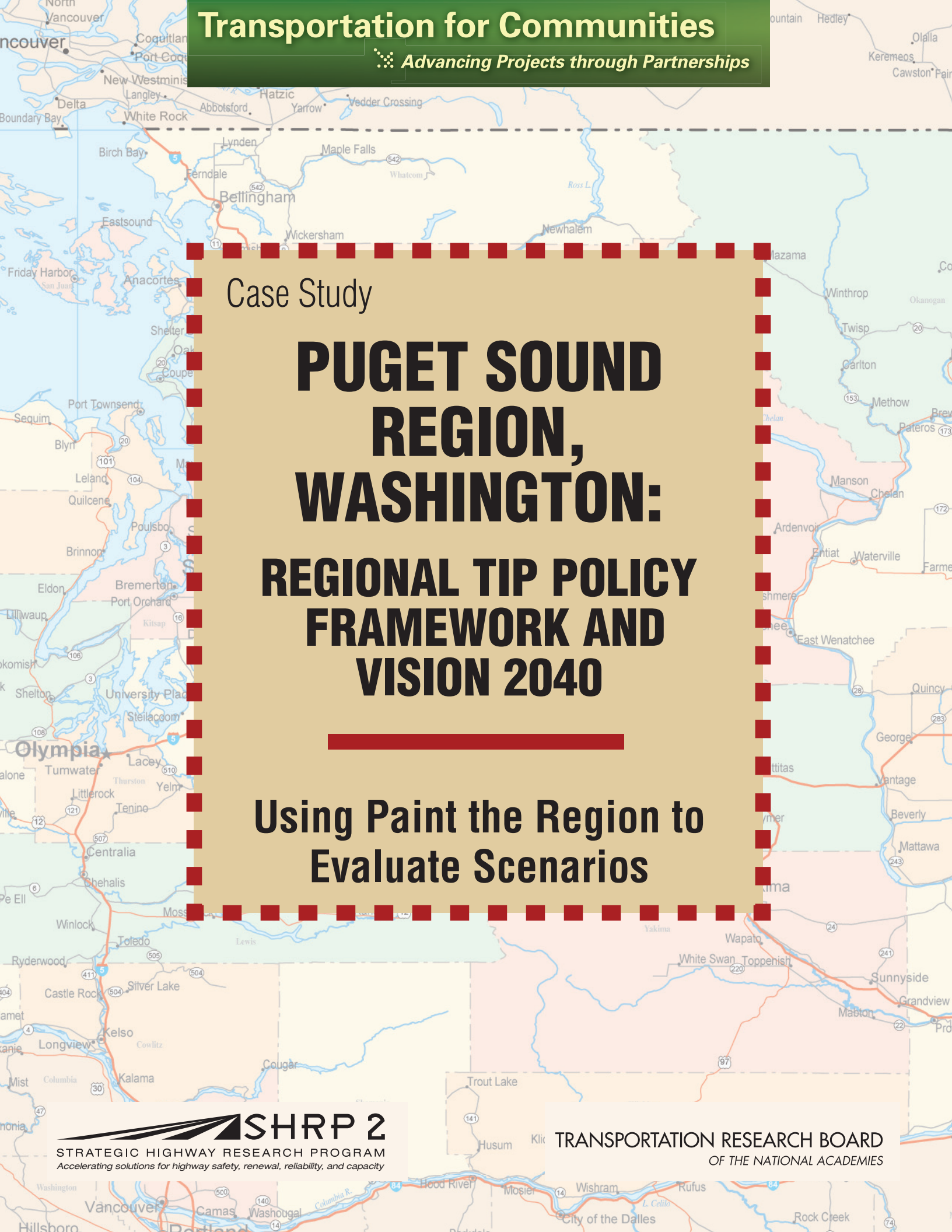

Transportation for Communities

Advancing Projects through Partnerships

Case Study

PUGET SOUND REGION, WASHINGTON:

REGIONAL TIP POLICY FRAMEWORK AND VISION 2040

Using Paint the Region to Evaluate Scenarios

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

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

This case study was developed through SHRP 2 Capacity Project C01: A Framework for Collaborative Decision Making on Additions to Highway Capacity. It is integrated into Transportation for Communities: Advancing Projects through Partnerships, a website that is a product of research conducted under Capacity Project C01 (www.transportationforcommunities.com).

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.

