



Oregon Department of Transportation



Oregon Transportation Plan 2005

Modeling Alternative Policy Choices

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Presentation Highlights

- Analysis Role in Decision Making
- Analysis Process
- Evaluation of Alternatives Policies
- Use of Performance Criteria



Integrated Analysis



Integrated analysis blends the features of land use, transportation and economic activity together to represent the interactions and reveal net effects of change

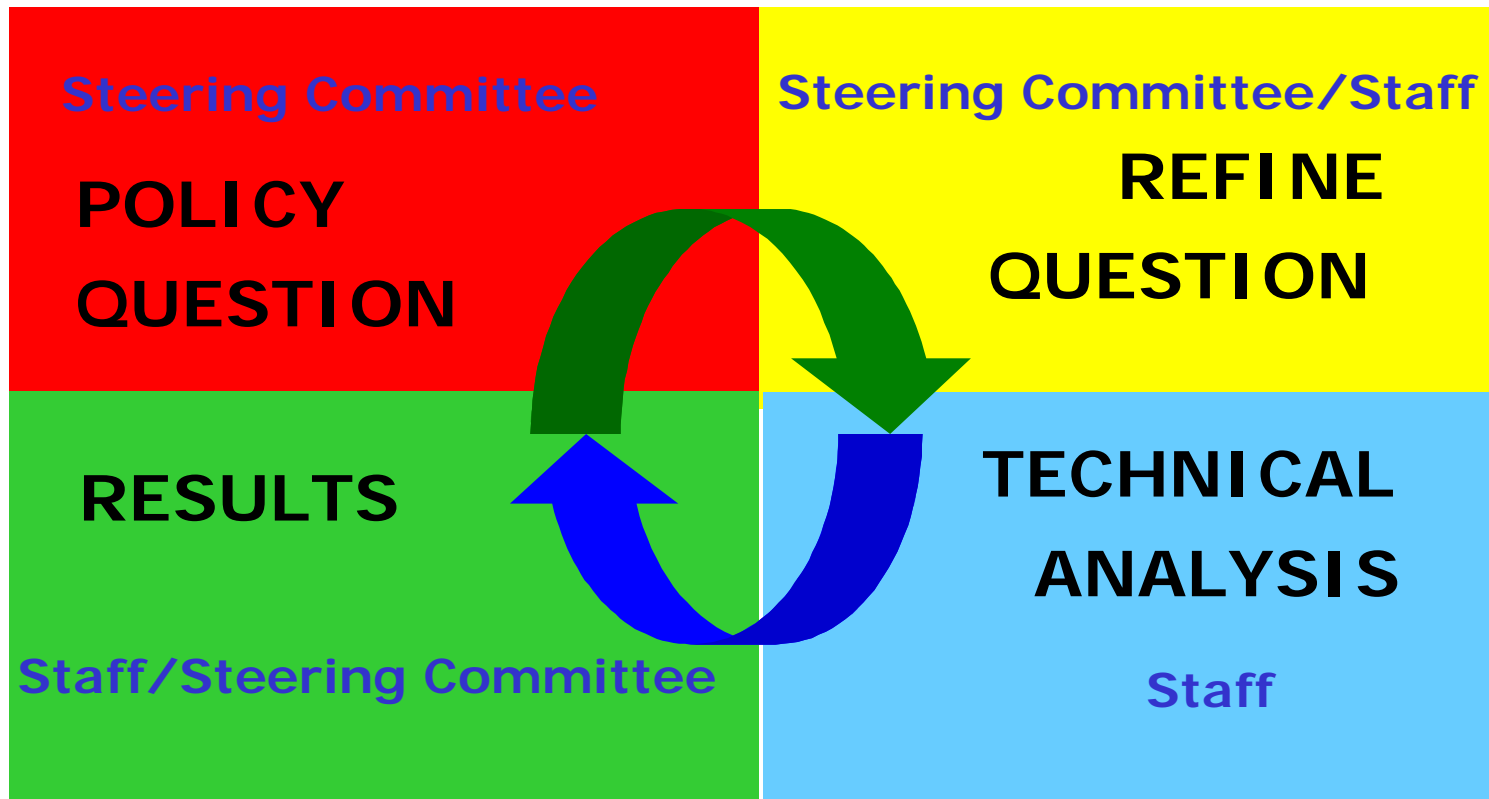


Value of Integrated Analysis

- Helps identify factors relevant to policy issues
- Allows prospective policies to be tested
- Reveals policy trade-offs
- Reveals synergies gained by grouping policies



