Federal Highway Administration and Federal Transit Administration

National Scenario Planning Peer Exchange

Irvine, California

July 8-10, 2012

Transportation Planning Capacity Building
Planning for a Better Tomorrow

U.S. Department of Transportation
Federal Highway Administration/Federal Transit Administration

National Scenario Planning Peer Exchange

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Peer Exchange Attendees: See Appendix B

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I. Executive Summary

This report summarizes a national scenario planning peer exchange jointly sponsored by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). The exchange was held as part of the Transportation Research Board (TRB) Summer Meeting in Irvine, California, on July 8-10, 2012. FHWA and FTA worked closely with the American Association of State Highway and Transportation Officials (AASHTO), the American Public Transportation Association (APTA), the National Association of Development Organizations (NADO), and the Association of Metropolitan Planning Organizations (AMPO) to plan the peer exchange.

Participants in the event shared examples of scenario planning processes across the United States as well as best practices, challenges, and success factors. Twenty-seven peers and 53 participants attended the event, including representatives from Federal agencies, State departments of transportation, metropolitan planning organizations, councils of government, transit agencies, and private sector organizations. All peers provided a range of backgrounds and perspectives on scenario planning. Appendix A provides the peer exchange agenda. Appendix B lists the exchange attendees and their respective agencies. Appendix C provides speaker contact information. Presentations from the peer exchange, including video recordings, are available on TRB's website.[1]

In convening scenario planning practitioners and other interested stakeholders from around the country, the peer exchange provided a unique opportunity to discuss the state-of-the-practice of scenario planning across the nation. Furthermore, the event allowed peers to showcase their innovative work through presentations, a tools showcase, and an awards ceremony honoring the winners and honorable mention recipients of the 2012 Transportation Planning Excellence Awards (TPEA). The tools showcase, staffed by participants and presenters of the exchange, provided opportunities for additional discussions and tutorials of scenario planning tools used by agency representatives attending the event. TPEA, a biennial awards program jointly sponsored by FHWA and FTA, recognizes outstanding transportation planning practices occurring across the country. Appendix D provides the list of TPEA winners and honorable mentions.

The peer exchange included a variety of approaches to scenario planning, including those that test multiple scenarios against a baseline trend and those that examine the influence of multiple issues or trends on community plans or operations. The presented scenarios also varied in terms of the topics addressed and types of data, indicators, and performance measures that are applied. Some recurring topics for scenarios mentioned during the peer exchange included population growth or decline, climate change, energy or fuel use, and assessing fiscal investments, but potential topics can range beyond those listed here.

Given this wide range of scenario planning approaches, data, and topics, peer exchange participants observed that the term "scenario planning" may have very different meanings to different people. As a result, some participants suggested that it is important to be clear with stakeholders about the goals and objectives for the scenario planning effort as well as roles and responsibilities. Several stakeholders noted the importance of involving diverse stakeholders in scenario planning as early as possible to help ensure that the results of the process are accepted, trusted, and implemented. Finally, several outreach methods for engaging stakeholders were also presented during the peer exchange.

In sponsoring the peer exchange, FHWA and FTA, along with AASHTO, TRB, AMPO, APTA, and NADO, succeeded in building a scenario planning community of practice and providing a strong foundation for future efforts in this area. By involving representatives from a variety of agencies, FHWA and FTA provided opportunities for peers to gain knowledge from others' successes and challenges in the application of scenario planning techniques. Throughout the peer exchange, participants also shared their agencies' practices in developing and implementing scenarios and supporting outreach efforts to gather

[1] The website is available at: www.cvent.com/events/2012-trb-planning-committee-summer-meeting/custom-39-449ea4e5418543c8a43aaea8906fc73a.aspx.

public input and create collective visions. FHWA and FTA intend to use the ideas and concepts discussed during the peer exchange to inform the future planning and development of the scenario planning program and provide opportunities for peers to continue the dialogue started at the event.

II. Introduction

Purpose

This report summarizes proceedings of a national scenario planning peer exchange held as part of the TRB Summer Meeting on July 8-10, 2012, at the Arnold and Mabel Beckman Center of the National Academies of Sciences and Engineering in Irvine, California.

The peer exchange convened 80 participants from State departments of transportation (DOTs), metropolitan planning organizations (MPOs), councils of government (COGs), transit agencies, and private sector organizations. The peer exchange provided opportunities for attendees to discuss scenario planning best practices, challenges, and success factors, as well as to showcase noteworthy examples. It sought to allow agencies newer to scenario planning to learn from peers with experience in this area. Finally, the peer exchange aimed to develop a community of practice for scenario planning practitioners and help guide future directions of the FHWA and FTA scenario planning program.

The event was sponsored by FHWA, FTA, and TRB. In addition to these agencies, staff from AASHTO, AMPO, NADO, and APTA helped plan the peer exchange agenda and identified peers to participate.

Background

Scenario planning provides a framework for analyzing various forces that affect transportation and assessing alternatives to see how well they address an area's future needs. Through the process of building and assessing scenarios, a State, community, region, or local area can better identify its long-term priorities, envision its ideal "future self," and determine a combination of policies, strategies, or actions that could best realize a desired future state. Scenario planning practitioners typically assess scenarios using qualitative or quantitative methods and engage in extensive public involvement to solicit feedback on current trends, scenarios, and analyses. Proactive and engaged public involvement can ensure broader buy in to scenarios and confirm that the vision and goals established through the process align with those established by stakeholders.

While these are common features of scenario planning, they do not always define the approach. There are multiple versions of scenario planning; not all utilize a visioning component, not all rely on public involvement, and not all focus on transportation and land use scenarios. For example, some scenario processes may involve internal staff rather than the public to explore and discuss scenarios. Scenarios may focus on transportation or a wide variety of topics that include fiscal investments, climate change, energy availability, and other issues.

FHWA and FTA view scenario planning as an approach that enhances, not replaces, traditional transportation planning processes. To promote the use of scenario planning, FHWA and FTA established a scenario planning program in 2004. Through this program, FHWA and FTA organize regularly occurring webinars, sponsor customized training workshops, and produce and distribute scenario planning guidance, case studies, and other resources, all available on the scenario planning website.[2] As part of the program, FHWA and FTA also produced a Scenario Planning Guidebook, which provides a suggested, step-by-step framework for the process that agencies can tailor to their own needs (see Figure 1). Recent passage of the Federal surface transportation legislation known as "Moving Ahead for Progress in the 21st Century" (MAP-21)[3] also affects scenario planning efforts. MAP-21 contains specific

[2] The website is available at www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/. The FHWA program contact is Rae Keasler (Rae.Keasler@dot.gov; 202-366-0329). The FTA program contact is Jeff Price (Jeff.Price@dot.gov; 202-366-0843).
[3] To learn more about MAP-21, please visit: www.fhwa.dot.gov/map21/.

language related to scenario planning and supports both the development of scenarios and performance measures to help communities, States, and regions create effective scenarios for the future.[4]

FHWA and FTA's scenario planning program falls under the broader Transportation Planning Capacity Building (TPCB) Program. The TPCB program provides a range of resources to help transportation practitioners develop skills and promote further understanding of transportation policy guidance and regulations. Additional information on the TPCB program is available on its website.[5]

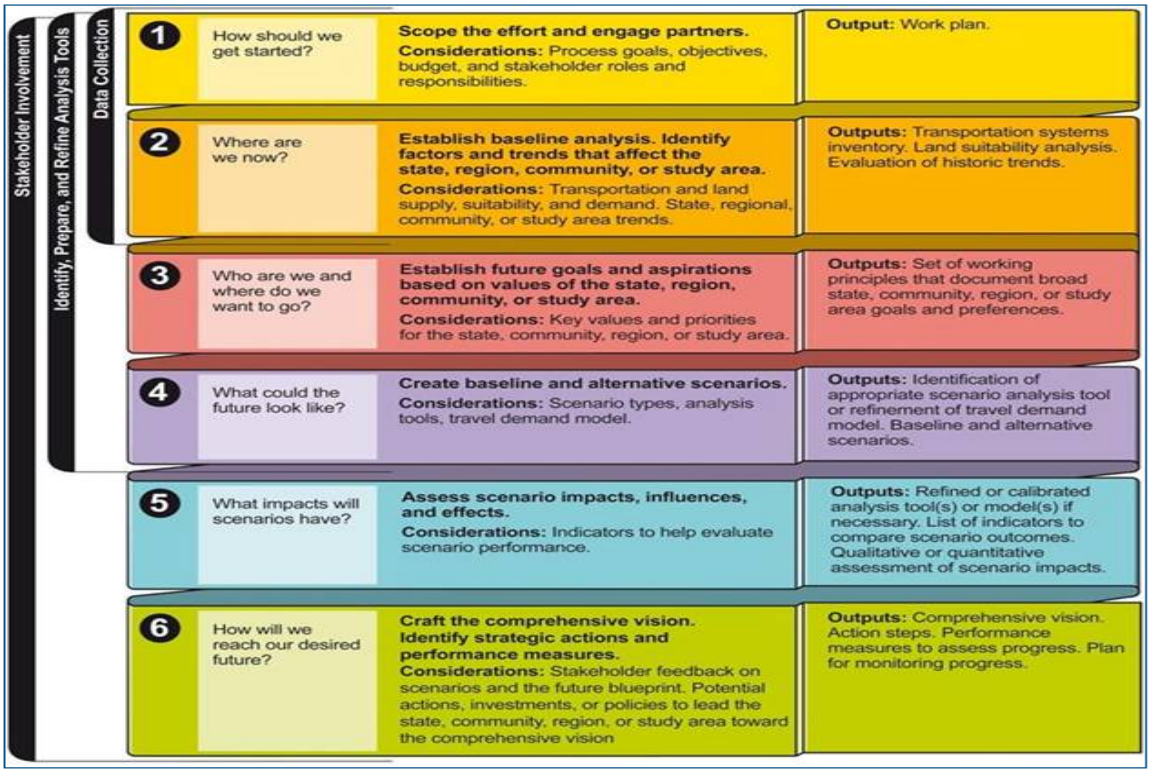

Figure 1. FHWA/FTA Six-Phase Scenario Planning Framework.

FHWA, FTA, TRB, AASHTO, AMPO, NADO, and APTA developed the peer exchange agenda to correspond with the Scenario Planning Guidebook framework. Following this framework, the peer exchange first presented on collaboration and scoping efforts in scenario planning, discussed ways to develop effective scenarios, presented helpful tools for scenario planning activities, provided examples of scenario assessment and evaluations, and offered ways to bring scenario planning forward into implementation. Opportunities for discussion were provided through question and answer periods held during many of the sessions, a panel session, moderated breakout sessions, and informal discussions during breaks. Additionally, a one-day tools showcase was held where participants engaged in dialogue with peers who had experience utilizing scenario planning analysis tools.

The 2012 TPEA awards ceremony was also held as part of the peer exchange. TPEA, a biennial awards program jointly sponsored by FHWA and FTA, recognizes outstanding examples of transportation planning from across the country. An independent panel comprised of ten representatives of transportation agencies, including MPOs and national transportation organizations, selected nine winners and six honorable mentions on the basis of several criteria, including attention to community and public

[4] See Section 20005 Metropolitan Transportation Planning of MAP-21. For the full text of MAP-21, please visit: www.govtrack.us/congress/bills/112/s1813/text.
[5] The TPCB website is available at: www.planning.dot.gov/scenario.asp.

involvement, use of context-sensitive solutions, and demonstrated results. Appendix D provides a complete list of 2012 TPEA winners and honorable mentions.

Presentations from the peer exchange, including video recordings, are available on TRB's website.

Key Observations

The peer exchange highlighted noteworthy examples of scenario planning approaches, tools and data used, outreach methods, and success factors. Additionally, the participants identified areas of scenario planning that could benefit from additional exploration or research, as well as next steps to encourage and sustain a scenario planning community of practice. Key observations related to these and other topics are detailed below.

- ***There are many approaches to scenario planning.*** Most perspectives shared during the peer exchange highlighted two general approaches. However, since scenario planning is flexible and can be highly tailored to the specific needs of a community or study area, there are likely examples of other approaches not captured in the peer exchange. The first general approach shared during the event, which is typically used by MPOs or other regional entities as part of long-range transportation planning or visioning, involves developing scenarios that explore land use and transportation alternatives. These scenarios typically compare a set of alternatives against baseline trends by examining a range of indicators. The result may be to identify a preferred outcome or scenario, create a new hybrid scenario, or use insights gained in this educational process to inform policies or strategies in the long-range plan. In this approach, scenarios are used to engage the public and others in discussions about regional priorities and preferences; these efforts often result in one scenario that provides a framework for strategies that could lead the region toward a "preferred future."

