Growing Wealthier Training:

Planning for a prosperous and equitable future in the Portland Metro Region

New Partners for Smart Growth
February 2, 2012
Mike Hoglund, Metro Research Director
Growing Wealthier: *Presentation Overview*

**Scenario Planning**
- Oregon requirements
- Portland Metro’s scenario planning approach and tools
- Metropolitan GreenSTEP/Results
- Envision Tomorrow

**Measuring Progress**
- Equity & the triple-bottom-line
- Evolving Tools and Methods
Scenario Planning:

Responding to Legislative Scenario Planning Requirements
Oregon Greenhouse Gas Goals

- Stop emissions growth by 2010
- Reduce emissions by 10% by 2020
- Reduce emissions by 75% by 2050

Adopted by the 2007 Legislature, the goals are for reductions below 1990 levels for all GHG emissions.
Mandated state climate work
HB 2001 and SB 1059

• Set statewide transportation strategy
• Set MPO GHG targets for light duty vehicles (<10,000 lbs.)
  o Estimate future vehicle & fuel technology
• Develop scenario guidelines & toolkit
• Public outreach campaign
• **Portland Metro scenario planning (light duty vehicles) to meet target**
• Update reports to Legislature

2035 GHG Targets for Oregon MPOs

per capita light vehicle GHG emissions reduction below 2005 levels

<table>
<thead>
<tr>
<th>Metropolitan area</th>
<th>Adopted target¹</th>
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</thead>
<tbody>
<tr>
<td>Portland Metro²</td>
<td>20%</td>
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<tr>
<td>Salem-Keizer</td>
<td>17%</td>
</tr>
<tr>
<td>Corvallis</td>
<td>21%</td>
</tr>
<tr>
<td>Eugene-Springfield³</td>
<td>20%</td>
</tr>
<tr>
<td>Bend</td>
<td>18%</td>
</tr>
<tr>
<td>Rogue Valley</td>
<td>19%</td>
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</tbody>
</table>

¹ Adopted by the Land Conservation and Development Commission in May 2011
² Required scenario planning and adoption
³ Required scenario planning
Light vehicles: region’s mandated focus

10% Other passenger transport
< 0.01% Transit
14% Local passenger transport
1% Local freight
48% Materials (goods and food)
27% Energy

The Portland Metro region generates over 31 MMT CO2e annually
Scenario Planning:

An approach for the 2010’s
What is scenario planning?

- Tests ability of various actions to meet *desired outcomes*
  - Understand the effects and degree of control
  - Develop strategies to optimize outcomes
  - Evaluate *plausible* choices to achieve outcomes
- Compare a “trend” or “base case” to one, more, or many alternatives
- Help visualize future outcomes
What is scenario planning?

• Typically used –
  – Test and narrow choices (what if...?)
  – Frame policies
  – Evaluate many choices/Advance few alternatives

• Utilizes “prescriptive” analytical methods
  – Sketch Tools

• Complements/precedes “formal” regional planning processes (e.g., RTP)
Portland Metro scenarios planning timeline:

2011
Phase 1

Understanding choices

2012
Phase 2

Shaping the direction

Jan 2012
Accept findings

2013 – 14
Phase 3

Building the strategy

Jan 2013
Confirm preferred scenario elements

June 2014
Adopt preferred strategy; begin implementation

Jan 2013
Confirm preferred scenario elements

June 2014
Adopt preferred strategy; begin implementation

We are here.
## Project tracks

|--------------------------|-----------------------------------|--------------------------------|---------------------------------------------|
| **Technical & policy analysis** | • Evaluation framework  
• Research policy levers and strategies  
• Tool development and integration | • Evaluation framework  
• Alternative scenarios  
• Tool integration & sensitivity testing | • Preferred scenario  
• Update regional plans and policies |
| **Communications & engagement** | • Opinion research  
• Literature review  
• Stakeholder interviews  
• Regional summit  
• Best practices research | • Design workshops  
• Other TBD | • Public comment period  
• Regional summit  
• Other TBD |
| **Tools** | • Metropolitan GreenSTEP  
• Literature review | • Metropolitan GreenSTEP  
• Envision Tomorrow | • Metropolitan GreenSTEP  
• Regional travel model  
• MetroScope  
• MOVES |
1 | Scenario Planning:

Scenario Planning – Right Tool for the Right Job
Sketch Tools:

*Selecting a Tool or Tools*

**Step 1: Planning Purpose**
- Strategic vs. Decision

**Step 2: Scale Definition**
- Local, Regional

**Step 3: Metrics**
- General: Travel Performance; environmental; social; economic.
- Specific: Greenhouse Gases; Criteria Pollutants

**Step 4: Tool Selection**
- Availability, Cost, Ease of Use
Selecting a Tool or Tools: Purpose

**Decision Tools**

- Purpose: Best Estimate
- Type: Equilibrium; Behavior; four-step/activity
- Benefit: Enhanced Detail
- Scale: Corridor, Regional
- Accuracy: predictive
- Cost:
  - Develop – High
  - Utilize – High
Selecting a Tool or Tools: Purpose

**Strategic/Sketch Tools**

- **Purpose:** What if?/Approximation/Comparison
- **Type:** Spreadsheet; GIS
- **Benefit:** Quick turnaround
- **Scale:** Local, Regional, State
- **Accuracy:** ordinal, prescriptive
- **Cost:**
  - Develop – Medium
  - Utilize – Low
Greenhouse Gas Emissions Analysis Tools

**Strategic/Sketch Tool** –

- **Examples:** GreenSTEP, I-PLACE$_3$S, Envision, Index, RapidFire...
- **Selection:** Scope, scale, policies, spatial/non-spatial, visualization, simulations; Tech Transfer
2 | Scenario Planning:

**Metropolitan GreenSTEP:**
Oregon’s Greenhouse Gas
Transportation Emissions Model
Metropolitan GreenSTEP...

- Advanced sketch model developed by Oregon DOT
- Metropolitan GreenSTEP is a regionally scaled version of the State GreenSTEP model

Purpose:
- Designed to assess the effects of policy strategies on transportation sector GHG emissions
- Provides understandable results for policy makers
...Metropolitan GreenSTEP

Scale:
GreenSTEP – Statewide
Metropolitan GreenSTEP – MPO-level

Scope:
• Analyzes the effects of policy strategies grouped into categories (“policy levers”)
• Each policy lever can be applied at various levels of ambition
• All future scenarios are evaluated off of existing plans and policies, e.g. the Reference Case
Building blocks for regional scenarios
Testing combinations of plausible strategies

<table>
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<th>Levels of ambition</th>
<th>Level 3</th>
<th>Level 2</th>
<th>Level 1</th>
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Policy areas and strategies

<table>
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<tr>
<th>Policy areas and strategies</th>
<th>Community design</th>
<th>Pricing</th>
<th>Marketing &amp; incentives</th>
<th>Roads</th>
<th>Fleet</th>
<th>Technology</th>
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3 | Scenario Planning:

**Metropolitan GreenSTEP:**
*Sample of Phase 1 Results*

*Can we meet our targets?*
Region’s 2035 GHG emissions reduction target (in per capita terms)

2005

4.05 MT CO$_2$e

Region’s 2035 target = 1.2 MT CO$_2$e

Fleet & Technology = 1.5 MT CO$_2$e

-20%

1.2 MT CO$_2$e

Community design
Pricing
Marketing & incentives
Roads

2035

2050
Current plans provide a strong foundation but are not enough.
Most ambitious pricing, fleet and technology

Target = 1.2 MT CO₂e per capita

Result = 1.2 MT CO₂e per capita

-22%
No new pricing, fleet or technology – community design level 3

Target = 1.2 MT CO2e per capita

Result = 1.1 MT CO2e per capita

Levels of Ambition

Policy Levers
Targets are achievable but will take more effort and new actions.
General findings

