



OREGON Scenario Planning Guidelines

*Resources for Developing and Evaluating
Alternative Land Use and Transportation Scenarios*

Volume 1.1

Oregon Sustainable Transportation Initiative (OSTI)

August 2017



Oregon Department of Land
Conservation and Development

This document was initially published in 2013 resulting from legislative direction to provide scenario planning guidance and support to Oregon's Metropolitan Planning Organizations and local jurisdictions in order to help achieve Oregon's greenhouse gas reduction goals. In 2017 this document was updated to represent changes in legislative rulemaking and to incorporate the best information available to date. This document presents a potential path for application of a scenario planning process to meet Oregon's greenhouse gas reduction legislative targets, and is not the only manner in which to conduct a scenario planning process. Questions regarding this version or the previous version of this document can be directed to the Oregon Department of Transportation.

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A copy of this strategy is on file at the Oregon Department of Transportation and online at: <https://www.oregon.gov/ODOT/Planning/Documents/Oregon-Scenario-Planning-Guidelines.pdf>

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Oregon Scenario Planning Guidelines

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Scenario Planning Guidelines

Resources for Developing and Evaluating Alternative Land Use and Transportation Scenarios

Oregon Sustainable Transportation Initiative (OSTI)

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Introduction:

Scenario Planning Guidelines

Resources for Developing and Evaluating Land Use and Transportation Scenarios

Metropolitan land use and transportation scenario planning is a powerful process for better understanding the long-term impacts of today’s policy and investment decisions.

Scenario planning allows a community to evaluate the likely outcomes of existing plans and to explore possible benefits and costs of alternative futures. With scenario planning, a community can better realize its long term planning and development goals while also achieving important state and federal goals and requirements. If a preferred future scenario is selected, communities can choose to move forward by modifying existing plans or creating a new strategic plan.

The *Guidelines* detail a process to take a metropolitan area from developing the initial framework of a scenario planning process through analysis of alternatives and onto consideration of implementation strategies. Whether scenario planning is voluntary or mandatory for a metropolitan area, this process can help metropolitan areas make progress on a range of community goals, community needs and benefits, including GHG emission reduction.

There is no one-size-fits-all prescription for scenario planning. Metropolitan areas are encouraged to use the handbook as guidance to design a scenario planning process that best addresses local conditions and builds on other concurrent or recent planning efforts.

This handbook is provided as a resource to metropolitan areas. Nothing in the handbook is intended to impose a requirement, beyond any that might exist in statute or rule, to undertake specific actions or to do so in specific ways.

SCENARIO PLANNING HISTORY
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Scenario Planning Emerges from the Military and Business Community

Scenario planning is an activity that allows communities to look to the future and explore possible outcomes of a variety of actions. It was developed after World War II as a technique to deal with futures not easily forecast using trends from the past. Scenario planning had its roots in military planning, including thinking about the “unthinkable” consequences of nuclear war and was adapted by businesses to deal with unknown and unpredictable futures.

What Is Land Use and Transportation Scenario Planning?

Oregon has a long tradition of land use and transportation planning. Most cities and counties already have a comprehensive plan and a **transportation system plan (TSP)**, and each **metropolitan planning organization (MPO)** works to coordinate transportation planning and funding within its region. This system of planning has served Oregon well, designating lands for urban development while protecting farm and forest lands and planning for transportation needs. However, with each individual community having its own UGB and TSP, existing plans do not always represent a coherent vision for the interrelated housing, jobs and transportation needs of an overall metropolitan region.

Land use and transportation scenario planning, as described in the *Guidelines*, does not replace traditional planning activities. However, scenario planning does allow a community to look long-term and envision the future it wants, rather than accept the trend line embodied in most existing plans. Scenario planning encourages policy makers, stakeholders and the public to think outside the box and consider a wider range of opportunities, challenges, and possible futures than typically considered in most traditional planning applications.

Scenario planning is not about predicting the future or providing a specific answer. Rather, it is a methodology for “seeing” alternative futures not easily estimated using past trends or assumptions. The expectation is that through the process of conceiving, developing, and evaluating a series of future scenarios and the outcomes they produce, a preferred and feasible course of action can be identified.

While standard planning processes tend to focus on processes and decisions under the control of the agency conducting the planning, scenario planning purposefully focuses on the combination of internal and external influences, including those statewide and national trends. Today, large-scale land use and transportation planning has evolved to include expanded public processes, involving a wide variety of stakeholders, conducted by a variety of organizations.

Scenario planning can also involve the use of newer tools that actively involve the public in envisioning possible futures, while at the same time developing **evaluation criteria** to help quantify the costs and benefits of different scenarios, e.g., housing costs or transportation costs.

Typically, scenario planning starts by evaluating base year conditions and then creates a **reference case** that estimates what the future would likely look like if current plans are carried out. Scenario planning then involves developing several significantly different **alternative scenarios** for the future to be evaluated and then presented to the public, stakeholders and policy makers for consideration. Armed with locally developed evaluation criteria, a community can then compare the reference and alternative scenarios and select a **preferred scenario** and a **set of implementation strategies**.

Why Do Scenario Planning?

Many regions and metropolitan areas around the country have engaged in scenario planning for a variety of reasons. Some have experienced rapid growth and are seeking to examine the long-range consequences of potential policies. Some are looking to develop economic strategies that might stimulate a depressed economy. Others are considering strategies to encourage more walking and biking trips to enhance the livability of their communities and the health of their residents. **Fundamentally, the scenario planning process is used to address issues that are not always dealt with by existing land use and transportation plans:**

- *What could the metropolitan area look like with different kinds of transportation and land use development?*
- *Are there different and better ways to manage change?*
- *How can land use and transportation strategies be used to increase the prosperity and well-being of communities without jeopardizing the environment?*
- *How can land use and transportation strategies reduce the emissions that contribute to climate change? What could happen if the metropolitan area grows in substantially different ways?*
- *How well will existing plans perform if there are major changes to conditions, or societal shifts on forces such as the economy, funding, demographics, housing, energy costs, etc.?*

There are compelling reasons for communities to undertake a scenario planning process beyond the legislative requirement to reduce GHG emissions from light vehicle travel. Scenario planning can help communities explore how plans and policies put in place today will affect their community in the future. What actions will best support revitalizing downtowns or other older commercial areas in a community? Which policies and investments can most effectively encourage a mix of uses and help increase the number of jobs and commercial services near where people live - thus helping to reduce VMT? How do these choices affect a community's finances by guiding investment choices more thoughtfully?

Local governments may also find scenario planning a useful way to explore the potential of alternative approaches to increase community health, reduce time in traffic, expand opportunities to bike and walk, preserve open spaces, and encourage vibrant local businesses and business districts. If a community can save taxpayer dollars, revitalize a beloved downtown, or boost economic development, while at the same time reduce auto travel and pollution, it becomes a much more attractive strategy.

What Will Scenario Planning Accomplish?

The scenario planning process described here will enable Oregon's metropolitan areas to evaluate their existing plans in light of recent trends and expected future conditions to:

- *Explore options to better address a wide range of community goals and needs*
- *Estimate how far current plans go toward achieving the target reductions in GHG emissions.*

The analysis, coupled with an effective public and stakeholder involvement process, will allow for creation and examination of alternative scenarios. These scenarios allow communities to assess an array of potential strategies for the achievement of local goals and GHG emissions reduction. Through the process, the communities making up the metropolitan area can arrive at an agreed upon collective vision for the future, and identification of land use and transportation strategies that can help the metropolitan area achieve the outcomes described by the vision. Though the vision will be shared, the steps to achieve it may be unique to each of the communities within a metropolitan area.

A regional scenario planning process can address a wide range of planning issues because it allows metropolitan areas to evaluate an array of subjects related to community goals. Metropolitan scenario planning, as described in the *Guidelines*, may include topics usually outside of traditional land use and transportation planning for some local areas. Land

use and transportation scenario planning specifically provides an opportunity to see how the mix of local land use plans, local and metropolitan transportation plans, and other plans would fare when evaluated together in a variety of future scenarios. Often a more integrated, cooperative system is developed as a result.

One of the most common findings of scenario planning is that better integration of land use and transportation plans can result in less congestion and less travel for the same amount of investment.

The various land use attributes (e.g., community design, jobs/housing balance, etc.) contributing to reduced travel distances can be translated into regional policies and implemented in local plans in a variety of ways. Many of the regions that have completed a scenario planning process used their findings to modify existing local and regional land use and transportation plans. Additionally, the scenario planning process can help inform the tailoring of future investments to better support the selected strategies.

An Adaptive, Step-by-Step Scenario Planning Process

The *Guidelines* outline a step-by-step framework for conducting scenario planning. The steps are presented linearly, however, since there is no one-size-fits-all prescription for scenario planning, it might make sense to do steps in a different order, to omit some steps, and/or even to repeat some steps as part of an iterative process.

Metropolitan areas are encouraged to innovate and adapt the recommendations in the handbook to fit local conditions and the latest information.

As new practices, tools and information become available this handbook will be updated to reflect current best practices.

Adapting the Step-by-Step Process for Different Planning Needs

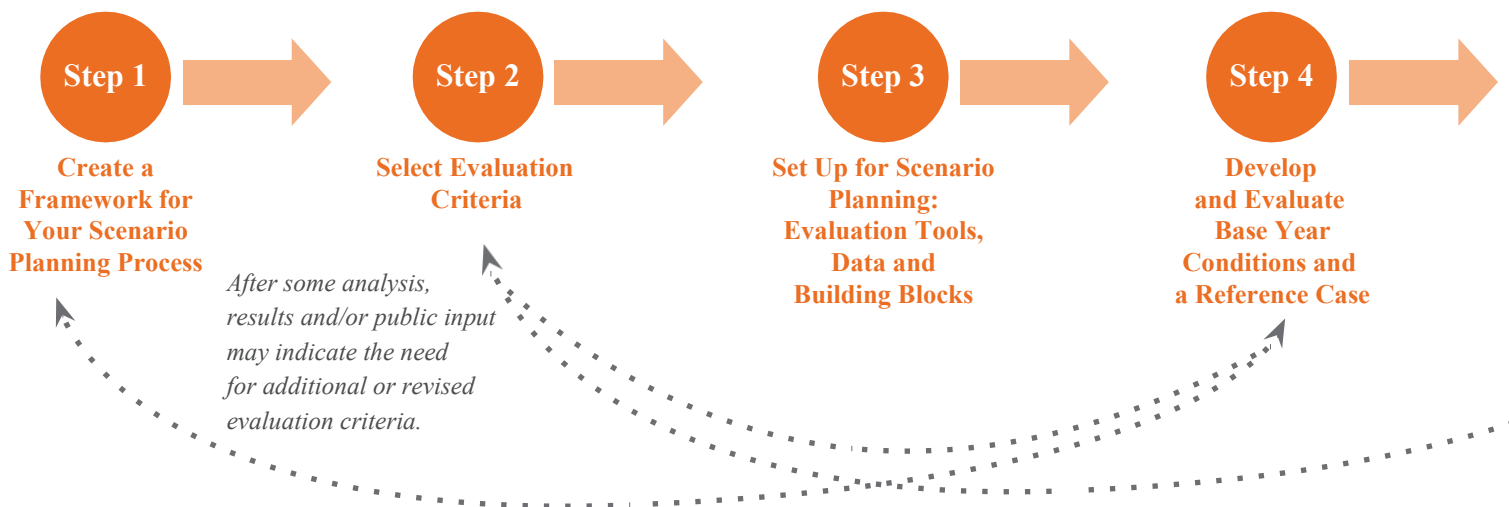
The scenario planning process is not always linear or entirely predictive. Take a flexible approach, and when appropriate, revisit previous actions with new information gained during the process. This graphic highlights the potential for adaptation and interaction between the steps.

Step 1: Create a Framework for Your Scenario Planning Process

Step 1 describes getting started with scenario planning for the metropolitan areas. This includes identifying political and technical leadership for the process, defining the geographical scope of the process, identifying potential funding sources, making use of the Regional Strategic Planning Model to do a baseline assessment of existing conditions and plans, and preparing a public involvement strategy.

Step 2: Select Evaluation Criteria

Step 2 involves translating the key issues identified in Step 1 into a set of guiding principles that will serve as objectives to guide the process. Metropolitan areas will use these guiding principles to prioritize the evaluation criteria for analyzing the scenarios later in the process.



Step 3: Set Up for Scenario Planning: Evaluation Tools, Data and Building Blocks

Step 3 begins by selecting the scenario planning tool(s) to be used, and gathering the data and other information needed to create the scenarios. As part of this step, specific building blocks may be created for use in the development of scenarios with the chosen sketch planning tool.

Step 4: Develop and Evaluate Base Year Conditions and a Reference Case

Step 4 outlines the process for developing and evaluating both the current base conditions of the metropolitan area and a reference case based on current plans and policies.

Step 5: Develop and Evaluate Alternative Scenarios

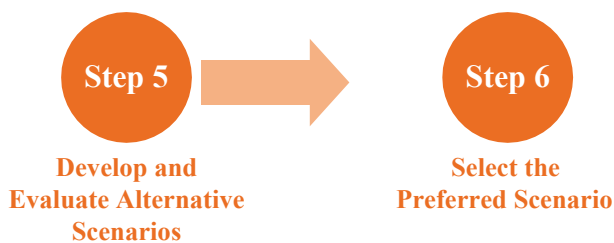
Step 5 engages the public regarding options for the future and creating alternative land use and transportation scenarios. Each scenario is then evaluated and prepared for the selection of a preferred scenario in Step 6.

Step 6: Select a Preferred Scenario

In Step 6, the alternative scenario are presented for public feedback and a preferred scenario is selected or designed. The preferred scenario should include a concept map, a set of major programs, policies or general actions, and spatially distributed housing and employment forecasts.

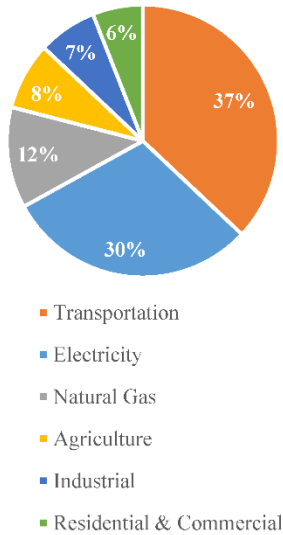
Next Steps

If a preferred scenario was selected in Step 6, this section outlines several implementation approaches that can work with Oregon's planning system.



Reducing GHG Emissions Through Scenario Planning

Figure 1: Oregon's 2015 GHG Emissions by Source



Although useful in its own right, land use and transportation scenario planning is an important part of statewide efforts to reduce energy use, promote a strong economy and reduce GHG emissions to sustainable levels. Scenario planning provides a way to explore the benefits and costs of possible local efforts in combination with state and federal efforts to reduce GHG emissions from light vehicle travel while at the same time advancing other important local and state goals.

Oregon's GHG Emissions Reduction Goals

In 2007, with House Bill (HB) 3543, the Oregon Legislature found that “Global warming poses a serious threat to the economic well-being, public health, natural resources and environment of Oregon...” and that “Actions to reduce [GHG] emissions will reduce Oregon’s reliance on foreign sources of energy, lead to the development of technology, attract new businesses to Oregon and increase energy efficiency throughout the state, resulting in benefits to the economy and to individual businesses and residents.”

The Legislature declared “it is the policy of [the state of Oregon] to reduce [GHG] emissions in Oregon pursuant to the following [GHG] emissions reduction goals:

- *By 2010, arrest the growth of Oregon’s [GHG] emissions and begin to reduce [GHG] emissions.*
- *By 2020, achieve [GHG] levels that are 10 percent below 1990 levels.*
- *By 2050, achieve [GHG] levels that are at least 75 percent below 1990 levels.”*

The Legislature also established the Oregon Global Warming Commission to “recommend ways to coordinate state and local efforts to reduce [GHG] emissions in Oregon consistent with the [GHG] emissions reduction goals.”¹

¹ HB 3543 is codified at ORS 468A.200 to 260

As Figure 1 shows, the transportation sector accounts for more than one-third of all GHG emissions in Oregon. Light vehicles (motorcycles, cars, SUVs, vans, and pickup trucks) account for roughly 60% of the emissions from the transportation sector, or roughly 20% of Oregon’s total emissions.² Metropolitan areas are in a good position to take steps to reduce emissions from light vehicles using the scenario planning process.

Oregon Sustainable Transportation Initiative

Metropolitan land use and transportation scenario planning is part of the Oregon Sustainable Transportation Initiative (OSTI), which aims to reduce Oregon’s GHG emissions from the transportation sector. Established by legislative approval of HB 2001 and Senate Bill 1059 this effort consists of several components:

- *Statewide Transportation Strategy*
- *Metropolitan Scenario Planning*
- *Support for Metropolitan Scenario Planning*

Statewide Transportation Strategy

Senate Bill (SB) 1059 directs the Oregon Transportation Commission to identify a “statewide transportation strategy on [GHG] emissions to aid in achieving [Oregon’s GHG emissions reduction goals].”

The Statewide Transportation Strategy (STS), developed by the Oregon Department of Transportation (ODOT), with the assistance of advisory committees and consultants, envisions significant reductions in GHG emissions, both inside and outside metropolitan areas of the state, from all modes of transportation: light vehicles, heavy vehicles, air, rail and marine. The STS includes strategies to encourage the use of improved vehicle technologies and fuels; improve the state’s transportation system and provide more options; and encouragements for people to drive less or travel in ways that produce fewer emissions.

RELATED GHG EFFORTS

Climate Change Initiative

This Scenario Planning Handbook and accompanying GHG Toolkit are part of a statewide effort to reduce GHG emissions and combat climate change. The Oregon Global Warming Commission was created by the state legislature in 2007 to recommend ways to coordinate state and local efforts to reduce Oregon’s GHG emissions below 1990 emissions levels by 2020, and to recommend efforts to help the state, local governments, businesses and residents prepare for the effects of global warming. The State has also developed an Adaptation Framework to identify key risks and reduce Oregon’s vulnerability to the effects of climate change. The Adaptation Strategy establishes short-term priority actions to address identified climate risks most likely to impact the state. Both initiatives are on-going with much work yet to do.

² Legislative Concepts Report: Responding to House Bill 2186 Section 10, Metropolitan Planning Organization Greenhouse Gas Task Force, 1/11/2010, p. 5

Metropolitan Scenario Planning

In 2009, with HB 2186,³ the Legislature established the Metropolitan Planning Organization Greenhouse Gas Task Force which concluded:

Revising transportation and land use plans in metropolitan areas will be a necessary part of a broader statewide effort to meet state [GHG] reduction goals. Planning our metropolitan areas in ways that build in transportation options can reduce the need for travel and significantly reduce [GHG] emissions from automobiles. The Task Force acknowledged that revising plans will be a challenging, long-term effort, and also concluded that it is also necessary, doable, and should start now. Done soon, and done well, it can help create safer, healthier, and more prosperous communities and expanded transportation choices for Oregonians, and can avoid the need for more dramatic measures later.⁴

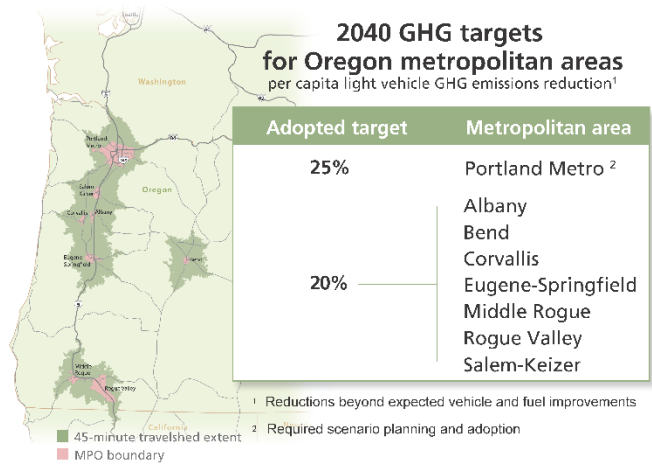
Metropolitan scenario planning is a good way to explore the benefits and costs of possible local efforts in combination with state efforts. Alternative land use and transportation scenarios are developed outlining what a metropolitan area’s land use and transportation systems could look like in the future, and suggesting actions to achieve such visions. The scenarios should assume and build on state and federal programs, including policies and incentives in the STS, such as actions to promote the use of improved vehicle technologies and fuels or local actions to change land use patterns and expand transportation options.

Finally, the scenarios should be detailed enough to enable estimates of the benefits and costs of implementation, including an estimate of the likely reduction in GHG emissions from light vehicle travel inside the metropolitan area.

Metropolitan GHG Reduction Targets

In January 2017, LCDC adopted updated GHG reduction targets for the state’s eight metropolitan areas: Portland, Eugene-Springfield, Salem-Keizer, Rogue Valley, Bend, Corvallis, Albany, and Grants Pass. The targets, codified as OAR 660-044, are designed to guide metropolitan areas as they explore ways to reduce GHG emissions from light vehicle travel by considering changes to land use and transportation plans through scenario planning.

Figure 2: Metropolitan Area Light Vehicle GHG per Capita Reduction Targets for 2040– Based on Percent Reductions from 2005 Levels.



Source: DLCD

³ HB 2186 was signed into law as Oregon Laws 2009, chapter 754

⁴ Legislative Concepts Report: Responding to HB 2186 Section 10, Metropolitan Planning Organization Task Force

Some key points on targets:

- *Targets are based on the estimated reduction in GHG emissions from light vehicle travel needed in each metropolitan area to meet the state goal of a 75 percent reduction in such emissions from 1990 levels by the year 2050. Targets are set as per capita reductions. This recognizes and allows for population growth and avoids setting higher targets for areas expected to grow more rapidly.*
- *Based on the technical information provided in the STS, the targets incorporate assumptions about future vehicle technology and the fleet mix. The baseline assumptions anticipate significant improvements in vehicle efficiency, as well as changes to the fuel mix and vehicle fleet. Therefore, targets are for reductions above and beyond expected reductions from these changes.*
- *Targets should be explored in long-range plans and can be addressed through a combination of actions and programs.*
- *Local governments can anticipate some state and federal actions and programs that may help reduce emissions.*

Support for Metropolitan Scenario Planning

Senate Bill 1059 directs ODOT and DLCDC to provide various kinds of assistance to local governments conducting metropolitan scenario planning, including:

- A Toolkit to assist local governments in developing and executing actions and programs to reduce GHG emissions from light vehicles.
<https://www.oregon.gov/ODOT/Planning/Pages/GHG-Toolkit.aspx>.
- Technical assistance and funding for metropolitan areas to conduct scenario planning activities.

Resources and Examples

Oregon Sustainable Transportation Initiative

Statewide Transportation Strategy (STS): The STS is a long-term vision for reducing Oregon's GHG emissions from the transportation sector through changes to transportation systems and operations, improved vehicle and fuel technologies, and changes in urban land use patterns by 2050. The STS provides a statewide vision for transportation, identifying a range of actions and policies intended to help the state meet its reduction goals.

Transportation and Land Use Greenhouse Gas Reduction Toolkit:

<https://www.oregon.gov/ODOT/Planning/Pages/GHG-Toolkit.aspx>

- **Database of actions and programs:**
A searchable database of programs and actions that could be implemented to reduce GHG emissions from light vehicles.
- **Case studies:** *Examples of the implementation of some of the actions and programs included in the database; describes a community's experience.*
- **Modeling and Analysis Tools Report:**
Summaries of the technical tools currently available to evaluate packages of programs and actions intended to reduce GHG emissions.
- **Communications guide:** *Information about involving the public in a dialogue about the costs and benefits of reducing GHG emissions from light vehicle travel.*

Cool Planning Handbook

This handbook produced by Oregon's Transportation and Growth Management Program provides a complement to the Toolkit for land use oriented strategies to slow climate change.

https://www.oregon.gov/LCD/TGM/docs/cool_planning_handbook.pdf

Regional Strategic Planning Model

The Regional Strategic Planning Model, is able to evaluate a range of different policies and factors affecting GHG emissions from the transportation sector. It is intended for use at the metropolitan level for scenario planning. It can be used independently or in conjunction with a sketch planning tool.

Place Types used in Regional Strategic Planning Model:

Place Types are used to quantify neighborhood characteristics by the role that they play in the region, proximity to destinations, and availability of various travel options. Through comparing the existing built environment characteristics with the expected future environment, decision makers are able to better understand how changes to infrastructure and land use might influence travel behavior. Place Types can be beneficial in local processes to forecast future land use inputs for travel models which in turn estimate the impact of future changes to transportation and land use policies.

https://www.oregon.gov/ODOT/Planning/PTVSV/PlaceType_Flyer.pdf

Scenario Planning Outside Oregon

Many other places outside of Oregon have initiated scenario planning to explore issues not addressed through conventional planning.

Envision Utah (population 1.1 million)

The Salt Lake City region undertook a regional scenario planning effort called Envision Utah. Through the process, they learned that the future they were headed towards – their reference scenario – would not achieve their goals. In particular, a growing population was straining their existing infrastructure. Envision Utah found that modifying development patterns and expanding transit could reduce the need for billions of dollars of roadway improvements. With strong public support for the preferred alternative, Utahans opted to tax themselves to have the resources to make the future they wanted a reality. Now, with help from the federal government, the construction of the Sugar House Streetcar line should be complete by late 2013. And local funding is making possible the expansion of the bus rapid transit system into a new line that would connect to TRAX light rail and FrontRunner Commuter rail. Envision Utah selected a preferred scenario from a range of alternative scenarios, they amended their RTP to enable them to build the transportation projects called for by the preferred scenario.

Envision Missoula (population 67,290)

Envision Missoula in Montana was conducted as part of the 2008 Long Range Transportation Plan update. It provided the community with an opportunity to consider how their planned transportation investments and land use policies would shape the community over time with the development of a “business

as usual” scenario. Through public input, two additional scenarios were developed. A preferred scenario was not selected, but the exercise proved fruitful, influencing planning conversations on Urban Fringe Development Areas, the Missoula Urban Transportation District Transit Development Plan, and other efforts.

Albany, New York (population 870,716)

A desire to investigate alternative transportation solutions resulted in the New Visions Plan in Albany, NY which looked at four alternative scenarios. Big ticket initiatives were identified as transportation and transit projects – encompassing the travelshed area – that could catalyze a more concentrated regional development pattern. New Visions recommended expanding the existing bus rapid transit system to cover a total of 100 miles and locate new development near transit stations.

Sacramento, California (population 1.5 million)

Concern that recent trends, if continued, would lead to dispersed future growth patterns with negative impacts on housing, transportation, air quality, and the ability to accommodate expected growth, one California region developed the Sacramento Regional Blueprint project. The preferred Regional Blueprint scenario informed the Metropolitan Transportation Plan for 2035 and was the basis for deciding which transportation investments would be made. The State of California learned strategies to curb traffic congestion from the Regional Blueprint, and developed statewide policies on growth, transportation and climate change.

Traverse City, Michigan (population 143,372)

A controversy over a highway project near downtown Traverse City led to an examination of land use and transportation alternatives. Some funds from the highway project were reallocated to a planning process called The Grand Vision. With additional funds from other organizations, six counties were able to collaborate in a visioning process in which 12,000 citizens voted on scenarios for the future of their communities, with 75% asking that growth occur in existing developed areas. Following the Grand Vision, the region was awarded a grant from the Housing and Urban Development (HUD) agency to provide additional planning assistance to cities and counties.



Step 1: Creating a Framework for Your Scenario Planning Process

Summary

To lay a solid foundation for the scenario planning process, good preparation is the key. Step 1 outlines how to organize and facilitate a scenario planning process. This includes establishing who will be involved, defining the geographical scope of the process, determining political and technical leadership, identifying potential funding sources, and preparing a public involvement strategy.

