

www.oregonmetro.gov/climatescenarios



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



Metro | *Making a great place*

Growing Wealthier: *Presentation Overview*



Scenario Planning

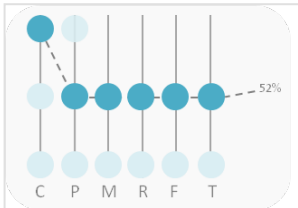
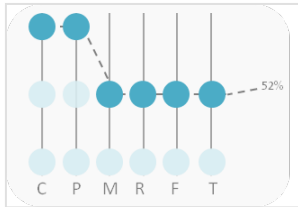
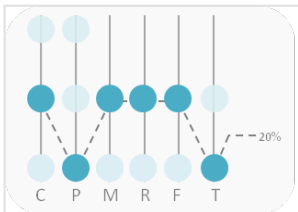
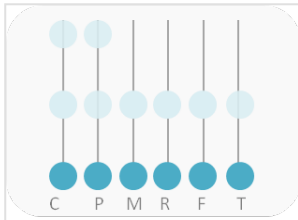
- Oregon requirements
- Portland Metro's scenario planning approach and tools
- Metropolitan GreenSTEP/Results
- Envision Tomorrow

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.)
 - 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

More information: <http://www.oregon.gov/ODOT/TD/OSTI/>



2035 GHG Targets for Oregon MPOs

per capita light vehicle GHG emissions reduction below 2005 levels



2035 GHG targets for Oregon metropolitan areas per capita light vehicle GHG emissions reduction

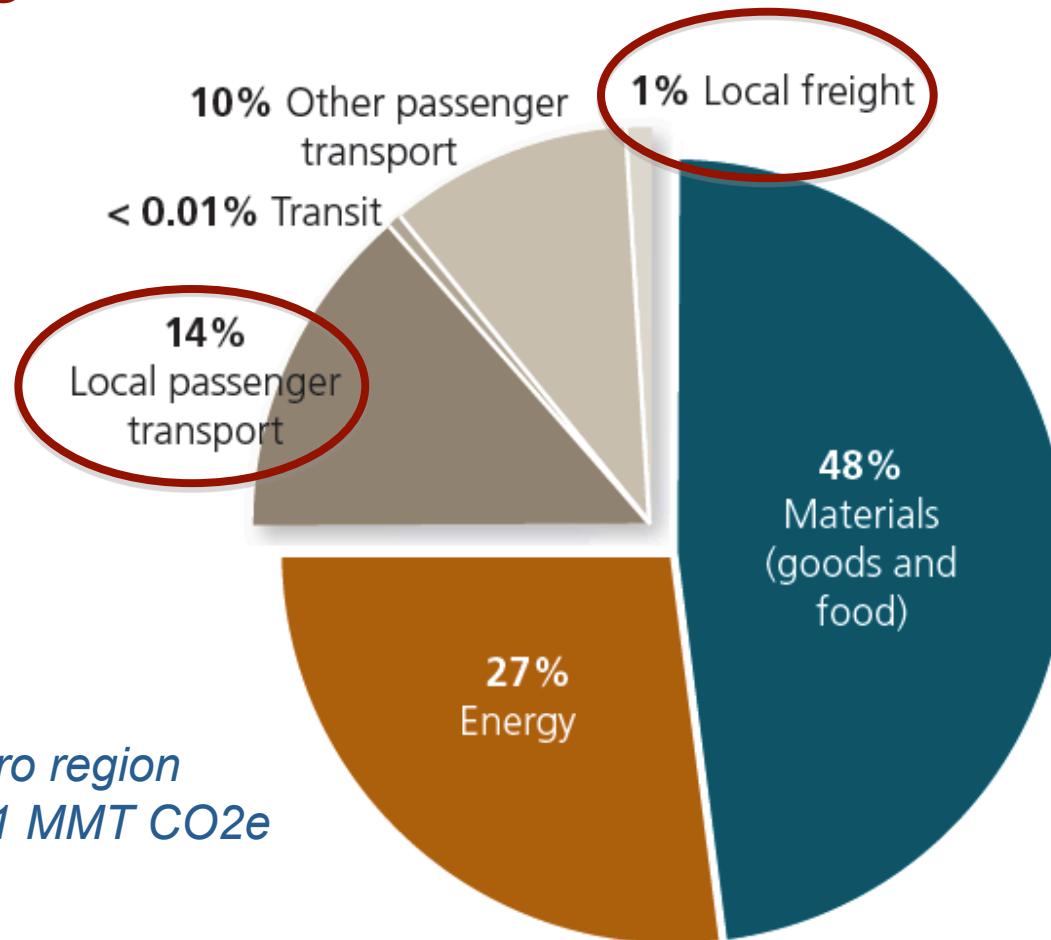
Metropolitan area	Adopted target ¹
Portland Metro ²	20%
Salem-Keizer	17%
Corvallis	21%
Eugene-Springfield ³	20%
Bend	18%
Rogue Valley	19%

¹ Adopted by the Land Conservation and Development Commission in May 2011

² Required scenario planning and adoption

³ Required scenario planning

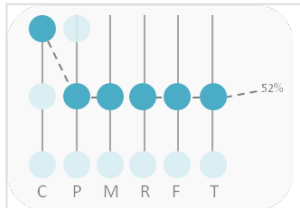
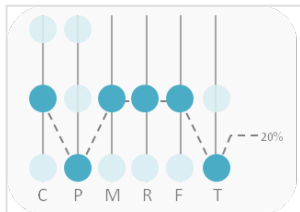
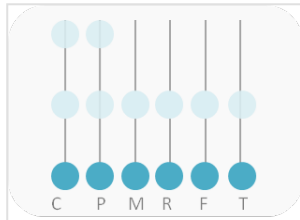
Light vehicles: region's mandated focus



The Portland Metro region generates over 31 MMT CO₂e annually

Scenario Planning:

An approach for the 2010's



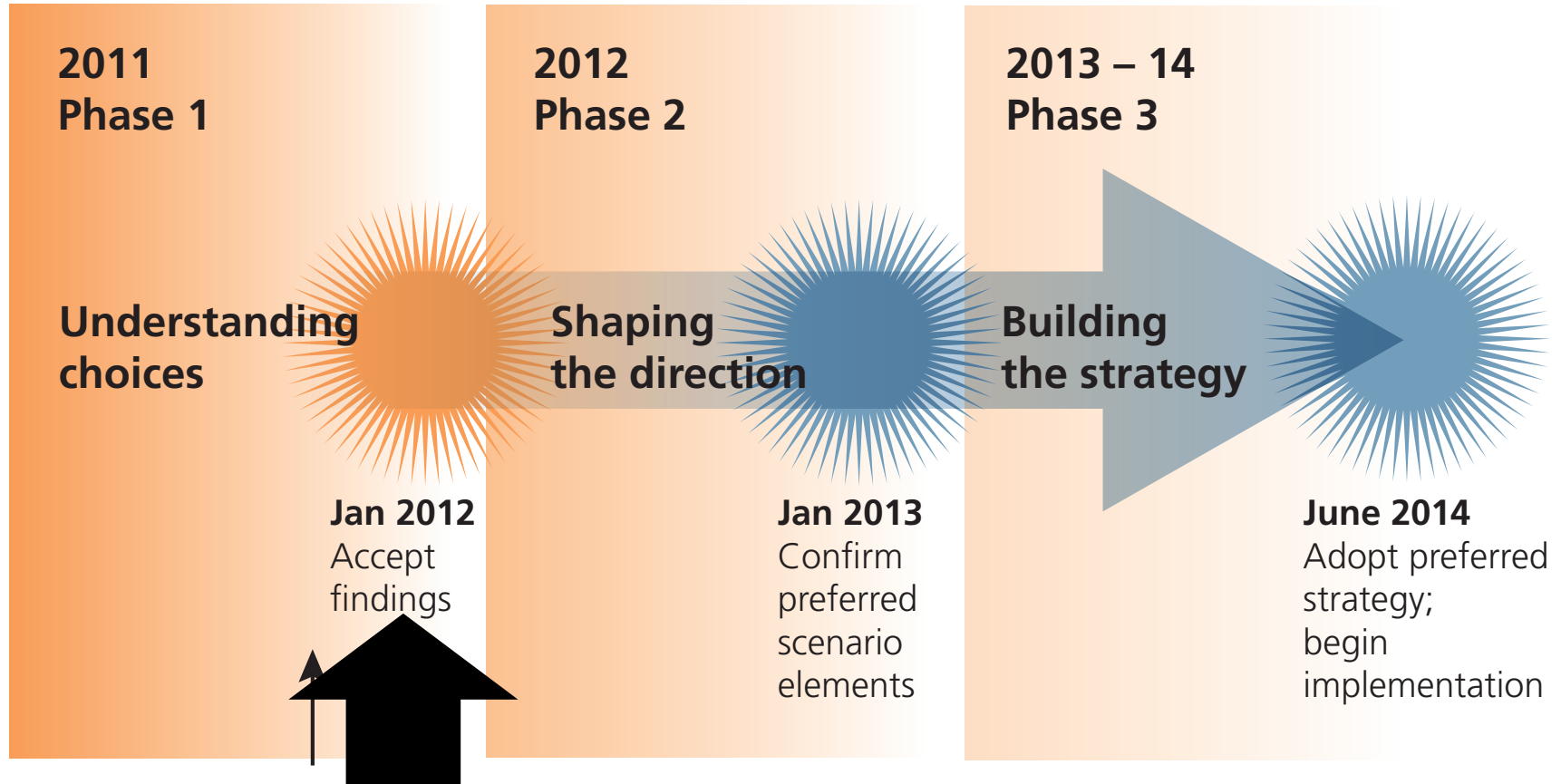
What is scenario planning?