Decision Making Using Integrated Analysis Four Step Iterative Process





Four Step Iterative Process

1. Steering Committee
Identify Goals & Objectives
Identify General Issues



Four Step Iterative Process

2. Steering Committee/ Staff

**Refine Issues into Specific
Policy Questions**



Four Step Iterative Process

3. Staff

**Determine Analysis
Approach and Data
Needs**

Conduct Analysis

Conduct Peer Review



Four Step Iterative Process

4. Staff / Steering Committee

Presentation of Results

Discussion of Results



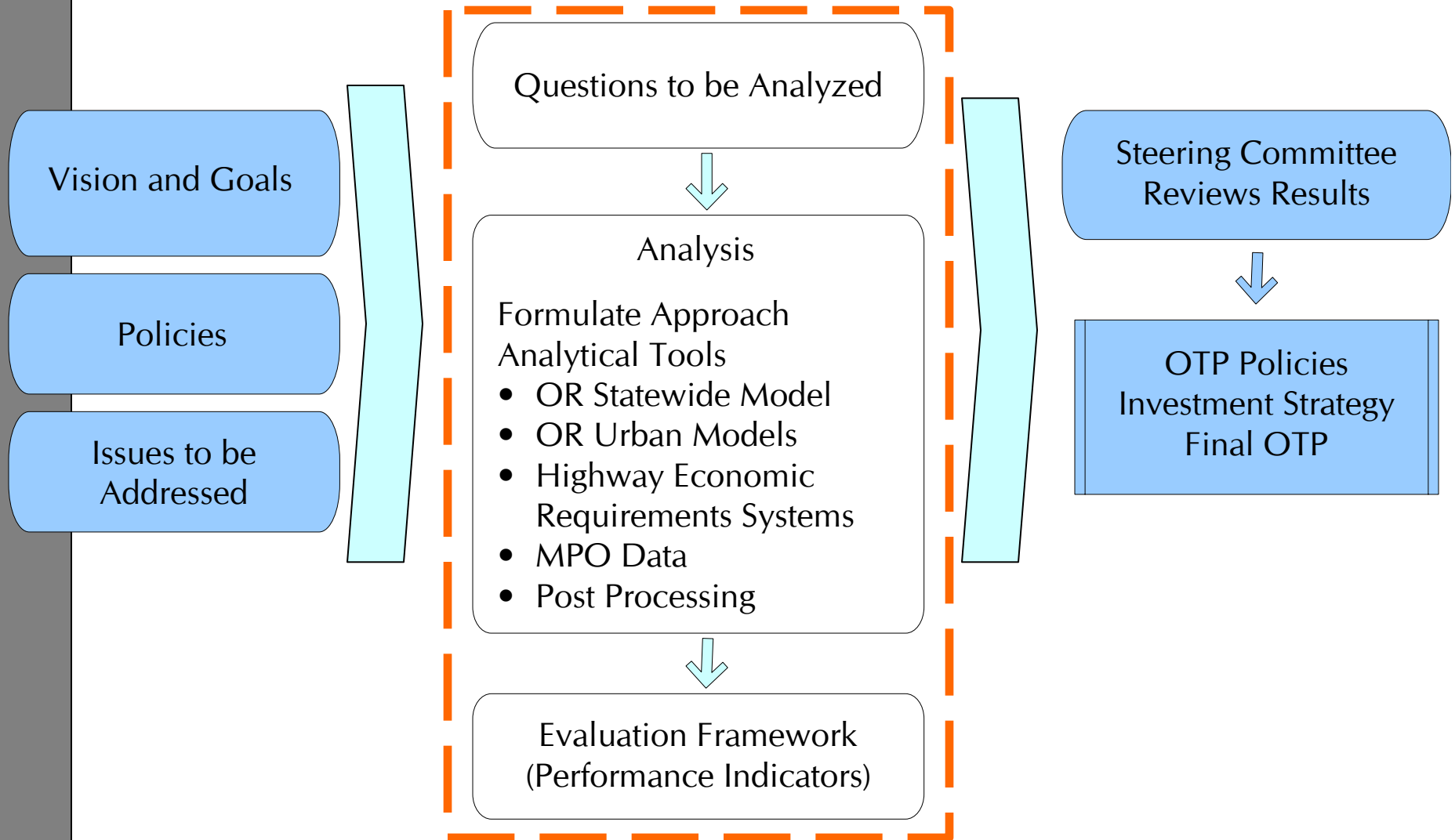
Second Iteration

Four Step Iterative Process

1. Steering Committee
Identify Goals & Objectives
Identify General Issues



OTP Policy Analysis Process





Basic Evaluation Approach

- Identify performance criteria
- Identify alternatives
- Analyze how well each alternative satisfies performance criteria
- Judge the total effectiveness of each alternative in meeting each performance criterion



Example: Buying a Car Analyst Style

Performance Criteria	Model A	Model B	Model C
Price	++	+++	+
MPG	++	+++	++
Reliability	+	-	+++
Comfort	+++	++	+
Safety	++	+	++



