transit passenger miles	Number of miles traveled by transit passengers each day
Vehicle miles traveled	Total daily auto miles traveled
Transit proportion of work and college travel	Proportion of all home-based work and home-based college person trips taken by transit in the afternoon peak period
Traffic volumes in constrained critical corridors	Sum of all morning peak period auto volumes on all modeled street segments that fall within identified areas that have both severe congestion and a practical inability to widen roads
Person-hours by auto	Total daily person-hours spent in an automobile
Weighted transit speeds	Average perceived travel speed of all transit trips assuming that the time waiting for transit is perceived as twice as long as the time spent on the vehicle
Home-based work auto speeds	Average speed of all auto trips between home and work on a daily basis
Auto delay	Annual number of hours of auto delay caused by traffic congestion during the peak periods
Improvements to geographic choke points	Both the number of projects crossing regional geographical choke points and the peak-period auto and transit seat capacity added by these projects
Transit access to major activity and mixed-use centers	Sum of all households and jobs within 20-min transit travel time during the afternoon peak period of each of the identified major activity centers and mixed-use centers
Auto access to major activity, mixed-use, and infill areas	Sum of all households and jobs within 20-min automobile travel time during the afternoon peak period of each of the identified major activity centers, mixed-use centers, and infill areas
Freight center–to-freeway access	Sum of individual afternoon peak-period travel times, in minutes, between each of the largest freight centers and the nearest freeway
Employment access for disadvantaged populations	Sum of all jobs within 20-min auto and transit afternoon travel times of all traffic analysis zones with a disproportionately high percentage of low-income families, minorities, persons with disabilities, seniors, and households with no autos
Households and employment potentially affected	Number of households and jobs in each 5-acre grid cell adjacent to a roadway project
Potential impacts to historic neighborhoods	Project miles bisecting U.S. Census Block Groups that have a proportion of homes built before 1950 that is higher than the regional average
Potential impacts to disadvantaged populations	Project miles bisecting a U.S. Census Block Group with a disproportionately high percentage of low-income families, minorities, persons with disabilities, seniors, and households with no autos
Air quality	Tons of nitrogen oxide, carbon monoxide, and volatile organic compounds emitted daily by transportation sources in winter conditions
Potential impacts to environmentally critical lands	Acres of steep slope, wildlife habitat, wetlands, streams, and lakeshores within 100 to 300 ft (depending upon facility type) of a project centerline

[a] All transportation statistics are projected for the year 2030 for travel within Weber, Davis, and Salt Lake Counties. Morning and afternoon peak periods are 6:00 a.m. through 9:00 a.m. and 3:00 p.m. through 6:00 p.m.

Table 2. Local and UDOT Scoring Measures (*2*)

Local Scoring Measures	UDOT Scoring Measures
2015 Cost per delay per day (need) 2025 Cost per delay per day (need) 2030 AADT 2015 Traffic on 2012 network (V/C) 2025 Traffic on 2015 network (V/C) Growth principles Choke-point alternative Degree project includes transit Extent right-of-way preserved Improved access to activity centers, etc.	2005 Average annual daily traffic (AADT) 2005 Truck AADT 2005 Volume/Capacity 2030 Functional classification Growth rate 2001–2003 Safety index

out the development of the 2030 RTP was a measure by which projects were developed and ultimately recommended.

Working Relationships Between Agencies

The relationships between WFRC and other agencies were key to the success of the solution screening process. By having agencies participate before the determination of recommended projects, the agencies were able to contribute information and data that could then be used in deciding on ultimate solutions. Also, the information gathered at the second meeting with the agencies provided details on mitigation opportunities that would be used in later phases of a specific project. The relationships between WFRC, the other MPOs, and UDOT were critical in the development of *Utah's Unified Transportation Plan: 2007–2030* (*6*), which aided in the prioritization of a statewide project list for use in funding by the Utah legislature.

Use of Innovative Tools with Knowledgeable Staff

There were innovative tools used by WFRC in the solution screening process, which required staff expertise in order to gain the most useful and applicable data. WFRC had staff on board who were knowledgeable in the technical tools, such as UrbanSim, ArcGIS, and Website, which allowed the screening process to be the most effective. The local scoring method, developed in-house by WFRC staff, contributed to the success of the solution screening process in that the weights to the measures could be applied according to the specific needs of the region.

Financial Support

A true key to the success of the process was the visioning effort of Wasatch Choices 2040, which, funded by multiple agencies, cost approximately $300,000. This support allowed a true public process, which carried forward throughout the development of the 2030 RTP.

