



# ***Use of the GreenSTEP Model for Scenario Planning in Oregon***

## ***Approaches to Scenario Planning***

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Brian Gregor

ODOT Transportation Planning Analysis Unit

Brian.J.Gregor@odot.state.or.us



## ***Outline***

- Scenario Planning in Oregon
- Overview of the GreenSTEP model
- Example: Statewide Transportation Strategy for Reducing GHG Emissions
- Lessons Learned



# ***Oregon Planning Context & Background***

- 1973: Comprehensive Planning Requirements
  - Urban growth boundaries, resource lands protection, requirements to accommodate housing
- 1991: Transportation Planning Rule
  - Require coordinated planning of land use & transportation
- 1992: Oregon Transportation Plan
  - State multimodal transportation plan
- 1992-1995: Region 2040
  - Scenario planning to develop 50-yr growth plan for the Portland metropolitan area
- 1999-2001: Willamette Valley Alternative Transportation Futures
  - Large scale land use and transportation scenario planning for Oregon's Willamette Valley



# ***Current Scenario Planning Efforts***

- Focus on greenhouse gas (GHG) mitigation
  - State GHG reduction goals from 1990 levels: 10% by 1990, 50% by 2050
- Statewide
  - Requirement to develop a statewide transportation strategy for reducing GHG emissions
- Portland metropolitan area
  - Requirement to develop and implement a scenario plan for reducing GHG emissions
- Eugene/Springfield metropolitan area
  - Requirement to develop a scenario plan for reducing GHG emissions
- Other urban areas
  - No current requirements. Figuring out how to move ahead.



# ***GHG Mitigation Planning is a Strategic Planning Exercise***

- Effects are large scale
  - Unlike criteria air pollutants, effects are not just local or regional
- Big challenge
  - If total GHG to be reduced by 75% while population doubles, per capita GHG has to be reduced by about 88%
- Many interacting factors
  - Demographics, economics, land use, transportation services, travel behavior, vehicle technology, fuels ...
- Many actors
  - Gov't (federal, state, regional, local), Private (many various)
- Large amount of uncertainty
  - Prices, technological advances, federal actions (or inactions)



## ***Models Important to Strategic Planning Processes***

- Enable evaluation of complex systems
  - Mental models are insufficient
  - It's important to model interactions between factors
- Enable evaluation of many scenarios
  - Large solution space to explore (but requires model to be fast enough: set up and run time)
- Facilitate discussions and consensus building among stakeholders
  - Differing mental models lead to conflict
  - Computer models bring together mental models and apply greater analytical rigor
  - Stakeholders see their mental models as important, but not the only important consideration



## ***The GreenSTEP Model***

- GreenSTEP = Greenhouse gas Strategic Transportation Energy Planning model
  - Requested by Oregon Global Warming Commission
  - Development started in 2008
- Models at the household level
- Two GreenSTEP versions
  - Statewide: supports strategic planning at the state level
  - Metropolitan: supports metropolitan area scenario planning
- Offshoots
  - FHWA Energy & Emissions Reduction Policy Analysis Tool (EERPAT) - [http://www.planning.dot.gov/FHWA\\_tool/](http://www.planning.dot.gov/FHWA_tool/)