  The second approach involves testing the effects of multiple trends (including, but not limited to, transportation and land use issues) on many outcomes. In this approach, scenarios spark dialogue among stakeholders, but they are also tools to identify robust strategies that address multiple sets of plausible future conditions. This approach leans away from identifying a "preferred future" and instead focuses on strategies that could work well given many possible futures. Examples shared by peers suggested that this approach is still emerging in the public sector and has not yet been fully explored by many planning agencies, particularly MPOs.

- ***The term "scenario planning" has different meanings to different stakeholders.*** The range of examples shared at the peer exchange demonstrated that there are different ways of defining scenario planning. A constant across all examples was that scenarios are frameworks that help explore alternatives and communicate with diverse stakeholders. What varied widely was the focus of scenarios; the process for developing, assessing, and implementing them; and the stakeholders involved in the process. For instance, some scenarios focused on population growth or decline and associated land uses; others explored fiscal investment alternatives or the effects of high fuel prices on travel behavior and development patterns. Additionally, some processes relied heavily on public involvement while others focused on internal agency discussion; some practitioners emphasized quantitative analysis while others emphasized qualitative assessment.

- ***Scenario planning tools support, not replace, analysis.*** Analysis tools should foster outcomes rather than be viewed as outcomes in and of themselves. In other words, practitioners should not over-emphasize analysis tools at the expense of other critical elements of the scenario planning process (e.g., ensuring effective communication of scenarios to stakeholders). Tools can help compare and contrast scenarios and communicate outcomes to stakeholders; ultimately, however, involving stakeholders in scenario analysis will ensure that the outcomes are meaningful.

- ***Well-developed and -defined indicators are critical to successful scenario planning efforts.*** Indicators "track" scenario performance against a variety of topics; some examples mentioned

include indicators focused on safety, accessibility, travel time, land use, quality of life, and affordability. Many peer exchange participants suggested involving stakeholders in identifying indicators. This outreach can ensure that indicators are thoughtfully developed and contribute to effective scenario analysis. Further, indicators can be used with both quantitative and qualitative performance measures to support scenario planning analysis.

- ***Outreach efforts may include both "face-to-face" and web-based resources*.** Peer exchange participants shared examples of a wide variety of outreach efforts as part of their scenario planning efforts. Some agencies conducted meetings, conferences, workshops, or staffed kiosks at local fairs and festivals to share information. Others used printed materials such as newsletters and brochures or used websites and social media. In some cases, outreach allowed agencies to collaborate with stakeholders to develop scenarios and share results of scenario analysis. Outreach is an important component of scenario planning (whether public outreach or outreach to internal staff within an agency). It ensures that stakeholders' perspectives are reflected in the process, encouraging stakeholders' trust in scenario planning and facilitating long-term implementation. Engaging stakeholders as early as possible is particularly helpful.

- ***Successful scenario planning efforts leverage a variety of resources.*** Peer exchange participants noted that their agencies use a wide variety of resources to support scenario planning. For instance, existing plans, documents, or reports can help to inform an understanding of current and future trends. Materials and strategies developed for previous scenario planning efforts, including visioning exercises, could also be leveraged. Partnerships with Federal agencies, community nonprofits, advocacy groups, State data clearinghouses, and others can help provide data needed for scenario planning, share tools, identify funding opportunities, and limit redundancies. For example, one peer noted that his agency (the San Luis Obispo Council of Governments) adopted a scenario planning tool used by a partner agency to ensure that the public would better understand the process and would not be confused by agencies in the same jurisdiction presenting different tools at public meetings.

- ***Effective and enduring scenarios develop from comprehensive scenario planning efforts.*** Successful scenario planning efforts involve thorough scoping, stakeholder involvement, development of sound indicators and performance measures, assessment of tradeoffs and uncertainties, and strong implementation plans. When a scenario planning effort incorporates these activities into its process, resulting scenarios are more likely to be more effective, trusted by stakeholders, result in successful implementation, and be applicable for future efforts.

The peer exchange highlighted many new ideas and approaches for scenario planning. As a result of discussions held during the exchange, FHWA and FTA identified several areas of future exploration and strategies to help to advance the scenario planning state-of-the-practice. These include gathering new examples of scenario planning across the country to highlight best practices and lessons learned experienced by a range of agencies, including State DOTs, MPOs, and transit agencies. FHWA and FTA also plan to update and leverage existing resources to continue assisting agencies in conducting scenario planning activities.

III. Proceedings

This section presents highlights from each of the peer exchange sessions.

A. Scenario Planning Across the Nation and Across Agencies

This session shared Federal, State, and regional perspectives on scenario planning.

1. Jim Cheatham, FHWA, and John Sprowls, FTA

Mr. Cheatham discussed the FHWA-FTA scenario planning program and its resources. The FHWA-FTA scenario planning program began in 2004 and is a valuable resource for those interested in learning more about scenario planning. Since the program's inception, FHWA and FTA have collaborated to sponsor numerous workshops and webinars, which provide participants with an opportunity to learn about scenario planning efforts and share perspectives and experiences.

Mr. Sprowls presented an overview of the TPCB program. This program provides "an umbrella of resources," such as examples and case studies on effective transportation planning practices and training, education, and technical assistance through peer exchanges, workshops, webinars, and conferences. Scenario planning is one of many resources that the TPCB program provides. The TPCB website offers an array of information to users, including a searchable library of reports and technical assistance opportunities.

FHWA and FTA are committed to advancing scenario planning through the scenario planning and TPCB programs. Through these and other efforts, FHWA and FTA will continue to assist planning professionals in addressing the complex needs of communities across the country.

2. Subrat Mahapatra, Maryland State Highway Administration (MDSHA)

The Maryland Scenario Planning Project is a joint Maryland DOT (MDOT), MDSHA, and University of Maryland (UMD) study that is generating land use and transportation scenarios. The study aims to help MDSHA address future risk and uncertainty. The results will help to answer questions such as how MDSHA will be able to move people and goods responsibly in the future.

As part of this project, MDSHA held a series of visioning exercises, known as "Reality Check Plus: Imagine Maryland," to develop a vision for scenarios. MDSHA worked with over 600 stakeholders to identify their visions of Maryland in 2030 and beyond. Using this input, MDSHA developed five scenarios, including a scenario focused on baseline conditions, "build out" development, transit-friendly development, market-driven changes, and one that examined the impact of high energy prices.

To assess scenarios, MDSHA is now using several models, including the Maryland Statewide Transportation Model (MSTM). MSTM is a multi-layer, four-step travel demand model that works at national, statewide, and regional levels to forecast and analyze scenario performance against several key indicators such as vehicle miles traveled (VMT) and congested lane miles. MDSHA plans to use scenario analysis results to identify strategies to carry the project forward. Strategies may include land use and transportation policies like transit-oriented development, performance measures focused on quality of life or transportation system reliability, and tools and applications that facilitate MDSHA's ability to integrate transportation, land use, and economic factors while communicating the analysis results to others.

3. Matt Carpenter, Sacramento Area COG (SACOG)

SACOG serves 2.4 million people in 6 counties and 22 cities. To address the rapid growth that the Sacramento region has experienced in the past 40 years as well as projected future growth, SACOG and its partners initiated three scenario planning-related strategies:

- *The Blueprint Vision process*, initiated in 2002, sought to better understand relationships between transportation and land use in the region. As part of this effort, SACOG conducted a series of regional workshops involving approximately 8,000 citizens between 2003 and 2004. SACOG then "stitched together" preferences expressed at these workshops into regional scenarios (each of which had a 2050 time horizon) and compared these scenarios to a base scenario that assumed no change in prevailing trends. Ultimately, the public and SACOG endorsed a preferred scenario that had a smaller growth footprint and performed well on transportation, land use, and economic performance indicators.

- *The Rural-Urban Connections Strategy (RUCS)* extends the Blueprint Vision process to focus on rural areas within the SACOG region and offers a rural perspective on the region's growth and sustainability objectives. SACOG is using IPLACE3S, a web-based transportation and land use modeling tool, in its efforts. IPLAC3S allows SACOG to assess the amount of land needed to support the demand for locally-grown food in the region.[6] Overall, RUCS produces highly detailed scenarios that identify risks and opportunities for rural areas in the region that border urban areas (see Figure 2). From analysis of these scenarios, SACOG aims to identify strategies, such as zoning changes, which could minimize rural and urban land use conflicts.

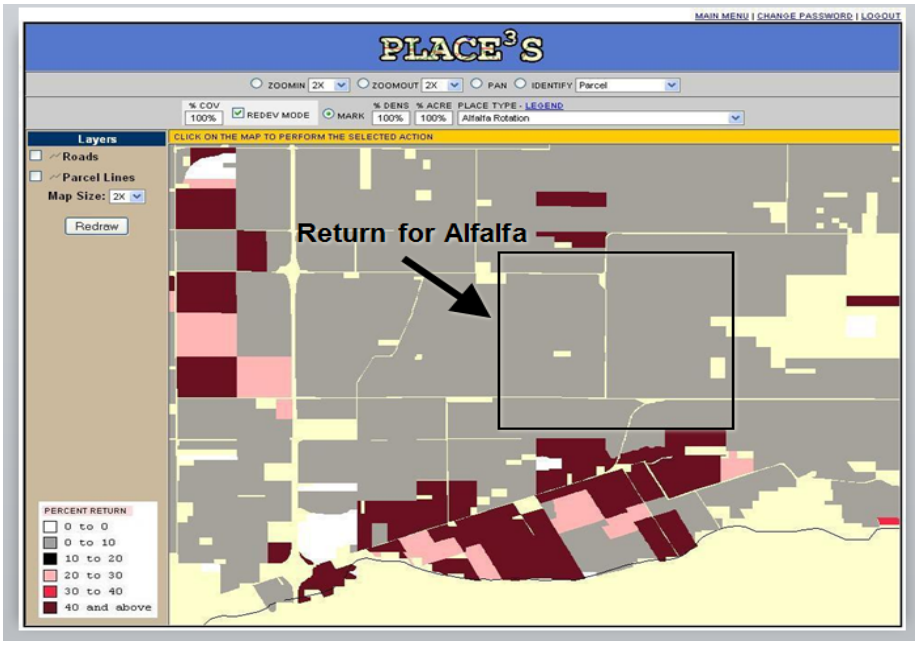

Figure 2. Screenshot of RUCS Scenario Analysis.

- *The Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS)* is SACOG's regional long-range transportation plan.[7] The MTP/SCS uses a scenario planning approach informed by the Blueprint Vision process, RUCS, and the FHWA-FTA Scenario Planning Guidebook. As part of the approach, SACOG developed three scenarios and solicited input from the public at a series of workshops. SACOG then linked core principles of the MTP/SCS[8] to indicators to assess how well a scenario would advance these principles. SACOG used feedback from the workshops to identify a preferred scenario that became the final, adopted MTP.

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[6] As another example, using IPLACE3S and other models, SACOG developed a scenario that examines returns on investment for various crops like alfalfa, rice, and grain given inputs such as crop prices, capital investments, and trucking and water needs.

[7] California's Senate Bill 375 requires a SCS from each MPO in the State. The SCS expands the focus of the MTP to focus more broadly on land use and transportation connections, identify investments that reduce GHG emissions, and minimize impacts to natural resources such as agricultural lands.

[8] These principles were: smart land use, economic vitality, environmental quality, access and mobility, equity and choice, and financial stewardship.

SACOG intends to continue the momentum built by its previous scenario planning efforts. Today, SACOG is working to develop new analysis tools, align scenario planning indicators more closely with Federal and State goals, and identify how Senate Bill (SB) 375 could provide more opportunities for further integration of transportation and land use planning.

B. Approaches to Scenario Planning

This session focused on sharing examples of different approaches to scenario planning, including one approach that is focused on likely or certain trends and another approach that is more exploratory and examines the uncertainty associated with various trends or issues. A combination of multiple approaches can often be helpful in implementing a scenario planning exercise.

1. Marlie Sanderson, Metropolitan Transportation Planning Organization (MTPO) for the Gainesville, Florida, Urbanized Area

The Gainesville MTPO used scenario planning to prepare "Year 2035 Livable Community Reinvestment Plan," its long-range transportation plan adopted in October 2010. Overall, the plan aimed to promote integrated land use and transportation planning to support community well-being.