Key Innovations

Several unique innovations used in the process made it different from traditional methods:

- The high amount of public involvement led to a tremendous number of public comments, which were individually addressed throughout the process. Furthermore, the way the public was treated at the workshops—as participants, not just as an audience—was unique compared with traditional public involvement practices.
- The use of UrbanSim early in the process was a unique feature that allowed consideration of land use principles before determination of transportation needs.
- The development and use of a scoring method to prioritize projects was a unique feature of the solution screening process. WFRC weighted the various metrics according to regional standards that, when applied to the project solutions, generated the final list of prioritized projects.

- Finally, the sheer amount of data considered at this early stage of a project was a true innovation when compared with traditional planning studies. As discussed in the Metrics and Data section, there were numerous detailed metrics against which the solutions were evaluated. This level of detail in a regional planning effort is unique to this process and generated solutions that were well supported with real data.

BARRIERS AND SOLUTIONS

Analytical Barriers

Proprietary Data

Proprietary data have acquisition costs and limits on distribution. Budget concerns and some licensing issues meant the budget had to be reviewed, adjusted, or augmented to acquire necessary data. Usually the solution is to revise the budget with new or reserve funding, or find an alternative at low or no cost. Data purchase, if it is not budgeted, can have an impact on other aspects of the project.

Considering All Environmental Factors

Some public participants voiced the perception that some environmental aspects were not considered to be as important as other factors. The solution was to develop a system that assigned a weight to environmental factors and review these with the public first so that environmental factors might be considered in project selection. The result was that a more balanced project ranking system was produced.

Implementing the Plan

An implementation strategy is outlined in the planning document, but it does not clearly define who is responsible and how the project will be accomplished or funded. The development of the plan would have been considered a waste of money and time if it could not be implemented properly. A loss of participants' trust could be severe without certainty that what was said would actually be done. Lawsuits could be filed for failure to meet legal requirements (e.g., not carrying out statements of plan intent). The solution was to specify an implementation plan and set up funding to develop and monitor performance measures. WFRC also followed through with participants that made commitments (e.g., local government zoning changes). In the end, the planning effort was realized and the participants and users of the system trusted that WFRC's work was worthwhile.

Institutional Barriers

Resistance to Technical Tools

There was some resistance from planning agencies to the use of UrbanSim as a tool to model population and employment demographics across the region and, from those projections, create travel demand projects using Travel Model because of the granularity of the analysis (a 150-m grid). This resistance meant that the project took additional time. WFRC stayed with the 150-m grid and was able to convince participants of its validity for the initial regional study, noting that a finer grid could be used for detailed work when required. As a result, the project was able to move forward.

Zoning Changes

In the implementation phase, the vision plan to redirect growth could not be realized without the enactment of zoning changes that the plan recommended. This requires intense work at the individual MPO level. If zoning is not changed, the vision will not be realized.

Acceptance of Software Modeling Outputs

Not all agencies accept all modeling outputs. A consensus will not be reached if the same model cannot be applied across all jurisdictions. A solution might require a complete redo of the modeling effort, which could mean a loss of momentum and funding to continue the study, and thus result in growth continuing more or less at current rates and patterns.

Competing Jurisdictions with Incompatible Plans

Land use and transportation plans are inconsistent and discontinuous across the region. The solution is to develop a regionwide vision with unified growth principles and have all local government entities participate together throughout the entire process. All local planning efforts are coordinated with regional planning and reflect unified growth principles.

Competing Metropolitan Planning Organizations

Multiple MPOs in the state have different goals and are competing for one block of money from the legislature. The state legislature may not be clear on how to prioritize projects and how to allocate and phase funding when faced with this issue. The solution was to create a unified transportation plan through consultation with all MPOs and other areas not under an MPO. The state DOT would then prioritize projects through a ranking system. Through this solution, one document is presented to the legislature with a clear prioritized project list for funding consideration. MPOs have initial projects with their own priorities, but the unified plan spells out all the state's needs. Trust is built between MPOs through this process.

Lack of Public Involvement

A public lacking awareness or education in the planning and land use process may demand unrealistic and unattainable goals. WFRC's solution was to actively participate with the public through interactive workshops that put the responsibility on the public participants to find solutions within the same parameters presented to the project team. The outcome was that the public was more supportive of realistic solutions and felt more a part of the process.

Technical Barriers

Technical Incompatibilities Limit Transfer of UrbanSim and Travel Model

Other neighboring MPOs would like to use the same tools that WFRC used. However, the tools are hard-coded to specific modeling and data sets, and they work with specific operating systems and databases. They will not transfer unless the configurations are identical. Only with truly compatible systems can the tools be interchanged, and even then the data must be in the same format for them to be used in the new system. The solution is extensive work that is not cost beneficial. The ultimate solution, not available at this time, is an advanced, agile version of these tools. This difficulty in transferring the tools remains a barrier.