# ***Factors are Considered at the Household Level***



# ***Forecasts Are Made at the Household Level***





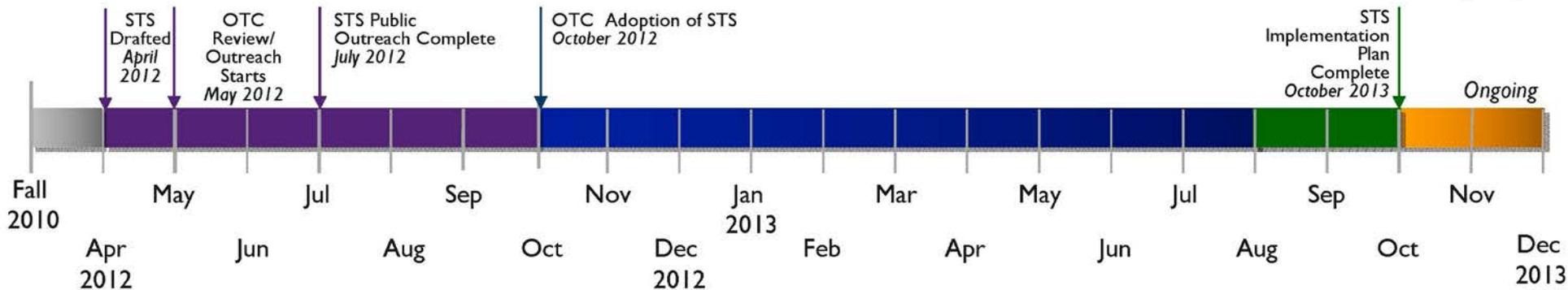
# Statewide Transportation Strategy (STS)