- 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:



Project tracks

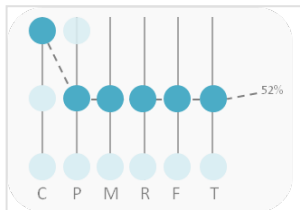
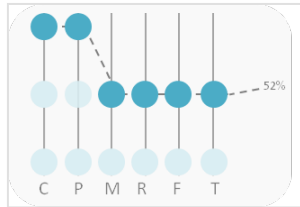
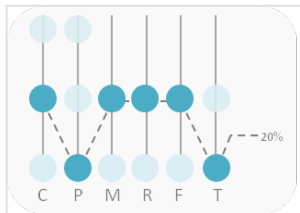
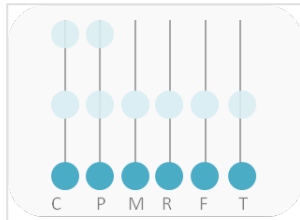
	Understand Choices Phase 1 (2011)	Shape Direction Phase 2 (2012)	Build and Select Strategy Phase 3 (2013-14)
Technical & policy analysis	<ul style="list-style-type: none"> • Evaluation framework • Research policy levers and strategies • Tool development and integration 	<ul style="list-style-type: none"> • Evaluation framework • Alternative scenarios • Tool integration & sensitivity testing 	<ul style="list-style-type: none"> • Preferred scenario • Update regional plans and policies
Communications & engagement	<ul style="list-style-type: none"> • Opinion research • Literature review • Stakeholder interviews • Regional summit • Best practices research 	<ul style="list-style-type: none"> • Design workshops • Other TBD 	<ul style="list-style-type: none"> • Public comment period • Regional summit • Other TBD
Tools	<ul style="list-style-type: none"> • Metropolitan GreenSTEP • Literature review 	<ul style="list-style-type: none"> • Metropolitan GreenSTEP • Envision Tomorrow 	<ul style="list-style-type: none"> • Metropolitan GreenSTEP • Regional travel model • MetroScope • MOVES



We are here.



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

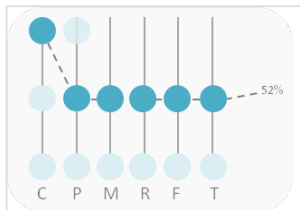
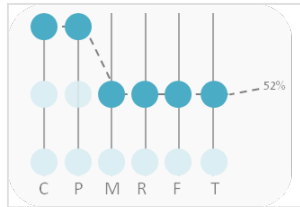
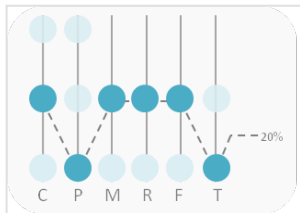
Greenhouse Gas Emissions Analysis Tools



Strategic/Sketch Tool –

- Examples: **GreenSTEP**, I-PLACE₃S, 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

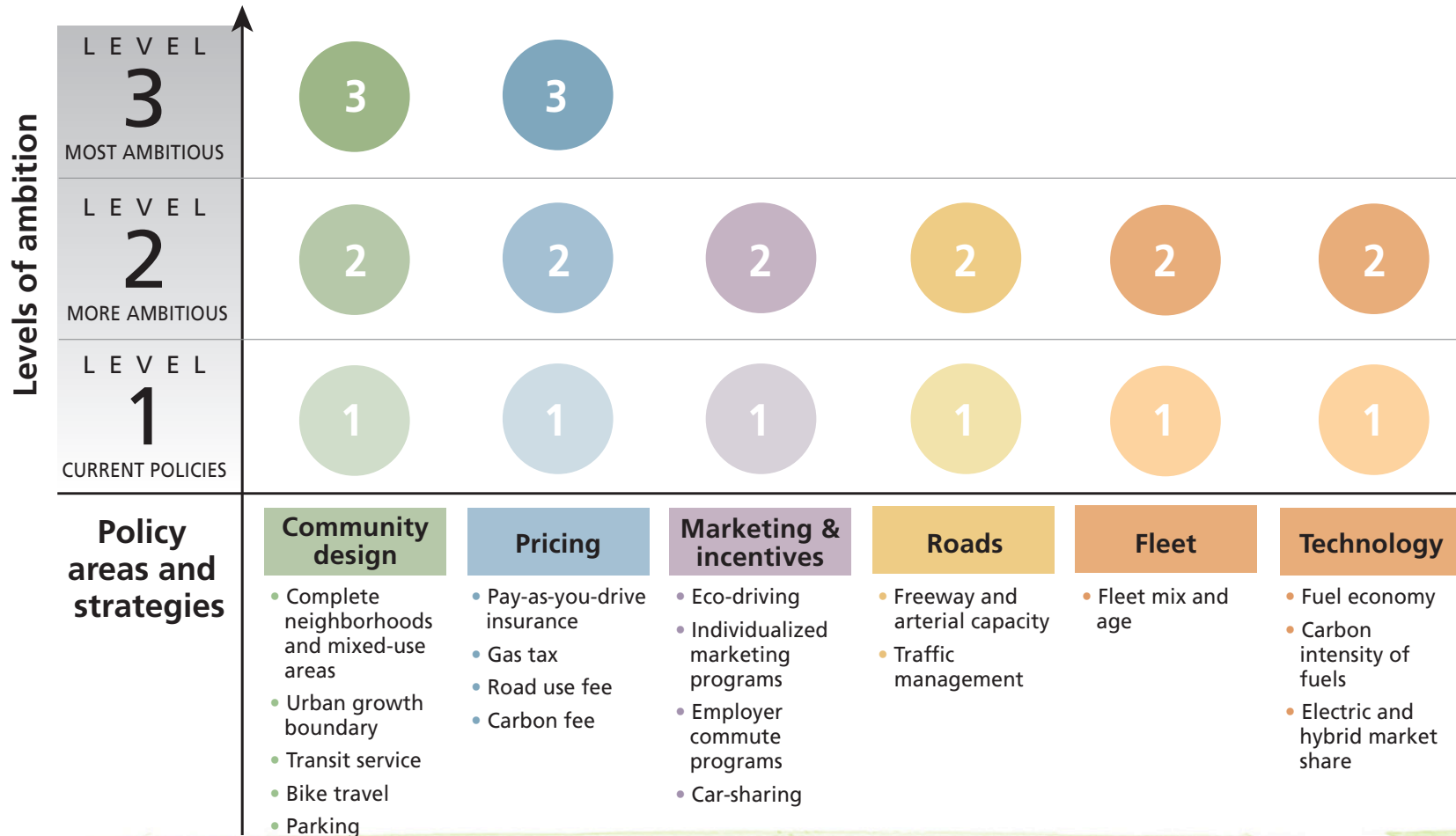
Metropolitan GreenSTEP – MPO-level

Scope:

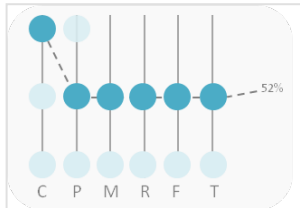
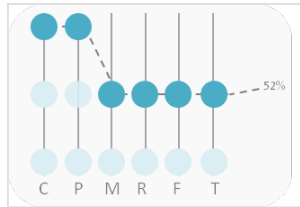
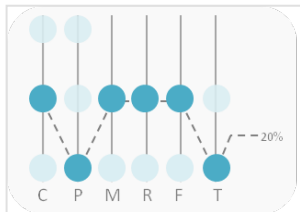
- Analyzes the effects of policy strategies grouped into categories (“policy levers”)
- Each policy lever can be applied at various levels of ambition
- All future scenarios are evaluated off of existing plans and policies, e.g. the Reference Case