The Gainesville MTPO initially developed two scenarios, including a peak oil scenario in which the cost of petroleum increased substantially and a baseline "business as usual" scenario. The peak oil scenario sought to examine the effects of a potential peak oil crisis in the future and identify specific land use and mitigation strategies that could be adopted given this occurrence. The agency then created four different transportation network alternatives and compared each of these against the peak oil and business as usual alternatives. The agency used the travel demand model to assess scenarios and evaluate their effects on the region's land use and transportation patterns.

As part of this effort, the Gainesville MTPO also conducted visioning exercises with the public and elected officials. These led to discussions about future regional goals and strategies that could lead the region in achieving its goals. Using the travel demand model to assess scenario outcomes, the MTPO found that the baseline scenario would lead to considerable traffic congestion while there would be a substantial shift from automobiles to transit given a peak oil scenario. As a next step, the MTPO considered strategies (e.g., investing in multimodal projects) that would take the region toward its preferred vision. Ultimately, these strategies were included in the Year 2035 Livable Community Reinvestment Plan.

2. Trey Wadsworth, Massachusetts DOT (MassDOT)

In 2009, the Commonwealth of Massachusetts consolidated its transportation agencies into one single entity, MassDOT. Prior to the reform, using a scenario planning approach was difficult given that there were multiple State-led transportation entities, each with its own systems, data, and objectives. Since the reform, however, scenario planning has served as a helpful tool to coordinate MassDOT efforts related to integrating transportation and land use.

As part of its 2009 "youMove Massachusetts" initiative, MassDOT reached out to the public to help define and shape MassDOT's priorities and identify gaps in the transportation system. In early 2012, MassDOT established "weMove Massachusetts," which builds on the youMove initiative and serves as the agency's comprehensive scenario planning effort. Ultimately, weMove Massachusetts will inform the Commonwealth's multimodal strategic plan, to be finalized in 2013.

Like "youMove Massachusetts," "weMove Massachusetts" focuses on stakeholder participation as a way to gather input on transportation priorities and gaps. To date, "weMove Massachusetts" has interviewed over 100 stakeholders internal to MassDOT and conducted additional outreach to Massachusetts residents to encourage widespread participation, including through an online survey.

As next steps, MassDOT will use stakeholder feedback to identify strategies that could address the State's overall transportation goals, such as preserving existing assets and modernizing the transportation system. MassDOT will then package the strategies into scenarios and conduct a trade-off analysis to select a preferred scenario. For example, a system preservation strategy may be more financially feasible and require state of good repair updates, while a system modernization strategy potentially may require more funding but may lead to reduced congestion and more reliable service. After this, MassDOT will develop a series of investment-focused scenarios to assess high-priority strategies and evaluation criteria for project prioritization. Through "weMove Massachusetts," MassDOT aims to build partnerships, identify implementable strategies, and better match available resources to strategies. This effort is expected to facilitate collaboration across the Commonwealth and produce a better future vision.

3. Brian Gregor, Oregon DOT (ODOT)

Oregon has long been engaged in coordinated transportation and land use planning activities as well as visioning activities. While many of these activities have not been directly defined as scenario planning efforts, they share some common features with scenario planning in that they consider the integration of transportation and land use and identify ways to prepare communities for sustainable futures through growth management, resource protection, and other efforts.

For example, in 1973, Oregon established a statewide program for land use planning that aimed to manage the State's growth, protect natural resources, and address housing needs. In 1992, the State issued a rule that required coordinated land use and transportation planning and recognized the role of MPOs in this process. Several regional efforts have also helped to advance this focus on integrated planning activities.[9] In 1996, ODOT established the Transportation Land Use Model Improvement Program (TLUMIP) to support more informed land use, transportation, and economic decision-making. TLUMIP developed state-of-the-art models that integrated land use and transportation and could be used at urban and regional scales. From 1999 to 2001, ODOT initiated the Willamette Valley Alternative Transportation Futures Project, a large-scale regional scenario planning effort to evaluate alternative futures for the Willamette Valley. As part of this project, ODOT used TLUMIP's new models to explore possible futures.

ODOT is now developing and implementing a statewide transportation strategy (STS) to reduce GHG emissions through the Greenhouse Gas Strategic Transportation Energy Planning Model (GreenSTEP).[10] GreenSTEP produces data at the metropolitan, household, and statewide levels, estimating not only GHG emissions and travel characteristics, but also information on types, numbers, and ages of vehicles owned.

Using GreenSTEP, ODOT has produced data on annual statewide greenhouse gas (GHG) emissions, fuel consumption, and air pollutants. This has allowed ODOT to more effectively analyze the environmental costs of transportation for different Oregon residents. Through the STS, ODOT recognizes the importance of monitoring and preparing for the impacts of technology on how people travel, particularly as more "smart" cars and highways are developed. As a result of its efforts, ODOT has learned that scenario planning is a strategic planning exercise that requires an iterative approach.

4. Uri Avin, National Center for Smart Growth, UMD

Mr. Avin discussed two types of approaches to scenario planning—"end-state" and "contingent planning"—as well as the benefits and challenges presented by each (see Figure 3).

- *End-state scenario planning* is the approach that most MPOs have typically taken in their scenario planning efforts. In end-state planning, agencies generally compare several transportation and land use alternatives against a set of baseline trends to identify outcomes. The

[9] For example, in 1994, Metro, the elected regional government for the Portland metropolitan area, adopted Region 2040, a long-term regional vision and framework that considered what the region could look like in 50 years and gives potential strategies to guide development.
[10] GreenSTEP is available at: http://cms.oregon.gov/ODOT/TD/OSTI/docs/Media/Model.pdf.

goal of end-state planning is usually to identify an optimal future for the region and policies and strategies that could lead the region to reach this future. End-state planning may result in a formal plan that incorporates one scenario or elements of multiple scenarios (e.g., a hybrid "preferred scenario"). Overall, end-state planning is a fairly linear approach.

- *Contingent planning* is a more exploratory, iterative approach to scenario planning. It tests the effects of multiple trends on many outcomes that often go beyond transportation and land use factors to include social, technological, economic, political, and environmental (STEPE) factors. The goal of contingent planning is to identify the most robust and resilient strategies that lead to positive outcomes under a variety of potential conditions. Contingent planning often results in a "living" document as opposed to one formal plan. A "living document" is a document that is not static but evolves over time as more information is known.

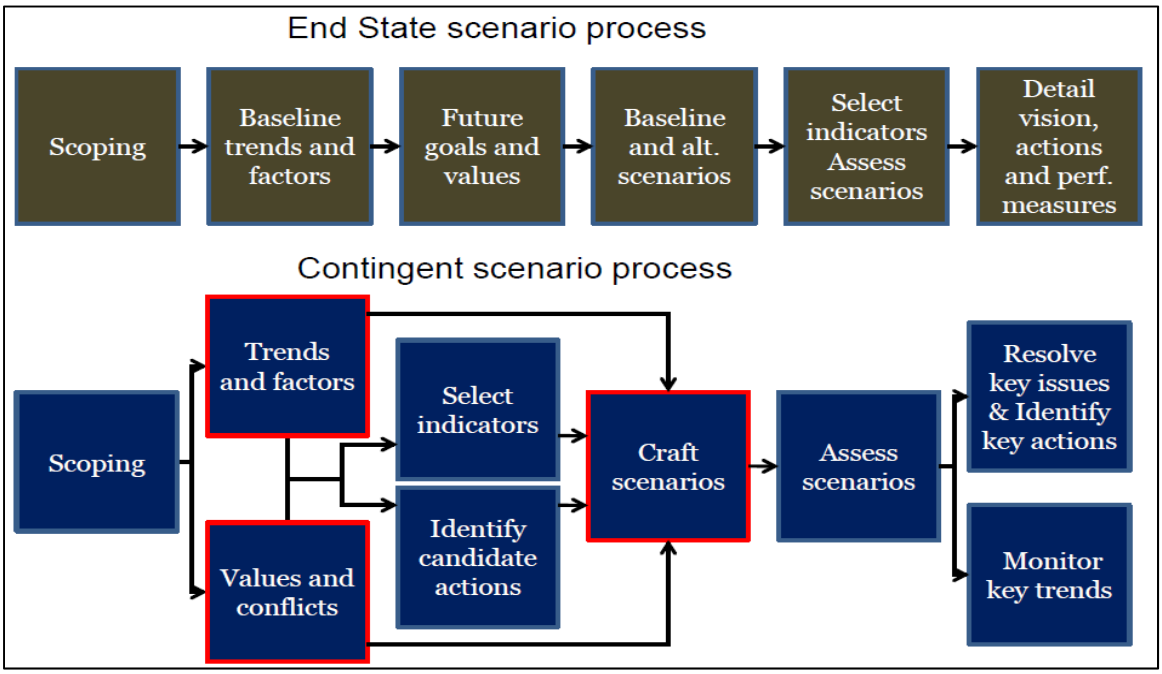

Figure 3. End-State and Contingent Scenario Approaches.

The end-state approach can facilitate cooperation and coordination because stakeholders are engaged in articulating a shared future vision. However, Mr. Avin noted that many end-state scenarios are not different enough to allow for meaningful comparison. End-state planning may also under-emphasize issues such as the market feasibility of strategies and fiscal impacts of scenarios. Furthermore, baseline scenarios developed in end-state scenario planning may not always be valuable, since they may feature arbitrarily selected trends and factors. Finally, end-state scenarios tend to reference a limited subset of transportation and land use trends rather than capture a broader "sweep" of many trends.

Contingent planning can require a large amount of time and a shift away from usual practices. However, this approach can more effectively identify and prioritize trends likely to occur. It can also better identify key actions and strategies that would work well given the occurrence of likely trends. A contingent approach can therefore be helpful to create more robust scenarios and plans.

As an example of a contingent approach, a Maine DOT team performed a cause-and-effect analysis as part of three different socio-economically driven scenarios for a 100-mile corridor study along the State's mid-coast. As part of this process stakeholders brainstormed the range of forces driving change as well as their level of impacts, likelihood of occurring and susceptibility to intervention. This effort, allied with parallel attitude and values surveys and exercises, allowed individuals to form clusters of trends and values, prioritize values, consider trade-offs, and thus further helped refine scenarios. In the next phase of

this project, participants continually tested scenario "storylines" until all data, trends, and values were consistent and clearly defined. Urban form alternatives were further evaluated for their impacts focusing on one of the socio-economic scenarios targeted for the action plan. Gwinnett County, Georgia, is another region that used a contingent approach for scenario planning in their Unified Development Plan of 2009.

C. Collaboration and Scoping in Scenario Planning

This session focused on providing examples of how agencies can successfully scope a scenario planning process and collaborate with partners. The session was structured to allow DOT and MPO representatives from the same State to present on collaborative activities.

1. Marilee Mortenson, California DOT (Caltrans)

Along with several regional agencies in California, Caltrans has engaged in several collaborative efforts that support the integration of transportation and land use planning. For example, the Statewide Regional Blueprint Planning Grants Program, established in 2005, provides "seed" funding to California's MPOs and rural transportation planning agencies to conduct comprehensive scenario planning efforts that encourage consensus and promote more coordinated land use and transportation decision-making. The program is voluntary and focuses on providing incentives for change rather than requiring it.[11] Currently, nearly all (97 percent) of California's population is represented by agencies that have received Regional Blueprint Planning Grants.

Ms. Mortenson offered some lessons learned related to collaboration; these lessons learned resulted from the grant program as well as previous California scenario planning experiences such as the Merced Partnership for Integrated Planning and SACOG's Regional Blueprint Process. For example, agencies should ensure that they communicate the scenario planning process in a way that stakeholders can clearly understand. At the same time, agencies should be aware of "flash points" that incite negative feedback and should take steps to proactively address these. Stakeholders may have misperceptions about scenario planning that should also be addressed through clear communication and outreach.

Agencies should consider using a variety of outreach methods to connect to all members of a community. These methods could include speaking at nonprofit meetings and reaching out to young people through schools or youth programs, geographic information systems (GIS) technologies and geospatial tools that depict scenarios or scenario analysis using maps; maps and visual displays can often convey information more effectively and clearly than a text-heavy document. While fostering collaboration and developing partnerships takes time, cultivating these relationships is critical to encourage trust in scenario planning.