October 2010–October 2012

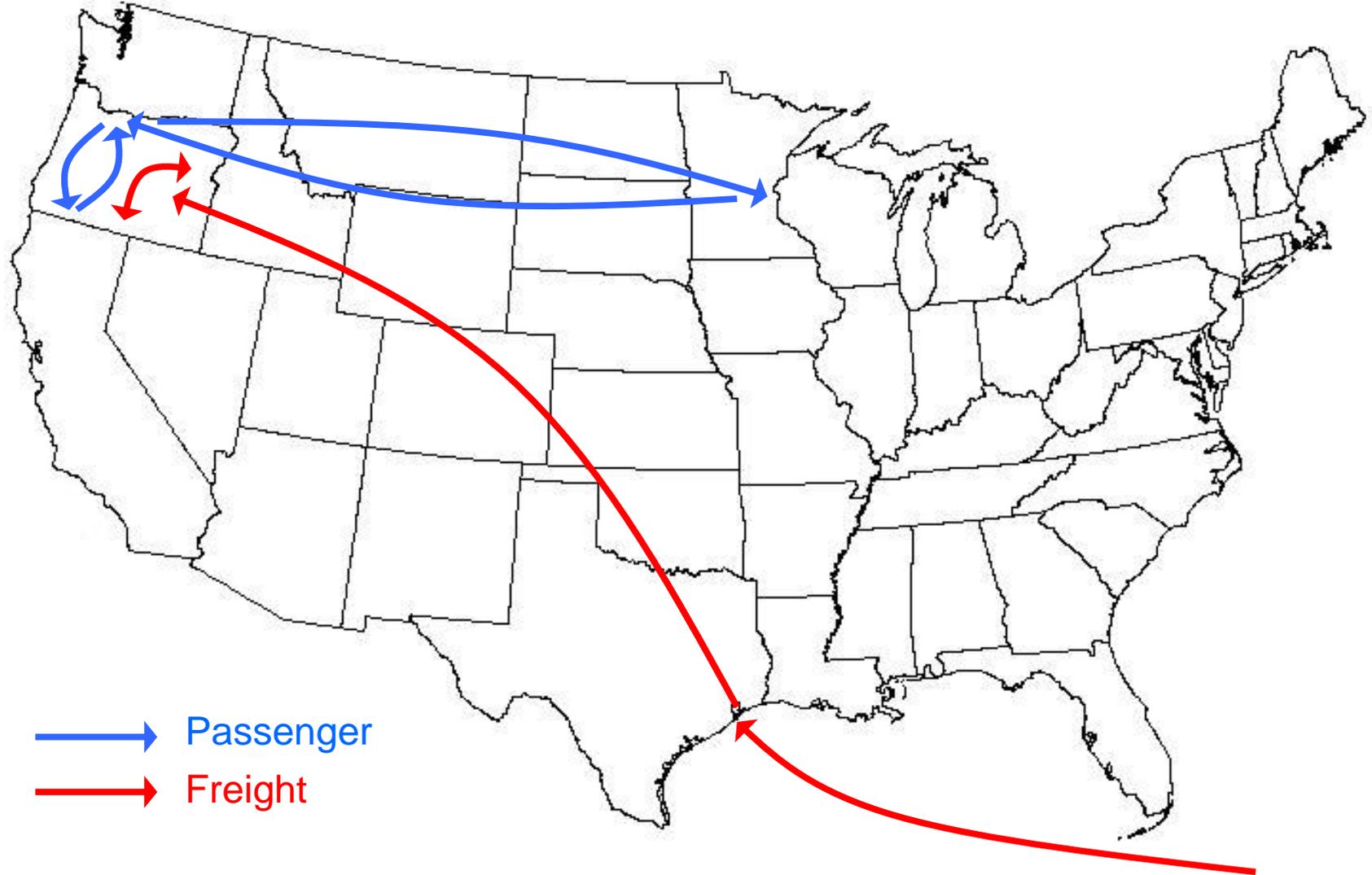
October 2012–October 2013

October 2013–Ongoing



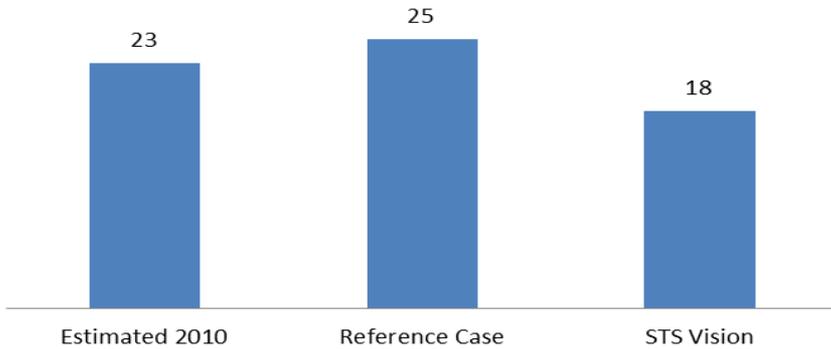


# ***STS Scope***

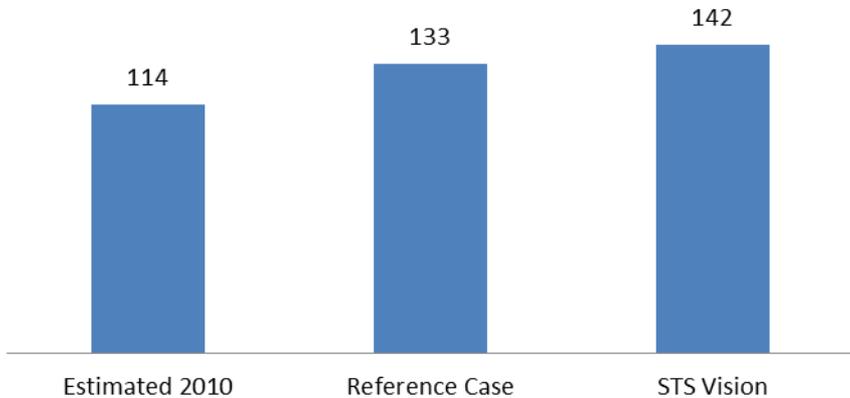




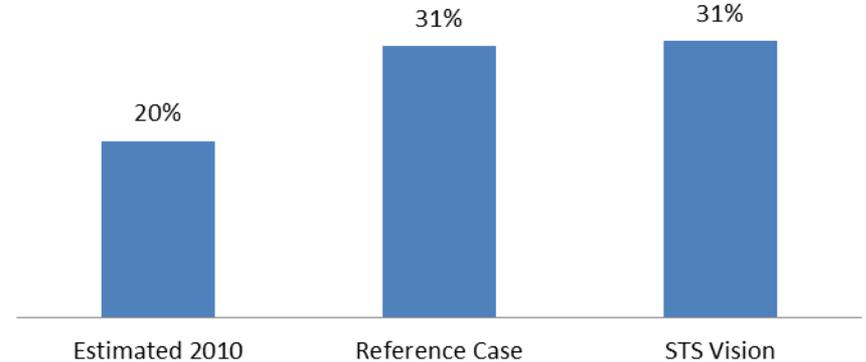
# ***Selection of STS Evaluation Measures***