Building blocks for regional scenarios

Testing combinations of plausible strategies



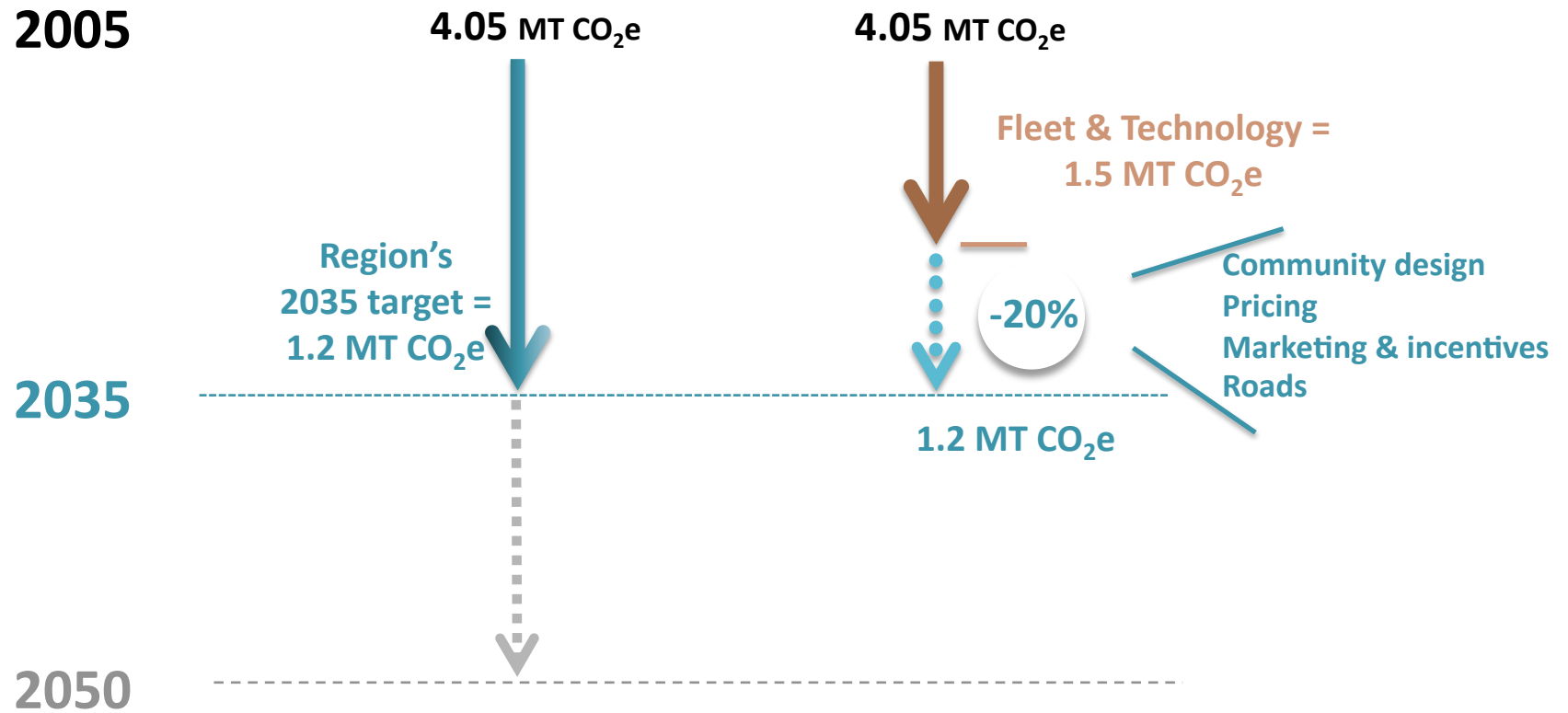
3 | Scenario Planning:



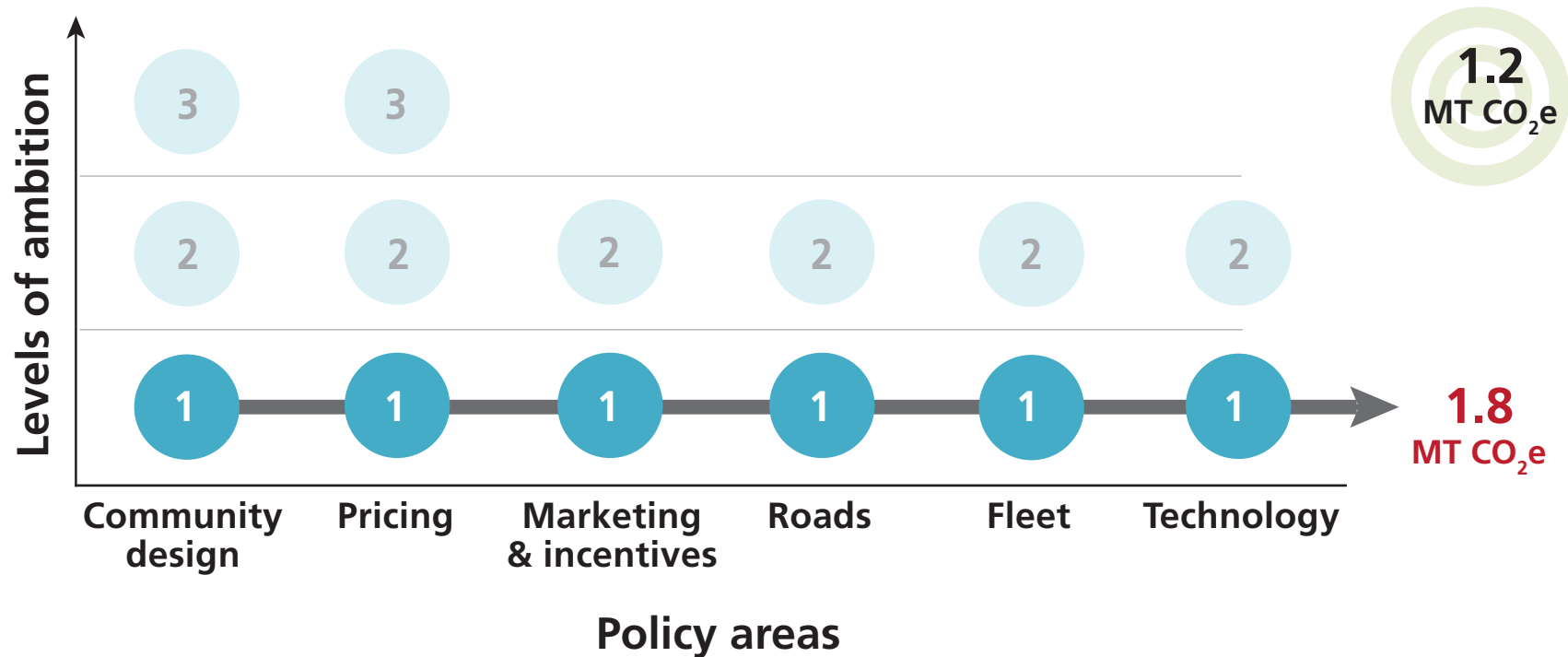
***Metropolitan GreenSTEP:
Sample of Phase 1 Results***

Can we meet our targets?