2. Rob Terry, Fresno COG

The Central California San Joaquin Valley, an area served by Fresno COG and seven other regional planning entities, includes eight counties, 62 cities, and a population of four million residents. By 2050, the region is expected to absorb 25 percent of new population growth in California.

To help address challenges associated with this increased growth, Fresno COG and the other seven regional planning entities in the San Joaquin Valley[12] developed the San Joaquin Valley Blueprint Planning Process in 2005. This process involved conducting regional visioning exercises and obtaining extensive public input on three alternative growth scenarios (see Figure 4). Twelve smart growth principles were developed (e.g., "create a range of housing opportunities and choices") that represented

[11] Grant recipients receive technical support in collecting data and developing more effective modeling tools; additionally, program funding has supported Caltrans in sponsoring several university research studies that investigate collaborative planning. Through this program, Caltrans has offered $5 million to MPOs and RTPAs collectively, with awards to MPOs often ranging from $250,000 to $300,000 annually and funds to RTPAs lower given their typically more modest proposals.

[12] These agencies are the Kern COG, the Kings County Association of Governments (AG), the Madera County Transportation Commission, the Merced County AG, the San Joaquin COG, the Stanislaus COG, and the Tulare County AG.

the core values of Valley residents and provided a framework for future transportation and land use decision-making. Ultimately, a single Valley-wide plan, adopted in 2009, was developed from stakeholder input.

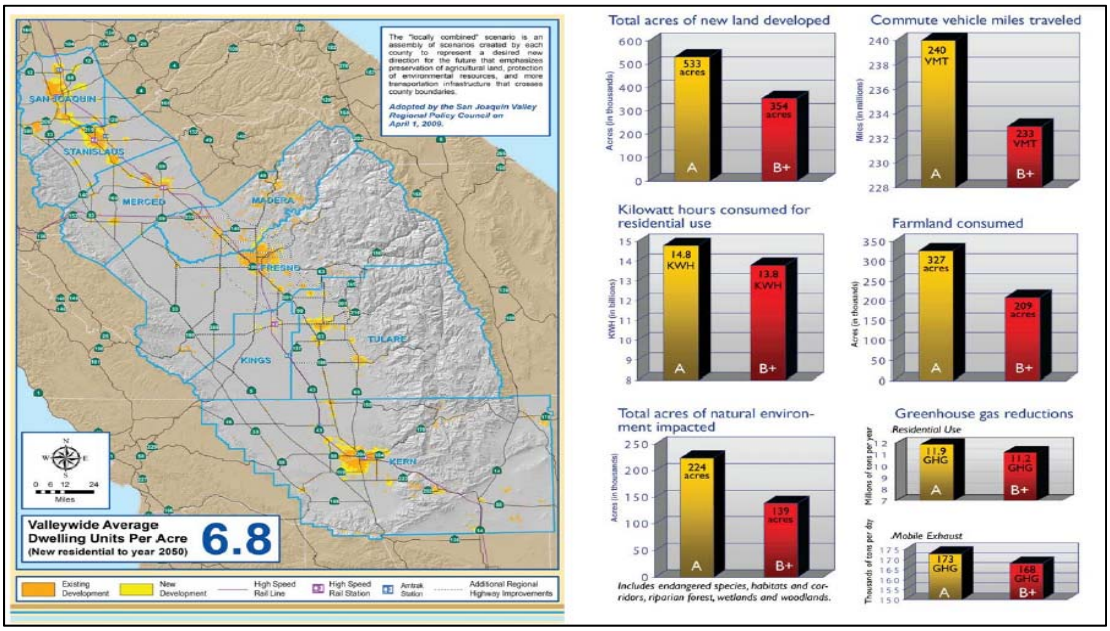

Figure 4. Example of Fresno COG Blueprint Growth Scenario and Performance Analysis.

Throughout the process, Fresno COG emphasized collaboration and outreach; along with its partners, the COG conducted multiple outreach activities to obtain input from over 8,000 participants representing over 300 organizations, including State, regional, and local agencies, nonprofits, educational institutions, and private sector entities. Because stakeholders trusted the process and had been significantly involved in each of the planning stages, there was little opposition to the final, adopted Valley-wide plan.

3. Jeff Sudmeier, Colorado DOT (CDOT)

CDOT uses scenario planning to develop its statewide long-range transportation plan; these scenarios primarily focus on revenue alternatives rather than on transportation and land use. The agency is currently updating its long-range transportation plan and will develop several revenue-oriented scenarios that assume varying levels of resources and funding from traditional and non-traditional sources.

In developing these scenarios, CDOT will collaborate with the Colorado Transportation Commission (CTC), the Colorado Statewide Transportation Advisory Committee (STAC), MPOs, transportation planning regions (TPRs) in the State, and FHWA to determine revenue forecasts and resource allocations over a 20-year time horizon. The scenarios resulting from this process will allow CDOT to better assess how resource availability will impact future transportation investments.

Leading up to the next statewide long-range transportation plan, CDOT recently conducted the EnergySmart Transportation Initiative, which established a framework for considering energy efficiency in transportation.[13] The initiative examined different scenarios and strategies to reduce transportation energy consumption and GHG emissions, as well as tools to assess reductions in GHG emissions, the costs, benefits, and trade-offs associated with a multimodal transportation system, and the relationship between transportation, economic development, and land use. CDOT worked with CTC, STAC, MPOs, TPRs, FHWA, and other Federal, State, and local partners to support and implement this initiative.

[13] The initiative concluded in 2011. To learn more, please refer to the Initiative's final report, published in March 2012.

CDOT is also conducting a pilot project to develop alternative transportation and land use scenarios for small but fast-growing communities in the State. The agency will identify a pilot community and use CommunityViz, a GIS-based analysis tool, to obtain public feedback on the scenarios. The project aims to cultivate partnerships between CDOT and the State's MPOs to support local decision-making and includes many of the partners involved in the EnergySmart Transportation Initiative.

4. Jill Locantore, Denver Regional COG (DRCOG)

DRCOG is the regional planning agency for the eight-county Denver metropolitan area. In 1985, DRCOG established a regional development framework that included a map of future urbanized areas based on the compilation of local comprehensive plans. The framework did not adequately address issues of concern such as air quality, increasing congestion, and rising transportation expenditures.

To resolve discrepancies and develop a more consistent guiding vision for regional growth, DRCOG developed Metro Vision, the region's long-range transportation plan, in the 1990s using a scenario planning approach. The approach involved evaluating four growth scenarios against a range of criteria. As part of outreach efforts, DRCOG established the Metro Vision Implementation Task Force comprised of a diverse group of local business, civic, and environmental leaders. The task force created a vision statement and provided feedback on scenarios. The statement, progressive for its time when adopted in 1992, established principles that supported the creation of vibrant urban centers throughout the region.

DRCOG has since been active in encouraging collaboration through scenario planning and continuing the ideals of the original Metro Vision. In 1997, DRCOG developed Metro Vision 2020, which focused on integrating regional growth, transportation, and land use considerations into a single comprehensive planning framework. Three years later, five counties and 25 municipalities signed the Mile High Compact, an intergovernmental agreement, to signify their commitment to Metro Vision values.

In 2007, DRCOG began a new process to update the Metro Vision plan document to increase public engagement in addressing regional challenges. To do so, DRCOG worked with a consultant to customize MetroQuest, a scenario analysis tool, for the Denver region.[14] DRCOG then developed six scenarios, including a baseline scenario and used a spider diagram to depict scenario performance and communicate results to the public (see Figure 5). DRCOG is now moving forward with a scenario planning exercise to develop Metro Vision 2040, which considers the region's future in the year 2040.

[14] MetroQuest allows workshop participants and online users to create a wide range of scenarios and assess outcomes quickly and easily. The software provides users with the ability to easily make adjustments to scenarios and demonstrate the impacts of decisions in "real time."

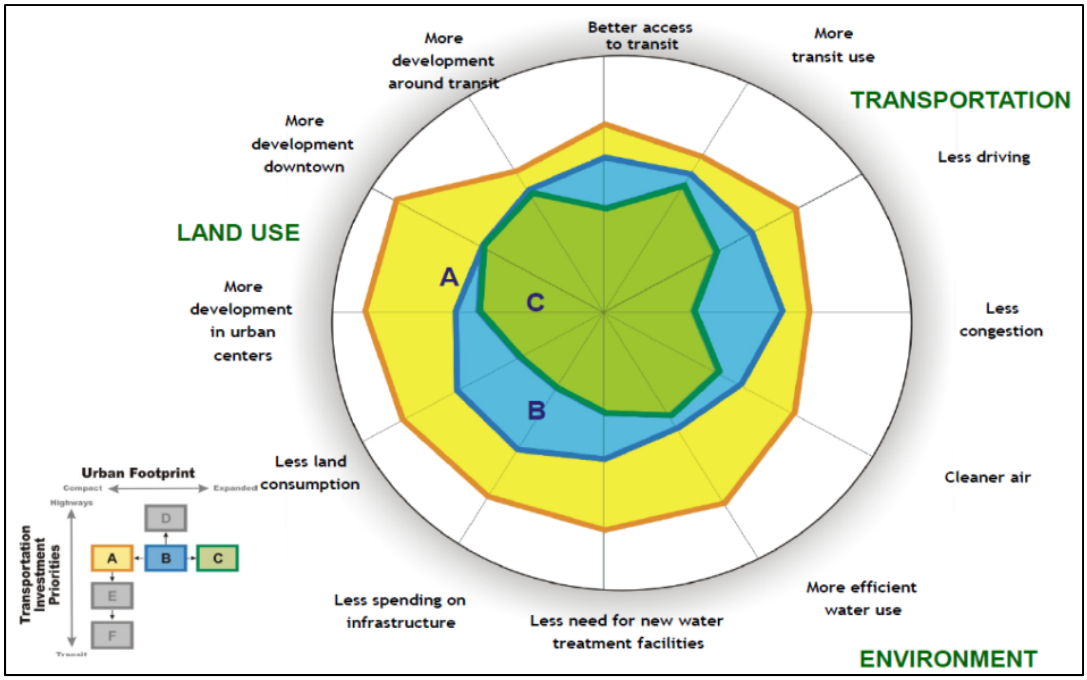

Figure 5. Spider Diagram for Scenario Analysis.

5. Claudia Bilotto, AECOM[15]

Georgia DOT (GDOT)'s Connect Central Georgia Study began in 2011 to assess safety, mobility, and connectivity across the State's central belt through the year 2035. The study area, a corridor that consists of 31 counties, extends through the middle of Georgia. While previous studies focused on economic development, freight connections, and goods movement, the Connect Central Georgia Study aims to identify safe and efficient interregional connections for people and freight.[16]

For this study, GDOT followed a scenario planning approach that reflects the FHWA and FTA Scenario Planning Guidebook. First, a data inventory was conducted. Next, GDOT established goals and objectives, evaluated existing and future conditions, developed and screened scenarios, and identified potential improvements and recommendations. Throughout the process, GDOT collaborated with partners and conducted public outreach to incorporate stakeholder feedback into the scenarios and recommendations. For example, GDOT established a Stakeholder Advisory Group (SAG) that included local elected officials and others. GDOT held bi-monthly meetings with SAG that featured interactive activities. GDOT also conducted stakeholder interviews and surveys, hosted informational kiosks at local festivals, and traveled to MPO board meetings to increase awareness of the study.

During the study, GDOT worked with SAG to develop three scenarios that considered possible futures related to transportation investments, land use, and economic development as well as impacts to Central Georgia's transportation network. GDOT tested scenarios using its statewide travel demand model. To maintain a consistent level of collaboration throughout the scenario planning process, GDOT shared the model's results with SAG to identify areas of need and determine next steps.

As a result of the study, GDOT recognized that collaboration is necessary to encourage sharing different perspectives. In all of the scenarios prepared by GDOT, priority needs identified by stakeholders remained consistent. This helped to achieve buy-in from the many stakeholders involved in this large-scale scenario planning effort.

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[15] Ms. Bilotto is also a member of the TRB Public Involvement Committee.

[16] Previous studies include the Governor's Road Improvement Program (1989), High Priority Corridor 6 Study (2001), US 280 Corridor Study (2003), Fourteenth Amendment Highway Study (2011), and the Investing in Tomorrow's Transportation Today Study (Present).

D. Developing Scenarios when the Future is Uncertain

Scenario planning does not attempt to predict the future; rather, it emphasizes developing a range of possible conditions and trends that could affect a region or area in the future. Scenario Planning can examine both likely and certain trends and those that are either unlikely (e.g., a 100-year flood) or uncertain (e.g., GHG emissions, climate change effects). While many scenario planning efforts (e.g., particularly those led by regional entities like MPOs or COGs) have focused on likely conditions and trends, this session showcased examples of scenario planning that focused on unlikely and uncertain conditions.