Average DVMT Per Capita



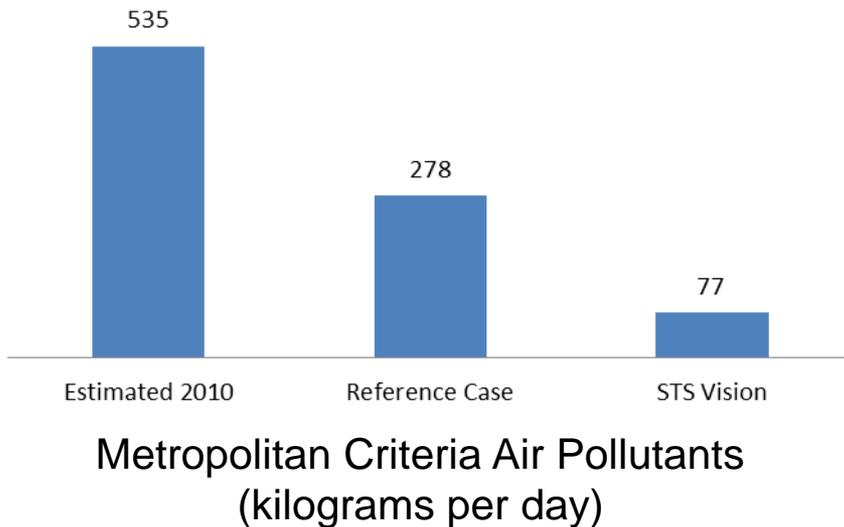
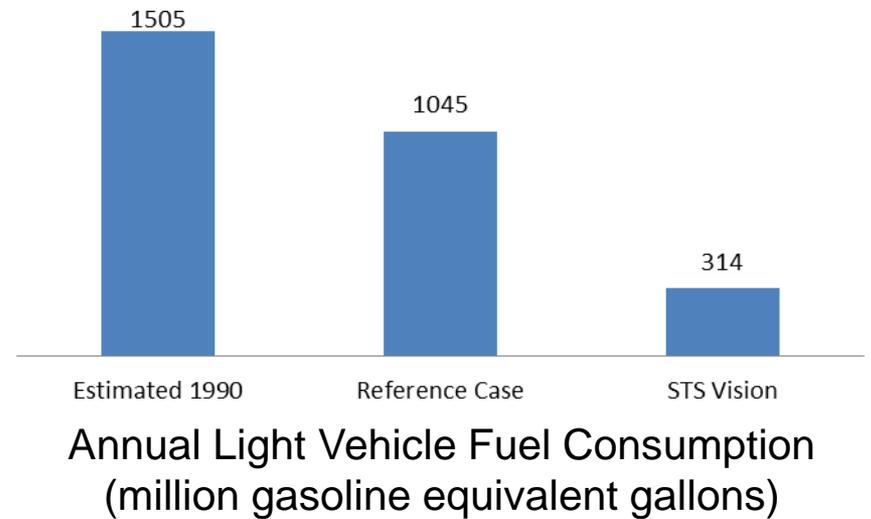
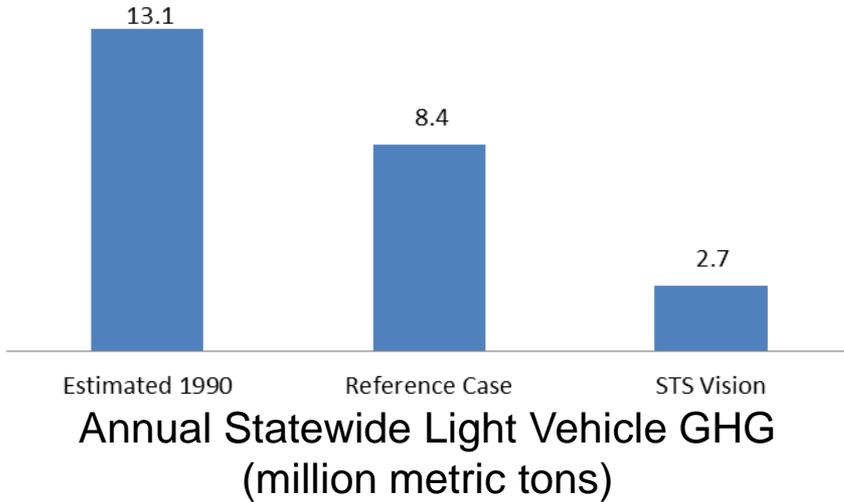
Average Annual Walk Trips Per Household