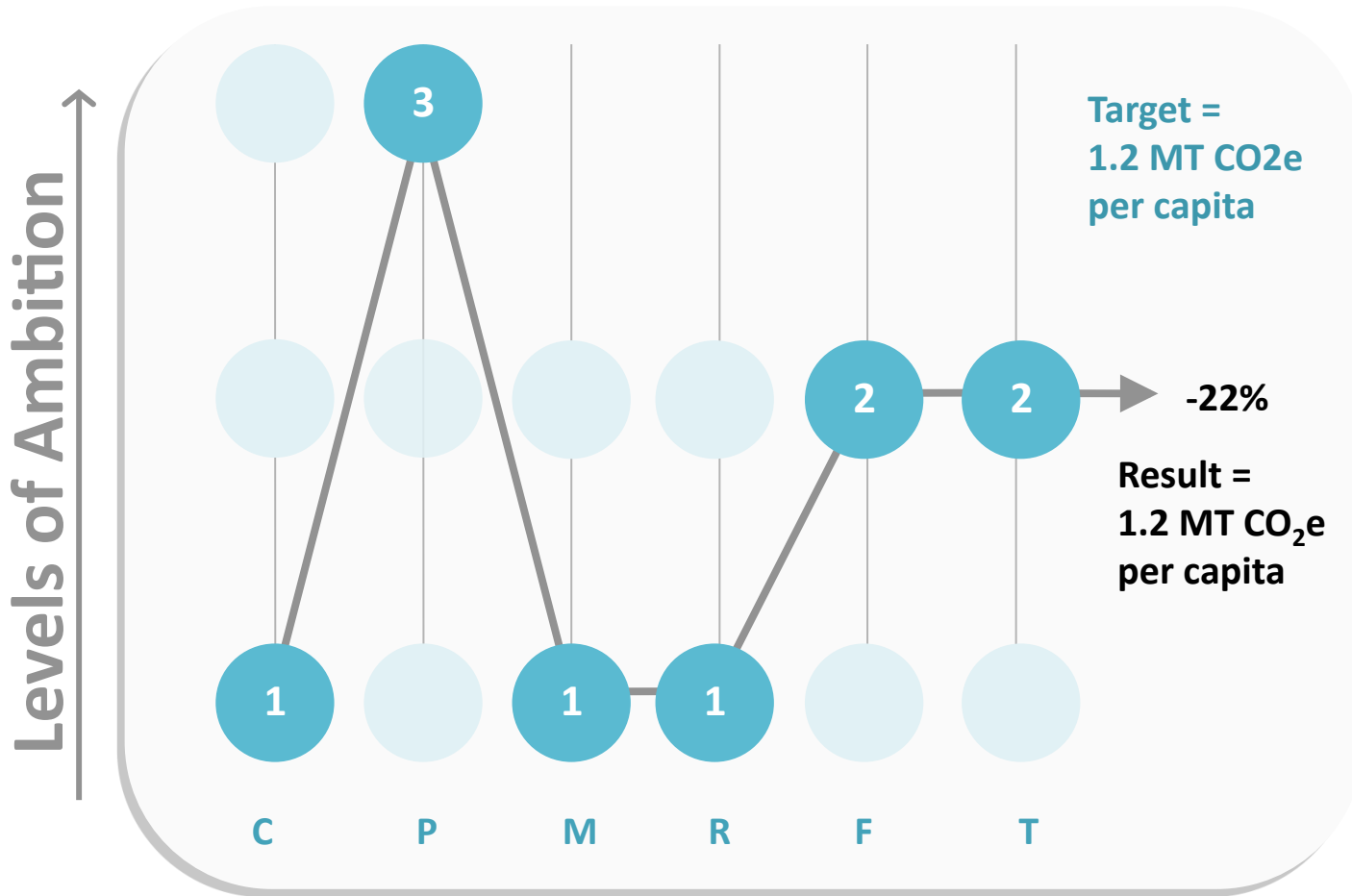
Region's 2035 GHG emissions reduction target (in per capita terms)



Current plans provide a strong foundation but are not enough

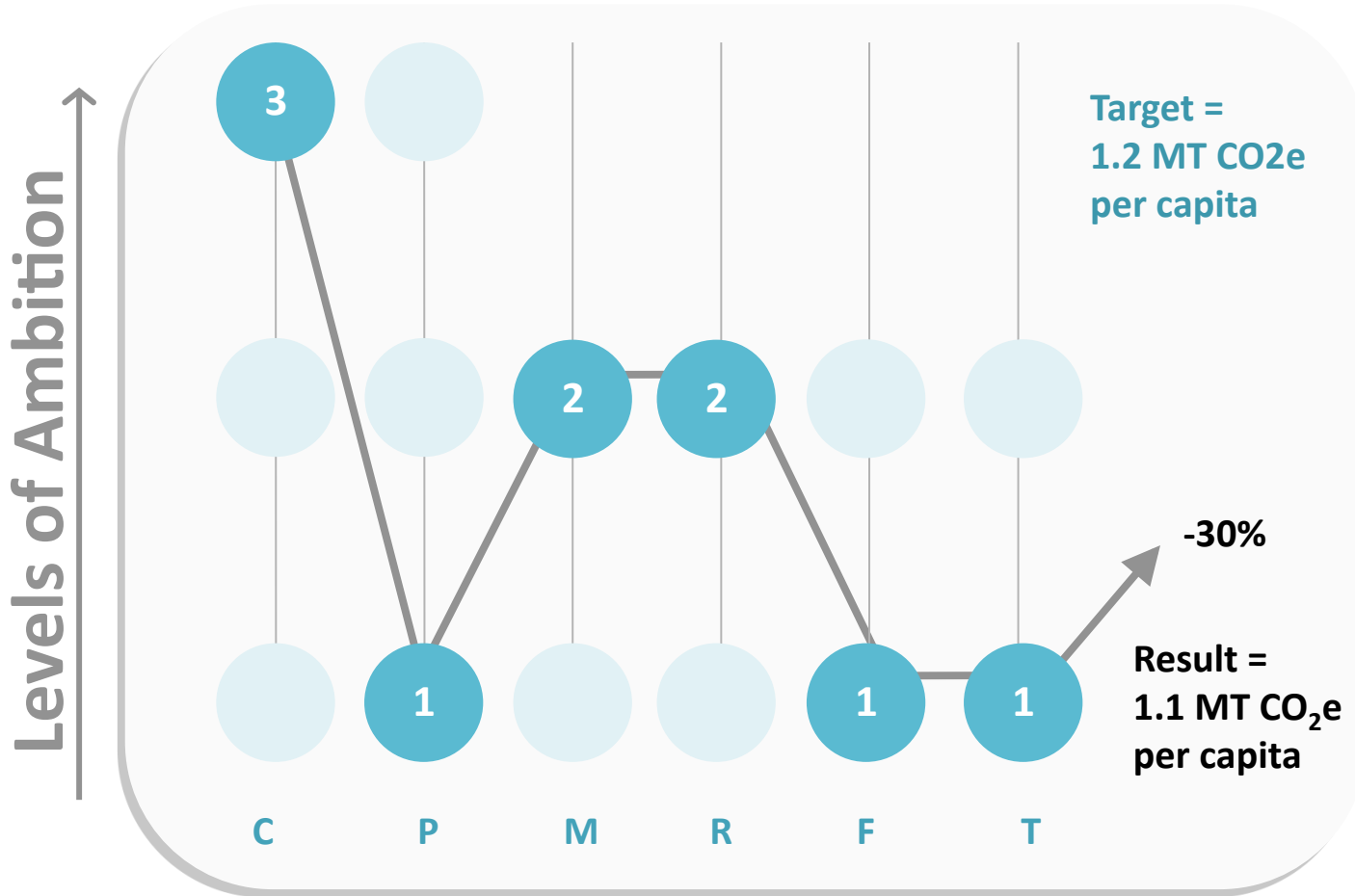


Most ambitious pricing, fleet and technology



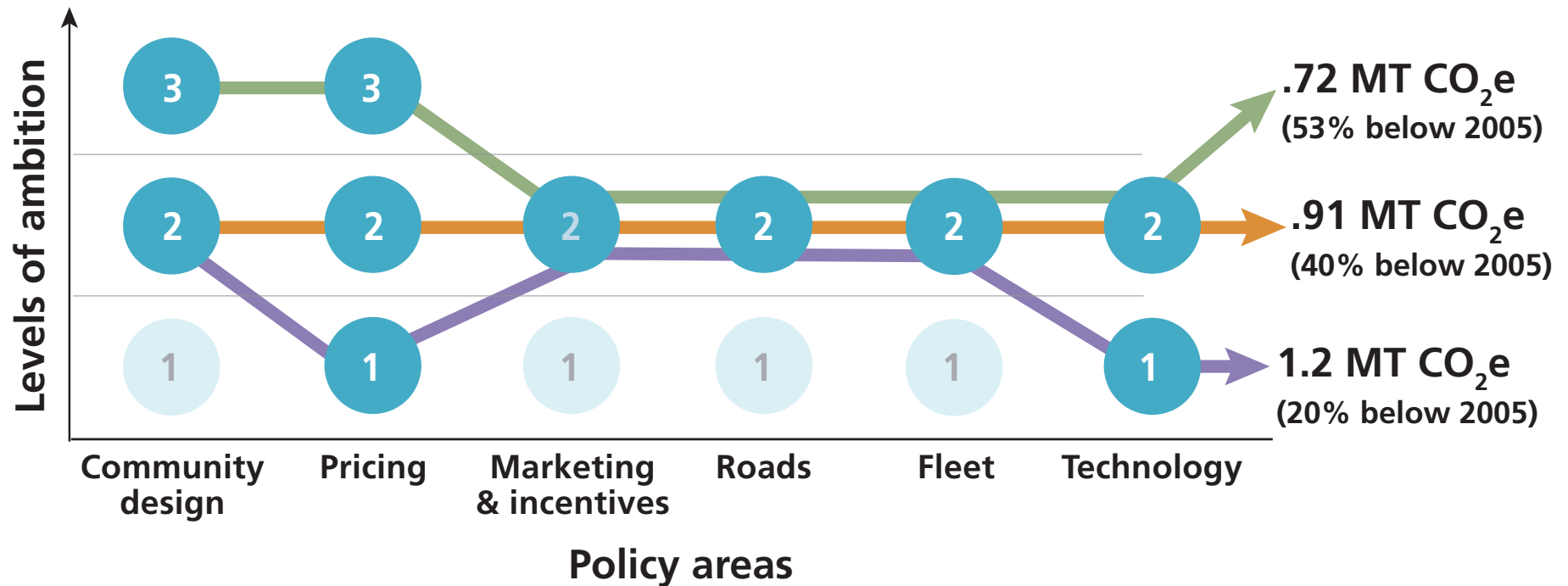
Policy Levers

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



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

Comparison of Phase 1 policy areas
Estimated reductions in roadway GHG emissions from current plans and policies