- Current local and regional plans and policies are ambitious and provide a strong foundation
- Targets are achievable but will take additional effort and new strategic actions
- Most strategies are already being implemented in the region
- The best approach is a mix of policies and strategies
Policy area findings

- Community design or pricing need to be more ambitious to meet target
- Fleet, technology and pricing provide similar significant GHG reductions, but not enough individually to meet target
- Road management, marketing and incentives provide similar, but modest GHG reductions
4 | Scenario Planning

Phase 2 tools and model development

- Envision Tomorrow
- Synthetic Population Model (SPM)
- Housing Assignment Model (HAM)
- Metropolitan GreenSTEP
- Additional evaluation methods
Phase 2: Shaping the direction

What’s missing from Phase 1?

• Growth allocation is NOT spatially explicit
• No relationship to housing supply and demand
• No housing cost
• Only evaluating GHG emissions

Technical approach for Phase 2

• Address gaps with Phase 1
• Link regional sketch models
Phase 2: Developing alternative scenarios

Supply
- Envision Tomorrow

Demand
- Synthetic Population Model

Allocation
- Housing Assignment Model

Outputs
- Metropolitan GreenSTEP
- Additional evaluation criteria

A → B → C → D

Comparison of Phase 1 policy areas (Sustainable Transportation Policy, Phase 1)

<table>
<thead>
<tr>
<th>Policy area</th>
<th>Level</th>
<th>Interest percent</th>
<th>DB/NR%</th>
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<tbody>
<tr>
<td>Accessibility</td>
<td>3</td>
<td>14%</td>
<td>16%</td>
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<tr>
<td>Affordability</td>
<td>2</td>
<td>24%</td>
<td>16%</td>
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<td>Housing</td>
<td>2</td>
<td>14%</td>
<td>14%</td>
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<tr>
<td>Land use</td>
<td>2</td>
<td>14%</td>
<td>14%</td>
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<tr>
<td>Transportation</td>
<td>2</td>
<td>14%</td>
<td>14%</td>
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<tr>
<td>Sustainability</td>
<td>2</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Non-metric</td>
<td>2</td>
<td>14%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Climate Scenarios Phase 2 tools and model development
Features of the Envision Tomorrow

- Sensitive to Key Strategies:
  - The 4Ds: Density, Diversity (mix and balance of uses), Design (walkability), Destinations (transit accessibility)
- Highly Visual
  - Clearly picture development features through mapping
- Geographically Scalable
- Interactive
  - Able to function in workshop environment
  - Allow users to experiment with scenarios
  - “Instant Feedback” on results of tests
- Understandable to Non-Technical Audiences
- Compatible/Adaptable to MPO models
Envision Tomorrow Step 1...

**Step 1:** Prototype buildings

Prototype Buildings → Development Typologies → Scenario Development

Allocation of demand

SPM & HAM

4 | Climate Scenarios Phase 2 tools and model development
Envision Tomorrow Step 2...

**Step 2: Development Typologies**

Prototype Buildings -> Development Typologies -> Scenario Development

Allocation of demand

SPM & HAM

4 | Climate Scenarios Phase 2 tools and model development
Development Typology examples: a variety of buildings, streets and amenities create a “place”

- Commercial node
- Transitional neighborhood
- Single-Family Residential
Envision Tomorrow Step 3...

Step 3: Scenario painter

Building Types → Development Types → Scenario Development

Allocation of demand

SPM & HAM

4 | Climate Scenarios Phase 2 tools and model development
...Envision Tomorrow Step 3

4 | Climate Scenarios Phase 2 tools and model development
Linking supply and demand...