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Preview

This chapter describes **how to set up a scenario planning process** and get started. It describes some of the ways organizations including MPOs, local governments, agencies and non-profits might choose to set up their scenario planning process, and the importance of partnerships and cooperation. This section also discusses **key public and private funding sources** that could be used to support the scenario planning effort. Finally, because a successful scenario planning process includes public input and comment, it describes the recommended elements of a **public involvement process**.

There are several parts of Step 1 intended to assist agencies and communities in deciding whether to employ scenario planning and how to do it:

- *What are the benefits -why do scenario planning?*
- *What is to be achieved - what will scenario planning accomplish?*
- *How to get started - how to do scenario planning.*

Designing the Scenario Planning Process: How to Do Scenario Planning

A successful scenario planning process will rely on a sound organizing structure, local and community leadership and public support. Some of the major issues to address are:

- *Who needs to be involved?*
- *What is the planning area?*
- *What organizational structure should be employed?*
- *Who will be responsible for the technical work and analysis?*
- *How will funding be secured?*
- *Who will be responsible for the financial and logistic aspects?*
- *How will the process ensure broad participation?*

SCENARIO PLANNING IN ACTION
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Finding Common Ground

Cultivation of a shared desire to engage in collaborative planning to address challenges and opportunities faced by the metropolitan area can be an effective precursor to initiation of a scenario planning process. Other communities have used events, conferences and other techniques to help identify community desires or needs and likely participants in the upcoming scenario planning process. These techniques can also help to build greater awareness of the potential benefits of regional scenario planning. Some examples include:

- A speaker series, such as TGM sponsored events, focusing on local policy issues.
- Sponsored speakers at civic organizations such as the City Club or Rotary.
- Public surveys or focus groups to review public attitudes and concerns related to community growth and climate change.
- A conference of community leaders to discuss climate change and community.
- City council or planning commission work sessions focusing on long-range planning issues and goals.

Establishing the planning process structure includes developing the procedural arrangements for how scenario planning will be conducted and memorializes the arrangement in a scope of work, an intergovernmental agreement (IGA) or a contract. This also entails identifying the people and organizations in a region who can either make or influence land use and transportation decisions. Equally as important as including the decision makers is including stakeholders who represent a variety of interests important to your community, such as business leaders and environmental justice and equity proponents.

Develop Local Support

A successful scenario planning process needs local leadership to carry out the process. Having respected local leaders involved, expressing their support and enthusiasm, gives the process credibility and will help garner support and maintain momentum during the process. This is described in more detail below in the sections titled Determine Technical and Logistical Leadership and Determine Civic Leadership.

The specific focus of the legislation that initiated the development of the *Guidelines* (HB 2001 and SB 1059) is the planning needed to reduce light vehicle GHG emissions that contribute to climate change. However, local agencies undertaking this activity voluntarily are often more interested in other issues that address broader benefits for their communities. Scenario planning can address these other issues, and also address topics usually outside of traditional land use and transportation planning. Examples include: household transportation costs, health impacts, levels of congestion, and energy use, which are direct outputs of the scenario planning tool. The planning area for a scenario process can cover a larger geographic area – beyond city or metropolitan boundaries in order to address regional issues or to coordinate planning among a number of different jurisdictions.

Building local support for scenario planning requires an understanding of local issues that are of the greatest concern; a process designed to address those concerns openly will earn local support. Scenario planning is an opportunity for local jurisdictions to build on past and current planning efforts to build momentum towards defining and achieving a long term vision for the community’s future. It should include a clearly defined

process, with clearly identified goals. The process should be both exciting and dynamic, rather than a dry academic exercise. Even if there is no commitment to action, engaging in a scenario planning process will provide useful information for communities' long range planning needs.

Identify Key Planning Issues

It is recommended at this stage to conduct a series of in-depth interviews with stakeholders and review existing plans to help get a comprehensive picture of the region's key issues. In-depth interviews are best conducted by a person independent of the MPO or local jurisdictions, and are most effective if they can be conducted confidentially or anonymously. This will allow for open communication by opinion leaders and potential stakeholders in a metropolitan area. The results of these interviews can help guide:

- *The composition of an advisory committee.*
- *The topics that need to be addressed in addition to GHG emissions.*
- *The networks available to engage the public in the process.*

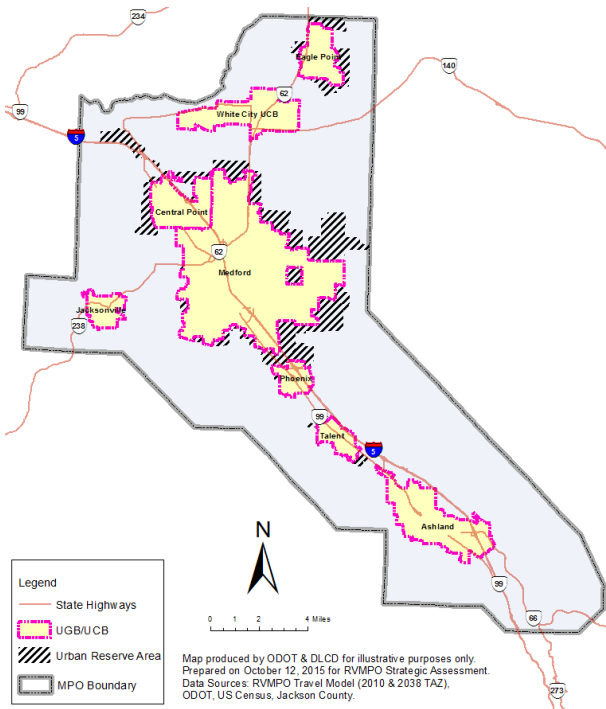
A review of existing plans can uncover guiding principles, goals, objectives and issues identified in past planning efforts. These values and goals found in past planning efforts will help inform the development of guiding principles in Step 2. Additionally, as part of Step 4 an analysis of existing plans using both the Regional Strategic Planning Model and a sketch planning tool will be conducted. This may also reveal local and regional planning issues that could be also analyzed as part of a scenario planning process.

SCENARIO PLANNING IN ACTION

Refer to the **Transportation and Land Use GHG Reduction Toolkit** for additional case studies of scenario planning and descriptions of implementation of selected actions and programs.

<https://www.oregon.gov/ODOT/Planning/Pages/GHG-Toolkit.aspx>

Figure 3: Rogue Valley Metropolitan Planning Area



Define the Planning Area

Determining the geography of the planning area is a necessary starting point in the scenario process. It defines both the likely participants in the process and sets parameters for data collection and analysis. The MPO planning area boundary is likely the appropriate scale to use in scenario planning since a common consideration of scenario planning is the location of present and future jobs and households in the MPO planning area. The minimum planning area should be based on 2010 metropolitan planning area boundaries, which were used to establish the GHG reduction targets.

Selecting the area of involvement is more complicated. The jurisdictions within the MPO boundary should be involved and in a leadership role. However, it may also be beneficial to invite interested leaders and community members of adjacent jurisdictions to participate and/or be regularly briefed on the process. This is solely an invitation to be part of the modeling exercise, data gathering and conversation - it is not a requirement to edit plans or participate in implementing strategies.

This figure shows the Rogue Valley MPO planning area boundary which is the geography used in the Regional Strategic Planning Model.

Determine an Organizational Structure for the Scenario Planning Process

A successful scenario planning process relies on building and maintaining a partnership from the outset. The various agencies, interest groups, the general public, and even any consultants who might be involved, will need to come together at the beginning of the process to identify and collaborate for a common purpose. There will no doubt be times where compromise is required. The process must be transparent and inclusive to ensure that the partners will trust the process and support the outcomes. Developing the partnership can feel like a daunting task and may take up significant time in the beginning of the project. However, this partnership needs to be in place for the metropolitan area to commit to a scenario planning process, and to reap the rewards of implementation. After making the collective decision to initiate a scenario planning process many different organizing structures can be employed.

Using MPOs

MPOs are a natural host agency for initiating a regional scenario planning process, especially for the early strategic assessment phase using the Regional Strategic Planning Model. They may already have many of the technical skills, data and tools needed for scenario planning, or the ability to obtain these services. They are familiar with federal and state planning processes relating to transportation, and already develop and update the regional transportation plans. They have the financial and accounting expertise to receive and expend funds in accordance with the regulations governing the expenditures of public funds. Local cities and counties may collectively decide their MPO should staff and help lead the scenario planning effort. The MPO can help guide the process by developing a work scope and budget approved by the governing board.

On the other hand, though MPOs can provide important organizational structure and resources to the scenario planning process, it is the local governments within the MPO that have the authority and the obligation, to implement a preferred scenario in terms of transportation and land use. For those areas required by the legislation to participate in scenario planning, the local governments within the MPOs have the ultimate responsibility to comply.

SCENARIO PLANNING STRUCTURES

190.010 Authority of Local Governments to Make an IGA

A unit of local government may enter into a written agreement with any other unit or units of local government for the performance of any or all functions and activities that a party to the agreement, its officers or agencies, have authority to perform. The agreement may provide for the performance of a function or activity:

1. By a consolidated department.
2. By jointly providing for administrative officers.
3. By means of facilities or equipment jointly constructed, owned, leased or operated.
4. By one of the parties for any other party.
5. By an intergovernmental entity created by the agreement and governed by a board or commission appointed by, responsible to and acting on behalf of the units of local government that are parties to the agreement.
6. By a combination of the methods described in this section.

Many scenario processes have included a leadership or advisory group that goes beyond the MPO, including other local officials, and leaders from business, education, environmental organizations, developers and builders, and citizen groups. Even where the process is housed in the MPO, it is often considered desirable for the process to be led by a more broad-based advisory committee than the MPO board.

Councils of governments (COGs), which may also be their region's designated MPO, can be useful for bringing local elected officials into the scenario planning process, and for coordinating later implementation efforts. Additionally, COGs also have the skills and procedures to accept and expend public funds.

Forming a New Consortium

In the absence of an already established vehicle for reaching agreement in a metropolitan area, forming a new consortium is an option. A cooperative process among all of the affected local governments is critical in ensuring they are engaged throughout the scenario planning process. Active engagement leads to ownership that will be needed in development of alternative scenarios, and ultimately in the selection of a preferred scenario. Under this model, an Inter-Governmental Agreement (IGA) provides a useful tool for organizational structure and securing funding. Oregon law (ORS 190) provides broad authority and a great deal of flexibility for local governments to develop IGA's for almost any conceivable purpose.

Local governments in Oregon have successfully used the IGA authority for a range of activities, from providing for jointly-owned and operated

utilities, to urban renewal agreements, to the design, construction, and operation of facilities. In the case of a scenario planning process, the IGA may be advisable if a new entity is to be created and if funds from several governmental agencies are being pooled to finance the effort. A sample IGA document for a scenario planning process is included in the Technical Appendix.

Using an Existing Non-Profit Organization

It is also possible for a scenario planning effort to be led by a local non-profit organization. Several nationally recognized regional scenario planning processes have been led by regionally-based non-profit organizations. These organizations often have a broad base of local leaders they rely on, are typically funded by corporation or foundation grants (along with public funds) and are in a good position to identify potential planning issues. They rarely have the skills or tools needed for scenario analysis, but in other states they have contracted with the MPO or COG to accomplish these tasks. They often delegate receiving or expending public funds to a MPO, COG, city or county.

However, this is logistically the most complicated way to conduct a scenario planning process. In some cases, a non-profit may have to be formed from scratch, which can take many months. Since the MPO and local governments are likely to be involved as well, a combination of methods may be needed: the MPO work program for MPO technical services, an IGA to coordinate local government involvement and the handling of government funds, and the use or formation of a non-profit to conduct part or all of a scenario process (such as the public involvement process).

Creating an Ad Hoc Organization

Sometimes no regional organization is able to bring together the broad coalition of groups necessary for a successful regional scenario process. In these cases a new ad-hoc organization can be formed, often supported tactically and financially by other organizations such as MPOs and regional non-profit foundations. The advantage is that a broad-based coalition can be formed without a pre-conceived agenda in the minds of the public, and draw on support and funds from a broad base. If following this approach, it will be important to identify the parties responsible for implementation following the completion of the scenario planning process. There are examples of this model being used successfully. Perhaps the most well recognized example is Envision Utah, which has maintained a staff and contracts with both public and private entities, since the completion of its scenario planning process, to regularly engage in planning and implementation activities.

There are innumerable combinations of these methods. Metropolitan areas should consider the pros and cons of each, and collaboratively design a plan that best aligns with the metropolitan area's own goals.

Option for a Phased Approach

A scenario planning process may span one to three years, with outcomes difficult to predict. Agencies and stakeholders, if reluctant to sign on to a project of this scale all at once, may opt for a process with additional checkpoints and opportunities for decisions. By committing to portions of the process, agencies and stakeholders can use feedback in the form of initial modeling results and impacts on existing workflows and budgets to help select subsequent phases. Following is a sample of an optional phased approach. This would allow participants to take time to consider the next steps each time a significant discovery is made.

GETTING STARTED

A Step by Step Approach to Determining a Structure and Roles

Looking ahead from this first step, the scenario planning process may seem daunting. One option, to get the process initiated sooner, is to approach it in phases, with decision points along the way. In this way, the larger decision of how to organize the process can be put on hold while momentum and agreement are built among stakeholders. During the starting phase the affected jurisdictions and stakeholders could convene a series of working sessions to discuss the questions:

1. What can the metropolitan area gain from scenario planning?
2. What concerns are present that must be addressed?
3. Who has the capability to perform the analysis?
4. Who will lead the effort?
5. What are the next steps?

Addressing these questions could be accomplished with a short, to the point work plan spanning just a few short months. An ad hoc group could host a work session or summit to bring stakeholders together to find out the hopes, concerns, and skill sets they can bring. The ad hoc group could then develop a work plan to cover the next steps. This workshop should be structured to address the hopes and aspirations of the stakeholders, while specifically steering away from issues that could derail the process. With the work plan in hand, the group can return to the stakeholders to discuss moving forward, and request buy-in for the remainder of the process, or even just the next few steps.

Phase 1: Agree to hold a work session or summit to decide on the structure of a scenario planning process. The result of the work session or summit may be an abbreviated work plan that lays out the process through Step 4 where the metropolitan areas can learn how current plans are expected to perform. Move forward with the identification of guiding principles and evaluation criteria in Step 2 and technical staff moves forward with the setup of modeling tools in Step 3.

Use the Regional Strategic Planning Model to develop a baseline assessment to communicate where the metropolitan area is likely headed based on existing plans.

Phase 2: Host a second work session or summit to review the Regional Strategic Planning Model report and decide what to do next. At this point, the metropolitan areas will have a sense of whether current plans will achieve community goals, and what sorts of challenges to expect. With this knowledge, the metropolitan area can determine what level of stakeholder or community member engagement is most appropriate for the scenario development work that occurs in Step 5. Depending on the decisions about how to move forward, additional tasks can be added to the work plan as needed.

Phase 3: Another key time to revisit the organizational and operational structure is after analysis of the scenarios in Step 5. Scenario analysis will result in a detailed reporting of how differing policies, investments and development patterns may affect a range of issues important to the people living and working in the metropolitan area. Check in and decide how to select a preferred scenario and whether to move forward on implementation strategies.

Developing a structure and work plan for a scenario planning process may seem daunting at the outset. However, breaking the process up into small commitments of time and resources, with an understanding that the work plan will evolve as discoveries are made can remove some of the barriers and help to get the process started.

Determine Civic Leadership

A successful scenario planning process requires effective leadership. A local elected official can often play the role of champion for scenario planning, or in some cases the MPO board can assume that champion role, since it is composed of representatives of multiple local jurisdictions.

For effective community engagement and investment, citizens and stakeholders must be able to trust the opinions and skills of the leadership. The leaders need to be able to effectively convey the benefits of scenario planning, the process and its potential outcomes. It is equally important that community members and stakeholders trust that the leadership believes scenario planning can make desirable changes for the community.

In some scenario planning processes, local officials have delegated leadership to an outside agency due to a desire to include a wider array of community leaders than exist on an MPO board - or due to the potentially controversial nature of the process. When this is the case, as described above under Determining an Organizational Structure, the most common outside agency is either an existing nonprofit organization, or an ad-hoc group that includes a broader coalition of leaders. This gives more community members a seat at the table and opens the process to non-governmental stakeholders who can be crucial in crafting and implementing a strategy.

Overall, the leaders who represent the citizens and stakeholders must ensure they fairly represent them and that interested citizens and stakeholders have an opportunity to be heard throughout the process.

Establish a Policy Advisory Committee

The recommended approach is to form a policy advisory committee that includes a broad array of community representatives. In addition to the leaders and champions identified above, it is important to include members who represent some or all of the following interests on the advisory committee:

- *Participating jurisdictions (an elected Official or high-level staff person)*
- *Community leaders*
- *Community-based organizations*
- *Environmental organizations*
- *Tribal leaders (if tribal lands are impacted)*
- *Business community members*
- *Chambers of commerce*
- *Media organizations*
- *Hospitals and health care organizations*
- *Public and private utilities*
- *Development interests*
- *Local colleges or Universities*

Determine Technical and Logistical Leadership

The MPO, a county, or a large city are all logical candidates to be contracted to provide the technical or logistical support, including the staff who will be creating the actual scenarios. This selected agency will need to be able to receive, budget and expend state and federal monies, and have sufficient financial procedures in place to be successfully audited.

The tasks of overall project management, direction, and coordination describe the second piece of technical and logistical leadership. A consultant or area-selected project manager may best fulfill this role. The lead organization(s) for the planning process should be able to bring together the disparate parts of their community and provide a forum where disputes are resolved, policies are tested, and a strategy can be crafted.

In addition to identifying and engaging the core players essential to moving the process forward, the net should be cast widely to invite as many entities as possible to join in the scenario planning process. The cooperation and peer review of local technical experts is needed. It is recommended that a technical advisory committee be formed; an existing technical committee that performs similar functions for the MPO can also be utilized.

The structure of a technical committee needs a dedicated group of multiple people. One successful approach to maintaining many diverse representatives on a committee, while simultaneously allowing for productive work sessions, is to have one large committee meeting infrequently coupled with a core committee meeting more frequently. Given that scenario planning typically looks at a broader array of issues than most MPO and local planning processes, the technical committee should include a diverse

group of stakeholders from many of the agencies and organizations listed below to ensure a variety of interests and viewpoints are represented:

- *Local land use and transportation planners*
- *State government representatives (e.g., DLCD, ODOT)*
- *Transit districts*
- *Transit, bike, and pedestrian experts*
- *Community non-profits*
- *City and county administrators*
- *Developers*
- *Environmental organizations*
- *Public health organizations/advocates*
- *Small and large businesses or representatives*
- *Transportation organizations*
- *Tribal government officials*
- *Universities and schools*
- *School districts*
- *Freight*

Identify Funding Sources for the Planning Process

There are many potential funding sources, including some non-governmental sources not covered here. An important component of the IGA will be identifying those funding sources and getting commitment from funding parties.

State Funds

The extent of state funding support for scenario planning - and other transportation programs - is decided by the Oregon Transportation Commission as it develops and updates the Statewide Transportation Improvement Program.

Local jurisdictions are also eligible to compete for Transportation Growth Management (TGM) program funds to conduct scenario planning as part of their TSP update process. The TGM program provides grants to local governments to update TSPs and prepare integrated land use and transportation plans. Many regional and local TSPs have received TGM funding

Federal Funds

MPOs receive federal metropolitan planning funds that can be used for scenario planning. If scenario planning is done in conjunction with an RTP update, there may be an economy of scale advantage. Doing the two projects in conjunction, rather than paying for two separate projects may cost less overall.

Local Government Funds

In many regional scenario planning examples from other states, local governments are asked to contribute a portion of the funds, in proportion to their size and ability (this can be in-kind too). This has ranged from a nominal to a significant proportion of the funding, but the intent is that local governments can help demonstrate their commitment to the process by contributing funds. This can also help fulfill any matching requirements of state, federal, and private funding sources.

Foundations, Utilities and Large Companies

Another source of funding commonly used outside Oregon is philanthropic foundations. Projects such as Envision Utah and Chicago Metropolis 2020 were almost entirely funded by foundations. Again, this source of funding requires a non-profit, tax-exempt entity to receive and expend the funds. Local utilities or large companies may also fund a portion of the project, especially the outreach component. Utilities often have an in-house print shop, and might contribute the printing and sometimes distribution or materials. They may also have extensive Internet design and web hosting capabilities, and could contribute to the web design and hosting needs of a project.

Design a Meaningful Public Involvement Plan

Regardless of the organizational model selected, the process should begin by designing an active, two-way approach to communicating with community members. Communication in terms of scenario planning should be a broad, double-sided style of engagement—true give and take between planners and the community that continues throughout the process. Before designing a public involvement process, read through this entire guide, including the Step-by-Step Public Involvement section of the [Technical Appendix](#), to identify the right moments and methods to reach out to the public.

The scale of public involvement effort will depend on the size of the metropolitan area and the scale of the scenario planning project. For instance, the Grand Vision, in the Traverse City area of Michigan, a community of six counties and 100,000 people, included an ambitious public involvement effort that garnered input from 15,000 citizens. Over a period of three years, the Grand Vision utilized workshops, surveys and a public rollout event. A scenario planning workshop focused on gathering general themes and visions of the community. Small area workshops focused on localized community planning. A transportation workshop focused on desired connections and improvements throughout the region and in local communities. A survey presented a decision scorecard of the scenario results to ask the public to decide on their priorities. It resulted in 12,000 votes. The Grand Vision rollout event presented the final Vision to inspire community members and leaders to become involved in and start work on Grand-Vision inspired projects.

Step 1

PUBLIC ENGAGEMENT IN ACTION

Public engagement allows citizens to share their visions for the future through a meaningful process.



When deciding on the scope and scale of the public outreach effort consider factors such as the level of the community’s involvement in past planning efforts, expected levels of community interest, the type of proposals likely to be considered in the scenario planning process and the available budget for outreach.

In order to bring the community into the planning process, it is important to describe scenario planning in terms of the livability criteria, or benefits, that the community will be considering. Many community goals – such as livable communities, health concerns, safety for children and others, walking and biking – have the additional benefit of also addressing GHG emissions. On a local level, Oregon communities have been actively engaged in conversations about land use and transportation for many years. Many ongoing or recurrent planning efforts will likely gain new interest and excitement from using the scenario planning process, and then can also lend their credibility and constituency to scenario planning.

Understand the Community’s Values and Opinions

A successful scenario planning process begins with an accurate representation of community values. Gaining an understanding of what they are through values research is critical to ensuring that plans reflect local and regional culture. Comprehending the shared ideals of the metropolitan area is a first step toward defining big ideas and creating specific messages for targeted audiences. Existing comprehensive plans and TSPs typically provide guiding principles, goals and a vision summarizing a community’s values. This is a good place to begin the assessment of regional values.

In addition to existing written sources, it is often useful to conduct research on the area’s values. Public values research has evolved over the years to become a quantifiable science. Values research can be conducted using various tools, such as; online qualitative surveys, focus groups, in-depth interviews, online panels, and phone and mail surveys. Interestingly, while each region’s values are different, some nationally shared values and principles appear in many regions. Values research and analysis provides a means to ensure that a plan reflects the core values of a diverse regional community. It also allows planners to

design a plan with benefits for the broadest segment of the community, not just motivated citizens involved directly with the planning process. The results from values research can also be shared with the community as a means for helping all citizens, motivated or not, better understand their own community and reconsider long-held assumptions. An understanding of the values held by people within the metropolitan area can be helpful in drawing in the partners required for the collaborative scenario planning process.

Figure 4: Public Engagement Recommendations for Each Step

Step 1: Create a Framework for the Scenario Planning Process
Develop a public involvement strategy.
Step 2: Select Evaluation Criteria
Conduct forums and community values research.
Step 3: Set up for Scenario Building
Provide updates for those following a project website. Provide updates on values from Step 2.
Step 4: Develop/Evaluate Current Base Conditions and Reference Case Scenario
Presentations to elected officials and appointed committees. Create fact sheets or “report card.” Host an open house to share results or a workshop (end of Step 4).
Step 5: Develop and Evaluate Alternative Scenarios
Consult with elected officials. Hold an interactive visioning workshop. Reach out to key stakeholder groups. Provide newsletters, fact sheets, articles. Use social media tools such as websites or surveys. Utilize online scenario building.
Step 6: Select the Preferred Scenario
Share results of the alternative scenarios with the public. Use public input to help identify preferred strategies. <i>Formats for engagement include: summary brochures, newsletters, websites, forums, open houses, small focus groups and short videos.</i> Use a focused stakeholder group.
Next Steps
Hold multi-agency meetings. Other public engagement opportunities will occur as implementation measures are proposed and considered as part of local plan updates.

Conclusion

At the completion of Step 1 the framework for the scenario planning process should be established and presented in a work plan that will be used to guide the remaining steps of the process. At this point, the participants should have been identified and have a good understanding of why they want to embark on scenario planning, how it will benefit the area, and the general range of potential options and strategies. Decisions will have been made about who will be involved in the process, what geographical area it encompasses, who the project leaders and champions are and how the public will play a role. Moving into Step 2, the *Guidelines* recommend a process for discovering, gathering, and prioritizing community goals and establishing scenario evaluation criteria.



Step 2: Selecting Evaluation Criteria

Summary

This step involves translating the goals identified in Step 1 into a set of guiding principles that will serve as the objectives to guide the process. Metropolitan areas, or local jurisdictions within the area, may have recently developed guiding principles from comprehensive plans, TSPs or community visions that already support scenario planning goals. If so, it may not be necessary to develop new guiding principles, but rather assemble existing guiding principles. This step also discusses the process for establishing the evaluation criteria that will be used to analyze the alternative scenarios and communicate their results in Step 5. The guiding principles established in this step will be used to help develop and prioritize the evaluation criteria.

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Preview

The benefit of scenario planning is the ability to objectively compare a range of possible futures. This step discusses how to measure success by creating **guiding principles** and translating them into a set of **evaluation criteria** to measure scenario outputs. While the reduction of GHG emissions will be a central evaluation criterion, measuring and communicating other important local priorities and criteria will be essential to garnering widespread community interest. A common set of evaluation criteria are recommended in this step, but should be adjusted or augmented to fit the community.

Develop Guiding Principles

One of the keys to scenario planning and implementation is clearly defining the outcomes that will signify the success of the project. In order to do this, development of a series of guiding principles for the scenario planning project is recommended. Guiding principles are broadly stated objectives or precepts to guide the scenario planning process. Developing a set of guiding principles will help to identify and prioritize evaluation criteria that will be used later to assess and compare scenarios. The guiding principles will serve as a touchstone throughout the project in all circumstances, irrespective of changes in goals, strategies, type of work, or management. These can be new guiding principles developed specifically for the scenario planning process or assembled from objectives identified in existing plans.

First, comb through existing plans for guiding principles shared by the participating jurisdiction(s). Work with the advisory committee developed in Step 1 to expand that list by brainstorming other potential guiding principles. It is best to select and organize the guiding principles into categories, such as: economy, transportation, environment, equity and opportunity, and community and housing. Following are four examples of guiding principles, a full sample list is located in the Technical Appendix.

PUBLIC ENGAGEMENT IN ACTION

Selecting the Guiding Principles

Selection of guiding principles can serve as an early stakeholder and advisory committee engagement activity. A simple six step process could resemble the following:

1. Project staff draw preliminary guiding principles from existing sources and categorize them based on regional values.
2. Staff develops new guiding principles for goals that arise from values research.
3. Hold a brainstorming session with the advisory committee to add principles if needed.
4. Conduct a prioritization exercise with the advisory committee.
5. Publish the project's guiding principles and share them with the general public.
6. Optionally, calibrate with a scientific poll to ensure that the guiding principles are widely held objectives in the community.



At a committee meeting for the Dallas TOD, Investing in Transit Neighborhoods project, committee members prioritized potential guiding principles for the planning process and were given the opportunity to provide specific ideas for additional guiding principles.