New Car Evaluation Matrix

Performance Criteria	Model A	Model B	Model C
	10	8	9
Price	++	+++	+
MPG	++	+++	++
Reliability	+	-	+++
Comfort	+++	++	+
Safety	++	+	++



New Car Evaluation Matrix

Performance Criteria	Model A	Model B	Model C
	11	7	12
Price	++	+++	+
MPG	++	+++	++
Reliability	+	-	+++
Comfort	+++	++	+
Safety	++	+	++



Evaluation Matrix for OTP Alternative Scenarios

	Alternative Scenarios		
Performance Criteria	Alt. 1	Alt. 2	Alt. 3
Accessibility/ Mobility			
Economic Vitality			
Efficiency & Cost Effectiveness			
Equity			
Reliability/ Responsiveness			
Safety			
Sustainability			
Public Support/Financial Feasibility			



Evaluation Matrix for OTP Alternative Scenarios

	Alternative Scenarios		
Performance Criteria	Alt. 1	Alt. 2	Alt. 3
Accessibility/ Mobility			
Economic Vitality			
Efficiency & Cost Eff			
Equity			
Reliability/ R			
Safety			
Sustainability			
Public Support/Financial Feasibility			

Definition: A reliable transportation system provides dependable levels of service by mode within established expectations.

Objective: To maintain or improve travel time predictability or dependability.

Potential Performance Measures: peak-period travel time, off-peak travel time, duration of peak period, incident delay...



Evaluation Matrix for OTP Alternative Scenarios

	Alternative Scenarios		
Performance Criteria	Alt. 1	Alt. 2	Alt. 3
Accessibility/ Mobility			
Economic Vitality	<p><u>Things that affect reliability:</u> transportation demand, smoothness of traffic flow, traffic incidents</p> <p><u>Example actions to affect reliability:</u> incident detection and clearance, ramp metering, signal coordination, road system improvements, transit system improvements, road pricing</p> <p><u>Analysis tools:</u> models and other analysis</p>		
Efficiency & Cost			
Equity			
Reliability/ Response			
Safety			
Sustainability			
Public Support/Financial			



Reference Scenario Elements

- Population and the Economy
- Land Use Planning
- Transportation System



Summary (Modeling Mission Restated)

Analysis will provide information to assist you in recommending the best plan to the Transportation Commission. You will be evaluating the information gained through analysis to understand the merits of individual actions and the effectiveness of different combinations of actions.



OTP Scenarios

Reference Scenario

Sensitivity Scenario 1 High Fuel Prices

Sensitivity Scenario 2 Relaxed Land Use Controls

Alternate Scenario 1 Flat Revenue

Alternate Scenario 2 Max Operations & Maintenance
without Pricing

Alternate Scenario 3 Major Improvements

Alternate Scenario 4 Pricing



OTP Performance Measures

	Model Generated Output		
Performance Criteria			
Accessibility/ Mobility			
Economic Vitality			
Efficiency & Cost Effectiveness			
Equity			
Reliability/ Responsiveness			
Safety			
Sustainability			
Public Support/Financial Feasibility			



OTP Performance Measures

Accessibility/ Mobility Performance Criteria

- Average annual recurring and non-recurring delay per capita
 - average delay, Hh, region; average delay vehicle region
- Average travel time per trip (peak, off-peak, by purpose, region, income class)
 - average travel time; average trip distance
- Variable passenger transportation user cost as percent of income (by region, income class)
 - Passenger costs as percent of income by income category & region
- Percent of trips with viable transit, bicycle and walk options
 - Proportion of trips with transit as choice



OTP Performance Measures

Economic Vitality Performance Criteria

- Change in economic output between alternatives
 - Total statewide production
- Change in employment between alternatives
 - Employment by industry
- Variable passenger transportation user costs as percent of income
 - Total labor income as percent of total transport costs by income group
- Number of workers within 30 minutes of the average job
 - Number of HH (workers) within 30 min by region



OTP Performance Measures

Safety Performance Criteria

- Transportation-related fatalities per 100,000 population
 - HERS – total crash costs by FC and region
- Transportation-related crashes per 100,000 population
 - HERS – total crash costs by FC and region



Reference Case – Summary of Impacts

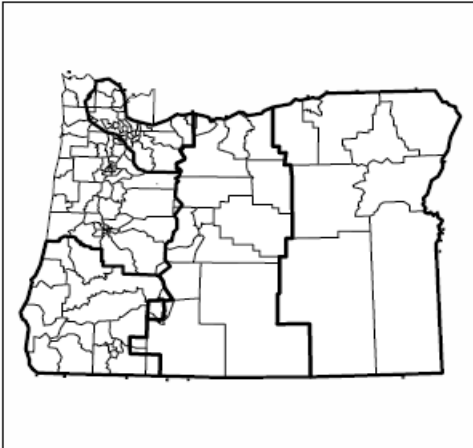
	Passenger Surface Transport	Trucking	Rail Freight	Aviation	Ports
Accessibility	↔	↓	↔	↔	↓
Mobility	↓	↓	↓	↔	↓
Economic Vitality	↔	↓	↓	↔	↓
Effectiveness and Efficiency	↔	↓	↓	↔	↔
Equity	↔	↔	↔	↔	↓
Public Support & Financial Feasibility	↔	↔	↔	↔	↔
Safety	↔	↔	↓	↔	↔
Sustainability	↔	↓	↓	↔	↓