Policy area	Level	Estimated percent reduction from 1.8 MTCO ₂ e*
Community design	2	18%
Community design	3	36%
Pricing	2	13%
Pricing	3	14%
Marketing and incentives	2	4%
Roads	2	2%
Fleet	2	11%
Technology	2	14%

*MT CO₂e percent change from 2035 Reference Case (current plans and policies)

Outputs

- Metropolitan GreenSTEP
- Additional evaluation criteria



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

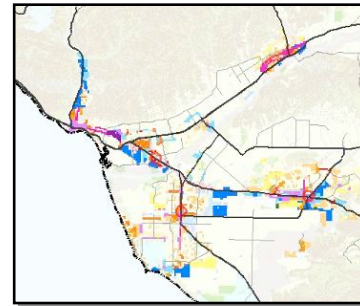
Envision Tomorrow Step 1...

Step 1: Prototype buildings



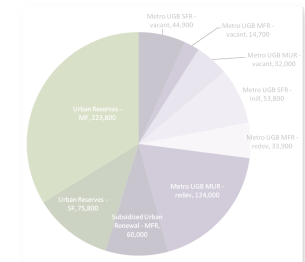
Prototype Buildings

Development Typologies



Scenario Development

Allocation of demand



SPM & HAM



Envision Tomorrow Step 2...

Step 2: Development Typologies

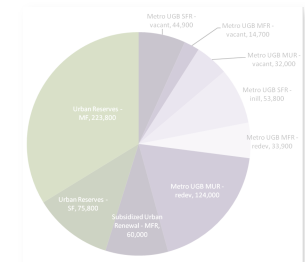


Prototype Buildings

Development Typologies

Scenario Development

Allocation of demand



SPM & HAM



...Envision Tomorrow Step 2

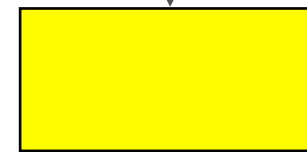
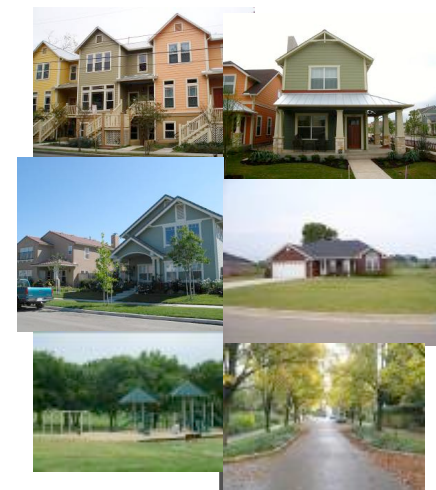
Development Typology examples: a variety of buildings, streets and amenities create a “place”



Commercial node



Transitional neighborhood



Single-Family Residential

Envision Tomorrow Step 3...

Step 3: Scenario painter

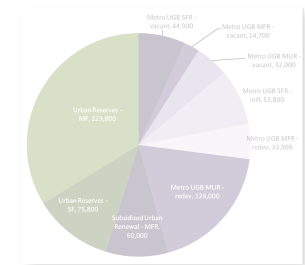


Building Types

Development Types

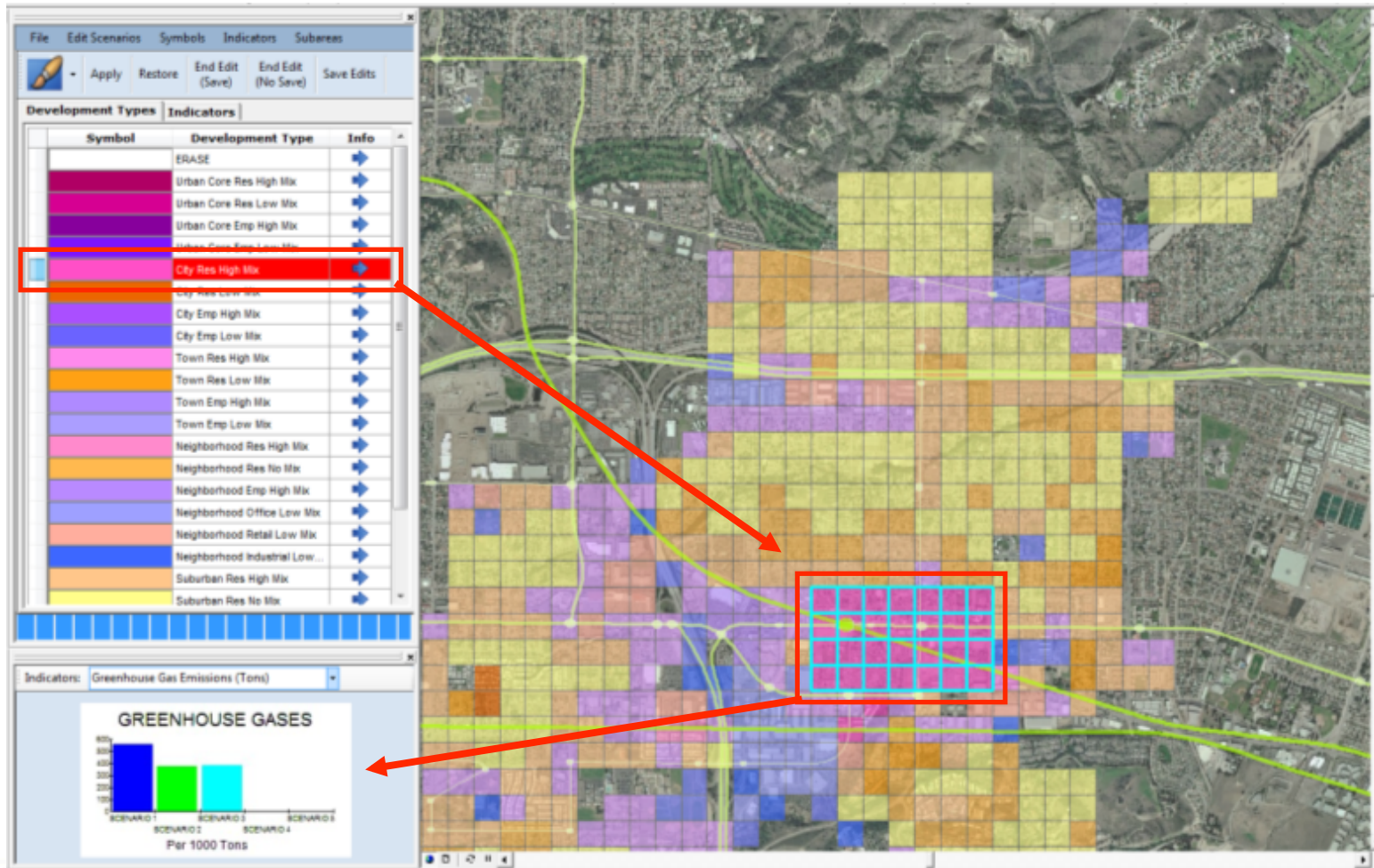
Scenario Development

Allocation of demand



SPM & HAM

...Envision Tomorrow Step 3





demand

Linking supply and demand...

