



# Connecting Scenario Approaches with Scenario Tools

## Oregon DOT Case Study

### VisionEval Strategic Planning Tools

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August 16, 2016 TRB Scenario Planning Conference

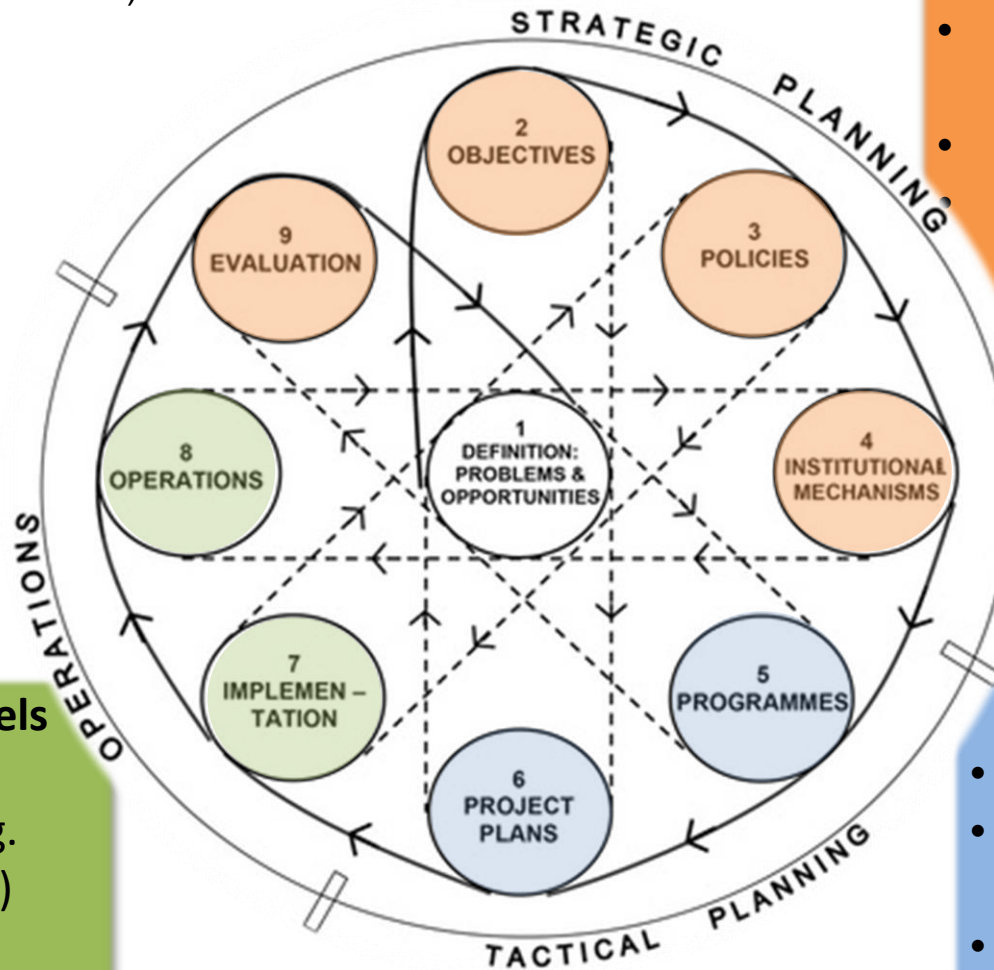


# Outline

- Tool Background, where fits into process
- Case Study in Oregon (state & metro levels)
- Resourcing
- VisionEval Open Source Project  
(family of strategic models)

# Introducing Strategic Planning Layer

Modified from planning diagram by:  
Edward Leman (www.chreod.ca)



## Strategic Planning Models

- Broad scope
- Limited detail (e.g. system level)
- Many scenarios  
e.g. GreenSTEP, RSPM, RPAT

## Operational Models

- Limited scope
- Very detailed (e.g. intersection level)
- Few scenarios
- e.g. traffic simulation, transit operations

## Tactical Models

- Moderate scope
- Moderate detail (e.g. link level)
- Few scenarios
- e.g. urban travel demand model

# Regional Strategic Planning Model

## Inputs

- Regional Context
- Community Design
- Marketing & Incentives
- Fleet & Technology
- Pricing

## RSPM

1. Create MPO Households
2. Estimate Daily VMT

Re-calculate to  
balance VMT &  
travel costs

3. Add Vehicles & Estimate  
Greenhouse Gas  
Emissions

## Outputs

- Mobility
  - Vehicle miles traveled
- Land Use
  - Mixed Use
  - Housing Type
- Economy
  - Travel delay
- Equity
  - Household travel costs
- Environment
  - Air Quality
  - Greenhouse gas emissions