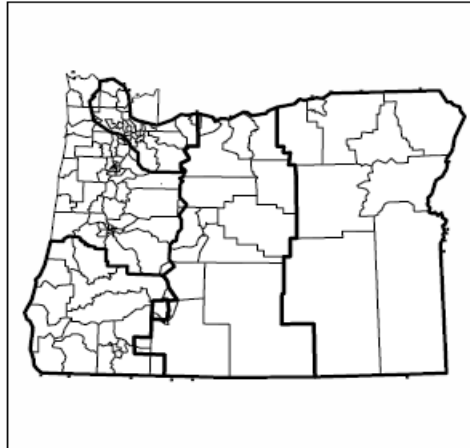
Maps Example

Num of Jobs within 30 min of Ave Household for ServEmp for year: 05

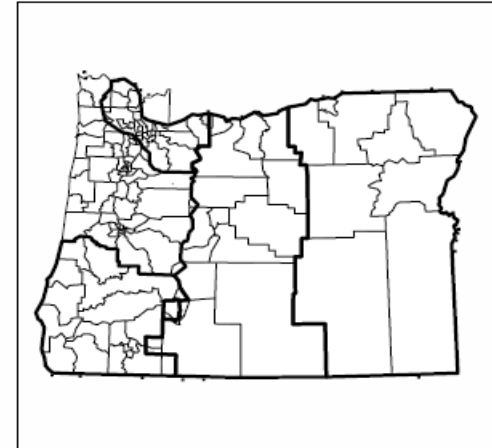
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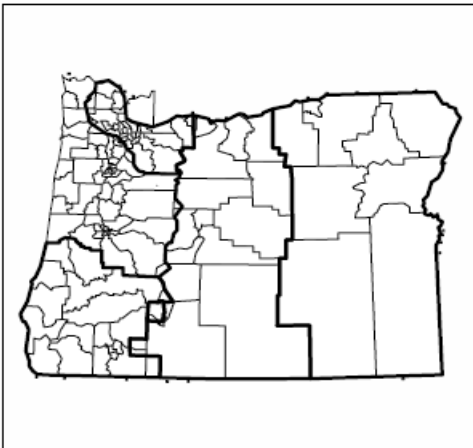
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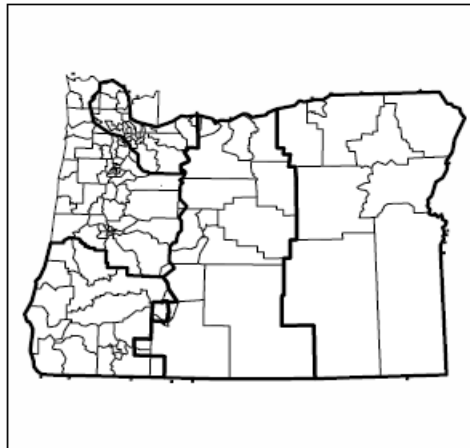
The Percent Change from '05 for, d



The Percent Change from '05 for, y



The Percent Change from '05 for, z



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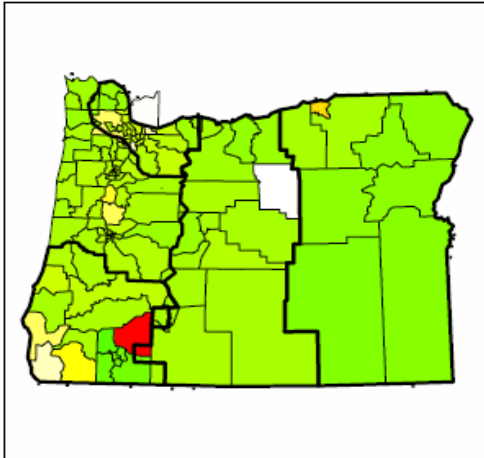
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- c = Operations Case
- d = Major Improvements 1
- y = Major Improvements 2
- z = Pricing (very low: all)

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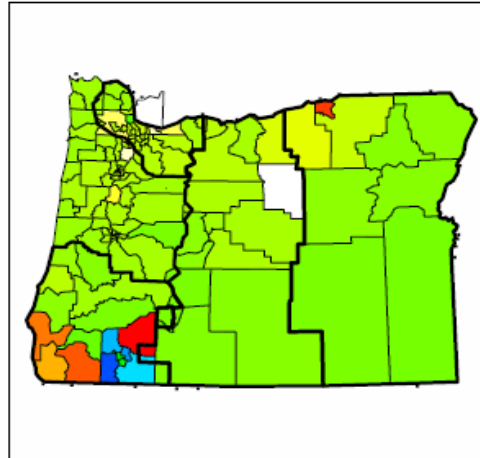
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Num of Jobs within 30 min of Ave Household for ServEmp for year: 10