Step 4: Generating demand (synthetic households)

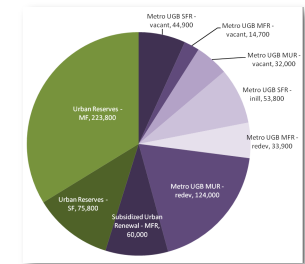


Building Types

Development Types

Scenario Development

Allocation of demand



SPM & HAM



demand

Synthetic Population Model

SPM Purpose

- Generate synthetic households (2010 & 2035)
- Calculate willingness to pay or rent demand price for each household



allocation

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

D

outputs



Outcomes for Phase 2

Equity

- Access to affordable housing and travel options
- Access to opportunity
- Public health
- Freight travel time costs
- Economic development opportunities

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)



outputs

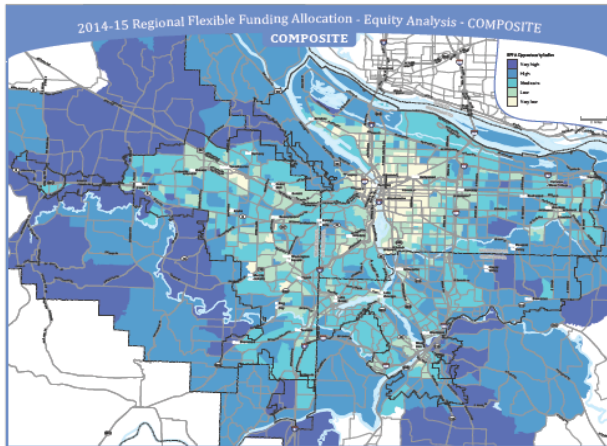
Phase 2: Other Equity Evaluation Methods

- 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

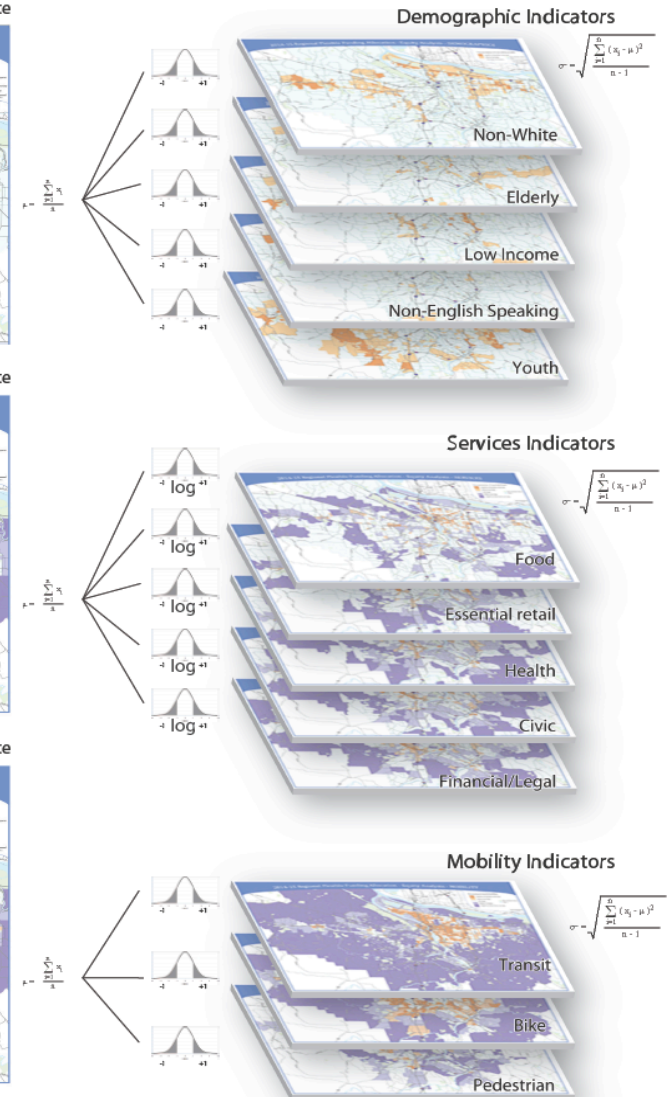
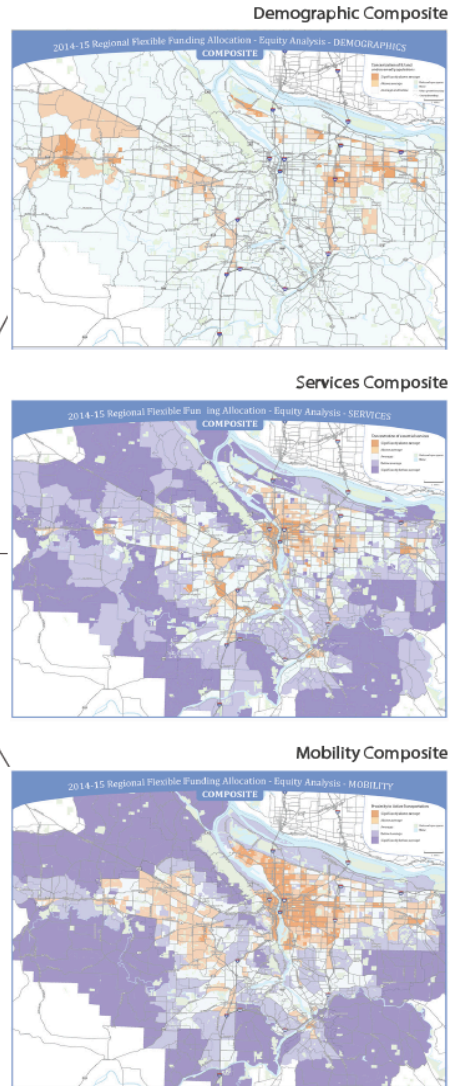
Equity Composite²



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 RFFA Opportunity Index.

Designed and produced in Portland, Oregon at Metro
matthew.hampton@oregonmetro.gov