Example Guiding Principles

- *The transportation network should ensure efficient and cost effective movement of goods and people.*
- *The transportation network will ensure safe and timely access to housing, jobs, shopping, services, and recreation.*
- *The metropolitan region promotes a full-range of housing types to fit every income, household and preference.*
- *Ensure there are parks, trails and open spaces easily accessible to residents throughout the community.*

Establish Evaluation Criteria

A set of evaluation criteria is a benchmark or yardstick against which the performance of the scenarios can be measured. Establishing evaluation criteria that resonate with members of the community is essential to a successful process. Develop criteria tailored to the needs and values of the participating local jurisdiction(s) using the key issues identified in Step 1 and the guiding principles.

Effective evaluation criteria can be measured objectively and are meaningful to stakeholders. Objective measures allow for clear assessment of scenario performance and highlight tradeoffs between policy choices. Evaluation criteria should address a range of community objectives such as public health, a stronger local economy, average household fuel expenditures, access to transit, access to bicycle and pedestrian routes, and preservation of natural areas, as well as GHG reduction. Many of the strategies that help meet the evaluation criteria will have more than one benefit. For example, an evaluation criterion calling for calculating the reduced amount of driving one might experience in a scenario can resonate with many members of the community primarily in terms of money saved on fuel and secondarily on benefits to the environment through reduced fuel consumption.

The evaluation criteria in the scenario planning process are not designed to assess specific impacts and precise outcomes such as congestion at a specific intersection or roadway level of service. Specific impacts and outcomes typically are assessed when developing an implementation plan or updating existing plans as part of an implementation phase. The evaluation criteria will be used to gauge big-picture items such as the amount of daily driving or the potential consumption of land. Objective evaluation of scenarios will provide a general sense of the potential impacts of actions and programs, such as those described in the Oregon GHG Reduction Toolkit, as they pertain to the guiding principles. Through comparison of several evaluation criteria, tradeoffs between actions and programs can be examined and better understood.

Potential Evaluation Criteria

Scenario planning tools create the potential to develop and apply dozens of different evaluation criteria. The ability to construct computer simulations of metropolitan areas has advanced tremendously over the past two decades. However, even prior to recent technological advances in modeling, the Oregon planning system required planners to develop an estimate of future conditions (e.g., land consumed by urbanization). The federal transportation planning system also requires that future modeling demonstrate compliance with the Clean Air Act and other legislation. Existing plans in Oregon jurisdictions include many evaluation criteria, so the notion of using predictive evaluation to analyze plans is not new. It will be helpful to carry forward some of the evaluation criteria the metropolitan area is currently using into the scenario planning process. Tracking some consistent measures will aid in communicating the scenario analysis with stakeholders already familiar with some of these well-established criteria.

This step also recommends new evaluation criteria that can be employed in the scenario planning process. The evaluation criteria will be used to track a range of potential outcomes expressed by the scenarios and evaluated through the sketch planning tool and the Regional Strategic Planning Model. The scenarios will express the future in terms of land uses, including the types, locations and intensities of uses, and the transportation network with its accompanying infrastructure from roads and trails to trains and buses. The scenario comparison can include measures such as: residential and transportation-related GHG emissions, land consumption, land use patterns (e.g. housing and job distribution, density),

mobility (e.g., delay and travel times), travel behavior (e.g., vehicle miles traveled, walking, bicycling, transit ridership, carpooling, drive alone trips), mobility corridor performance and regional travel patterns.

Recommended Evaluation Criteria

The process of comparing multiple future scenarios should employ a set of criteria that addresses the full range of needs and desires expressed through the guiding principles. This set of criteria should be used consistently for apples-to-apples comparisons of scenarios. The best practice is to select the number of evaluation criteria based on the guiding principles and what is important to the community. The same evaluation criteria may apply to multiple guiding principles. Use of too many indicators can overload the team as they may start to focus too much on mathematical evaluations, rather than the bigger picture planning concepts being discussed. When sharing results with the community, a smaller subset of the selected evaluation criteria may be more appropriate. Step 6 discusses in greater detail guidelines for effectively communicating the evaluation criteria to the public.

The final set of evaluation criteria should be drawn from measures established in existing plans, and calculated by the Regional Strategic Planning Model and the chosen sketch planning tool. The accompanying table presents a suggested set of criteria likely to support the selected guiding principles. However, as always, this list will need to be adjusted to address the community's specific guiding principles. For example, the Envision Central Texas project added measures related to the health of the region's aquifer because water quality was a top priority for the public and stakeholders.

Figure 5: Recommended Evaluation Criteria, Corresponding Unit of Measure and Source*

EVALUATION CRITERIA	UNIT OF MEASURE	OUTPUT SOURCE
Land Consumption and Density		
Land consumption	acres	sketch planning tool
Density	housing units/acre and jobs/acre	sketch planning tool
Development uses	square feet	sketch planning tool
Parking area	square feet	sketch planning tool
Housing and Affordability		
Housing mix by type (single-family, multi-family, townhome)	percent of units	sketch planning tool
Housing tenure (rental or ownership)	percent of units	sketch planning tool
Housing cost	average rent and sales price	sketch planning tool
Housing affordability by income level	number of units and % of units	sketch planning tool
Economy and Prosperity		
Employment by sector	# and %	sketch planning tool
Housing and transportation costs	\$ and % of average income	sketch planning tool
Development value	\$/acre	sketch planning tool
Costs of providing parking spaces	\$	sketch planning tool
Household auto ownership costs	\$	RSPM
Fuel and electricity costs per capita	\$	RSPM
Transportation and Health		
Light vehicle miles traveled (<i>e.g., total, per capita</i>)	miles and miles/capita	RSPM
Vehicle delay (time lost due to congestion)	hours/capita	RSPM
Travel mode split, average trip time, average trip distance	%, time and distance	sketch planning tool/travel demand model
Accessibility to transit	households and jobs within 1/4 mile walking distance	sketch planning tool and GIS
Transit service levels	service miles/capita	RSPM
Walkable areas	households and jobs within areas of well-connected street or path networks	sketch planning tools and GIS
Complete neighborhoods	ratio of households to jobs	sketch planning tool
Households within walking distance of parks, schools, cultural amenities, etc.	households and %	sketch planning tools and GIS
Fuel consumption	gallons/capita	RSPM
Non-motorized travel per capita	miles/capita	RSPM
Environment, Sustainability and Public Health		
Sensitive lands developed (<i>growth in Goal Five lands, prime and secondary agricultural and forestry lands</i>)	acres	sketch planning tool
Hazard mitigation (<i>growth in hazard prone areas</i>)	acres	sketch planning tool
Building energy consumption	btu/housing unit or employee	sketch planning tool
GHG emissions (<i>building and transportation emissions</i>)	tons CO ² /year	RSPM

* A more comprehensive list of potential evaluation criteria is available in the Technical Appendix.

Link Guiding Principles and Evaluation Criteria

Evaluation criteria can help community members and stakeholders understand the benefits or trade-offs of a scenario as they relate to guiding principles. In some instances, evaluation criteria can be used to assess the performance of a scenario in relation to more than one guiding principle. In this section, four examples of guiding principles are linked to related evaluation criteria examples to highlight their relationship.

Guiding Principle Example #1:

The transportation network should ensure efficient and cost effective movement of goods and people.

Associated Evaluation Criteria:

- *Vehicle miles traveled per capita*
- *Average trip time*
- *Vehicle hours under congestion or vehicle hours of delay region wide*
- *Amount of new development located within proximity of transit*
- *Average speed by travel mode*
- *Cost of transportation improvements and maintenance*

Guiding Principle Example #2:

The transportation network will ensure safe and timely access to housing, jobs, shopping, services, and recreation.

Associated Evaluation Criteria:

- *Number of people with 20-minute access to employment centers*

- *Average trip time*
- *Vehicle hours under congestion or vehicle hours of delay*
- *Amount of new development located within proximity of transit*
- *Total time traveled per capita, by travel mode*

Guiding Principle Example #3:

The metropolitan region promotes a full-range of housing types to fit every income, household and preference.

Associated Evaluation Criteria:

- *Housing mix by type*
- *Housing tenure*
- *Housing affordability by income level*
- *Housing costs*

Guiding Principle Example #4:

Ensure that there are parks, trails and open spaces easily accessible to residents throughout the community.

Associated Evaluation Criteria:

- *Households within a ¼ and ½ mile walk distance of parks, trails and open space*

EMERGING INDICATORS

The practice of linking community goals to measurable evaluation criteria is expanding as modern technology introduces new data and tools for analysis. The following case studies describe examples of indicators other regional efforts selected to measure.

- Transportation safety
- Workforce housing production
- LEED-ND
- Arts and public amenities impacts
- Local jobs-housing balance

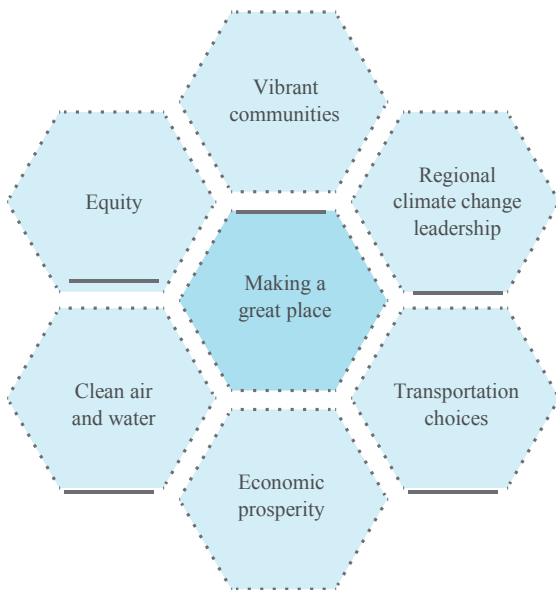
Salt Lake City Region Scenario Planning Process

One of the reasons it is now easier to link broad community goals with land use and transportation planning is that there has been a great deal of research over the last decade correlating urban form to a number of measures. These measures range from travel behavior, to health and obesity, to employment resilience. The Salt Lake City region recently received a \$5 million dollar HUD Sustainable Communities grant, which included a substantial portion being used by the University of Utah to build 18 modules to calculate a host of new evaluation criteria. These modules are open source and will be usable with Envision Tomorrow and other sketch planning tools (described further in Step 3):

- Growth location prediction
- Transportation effects using seven factors (more accurate than current five factors)
- Return on investment
- Housing transportation costs
- Air quality and CO₂ impacts
- Fiscal impact
- Public health
- Employment growth
- Employment resilience
- Development capital attraction
- Redevelopment timing
- Water consumption

Metro's Scenario Planning Process

One example can be seen in Metro's Climate Smart Communities scenario planning process. Metro's honeycomb graphic illustrates the six desired regional outcomes that serve as guiding principles for its Climate Smart Communities project. Metro's scenario planning process identified evaluation criteria that could assess scenario performance on all of the region's six desired outcomes.⁵



Cumberland Region Tomorrow Scenario Planning Process

Another example of planning for multiple objectives can be seen in the Middle Tennessee region. A multi-faceted coalition brought together by the non-profit Cumberland Region Tomorrow identified six issues of regional importance:

- Transportation/transit
- Land use/quality growth/sustainable development
- Infrastructure
- Open space conservation
- Air and water quantity and quality
- Economic competitiveness

The region has worked together, planning and implementing through workshops, plans, handbooks and lobbying. They consider these six key issues and how the region handles them vital to Middle Tennessee's continued economic success, community health and resource sustainability.

⁵ Metro's Climate Smart Communities, <https://www.oregonmetro.gov/climate-smart-strategy>

Refine the Evaluation Criteria

It is likely that a large number of evaluation criteria will be employed for the technical scenario analysis. However, when communicating the results of the scenario comparisons with residents of the community, the list should be pared down. Key criteria, most closely linked to the highest priority guiding principles, should be identified. At the same time, it is important that the full range of issues within the guiding principles be addressed. Measures communicated to the community should be those that affect their lives, and be communicated in terms to which they can relate. For example, in estimating transportation outcomes, it would be useful to report on annual transportation costs per household, or time spent behind the wheel in addition to VMT per capita. A short list of well-chosen evaluation measures will help the public relate to the scenarios.

In addition, since many evaluation measures are calculated from a small number of model outputs, these measures are likely to be closely related and increase or decrease together. For example, land consumption and density are closely related and likely to communicate similar messages when charted or graphed. While both may be useful for a few stakeholders, it is better to pick a single measure to represent the related ones, and use the measure the public can relate to the most.

Conclusion

Completion of this step results in the selection of a series of guiding principles that provide the focus for the scenario planning effort. Evaluation criteria, linked to these principles, will be used to measure the relative performance of the alternative scenarios in Steps 4 and 5. A subset of the evaluation criteria, which best resonate with the community, will be selected to be used in communications describing scenario performance. These criteria will communicate to the community members, stakeholders and decision makers the benefits, impacts and tradeoffs of different policy choices and investments within each alternative scenario, based on the metropolitan area's goals and values.

With guiding principles identified and evaluation criteria established, the next step is to prepare for actual scenario planning by choosing and calibrating planning tools, then collecting and preparing the needed data.



Step 3

Step 3: Set Up for Scenario Planning: Evaluation Tools, Data and Building Blocks

Summary

Step 3 of the scenario planning process begins by selecting tools that will be used in subsequent steps to assemble and evaluate a range of scenarios in order to compare the estimated outcomes. Two types of evaluation tools are recommended: the Regional Strategic Planning Model, a strategic long-range planning model developed by ODOT, and a land use sketch planning tool. Using these tools requires deciding a geographic scale for analysis, compiling data and other information needed to create scenarios, and setting up the tools for scenario building. Some new planning concepts and analysis processes are presented here.

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Preview

Step 3 provides an overview of the tools recommended for the scenario planning process and their interrelationships. This chapter also describes setting up the tools and the types of data needed. Setting up the tools and gathering the data in this step will set the stage for developing and evaluating scenarios in Steps 4 and 5. Recommended scenario planning tools include the state's long-range strategic planning tool, the Regional Strategic Planning Model, and sketch planning tools that allow for creation and comparison of land use and transportation scenarios.

The Regional Strategic Planning Model allows planners and decision makers to analyze the effects of a large number of state and local actions and other trends on transportation related outcomes of value to communities (e.g., GHG emissions, household travel costs, biking and walking, vehicle delays). The Regional Strategic Planning Model has the ability to quickly test hundreds of high-level policy scenarios. It can also be coupled with a sketch planning tool to more easily estimate outcomes of detailed land use scenarios. Sketch planning tools involve creating land use types, called building blocks, which are then used to construct different detailed land use scenarios in order to evaluate alternative future land use patterns. The Regional Strategic Planning Model aggregates the detailed building types of the sketch planning tools into inputs known as Place Types to describe land use and built form in the model.

Use of the recommended scenario planning tools will be described in three steps, which can be ordered to best suit the needs of the community:

- 1. The Regional Strategic Planning Model is used to model a number of high-level policy scenarios for impacts on various outcomes defined by local community values, and test adopted plan resilience to future uncertainties. This is an opportunity to assess the range of possibilities and to use the results in building a coalition to spearhead the scenario planning process. This tool operates at a neighborhood level of analysis.*
- 2. A land use sketch planning tool is used to develop scenarios at a more detailed scale. In this step, the process moves from a neighborhood-level analysis to refining data at a more detailed geographic scale.*
- 3. Geographically detailed scenarios from sketch planning tools, can be aggregated in the Regional Strategic Planning Model to evaluate transportation impacts or other various measures valuable to the community.*

As with most analytical tools, an initial setup is required prior to using the tools. A **base year** will need to be established as the starting point for scenario planning along with a **planning horizon year** representing an end date for the future scenarios. The tools will require designation of a **planning unit** size, reflecting the geographic scale at which the scenarios will be designed. A part of the setup for both tools will be collecting **data** about existing conditions and plans in place, along with future forecasts.

Set a Base Year and Future Planning Year

Selecting a base year is an essential first step to define the process and to gather the data needed for the tools. A base year scenario will approximate existing conditions in the metropolitan area using data from that time period, which officials and public stakeholders can verify and confirm. The base year provides a benchmark for comparison of existing conditions with the reference case and future alternative scenarios.

2010 is the recommended base year for conducting scenario planning because the state and most local jurisdictions have comprehensive and available data for that year. If there are significant studies, inventories or other published data (such as the Census) that would enable more accurate or in-depth analysis, a more recent base year may be chosen.

However, since the adopted targets for metropolitan GHG reduction are based on decreases from 2005 emission levels, some additional work would be needed to properly account for changes in emissions from that 2005 base year.

The minimum future planning year for the reference case and alternative scenarios should be 2040.

Because most local land use and transportation plans currently extend to this date, or close to it, making needed information readily available. The adopted metropolitan area GHG reduction targets are set for the years 2040 through 2050. However, scenario planning is also an opportunity to engage in a long-range visioning process that looks beyond normal planning processes and timelines. Using a longer planning period enables a community to see the cumulative impacts of current trends more clearly. It also allows the community to consider a broader range of options, which may take more funding and time to implement major changes in land use and transportation patterns.

Evaluation Tools

The *Guidelines* recommend and focus on two analytical scenario planning tools. First, the Regional Strategic Planning Model used to estimate the effects of a large number of policies including, but not limited to, land use and transportation outcomes. Additionally, a sketch planning tool used for efficient creation and evaluation of alternative future land use patterns, which can provide data for the Regional Strategic Planning Model evaluations.

Applying the Evaluation Tools: Using Sketch Planning Tools and the Regional Strategic Planning Model Together

The Regional Strategic Planning Model and land use sketch planning tools each have many strengths and can greatly inform the planning process as stand-alone tools. However, using these tools together to fully benefit from the unique strengths each provides allows for the most comprehensive analysis for scenario planning. The recommended process and use of these tools for scenario planning involves three phases.

The Regional Strategic Planning Model is used to conduct long-range strategic tests of a range of policy scenarios for impacts on community desired outcomes, including transportation emissions. This large set of scenarios allows stakeholders to select and focus on the types and combinations of policies that meet their desired outcomes and overall community goals. This is an opportunity to gauge the range of possibilities, test their resilience under alternative futures, gauge the contribution of state actions, and to use the results in building a local support for the planning process. Land use inputs at this stage are generalized and large scale (i.e. regional transportation service levels not specific projects).

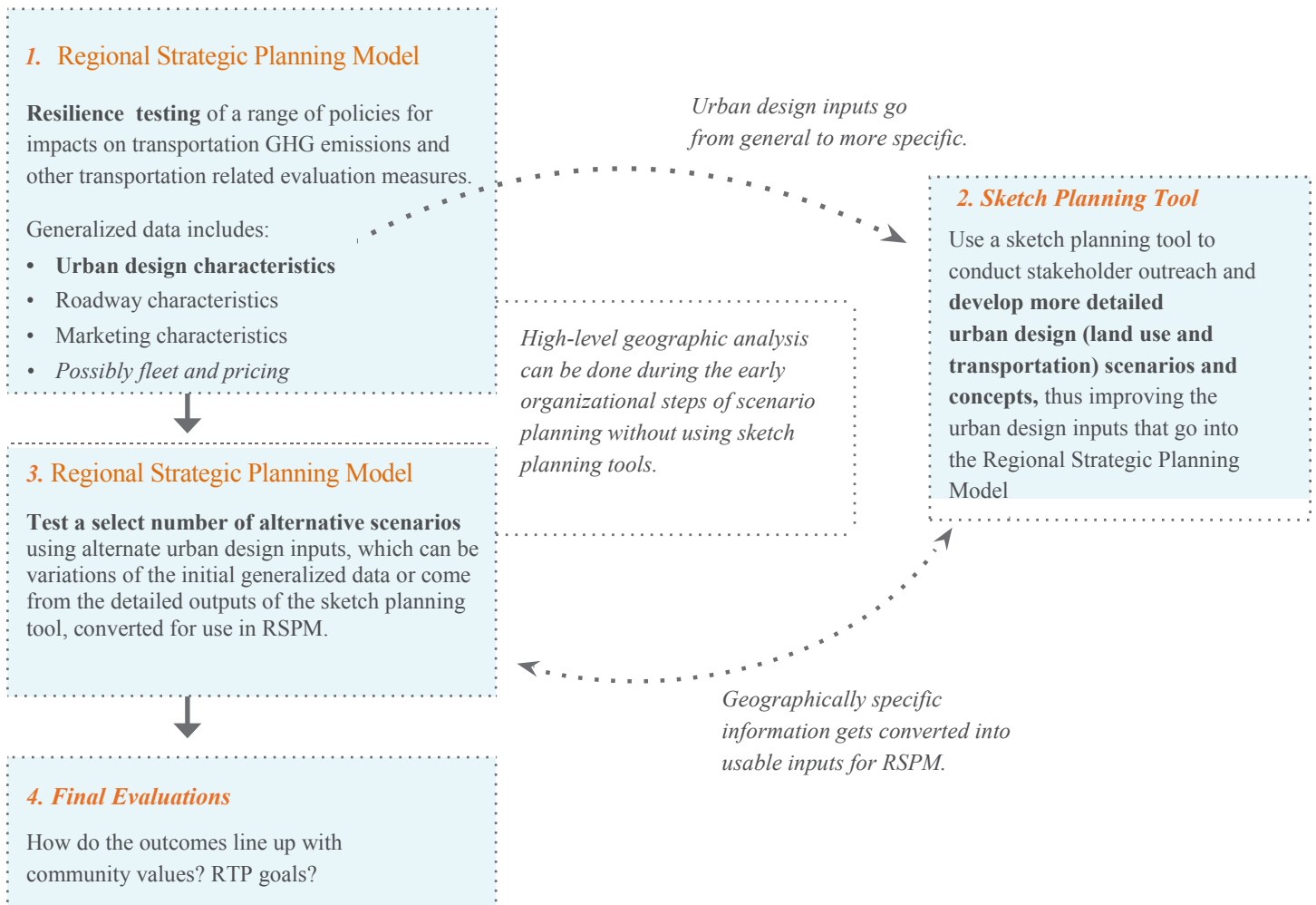
Sketch planning tools can be used to further detail future land uses and scenario concepts for additional analysis by the Regional Strategic Planning Model. In this step, the process moves from the general to the specific, using a more detailed geographic scale, possibly as specific as parcels. The sketch planning tools described in the *Guidelines* build on the functionality of GIS to allow testing of different land use and transportation options for the future. These

tools are also set up to use in outreach and input by the community, committees through workshops using the tool in groups.

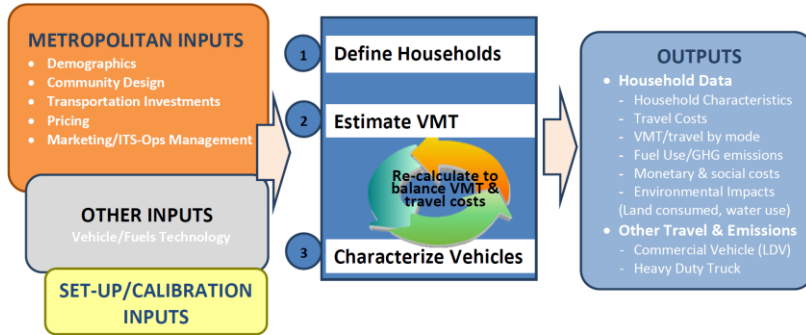
At this point, the outputs from the sketch planning tool can be used to define new Regional Strategic Planning Model inputs for a select number of alternative scenarios. After developing geographically specific scenarios using land use sketch planning tools, the data is converted to translate the outputs from the sketch tool to be usable in the Regional Strategic Planning Model. Using the Regional Strategic Planning Model and sketch planning tools together provides the flexibility to evaluate how detailed proposed land use scenarios will perform in relation to the policies the state has assumed, as well as the outcomes and aspirations defined by a local community.

Through aggregating the more detailed land use scenario into the Regional Strategic Planning Model, the land use concepts, non-land use concepts, and policies an area is planning on pursuing will be accounted for and allowed to impact one another in the analysis. Sketch planning tools do not take into account federal or statewide policies, such as the fuel efficiency of the future vehicles or taxing policy and household budget impacts on VMT. The land use sketch planning tools can provide initial estimates to help refine land use scenarios (development visions) as they are being created by planners or the community in Step 5. A final evaluation should occur with the land use information from those scenarios combined with other policies in the Regional Strategic Planning Model to get more accurate outcomes, including measures of GHG comparable to the state GHG target rule.

Figure 6: Example application of the Regional Strategic Planning Model with the Sketch Planning Tool



Regional Strategic Planning Model



The Regional Strategic Planning Model was developed by ODOT for the purpose of estimating and forecasting the effects of various long term policies and other influences on the amount of vehicle travel, the types of vehicles and fuels used, and the resulting greenhouse gas (GHG) emissions among other things. As the name indicates, the Regional Strategic Planning Model is a model which supports strategic planning processes, such as Strategic Assessments and scenario planning, at a regional level, often when few details are available.

The Regional Strategic Planning Model⁶ tool helps regions assess policy actions along with fundamental shifts underway that will affect future travel. The tool captures how adjusting one factor can impact others. For example, the number and type of vehicles owned influences the amount of vehicle travel. Electric vehicles are much cheaper to operate and produce few emissions idling in congestion. The way the transportation network is managed and priced effects future vehicle purchases and where people and businesses locate. The resulting impact on trip distances influences the market penetration of electric vehicles and the ability to use alternative modes. These are just a few examples of how different factors impact and influence one another.

To capture these complicated interactions the Regional Strategic Planning Model is constructed to work at a very disaggregate level, modeling decisions at the household and vehicle level. The Regional Strategic Planning Model first builds a database of each household in the study area in significant detail. Attributes of household income, age mix, are supplemented with whether members of the household are involved in programs such as car sharing or TDM. From this information, the Regional Strategic Planning Model estimates the household's travel directly. Vehicles are assigned and then an iterative process adjusts vehicular travel depending upon the cost of driving. So while the inputs only need to be high-level regional approximations, the computations occurring within the Regional Strategic Planning Model estimate how individual households will make decisions based on different conditions.

The Regional Strategic Planning Model can test a range of scenarios and policy actions that a local area may want to pursue, including:

- **Urban characteristics:** density, mixed use, public transportation, non-motorized transportation, parking management.
- **Road characteristics:** the supply of freeways and other arterials and the management of operations.
- **Marketing characteristics:** such as the deployment of employer-side and household-side travel demand management programs, eco-driving, low-rolling resistance tires, and pay-as-you-drive insurance.
- **State-led actions:** policies that typically require state and/or federal action such as household and commercial vehicle mix, renewable fuels programs, landfill-capture of CNG for vehicle use, pay-as-you-drive insurance, state gas taxes and other fuel or mileage based fees.
- **Resilience to future uncertainties:** external factors outside of the control of local influence such as population growth, future fuel price, and income growth directly impact choices made related to mobility, livability, and air quality. Testing differing levels of these variables demonstrates the resiliency of a region's adopted plans to a future uncertainties.

⁶RSPM was formerly known as GreenSTEP. The name change reflects expanded capabilities for metropolitan area application while addressing a more general set of transportation and land use considerations in addition to greenhouse gas emissions.

The resulting outcomes cover a range of mobility, economic, and environmental measures.

The Regional Strategic Planning Model differs from traditional travel demand models that support planning in most urban areas. Urban travel demand models are designed to model the effects of specific transportation projects or groups of projects on specific parts of the transportation system. The Regional Strategic Planning Model, in contrast, operates at a strategic level and is less detailed but considers a wider range of potential policies and outcomes. An important capability of the Regional Strategic Planning Model is that it considers a more complete cost of travel, including gas prices, congestion charges, pay-as-you-drive insurance, parking charges, etc. and compares these costs to a household's total budget, with impacts on travel. This allows testing resilience to changes in costs including vehicle fuel efficiencies, as well as the effectiveness of pricing policies to manage transportation system demand, aspects that are not currently accounted for in most urban travel models.