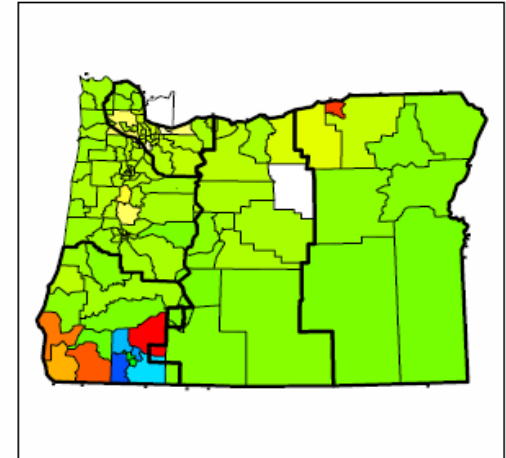
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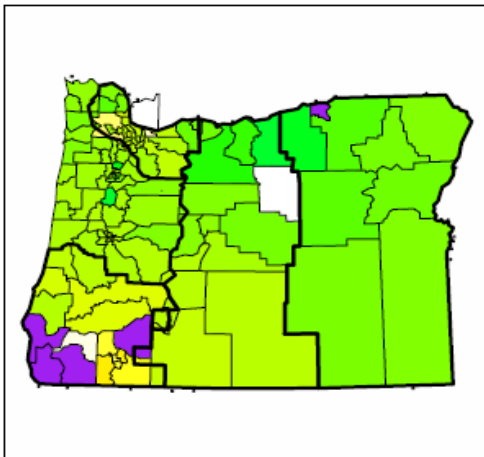
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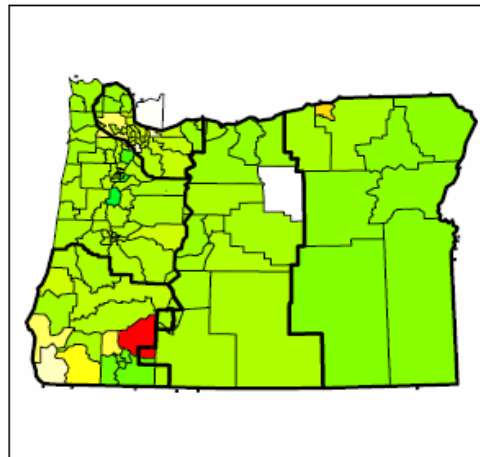
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The Percent Change from '05 for, y



The Percent Change from '05 for, z



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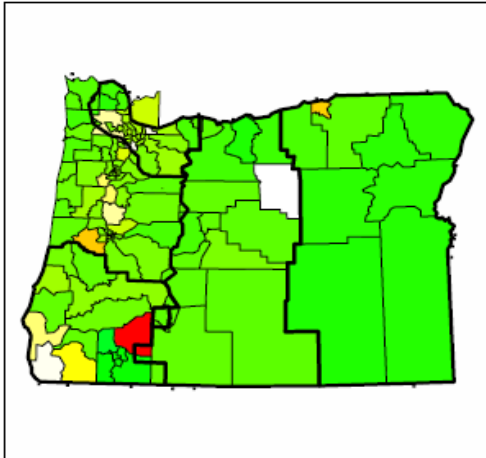
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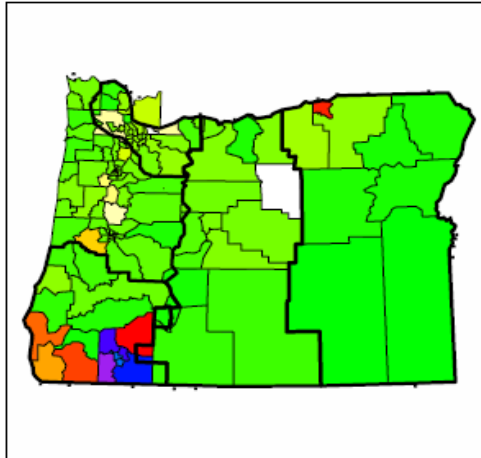
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Num of Jobs within 30 min of Ave Household for ServEmp for year: 15