**Step 4:** Generating demand (synthetic households)

[Diagram of building types, development types, scenario development, allocation of demand, SPM & HAM]
Synthetic Population Model

SPM Purpose

• Generate synthetic households (2010 & 2035)

• Calculate willingness to pay or rent demand price for each household
Housing Assignment Model

HAM purpose

• Match demand to supply
• Report housing mismatch (non-iterative and non-equilibrium based approach)
• Housing affordability implications of land use decisions
Outcomes for Phase 2

**Equity**
- Access to affordable housing and travel options
- Access to opportunity
- Public health

**Environment**
- Air quality
- Access to parks and natural areas

**Economy**
- Access to industry/jobs

**Costs and savings**
- Implementation
- Household and business (green dividend; housing/transportation cost)

**Greenhouse Gas (GreenSTEP)**

- Freight travel time costs
- Economic development opportunities
Phase 2: Other Equity Evaluation Methods

- Opportunity Index (Flex Funds)
- Context Tool (Portland Metro)
- Regional Indicators (Portland Pulse)
Opportunity Index: Regional Federal Flex Funds

2012-15 Regional Flexible Funding Allocation
Transportation Equity Analysis

Equity Composite²

The Equity Composite² map visualizes areas that simultaneously have a high population of underserved, a low density of essential services, and low proximity to non-auto transportation.

The data represents averages of z-scores that have been classified 1-5 (adjusted for direction) and averaged into the RFTA Opportunity Index.
Phase 2: Context Tool
The Walk Method

Each cell represents a 1-minute walk time at 3 mph

264’

5 minutes

¼ mile
The Model

- People
- Places
- Open Spaces
- Accessibility

Composite Score
TOD Strategic Plan
TOD Station Community Typology

market activity (sales per square foot)

2/21/12

Eastside  Westside  Airport  Interstate  Green
Urban Form/Activity
5 P’s of TOD

urban form & activity
Value
- transit oriented
- transit adjacent
Portlandpulse.org

GREATER PORTLAND PULSE  Measuring Results, Inspiring Action
What We Do

Greater Portland Pulse gathers data and provides a shared set of indicators to track social, environmental, and economic well-being for the Portland region. [Read more]

Portland Pulse Report

Read our new report, "The Path to Economic Prosperity: Equity and the Education Imperative."

Endorse Us

Show your support for Greater Portland Pulse. Sign on to our list of GPP supporters.

Explore Indicators

The following are a few of the available indicators:

- Housing Cost Burden
First State of the Region Report
Wrap up and next steps

- Documentation
- Continue model development
- Scope Phase 2 approach and engagement
- Develop evaluation criteria
- Tech transfer
Questions?
Thank you!

mike.hoglund@oregonmetro.gov
www.oregonmetro.gov/climatescenarios
Metro’s Context Tool

• URL:
  https://selenite.oregonmetro.gov/cistool/

• Contact:
  Clint Chiavarini
  503-797-1738
  clint.chiavarini@oregonmetro.gov
# Phase 2: Linking regional sketch models

<table>
<thead>
<tr>
<th>Model</th>
<th>(A) Envision Tomorrow</th>
<th>(B) Synthetic Population Model (SPM)</th>
<th>(C) Housing Assignment Model (HAM)</th>
<th>(D) Metropolitan GreenSTEP/ additional evaluation criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geographic specificity: 264’ grid cell</td>
<td>Household size, income and age characteristics</td>
<td>Match housing supply (envision) with demand (SPM)</td>
<td>Other GreenSTEP outputs</td>
<td></td>
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<tr>
<td>Buildable lands inventory and capacity assumptions</td>
<td>Willingness to pay or rent demand price by HIA</td>
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<td>Roadway GHG emissions</td>
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<td>ROI: construction costs of new development (2010)</td>
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<td>Matches supply and demand</td>
<td>Health Impact Assessment</td>
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<td>2010 and 2035 Land values (place-based costs)</td>
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<td>Economic impacts</td>
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<td><strong>Outputs</strong></td>
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<td>Housing and job supply (2010 &amp; 2035)</td>
<td>Housing demand by type and HIA</td>
<td>Identify housing mismatch</td>
<td>Implementation costs</td>
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<td>Housing costs (2010 &amp; 2035)</td>
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<td>Metropolitan GreenSTEP inputs (selection)</td>
<td>Costs and cost benefits</td>
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