# State GHG Planning with RSPM

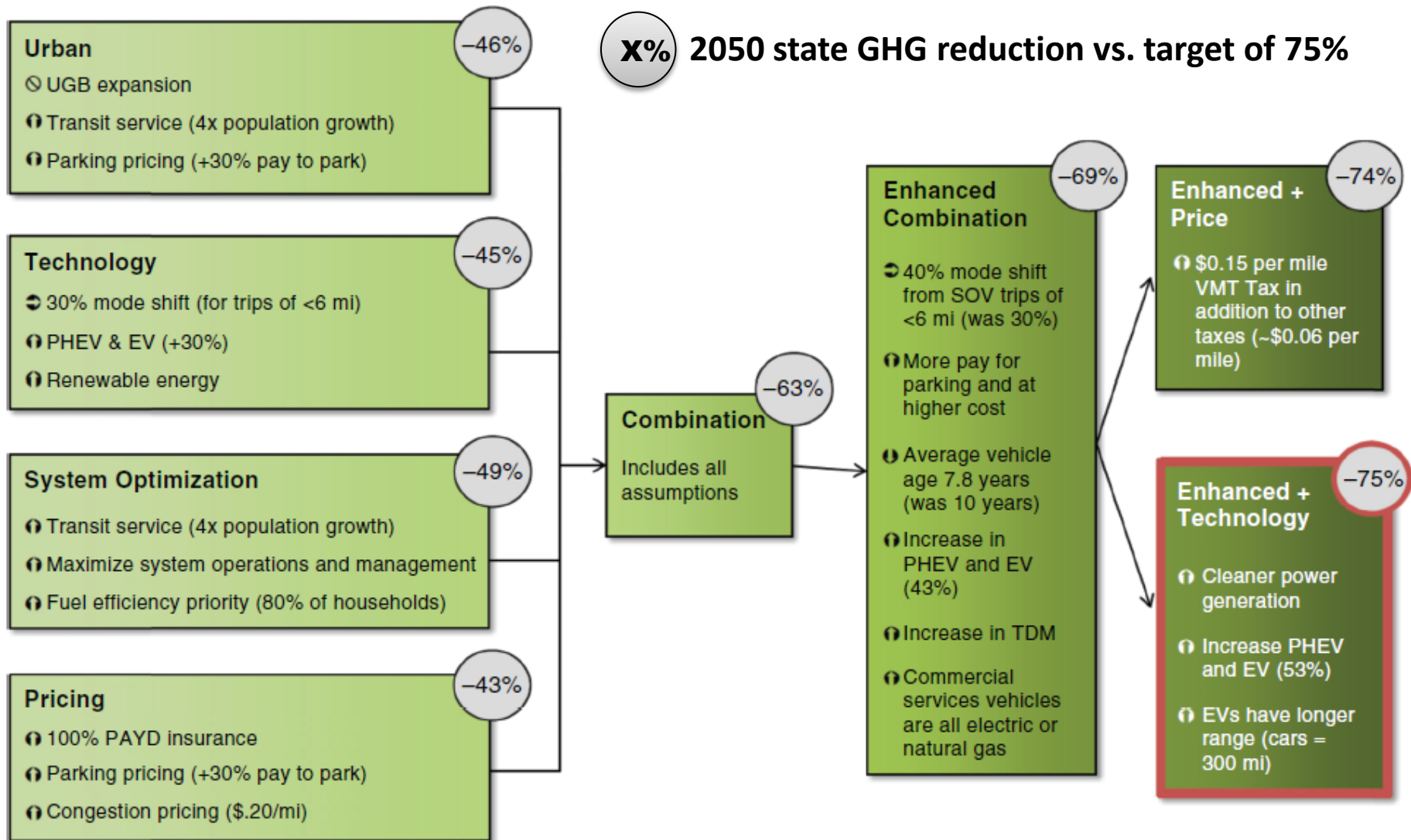


FIGURE 1 Evolution of STS scenarios for on-ground passengers (SOV = single-occupant vehicle, TDM = transportation demand management, UGB = urban growth boundary).