Percentage of Metropolitan Households Living in Urban Mixed Use Neighborhoods



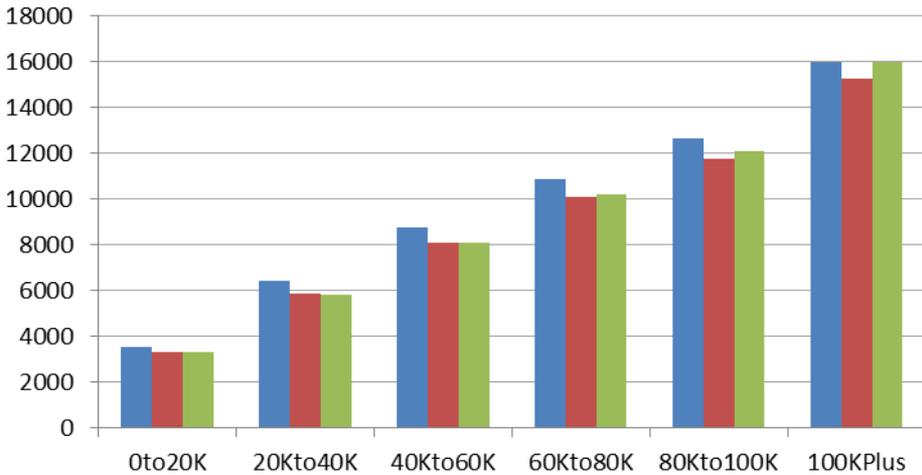
# ***Selection of STS Evaluation Measures***





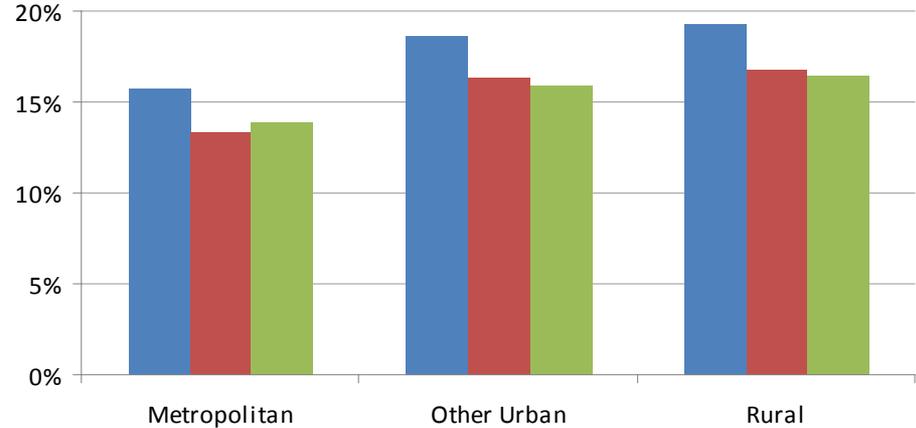
# Selection of STS Evaluation Measures

■ Estimated 2010 ■ Reference ■ STS Vision



Average Annual Household Costs for Owning & Operating Vehicles

■ Estimated 2010 ■ Reference ■ STS Vision



Average Percentage of Income Spent on Owning & Operating Vehicles



## ***Lessons Learned***

- Scenario planning is a strategic planning exercise
- Planning for GHG reduction is a learning process
- An iterative approach is necessary
- Oregon's land use framework is well established & carrying out existing plans will achieve most of the land use related benefits
- Many of the key issues are related to financing
- Need to monitor and continue to consider implications of vehicle and information technologies