The Regional Strategic Planning Model also differs from land use sketch tools. Land use sketch tools operate from a building perspective, calculating the impact of buildings, their occupants, and built environment on travel as well as reporting building energy, water use, etc. The Regional Strategic Planning Model, in contrast, centers on households and their attributes including elements of the built environment and dwelling type which influence their transportation choices (number and type of vehicles) and travel behavior.

These models are complementary. The Regional Strategic Planning Model supports discussions of a region's long term future, evaluating many scenarios relatively quickly to help identify a mix of policies that might meet the region's vision. An urban travel demand model can then be used to evaluate and effectively implement specific elements of this vision. Land use sketch tools can assist in the development and public input on alternative land use patterns critical in estimating travel from both the Regional Strategic Planning Model and urban travel demand models.

Sketch Planning Tool Outputs Useful in the Regional Strategic Planning Model

Land Use by TAZ:

Activity - Count of households, population, university group quarters; employment (total and retail/service share)

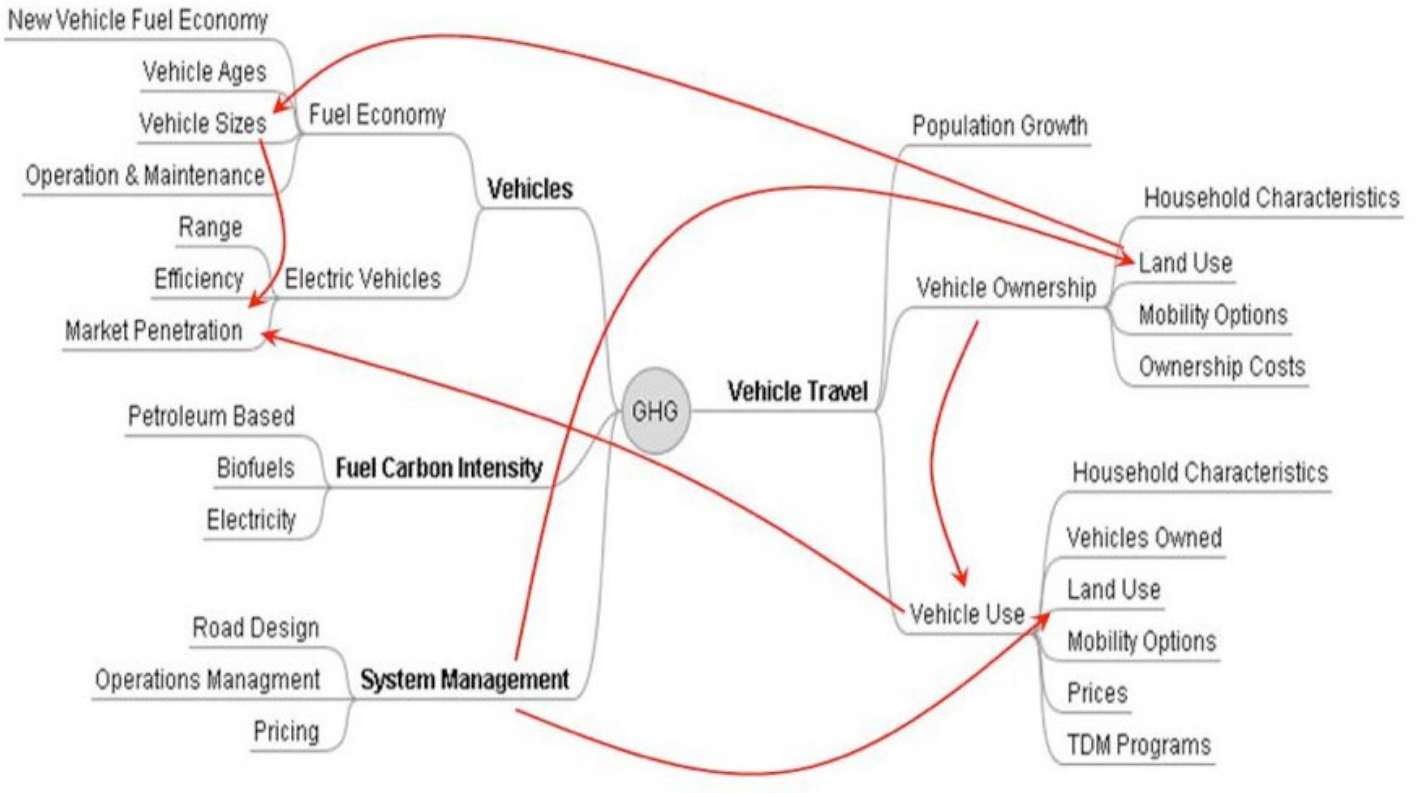
Housing - Dwelling unit mix (RSPM uses: Single Family Detached, Single Family Attached, Apartments 2-4 units, Apartments 5+ units, Manufactured Home, University Group Quarters)

Multi-modal improvements: An indication of places with changes relative to the base year in (could indicate that an area will look like another existing area does today).

Design - intersection density, pedestrian-oriented street miles per acre, walk/bike facility upgrades

Transit - new/improved transit service with service frequency

Figure 7: Major Factors Affecting Light Vehicle GHG Emissions Addressed in GreenSTEP



This Figure illustrates the many factors influencing GHG emissions that are built into the GreenSTEP and RSPM evaluation tool. The red lines indicate just some of the inter relationships between factors; many more such relationships are considered by the models.

Performance Based Planning using Strategic Tools:

Using strategic tools like the Regional Strategic Planning Model for long range planning is becoming increasingly valuable as a means to help state and metropolitan area governments select policies and actions to address pressing issues that are fraught with uncertainty. Strategic tools are designed to address a wide range of trends and policies, rather than focusing on details, and report on a wide range of outcomes of interest to communities such as sustainability, health, household costs, and mobility. As a result, many alternative futures and policies can be evaluated, enabling planners to reason more effectively about intended and unintended consequences of prospective policies and test plan resilience to uncertain external influences. Performance metrics set in a strategic phase may be incorporated into subsequent planning, programming and project prioritization processes, as well as monitor plan performance that can in-turn influence long range planning decisions.

Regional Strategic Planning Model Awards

The development of the Regional Strategic Planning Model was reviewed extensively by state, national and international travel and emissions modeling experts in multiple venues. In 2010, the American Association of State Highway and Transportation Officials (AASHTO) awarded ODOT its 'Presidents Award for Planning' for the development of the GreenSTEP model, and again in 2013 for the Statewide Transportation Strategy using GreenSTEP. In 2015, the Strategic Assessment Report in Corvallis using the Regional Strategic Planning Model was awarded the FHWA Environmental Excellence Award.

The Regional Strategic Planning Model has been adapted for use by other states in the form of the Federal Highway Administration's (FHWA) Energy and Emissions Reduction Policy Analysis Tool (EERPAT). Portions of the model became the underlying basis of the SHRP2 C16 Rapid Policy Assessment Tool (RPAT, formerly SmartGAP). A partnership with ODOT, FHWA and other users is underway to merge the related tools into an open source software framework called VisionEval and further develop the tool, which will make it easier to share updates and collaborate to improve performance-based planning efforts across the country.

Portland Metro Climate Smart Communities Findings from Phase 1

In its initial use of GreenSTEP, Portland Metro ran 144 high-level scenarios through the model. The results produced an understanding of the region's land use and transportation options for reducing GHG emissions while advancing community goals. It also gave them a sense of whether they are looking at a mountain of challenges that would discourage even the heartiest of planners, or a hill of smaller efforts that instead would provide the region with inspiration. Through GreenSTEP, Metro found that 93 of the 144 scenarios met the 2035 GHG emissions reduction target of 20 percent per capita.

The Major Findings:

The cursory analysis with Metropolitan GreenSTEP provided some certainty for the region by showing them that the GHG reduction targets are achievable. It also helped them better understand the challenges ahead, knowing that they will need to look at a range of strategies to accomplish the goal.

- The reduction target is achievable but will take additional effort and new strategic actions.
- Community design and pricing play a key role in how much and how far people drive each day and provide significant GHG emissions reductions.
- Fleet, technology and pricing strategies provide similar significant GHG emissions reductions but no single strategy is enough to meet the region's target.

Step 3

In addition, the Regional Strategic Planning Model can be used to evaluate the implications of changes in the vehicle fleet, vehicle and fuel technologies, and various types of pricing. However, these are typically viewed as factors that require state and/or federal action and are not actions that a local area would generally pursue.

The Regional Strategic Planning Model can also be used as a strategic level tool to evaluate many scenarios relatively quickly. This approach is the first phase of the three phases.

Many interrelated factors influence GHG emissions, and adjusting one can directly impact others. For example, vehicle ownership relates to how the vehicles are used. The way the transportation network is managed and priced effects future land use development. Land use development affects how vehicles are used. Vehicle use, especially the distance vehicles are driven, impacts the market penetration for electric vehicles. These are just a few examples of how different factors impact and influence one another. (Figure 7 provides an illustration of these relationships.)

Because of these complicated interactions, the Regional Strategic Planning Model is constructed to analyze the interactions at a very disaggregate level, modeling decisions at the household and vehicle level. So while the inputs only need to be high-level regional approximations, based on state and national data on travel behavior, the computations occurring within the model estimate how individual households will make decisions based on different conditions.

However, as detailed later in this step, land use sketch planning tools can be used to help communities compare and agree on varying development strategies at a very detailed level, even specific parcels if desired. The detailed land use visioning done with sketch planning tools can be aggregated into Place Types, which allows the Regional Strategic Planning Model to estimate impacts of specific land use patterns developed with the sketch planning tool, while also accounting for the interactions and potential synergies of all the other (non-land use) policies.

Place Types

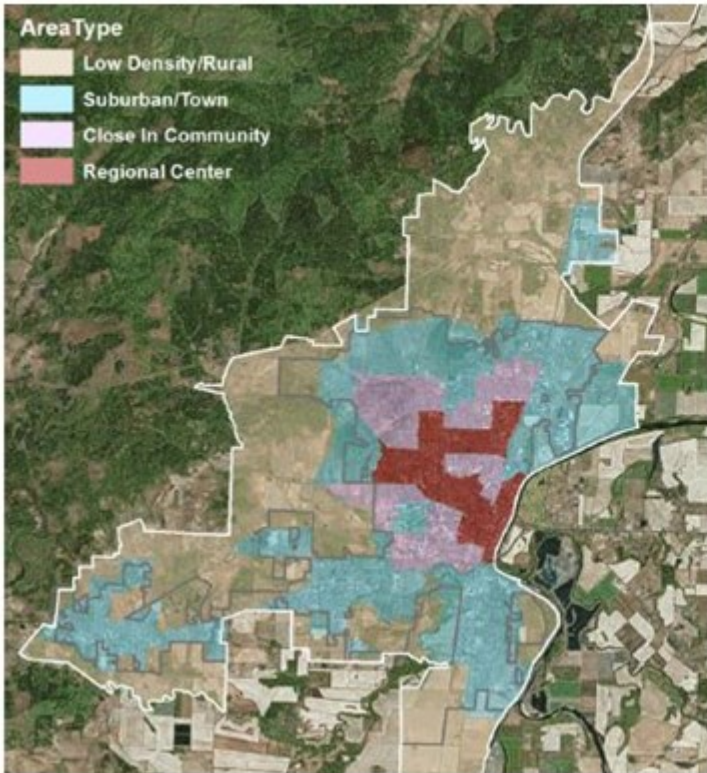
Place Types are data-driven ways to define and visualize the many aspects of land use-transportation interactions embodied in our land use plans. They are then used as an input to the Regional Strategic Planning Model, allowing users to measure the impact of future changes to transportation and land use policies. To better understand land use and transportation interactions and to make more informed policy decisions, neighborhood characteristics can be analyzed by the role that they play in the region; a more comprehensive view than parcel changes, but more specific than zoning and comprehensive plans. These neighborhood characteristics influence the transportation choices that individuals make, and ultimately affect the overall amount of vehicle travel in the region. By comparing the existing built environment characteristics to what is expected to occur in the future, users can explore how changes to the built environment can affect travel.

Area Type (or Regional Role) describes the interdependencies of each neighborhood compared to the rest of the region, e.g. how centered is it to jobs in the region. The Area Type is measured by the accessibility to Destinations (jobs accessible from TAZ), Density (jobs and households per acre), and walkable street Design (multi-modal network links). Development Type (or Neighborhood Character) is used to describe the physical characteristics of each neighborhood in isolation. Development Type is determined by the Density (jobs and households per acre), walkable street Design (multimodal network links), land-use Diversity (ratio of jobs to households), and presence of transit (service level) within each neighborhood district.



Step 3

Sample Area Types Corvallis Area MPO



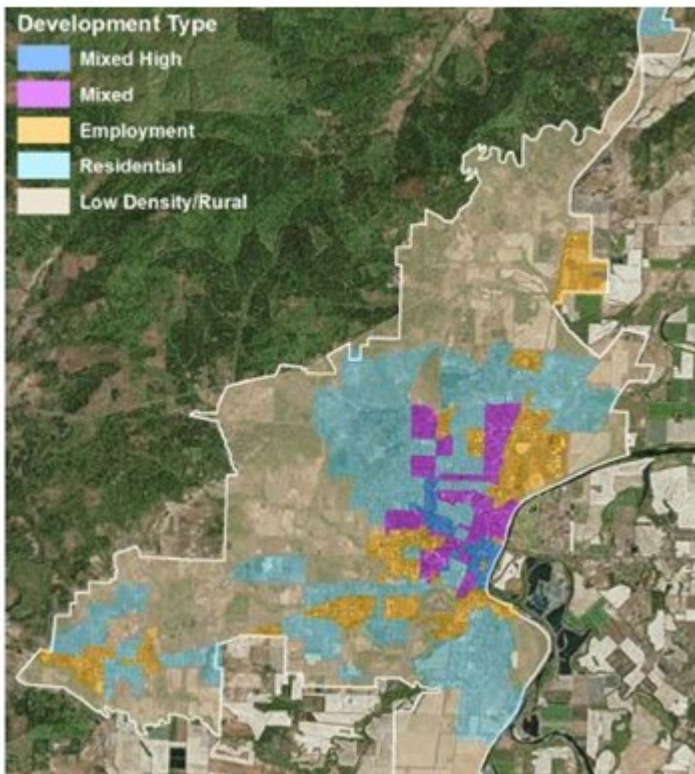
CASE STUDY

Place Types Support in Sketch Planning Tools

Place Types and RSPM Sensitivity Tests can be used to inform sketch planning tools used in public workshops.

In the development of the Corvallis Area MPO’s 2017 Regional Transportation Plan, RSPM sensitivity tests were run for various levels of assumed population living in mixed use areas, a policy action that was desired to be tested in public workshops. The results enabled planners to create a “Mixed Use Design Tool” where workshop participants could paint neighborhoods with a multi-modal/mixed use design, and see real time outcomes, as well as other associated benefits from the RSPM runs such as bike/walk modes, and reduced VMT.

Sample Development Types Corvallis Area MPO



CASE STUDY

Metro and Metropolitan GreenSTEP

Metro utilized a version of Metropolitan GreenSTEP with 20 sub-regional geographies. Metro delineated these minimum geographic units based from its 18 district TAZ map and then adjusted them to Census boundaries to be consistent with Metropolitan GreenSTEP data inputs. Each metropolitan area will be able to delineate the minimum geographic units, or sub-regional geographies that it feels work best for the land use scenario development using sketch planning tools.

Metropolitan GreenSTEP and sketch planning tools are described in greater detail in the *Modeling and Analysis Tools Report* in the Oregon GHG Reduction Toolkit.

Baseline Planning Assumptions

The Regional Strategic Planning Model uses a large number of inputs to model GHG emissions. However, some of the inputs will be used from the data developed for the analysis of metropolitan GHG target rules and for the STS. The default assumptions address:

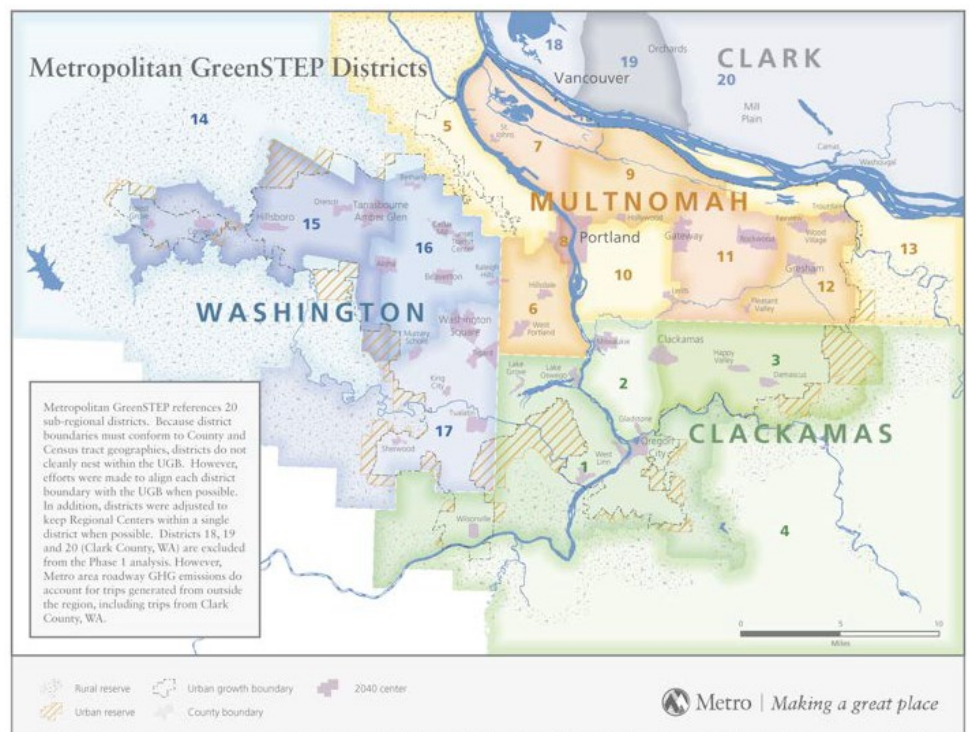
Pricing

- *Fuel prices*
- *Statewide policies on pricing and finance (e.g., gas tax, VMT tax, carbon fee, tolling)*
- *Pay-as-you-drive insurance*

Vehicle Fleet Mix and Technology

- *Fuel economy goals*
- *Advanced vehicles in the fleet (e.g., electric vehicles)*
- *GHG production from Oregon's electricity generation*
- *Future fuels and fuel standards (e.g., low carbon fuel standard, amount of GHG produced per unit of fuel)*

Figure 8: Metro's 20 GreenSTEP Geographies

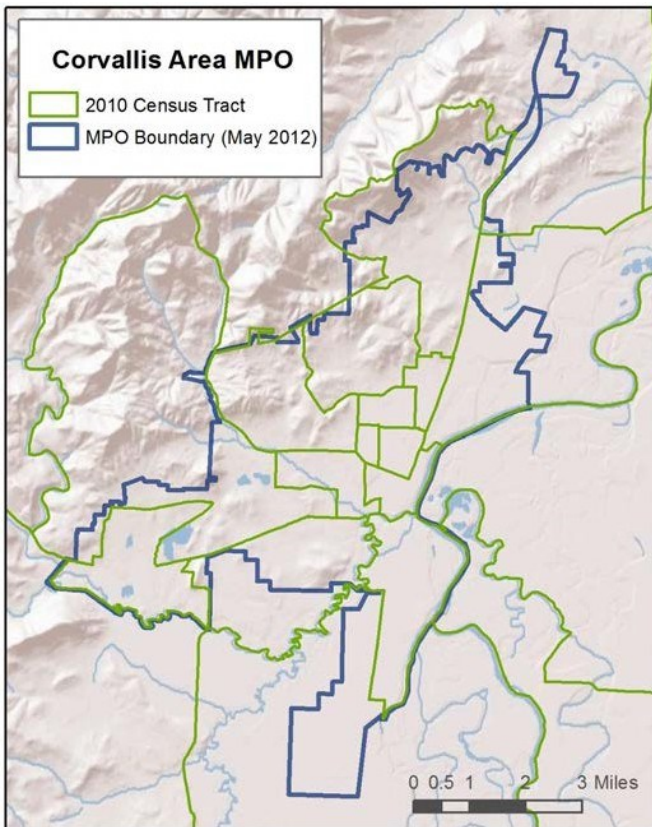


Selecting the Geographic Scale for the Regional Strategic Planning Model

A level of detail needs to be selected for use in the metropolitan area and incorporated into the Regional Strategic Planning Model. The statewide GreenSTEP model uses counties and whole metropolitan areas as the minimum geographic units. For metropolitan-level scenario planning using the Regional Strategic Planning Model, the MPO boundary should be employed to make the model more sensitive to localized details. Much of the data required for the tool is available at this geographic level, or within smaller geographic areas such as traffic analysis zones (TAZ), which often nest within the tracts.

The goal in determining the geographic scale is to find areas small enough to reflect significant differences between sub-areas within the metropolitan area. For example, residents in downtown, be it Bend or Medford, are likely to have different travel patterns, and other characteristics, than people in neighborhoods dominated by single-family homes, such as South Eugene or West Salem. At the same time, there is no significant benefit of smaller sub-geographies if there are few differences between the residents' travel behavior and lifestyles throughout the area.

Figure 9: Corvallis Area MPO Census Tract Boundaries



Scenario planning analysis using the Regional Strategic Planning Model is typically done at a high-level that divides the metropolitan area into 15-20 subareas or districts. Census tracts, like those shown here, provide a good starting point: tracts relate well to different neighborhood and land use patterns, and allow planners to tap into detailed Census data to help understand and evaluate different policies and options.

Collecting Data for the Regional Strategic Planning Model

To model prospective land use and transportation policies at a local or district level, a number of inputs are required for each policy area. Figure 10 provides a list of inputs that will be calibrated and selected for the local jurisdictions. The Community Design, Pricing, Marketing and Incentives, and Roads inputs will be locally generated and therefore do not have standard values for all metropolitan areas. The Fleet and Technology inputs use values from the Target Rule as a starting point for all metropolitan areas. (Input values can be found in the Target Rule Appendix).

Figure 10: Policy Area Inputs to choose from for use in Base Case, Reference Case and alternative scenarios.

INPUT
COMMUNITY DESIGN
Urban growth boundary (UGB) (<i>rate of expansion relative to rate of population growth</i>)
Households in mixed-use areas by census tract or county (<i>percent</i>)
Rate of growth of public transportation service (<i>revenue mile growth per capita compared to base year level</i>)
Bicycle or light vehicle mode share
Work and non-work parking extent and cost
PRICING
Pay-as-you drive insurance (<i>percent households and cost</i>)
Gas tax (<i>includes state and federal gas tax, reference scenario assumes HB 2001 gas tax increase</i>)
Carbon emissions fee
Vehicle travel fee
MARKETING AND INCENTIVES
Households participating in individualized eco-driving marketing programs (<i>percent</i>)
Participation rate in individualized marketing and employer-based commute programs (<i>percent</i>)
Extent and participation in car-sharing
ROADS
Rate of growth of freeway and arterial lane miles
VEHICLE FLEET
Fleet turnover rate/ages*
TECHNOLOGY
Auto fuel economy - internal combustion engine*
Light truck fuel economy - internal combustion engine*
Auto fuel economy - plug-in hybrids*
Light truck fuel economy - plug-in hybrids*
Carbon intensity of fuels (<i>CO₂e grams/magajoule</i>)*
Percent of autos that are plug-in hybrids or electric vehicles*
Percent of light trucks that are plug-in hybrids or electric vehicles*

* As defined in State Agency Technical Report and assumed in the Metropolitan GHG Reduction Targets Rule.

Land Use Sketch Planning Tools

Land use sketch planning tools facilitate the development and evaluation of a variety of land use and transportation alternative scenarios and can be effective public outreach tools. They are particularly useful for public outreach and workshop setting development of alternative land use scenarios that can also be used as input in other tools. The discussion in this guidance document focuses on the sketch planning tools that are software extensions to GIS and allow planners to “paint” building blocks (descriptive land use types described in detail below) and “draw” transportation improvements on the landscape to create unique land use and transportation scenarios, a more detailed land use exercise than the place types used in the Regional Strategic Planning Model noted above.

The land use sketch planning tools are used to report various land use, housing and environmental measures based on designated building blocks. This process allows convenient comparisons of the impacts of different land use and transportation arrangements.

A major benefit of using land use sketch planning tools is the ability to conveniently develop many possible future land use scenarios with detailed information describing the locations, types and intensities of land uses. This land use information can then be output and used by other evaluation models and tools in the planning process, like long range scenario planning using the Regional Strategic Planning Model or a travel demand model. These other models include traditional traffic analysis zone (TAZ) based travel demand models, transportation post-processing models that estimate vehicle trip reductions (also known as traffic calculation models), energy models, land use models and infrastructure models. As discussed earlier, the Regional Strategic Planning Model uses more simple Place Types description of land use in its input, which can be aggregated from the land use building blocks used in the sketch planning tool to ease passing data between the tools. Complex market-based land use models which predict land development in response to market conditions such as Metroscope and Land Use Scenario DeveloperR, or LUSDR, are also a potential source of information for the scenario planning process and can assist in allocating the growth forecast, if available.

Collecting Data for Land Use Sketch Planning

Development of base year and reference case scenarios – using land use sketch planning tools - relies on compiling and developing accurate, region- wide land use and transportation data for the base year and the future planning year. Some of this data, such as the transportation network and the geographic scale are displayed on a base map that will serve as a guide when painting scenarios.

Buildable Lands Inventories

City and county Buildable Lands Inventories (BLIs) need to be combined and their information transferred, within GIS, to the planning units selected for the geographic scale upon which scenarios will be developed. Filtering out environmentally or physically constrained lands (e.g., water, parks), the BLI conveys how much land within each planning unit is vacant or potentially available for redevelopment (unprotected acres). BLIs are typically developed at parcel level geography, so translating their values to the selected planning units should be a fairly straightforward GIS process. One of the likely challenges will be coordinating all of the BLIs within the metropolitan area to provide quality data for the selected base year. Where available, BLIs may be outdated or for years other than the base year. Thus, the BLI will likely need to be updated or adjusted to provide a reasonable and consistent baseline for analysis.

In considering whether to update the BLI to support scenario planning, planners should assess whether there have been significant changes in areas that are likely to be considered for higher density development in the scenario planning process. Up-to-date information in these areas is key to evaluating their potential. As discussed below, the level of detail in the BLI also affects the geographic scale available for use by the sketch planning tool. In short, having more detailed data allows the use of smaller planning units.

Current Land Use Inventory

This data shows the occupied land in the metropolitan area and the land use associated with it. Like the BLI, the current land use inventories are best when accurate to the parcel level. The current land use inventory, commonly referred to as existing land use, should portray what was on the ground for the selected base year. This data can then be used in the scenario development process to determine where redevelopment opportunities may exist.

Existing and Planned Transportation Network

The transportation network for a metropolitan area is the supporting skeleton for all of the region's land uses. The RTP and TSPs within the metropolitan area will include infrastructure that exists today, as well as budgeted and planned infrastructure, and infrastructure that is planned but not yet funded. These components could include available networks ranging from arterials to sidewalks which will be used as a backdrop for the scenario design process. The characteristics of the transportation network are coded into the base map and can be used for analysis in addition to the network. The transportation network is also included in the base map as a guide for urban design and allows the testing of changes in future land use and transportation scenarios.

Land use sketch planning tools generate estimates of vehicle travel and travel by other modes, but do not allocate or estimate trip distribution on the network as a travel model would. Consequently, while these tools can be used to compare the overall level of vehicle travel that is likely to be generated by different development patterns, they are not intended or well adapted to estimating details of performance on the roadway system. Generally, these estimates are expressed as increases or decreases in driving, transit use and sometimes walking and biking. At the core of land use sketch planning tools is the ability to locate household and job growth prior to analysis within the Regional Strategic Planning Model or travel demand models.