The case studies for Capacity Project C01 were prepared by ICF International, Research Triangle Park, North Carolina; URS Corporation, Morrisville, North Carolina; and Marie Venner Consulting, Lakewood, Colorado.

This work was sponsored by the Federal Highway Administration in cooperation with the American Association of State Highway and Transportation Officials. It was conducted in the second Strategic Highway Research Program (SHRP 2), which is administered by the Transportation Research Board of the National Academies.

NOTICE

Capacity Project C01 was a part of the second Strategic Highway Research Program, conducted by the Transportation Research Board with the approval of the Governing Board of the National Research Council.

The members of the technical committee selected to monitor this project and to review this case study were chosen for their special competencies and with regard for appropriate balance. The case study was reviewed by the technical committee and accepted for publication according to procedures established and overseen by the Transportation Research Board and approved by the Governing Board of the National Research Council.

The opinions and conclusions expressed or implied in this case study are those of the researchers who performed the research and are not necessarily those of the Transportation Research Board, the National Research Council, or the program sponsors.

The Transportation Research Board of the National Academies, the National Research Council, and the sponsors of the second Strategic Highway Research Program do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the object of the case study.

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

The nation turns to the National Academies—National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council—for independent, objective advice on issues that affect people's lives worldwide.

www.national-academies.org

Case Study

PUGET SOUND REGION, WASHINGTON:
REGIONAL TIP POLICY FRAMEWORK AND VISION 2040

Using Paint the Region to Evaluate Scenarios

OVERVIEW

Project Overview

The Puget Sound Regional Council's (PSRC) 2002 Regional Transportation Improvement Program (TIP) Policy Framework establishes regional policy direction and project selection criteria to ensure that transportation projects selected to receive federal funding through PSRC are consistent with the regional long-range growth management plan, VISION 2020, and the regional long-range transportation plan, Destination 2030. According to the July 2007 draft of the VISION 2040 plan (the update to VISION 2020), VISION 2020 "combines a public commitment to environmental sustainability and growth management with the economic strength and efficient transportation facilities necessary to support that vision" (*1, 2*).

The policy framework establishes criteria for the competitive selection process in which transportation projects are chosen to be placed on the TIP. The competitive process for selecting TIP projects was developed by PSRC in 1993 and has been refined every 2 years in subsequent versions (*3, 4*). Through this process, regional and countywide TIP candidate projects receive scores that are based on how well the project meets individual criteria derived from VISION 2020 and Destination 2030.

The basis of the TIP selection process is VISION 2020, which establishes multicounty planning policies for land use patterns, economic development, and transportation investments (*5*). The update to VISION 2020 is VISION 2040 (formerly known as VISION 2020+20) (*1, 2*). The process of updating VISION 2020 has involved developing several land use development scenarios or alternatives and evaluating them in an environmental impact statement (EIS) through the State Environmental Policy Act process (*6, 7, 8*).

At the outset of the VISION 2040 project, PSRC decided that a new sketch-planning tool would be valuable in helping decision makers consider various growth scenarios and select alternatives for evaluation in an EIS. INDEX Paint the Region (PTR), developed by Criterion Planners, is a geographic information system (GIS)–based modeling tool that evaluates land use scenarios on the basis of numerous indices, allowing the user to "paint" and evaluate a variety of land use and transportation scenarios in a neighborhood or region and then evaluate how the scenarios meet various performance indicators, such as air quality, transportation, impervious surface and stormwater runoff, water and wastewater, and solid waste. PTR was used to develop and evaluate four growth management scenarios. Selection of a preferred alternative was a collaborative process involving representatives from 4 counties and 82 municipalities, as well as the general public. Selection of the preferred alternative is documented in the draft VISION 2040 document, which at the time of this writing was being circulated for public comment (*1, 2*). (Note: After public comments were received, PSRC prepared the final draft VISION 2040 for review by the PSRC boards. The final VISION 2040 plan was adopted by the General Assembly in spring 2008.)

Screening Process Overview

Growth management planning is mandated in the State of Washington by the Growth Management Act. The state mandate has led to the creation of overarching regional policies that allow for and ensure the integration of land use, transportation, economic, and environmental planning. Thus, as the regional planning agency as well as the metropolitan planning organization (MPO), PSRC (*9*) is responsible for long-range comprehensive growth management and long-range transportation planning. As such, PSRC has developed a multilevel process to integrate growth management policy decisions with transportation policy decisions through the policy framework for PSRC's project selection process.

The focus of this study is on two main processes: development of VISION 2040 and PSRC's project selection process for the regional TIP.