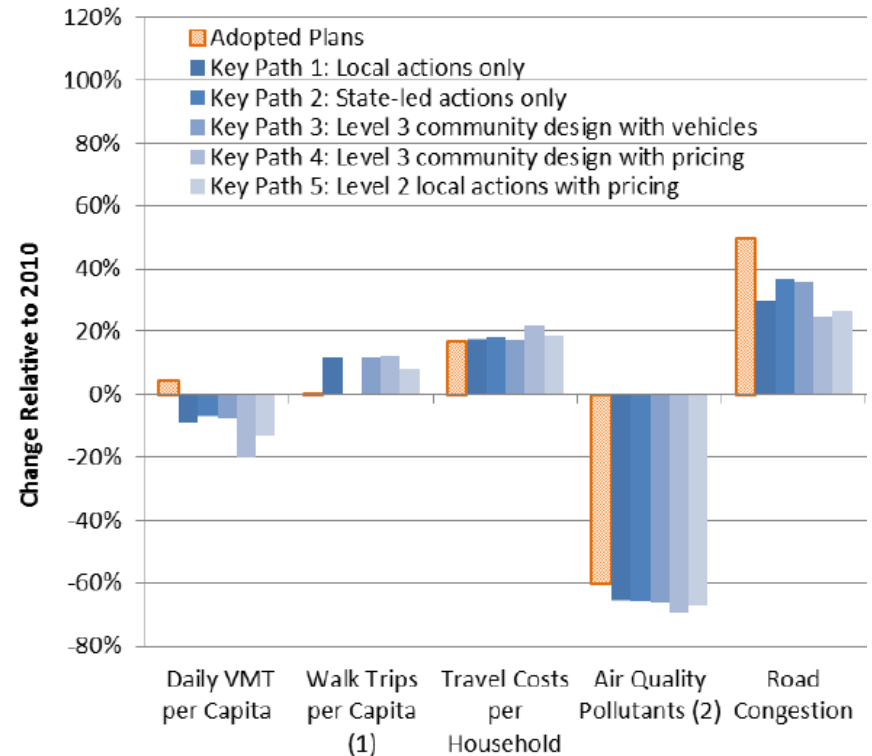
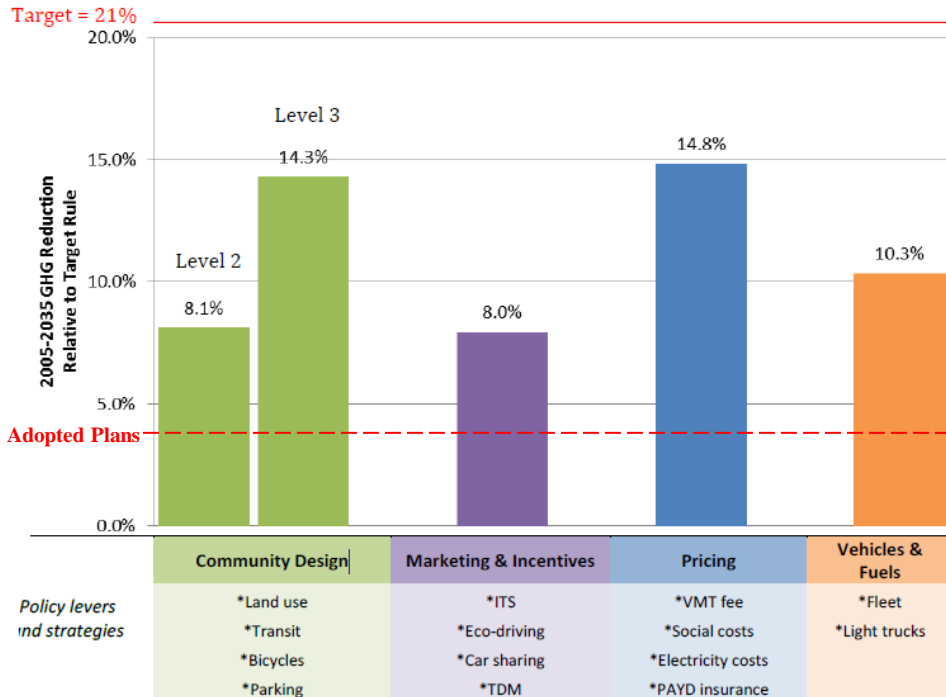


# Corvallis MPO GHG Planning with RSPM

## RSPM Inputs:

Regional Context	Local Actions		Collaborative Actions	
	Community Design	Marketing & Incentives	Vehicles & Fuels	Pricing
<ul style="list-style-type: none"> <li>• Demographics</li> <li>• Income Growth</li> <li>• Fuel Price</li> </ul>	<ul style="list-style-type: none"> <li>• Future Housing (Single- &amp; Multi-Family)</li> <li>• Parking Fees</li> <li>• Transit Service</li> <li>• Biking</li> </ul>	<ul style="list-style-type: none"> <li>• TDM (home &amp; work-based)</li> <li>• Car Sharing</li> <li>• Education on Driving Efficiency</li> <li>• Intelligent Transportation Systems</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle Fuel Economy (mpg)</li> <li>• Fuels</li> <li>• Commercial Fleets</li> </ul>	<ul style="list-style-type: none"> <li>• Pay-As-You-Drive</li> <li>• Insurance</li> <li>• Gas Taxes</li> <li>• Road User Fee</li> </ul>