1. Mary Archer, Marin Transit

Marin Transit is one of more than 25 transit agencies in California's San Francisco Bay area. The Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG), along with partners that include Marin Transit, are collaborating to develop Plan Bay Area, a comprehensive regional plan that outlines strategies for long-term growth, transportation, and housing. The plan will help meet SB 375's requirements that each of the State's metropolitan areas must demonstrate strategies to reduce the Bay Area's GHG emissions by 15 percent by 2035.

To develop Plan Bay Area and identify GHG reduction strategies, MTC, ABAG, and its partners engaged in a scenario analysis effort. Some scenarios placed growth in dense, focused areas, while others dispersed growth. Scenarios also included a mix of transportation elements such as expanded highways, operational improvements, and transit use. The scenarios highlighted the need for trade-offs. For example, dispersing growth evenly across the region would minimize impacts in the urban core but would also lead to higher-density development in suburban areas. Scenario analysis showed that each scenario would potentially lead to an eight or nine percent reduction in GHG emissions per person by 2035.

To promote the Plan Bay Area effort, MTC, ABAG, and its partners developed an educational video to showcase scenarios. The video also identifies transportation challenges facing Marin County, including heavy commuter traffic from Marin County to San Francisco.

2. Larry Redd, P.E., Consultant

Mr. Redd discussed his work with the Wyoming DOT (WYDOT) on a scenario planning project. The project focuses on identifying sources of transportation risk and minimizing the impacts of highway funding uncertainties that might result from situations like budget overruns, projects not completed on schedule, scope creep, labor and material price increases, and environmental and right-of-way issues.

WYDOT developed two scenarios, each with a 15-year timeframe, to consider alternatives in terms of transportation project mix and funding projections. The "blocky" scenario assumed that funding availability would be inconsistent over the 15-year period; years of increased funding would contrast with years of sharply decreased funding (see Figure 6). The "smooth" scenario assumed that funding would steadily decrease over time with a static funding level over the last few years of the timeframe. WYDOT then analyzed scenarios to determine impacts on overall transportation project mix, scheduling, and costs. For example, WYDOT found that a blocky scenario would result in a two percent reduction in transportation project costs as opposed to four percent given a smooth scenario.

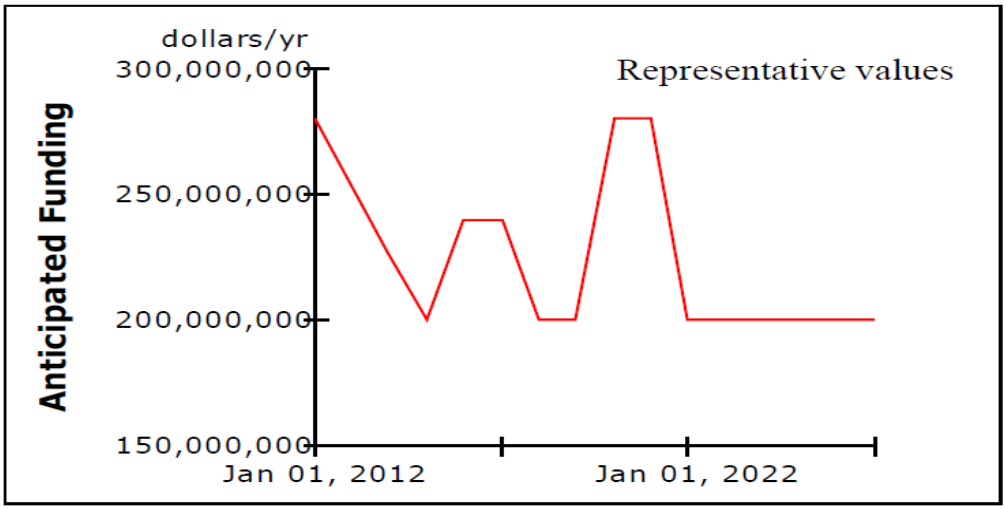

Figure 6. WYDOT "Blocky" Scenario.

The results of this analysis will help WYDOT identify the optimal mix of projects to include as part of its Statewide Transportation Improvement Program (STIP) given future revenue uncertainties. The goal is to program a STIP that is robust under a range of future funding scenarios. A "leaner" STIP that does not include the right number of projects could be detrimental; for example, WYDOT may not be able to take advantage of stimulus funds or certain grants if projects are not well developed. A "thicker" STIP that includes too many projects could lead to higher costs (e.g., if projects become obsolete before they are implemented).

Mr. Redd emphasized caution in using models to support scenario analysis. While complex models and quantitative measures can be helpful to evaluate scenario performance, they are not always necessary; oftentimes, qualitative analysis or diagrams that show cause-and-effect can be productive tools. Mr. Redd also emphasized that scenario planning can help identify effective strategies that minimize risks and uncertainties.

3. Tom Schwetz, Lane Transit District (LTD)

LTD provides transportation services to Eugene, Springfield, and surrounding communities in Oregon. The agency annually purchases one million gallons of fuel to operate its services. In 2008, LTD faced challenges in meeting increased demand for services while addressing rising fuel costs. LTD recognized that it had a limited understanding of how uncertainties such as fuel increases might play out and affect the agency's decision-making process. At the time, LTD had a limited ability to develop effective, nimble solutions that addressed unexpected conditions.

To address these challenges, LTD worked with partners to establish a variety of scenarios that considered the impact of uncertain conditions. To do so, LTD utilized a scenario planning model developed by the Global Business Network, a consulting firm. As a first step, LTD identified a focal question for the scenario analysis: how do changes in service costs, funding levels, public policies, and community support affect LTD's ability to provide effective transportation over the next 20 to 30 years?

Next, LTD evaluated highly uncertain factors that could present the greatest challenges toward delivering transportation services (e.g., rising pension and health costs, rising fuel prices, changing technologies, shortage of critical skills, community support for transit) and identified the predictability of these factors (see Figure 7). Using these factors as a framework, LTD established four scenarios. Ultimately, these will be developed into larger narratives that "tell a story" that is easily understood.

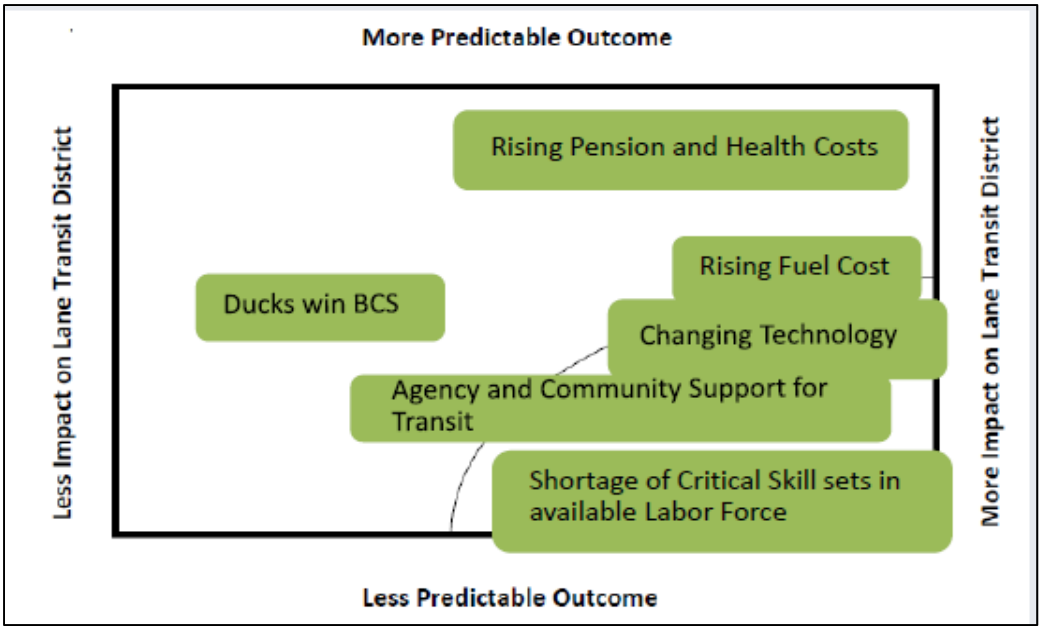

Figure 7. LTD Matrix of Predictable and Unpredictable Factors.

To evaluate scenarios, LTD will consider how the focal issues (e.g., service costs, funding levels) might play out in each scenario and how this would affect LTD's efficiency and decision-making. LTD will also look for vulnerabilities to better anticipate what adaptations it would need to make and identify robust strategies that could work well under a variety of future conditions.

Mr. Schwetz noted that when using scenarios to assess risks and highly uncertain conditions, which is an approach that aligns closely with the concept of contingency planning, it is important to identify and monitor signs that will indicate whether actual conditions are tracking toward one scenario or another. This will help an agency put into action those strategies that respond to certain conditions. Mr. Schwetz also noted that he found The Art of the Long View and Learnings From the Long View, both by Peter Schwartz, to provide very informative background for the scenario process.

E. Scenario Planning Analysis Tools

This session shared examples of scenario planning analysis tools. These range from low tech tools that do not use a large amount of data to complex tools that require large data inputs. Many tools use maps or other visualization strategies to depict scenario results. Analysis tools can be particularly effective in communicating the results of scenario performance to stakeholders, particularly the public.

1. Steve Devencenzi, San Luis Obispo COG (SLOCOG)

SLOCOG, the regional transportation planning agency for California's San Luis Obispo region, used several different scenario planning analysis tools to support various initiatives. For example, the agency used IPLACE3S as part of its Community 2050 effort, a regional visioning exercise that resulted in a plan (adopted in 2008) for the San Luis Obispo region's growth to 2050.

SLOCOG is also using land use and traffic models to develop and assess scenarios for the SCS, a required SB 375 element. The models help to assess how well different growth scenarios address SCS principles that include maximizing housing choices, preserving open spaces, and creating walkable, vibrant communities. To build the models, SLOCOG compiled local comprehensive plans from across the region to categorize 45 distinct development types (e.g., rural residential, large-lot parcels, high-density development) and 25 land uses (e.g., commercial/retail, office).

Applying the models, SLOCOG determined the land uses and development types that would best characterize the Region under several scenarios, including a “business as usual (BAU)” alternative that assumed no change in current trends and a “preferred growth scenario (PGS)” (see Figure 8). In 2010, SLOCOG’s board adopted a PGS that will be integrated into the SCS.

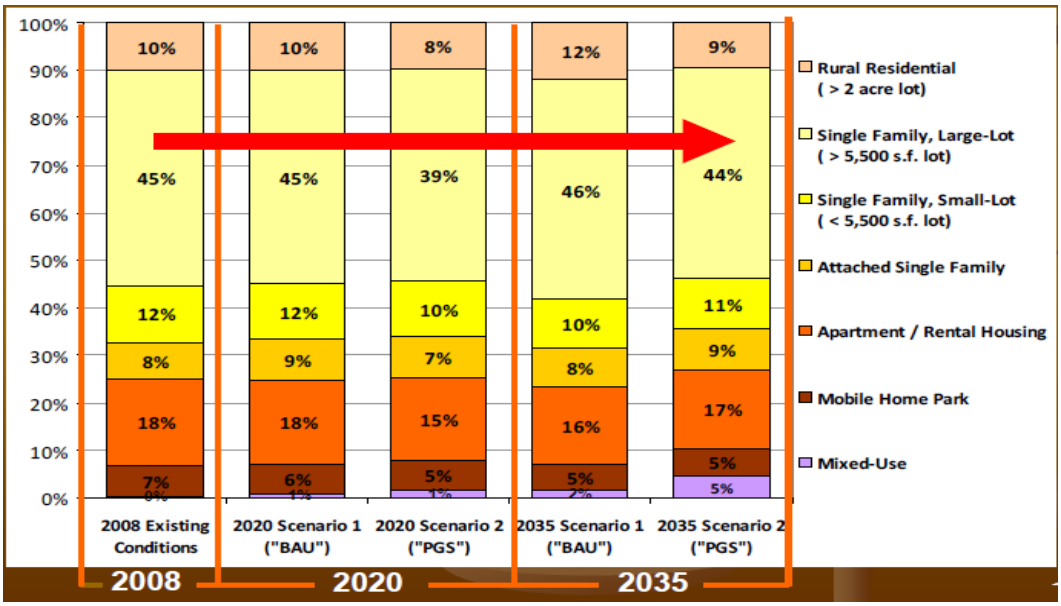

Figure 8. Analysis of SLOCOG Growth Scenarios: New Housing Units.