Lengthy and Technically Challenging Software Implementation Process

Modeling software (UrbanSim and Travel Model) customization and implementation took 1–1.5 full-time-equivalent employees to prepare for the project modeling runs. This undertaking required (1) knowledgeable technical resource, (2) new workstations, (3) staff time, and (4) development time that reduced time available for actual project production. The required level of customization effectively turned the modeling staff into a coding shop for many months. Several staff worked as a development team to configure the software package for the project. Additional equipment and software were purchased; contractor support was also purchased. Until resources could be freed, the customization affected the project schedule. Further, the process locked the solution into one software version because the customized code cannot be moved forward into a newer version. The project schedule was met; however, additional requests for scenario modeling could not be met because of time and resource constraints.

Length of Model Runs

The run time for the modeling software package, UrbanSim and Travel Model, took approximately 72 hours. This time required staff monitoring hours, tied up machines, and reduced the overall number of model scenarios that could be run. The process wasted time because a bad run would not be discovered until it was completed. There was no easy solution available. Extensive customization or a newer software version might have allowed for faster processing or for distributed processing among several machines.

Use of Customized Code

Customized code is unique to this project in terms of the software version and the specific functionality and data references written into the code. The customized code will not work with a newer version of the software, nor can it be shared with other jurisdictions working on other solutions. To minimize future problems with updated systems, the team froze all software versions. The customized code will work only with the current software versions, including the computer operating system. Any significant upgrades will require a complete rewrite.

Modeling Software Updates Are Not Usable

Newer versions of modeling software or operating system software probably will not run the current heavily customized code without an extensive rewrite. The solution is to stay with the current software versions until the project stage is completed. At some point, software versions may be evaluated.

Other Barriers

Project Schedule

The project schedule was mandated to meet regulatory requirements for the RTP submission. A tight schedule made scheduling and completing all meetings, development, and reviews problematic. WFRC realized it would not have time to attain 100% buy-in or adoption of the principles of the study. Therefore, WFRC decided that asking participating agencies if they could live with the principles would be sufficient enough buy-in to move forward. Agencies, for the most part, agreed to this. The project was able to move forward and maintain its schedule.

Multiple Meeting Scheduling and Staffing Conflicts

WFRC met with more than 50 groups, 1,000 individuals, and numerous agencies during the visioning process. It was difficult to coordinate with everyone's schedule. If a traditional one-on-one meeting schedule had been adhered to, the process could not have been completed within the schedule. WFRC held open-house review meetings and invited multiple participants to attend at the same time, thus compressing the schedule. The project schedule was met. In addition, parties that otherwise might not have met or collaborated were drawn together around the shared vision and worked as a more cohesive group. This created a more participatory process.

Technical Staff Availability

The lead software modeler left WFRC and thus left a technical and production gap. This absence increased the staff workload for the short term and required hired contractor assistance. Despite the staff changes, the project was kept on schedule.

RECOMMENDATIONS

The selection process that WFRC used is one that could be transferred to other agencies. The availability of critical resources, including the budget, staff, and innovative tools, was instrumental in the success of the selection screening process. Specifically, the incorporation of public involvement as a key aspect of the visioning process led to the identification of project needs directly from the users of the system. These needs were the foundation of the project selection process and were critical to its success. The visioning process may be a financial barrier to agencies without support from sponsors, so it is important that the budget be addressed in order for the agency to be successful in this process.

Another critical element for enabling an agency to apply this selection screening process is the ability to obtain the same abundance of detailed transportation data that WFRC was able to compile. As shown in the Metrics and Data section, the amount of data involved in the selection screening process is enormous when compared with that of other agencies in similar stages in the planning process. The access to the specific software (i.e., UrbanSim) and tools (i.e., Local Scoring Method) to obtain these data and the availability of staff to process the data are key factors in the transferability of the selection screening process. In addition, had a data model for highway planning been available, a large savings of staff effort and modeling run preparation time would have been realized. The term "data model" refers to the set of database standards, rules, and data sets to be included, and procedures that describe the actual structure of a database; it is typically prepared and reviewed before beginning actual database development. It is an essential step in preparing a project database.

Finally, support from the sponsors, agencies, and the public is integral to the success of the screening process. As shown in the example of the visioning process, the public input and support of the project led to a true vision of the area to which the transportation needs were addressed. The effort by WFRC to involve the various resource agencies at numerous times during the process led to input on other projects in the area, sensitive areas to be avoided, and mitigation opportunities, all of which were factors considered in the selection screening process. UDOT's and the local government agencies' assistance, support, and buy-in to the process were also vital to the selection process and to the implementation effort.

The solution screening process was multiphased and used extensive data. Financial concerns could deter another agency from using it. However, if these barriers are overcome, its use, whether in part with specific tools or in whole, is highly recommended in other planning or project selection efforts.

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