## Corvallis Area MPO Results:

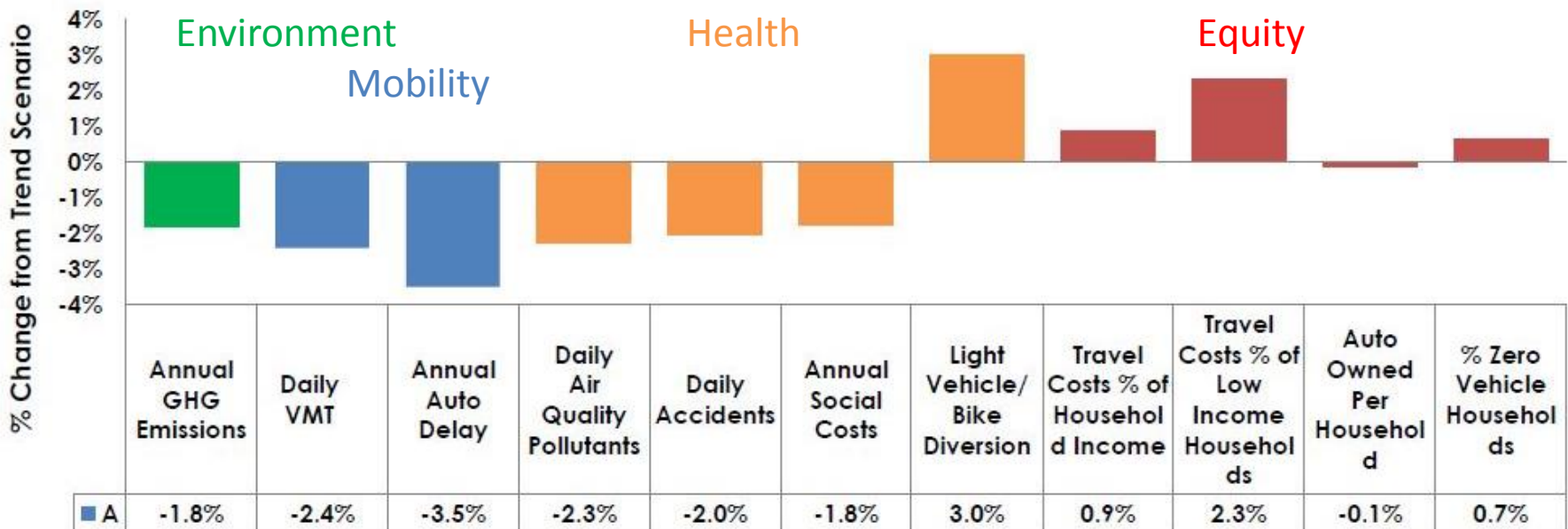


# Corvallis MPO: MPO's Scenarios

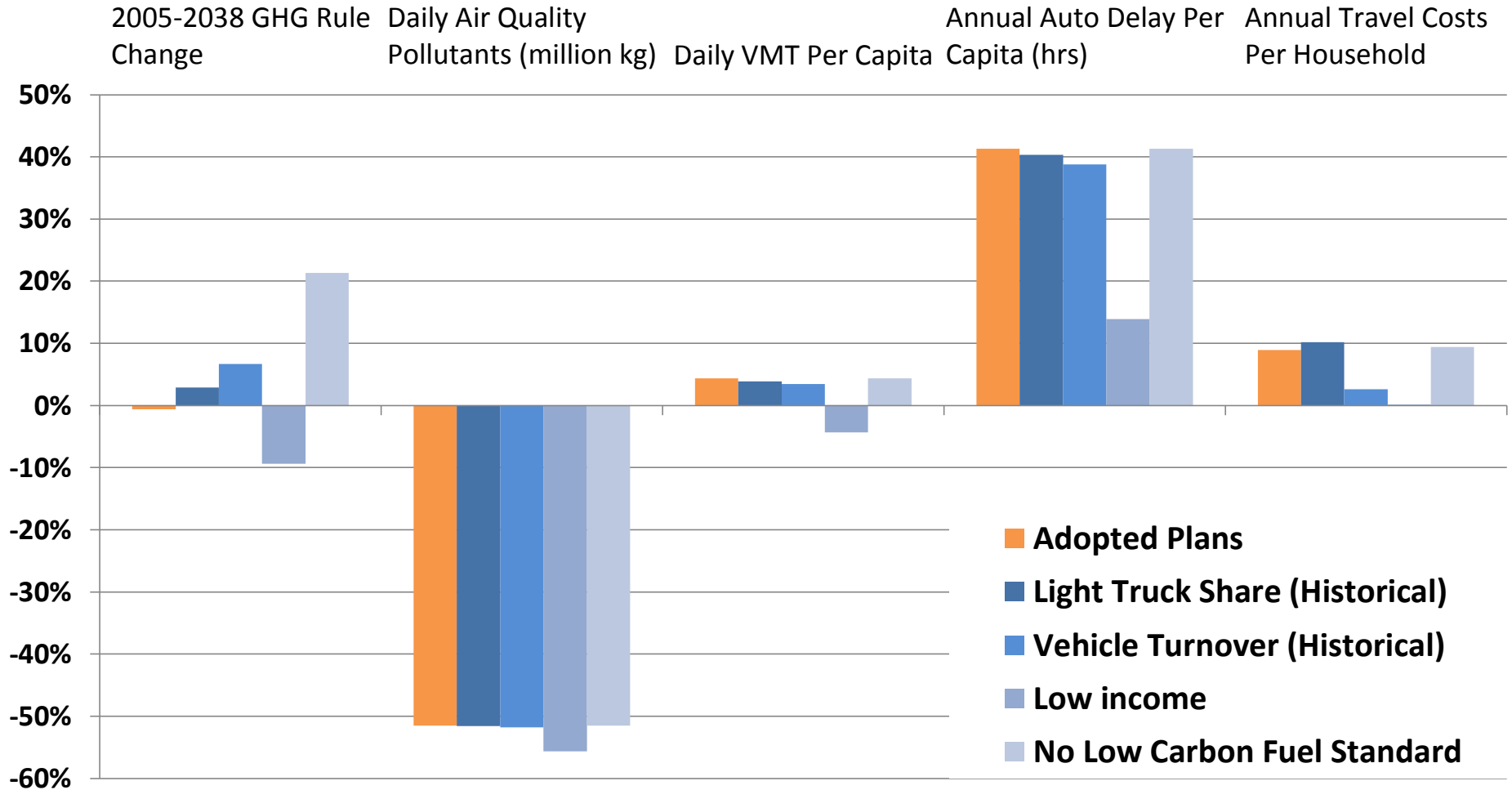
## Policy Bundle- Scenario A

This policy bundle uses the land use pattern from the adopted plans reference case, and combines the highest levels of parking with bicycle and Transportation Options policies. This scenario serves to give an understanding of the likely effects of implementing a more comprehensive set of transportation policies in the region with adopted land use plans.

Land Use	Parking	Alternative Modes	Transportation Options
Trend Scenario	<ul style="list-style-type: none"> <li>Expanded parking districts</li> <li>Increased fees downtown</li> <li>Cash-out parking</li> </ul>	<ul style="list-style-type: none"> <li>Expand bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based marketing</li> <li>Car Sharing</li> </ul>