Detailed information about the transportation network is important to constructing and evaluating different scenarios. For example, most sketch planning tools will estimate the amount of employment and housing within walking distance of transit. Consequently, to construct a scenario that maximizes access to transit, the base maps used in the sketch tool need to show the location of existing or planned transit stops.

Existing Comprehensive Plans

GIS versions of city and county comprehensive plans will need to be gathered and combined together to create a digital map of the expected long-range land uses within the metropolitan area. Written descriptions of each designation that includes density, land use type, and land use mix should accompany the GIS maps from the local governments. The building blocks used to develop the scenarios will be based in large part on the written descriptions of the plan districts including expectations relating to use, mix, intensity and urban form.

Household and Employment Forecasts

Typically, metropolitan areas will want to use the housing and employment allocations from the adopted RTP as the basis for scenario planning. RTPs typically provide the most detailed and up-to-date estimate of the base year and future year housing and employment distribution within the metropolitan area. In the RTP both are allocated to the TAZs. The distribution for the base year will need to be allocated to the established planning units, based on the existing land use conditions in order to develop the base year scenario.

Later in the process, building blocks will be used within the sketch planning tool to build the reference case and to test different land uses by examining alternative allocations of the expected housing and employment to different locations within the planning area. During that process, the user will have to ensure that assumed demographic and employment totals remain constant for all future land use scenarios developed and tested, if they are to be compared apples-to-apples. An area might also want to do some sensitivity testing to better understand the effects of population changes. That type of scenario testing would not need to maintain the same control totals. However, all scenarios intended to be compared against one another should match on key demographic totals (e.g., household size, age, income) when the entire analysis area is summed.

Selecting the Geographic Scale for Land Use Sketch Planning

Scenario planning analysis can be conducted at a variety of geographic scales. The land use sketch planning tools rely heavily on geographic data in order to allow for testing different geographic combinations of land uses. The size of the metropolitan area and the resources available often dictate how coarse or fine the geographic planning units should be. For instance, a regional scenario project for a large MPO like Portland Metro may use either an acre-sized grid cell planning unit or census blocks, while a project for a smaller MPO could make use of aggregated parcel data (if the data resources are available) to create planning units smaller in scale and more finely grained.

Regardless of what level of detail is chosen, the geography should be designed to nest into available larger geographic units used for planning or analysis – including census tract, block and group boundaries, TAZ boundaries, plan or zoning district boundaries. Make sure that the units of geography used in the sketch tool can be easily aggregated to the larger areas or units of analysis used by the Regional Strategic Planning Model.

Grid Cell Based

A grid cell based approach is the most straightforward method for painting the scenario landscape. It results in planning units of consistent size throughout the metropolitan area, in both urban and rural areas. The cells can be scaled to a familiar size, such as a typical city block or group of blocks. These grid cells will be a new geography introduced to metropolitan areas as part of scenario planning and will require adapting existing data to match the grid cells. This means either aggregating or

disaggregating existing data to fit the grid cell. The primary benefit to the grid cell approach is that it can be adapted to allow for a fine scale that can approximate real world development, or cover larger areas, and avoids the need to subdivide large parcels in the future. This granularity can also cause raise concerns; some may worry that the scenarios represent proposals that are intended to affect specific properties, which is not the purpose.

Census Block Based

Census blocks will vary in size between urban and rural areas in the metropolitan area. In rural or suburban areas where census blocks are larger, there will be less precision and control over design in the scenarios. Smaller census blocks in the urban areas will provide greater design control. The advantage of a census block based approach is the convenient availability of consistent data for all of the metropolitan areas. Additionally, they are familiar to people and large enough to be abstract and avoid any misconceptions that the scenarios contain proposals intended to affect a given persons property.

A census block based example. The San Diego Foundation initiated a regional planning process in early 2011. They utilized census blocks because of consistency, timeliness and data availability.

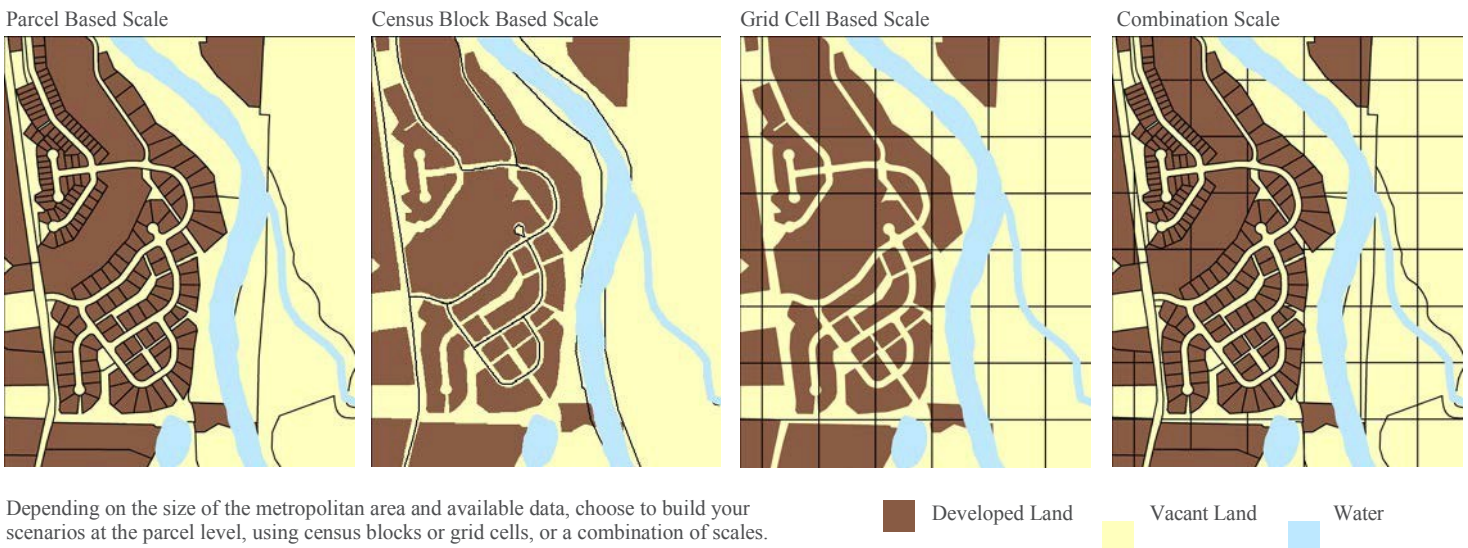
Parcel (or Tax Lot) Based

Scenario planning done at a parcel level provides the most precision in design, particularly in urban areas where parcels are smaller. This requires assessor’s parcel level data, which is available for most counties. However, data quality is highly variable at the parcel level due to variable methods for coding and maintaining data. This is the least abstract of the three methods, as such, it presents potential for overly detailed critiques based on specific designs and concerns that the scenarios represent proposals intended to affect specific properties, which is not the purpose. It could also create over-burdensome scenario creation processes, as the long-term future is too unknown to predict how specific parcels will develop or transform overtime.

Combined Approach

A combination of grid cells, census blocks and parcels, can also be used. This is particularly useful in adding precision in both developed areas with small parcels as well as large undeveloped areas. For instance, if census blocks or parcels are the selected geography these are typically large areas toward the urban edge and more detail may be desired. For example, an

Figure 11: Geographic Scale Options



urban reserve could easily exceed 1,000 acres in size while being comprised of only a small handful of parcels, or even just a portion of one census block. Parcels or large census blocks can be split into smaller polygons, or grid cells in specific locations.

Downtowns, transit areas or main streets provide an example of where a process based on census blocks, or grid cells, may wish to shift to the small ownership parcels typically found in these areas. This extra precision will allow for scenarios to reflect discrete properties based on the knowledge of local planners. This combination of planning units allows for increased precision and greater detail in specific areas.

Figure 12: Options and Considerations for the Geographic Scale of Land Use Sketch Tools. This table illustrates advantages and disadvantages of each approach.

GEOGRAPHIC SCALE/ Level of Detail			
CENSUS BLOCK Coarse or General	GRID CELL Variable Scale	PARCEL Fine or Detailed	COMBINATION Variable Scale
Advantages			
<ul style="list-style-type: none"> • Uses readily available and familiar data • Analysis can be done quickly; allows multiple alternatives to be evaluated 	<ul style="list-style-type: none"> • Uniform detail of analysis • Can be a variety of sizes – depending on need 	<ul style="list-style-type: none"> • Can produce very detailed alternatives and estimates of outcomes 	<ul style="list-style-type: none"> • Provides ability to add precision in specific locations
Disadvantages			
<ul style="list-style-type: none"> • Results are general • Difficult to refine 	<ul style="list-style-type: none"> • Requires work to adapt existing data to match new grid cell boundaries 	<ul style="list-style-type: none"> • Requires more resources to construct and run alternatives • Quality of assessor’s parcel data may vary among jurisdictions • Parcel level discussions can become political 	<ul style="list-style-type: none"> • Requires setup of data at two geographic scales
Best for			
<ul style="list-style-type: none"> • Preliminary analysis or a quick assessment of existing plans • When resources are limited • More detailed data is not available 	<ul style="list-style-type: none"> • Communities where more detailed information is not available • Uncertainty about how scenario planning fits into long-range planning and analysis 	<ul style="list-style-type: none"> • Communities with detailed GIS data and capability • Sketch planning tool or scenario planning will be incorporated into ongoing community planning and analysis 	<ul style="list-style-type: none"> • Areas where there is a mix of large and small census blocks, grid cells, or parcels do not provide the level of precision desired

Example Building Blocks

Example building blocks that can represent different development types in a region.

- Central Business District
- Office District
- Residential District
- Urban Residential District
- Regional Commercial District
- Commercial District
- Neighborhood
- Historic Area
- Urban Transit Corridor
- Regional Corridor
- Main Street
- Urban Neighborhood
- Suburban Neighborhood
- Heavy Industrial
- Light Industrial
- Rural

Developing Building Blocks for Sketch Planning

Sketch planning tools use building blocks that describe the different types of land uses that exist within the metropolitan area or are planned for the future. Each building block is comprised of a mix of different types of buildings along with assumptions about characteristics such as the amount of land devoted to streets, parks, and civic areas. The building blocks represent the places people are familiar with, such as main streets, town centers, and residential neighborhoods. Communities that have engaged in scenario planning have typically used between 10-25 different building blocks depending on the size of the area, and diversity of places within the area. Comprehensive plan land use categories will inform the building blocks. When assembling the building blocks within the sketch planning tool, refer to the comprehensive plans of local jurisdictions for ideas on the types of places that should be represented in the scenarios. The purpose is not to create a category to match every city's comprehensive plan category, but rather a description of all of the places that exist today, and those that may exist in the future. These building blocks should nest within the more general Place Type categories used in the Regional Strategic Planning Model.

Once the building blocks are constructed, they are painted onto the base map of the metropolitan area using the sketch planning tool. Each building block carries with it values that describe the characteristics of the places they represent.

Through a land use sketch planning tool, building blocks are used to estimate likely outcomes, and comprise the foundation of the future land use scenarios used in the Regional Strategic Planning Model and other tools. Baseline data and information about each building block used in the sketch planning tool allows the sketch planning tool to calculate results for many of the evaluation criteria discussed in Step 2. Examples of the outcomes that sketch planning tools estimate include: employment and housing densities, new impervious surface (e.g., rooftops and parking lots), the amount of land developed and redeveloped, total number of parking spaces, mix of housing types, mix of employment types, and if calibrated to local markets, the relative value of new development, along with other measures. Each sketch planning tool handles building blocks a little differently, but their fundamental variables are related to housing and employment densities and urban design. (See the Technical Appendix for more detailed discussion and examples.)

After applying these building blocks across the planning area, for the base conditions and the reference case scenario, household information is extracted from the building blocks, through a conversion process (described later in Step 3, *Preparing the Sketch Planning Results for Analysis with the Regional Strategic Planning Model*) to enable to the model to calculate additional, more detailed evaluation criteria. The scenario produces data that can be transferred to TAZs or census tract-size districts for the Regional Strategic Planning Model, including population, housing units and employment by type. This data can also be used as land use inputs in the more detailed regional travel demand model.

Each building block will be assigned a mix of building types, each having an associated job and housing density. Examples of **building types** include: mixed use residential four- stories, garden apartment, compact single family home, office, main street retail, and business flex. Because building blocks make it possible to measure evaluation criteria that rely on information tied directly to individual buildings and uses, many of the assumptions are built into the individual building spreadsheets (called prototype buildings), which are then linked to the building block spreadsheet and grouped together to form **building blocks**. (Be sure to show the key characteristics of building blocks needed to generate estimates of key outcomes, especially land use and transportation related outcomes, e.g., street network, density, parking.)

Building blocks are primarily used in the land use sketch planning tools to perform the land use analysis. While building blocks themselves do not include measurable transportation characteristics, they are intended

to match or complement specific transportation investments included in the scenario. The transportation design and assumptions serve as a guide so that placement of building blocks is consistent with, and takes advantage of, planned transportation improvements and programs. For example, it may not be highly effective to locate auto-oriented, low-density building blocks in an area of the region where transit investment is already in place or planned. Conversely, it could be effective to place high-density and mixed- use building blocks in areas along transit lines and in areas with well-connected streets. The sketch planning tool itself will not incorporate the transportation infrastructure in delivering its evaluation criteria. The sketch planning tools which produce transportation estimations are based on just a few land use factors such as density, use mix, the connectedness of the street network, and availability of transit service.

The base and reference case scenarios should be based on the financially-constrained transportation network. Assessing various scenarios' performance relative to community goals and budgets can be a productive way to evaluate and prioritize other, non-funded investments, and test plan resilience under alternative futures (e.g., population growth or fuel price forecasts).

Step 3

Developing Building Blocks

These are the basic steps for developing **building blocks**. More details can be found in the Technical Appendix.

Develop prototype buildings:

1. Devise a list or selection of buildings that match or represent the **current and potential future characteristics of the metropolitan area**.
2. Populate the prototype building spreadsheets with **data relating to the physical form, intensity and mix of uses and financial attributes (such as construction costs and sales prices)** if available. This data will be entered for each prototype building.

Group and assemble prototype buildings into building blocks:

3. Select a set or mix of buildings that would likely be found in each building block. Some building blocks will be fairly homogenous. For example, a typical lower density residential neighborhood is likely comprised of four or fewer prototype buildings. Other building blocks, such as urban corridors may require a mix of more than ten types of buildings to adequately represent the range of uses found today, let alone the future.
4. Assign each building a percentage to indicate the portion of the building block that is comprised of each prototype building.
5. Add in net land reductions to account for streets, civic space and parks. The values for these reductions can usually be found in any previous land use capacity developed by the jurisdictions.

Building Types

Key Building Stats	Housing Units	2
	Housing Unit Density	12.9
	Jobs	-
	Job Density	-
	Floor-area Ratio	0.63
	Net Building Square Feet	3422

Site Area	7000 square feet
	0.16 acres
Site Gross-to-net Ratio	1
Landscaping or Open Space	0.36
Building Height	1 stories
Under-build	1

Building Uses	
Residential	Multifamily
	Owner
Market-rate	100%
Affordable	0%
Retail	0%
Office	0%
Industrial	0%
Public	0%
Total	100%

Average Residential Unit Size or Gross Square Footage per Employee by Sector	
Market-rate Residential (Unit Size)	1,650 net square feet/unit
Affordable Residential (Unit Size)	750 net square feet/unit
Retail	1,246 gross square feet/unit
Office	434 gross square feet/unit
Industrial	601 gross square feet/unit



Building Blocks

	Building Type								
		MU Residential 30	MU Residential 15	MU Residential 6	MU Residential 3	Multifamily 15	Multifamily 6	Garden Apartment	Cottage Homes
Building Block	Metropolitan Center	3%	11%	15%	5%	8%	15%	8%	
	Urban Center		6%	20%	10%	6%	15%	10%	3%
	Town Center		2%	10%	10%		10%	22%	9%
	Community Center							35%	20%
	Rural Village								5%
	Multi-Family Residential					5%	10%	37%	10%
	Traditional Neighborhood							12%	15%
	Master Planned Community								
	Single Family Residential								

Recommended Building Blocks

Oregon's metropolitan areas have similar land use patterns. Each region includes a primary downtown area, a number of smaller town or neighborhood centers, and larger single-use areas like residential neighborhoods, commercial strips, industrial areas and parks. Similarly, each of Oregon's metropolitan areas is planning for some newer development types, like transit-oriented developments and mixed-use neighborhoods. The recommended building blocks are suggestions that represent both existing forms of development common in the metropolitan areas of Oregon and new types considered possible over the next 10-20 years. Much more detail about the recommended building blocks (i.e. building types, FAR, number of stories, parking factors, street network, level of transit service or other key characteristics used by sketch planning tools to generate estimates of outcomes) is provided in the Technical Appendix.

Figure 13: Recommended Building Blocks with Corresponding Housing and Employment Densities

PLACE TYPE		BUILDING BLOCK	DWELLING UNITS/ACRE	JOBS/ACRE
Area Type	Development Type	Mixed-Use		
Regional Center	TOD, Mixed High, Mixed	City Center (similar to downtowns in Eugene, Corvallis, Bend, Salem, and Medford)	25-40	60-100
Close in Community	TOD, Mixed High, Mixed	Town Center (similar to downtowns in Ashland and Coburg)	20 -30	30 - 50
Close in Community	TOD	Transit-Oriented Development	30-50	8-10
Close in Community	Mixed	Mixed-Use Neighborhood Center	15 -25	0 - 15
Close in Community	Residential	Town Neighborhood	15-25	0-2
Close in Community	Mixed High, Mixed	Main Streets	15-25	20-30
		Single-Use		
Close in Community	Residential	Compact/Neotraditional Neighborhood	8-9	
Suburban Town	Residential	Single-Family Residential Area	4-7	
Close in Community	Residential	Multi-Family Residential Area	12-24	
Suburban Town	Employment	Strip Commercial		15-35
Suburban Town	Employment	Office Park		25-40
Suburban Town	Employment	Industrial Areas		8-10

SCENARIO PLANNING GUIDELINES

Step 3



Residential Subdivision



Compact/Neotraditional Neighborhood



Strip Commercial



Town Center

Preparing the Sketch Planning Results for Analysis with the Regional Strategic Planning Model

Land Use Model or Tool: An Optional Step

An optional step is to use a market-based land use model, tool, or process to better inform the scenarios developed with the sketch planning tool. These tools use land market conditions and regional transportation accessibilities to influence the location and type of development. As an example, Metro's land use model *MetroScope*, can predict how an area will likely grow given economic realities, which can help to provide a reality check on land uses being developed with the sketch planning tool. Another example is the *Land Use Scenario DeveloperR (LUSDR)* tool, which was used in the Rogue Valley MPO to build and evaluate many plausible future land use scenarios.

Transferring data from a sketch planning tool to the Regional Strategic Planning Model may require some additional post processor formatting and analysis depending on the type of sketch planning tool and the number of the Regional Strategic Planning Model policy areas incorporated into the sketch planning tool interface. Data produced by the sketch planning tool will need to be analyzed and aggregated before entering the data into the Regional Strategic Planning Model. Land use sketch planning tools assign dwelling units to land uses, whereas the Regional Strategic Planning Model is household based. Therefore, the results measured in dwelling units produced by the land use sketch tool need to be translated into households (essentially occupied dwelling units) for use in the Regional Strategic Planning Model. The Regional Strategic Planning Model then generates a synthetic household data set.

For instance, if there are 100 dwelling units in a particular census tract in the sketch planning tool, that data is stored as one record of data. Within the Regional Strategic Planning Model, 100 separate records are created from that one record – one for each of the households, with each household record containing a specific mix of individuals by age, a combined household income, a home of a certain type, etc. The process for analyzing and aggregating the data for transfer between sketch tools and the Regional Strategic Planning Model should include at a minimum a density of households and whether or not it is in a mixed-use environment. The geographic scale of the Regional Strategic Planning Model or a regional travel demand model must be considered when aggregating the sketch planning results to the appropriate geography (e.g., TAZ, census tract, district, county).

A Note on Modeling

An important step in using modeling tools is to calibrate the tool by comparing outputs from the model to other available information. Much time goes into calibrating models such as the Regional Strategic Planning Model to ensure that they accurately estimate likely future conditions. When possible, the results obtained by the sketch model or the Regional Strategic Planning Model should be compared to other known and reliable models. It is unlikely that any two models will deliver the exact same results when making estimations based on different techniques, so any calibration that can bring the results closer together will help provide consistency.

Step 3

Additionally, land use sketch planning tools (and the Regional Strategic Planning Model) offer the ability to estimate a range of other benefits and outcomes. Most land use sketch models use national or state level studies or information to estimate different factors. Local planners are encouraged to review the data in the model and, where appropriate, substitute available local data. For example, most local governments have access to detailed information about average household water and building energy consumption that should be gathered to calibrate these model components. For example, water bureau data can be categorized by type of use by combining consumption data and land use data together. Other items such as building energy consumption may require further research, factoring in variables such as climate patterns, construction types and consumption data from the local utility. Calibration for some of the measures that can be tracked falls beyond the expertise of most planning professionals. Accordingly, it may be necessary to consult with experts from the fields in question.

Conclusion

This step of the scenario planning process involved selecting the tools and assembling the data to be used in succeeding steps to develop and evaluate alternative scenarios. Deciding which combination of tools to use depends on the data and resources available, and how scenario planning fits with other local and regional planning work. The Regional Strategic Planning Model (developed by ODOT) provides metropolitan areas with a powerful tool to evaluate the outcomes of a broad range of regional policy actions from a transportation-perspective, is recommended. Land use sketch planning tools enable local planners to construct and evaluate detailed land use and transportation options, based on compilation of detailed information about local conditions and construction of data from a detailed land use perspective. With these tools in place, local planners can use them in Step 4 to quantify existing conditions and estimate the likely result of currently adopted plans in relation to community goals and values, including GHG reduction targets.



Step 4

Step 4: Develop and Evaluate Base Year Conditions and a Reference Case

Summary

Before a metropolitan area develops and evaluates alternative scenarios for its future, it is important to understand existing conditions and the likely outcomes of its currently adopted plans. In this step, information about existing or recent conditions in the planning area are compiled to create a base year conditions report. Growth forecasts from existing plans are then added to the base year conditions to develop a “reference case” for the selected planning period. Key products of this step are a technical report and outreach documents, such as a report card. They show both performance today and how well current plans are expected to perform in achieving various objectives, including reducing GHG emissions, by the end of the planning period. The development and evaluation of the base year conditions and the reference case are useful for engaging decision-makers, advisory committees, and the public in discussions about potential strategies for the future that meet the region’s values and vision, which would be tested later in the alternative scenarios.

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Preview

Scenario planning starts with developing an understanding of current conditions, or “where the metropolitan area is today,” and then evaluating the likely results of existing adopted plans and policies in a reference case. Use of the Regional Strategic Planning Model to perform an early high-level baseline assessment is recommended before embarking on a more detailed analysis utilizing a land sketch planning tool.

The **base year conditions** (or current conditions) are the conditions that exist in the metropolitan area in the base year (determined as part of Step 3), including factors related to population, employment, mix of land uses, transportation system, travel patterns, infrastructure, etc. This step involves assembling the information about base year conditions and building a base year conditions report as the benchmark for comparison with the reference case and alternative future scenarios. Using the data and information collected in Step 3, a base year can be described and modeled in the Regional Strategic Planning Model. The results of the Regional Strategic Planning Model analysis will provide a benchmark accounting of today’s transportation behavior and GHG emissions.

The **reference case** is the default or starting point for developing future scenarios. It is an estimate of where **current adopted land use and transportation plans** are likely to lead the metropolitan area over the selected long-term planning period.

Baseline assumptions include assumptions about future conditions likely to affect people’s travel habits. These include estimates about the price of gasoline, forecasts about future vehicle technologies, and estimates about expected state and federal policies and programs, including state and federal funding for transportation.

Using the Regional Strategic Planning Model initially, and later a sketch planning tool, along with the associated data developed in Step 3, the conditions in the base year scenario and the outcomes of the reference case at the end of the planning period will be estimated. The process will include the use of evaluation measures (identified in Step 2) that indicate how well the metropolitan area is doing – and is expected to do in the future – in terms of household transportation costs, travel delay, amount of open space, and GHG reduction, for example. This information can be presented to the community as a **report card**. This report card provides an opportunity to engage stakeholders in a discussion about where the community is heading based on current trends, and identify key issues or problems that the community may want to explore further.

Base Year Conditions

A crucial element of scenario planning is estimating a metropolitan area's base year conditions, which provides a known reference point. As discussed in Step 3, the recommended base year is 2010, unless more current comprehensive data are available. Because of today's rich data availability and variety of state-of-the-art technical tools, we can better understand, visualize and evaluate existing conditions. Measuring what conditions are like today (in the agreed upon base year) makes it possible to describe the future in comparative terms that make sense to people.

Build the Base Year Conditions

Oregon's metropolitan areas have a wealth of data available related to housing units, households, commercial uses, employment and existing transportation networks. Due to the availability of data the recommended base year of 2010, although a 2005 year is needed to evaluate against the state GHG reduction targets. Unless a different base year was selected in Step 3. These datasets form the backbone of defining the base year conditions. However, this data needs to be organized and translated by the user first to be entered into a sketch planning tool. Use of the sketch planning tool then allows for a visual representation of the base conditions. The result is an accurate, realistic and visually displayed base year. This virtual present is now in a format that can be easily compared to the reference case and future alternative scenarios built in Step 5.

To build base year conditions for use with a sketch planning tool, or other GIS-based methods, translate what is on the ground in the adopted base year into a GIS layer by applying the building blocks described in Step 3. Paint the building blocks on the GIS base layer in the sketch planning tool by matching the building block types as closely as possible to the existing land use on the ground, that existed in the base year. The process can be automated by simply assigning building blocks based on comprehensive plan designations and TAZ numbers.

At this point, select either an automated or manual input method depending on needs and time requirements. Although the automated method can be refined and adjusted, the manual method is typically more accurate, but significantly more time consuming. Each of these methods is explained in further detail in the sidebar to the right and the Technical Appendix. This base year provides a distribution of housing and jobs that will serve as the base upon which future housing and jobs are added to form land use scenarios.

Understand Base Year Conditions

Once the base year conditions have been compiled, the next task is to analyze them. Documenting the base year conditions provides a point of reference for comparing future conditions in the reference case and in any alternative future scenarios developed later. Results of the analysis will include the outputs of the Regional Strategic Planning Model, the sketch planning tool and any other models used. For example, by documenting how many miles the average household traveled in the base year, the evaluation of future scenarios can report how much more or less households are expected to travel in the future planning year.

Input Methods for Building the Base Year Conditions for Land Use Sketch Tools

The automated method relies on calculations within GIS to create the base year. First, each planning unit needs to be assigned with one of the building block designations developed in Step 3. The recommended method is to assign each planning unit with the comprehensive plan designation for which it is spatially co-located. Then, make a list of all possible current plan designations and assign each planning unit the building block that most closely matches its plan designation. The second step is to assign the number of households or jobs to the planning unit. This is done by prorating the number of units known to exist within TAZs or census blocks based on the relative densities of the building blocks. The resulting GIS scenario will likely not compare exactly when looking at an individual parcel, but the numbers of jobs or households will match the control total of the parent geography, be it TAZ or census block. While the precision may be reduced from the level of data available at the parcel level, this step allows for a consistent comparison of the base year against future scenarios.

For the manual method a user will manually assign building blocks to planning units by making the best assessment of which building block is most similar to existing conditions. As planning units are assigned with building blocks, the corresponding jobs and housing units are also assigned. The user will need to be sure to keep the total jobs and housing within each TAZ or census block consistent with the source data.

Using the Regional Strategic Planning Model to Model GHG Reductions

ODOT created GreenSTEP to help estimate GHG outcomes of different policy choices for the state, and developed the Regional Strategic Planning Model, a refined version of the model for metropolitan areas. Portland, Eugene-Springfield, Corvallis, and the Rogue Valley in Oregon have used the Regional Strategic Planning Model in their long range scenario planning efforts, including evaluation to the state-set GHG reduction targets.