Selecting a Preferred Growth Management Strategy

The first process involved developing and updating the long-range growth management strategies and policies. When PSRC was developing and updating VISION 2040, the long-range comprehensive plan, it evaluated the compliance of alternative development

scenarios with the State Environmental Policy Act. PSRC wanted to use PTR interactively in stakeholder workshops to create and evaluate alternative scenarios for the Puget Sound region. It had needed a tool that could create regional scenarios in real time during workshops and evaluate them on a wide range of indicators. The ultimate goal was to select a preferred development scenario for the region through an open and collaborative process.

PSRC started by talking to stakeholders about the kinds of scenarios that they wanted to examine. Eight conceptual scenarios were developed from this step. PSRC then created PTR land use scenarios internally (population and job allocation) as follows:

- It created a layer with the planned land use designation of each 5.5-acre grid cell, drawing land use data from the UrbanSim database (*10*).
- It created a palette of 26 land use categories that were based on current land use.
- PSRC worked with stakeholders over several months to combine scenarios into the four scenarios to be modeled. These were essentially conceptual descriptions (e.g., metro focused, suburban growth, urban fringe growth).
- It divided the region into seven categories: (1) metropolitan cities, (2) core suburban cities, (3) larger suburban cities (but smaller than core), (4) small suburban cities, (5) unincorporated urban growth areas; (6) rural areas, and (7) natural resource lands. For further description of these categories, see the July 2007 issue of the PSRC newsletter, Regional VIEW (*11*).
- PSRC then built out existing areas and determined the "shortfalls" (areas expecting extra growth). It allocated the shortfalls according to scenarios (e.g., certain levels of growth were allocated to metropolitan cities). It assigned new land use categories to the 5.5-acre polygons (also known as "painting the cells") and then allocated the shortfalls to the extent that they would be built out in 2040.
- It ran the PTR model, which provided outputs for 17 indicators, including air quality, land use, demography, housing, employment, transportation, impervious surfaces, and other environmental parameters. However, the stakeholders didn't end up using the output for all the indices, because they determined that the data outputs from the model were too simplistic for the information required to comply with the State Environmental Policy Act.

PSRC then created four scenarios on posters (bubble diagrams) and in PowerPoint for public comments. It held workshops and regionwide meetings with elected officials, environmental groups, policy boards, planning directors, and other stakeholders. From comments received, PSRC developed a preferred alternative composed of elements of the four alternative scenarios. PSRC shared the preferred scenario publicly and requested comments.

The last phase was to finalize the preferred scenario according to the comments received and seek approval from the PSRC policy boards, PSRC Executive Board, and the State General Assembly.

Regional TIP Project Selection Process

The project selection process begins with the adoption of the policy framework (*3, 4*). The policy framework document includes policy direction and guidelines and funding levels or allocations for the selection of projects to receive PSRC funds. The project selection process is summarized as follows:

1. Each county in the region submits a number of projects to PSRC for evaluation.
2. PSRC staff score the projects using criteria defined in the policy framework. The scoring team meets regularly to discuss projects.
3. After scoring and ranking are complete, PSRC staff present the projects to the Regional Project Evaluation Committee (RPEC) for consideration. RPEC is composed of representatives (county and municipal leaders) from each county in the region.
4. RPEC makes recommendations of projects to be included in the TIP to the Transportation Policy Board (TPB). TPB is composed of voting (typically elected officials) and nonvoting members.
5. TPB accepts or amends the recommendation.
6. PSRC issues the recommended TIP projects for public comment and then compiles comments and responses and reports back to TPB.
7. TPB changes or adopts the recommendation and submits the recommendation to the PSRC Executive Board.

8. The PSRC Executive Board gives final approval and the projects are programmed in the TIP.

KEY ASPECTS OF THE SCREENING PROCESS

Scope

The State of Washington has a Growth Management Act (GMA), which is overarching legislation that mandates comprehensive growth management planning. VISION 2040 promulgates multicounty planning policies, adopted under the state's GMA. According to the draft of VISION 2040, the policies are designed to help achieve the adopted regional growth strategy and "address region wide issues—including environmental planning, economic development, and transportation planning—within a collaborative and equitable framework. They provide guidance and direction to regional, county, and local governments on such topics as setting priorities for transportation investment, stimulating economic development, planning for open space, making city and town centers more suitable for transit and walking, and improving transportation safety and mobility. Multi-county policies lay the foundation for securing the necessary funding for services and facilities, and provide direction for the more efficient use of public and private investments" (*1, 2*).