# Rogue Valley MPO: Plan Resilience



Plans Resilience to Low Income Growth, Vehicle Turnover, Light Truck Share, and No Low

Carbon Fuel Standards





# Web-based Viewer - Sensitivity Tests

## Corvallis Metropolitan Planning Area Scenario Viewer

About This Effort

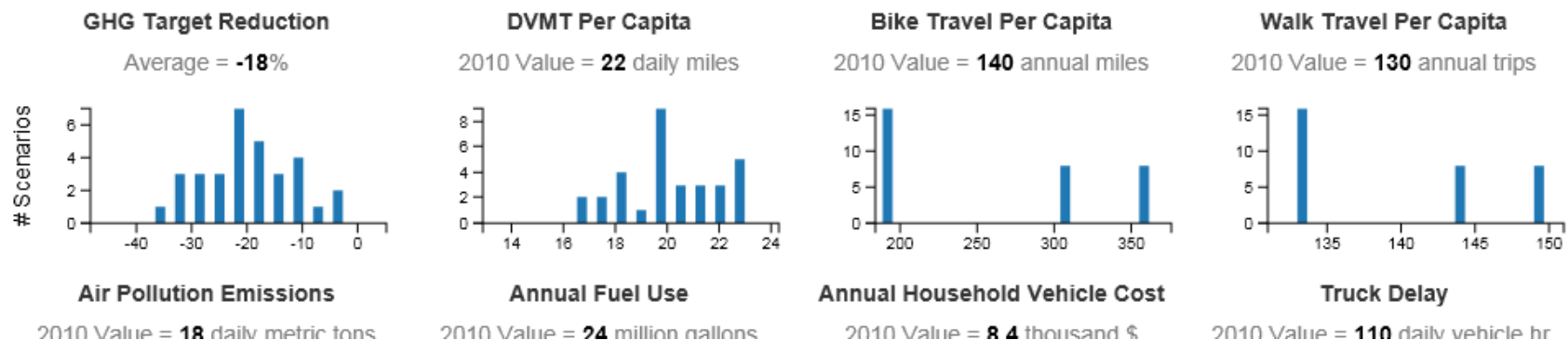
Quick Start

Detailed Instructions

### Scenario Input Levels | [Clear All Selections](#)



### Model Outputs: 32 scenarios selected out of 288 scenarios | [Clear All Selections](#)



<http://www.oregon.gov/ODOT/TD/TP/Pages/ORScenView.aspx?sv=CAMPO>



# Viewer - Community Involvement



## Central Lane Scenario Planning

- Stakeholder workshops
- Future Builder online tool
- Telephone survey
- Targeted equity outreach

### What actions should the region take?

#### Actions



**Invest in active transportation**

Level 2: Investment could...