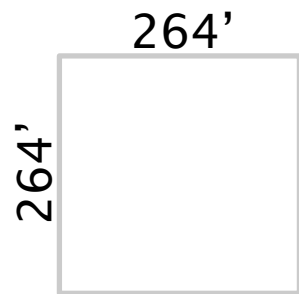
Draft 1.2



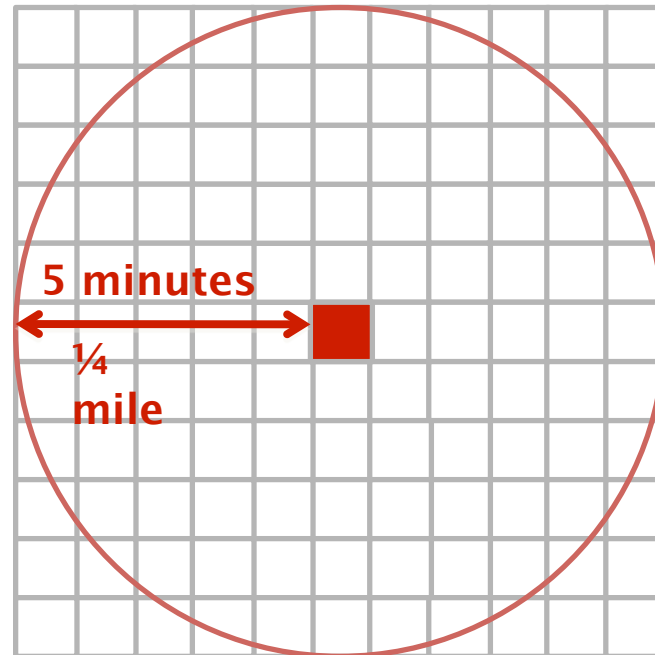
outputs

Phase 2: Context Tool

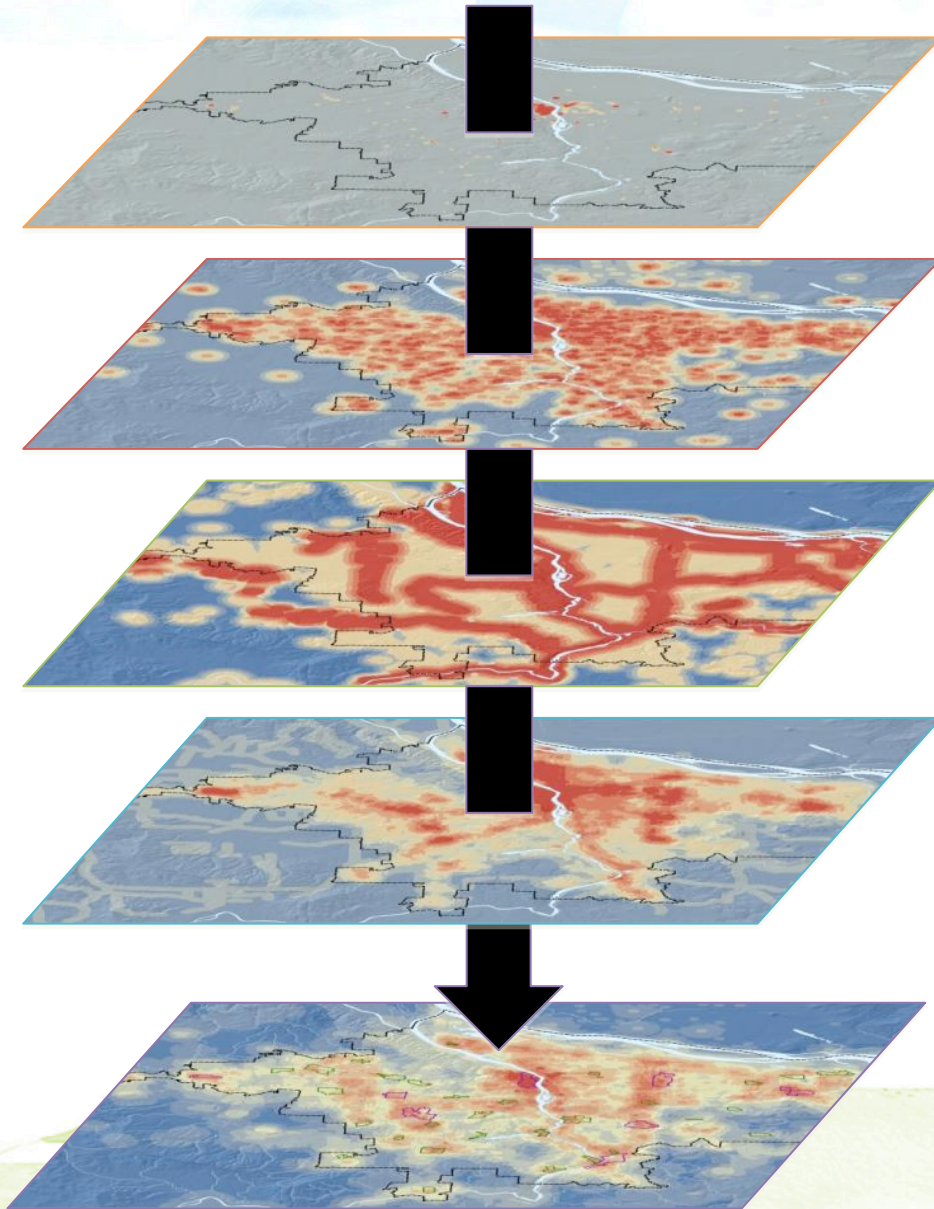
The Walk Method



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



The Model



People

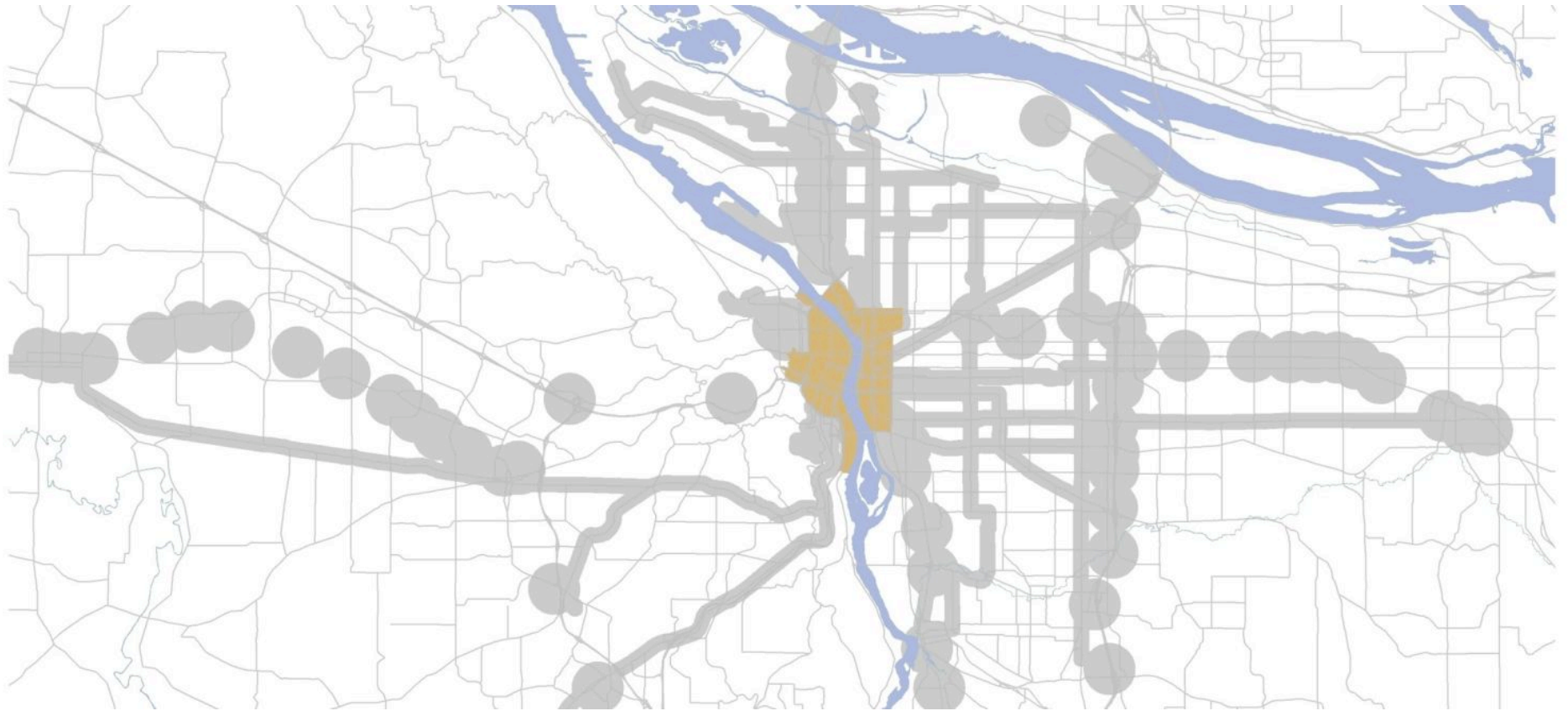
Places

Open Spaces

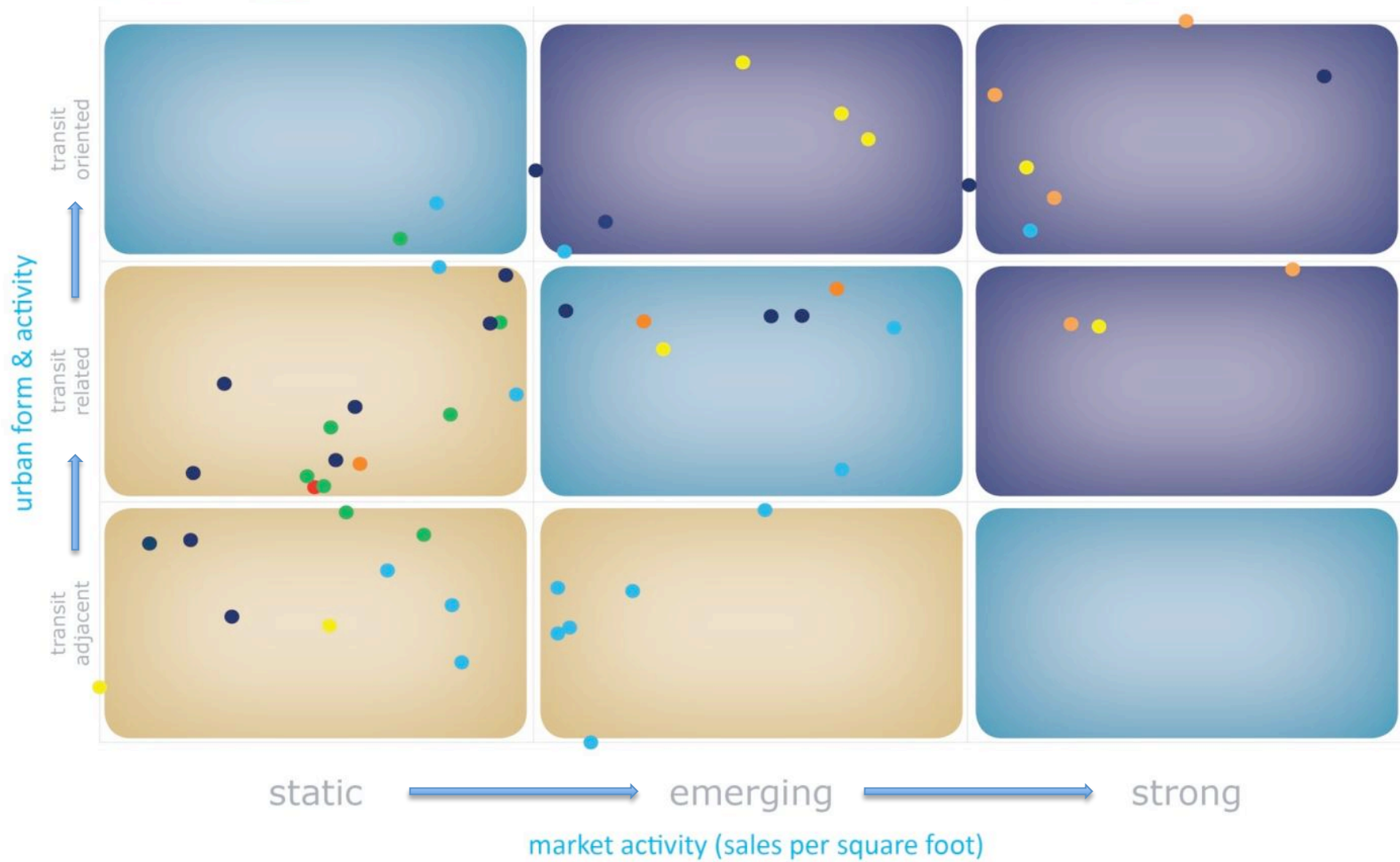
Accessibility

Composite Score

TOD Strategic Plan



TOD Station Community Typology



2/21/12

● Eastside

● Westside

● Airport

● Interstate

● Green




Urban Form/Activity

5 P's of TOD

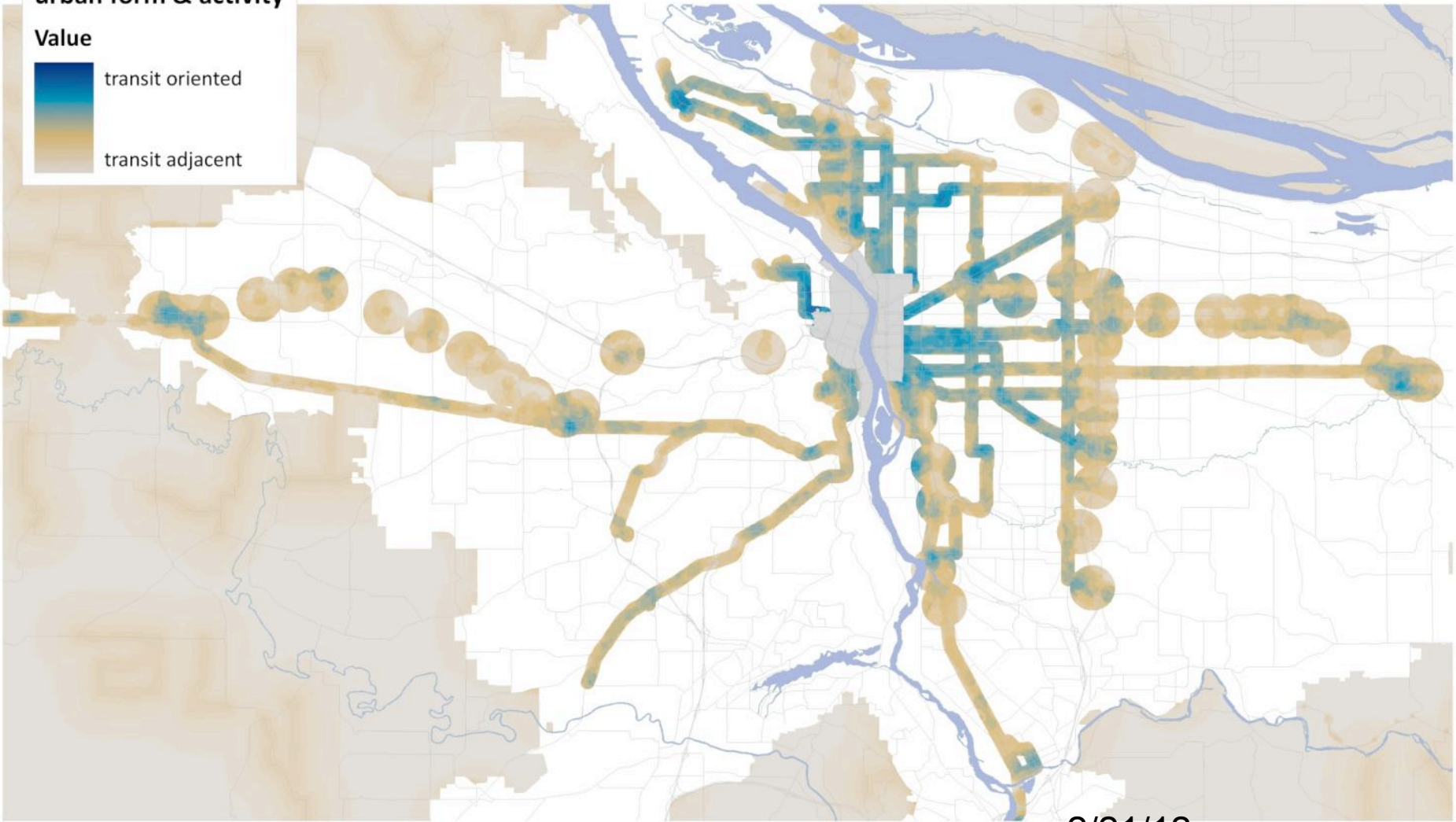
urban form & activity

Value



transit oriented

transit adjacent





Indicators

Portlandpulse.org

GREATER PORTLAND
PULSE

*Measuring Results,
Inspiring Action*





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GREATER PORTLAND PULSE