To promote coordinated planning efforts across the region, particularly with those of San Luis Obispo County, SLOCOG is transitioning from IPLACE3S to CommunityViz. Through CommunityViz, SLOCOG has been able to make its modeling more consistent at a regional level.

Using IPLACE3S, SLOCOG has also developed three revenue scenarios that explore financially constrained, reasonably expected revenues, and supplemental revenues for the San Luis Obispo region as part of its regional long-range transportation plan. These scenarios, accompanied by the corridor visioning activities promoted by CommunityViz, support SLOCOG in its efforts to involve the public in the transportation planning process and to evaluate how varying funding levels and growth projections might impact transportation investments. While SLOCOG noted that there are challenges regarding the use of tools in scenario planning, including limited funding, the agency has been proactive in seeking tools that best fit its needs and those of its stakeholders.

2. Jill Locantore, Denver Regional Council of Governments (DRCOG)

Since 2009, DRCOG has used MetroQuest to support several scenario planning efforts to update its Metro Vision plan. MetroQuest offers interactive keypad polling capabilities that assist DRCOG in identifying the public’s priorities and preferences. Using these preferences as a framework, DRCOG staff can more effectively develop scenarios and implementation strategies. Typically, DRCOG uses MetroQuest in public workshop contexts to allow participants to share feedback on scenarios in real-time.

Ms. Locantore engaged peer exchange participants in a demonstration of the MetroQuest keypad polling technology. Each participant received a keypad polling device, which is a small electronic clicker, with which to record his or her preferences. Participants then responded to a series of questions similar to those that would be posed to participants in DRCOG’s interactive public workshops. For example, participants were asked their feedback on the types of new development that participants would like to see in the region and how the built environment should encourage transit use, walking, and bicycling. Using keypads, participants responded to each question. While individual responses were anonymous, participants could see aggregated responses as they were received in real-time.

Since MetroQuest allows participants to see each other's responses, DRCOG has found that using this tool in public workshop settings is an effective way to build consensus around the core elements that scenarios should include, increase awareness of the scenario planning process, and stimulate conversations about scenario impacts and trade-offs. The tool is adaptable and can be used in a variety of contexts and with a range of group sizes. However, like many other similar sketch planning tools, MetroQuest does not have a fine-grained level of detail nor does it test specific policies or strategies.

Another benefit of the tool is that it can depict the "look and feel" of different scenarios. For example, a streetscape where transportation investments are focused on favoring drivers could look different from one that encourages transit use, walking, and bicycling (see Figure 9).

Figure 9. Screenshot of MetroQuest Keypad Polling Question.[17]

F. Assessing, Developing, and Monitoring Scenarios

This session focused on sharing examples of indicators and performance measures to assess and monitor scenarios. Indicators and performance measures can focus on different topics, including economic development, safety, travel time, and land use, but all help agencies evaluate the degree to which alternatives meet goals and objectives.

1. Ted Knowlton, Wasatch Front Regional Council

Envision Utah, a public-private partnership and non-profit organization established in 1997, engaged in several intensive statewide and regional scenario planning efforts to develop strategies that can help accommodate Utah's growth rate while ensuring a high quality of life for all residents.

Through these efforts, Envision Utah worked with diverse stakeholder groups to identify residents' preferences for Utah and its growth. An important success factor is the development of carefully balanced stakeholder coalitions to avoid perceptions that the scenario planning process is being driven by particular advocacy groups. As a result of its outreach efforts, Envision Utah obtained approximately 18,000 responses from stakeholders about what they would like to see for their communities' futures.

[17] In a workshop context, this screen would reflect the percentage of participants who responded to each option.

Mr. Knowlton emphasized that—for a scenario planning process to be successful—all participants must believe that their values, preferences, and priorities are reflected in analysis and implementation strategies. This can be accomplished by choosing scenario indicators that "speak" to all participants. To ensure that scenario indicators connected with stakeholders, Envision Utah engaged in value-chain exercises during which Utah residents were asked questions that encouraged them to articulate their priorities and values (see Figure 10).

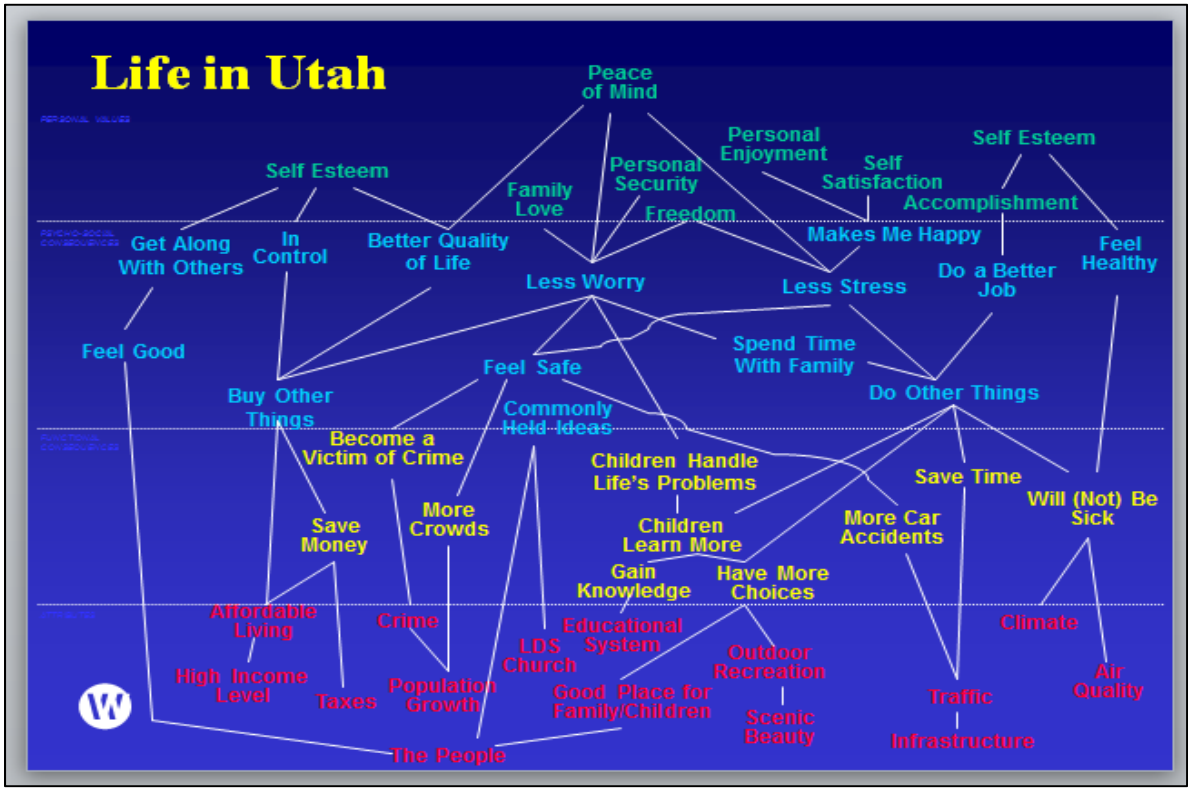

Figure 10. Envision Utah Value Chain Exercise.

As a result of these exercises, Envision Utah staff learned to effectively communicate scenarios and analysis in ways that were highly personalized to particular community values and needs. For instance, rather than focusing on how a compact land use scenario might be conducive to transit, staff focused on how land use scenarios might support a wide variety of housing and transportation choices. Envision Utah thus ensured that the scenarios related closely to people's lives so that stakeholders had a better understanding of what they meant for the community.

Mr. Knowlton also noted that practitioners should ensure that selected indicators are tied to broad goals when assessing scenarios. For example, given a broad goal to create a more accessible region, indicators could assess the number of destinations reachable within a given time or the number of jobs reachable by public transit. A broad goal to reduce GHG emissions could be assessed by indicators that evaluate household transportation and energy costs.

2. Chris O'Neill, Capital District Transportation Committee (CDTC)

CDTC is the MPO for the Albany-Schenectady-Troy metropolitan area in New York, serving about 800,000 residents. From 2005 to 2007, CDTC engaged in scenario planning to update its regional long-range transportation plan. The agency sought to address the potential impacts of higher growth and development rates in a region that has historically seen slow growth rates. As part of its scenario planning, CDTC conducted extensive public outreach to diverse stakeholders.

For example, in the 2007 scenario planning exercise, CDTC obtained stakeholder feedback to develop four scenarios that examined impacts of trend growth rates and higher growth rates on concentrated and dispersed development patterns. To assess scenarios, CDTC developed a broad range of performance measures that considered congestion, safety, reliability, economic costs, GHG emissions, accessibility, and other issues. The agency used these measures to evaluate scenario performance at the regional, corridor, and project planning levels. Ultimately, CDTC found that the dispersed growth scenarios led to a significant increase in travel times, while the concentrated growth scenarios led to more manageable congestion levels, improved transit, reduced automobile dependence, and more compact development.

Mr. O'Neill offered several lessons learned related to development of scenario performance measures:

- It is critical that scenario planning practitioners obtain public input on the tradeoffs inherent in different performance measures. For example, in the past, planning professionals supported projects without consulting stakeholders or considering quality of life impacts. Scenario planning leaders may believe that addressing certain issues are priorities when, in fact, the community may not agree. For example, the public may be willing to tolerate existing congestion if improvements to transit, walking, bicycling, landscaping, and safety were made.

- Measures associated with quantitative analysis are often given undue priority. More qualitative measures are still important but might be harder to define and monitor. For example, some practitioners might give less emphasis to community quality of life because related measures and strategies can often be more qualitatively assessed. Practitioners should understand that all measures and strategies have some amount of subjectivity and require community input to define objectives.

- Sophisticated modeling tools that support scenario analysis should not be viewed as an "end to a means" but instead as a "means to an end." Modeling or analysis tools must be supplemented with public input to ensure successful analysis.

3. Robin Blair, Los Angeles Metropolitan Transportation Authority (Metro)

Metro is the transportation authority for Los Angeles County. The agency maintains and operates a substantial bus fleet of more than 3,400 vehicles, 27 routes for rapid transit service, and 1,250 miles of bicycle facilities. Given the agency's comprehensive transportation services and an anticipated 3 million more residents moving to the county in the next 30 years, Metro uses scenario planning to assess, monitor, and evaluate how it can prepare for anticipated challenges and provide efficient and reliable transit service.

Metro's 2009 long-range transportation plan evaluated what Los Angeles County could look like over the next three decades. In addition to population growth, Metro expects the addition of 1.5 million more jobs by the year 2040 as well as increased numbers of vehicle trips and dispersed development patterns. With these considerations in mind, Metro used a scenario planning process to assess how well transportation projects outlined in the 2009 plan would perform under these conditions.

As a first step, Metro established performance criteria that identified benefits resulting from the 2009 plan and ways to measure the progress of new projects. The agency developed a "no build" scenario that considered the area's future without new transportation investments. To address funding constraints and capacity, Metro evaluated past financial commitments and determined its financial capacity by estimating future available revenue for both operations and capital. Metro then determined potential new projects based on the established performance measures and funding availability; this information was used to inform recommendations and its subsequent regional transportation plan.

Metro then performed multiple comparisons to evaluate the differences between the "no build" scenario and projects outlined in the 2009 plan, specifically if the 2009 projects would improve mobility and air quality and promote environmental justice. Metro's analyses found that the 2009 plan would improve the

area's mobility index by 14 percent and reduce mobile source emissions by 7 percent by 2040. In addition, the 2009 plan would potentially increase the percentage of work-related trips that could be taken by transit within one hour from 47 to 59 percent.

Metro's scenario planning process helped to inform the agency's future agenda. By assessing scenarios and establishing performance criteria to monitor projects moving forward, Metro was able to focus on its broader goal of supporting more efficient transit travel. Metro currently has 12 new transit corridor projects anticipated or underway that support elements of the 2009 plan. Monitoring these projects' performance and progress regularly will allow Metro to stay on track and achieve the 2009 plan goals.

G. Carrying Scenario Planning Forward to Implementation

This session discussed ways to effectively implement scenarios, such as by integrating scenarios with existing agency documents, developing strategies or recommendations to encourage policy changes, and engaging with key partners and stakeholders.