**Invest in public transportation**

Level 3: Investments could...



**Manage parking to meet demand**

Level 2: Parking could be...



**Change the way residents pay for driving**

Level 3: This level could...



#### Results Compared to Today

The tool starts at the "reference case" which is the best assumption about how current policy direction could be implemented over the next 25 years.

Greenhouse gas emissions reduction (per person) ?



Cost of driving ?



Miles driven (decrease per person) ?



Freight truck delay (increase) ?



Increase or decrease in traffic delay ?



Biking and walking (increase) ?



Revenue - new tax or fee revenue generated ?



Source: Central Lane MPO Scenario Planning Process, 2015.

<http://www.clscenarioplanning.org/future-builder/>

# Resourcing

- **Data:**
  - setup/calibration
  - policy inputs, links to other tools
- **Computers:**
  - Open Source Software, github download & R software
  - Runtimes: 5 min (150K pop) – 20 min (3M pop)
- **Staff & Skills:**
  - Technical staff/consultant
  - Planning staff for inputs
  - Stakeholder process
- **Schedule:**
  - Setup
  - Apply
- **Maintenance**

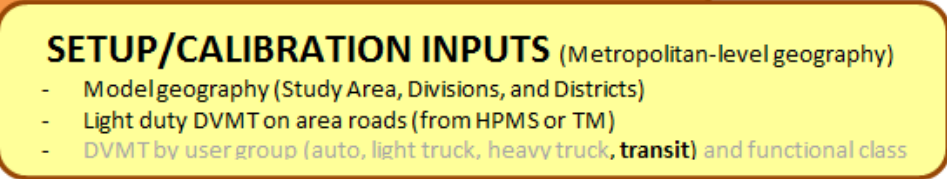
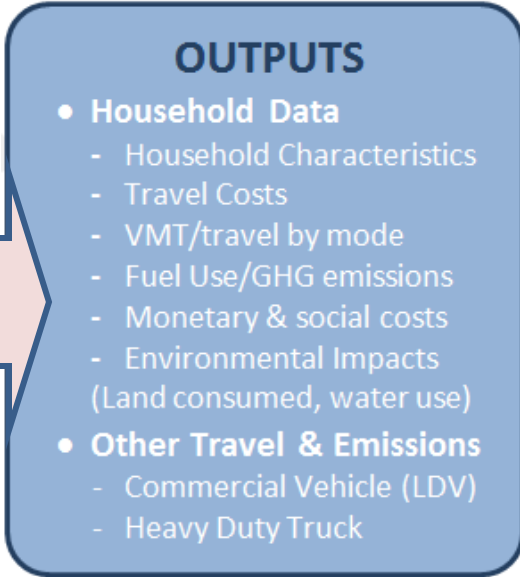
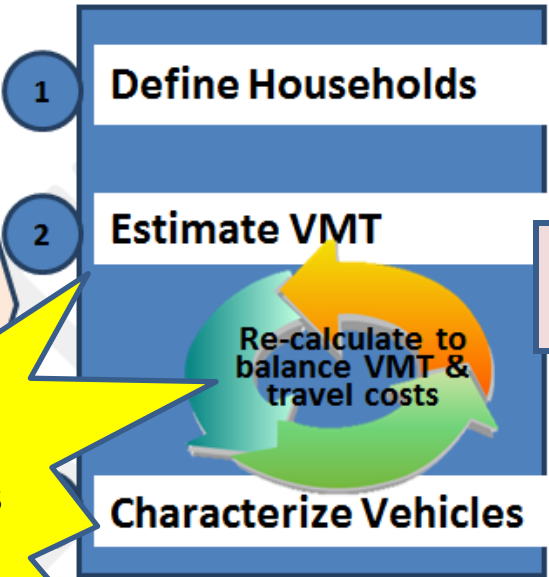