The Regional Strategic Planning Model was created in part because existing land use and transportation models were not capable of analyzing GHG emissions and the policy levers that affect GHG emissions. The Regional Strategic Planning Model:

- Evaluates a large number of different policies and other factors on GHG emissions such as land use, transportation, prices, vehicle characteristics, and fuels.
- Evaluates interactions between factors: e.g., density > vehicle ownership > vehicle travel.
- Includes modeling components that can be combined with other models, statewide and urban, for estimating GHG emissions.

Reference Case

The reference case builds from the base year conditions to forecast how today's plans and policies are likely to play out in the future planning year. The reference case will reflect future development consistent with current local comprehensive plans.

The reference case developed with the Regional Strategic Planning Model will show the likely results of current plans on the evaluation criteria in the future planning year. The reference case expressed through the sketch planning tool illustrates future conditions based on comprehensive plans, using the population and employment allocations included in the adopted Regional Transportation Plan (RTP).

Build the Reference Case *Regional Strategic Planning Model*

The initial run of the Regional Strategic Planning Model, described in Step 3, painted a general picture of where the metropolitan area may be in the future planning year based on various policies. The approach used in Metro's Climate Smart Communities initiative was an initial Regional Strategic Planning Model base future scenario, as well as alternative future scenarios based on staff-developed variations designed to see how outcomes might vary if anticipated vehicle and fuel technology changes occur at a different rates than expected.

The Regional Strategic Planning Model was built with detailed assumptions about state and federal policies and assumptions expected to be in place over the planning period, as described in Step 3 and the Technical Appendix. The Regional Strategic Planning Model accounts for the combined effect of all these factors to estimate a series of transportation related outcomes, including GHG emissions.

Future Land Uses

As described in Step 3, a land use sketch planning tool can be used to create the reference case by assigning building blocks based on planned land uses for each specific sub-area or planning unit (i.e. census block, grid cell, parcel etc.). Sources for the growth numbers within the RTP, and subsequently the reference case, should come from adopted comprehensive plans and the county coordinated population forecast. The sketch planning tool reference case provides evaluation of future conditions based on a variety of land use evaluation criteria established in Step 2.

The TAZ employment and household allocations from the RTP provide the recommended starting point for the reference case. It is important to make sure that housing and employment assigned to each TAZ correspond with the assignments in the RTP – this assures that the sketch tool version of the reference case is consistent with the RTP (and the comprehensive plan). This process can be automated, just as in the development of the base year conditions, by assigning building blocks based on comprehensive plan designation and distributing growth proportionately by TAZ to planning units assigned with growth. For greater precision, current plans can be used as a guide to manually assign building blocks to individual planning units with developable land until the future household and employment totals within the TAZs in the RTP scenario are reached.

Following the initial run of the Regional Strategic Planning Model, staff with modeling and programming experience can import the reference case land use data from the land use sketch planning tool into the Regional Strategic Planning Model.

Future Transportation Network

In order to represent the metropolitan area’s planned future transportation network, including road and transit improvements, the base year conditions and reference cases should be calibrated to the financially constrained network from the currently adopted RTP. The data to develop the base map was collected in Step 3. The future network may be different than the current network and therefore will require modifying the transportation network based on current plans or the RTP, such as calling for increased funding for transit. If so, the transportation network used in the reference case and alternative scenarios should reflect those adopted plans.

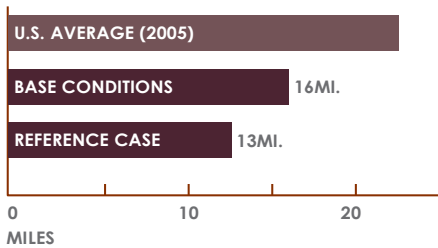
The transportation network will be employed in several ways during scenario planning.

- *It will act as a backdrop to guide scenario design in Step 5 such that potential land uses can be directed to areas with the appropriate amount and types of transportation investments.*
- *Distance to transit and intersection density can be used by sketch models and Regional Strategic Planning Model place types to estimate travel behavior.*
- *It will be utilized by the travel demand model, if that additional step is taken.*

Evaluating the Reference Case Against Base Year Conditions

Vehicle miles traveled and percent of housing units in mixed-use areas are two examples of evaluation criteria that you may choose to consider. Graphics like these can also be useful during the following public engagement phase to help people visualize the comparison.

VEHICLE MILES TRAVELED PER PERSON PER DAY



Evaluate the Reference Case

Performance of the reference case is evaluated initially using outputs from the Regional Strategic Planning Model and subsequent outputs from the sketch planning tool. The recommended approach for applying these two tools together involves three analysis phases. First, conduct a high-level baseline assessment with the Regional Strategic Planning Model. Second, develop detailed scenarios with a sketch planning tool. And third, further evaluate the scenarios by running the Regional Strategic Planning Model a second time. (Each of these phases is described further in Step 3.) The outcomes of the reference case should be organized and interpreted based on the metropolitan area's own evaluation criteria and other community objectives.

The evaluation criteria do not necessarily focus on goals or targets, but on results described in quantifiable terms that provide a basis for comparing outcomes of different scenarios. These evaluation criteria may include jobs to housing balance, vehicle miles traveled, land consumption, housing and jobs mix and GHG emissions. For instance, when measuring congestion and emissions, it is generally considered that lower is better. Housing split, however, has no proscribed target and the goal may vary among jurisdictions.

Comparing the reference case to the base case, using a consistent set of evaluation criteria from Step 2, will provide important perspective for community residents and stakeholders in understanding the magnitude of the changes anticipated. Evaluating the reference case in this way will answer the important question of where the metropolitan area is likely headed in terms of community objectives, including GHG emissions reduction.

The activities leading to this evaluation task have focused on setting up models and tools, gathering data and scenario development. The evaluation of the base and reference cases provides the first set of answers to the overarching questions about how the metropolitan area is doing and where things are headed based on current plans. A wealth of evaluation data will have been produced. Some results will be expected, while others may come as a surprise. With this new information the project enters a new phase – sharing the numbers from the evaluation among staff, elected officials and with community members.

Share the Base Year Conditions Report and Reference Case Evaluation

The outcomes of Step 4 can be used to tell a story about the community's future based on current trends. This task now involves communicating that information in a compelling manner. The evaluation criteria provided a way to evaluate the performance of that scenario. The next step is to engage the community in a dialogue and lay the groundwork for developing alternative scenarios.

Technical Report and Presentation

A technical report can represent the work done in Steps 1 through 4, including the evaluation of the base year and expected performance of the reference case scenario in addressing the evaluation criteria and the adopted GHG reduction targets. The report should describe the scenario process used, illustrate the base conditions and reference case scenario, and include a detailed assessment of how the base conditions and reference case scenario performed against the evaluation criteria.

In particular, the report should identify techniques that may help the community achieve its community values and goals (as described by the guiding principles and the evaluation criteria) and lead to measurable achievement of community goals. These techniques would be tested in Step 5. The outputs of the Regional Strategic Planning Model are used here to identify potential land use, transportation, economic, and environmental policy options that seem to be working, or are not working as expected. Outputs include estimates of vehicle ownership, travel by mode, fuel consumption, travel costs, congestion, and GHG emissions at the individual household level. This information will be useful in engaging people in dialogue, and in the development of the alternative scenarios in Step 5.

Presenting this information in a manner that translates the technical findings into everyday language and concepts is an important task: doing this effectively will help illuminate choices for the public and decision makers. A report card can also be an effective tool to summarize and convert complex technical information into meaningful communication material.

Customize the Public Engagement Process

As described in Step 1, this could be a point in the process for involved stakeholders and agencies to take stock, regroup, and consider modifying the work plan based on what has been learned through Step 4. Up until now the work has been technical research and these results from Step 4 can be used to get people excited and invested in Step 5 where the process extends past technical research.

Some metropolitan areas may have chosen to develop a workplan to get to this point without any specific types of public engagement efforts planned past Step 4. This is the time to decide on the most effective and appropriate methods for engaging and learning from stakeholders and the public.

Public Engagement Materials

At this point in the scenario planning process, a realistic portrayal of what the future may hold based on the plans and practices of today should have emerged. For many people, it will be the first time they will have seen estimates about how their communities might be different in the future and how it might affect them in their daily lives, such as the amount of money they will spend on housing and transportation or how future growth patterns may affect nearby farms, forests and open spaces.

The analysis and lessons learned in this step should form the basis of a public engagement effort that occurs for the most part in Step 5. To create a report card, the guiding principles established in Step 1 should be used to help group the findings in ways that will resonate with the community. From the analysis of the base year conditions and reference case, capture the messages that link to the guiding principles. The results of the evaluation criteria can then be reframed into a more useful communications tool and utilized to excite people for alternative scenario development in Step 5.

RELATING THE GUIDING PRINCIPLES

Sharing Key Results with the Public in a Report Card

The following example guiding principles and evaluation criteria were identified in Step 2. A report card can show the types of measures and information that may be useful and interesting to the public and still based on the evaluation criteria.

Guiding Principle Example #1:

The transportation network should ensure efficient and cost effective movement of goods and people.

Associated Evaluation Criteria:

- Vehicle miles traveled per capita
- Average trip time
- Vehicle hours under congestion or vehicle hours of delay regionwide
- Amount of new development located within proximity of transit
- Average speed by travel mode
- Cost of transportation improvements and maintenance

Report Card:

- Average fuel cost savings per household

Guiding Principle Example #2:

The transportation network will ensure safe and timely access to housing, jobs, shopping, services, and recreation.

Associated Evaluation Criteria:

- Number of people with 20-minute access to employment centers
- Average trip time
- Vehicle hours under congestion or vehicle hours of delay
- Amount of new development located within proximity of transit
- Total time traveled per capita, by travel mode

Report Card:

- Average Annual Daily Vehicle Miles Traveled (AADVMT)
- Percentage of households within walking distance (¼ to ½ mile) of a transit stop.

Guiding Principle Example #3:

The metropolitan region promotes a full-range of housing types to fit every income, household and preference.

Associated Evaluation Criteria:

- Housing mix by type
- Housing tenure
- Housing affordability by income level
- Housing costs

Report Card:

- Percentage of each type of housing
- Number of new units affordable to median income
- Average cost of new housing

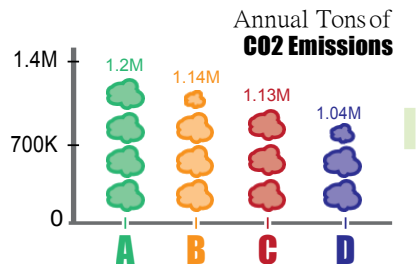
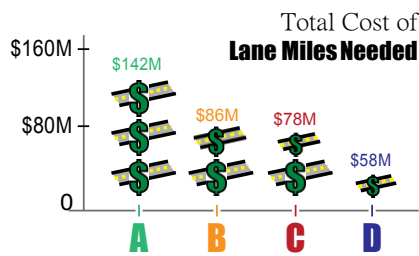
While the technical report should describe all of evaluation measures employed, a smaller set of evaluations can be used during public engagement, either by consolidating concepts or by drawing out the issues of most interest. There is no magic number of measures that should be presented in the report card. Rather, the task involves selecting key results from the analysis which can be interesting and helpful in making the process meaningful to the public.

COMMUNICATING THE RESULTS WITH A REPORT CARD

A report card can be an effective tool to distill complex technical information into easy to understand graphics. These graphics used in the report card from the Grand Traverse Vision in Michigan helped the public understand the tradeoffs between scenarios.

Transportation Indicators

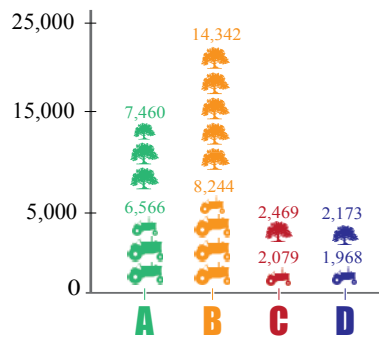
The following charts show each scenario's performance relating to getting around the region.



Land Use and Housing Indicators

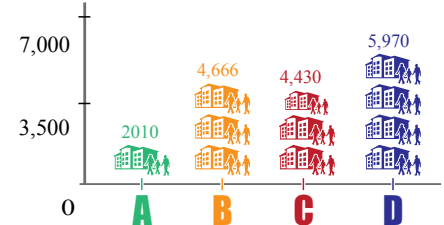
The following charts show each scenario's performance relating to land consumption, housing choices and walkable neighborhoods.

Acres of Farm and Forest

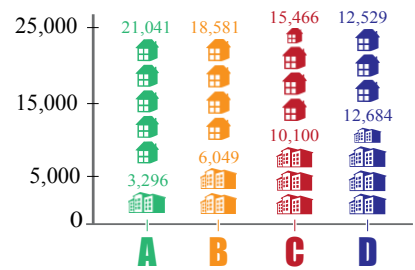


New Housing Units in Walkable Areas

Walkable Areas = mixed use and



New Homes and Multifamily Units



Three Part Approach to Assembling Materials for Use in Discussions with Board or Advisory Group or a Full Public Engagement Process

The level of detail addressed in the approach described below will vary depending on the evaluation processes chosen. If only the initial baseline assessment has been completed to this point, the land use and transportation system results will be relatively general and likely shown in tables, charts, and graphs. If a more detailed process has been utilized, then the land use and transportation network results will be more detailed and likely shown on maps, as well as tables, charts, and graphs.

1. Describe where the metropolitan area is today. In particular, the results of the base year conditions analysis should be communicated in terms that resonate with the community, such as the cost of housing and transportation. People are curious to learn more about the place they love and call home including some comparisons with other places may help to draw the reader into the materials

2. Describe the region's possible future based on current plans and policies. The reference case should be communicated using narrative and data from the report card that will resonate at the individual level, along with illustrative visualizations and graphics. The report should highlight major findings about future conditions likely to be different than those people experience today. The objective is to help community members understand and visualize the likely outcomes

of existing plans. It will help them recognize the value of their participation, especially if they see issues they will want addressed or further considered as part of alternative scenarios.

3. Encourage the community's feedback related to future direction. The scenario planning process will have the most potential to bring positive results to the metropolitan area if the public and stakeholders are actively engaged. The Step 4 analysis, when shared in an engaging fashion will be highly useful in bringing participants into the process. A newfound understanding of what the future may hold presents a key opportunity for members of the public, and elected officials, to think about how policy decisions made today and tomorrow could impact the community and their lives over the next 20-25 years.

The Technical Appendix contains details and examples of these techniques and others appropriate to this step. The Greenhouse Gas Reduction Toolkit Communications Guide provides best practices for communicating around GHG related issues.

Conclusion

Development of the base case and the reference case provides a key starting point for stakeholder and public dialogue to consider options for the future. Documenting base year conditions gives the decision-makers and the public a clear picture of current conditions, which provides a convenient yardstick for assessing whether things are likely to get better or worse in the future – either in the reference case or in the different alternative scenarios that are developed in the next step. Using the Regional Strategic Planning Model in the beginning to perform a high-level assessment, and then using the more detailed sketch planning tools later to evaluate the reference case, also provides important new information by estimating the likely outcomes from existing adopted plans. With this information in hand, communities are positioned to take the next step – considering ways land use and transportation plans and policies might be changed to create a better future for the community.



Step 5: Develop and Evaluate Alternative Scenarios

Summary

Step 5 is the essence of scenario planning: engaging the public, stakeholders and decision-makers in a broad public discussion about different options for the area’s future. Involving the public is critical to evaluating the pluses and minuses of different choices, and identifying realistic options. This step also invites the community to consider how changing economics, demographics and social conditions affect the community’s prospects and options for the future. Finally, public involvement in evaluating a range of choices sets the stage for developing and selecting a preferred scenario in Step 6 that best achieves community goals and objectives.

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Preview

Step 5 of the scenario planning process involves developing and evaluating **alternative scenarios** to better understand the long-term results of a variety of different policy decisions and assumptions, as well as to test **land use and transportation strategies** known to reduce GHG emissions from light vehicles. These alternative scenarios are evaluated and compared against each other, and against the reference case developed in Step 4. Such alternative scenarios allow testing of policy options such as adjusting land use allocations and codes, different transportation investments, expanded bicycle and pedestrian programs, and other possible changes, to evaluate their effectiveness and feasibility based on issues most important to the community. The Regional Strategic Planning Model can be used to perform a baseline assessment of potential alternative scenarios before embarking on a more detailed analysis utilizing a land use sketch planning tool. In this step, alternatives go from a theoretical discussion of themes that address the needs and interests of the community to the actual testing of specific policy choices through evaluation of alternative scenarios. This step also describes how **public engagement** can assist in developing themes and methods to compare the effects of different strategies and policy choices.

Public Engagement

At the close of Step 4, the *Guidelines* recommended ideas for presenting the base year conditions and the reference case to the public. The goal was to inform the public about the findings and to consult with them about what should come next. The results of that conversation set the stage for this step: developing alternative scenarios. At this point, a preliminary run of the Regional Strategic Planning Model can be used to assess a wide range of scenario theme options, which can inform to help make decisions about selecting alternative scenarios, before embarking on a more detailed and time consuming process.

During the creation of alternative scenarios, public and stakeholder engagement should take a prominent role and feed directly into the scenario building process. Elected officials can play a role in the process at this time as well. Through work sessions, they can help to develop scenario concepts, review concepts generated through public workshops, or both. They should also be called upon during this step to help bring stakeholders to the table. Their involvement will help to lend an air of legitimacy to the process in the eyes of their constituents.

Creation of several different alternative scenarios is a key point in the process, and public involvement is important. People care about their neighborhoods and their community's future, and typically have strong feelings about what they would like that future to be. Therefore, it is important they have a role in designing the choices to be considered. Building public understanding ensures that participants have a common frame of reference and understand what is in current plans and policies. An expanded understanding of existing plans and their likely outcomes also helps those involved formulate and evaluate options.

Scenario creation is one of the high points of the entire scenario planning process. With the report card in hand, the public and stakeholders are provided with valuable insight on what the future may hold. The ability for potential participants to help reshape, or even confirm some of those expected outcomes, can provide a powerful motivation for their involvement.

The important public engagement goal of this step is to solicit ideas from the community that would be useful in building scenarios of the future. This input can be informed by the evaluation of the base conditions and reference case presented in the report card from Step 4. To begin the

Metro's Climate Smart Communities

Metro's Climate Smart Communities project described their Phase I work as "understanding choices". During that phase, Metro staff primarily worked with Metro's regionally elected and appointed bodies by keeping them informed and consulting with them as they worked through the Regional Strategic Planning Model. As Phase I drew to a close, Metro council members, supported by staff, conducted individual briefings with jurisdictions and key stakeholders.

Phase 2 of the project focused on shaping the choices to combine the most effective strategies to define three alternative scenarios that could achieve community and regional goals. The work plan called for working closely with local governments, community leaders and other partners to identify scenario options to be tested and outcomes to be evaluated in Phase 3. Partnering and engagement activities included convening stakeholder workshops, participating in speaking engagements, one-on-one briefings of local elected and community leaders, gathering input from on-line public surveys, and keeping the general public informed through a project website, newsfeeds and media. The engagement activities were aimed at building consensus, ownership and support for the project and the strategies developed and selected in Phase 3 of the project. Building a strong coalition among local, state and regional partners was critical to successful implementation of the region's strategy.

conversation about what the region could do to improve the future, the public should be given an opportunity to convey their visions for the region by providing input on policies, actions and programs that should be tested in the scenarios. Step 2 identified values and guiding principles for the communities in the metropolitan area that should also be used to inform the selection of themes for scenarios.

Two examples of public engagement at this stage in a scenario planning effort are summarized below. A full-fledged engagement effort involving the community can draw from a menu of options described in more detail in the Technical Appendix.

Workshops and Public Meetings

The purpose of public engagement at this step is to collect ideas that can be used to refine the initial set of scenarios or develop one or more new scenarios. The public will learn even more about the scenario planning process, and become invested in the outcomes. Participants will most likely identify, in the scenarios, and the preferred scenario discussions in Step 6, the ideas brought forth from these meetings. This awareness can further help the process through increased ownership of the outcomes.



Public Involvement in the Corvallis MPO

In a series of public workshops in the Corvallis region, community members were given a chance to envision the future of the region using a variety of development types. On large interactive maps of the Corvallis region, participants were asked to place specific building block chips to tell planners both the locations for new growth they would support, and what types of densities of jobs and housing were desired. These workshops provided insight about the values and preferences of the region, which were used in the MPO's development of detailed scenarios for testing.

www.corvallisareampo.org

Step 5



It is important for workshops to be interesting and allow the public to grapple with trade-offs, sharing what they learned with other community members.

The challenge is to design engagement activities that nurture awareness and ownership of the process, and still fit within budgeted funds and staff resources. Expenses and staff time can be managed by limiting the number of events and using low-cost, yet effective outreach technologies such as interactive polling. (For more information about cost-effective outreach strategies, see the Step-by-Step Public Involvement section of the Technical Appendix.)

Most of Oregon's metropolitan areas should be able to garner quality input with one or two centrally located workshops and/or meetings. Occasionally, additional meetings may be necessary for specific subareas where significant changes may be occurring, or to involve specific interest groups such as minority communities, business people, students, and other stakeholders. However, it is important to avoid hosting too many events in order to manage costs as well as to ensure as large as possible turn-outs for each single event. Too few interested participants make it difficult to achieve the sort of critical mass necessary for creative thinking.

The public engagement plan developed in Step 1 should be revisited at this time to ensure that the planned efforts and activities will reach key audiences and provide the kind of information stakeholders need in order to understand the scenarios and provide meaningful input. Consider potential issues, such as:

1. *What new information is available about the community's likely future that would trigger public interest or concern? How well do existing plans help the community achieve the guiding principles identified in Step 2? What was learned from the development and evaluation of the base year conditions and reference case in Step 4? Examining the reference case in light of the guiding principles from Step 2 may provide valuable insight into what types of issues the public will want to work on.*
2. *Has the project schedule shifted? Public engagement is most effective during the school year, minus the winter holiday season. If schedules have shifted, it may be worth reconsidering the scheduling of public events.*
3. *Are people ready to engage in a workshop? Gauge responses from previous meetings, correspondence and website visits to get an idea of what sort of turnout is likely. Also, look at who has participated thus far to see if your plan may need to change in order to reach across the entire metropolitan area.*

Map-based or computer-based scenario workshops produce data that can be used to inform the construction of the alternative scenarios. It is important for these workshops to be interesting and allow the public to grapple with trade-offs, sharing what they learned with other community members. Following are three sample workshop styles that could be employed as part of the public engagement process to develop alternative scenarios. For more information please refer to the Technical Appendix.

Map-Based Workshops

Providing maps, data, and information to the public can be extremely effective in producing innovative ideas and analysis. Workshops challenge participants with the task of deciding where new growth should and should not occur, the general urban form that new growth should take, and the type of transportation systems needed to serve it.

Introduce the workshop with a presentation updating the public on the scenario planning process to date: a brief overview of the research and methods used to develop the base and reference case scenarios and a summary of the results of the reference case scenario. As discussed in Step 4, these should be presented in a way that connects with the audience. For instance, instead of average VMT per capita, present the data as average household spending on gasoline, or time spent in traffic.

Ask attendees working in small groups to sketch their visions for the future on sample maps, considering the trade-offs related to population growth and transportation infrastructure in different areas given environmental, institutional, and other constraints. The maps serve as the participants' canvas where they can experiment with placing stickers matching the selected building blocks. At the end of the map exercise, a representative from each group presents the group's findings, and common themes become evident from the whole group. Workshops should be highly-interactive and exciting, with the results analyzed and publicized throughout the region. Detailed instructions on developing a workshop agenda and digitizing workshop results are included in the Technical Appendix.

Envision Tualatin Tomorrow In early 2007, Tualatin completed a city-led, community-wide visioning process. The process featured ongoing communications with community members which helped build project momentum and increased the number of citizens participating. Checking in with the community at key points in the process ensured that community values and issues were well understood, refined and confirmed. As part of its promise to maintain a "living" action plan, a plan update was completed in 2013. Through forums, online surveys, work groups and other outreach activities, more than 1,000 people shared their suggestions and priorities for Tualatin's future. Four "theme teams" were convened to sort through ideas and develop a new round of actions to advance the community vision. The City Council adopted the updated Action Plan which provides a 100-action road map for tackling community goals. www.tualatinoregon.gov/tualatintomorrow

Step 5

Computer-Based Workshops

The computer-based workshop is based on the idea of the map-based workshop, but uses a computer as an additional tool. The participants interact with a user interface that enters the information on a computer. This allows for some real time analysis of the ideas being shared by the public.

Real time evaluation offers participants almost instant feedback on key indicators while they are developing the scenario. Participants can then adjust their scenario as they go. This process is not only useful feedback for the scenario builders, but educational for the public.

However, computer-based workshops introduce more technological complexity. A computer is needed for each table in the workshop, and a large display is needed so all the participants can see the results.

Nevertheless, this process has been done many times over the last decade with good results. As technology improves, a touch screen tablet could replace the maps and provide instant feedback for scenario development. (Details and examples can be found in the Technical Appendix.)

Online Scenario Building

Online scenario building tools are web-based and allow members of the public to experiment with different trade-offs and see the results instantly. These online tools are an effective way to give the general public easy access to information about the issues and choices being addressed through scenario planning. The public can “turn the policy knobs” for themselves and see the likely results.

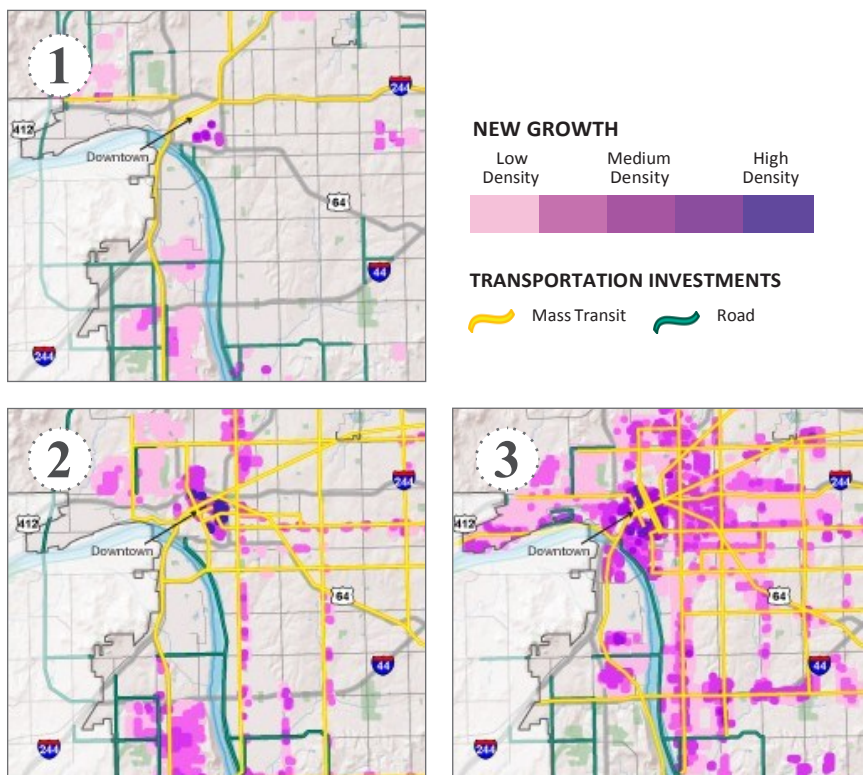
Develop Alternative Scenarios

After conducting public engagement, the ideas and concepts that emerged should be compiled and summarized to begin identifying themes for use in designing scenarios. Even though alternative scenarios can be developed in a short time, the number of alternatives that can be developed depends on resources and the complexity of the selected scenario themes. Too many scenarios may make the differences between each difficult to understand, and too few scenarios may not present sufficient options for stakeholders.