Consistency and integration of planning activities and processes are ensured through the development of functional plans. Destination 2030, for example, is the region's long-range transportation plan and is the functional plan for transportation improvements in the region (*12*). It is developed to be consistent with the VISION 2040 development strategy.

Communications

Agency Involvement

Agencies involved generally include county and municipal, or stakeholder, agencies. These agencies are well represented and are involved throughout the decision-making process. The processes are collaborative by nature. The overarching legislation (Growth Management Act) and policies require an open and cooperative approach among agencies. The decision-making bodies are composed of agency and public representatives. Regulatory agencies generally are not directly involved in these early planning processes, but they are given opportunities to provide input at various steps throughout the processes.

No particularly innovative approaches were used to involve agencies. Information was disseminated and collected through newsletters and written and electronic comments. The Internet was used to a small degree to post information and collect comments.

Stakeholder agencies are critical to the success of the process and are involved at and between all the major decision points. Policy boards are important decision-making bodies that are generally composed of elected officials from throughout the region. The Policy Planning Board and the Transportation Policy Board in particular are integral to the planning processes of PSRC. PSRC's Executive Board makes all final decisions on recommendations from policy boards.

Public Involvement

The public was involved throughout the VISION 2040 alternative screening process. PSRC created and managed a variety of activities, workshops, and feedback options (e.g., councils, community-specific and region-wide activities, written feedback, website notices). For each decision point, PSRC had a number of different types of public involvement activities, including

- Large workshops at each major decision point;
- Presentations at other established events;
- Targeted focus groups (e.g., low income, high needs); and
- Open houses in various communities.

A consultant, Parametrix, was used to collect and analyze public comments. Parametrix developed CMART software to organize comments and responses and record them in the EIS (*13*). CMART replaced Excel spreadsheets that had previously been used by PSRC to log comment letters. CMART is described further in the technology section below.

PSRC conducted a regional opinion survey using postage-paid postcards distributed in newsletters and at public involvement activities and summarized the findings in newsletters. Staff created attractive and well-written documentation and multimedia presentations of the process and the results, which likely contributed most significantly to their success.

The public was provided an opportunity to review and comment on the recommendation made by the RPEC during the TIP development process. The comment period lasted 30 days. Comments were compiled, and responses were prepared. This information was provided to the Transportation Policy Board to consider before making their final decision.

Technology

The TIP Policy Framework does require or use specialized technology and is not discussed further in this section.

The key technology component for selecting a preferred growth scenario for the region was the INDEX Paint the Region tool. The tool was used in the planning stage of solutions screening. PSRC used PTR internally to paint future land uses in the region using a palette of raster categories, including population and employment values. Four alternatives for the 2040 land use development were painted. The tool has the capacity to analyze 26 environmental, land use, demographic, and transportation indicators and is intended to allow analysis and comparison of a range of land use and transportation scenarios and provide a better understanding of possible long-term benefits and cumulative impacts of the choices that different growth patterns represent.

Inputs for PTR included creating a layer with the planned land use designation of each 5.5-acre grid cell, drawn from an UrbanSim GIS database (*10*). The Puget Sound region is approximately 6,300 square miles. A palette of 26 land use categories was created using current land use and population/employment/critical areas data.

Outputs for each alternative solution that PSRC chose to be provided by INDEX PTR included environmental measures, such as impervious surface, non-point-source pollution, wastewater, and solid waste, and land use characteristics.

Staff requirements for the adaptation of PTR and use of the tool were

- 1 intern full time for 1.5 years;
- 0.5 GIS person for 1 year;
- 0.5 data analyst for 1 year; and
- 0.5 project manager for 2.5 years.

Cost for the development and use of the tool is difficult to calculate because PSRC staff were used. It is worth noting, however, that a commitment of staff or consulting resources is needed. Approximately $250,000 was required for outside materials (e.g., printing, advertisements). The consultant, Criterion, developer of INDEX PTR, and the staff team worked for 6 to 8 months with PSRC staff inputting UrbanSim data, environmental areas, city boundaries, transit layers, and so forth and adapting and calibrating the tool at an approximate cost of $100,000.