1. Rob Terry, Fresno COG

Mr. Terry provided additional detail on the San Joaquin Valley Blueprint Plan. Implementation of this plan began in 2009 and focused on two major areas: 1) developing collaborative local and regional programs and planning processes; and 2) working with private sector developers to complete on-the-ground projects. Additionally, in 2010, the Fresno COG prepared the Valley Blueprint Roadmap on behalf of all Valley Blueprint partners. The Roadmap is a policy guide that will support implementing the Valley Blueprint vision and principles through various strategies, including the following:

- *Valley Legislative Advocacy Program (VLAP).* The VLAP, run by staff of the eight San Joaquin Valley regional planning agencies, lobbies for the needs of California's Central Valley at the State and national levels. For instance, VLAP offers "Valley Voice" trips in which VLAP representatives and constituents visit legislators' offices and attend meetings to advocate for policies that will support the Blueprint vision. VLAP presents a unified voice to achieve legislative success.

- *Blueprint Planners Toolkit*. This toolkit provides a "one-stop shop" for agencies looking for information on the Blueprint Plan, offering templates, documents, and master plans as guidance for adopting Blueprint principles. This resource allows communities to prioritize strategies and share information and best practices with others, strengthening collaboration and partnerships.

- *Translating Blueprint into city and county strategies.* Fresno COG and its partners established the Blueprint Integration Project, which connects the Blueprint Plan to policies and programs of the San Joaquin Valley's 62 cities and 8 counties, which have primary legal authority for land use. The integration project supports "Smart Valley Places," an initiative that provides technical and funding assistance to the Valley's largest cities to develop plans that adopt Blueprint principles.[18]

In addition, Fresno COG and its agency partners have supported a range of other initiatives, including increasing technical support, data-sharing capacities, and modeling capabilities; conducting regional events to celebrate the Blueprint; hosting an awards ceremony to support successful examples of residential, commercial, mixed-use, historic district, and downtown revitalization projects; and creating a leadership training and public outreach program to support stakeholders' knowledge of Blueprint through workshops, meetings with stakeholders, community organizations, service clubs, and public agencies, summits, informal surveys, online and phone surveys, and media campaigns.

[18] Smart Valley Places supports planning efforts in the following cities: Clovis, Delano, Fresno, Hanford, Lodi, Madera, Manteca, Merced, Modesto, Porterville, Stockton, Tulare, Turlock, and Visalia.

2. Shawn Walding, Minnesota DOT (MnDOT)

MnDOT is developing investment-focused scenarios to identify strategies that allow the agency to respond to changing conditions such as availability of State and Federal funding. These scenarios will inform development of the Minnesota State Highway Investment Plan (SHIP), which looks out over a 20-year time horizon (2013-2032).The SHIP will in turn inform MnDOT's broader "family of plans" by focusing specifically on mode-specific investment scenarios for highway funding. Overall, SHIP is MnDOT's approach to implementing Minnesota GO, the 50-year vision for the State.

To develop the SHIP's fiscally constrained investment scenarios, MnDOT is creating risk assessment sheets to identify potential transportation performance outcomes given variances in priorities, revenues, and investments. These sheets will provide frameworks for scenarios that underscore trade-offs and describe potential risks to transportation system performance. For example, a scenario focusing on transportation assets will emphasize asset preservation and maintenance but may lead to less focus on improving mobility. Risks resulting from this scenario include increased congestion in the Twin Cities area, negative effects on freight mobility, and limited investments in projects that are regional and community priorities.

As a next step, MnDOT will identify and implement strategies that could help the agency meet conditions associated with a range of investment scenarios. MnDOT will present the scenarios to the public through outreach efforts that include meetings, webinars, and websites. MnDOT is also creating an interactive, online budget calculator for stakeholders to understand more clearly what trade-offs will occur given differing investment levels. From stakeholder feedback obtained through outreach, MnDOT will develop a preferred scenario that will provide a framework for the SHIP. Progress toward adopting strategies to meet this preferred scenario will be assessed annually.

MnDOT believes its efforts will demonstrate how scenarios can help to anticipate, prioritize, and address risk. Also, the agency believes this approach will provide for a greater degree of transparency and accountability. As there are several challenges in developing investment scenarios, including isolating risks and defining performance measures for emerging and new investments, MnDOT regularly seeks opportunities to encourage buy-in from stakeholders through information-sharing.

3. Bob Hazlett, Maricopa Association of Governments (MAG)

MAG is the MPO for the Phoenix, Arizona, metropolitan area and serves approximately 4.5 million residents. MAG worked closely with the Arizona DOT (ADOT) to evaluate and rebalance its regional freeway and highway program through assessment of multiple investment-focused scenarios.

The MAG freeway and highway program expected to invest $10.5 billion over 20 years (2006-2026) to maintain regional transportation assets and develop new transportation projects. In 2009, however, MAG and ADOT found that the program would face a $6.6 billion deficit given sales tax revenues that were declining faster than expected as well as significant uncertainty in Federal funding availability. MAG and ADOT developed three scenarios to assess how the agencies could reprioritize investments given changes in revenue availability. These included a "trend-line" alternative that assumed little or no change in current freeway and highway investment priorities, a "maintain budget" scenario that focused on reducing expenditures by reprioritizing investments, and a "blend" scenario that combined elements of both (see Figure 11). The scenarios allowed MAG to analyze its priorities and provided decision- and policy-makers with a better understanding of MAG's needs and goals.

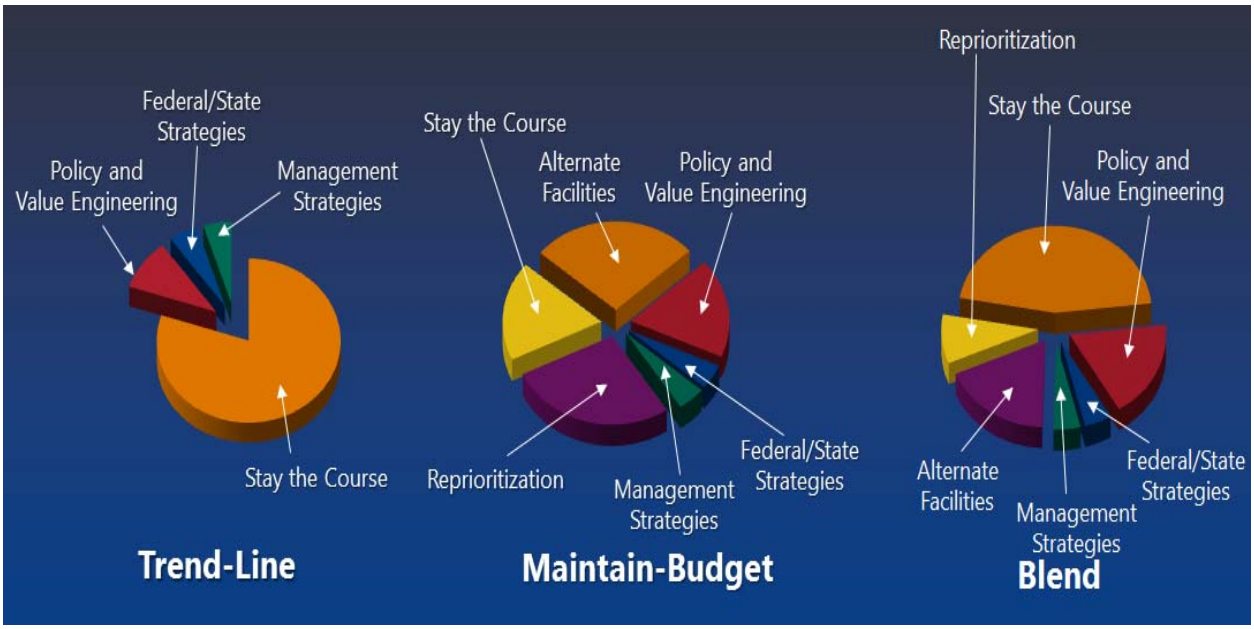

Figure 11. MAG's three scenarios.

MAG continues to use scenarios to inform its regional freeway and highway program. Recently, MAG and ADOT developed four scenarios to evaluate how different investments could affect current projects. For example, one scenario considers the impacts of delaying general purpose lane-widening projects. Another shows trade-offs between extending Loop 303, a 39-mile freeway in Arizona that connects Interstate 10 and Interstate 17, and widening the State's portion of Interstate 10. The agencies then developed benefit-cost ratios for scenarios to further analyze their benefits and trade-offs. MAG and ADOT are also developing performance measures to assess infrastructure performance and encourage projects that carry more traffic with fewer lanes and better performance results.

MAG's use of scenario planning has helped to guide its regional freeway and highway program, saving time and resources. In 2009, for example, MAG originally developed the Loop 303 scenario but did not pursue this option; by 2012, however, when MAG revisited the Loop 303 scenario, it relied on information and data contained in the 2009 scenario. By leveraging this existing information, MAG was able to move forward quickly to discuss implementation plans and cost considerations for the Loop 303 extension. Overall, these efforts demonstrate how scenario implementation strategies can include balancing priorities and considering trade-offs.

IV. Conclusion

During the peer exchange's closing session, Rae Keasler of FHWA offered remarks that referenced the preceding sessions and provided overarching insights. A group of panelists, including Richard Brockmyer of the Utah Transit Authority, Alisa Fine of the USDOT Volpe Center, Dean Lookingbill of the Southwest Washington Regional Transportation Council, and Philip Schaffner of MnDOT, also provided perspectives on the exchange. Following the peer panel, all peer exchange participants had opportunities to discuss the presentations and ask questions.

The closing session discussion underscored the fact that scenario planning is a flexible approach with many different possible interpretations. Across all of these interpretations, however, the process emphasizes developing scenarios that tell "stories" to which stakeholders can easily relate and understand. Further, the process uses scenarios as mechanisms to foster discussion and dialogue. Participants also noted the importance of outreach, transparency, and early stakeholder involvement throughout scenario planning, as well as the development of effective indicators to track scenario performance and sound implementation strategies to carry a process forward to next steps.

Because "scenario planning" may have different interpretations, it is important that all products resulting from the process, including scenarios themselves, performance measures, indicators, and implementation steps, are translated into language and values to which people can relate. Without tangible connections to people's lives, stakeholders may not necessarily consider scenario planning to be meaningful. To encourage strong awareness of scenario planning at a broad level, it can be important to involve stakeholders through different mechanisms that could include visioning exercises, interactive polling activities, workshops, meetings, community events, and collaboration with agency partners.

Scenario planning's end goals can include developing resilient policies and strategies that allow a community, region, or study area to be successful in uncertain circumstances. However, these strategies cannot be implemented without thoroughly developed and tested scenarios. Overall, robust scenarios result from comprehensive scoping activities, consideration of uncertain outcomes and risk, incorporation of stakeholder feedback, and leveraging of agency partnerships and existing efforts.

These insights and others will help inform peers as they continue current scenario planning efforts and begin new ones. Practitioners new to scenario planning can also adapt the lessons learned and success factors discussed during the event to shape their own processes. Moreover, the insights that emerged from the event will help further evolve the scenario planning state-of-the-practice. As a result of the discussions, FHWA and FTA plan to refine their scenario planning program to better meet the needs of scenario planning practitioners at all levels of experience across the country.

Appendix A: Peer Exchange Agenda

Sunday, July 8, 2012

11:00 a.m. - 6:00 p.m., *Beckman Center*
Registration

1:15 p.m. - 3:30 p.m., *Board Room*
Metropolitan Policy, Planning, and Processes Committee (ADA20) Committee Meeting

1:15 p.m. - 3:00 p.m., *Auditorium*
Scenario Planning Across the Nation and Across Agencies
Moderator: Fred Bowers, FHWA
Speakers will provide different perspectives on scenario planning and how it can benefit States, regions, communities, neighborhoods, or others. Speakers will introduce the Federal perspective on scenario planning, including the FHWA and FTA Scenario Planning Program, which delivers resources, technical assistance, and guidance to agencies interested in learning more about scenario planning, and describe how scenario planning can be an integral part of the Federal planning process. Other speakers will describe scenario planning from the State, regional, and other perspectives.

3:00 p.m. - 3:30 p.m., *Auditorium*
National Examples of Excellence in Transportation Planning
The TPEA Program is a biennial awards program recognizing outstanding initiatives across the country to develop, plan, and implement innovative transportation planning practices. Join representatives from FHWA, FTA, APA, and TRB as they announce the nine winners of the 2012 TPEA program.