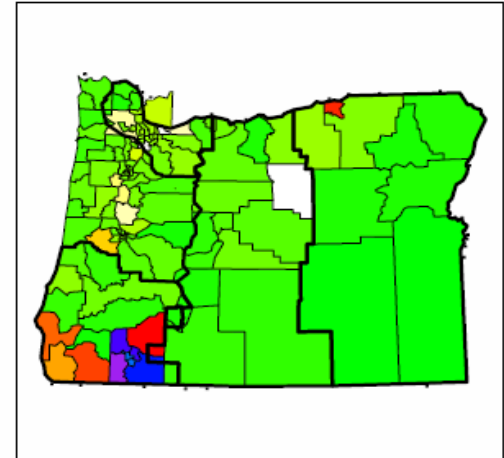
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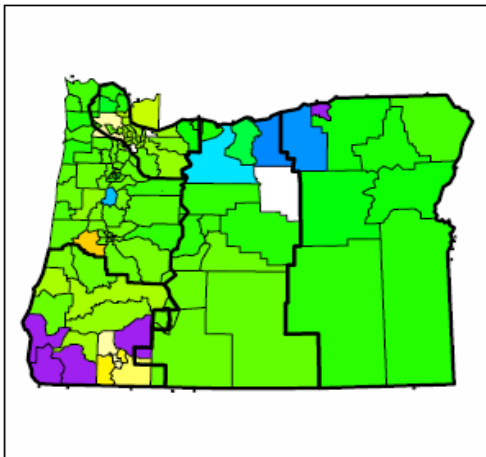
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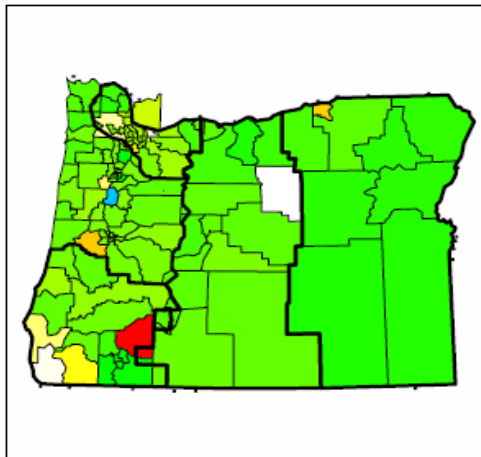
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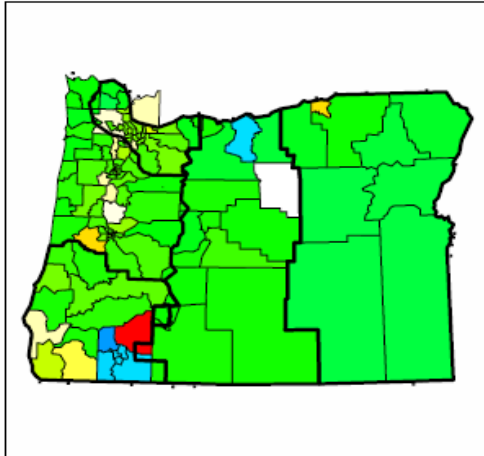
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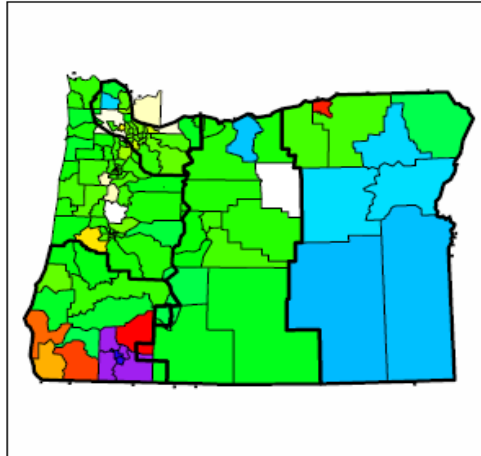
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Num of Jobs within 30 min of Ave Household for ServEmp for year: 20