# RSPM Inputs/Outputs

## METROPOLITAN INPUTS

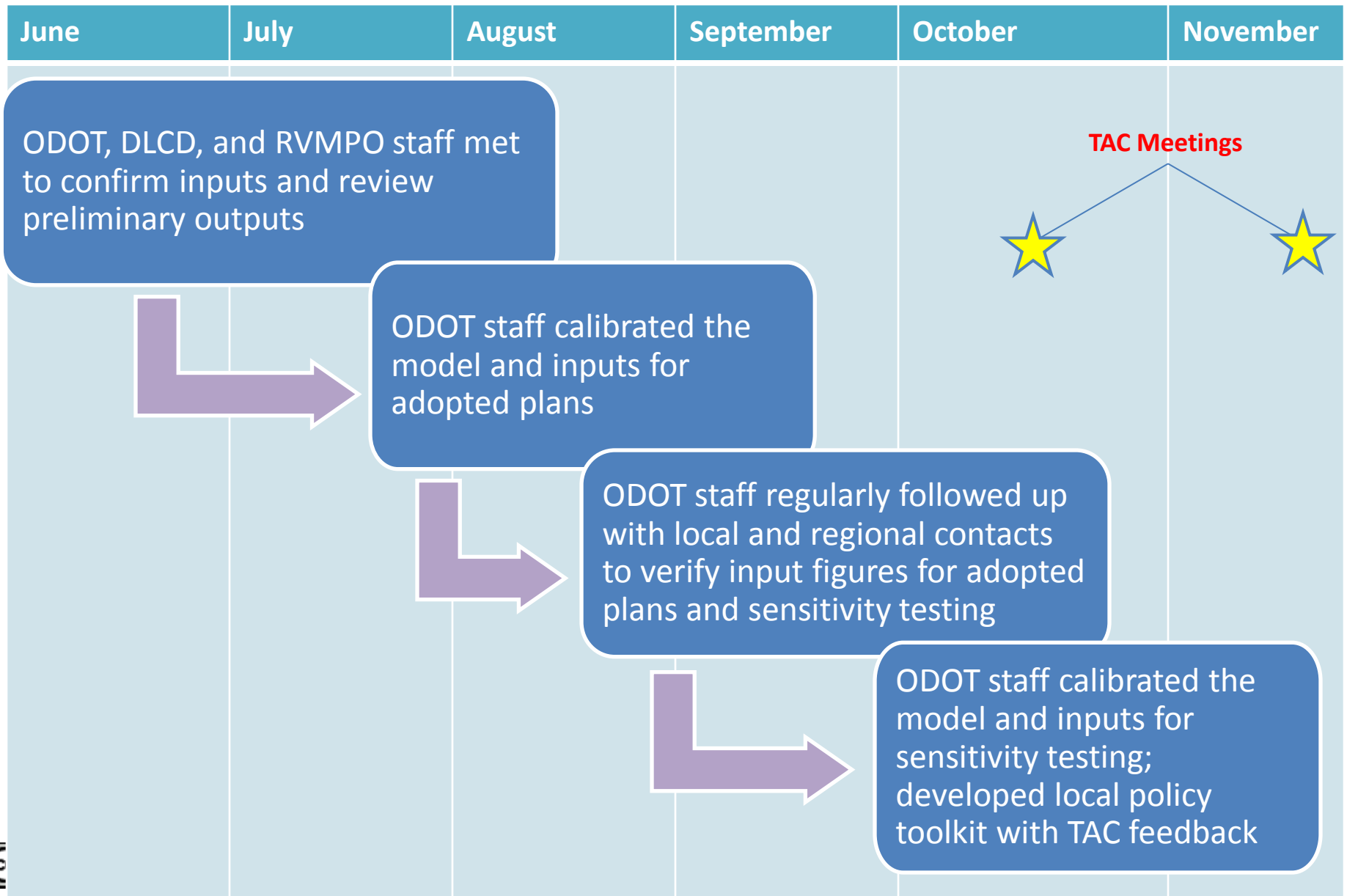
DATA	Geography
<b>Demographics</b>	
- Population in Households by age	District
- Group Quarters(Pop by age, income, autos)	Division
- Average HH Size & % 1-person HHs	Division
- Per Capita Household Income	District
<b>Community Design</b>	
- Land Area by Dev type (acres)	District
- Dwelling Units by Dev & Hsg type	District
- % HHs living in Mixed Use Areas	District
<b>Transportation Investments</b>	
- Bike/Light Vehicle Usage (distance threshold, % SOV t	District
- Transit Revenue Miles	District
- Freeway & Arterial miles	District
<b>Pricing</b>	
- Parking (% pay for parking, ave	District
- Per Mile Fees (Gas, VMT)	District
- PAYD Insurance	District
<b>Marketing/ITS-Ops</b>	
- Workplace TDM Pro	District
- Individualized Market	District
- Car Sharing (pop pr	District
- ITS Degree of De	District
- (Freeways - Ramps & incident	District
- Eco-Driving Practices	Metropolitan
- Low Rolling Resistance Tires	Metropolitan
- Vehicle Use Optimization	Metropolitan
<b>Vehicle/Fuels Technology</b>	
- Transit Vehicles/Fuels	Metropolitan
- Truck share of personal & fleet autos	Division
- Electricity emissions rate(Co2e lbs/kwhr)	District

**Key Local Inputs:**  
 Dwelling Units  
 RTP Road/Transit Plans  
 Bike Diversion Target  
 Parking, TDM  
 Carsharing, ITS



Note: White Text indicates items where STS defaults are provided or required. Local adjustment for special considerations may be allowed.