Alternative Scenario Themes

The theme of a scenario is the basis, or focus, of its design. Themes can range from recent trends to modifications of the reference case (like improving jobs-to-housing balance), to those based on specific drivers (like housing or economic development forecasts). The selected scenario themes should be as distinct as possible, so that the choices defining each scenario are clear, and the differences between them can be easily distinguished. Alternative scenarios that push the limits of a particular policy option or theme should be considered.

Figure 14: Example: Alternative Scenarios for Tulsa, Oklahoma



SCENARIO MAPS

What Does a Land Use and Transportation Scenario Look Like?

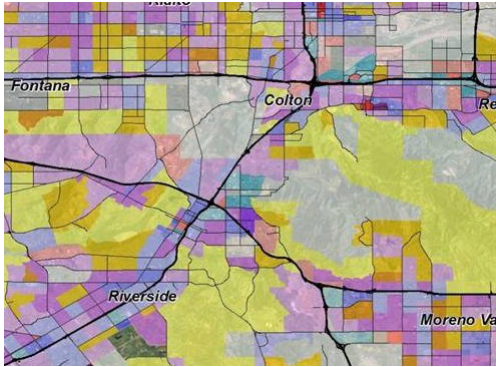
A scenario map shows where future growth and investment could occur. This series of scenarios for Tulsa, Oklahoma, modeled alternative futures based on different growth and transportation patterns; 1. Trends Continue 2. New Communities and 3. Centered City.

Because a scenario is based on characteristics of development, scenario maps can visually articulate how a change today can have a big impact in the future. For example, the amount of surface parking required for a retail store may seem like a minor issue at the neighborhood scale, but over time and across the city, the amount of land consumed just by surface parking lots can be enormous. By adjusting specific requirements a community can simulate and then evaluate the impact of any number of policy choices.

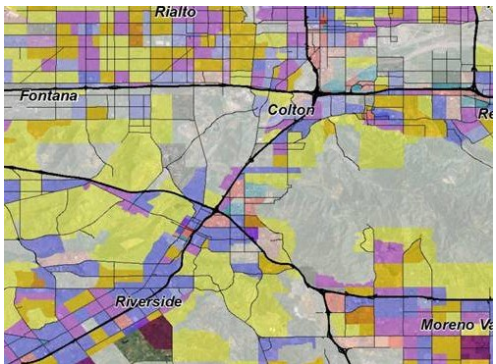
Step 5

Figure 15: Example: Alternative Scenarios for San Bernadino, California Using a Variety of Scenario Themes

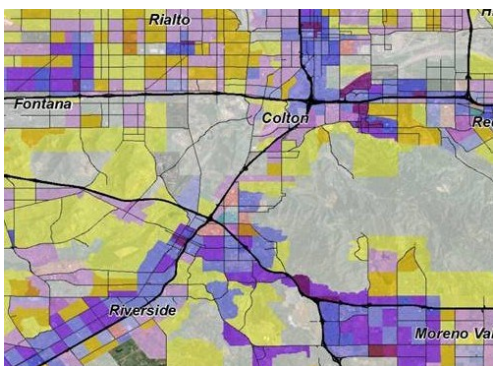
Reference Case



Mixed-Use District Focus



Transit Priority Focus



The purpose of alternative scenarios is to illustrate differences between possible choices. This is especially important if the metropolitan area is not rapidly growing. It may be that 75% or more of the jobs and housing in the planning year were already on the ground at the time of the base case. Subtle changes in housing styles or lot sizes for example, may not significantly “move the needle” on the evaluation criteria results since only a minority of the population would be able to take advantage of new housing options. Scenarios, at this point, are not specific proposals for how plans might be changed, they illustrate the range of possible outcomes and inform selection of a preferred alternative.

Below are some scenario themes to use for guidance. This is not an exhaustive list, nor do these themes need to remain segregated. For example, testing increases to infill housing could be in a scenario based on recent trends, and also one aimed at examining land use practices shown to reduce GHG emissions.

Refine the Reference Case as a Scenario

One strategy is to refine the reference case scenario to improve scenario performance (within the current comprehensive plan designations). Some of the key considerations include:

- *Adopted comprehensive plans and zoning often allow for a wide range of possible land uses. Most commercial or multifamily areas allow for higher densities than typically occur.*
- *RTP employment and housing distributions may assume recent trends and not future behavior patterns.*
- *Changes to economic conditions may result in different growth patterns. For example, many general commercial designations allow housing, offices or shopping.*
- *There may be sub-area plans for areas such as downtowns or new neighborhood plans which more precisely spell out the implementation of the comprehensive plan.*
- *Major employers and developers may have plans based on their expectation of the market within the metropolitan area. Consultations could provide insight into both likely market changes and preferences for future housing styles.*

The considerations above point out that many times within a plan's parameters, assumptions or estimates about likely densities and uses can be changed, certain areas not developed, and transportation packages changed, without a major comprehensive plan change. A scenario based on strategies that could be accomplished within the parameters of the existing comprehensive plan, and does not require changes to adopted comprehensive plans or zoning maps will likely be easier to implement.

Recent Trends

The reference case scenario, developed in Step 4 represents the future as depicted by local plans. However, since current trends may be diverging from the planned future, a scenario theme may also be based on recent trends. For example, a plan may call for extensive infill of jobs and housing in a metropolitan area's core, while recent trends may indicate most development is occurring on the edge of the metropolitan area. It could be helpful to develop this scenario to find out what the effects of outward growth may be.

Land Use Changes

A scenario such as this would be based on the premise that the transportation system and other policy tools remain the same as in the baseline assumptions. The purpose is to answer the question, "What is the most the metropolitan area could get from land use changes alone?" The Southern California Association of Governments, southern California's MPO, is engaged in a scenario planning process to estimate the potential GHG emissions benefits from a variety of land use strategies.

Metro's Urban Growth Report

Metro's Urban Growth Report (UGR) provides the kind of detailed information about changing development trends that other metropolitan areas may want to develop as they undertake scenario planning. The UGR documented recent development patterns in different parts of the community and compared actual outcomes with what was assumed when plans were adopted. Metro's analysis revealed significant changes in housing and development markets – with higher densities of commercial and residential development, and more infill and redevelopment than was originally projected. This kind of review of changing market trends can help the public and decision-makers evaluate feasibility of changing development patterns into the future. Taking time to understand changing demographics and evolving housing markets can provide a good knowledge base for planners engaging in scenario planning. <https://www.oregonmetro.gov/urban-growth-report>

Lessons from *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions* and other literature suggest focusing development in mixed-use areas close to urban centers decreases travel distances, encourages alternative travel options, and therefore plays a major role in decreasing GHG emissions. Create a design incorporating strategies known to be associated with lower GHG emissions. For ideas on actions and programs and their relative effectiveness at reducing GHG emissions, visit the Oregon Transportation and Land Use GHG Reduction Toolkit. Some ideas include:

- *Increase housing and employment density. Increased density in locations with close proximity to efficient transportation infrastructure can help shorten and eliminate auto trips. Increased density in remote or poorly connected locations on the other hand can lead to increases in travel.*
- *Maximize infill development. Underutilized areas are typically located close to city and town centers, and in areas with better than average transportation connectivity.*
- *Diversify land use mix. Having housing, jobs, shopping and services located closer together can enhance accessibility.*
- *Place schools in walkable neighborhoods to provide for greater transportation choice.*
- *Include pedestrian improvements such as: higher intersection densities; greater sidewalk coverage; reduced building setbacks; reduced street widths; a greater number of pedestrian crossings; and a higher number of street trees.*
- *Include accessibility factors such as: closer distance to employment for households; a higher number of jobs within 1 mile of housing; shorter distance to retail/services for housing; greater proximity to nearest retail employment; and shorter distance to transit.*

The intention of a land use focused scenario that minimizes GHG emissions is to maximize the parameters listed above within the realm of plausibility. For this reason, it can be informative to consult the outputs of travel demand models for the metropolitan area to identify TAZs with low VMT per capita. These are likely the areas most suitable for new

development. Another tactic is to find areas with concentrations of jobs or housing, where redevelopment might help in creating a better jobs-to-housing balance.

An example of using previous travel demand model outputs to guide land use planning can be seen in the VMT map of Eugene-Springfield. It identifies low-VMT areas coinciding with the transportation infrastructure. Adding future growth to the identified areas of low-VMT is likely to result in reduced or limited GHG emissions. In addition to land use considerations alone, another alternative scenario might include transportation policies that would reinforce lower GHG production, such as a higher reliance of electric vehicles, and transportation demand management (TDM) policies that reinforce transit, car sharing, walking, and biking.

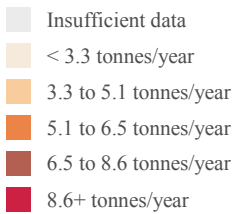
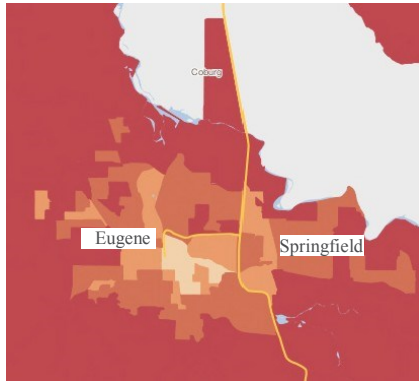
Urban Design

This theme uses ideas about urban form as the basis for its design. For example, this might include planning for more development along key transit corridors and station areas while leaving stable, single-family neighborhoods untouched. Other regions have developed scenarios based on the design concept of centers, pushing infill and redevelopment densities to the limit of what is feasible in the market both today and in the future. The research found that when other factors are controlled, U.S. metropolitan areas with low density can have as much as a 40 percent increase in VMT over metropolitan areas with high density. Many scenarios are likely to involve an increase in planned densities in some parts of the community.



The Lincoln Institute of Land Policy has developed a website with information, images and tools to help better understand real on-the-ground impacts of higher density development. <https://www.lincolnst.edu/>. Photo source: Lincoln Land Institute

Figure 16: GHG Emissions per Household in Eugene/Springfield Area



The Center for Neighborhood Technology's GHG per household maps can be useful guides for building alternative scenarios. GHG emissions from household auto use are calculated using the modeled values for VMT, a national average fuel efficiency, and a average emissions factor per gallon of gasoline. This per household measure divides the total block group emissions by the count of households.

<https://htaindex.cnt.org/>

At the same time, proposals to “increase density” are often controversial with the public and generate understandable concerns about increased traffic, noise, loss of open space and crowding. It’s important to acknowledge and address these concerns. When talking about density:

- ***Provide illustrations and pictures showing what mixed-use centers or neighborhoods might look like.*** Often the public concern about density is based on experience with poorly planned developments. Oregon has a growing number of good examples of mixed-use development that show higher densities can be attractive, inviting, desirable places which most people would accept in their neighborhood or community.
- ***Be clear about what areas are and are not possible candidates for higher density development.*** Most scenario planning projects focus proposals for mixed-use or higher density development in a small percentage of the planning area –leaving most areas – especially stable, developed neighborhoods largely unaffected. Maps that make it clear which areas might be considered for infill, redevelopment or higher densities can help overcome stakeholder apprehension.
- ***Provide information about changing housing needs due to shifts in demographics and consumer preferences.*** Studies show the nation and state are in the midst of massive changes in demand for housing, with a shift in demand toward smaller houses, rental housing and an increasing preference of many people for smaller lots. Scenarios can be developed to respond to these changing demands.
- ***Provide information on the role higher densities, and mixed-use development can play in minimizing people’s need to drive.***
- ***Make it clear that options for more standard single-family housing will continue to be provided.*** As noted above, most scenario plans will leave much of the planning area – including most existing single family neighborhoods largely unchanged.
- ***Address reasonable concerns about increased density – like planning for parks and open space to serve the new and current residents.***

Many of the concerns about density are often a result of misunderstanding. How people define density is based on their own individual experience, perceptions or a specific community's context. Two and three story mixed-use buildings, for example, can provide the benefits of mixed-use development, while also being compatible with the nature of a historic district. On the other hand, eight-story modern buildings would likely be met with opposition from neighbors who choose to live in the area based on its existing character.

If the participants can visualize attractive higher density buildings or places, they are more likely to utilize them in the development of their vision for the future. The planning team then is in the position of testing community members' ideas for increased density, rather than a proposal from planners.

Scenarios provide opportunities to test new ideas, they are not formal proposals. However, care should be taken to avoid testing conditions that are nearly guaranteed to draw negative reactions from the community at large.

Specific Drivers

A driver is a force that can change the future. For example, demographic changes and their impact on the housing market have a substantial effect on development style and location. Using a housing forecast as a driver, a scenario could be created based on a variant of projected future housing demand. Common traits among Oregon's metropolitan areas include a population that is aging, and becoming more diverse. Economists and land use experts suggest this may result in housing demand shifting away from the conventional single-family home toward an increase in smaller lots and multifamily types.

Another driver could be an economic development program. If an area is interested in pursuing a future where high tech and medical fields are dominant, a scenario can be tailored to the employment, transportation, and workforce needs of the economic driver. Changing economic conditions can affect both demographic conditions and a community's decision to target a specific economic development program. An economic development scenario theme provides an opportunity to explore how changing economic conditions may impact changes in housing values, transportation needs, and demand for single-family versus multifamily housing.

Specific Community Goals

This scenario theme uses specific community goals to guide the design. The first component of developing this scenario is to identify attributes that will lead to successfully achieving these goals. The scenario design should then be based on those attributes. For example, one community goal might be to attract and retain young people. Therefore, in addition to the attributes related to educational institutions and employment opportunities, this scenario could be crafted to include the close-in housing, entertainment districts, and urban lifestyle that appeal to younger people. One of the scenarios built for PLANiTULSA (Tulsa, Oklahoma) was designed to do just this; the scenario focused more compact development in the downtown area and close-in neighborhoods.

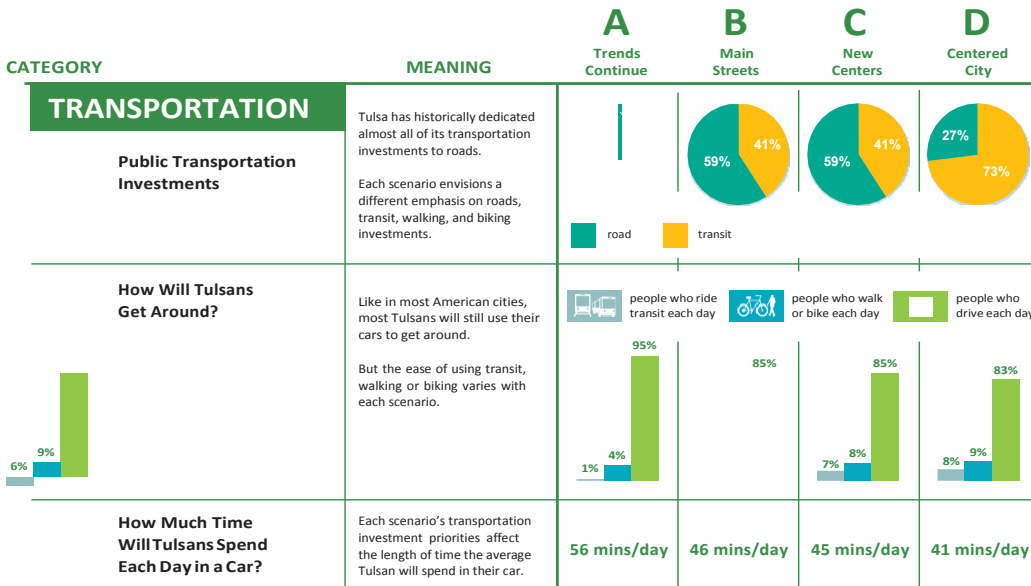
Evaluate the Alternative Scenarios

The performance of the alternative scenarios is evaluated using the land use sketch planning tools, evaluation criteria, and the Regional Strategic Planning Model. This evaluation process is similar to that described in Step 4 regarding the reference case scenario. A portion of the evaluation criteria identified in Step 1 will come from the Regional Strategic Planning Model, while others will be direct results of the sketch planning tool. As discussed in Step 3, the recommended approach is to begin with a high-level baseline assessment using the Regional Strategic Planning Model, then link the more detailed land use and urban design

information produced by the sketch planning tool into the Regional Strategic Planning Model for evaluation. Each alternative scenario should be evaluated based on the same evaluation criteria used in the reference case evaluation for easy comparison. Additionally, be sure to do a “reality check” against known local trends and projections.

Make it meaningful – draw connections to the characteristics of the scenarios. Once the scenarios are developed, organizing the evaluation criteria created in Step 2 to provide context will be important. The evaluation criteria should be accompanied by a discussion of what is significant about the data. In particular, the differences in the scenarios should

Figure 17: Example: Graphic Illustrations of Scenario Evaluation



These transportation-related graphics appeared in the PLANiTULSA survey distributed in Tulsa, Oklahoma. Graphic illustrations of the evaluation criteria analysis like these communicate the tradeoffs between scenarios to the public.

be tied to the design differences that produced the results. The best strategy is to highlight differences between the scenarios, not the absolute numbers. For example, announcing that a scenario models specific VMT per day may be too abstract for most people to understand. It is easier to visualize the meaning of those results when the evaluation is compared with today's VMT, and other future scenarios, such as the reference case and alternative scenarios. Adding measures such as the average per capita fuel costs will go even further to making a measure such as VMT more meaningful. When preparing the evaluation of the scenarios to be shared with the public and policy makers in Step 6 use language and graphics that communicate the issues to which people can relate.

Conclusion

Themes for the development of alternative scenarios are selected, first through early use of Regional Strategic Planning Model as part of a high-level baseline assessment of many possible alternatives, and later through a more detailed planning process with broader public engagement. Through the early phase of the process decision-makers, stakeholders and the public will have been given an opportunity to explore and discuss the land use and transportation choices the community faces in addressing important issues over the next 20 years or more and test those choices in alternative scenarios.

Through the more detailed sketch planning phase of the process, using a broader public engagement process, the general public enters into the conversation with decision makers and stakeholders about the future of their community. Based on the selected themes, several alternative scenarios should have been designed and evaluated by the metropolitan area. The results of these alternative scenario evaluations will be reported back to the public and stakeholders in Step 6 to inform the selection of a preferred scenario.



Step 6: Selecting a Preferred Scenario

Summary

In this step the alternative scenarios will be presented to decision makers, stakeholders and the public to solicit feedback in the selection and design of a preferred scenario for the metropolitan area.

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Preview

Step 6 involves the development and selection of a **preferred scenario** based on a combination of public and stakeholder input and the evaluation results. This step provides a significant opportunity to engage the public and stakeholders. With a review of the evaluation results for the alternative scenarios, they will discover what the future could look like based on the scenarios they played a role in designing. The newfound wealth of knowledge will help the public in identifying which elements of the scenarios they support, and ultimately, the composition of a preferred scenario.

The preferred scenario is a package that includes a concept map depicting expected outcomes, a set of major programs, policies or general actions, and spatially distributed future housing and employment estimates. The approach to these elements of a preferred scenario is flexible and may be customized for each metropolitan area.

The **concept map** is a visual representation of the future that conveys predominate themes of the preferred scenario. It depicts land use design types and significant transportation changes, while remaining more general than comprehensive plans or zoning maps. This provides a useful communication tool for the public to see the preferred elements.

A **set of major programs, policies or general actions** will guide the metropolitan area in achieving the preferred scenario.

A preferred scenario includes **forecasts of future housing and employment** at the TAZ level. This helps to guide subsequent planning, such as RTP updates. Providing estimates of housing and employment at the TAZ level enables the scenario to inform and guide subsequent plan updates, and builds in flexibility for local governments to consider a variety of options to accommodate expected growth consistent with a preferred scenario.

A **narrative** describes the concept map and the programs, policies or actions selected to achieve a preferred scenario.

Present Alternative Scenarios to the Public

Using the Regional Strategic Planning Model to look at alternative scenarios

The continued use of the Regional Strategic Planning Model may be appropriate at this step to evaluate the alternative scenarios in developing a preferred scenario. For instance, the Regional Strategic Planning Model can be used to scope various mixes of options that may make up a preferred scenario before embarking on the more time consuming and the broader public engagement process.

The public and stakeholders provided guiding input for the scenario planning process in Step 5 when they were asked to convey their visions for the future of the region, thus helping to shape the themes and strategies of the alternative scenarios tested. The alternative scenarios and their evaluation completed in Step 5 are used in this step to help the public and stakeholders understand outcomes of different policy choices. Presenting the performance of the alternative scenarios in comparison with the reference case scenario created in Step 4 further informs the community and stakeholders by providing a **benchmark** from which to evaluate the alternatives. In this phase of public engagement, the community will have an opportunity to review the results of alternative scenario evaluations, give their feedback and preferences, and identify popular policies or actions that are still effective in achieving community goals. Public input will be used, along with the results of the alternative scenario evaluations, to inform the development of a preferred scenario. This step is often the one that sees the greatest amount of participation in the scenario planning process.

For the best results during an outreach campaign, and to maximize participation, it is important to use a variety of **engagement methods**. Choosing preferred strategies and elements from the alternative scenarios is an empowering activity for the public and stakeholders, and as a result, participation is likely to grow. This section outlines some recommendations for engaging stakeholders and the public during the selection of a preferred scenario.

Design Easy-to-Read Alternative Scenario Maps

Scenario maps can be useful for visually expressing scenarios. However, scenario maps, especially those coming straight out of a land use sketch planning tool, can be difficult for the public to interpret. It is recommended that the alternative scenario maps shared with the public, stakeholders and public officials are rendered by a cartographer or graphic designer, simplified and made easy to understand. The scenario maps should be supplemented with written descriptions. Photographic and video simulations are also an effective way to communicate how places may look and feel if the future portrayed by the scenario became reality.

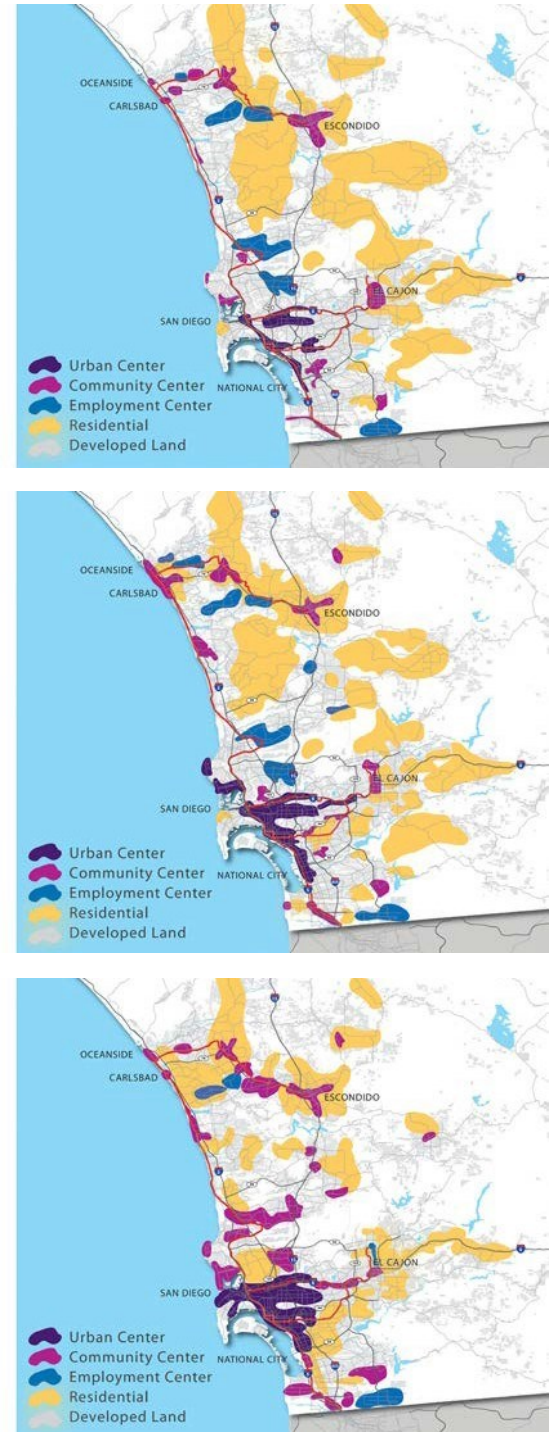
Present Key Evaluation Criteria Choices in a Relevant Way

Scenario results should be presented and compared in relation to how they performed based on the evaluation criteria established in Step 2, such as GHG emissions, housing, economy, and transportation. Use techniques described in Step 5 for communicating the criteria in understandable and relevant methods (e.g., annual fuel costs per family versus VMT per capita).

Key themes supported by the public were identified in Step 5. Share the performance of each alternative scenario with the public based on these issues that resonate with them. When presenting the programs, policies and actions that can be implemented as part of the scenario, it may be useful to categorize each as either “achieving local goals,” “neutral or minimal impact,” or “not achieving local goals” to make clear connections to achieving the targets.

Technical planning terms and concepts can be off-putting for stakeholders or policy makers. One recommended technique is to have people outside of the scenario planning team review the outreach materials to ensure they are

Figure 18: Example: Scenario Maps for Our Greater San Diego Vision



The scenario maps created for the Our Greater San Diego Vision public survey helped the public visualize different ways that the region might develop to accommodate expected growth.

easy to understand. Using a small focus group of the public, or people from a different department or agency, to review materials can be an effective way to ensure that questions and messages are clear and free of jargon.

Use a Range of Methods for Informative Engagement

Common formats for presenting alternative scenarios and their core strategies are summary brochures, newsletters, websites, forums, open houses and short videos. Using a graphically rich newsletter or an interactive web survey, people can review scenarios and express their preferences conveniently from home, without needing to invest a great deal of time.

Forums and open houses are great for two-way communication with the public and stakeholders. However, they require more resources and are more time consuming, using guest speakers, discussions, table exercises and/or instant key-pad polling to help illuminate the scenario choices from different points of view and give the public a chance to make recommendations. These events often aim to attract one hundred to several hundred participants. Some communities have used smaller forums or facilitated conversations among community members as an alternative to large public events.

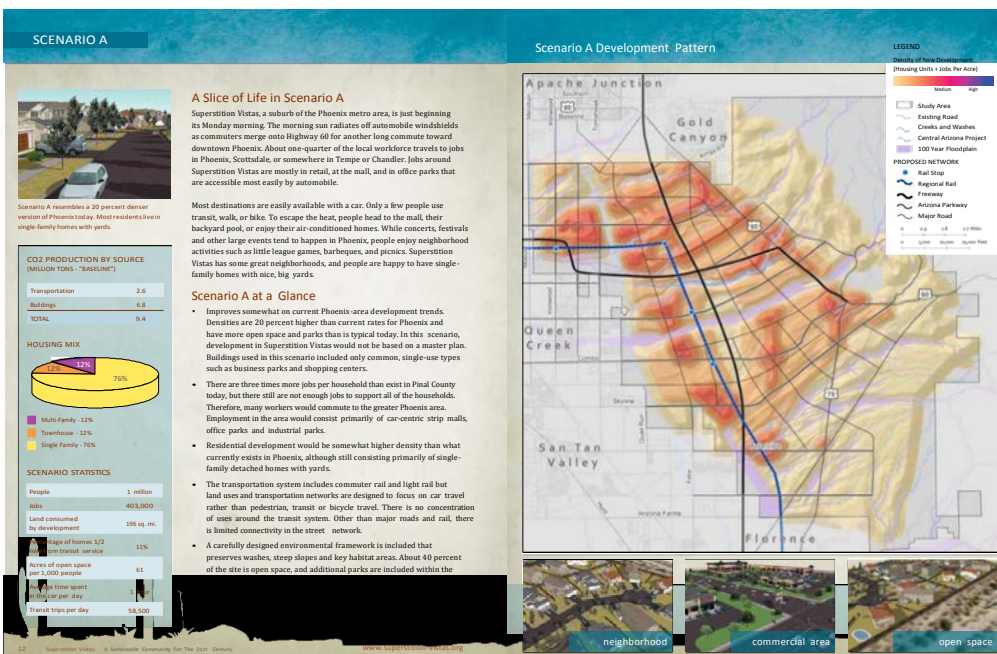
While a broad outreach campaign can result in thousands of responses, some policy makers or stakeholders may be skeptical that the responses do not represent everyone in the metropolitan area. Voluntary input may not provide a representative sample of the population. This is not necessarily a

problem however; it is indeed much like voting or public testimony where interested people self-select to weigh in. Understanding the needs and desires of these participants is important for long-term success. Within this pool of people are those most likely to vote on potential future implementation actions such as bonds or policy changes.