The tool was intended for use in an interactive public involvement situation. Originally, it was envisioned that PTR would be used to calculate the impacts of the scenarios in terms of transportation demand and environmental outcomes (air quality). However, it was discovered that the PTR model was too simplistic—simple extrapolation from population growth (i.e., more people = more water use)—for the level of analysis required to be presented in the EIS. Thus, the decision was made to not use the output of the PTR model for all indices. Instead, land use scenarios were fed into PSRC's in-house transportation and air quality models to evaluate the outcomes. The transportation demand model and the Mobile6 air quality model used output provided by INDEX PTR to assess the effect of the growth scenarios on transportation and air quality. These models are typically used by MPOs around the country.

Early in the community engagement process, PSRC discovered that the process used to allocate growth in communities throughout the region (i.e., PSRC manually assigning it to 5.5-acre tiles) resulted in contentious allocations (e.g., "You can't put that type of development there—that's a park"). PSRC staff commented that the level of specificity of the PTR results became red herrings in meetings. For this reason, PSRC staff decided to not use the GIS maps created in PTR. Instead, they decided to have their

graphics staff create cartoonlike "bubble diagrams" to represent the four scenarios.

Other tools used in the VISION 2040 development process included UrbanSim and CMART (*10, 13*). UrbanSim is an integrated planning and analysis simulation model that can integrate with transportation demand models. PSRC has their land use data in UrbanSim and populated INDEX PTR from UrbanSim's database. UrbanSim is licensed under the GNU General Public License and is available free of cost (*10*). So far, PSRC has only used UrbanSim experimentally and is not currently using UrbanSim for its modeling needs.

CMART (Comment Management and Response Tool), a proprietary web-based tool developed by Parametrix (*13*), has the ability to manage documents/comments and create a response and review chain, maintain response history, query comments/responses, track the status of "in process" responses, develop summary comments/responses for "like" comments, and produce the typical EIS side-by-side output report. As a consultant to PSRC, Parametrix used CMART to catalog and respond to comments on the VISION 2040 EIS.

Metrics and Data

Screening criteria are used in scoring potential TIP projects. The criteria are based on the overlying planning policies adopted for the region. The project scoring team objectively evaluates and scores each project for its relative ability to support designated urban centers and manufacturing/industrial centers and to connect corridors. Specific criteria are used in the comparison, including circulation/continuity, urban environment, mobility/accessibility, benefit to the center, and sustainability. After initial scoring of projects, the scoring team meets to subjectively evaluate the projects (compared with other candidate projects).

The metrics used for selecting the preferred growth scenario are based on the development goals for the regions, which are established through an iterative collaboration process involving the regional stakeholders and the public. The preferred scenario and its alternatives are evaluated in an EIS as mandated by state law.

LESSONS LEARNED

Success Factors

The competitive screening process outlined in the TIP Policy Framework is a success in that it ensures that projects programmed to receive PSRC funds are consistent with regional transportation and land use policies and objectives.

Overall the VISION 2040 project seems to have had a positive outcome. Likely contributing factors to the positive outcome include

- Successful integration of land use and transportation planning;
- High level of trust that the PSRC enjoyed in the community;
- Excellent communication materials (e.g., newsletter, DVD);
- Diverse series of participation opportunities with thorough reporting;
- Integration of land use, transportation, and economic planning within one agency, PSRC;
- Overarching legislation (Growth Management Act) and policies;
- Well-established decision-making entities composed of representatives from throughout the region; and
- General commitment to collaboration and accountability.

Key Innovations

Although this case study may not present effective use of technology, PSRC was innovative in its foresight and attempt at using innovative technologies in its planning process. As noted under the Success Factors section above, there are important lessons and key strategies that PSRC employed that contributed to its success.

The use of a competitive process for scoring and ultimately selecting projects to be funded in the TIP that are consistent with the region's planning policies and objectives is seemingly unique to PSRC. The process also has built-in accountability in that the projects selected for federal funding will be monitored for success through project tracking policies established in the policy framework.