# RSPM: Model Run Timeline





# VisionEval Open Source Project

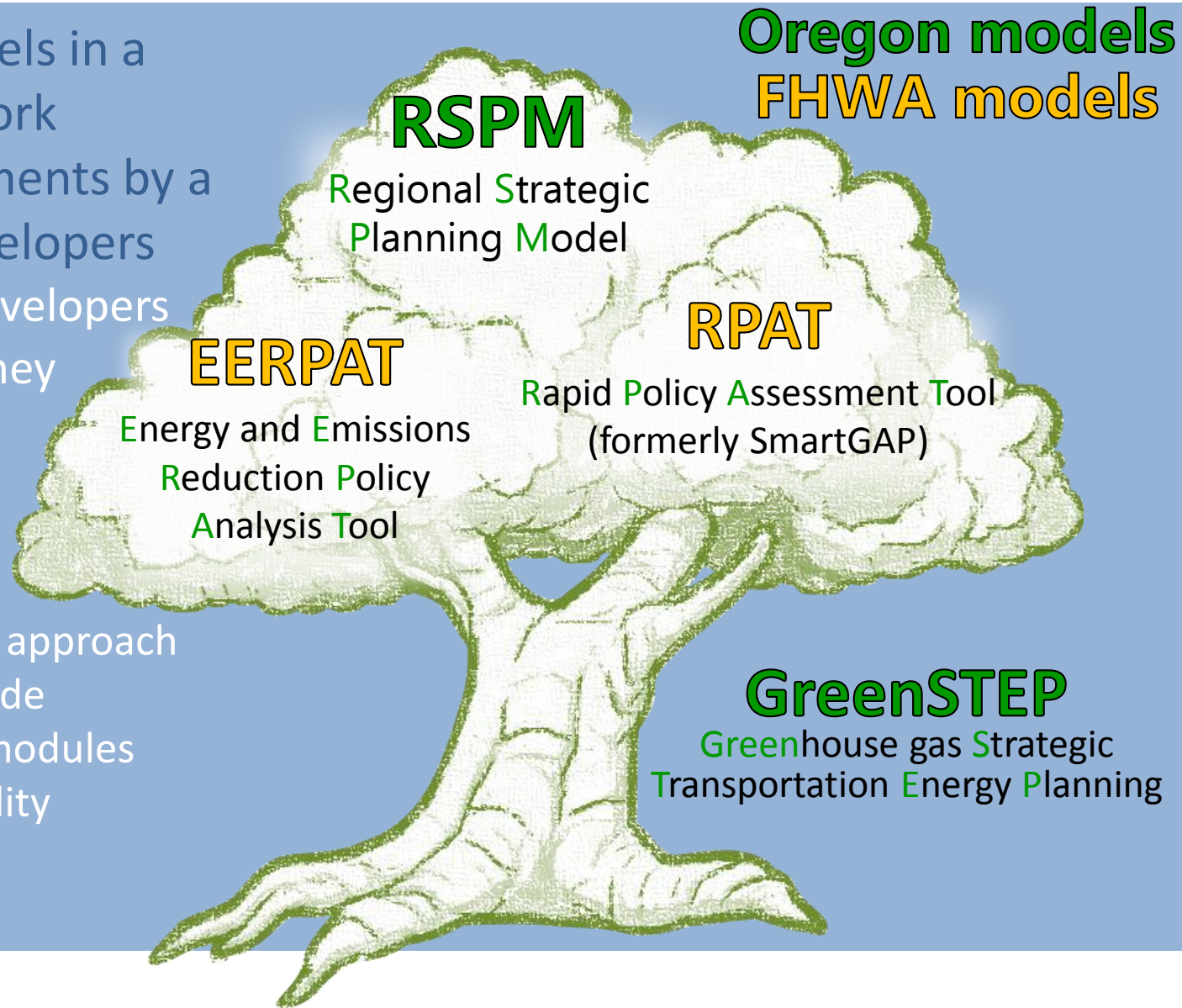


**WHAT?** Four models in a Common Framework allowing improvements by a community of developers

- Expand users & developers
- Save time and money

**HOW?**

- Common modeling approach
- Modular, shared code
- Loose coupling of modules
- Geographic Scalability
- Data accessibility
- Open Source



# Questions?

For More Info...

<https://gregorbj.github.io/VisionEval/>

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