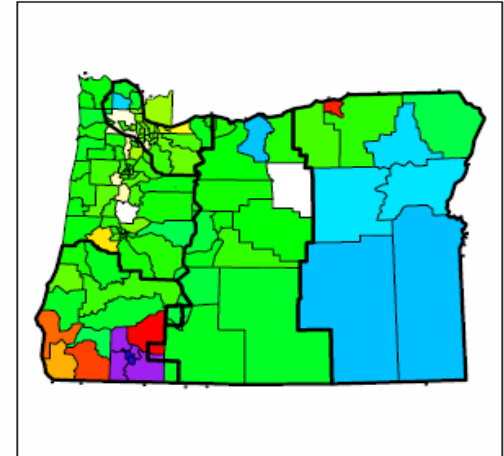
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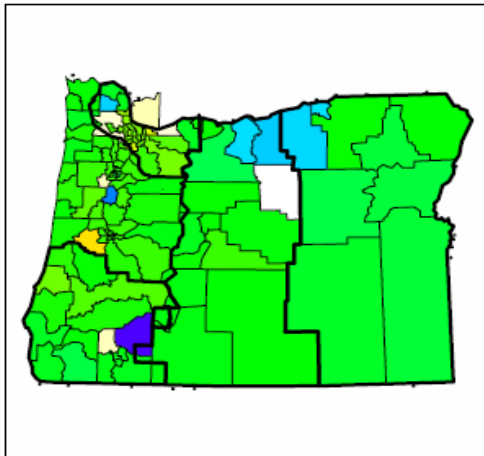
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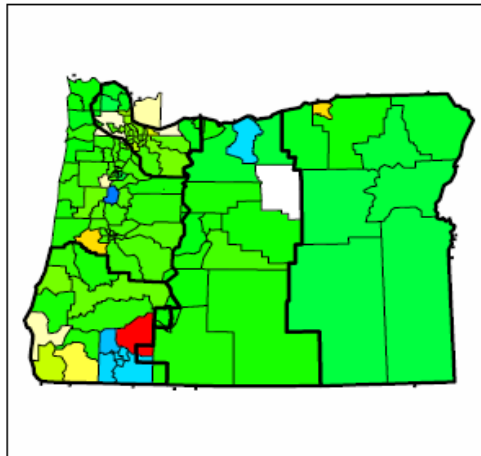
The Percent Change from '05 for, d



The Percent Change from '05 for, y



The Percent Change from '05 for, z



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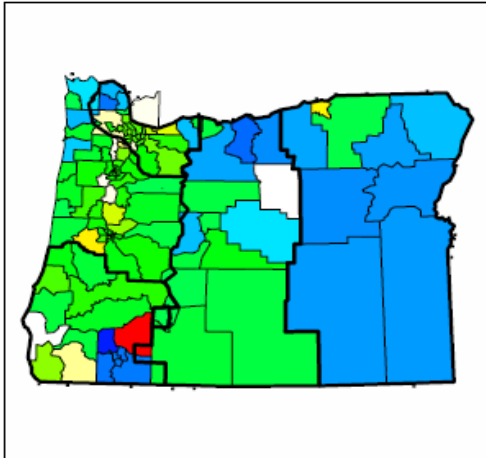
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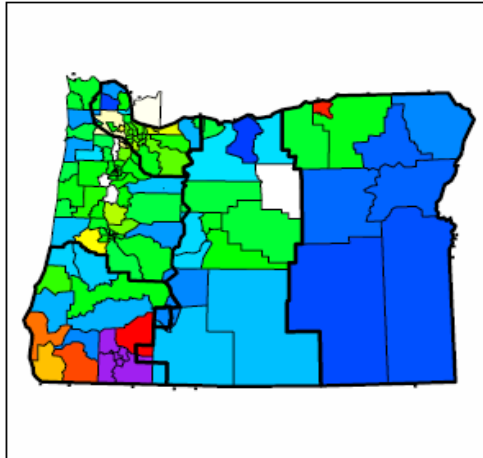
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Num of Jobs within 30 min of Ave Household for ServEmp for year: 25