3:30 p.m. - 4:00 p.m.
Break

4:00 p.m. - 5:30 p.m., *Auditorium*
Approaches to Scenario Planning
Moderator: Jim Thorne, FHWA
This session will explore a range of approaches for conducting scenario planning. These approaches range from efforts exemplified in Envision Utah or the Blueprint processes where a future based upon current trends is contrasted with an alternative future (e.g., Smart Growth) to approaches that focus on addressing uncertainty, contingency planning, or robustness of different investment decisions. Approaches may reflect context (e.g., statewide, regional, corridor, local), issues to be considered, and available tools and resources. Lessons learned in the application of these approaches will also be shared.

6:00 p.m. - 7:30 p.m., *Hyatt Regency Newport Beach Garden*
Reception
Join conference participants at the opening reception at the Hyatt Regency Newport Beach Hotel for light refreshments. Meet the winners of the 2012 TPEA at the poster session to learn more about their award-winning transportation plans and projects.

Monday, July 9, 2012

7:00 a.m. - 8:00 a.m., *Dining Room*
Breakfast

7:30 a.m. - 5:00 p.m.
Registration

8:00 a.m. - 5:15 p.m., *Auditorium*
Tools Showcase (throughout the day during breaks)
The tools showcase will occur throughout the day during breaks. The showcase will present more informal opportunities for participants to engage in dialogue with presenters, specifically as related to use of analysis tools to support scenario development or evaluation. The showcase will include examples of both simpler and more complex tools. It will focus on highlighting examples from the public sector but may include representatives from the private and academic arenas as well.

8:00 a.m. - 9:45 a.m., *Auditorium*
Collaboration and Scoping in Scenario Planning
Moderator: Rich Weaver, APTA
This session will focus on how to "gear up" for a scenario planning effort by identifying the major objectives of the process and the resources needed to support the effort. This includes engaging partners, outlining the nature and extent of the public and stakeholder process, identifying ways to integrate scenario planning into existing programs, and describing the current status and trajectory of the region, such as transportation systems, land use patterns, environmental resources and constraints, and demographics. The session will address considerations in getting organized to conduct scenario planning, how to work collaboratively with other agencies and stakeholders, and strategies for effectively engaging the community in the process.

9:45 a.m. - 10:15 a.m.
Break

10:00 a.m. – 12:00 p.m., *Board Room*
Transportation Programming, Planning, and Systems Evaluation Committee (ADA50) Committee Meeting

10:15 a.m. – 12:00 p.m., *Auditorium*
Developing Effective Scenarios When the Future is Uncertain
Moderator: Thera Black, Thurston Regional Planning Council
This session will hone in on scenario development itself. Central to successful scenario development is the ability to create compelling scenario narratives that not only frame the critical choices and trade-offs to be analyzed but that also point to actions needed to achieve those outcomes given predictive trends. During this session, participants will look at how to reconcile tensions between likely or plausible futures and those that are aspirational or driven by community desire. Participants will consider the importance of identifying and understanding causal relationships that drive trends and events, and how to temper them with future uncertainties. This session will also focus on how planners can develop meaningful scenarios and communicate scenario analysis with diverse public and stakeholder groups. Overall, the session will stimulate thinking about successful scenario development in an era of increasing uncertainty and volatility, the challenges of integrating driving forces and future uncertainties into scenario development, and the implications of not doing so.

12:00 p.m. - 1:15 p.m., *Dining Room*
Lunch

1:15 p.m. - 3:00 p.m., *Auditorium*
Scenario Planning Tools
Moderator: Brian Betlyon, FHWA
There is a broad spectrum of scenario planning tools available to practitioners from simple spreadsheet-based tools to complex simulation modeling tools. The requirements associated with selecting a specific tool (e.g., data, resource availability, functionality, and expertise) play a significant role in how tools are used as part of the scenario planning process. Simpler tools may require fewer data, resources, and expertise to run but also may have less functionality whereas complex tools might require more data, resources, and expertise to run but also might include a larger amount of functionality. This session will include case study examples from practitioners on the development and use of a range of scenario planning tools. Further, it will explore how agencies can choose the right tools based on available data

and resources, how tools can and should be used, and what analysis options are available to agencies with limited resources.

3:30 p.m. - 5:15 p.m., *Auditorium*
Assessing, Evaluating, and Monitoring Scenarios
Moderator: Matt Hardy, AASHTO
This session will focus on a discussion of indicators and performance measures that may be used in scenario planning, as well as how stakeholders can decide on the most meaningful measures and the appropriate data and analysis methods that support these measures. Finally, this session will explore what information should be presented or shared with others to support informed decision-making, performance tracking and reporting, and how agencies should use this information to improve the planning process and public engagement.

Tuesday, July 10, 2012

7:00 a.m. - 8:00 a.m., *Dining Room*
Breakfast

8:00 a.m. - 11:00 a.m., *Board Room*
Public Involvement in Transportation Committee (ADA50) Committee Meeting

8:30 a.m. - 10:00 a.m., *Auditorium*
Carrying Scenario Planning Forward to Implementation
Moderator: Kelli Fairless, Valley Regional Transit
This session will focus on how to effectively implement scenario planning and take some of the key ideas and concepts discussed during the workshop home to your organization. This session will explore some of the key elements learned by others to incorporate into action planning and implementation of scenarios by examining lessons learned from more experienced organizations (State DOTs, MPOs, transit agencies, and others) and regions (small, medium, large) in the United States. The panel of speakers will provide case studies highlighting a variety of approaches to successful action planning and implementation and integration with an organization's planning documents (e.g., long-range transportation plan and the transportation improvement program). Panelists will share what they learned about engaging decision-makers and key public and private partners, working through conflicts, the role of the private sector in implementation, and the importance of Federal, State, and local coordination efforts in funding projects.

10:00 a.m. - 10:30 a.m.
Break

10:30 a.m. – 12:00 p.m., *Auditorium*
Closing Session
Moderator: Rae Keasler, FHWA
This session will drive home the key findings from the peer exchange and identify potential short- and long-term action steps for participants and future users.

Appendix B: Peer Exchange Attendees

Name	Organization/Agency
Alalwan, Ameer	IPA, Saudi Arabia
Alden, Beth	Hillsborough County Metropolitan Planning Organization
Aldrich, Wayne	Town of Normal, Illinois
Archer, Mary	Marin Transit
Avin, Uri	National Center for Smart Growth, University of Maryland
Betlyon, Brian	Federal Highway Administration
Bilotto, Claudia	AECOM
Black, Thera	Thurston Regional Planning Council
Blair, Robin	Los Angeles County Metropolitan Transportation Authority
Blankenhorn, Randy	Chicago Metropolitan Agency for Planning
Bowers, Fred	Federal Highway Administration
Brockmyer, Richard	Utah Transit Authority
Brooks, Stephanie	Michael Baker Corporation
Carpenter, Matt	Sacramento Area Council of Governments
Cheatham, James	Federal Highway Administration
Cochin, Ted	U.S. Environmental Protection Agency
Cohn, Jesse	USDOT Volpe National Transportation Systems Center
Devencenzi, Steve	San Luis Obispo Council of Governments
Drecksel, Debra	U.S. Institute for Environmental Conflict Resolution
Duffy, Catherine	USDOT Volpe National Transportation Systems Center
El Harake, Maureen	California Department of Transportation
Evans, Everrett	California Department of Transportation
Fairless, Kelli	Valley Regional Transit
Fine, Alisa	USDOT Volpe National Transportation Systems Center
Fisher, Kimberly	Transportation Research Board
Geyer, Rebecca	North Dakota Department of Transportation
Gregor, Brian	Oregon Department of Transportation
Hall, Faith	Federal Transit Administration
Hardy, Matthew	American Association of State Highway and Transportation Officials
Hart, Maria	National Center for Freight and Infrastructure
Hazlett, Bob	Maricopa Association of Governments
Henderson, Mell	Mid-America Regional Council
Herre, Chris	California Department of Transportation
Hershkowitz, Paul	CDM Smith
Hopkins, Garth	California Department of Transportation
Ivey, Mary	New York State Department of Transportation
Keasler, Michelle Rae	Federal Highway Administration
Kidner, Martin	Wyoming Department of Transportation
King, William	AirSage
Knowlton, Ted	Wasatch Front Regional Council
Kresich, Dianne	Arizona Department of Transportation
Locantore, Jill	Denver Regional Council of Governments
Loewenherz, Franz	City of Bellevue, Washington
Lookingbill, Dean	Southwest Washington Regional Transportation Council
Lyons, William	USDOT Volpe National Transportation Systems Center
MacInnes, Mary	Pioneer Valley Transit Authority
Mahapatra, Subrat	Maryland State Highway Administration
Mazur, George	Cambridge Systematics, Inc.

McGuckin, Nancy	Travel Behavior Associates
McLaughlin, Patricia	MIG, Inc.
McQueen, Tom	Georgia Department of Transportation
Mortenson, Marilee	California Department of Transportation
O'Neill, Christopher	Capital District Transportation Committee
Palmerlee, Tom	Transportation Research Board
Redd, Larry	Consultant
Ritter, Travis	Bentley Systems
Rosales, Jennifer	Transportation Research Board
Rosenberg, Sondra	Nevada Department of Transportation
Sanderson, Marlie	North Central Florida Regional Planning Council
Sanford, Elizabeth	Cambridge Systematics, Inc.
Schaffner, Philip	Minnesota Department of Transportation
Schmidt, Christopher	California Department of Transportation
Schwartz, Brie	Transportation Research Board
Schwetz, Tom	Lane Transit District
Shigenaga, Kristena	Nevada Department of Transportation
Skipper, Michael	Nashville Area Metropolitan Planning Organization
Snavely, Michael	Cambridge Systematics, Inc.
Sprowls, John	Federal Transit Administration
St. John, Kasey	Indian Nations Council of Governments
Strauss, Rachel	USDOT Volpe National Transportation Systems Center
Sudmeier, Jeffrey	Colorado Department of Transportation
Terry, Rob	Fresno Council of Governments
Thorne, Jim	Federal Highway Administration
Torres, Gena	Hillsborough County Metropolitan Planning Organization
Turnbull, Katherine	Texas Transportation Institute
Wadsworth, Trey	Massachusetts Department of Transportation
Walding, Shawn	Minnesota Department of Transportation
Wall, Thomas	Georgia Institute of Technology
Weaver, Richard	American Public Transportation Association
Zhou, Lan	California Department of Transportation
Zmud, Mia	NuStats

Appendix C: Speaker Contact Information

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Appendix D: List of 2012 TPEA Award Winners and Honorable Mention Recipients

The 2012 TPEA awards ceremony was held during the first day of the national scenario planning peer exchange. The following list notes the winners and honorable mention recipients of the 2012 TPEA.

2012 TPEA Award Winners

2035 Regional Transportation Plan: Linking Health and Mobility
Nashville Area Metropolitan Planning Organization
Nashville, TN

Fast Forward Transit Plan Mobile Outreach Bus
Indian Nations Council of Governments
Tulsa, OK

Georgia Statewide Freight and Logistics Plan
Georgia Department of Transportation
Atlanta, GA

GO TO 2040 Comprehensive Regional Plan
Chicago Metropolitan Agency for Planning
Chicago, IL

Hillsborough Countywide Bicycle Safety Action Plan
Hillsborough County Metropolitan Planning Organization
Tampa, FL

Holyoke Multi-modal Transportation Center Project
Pioneer Valley Transit Authority
Springfield, MA

Lake Champlain Bridge Project
New York State Department of Transportation
Schenectady, NY; and
Vermont Agency of Transportation
Montpelier, VT

Toward Universal Access: Leveraging Technology for ADA Compliance
City of Bellevue, WA

Uptown Circle
Town of Normal, IL

2012 TPEA Honorable Mentions

Aquidneck Island Transportation Study
Aquidneck Island Planning Commission
Newport, RI

Emil "Lucky" Reznik Administration, Maintenance and Operations Facility
South Bend Public Transportation Corporation
South Bend, IN

Haywood County Comprehensive Bicycle Plan
Haywood County Recreation and Parks Department
Waynesville, NC

Highway District Transportation Plan
Kentucky Transportation Cabinet, Division of Planning
Frankfort, KY

Memphis MPO Regional Bicycle and Pedestrian Plan
Memphis Urban Area Metropolitan Planning Organization
Memphis, TN

Minnesota GO: Crafting a Transportation Vision for Generations
Minnesota Department of Transportation
St. Paul, MN