Measuring Results, Inspiring Action.

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Explore
by Topic >



economic
opportunity



education



healthy people



safe people



arts and
culture



civic
engagement



healthy natural
environment



housing and
communities



access
and mobility

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](#)

Latest News >

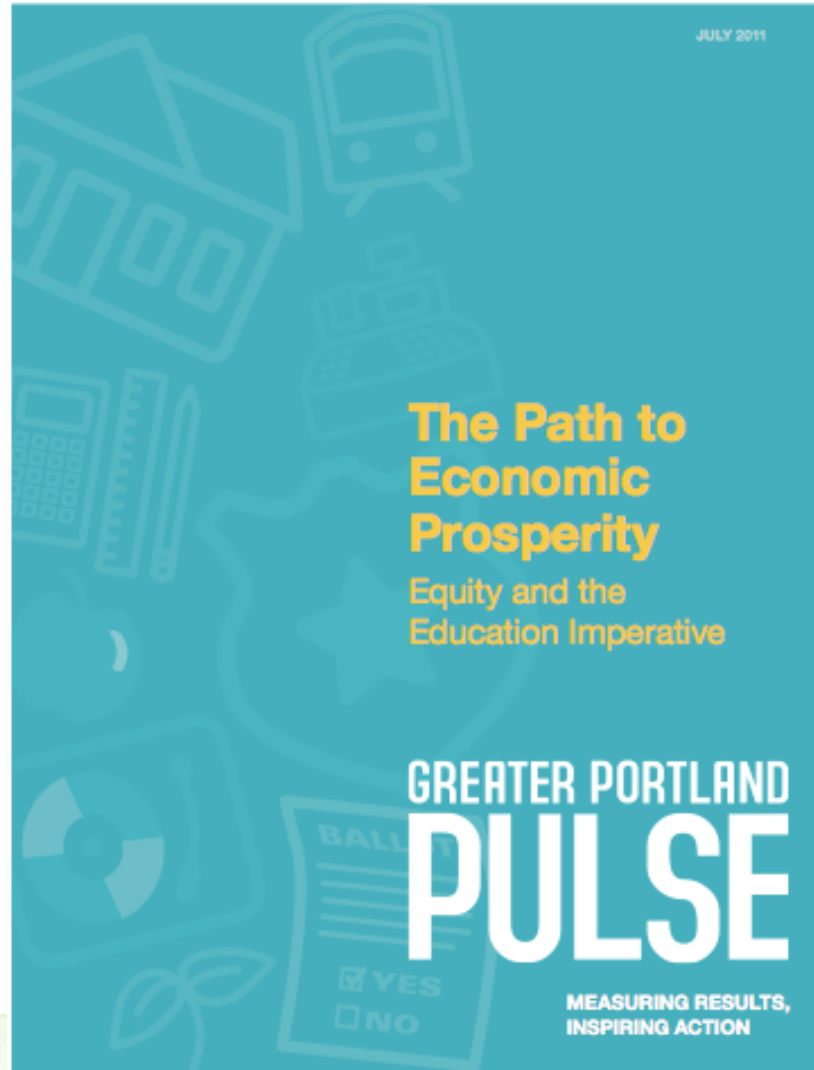
[What does poverty look like in Multnomah County?](#)

Mon, December 19, 2011

E

Indicators

First State of the Region Report



Metro



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/](https://selenite.oregonmetro.gov/cistool/)
- Contact:
Clint Chiavarini
503-797-1738
clint.chiavarini@oregonmetro.gov

Phase 2: Linking regional sketch models

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