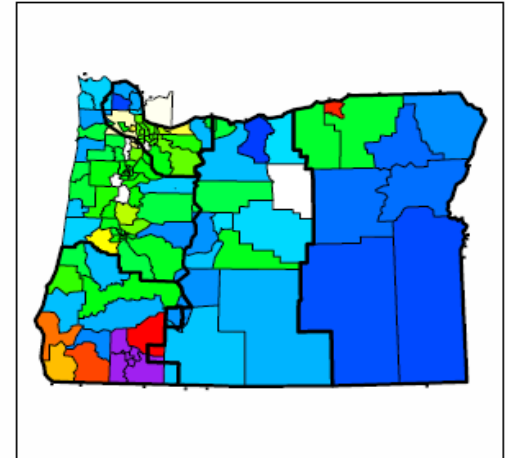
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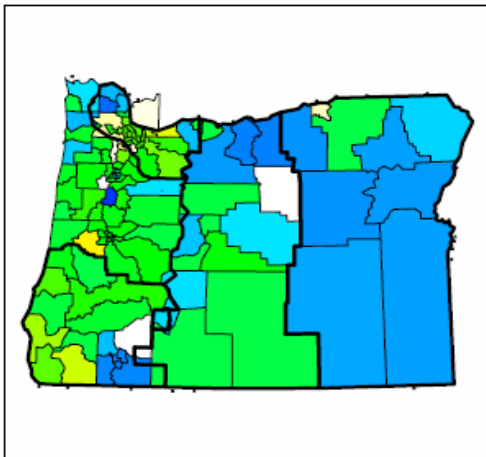
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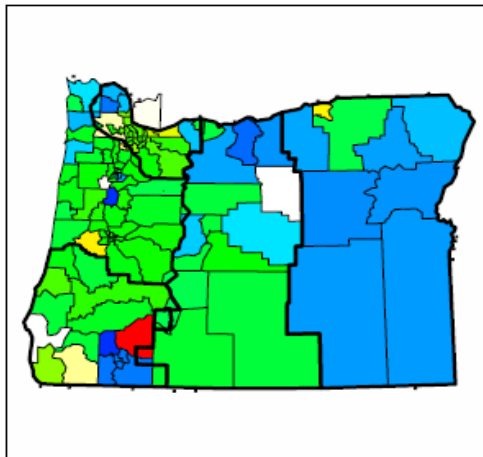
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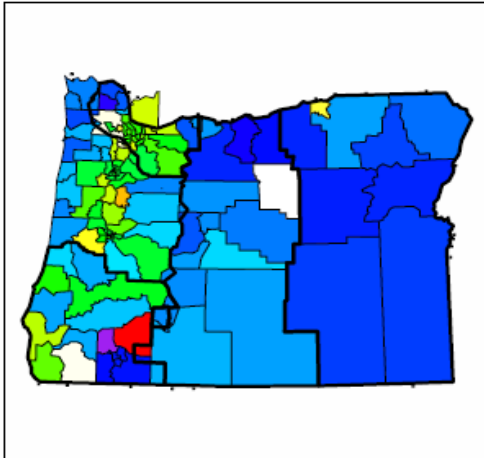
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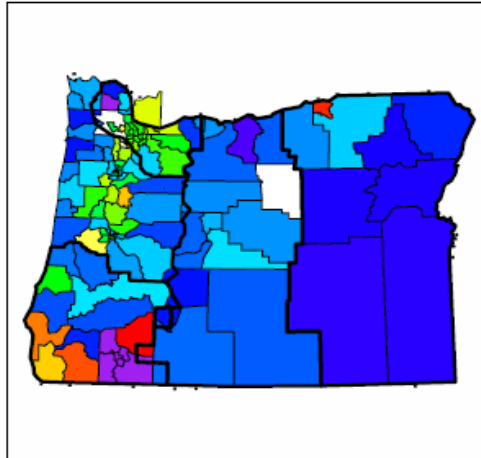
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Num of Jobs within 30 min of Ave Household for ServEmp for year: 30

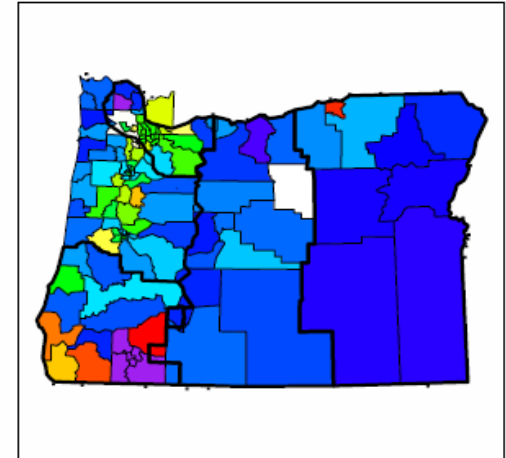
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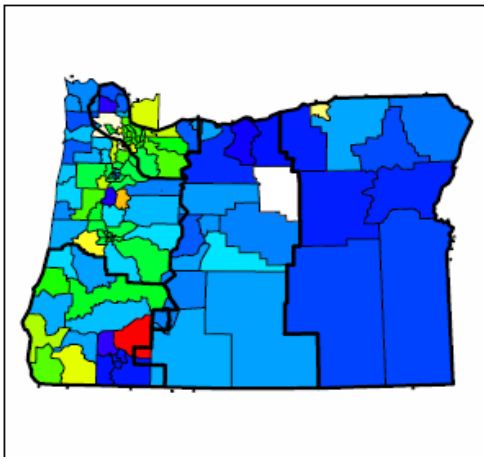
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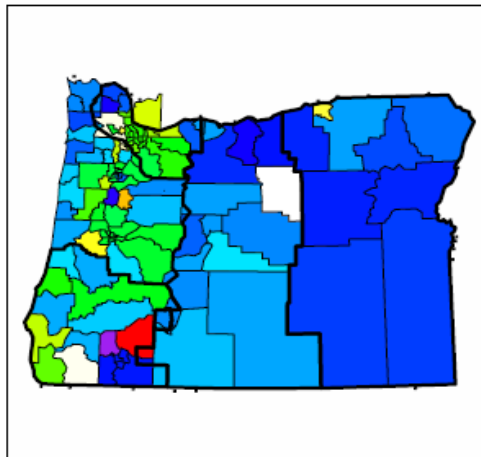
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The Percent Change from '05 for, z



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Lessons Learned

- Invest time explaining role of analysis
- Use real-world analogies when possible
- Automate runs as much as possible,
- Performance measures are the windows into the model performance, it is crucial they are sound
- Design a framework for evaluating model performance
- Spend time creating visual representation of output to review
- Beware of aggregate averages



Questions?

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