There is also value in having a true random sample. A scientifically valid survey can help ensure that the preferred scenario serves the entire population as best it can. Typically, this type of survey will be based on random sample telephone dialing and requires development of an additional version of the outreach materials that can be administered verbally. The best way to engage in this option is to consult with researchers who specialize in telephone surveys. These specialists can work with staff to develop the verbal questionnaire based on other materials already produced for this phase of public outreach.

Consider a Focused Stakeholder Approach

Due to issues such as costs or timing, extensive public outreach may not be the best fit for every community. Grand engagement programs utilizing several of the methods listed above have proved successful in engaging large portions of the public in other scenario planning efforts. While this is usually an exciting way to present the alternative scenarios for selection, focused stakeholder meetings can also be a useful method to gather input on the most and least favored elements of the alternative scenarios. A more limited engagement effort should include stakeholders with specific knowledge of land use and transportation planning, public policy from the perspective of public, private and non-profit entities. The main advantages of this approach, besides cost, are that stakeholders familiar with the subject matter will be able to comprehend complex information and better advise the team on the details of the scenarios being tested; and they will have insight on approaches likely to be supported by policy makers. The potential shortcoming of using a focused outreach exclusively is missing out on the opportunity to enhance the public discussion of planning, and the opportunity to build a large base of support for future actions.



SCENARIO MAPS

This scenario evaluation example from the Superstition Vistas project in Arizona combines a well-designed map, supplemental images, key indicator graphs, as well as written descriptions to convey the most important elements of the scenario.

CASE STUDY

Scenario Planning in Bend

In 2016, the City of Bend completed a Scenario Planning exercise using the Envision Tomorrow land use sketch planning tool to address a UGB expansion. The several scenarios addressed how much land, and where, was needed to best accommodate growth over a 20-year period, based on impacts to water and sewer facilities, the storm water system and transportation. It enabled the city and public to navigate a variety of future land use patterns and their impacts, leading to an adopted UGB expansion plan.

Role of a Preferred Scenario

A preferred scenario embodies a common set of long-term aspirations. It represents the preferred land use and transportation pattern that the region aspires to achieve over the next 20-40 years. The preferred scenario can be used to guide any subsequent updates to land use and transportation plans, programs, policies, codes and regulations.

While a preferred scenario may be based on a detailed technical analysis, it should be framed more generally to allow flexibility during implementation. For example, some areas planned for mixed-use development are likely to be more successful in attracting new housing and businesses than others. A preferred scenario should allow for slightly different outcomes over time (e.g., where one mixed-use area gets slightly more development and another gets slightly less) as long as overall objectives to accommodate mixed-use development are met.

A preferred scenario provides the basis for developing the next steps: implementation plans and actions to carry out the preferred scenario. With agreement on a preferred scenario, local governments can take steps to amend plans, policies, and programs, along with other actions to make it a reality.

Develop a Preferred Scenario

The scenario analysis and selection process should result in an understanding of the public's level of support for the elements comprising the scenarios. Once the public has weighed in on their preferred elements of each of the alternative scenarios, the next step is to synthesize that input and translate it into a preferred scenario.

Understanding Input

The responses from the public input on the alternative scenarios should be compiled into a report or memorandum, coupled with a presentation summarizing the public's rankings. It is possible that the community will overwhelmingly rally behind one scenario. However, it is also common for each scenario to possess some popular elements. For example, scenario planning processes often validate public support for local policies that encourage downtown redevelopment with expanded housing opportunities. Identifying popular elements and themes will help to form the preferred scenario. The goal of understanding the community's input is to identify areas of consensus and consider compatibility and tradeoffs among scenario elements and themes.

Translating Public Input into a Preferred Scenario

The scenario that most closely lines up with the rankings made by the public and the steering committee can be used as a starting point. Using the methods described in Step 4 and Step 5 for scenario development in the sketch planning tool, the scenario would then be modified by changing land uses, utilizing the development types, and modifications to the transport network as applicable. Unwanted elements would be removed and the strategic elements added to make it perform better, as measured by the evaluation criteria from Step 2. A combination of effectiveness and feasibility should be used to develop a scenario that can be selected as the most desirable.

It can be useful to build two or three technical scenarios that achieve similar desired outcomes but employ different themes or strategies. One scenario, for example, could add housing to job rich areas, while the other might focus new jobs and mixed-use developments in housing rich areas. The resulting mixed-use development in both scenarios may have similar outcomes. These additional scenarios can be used to illustrate the flexibility a community has to achieve the same outcomes but through different planning approaches.

Refine Scenarios with Stakeholders

Development of a preferred scenario may take several iterations. The preferred scenario is not generally a selection of one of the initial scenarios as the best. Rather, it is a new scenario combining elements or strategies from various alternative scenarios and as such it may need to be adjusted to ensure that compatible elements are being used.

Seek Guidance from Elected Officials

Elected officials within the metropolitan area should be regularly engaged throughout the scenario planning process. With the exception of an intergovernmental agreement used to initiate the scenario planning process, there are no expectations of elected bodies or officials to make decisions such as adopting ordinances or resolutions. Engagement should consist of sharing results at key milestones and engaging them in discussions on the project outcomes. It's reasonable to expect that public review of alternative scenarios will not result in a clear consensus about all the elements that ought to be included in the preferred scenario. Where the results of public review are conflicting or ambiguous, consultation with elected officials to discuss options for addressing key issues is recommended.



The City of Beaverton created a Beaverton Community Vision document during its visioning process. The Community Vision eventually led to the Beaverton Civic Plan.

Model a Preferred Scenario and Other Recommended Next Steps

Each metropolitan area will likely proceed differently in the scenario planning process. This step provides several potential outcomes and common products produced by communities that have engaged in scenario planning. The intent of these products is to guide metropolitan areas towards implementation of a preferred scenario with a range of benefits.

Modeling a Preferred Scenario

Ultimately, the preferred scenario will be evaluated through use of the land use sketch planning tool and the Regional Strategic Planning Model. The modeling of the scenario in this step is the same as in Step 4 and Step 5. Performance of the scenario can be evaluated from the outputs of the land use sketch planning tool and by summarizing the urban design information, using the census tracts or other boundaries (as described in step 3), to link those outputs to the Regional Strategic Planning Model. The GreenSTEP tool evaluates the preferred scenario for compliance with the adopted light vehicle GHG reduction targets for 2050. If using additional models, such as a travel demand model, run the preferred scenario through those models as well; sketch planning tools readily allow for generating the necessary TAZ data files. Identify and document the model results to be used as performance measure during future implementation efforts, for use in describing characteristics of the vision and for use in the final report.

Develop a Community Vision Document

A vision document captures the **community goals** expressed during the planning process, and describes the anticipated outcomes based on the selected scenario. It moves from the detailed analysis of the scenarios into general concept and descriptions of places and outcomes. A vision has been an important part of many communities' planning process. It provides more flexibility than a comprehensive plan. While visions are not necessarily developed with scenario processes, scenario plans often include a vision as an outcome. The vision is typically based on a preferred scenario (or two) and may include a map.

What are Strategies?

Strategies are actions and methods employed at multiple levels to achieve specific outcomes. Below are examples of the different levels of a strategy: overarching, targeted but general, and specific. The three categories refer to the geographic scope and scale. For instance, an overarching strategy is regional, a targeted but general may be citywide and specific could refer to a corridor or neighborhood.

Overarching:

Prioritize centers to accommodate the majority of future growth. *Shown on the concept map.*

Targeted but General:

Designate regional and town centers. *Shown on the concept map, and tested by assigning growth in the technical scenario.*

Specific:

Design a small area plan (i.e. urban renewal to build housing in a downtown).

Overarching:

Create a robust transit network. *Shown on the concept map by major transit lines.*

Targeted but General:

Increase transit service – including more stops and increased frequency throughout the transit network.

Specific:

Design a main street pedestrian plan identifying specific transit stop locations and the connections to them.

Overarching:

Direct growth toward already developed areas in the metropolitan area.

Targeted but General:

Recommend new ordinances to support mixed-use redevelopment.

Specific:

Develop new ordinances and redevelopment demonstration projects compatible with the new ordinances.

Overarching:

Encourage a decrease in driving overall and at certain times.

Targeted but General:

Propose fees for driving, such as vehicle registration or fuel tax. Propose TDM program based on advertising or financial incentives.

Specific:

Build a key piece of infrastructure (highway and BRT). Implement district or cordon pricing or facility tolling.

A Vision Concept Map

A map that can be developed as part of the vision is known as a concept map. A concept map is intended to communicate the preferred themes selected in an easy to understand graphic format. For instance, a concept map may show a system of new centers and transit corridors that help guide future policy decisions. The concept map is a general representation of future development patterns. The specific boundaries of land use design types are spelled out later through subsequent planning efforts.

A concept map is more general than a comprehensive plan map – land use design types usually represent a combination of several different land use plan designations. The concept map expresses general agreement on preferred land use with details to be worked out later through subsequent planning. It provides guidance to local governments as they update land use and transportation plans, and take other actions, to carry out the preferred scenario. In other words, the concept map is a visual representation of the goals and desires identified in the scenario planning process.

Writing About the Vision

The written portion of the vision is short and easily digested. It conveys to a casual observer the desired outcomes and the actions, programs and policies that will be used to achieve them.

Create a Final Report

Another final product can be a final report on the preferred scenario and strategies. A final report might include descriptions of the effectiveness of the strategies, their performance, and key evaluations. In addition, the evaluations can be converted into goals used to monitor the progress of implementation.

The metropolitan area and member jurisdictions may choose to endorse the preferred scenario in a formal fashion.

If the cities and counties in the metropolitan area choose to give the preferred scenario official status, below are some considerations that may be helpful:

- *Selection of a preferred scenario need not be made as a formal land use decision.*
- *Selection of a preferred scenario can be adopted by resolution.*
- *Define the role of the preferred scenario in future planning and other work.*
- *Identify broad actions or next steps that the local government could take over time to implement the preferred strategy.*
- *Include recommendations of ways other groups, agencies or organizations might help implement strategies.*
- *Seek endorsement of the preferred scenario from key agencies, potentially affected by proposed actions or programs contained in the approved strategy, such as local school districts, transit district, utilities, major employers, and landowners.*
- *Identify roles and responsibility related to next steps.*

Conclusion

In this step, the community, stakeholders and public officials all weighed in to select a preferred scenario. A preferred scenario consists of a concept map, a set of major programs, policies or general actions, future spatially distributed housing and employment estimates. The preferred scenario can also include a detailed technical analysis that estimates light vehicle GHG emissions reduction and helps guide implementation and ongoing monitoring of progress. The preferred concept is then implemented through updates to land use and transportation plans, new policies and programs, and revised zoning codes and regulations – described further in Next Steps.

This step should also have built a new sense of awareness among the community, stakeholders and elected officials. The engagement activities will have helped to build large levels of public support for planning, and identified the approaches that the community supports. Coupled with the increase in public awareness, this knowledge will help the metropolitan area decide what actions, if any they want to explore to implement the strategies tested through this process.



Step 7: Next Steps

Summary

At this point, several alternative scenarios will have been developed and evaluated for the metropolitan area. Based on extensive community review, a preferred scenario representing how the community wants to grow and develop over the next 20-25 years or more was identified. The details of the preferred scenario provide the basis for the next steps; changing plans and pursuing other actions that help make the vision expressed in the preferred scenario an on-the-ground reality. Many of the overarching and general strategies needed to bring the preferred scenario forward should be spelled out in the scenario itself. However, be sure to take time to prepare an implementation strategy and a more thorough evaluation of feasible and effective opportunities and actions that work best for the community.

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Preview

Following Step 6, metropolitan areas will ideally identify a preferred scenario consisting of:

- *A vision document describing shared desires for the future and details about overarching and targeted strategies supported by the public and stakeholders.*
- *A concept map depicting a generalized view of the future linked to the vision.*
- *A technical scenario representing a potential distribution of future land uses at a scale that enables a range of analysis.*

If the public engagement process in the previous steps was successful, those organizations and individuals likely to support or implement some or all of the strategies from the **preferred scenario** will have been identified and will be ready to take action. There are many ways the metropolitan area can implement a preferred scenario. This section provides insight on some of the options that metropolitan areas may choose to take in moving beyond the scenario planning process toward **implementation** of the strategies that emerged in Step 6.

Implementation includes a range of techniques to accomplish the outcomes described by the preferred scenario. Implementation will come through many forms; some actions may bring about nearly instantaneous benefits, while others may take decades to be fully effective. This section outlines several optional approaches to implementation which can be employed within Oregon's planning system including:

- ***Pursuing changes to transportation or land use plans** – such as comprehensive plans, zoning and other implementation ordinances to allow new uses envisioned in the scenario.*
- ***Forming public-private partnerships** to coordinate development of new land use and transportation patterns that shorten automobile trips or encourage walking, biking and using transit.*
- ***Developing new programs or actions**, such as travel demand programs or detailed plans for important districts such as downtowns or key transit supportive areas.*
- ***Focusing public investments** to carry out actions that support key elements of the preferred scenario, from sidewalks and transit to electric car charging stations.*

Choosing to Implement

Coordination Period Preceding Implementation

Following the selection of a preferred scenario, there is important work to be done before implementation. Check back in with everyone who was involved in the process and share information about the preferred scenario, especially with the public, stakeholders and decision-makers, to build understanding and support. This creates an opportunity to dispel misconceptions. It is likely that throughout the process people thought more about outcomes and less about the pathways to reach the outcomes. As the process moves towards implementation, new stakeholders may come into the fold, especially after publicity about the preferred scenario. Step back and take the time to make sure everyone is on board and moving forward together.

Implementation of a preferred scenario will be made possible through voluntary, cooperative and individual efforts among the cities, counties and regional agencies. Implementation necessitates general agreement on the significant overarching strategies. These general strategies are fundamental components that define the preferred scenario. The final products of the scenario planning process however, should not be contingent on absolute agreement on every strategy.

At the broad level, the preferred scenario will be implemented over time, through overarching and targeted strategies that result in updates and amendments to comprehensive plans and transportation system plans. In the near-term, many of the targeted and specific strategies of the preferred scenario can lead to immediate action. With agreement on the preferred scenario, a city may choose to act upon a specific strategy on its own, which might also move the whole metropolitan area closer to its goals. For instance, a city may develop an implementation strategy to boost transit on a specific corridor; that decision does not require agreement by all cities within the metropolitan area, but it will likely benefit the entire area.

The preferred scenario expresses a general, broad view about the desired land use pattern and transportation system and the general policies, programs and actions (strategies) that the region expects to pursue. While the scenario outlines the overarching actions needed, it should be understood that many of the targeted or specific actions needed to carry out the preferred scenario will be detailed in step 6. With this in mind, the preferred scenario should include a clear vision and set of principles to help guide decision-makers as they consider implementing decisions.

The preferred scenario, and especially the concept map, should be general and not make specific assumptions about particular properties. Metro's 2040 Growth Concept for example used a large reddish circle to connote the regional role of Downtown Portland. It did not call out specific land uses or activities beyond the definition of the building block identified by the circle.

Begin with early wins. There are likely to be several strategies, both overarching and targeted, within the preferred scenario that enjoy

universal support. Some of these strategies may not bring about the biggest benefits, or even the best value. However, at the early stages of implementation, each success, even at a small scale, can go a long way toward helping the metropolitan area realize its shared future goals. Working through some of the easier actions or programs can help the affected agencies develop the collaboration framework needed for many aspects of implementation. It is better to test out the strategy framework on non-controversial issues before trying to tackle some of the larger issues that may have been identified through the scenario planning process.

Develop an Implementation Plan

The purpose of scenario planning is to get broad public consensus on possible land use and transportation changes that can better achieve community goals. Adoption of a preferred scenario does not by itself result in specific actions or changes to existing plans, but rather provides guidance to subsequent local actions and plan changes. Consequently, a key part of scenario planning is to develop an implementation plan. Step 6 generates a preferred scenario and strategies, comprised of actions, programs and policy options, with enough detail to inform future actions. The guiding principles from Step 2 provided the comparative framework that allowed for the public and stakeholder evaluation of the alternative scenarios and their embedded strategies. In this phase, key strategies and policies identified in Step 6 should be utilized to create a more detailed description of implementing actions, and to identify general timeframe (short, medium and long term). The process of selecting the implementation approaches will involve negotiating with key parties

and securing their agreement to participate. The implementation plan should link the various actions to people's values through use of the guiding principles.

Creating a written implementation plan or strategy can be an important step to identify the actions needed to implement the preferred scenario and the parties responsible for those actions. Implementation plans are non-regulatory plans that contemplate specific actions and allocation of resources, such as people or capital, to achieve those ends. They can serve as prioritized action plans with recommended immediate actions as the first steps towards realizing the metropolitan area's policy goals. Besides a clear description of recommended programs and improvements, the plan can include a matrix to identify what departments or organizations will have primary responsibility, and what potential funding sources may be available. It can also note the timeframe for each action and the relative priority for each action. Discussion around priorities not only helps allocate limited public funds, but also yields better project definition and clarity.

Potential Implementation Plan Components

Align the RTP and Other Transportation Plans

A scenario planning process can be used to inform an MPO's RTP update process. One of the most common ways to implement the preferred scenario is to incorporate it into the metropolitan area's RTP, whether it is a part of a RTP update or the result of a separate scenario planning process. The regional vision about future development patterns in the preferred scenario can be used to guide RTP development. For example, the preferred scenario

should include a detailed land use forecast, which can be incorporated into the housing and employment distribution used to identify regional transportation needs. These plans are important because they identify regional priorities for transportation funds. Specific goals and strategies developed as part of the preferred scenario can also be added to the regional transportation plan or used to help shape regional transportation investments. The regional vision about future development patterns in the preferred scenario can be used to guide RTP development. Often a preferred scenario will highlight benefits that could come from changes in regional priorities as they apply to transportation.

Through the evaluations from the sketch planning tool, the Regional Strategic Planning Model and possibly other tools, the technical scenario will show the potential benefits that can be achieved. Since the regional transportation infrastructure forms the backbone for land use, this new land use allocation and associated urban design information should be used in future modeling and analysis. Cities and counties may need to think beyond individual transportation projects that their constituents have asked for previously and consider the region-wide projects.

Modify Comprehensive Plans and Implementing Ordinances

The majority of strategies embodied by the preferred scenario will be enacted at the local level, by cities and counties. If land use changes are a substantial component of the preferred scenario, changes to comprehensive plans will need to be considered. It may have been the case that scenario planning was conducted as part of a comprehensive plan update. It is important, however, that the preferred scenario

not be directive of such changes. Plan changes can be encouraged, but if they are a requirement of participation the process could falter. A better approach is for the preferred scenario to tie incentives to changes. For example, directing resources toward transit improvements linked to plan updates might be most effective.

Typically, changes to comprehensive plans are focused on specific areas where different land uses are shown to be of benefit. For example, for the preferred scenario's GHG reduction strategies, the modifications may include changing land uses to allow greater mixing of uses, higher intensity development, or employment in areas rich in housing. Other changes to plans could include new connectivity standards or planning for transit-oriented development. While some of this has been used in Oregon planning for decades, in a few areas its application may be fairly new.

Metro provides an example: following the adoption of the Metro Region 2040 Growth Concept, many local jurisdictions modified their plans to include the centers and corridors concept, a key component of the region's preferred scenario. After nearly 20 years, there are few plans in the region that have not been modified to adapt to the 2040 Growth Concept. While Portland Metro does have some land use authority, the vast majority of these changes were done in cooperation with local governments, as the local governments had an interest in the regional plan's implementation.

Update Zoning Ordinances

One common finding from scenario planning efforts is that local zoning ordinances might not permit, or guide, the types and locations of new development that is described by the vision. Updates to zoning ordinances can be initiated that are intended to make it easier for the private sector to develop the types of land uses the city and metropolitan area would like to see.

As part of a scenario planning process in North Central Texas, the City of Dallas learned that capturing a larger share of the region's housing was critical to their economic development desires, and at the same time helped to diminish region-wide VMT. With limited vacant land, Dallas looked toward its light rails stops, and urban districts as places that could attract the desired housing growth. However, faced with an outdated zoning code, developers had a difficult time producing the mixed-use and higher density housing the city and region were hoping to see. To change the situation one of the first things the city did was to develop several new zoning districts that would accommodate mixed-use and higher density development. The new districts were added to the zoning ordinance, but not applied to any specific properties. The intent was to provide new options for interested developers, while at the same time not initiating any legislative zoning changes on properties whose owners may not be ready or interested until some successful examples could be built.

Develop a Strategic Plan

There are many areas within Oregon where comprehensive plans currently allow for mixed-use and higher density urban housing, but where the real estate market has not followed suit. For example, the 2011 Beaverton Civic Plan planning process discovered that downtown Beaverton zoning allowed much larger buildings than were being built.

In similar cases, metropolitan areas cities and counties will want to work with the development community to determine why properties are often built to lower intensities than planned, or why they remain underutilized despite a healthy marketplace. In many cases, there are incentives that can correct the situation, such as waiving fees or providing infrastructure. An appropriate technique for these types of situations is to create a strategic plan that covers these additional topics.

Strategic plans are non-regulatory plans that contemplate specific actions and allocate resources, such as people or capital, to achieve those ends. A

strategic plan can serve as a prioritized action plan of recommended actions that become the first steps towards realizing the metropolitan area’s policy goals. Besides a clear description of recommended programs and improvements, the plan can include a matrix to identify what departments or organizations will have lead responsibility, and what potential funding sources may be available. It can note the timeframe for each action and the relative priority for each action. Discussion around priorities not only helps allocate limited public funds, but also yields better project definition and clarity.

The actions and priorities may also address co-benefits beyond those contained in local plans. While comprehensive plans are usually implemented through regulations, strategic plans involve programs and capital projects. Transportation capital projects and programs may be contained in the RTP or TSP, but other activities contemplated in a GHG reduction scenario may address a wider range of activities, including utilities, information technology, open space protection, or vehicle incentives.

Figure 19: Strategic Action Plan Example: Beaverton Civic Plan

2011-2015 Timeframe
Priority Level 1
Revise Land Use, Transportation, Economy, Housing Elements of the Comprehensive Plan to reflect Civic Plan strategies.
Engage in the Aloha-Reedville planning process to ensure that the Central City is not adversely affected by plans for TV Highway corridor.
Priority Level 3
Update the bicycle parking design requirements from 1998 standards and adopt standards to provide for on-street bike parking corrals in the Central City.
Plan and construct immediate-term bike facility improvements.
2016-2020 Timeframe
Priority Level 2
Plan and construct short-term bike facility improvements.
2021-2025 Timeframe
Priority Level 1
Plan and construct mid-term bike facility improvements
2026-2030 Timeframe
Priority Level 1
Plan and construct long-term bike facility improvements

This is an example of prioritized actions and respective timeframe from the Beaverton Civic Plan’s Central City Strategy.

Potential Funding and Support Mechanisms

For many years Oregon's Transportation and Growth Management (TGM) Program has linked land use and transportation planning in the state. In the same way, MPOs can direct infrastructure funds toward projects that further enable local implementation in support of the preferred scenario. Additionally, the metropolitan area can take advantage of other opportunities to support implementation, such as those described below.

Using Transportation Projects

Sometimes, transportation projects can be used to implement part of the preferred strategy. These may range from transit enhancements, transportation demand management programs, and bike paths to bike sharing programs, workplace incentives, or electric vehicle programs. The funding allocations or specific program allocations in the transportation improvement plan (TIP) may be a possible funding source. For example, Metro has allocated a certain amount of its TIP for TOD implementation. Metro has also targeted funding for implementing boulevard designs along transit corridors. Metro's funding criteria gave preference to projects that promoted development in centers, so that new sidewalks or bikeways support the desired outcomes of creating town centers.

Pilot Programs and Catalytic Developments

This approach may include zoning code rewrites, strategic plans or encouragement of new real estate projects. Well-known catalytic projects in the Portland region following the Metro Region 2040 plan have included the Belmont Dairy and Orenco Station. Each of these received some assistance as the region's preferred scenario was converted into funding catalytic projects.

A Suggested Approach to Monitoring Programs

A key recommendation for monitoring programs is to group related measures together. Develop a one or two page spread for each measure that contains a definition of the measure, why it is important, how it is calculated, and the resulting numbers through graphics and text. A consistent format with easy to read text and graphics will help to make the monitoring program useful by various agencies and stakeholders within the metropolitan area.

Regular Monitoring Updates

Another important way to encourage implementation is to keep the scenario planning effort, especially the preferred scenario, in the public's eye. A monitoring program should be used as a check-in to see if things are heading in the right direction. Look for opportunities to share progress with the public through press reports or website updates. Metro provides an excellent example of this tactic. They survey residents annually on the 2040 Plan and other issues related to planning. They publish on their website current projects within the region, from large-scale corridor plans to smaller individual transportation-oriented developments. By bringing awareness to the work being done to achieve the metropolitan area's goals, public decisions during ballot measures or general elections will be better informed.

Monitoring Programs

An important piece of any plan is developing metrics to gauge the metropolitan area's success in implementing the plan. Monitoring includes two parts. First, monitoring implementation of the preferred scenario itself (i.e. were specific actions like expanded transit service carried out) and second, assessing how well the region is doing in meeting broader regional goals and objectives – for example reducing household spending on transportation. In short, a good monitoring program evaluates both what is being accomplished and the means to do so. There should be specific performance measures tied to the evaluation criteria from Step 2 that can be used to help monitor the effectiveness of policies and actions. A monitoring program will provide periodic snapshots from which agencies can determine if there are adjustments or corrective action should be taken, to keep the metropolitan area, or the individual city or county on course to achieve planning goals.

The technical scenario, and the subsequent evaluations from the land use sketch planning tool and the Regional Strategic Planning Model, will provide the data to populate the monitoring program. There is no rule on the number of measures to include in a monitoring program. As with many issues related to planning, it often comes down to cost. It is advisable to start with a focused list of key measures that are widely seen as vital, but not so many that collecting the data requires unrealistic levels of effort or cost.

Common elements to track include:

- *Implementation of key actions called for in preferred scenario, such as expanded transit service or development of a downtown housing strategy.*
- *Changes in per capita VMT.*
- *Transportation mode choice (auto, transit, bike and walk).*
- *Land consumption.*
- *Amount of development accommodated through infill and redevelopment.*
- *Changes in jobs and households, and densities at various geographic levels (i.e. city totals, transit or mixed use areas, or targeted areas such as downtowns).*
- *Other measures as directed by the guiding principles and evaluation criteria established in Step 2.*

Conclusion

The *Guidelines* show that scenario planning is often only the beginning of a longer endeavor that utilizes the power of regional collaboration to move toward success on a range of shared goals, including GHG reduction. Implementation programs can take many forms, and are most likely to be successful if they are based on realistic outcomes of what can be accomplished. Even a modest implementation program can be instrumental to moving the metropolitan area toward the future depicted by the preferred scenario.

The result of scenario planning is a shared vision about how the metropolitan area can be better off. The vision serves as an important starting point and catalyst for a broad range of efforts throughout the community including land use and transportation plans, but perhaps more importantly, new partnerships among groups within the community to achieve the vision. Local governments and public agencies have a key role to play by pursuing public investments, programs and actions to achieve the vision.