BARRIERS AND SOLUTIONS

- The scenario planning tool, INDEX Paint the Region, was not able to perform as hoped (see the Technology section). Other methods using existing typical models were applied to achieve the evaluation objective.
- It was difficult to get people to focus on the big picture—that is, the far-reaching timeline (year 2040) and broad geographic applicability (four counties). Responses were anecdotal, focused at the local level, or not regional in their allocation of growth. Modification of the public involvement approach could facilitate a better understanding of the big picture.
- An interactive web portal was created for collecting and responding to comments on the EIS, but these efforts were abandoned for the less technical tried-and-true means.
- People considered interim outputs to be final. Education through public involvement efforts helped overcome this barrier.
- There was a significant learning curve associated with the technology used in the process.
- It was difficult to move beyond historical deficiencies. For example, stakeholders could not comprehend how they would accommodate more growth when resources were already pressured by existing growth.
- In many cases, there was an adversarial relationship between PSRC and its constituents. The collaborative process helped mitigate these situations by fostering working relationships and creating an environment of mutual trust.
- PSRC is responsible for land use (growth management), transportation (MPO), and economic development, thus facilitating an integrated approach. Other regions may have separate agencies responsible for these functions, requiring more interagency collaboration.
- A similar process may cost more in other areas because of the lack of sufficient data, staff, and resources (e.g., graphics, printing).

RECOMMENDATIONS

Investment (time and money) in scenario development tools or other software tools should be approached carefully, and decisions should be well informed about their merits and limitations.

Exact replication of the processes used by PSRC would be extremely difficult if not impossible in another state or region without significant changes to the political and statutory environment. States with existing growth management acts are likely to be more successful than those that do not have them.

Elements of the processes, such as linking the project selection process to planning policies and objectives, could be implemented in other locations to integrate transportation and land use planning and decision making.

The key to success in this study was its open process that relied on established relationships, mutual trust, and a high level of collaborative decision making.

REFERENCES

1. *VISION 2040: The Growth Management, Economic, and Transportation Strategy for the Central Puget Sound Region.* Draft. Puget Sound Regional Council, Seattle, Wash., July 2007.

2. *VISION 2040: The Growth Management, Environmental, Economic, and Transportation Strategy for the Central Puget Sound Region.* Puget Sound Regional Council, Seattle, Wash., December 2009. www.psrc.org/assets/366/FullReport.pdf. Accessed May 25, 2010.

3. *Policy Framework for PSRC's Federal Funds.* Puget Sound Regional Council, Seattle, Wash., February 23, 2006.

4. *Policy Framework for PSRC's Federal Funds.* Puget Sound Regional Council, Seattle, Wash., January 22, 2009. http://psrc.org/assets/320/2009PolicyFramework.pdf. Accessed May 25, 2010.

5. *VISION 2020 (1995 Update): Growth Management, Economic and Transportation Strategy for the Central Puget Sound Region.* Puget Sound Regional Council, Seattle, Wash., May 1995.

6. Executive Summary. In *VISION 2020 Update: Draft Environmental Impact Statement*. Puget Sound Regional Council, Seattle, Wash., May 2006. http://psrc.org/growth/vision2040/background. Accessed May 25, 2010.

7. *VISION 2040: Supplemental Draft Environmental Impact Statement*. Puget Sound Regional Council, Seattle, Wash., July 2007. www.psrc.org/assets/1986/draftsupplementaldeis.pdf. Accessed May 25, 2010.

8. *VISION 2040: Final Environmental Impact Statement*. Puget Sound Regional Council, Seattle, Wash., April 2008. http://psrc.org/growth/vision2040/background/vision2040-feis. Accessed May 25, 2010.

9. Puget Sound Regional Council. Membership Directory. www.psrc.org/about/members.htm. Accessed May 24, 2010.

10. UrbanSim. www.urbansim.org. Accessed May 24, 2010.

11. VISION 2040 Draft Released. *Regional VIEW,* Puget Sound Regional Council, Seattle, Wash., July 2007.

12. *Destination 2030 Update: Metropolitan Transportation Plan for the Central Puget Sound Region*. Puget Sound Regional Council, Seattle, Wash., April 5, 2007. www.psrc.org/assets/510/D2030plan5.07.pdf. Accessed May 25, 2010.

13. Parametrix. CMART (Comment Management and Response Tool). www.aboutcmart.com. Accessed May 24, 2010.

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

The National Academy of Sciences is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. On the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Ralph J. Cicerone is president of the National Academy of Sciences.

The National Academy of Engineering was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. Charles M. Vest is president of the National Academy of Engineering.

The Institute of Medicine was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, upon its own initiative, to identify issues of medical care, research, and education. Dr. Harvey V. Fineberg is president of the Institute of Medicine.

The National Research Council was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both Academies and the Institute of Medicine. Dr. Ralph J. Cicerone and Dr. Charles M. Vest are chair and vice chair, respectively, of the National Research Council.

The Transportation Research Board is one of six major divisions of the National Research Council. The mission of the Transportation Research Board is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied activities annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. www.TRB.org

www.national-academies.org