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10-28-2022

# Freight Moves the Oregon Economy

Becky Knudson

*Oregon Department of Transportation*

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Portland State University  
October 28, 2022



# Freight Moves the Oregon Economy



Presented by Becky Knudson  
Senior Transportation Economist  
ODOT Transportation Planning Analysis Unit



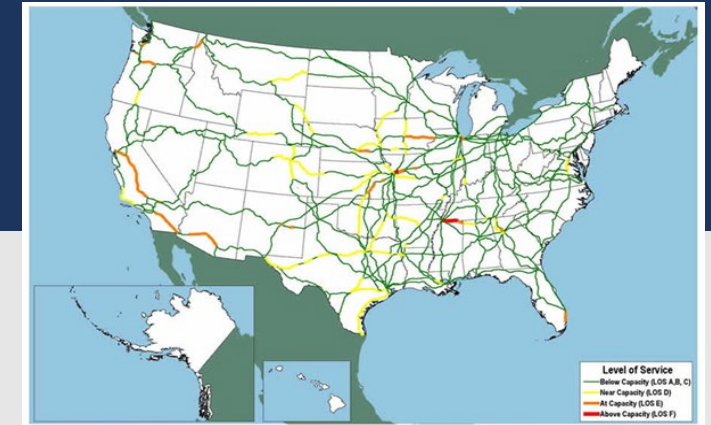
# Freight, the Economy, and Transportation Planning



ODOT Planning



Importance of Economic Context



Freight Analysis: Data, Tools and Examples

# Strategic Planning

## ODOT's Mission

*Provide a safe and reliable multimodal transportation system that connects people and helps Oregon's communities and economy thrive*

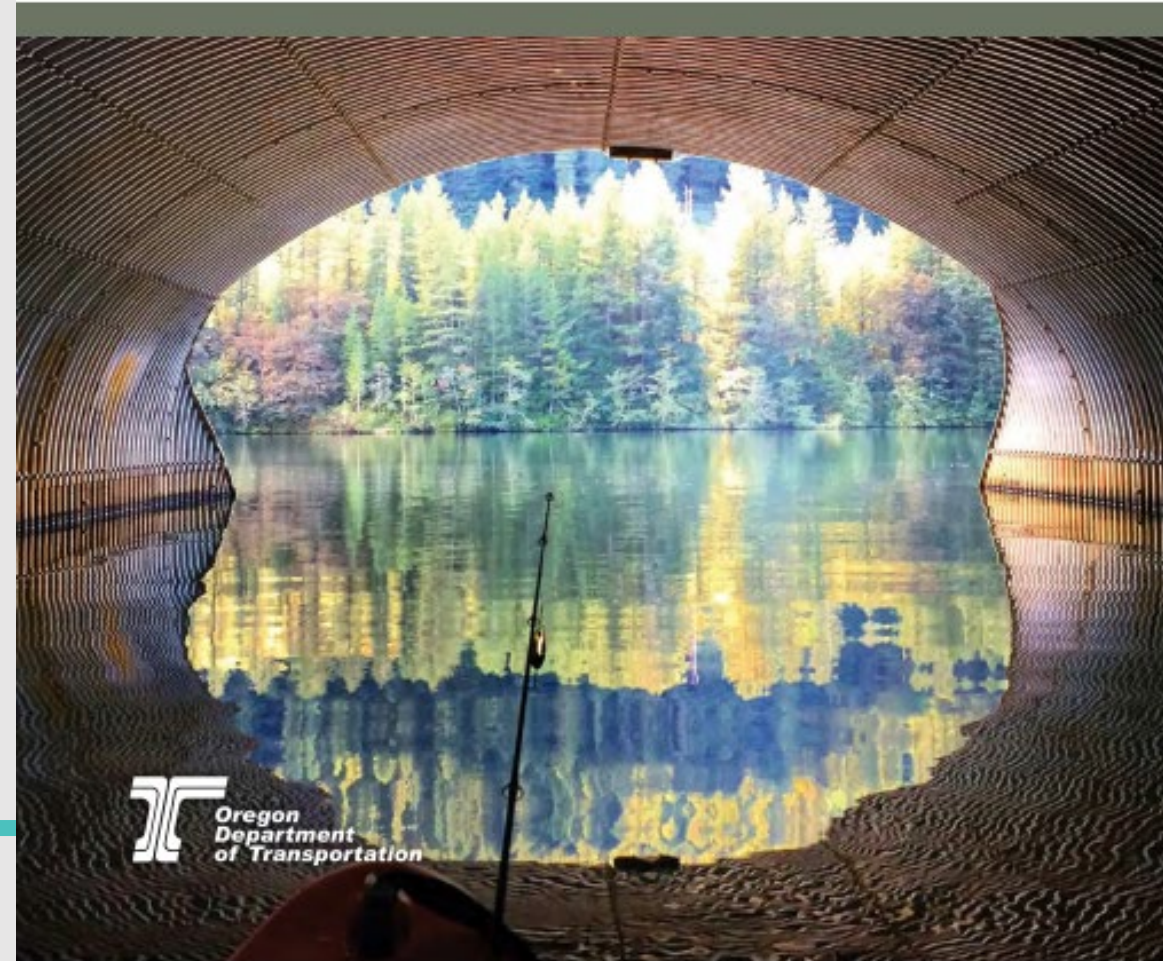
## Planning includes:

Range of time periods: today-2-5-10-20 years

Identifying priorities

Optimizing resources and assets

ONE ODOT:  
POSITIONED FOR  
THE FUTURE



# Policy and Operational Governance: *Distinct roles, shared objectives*



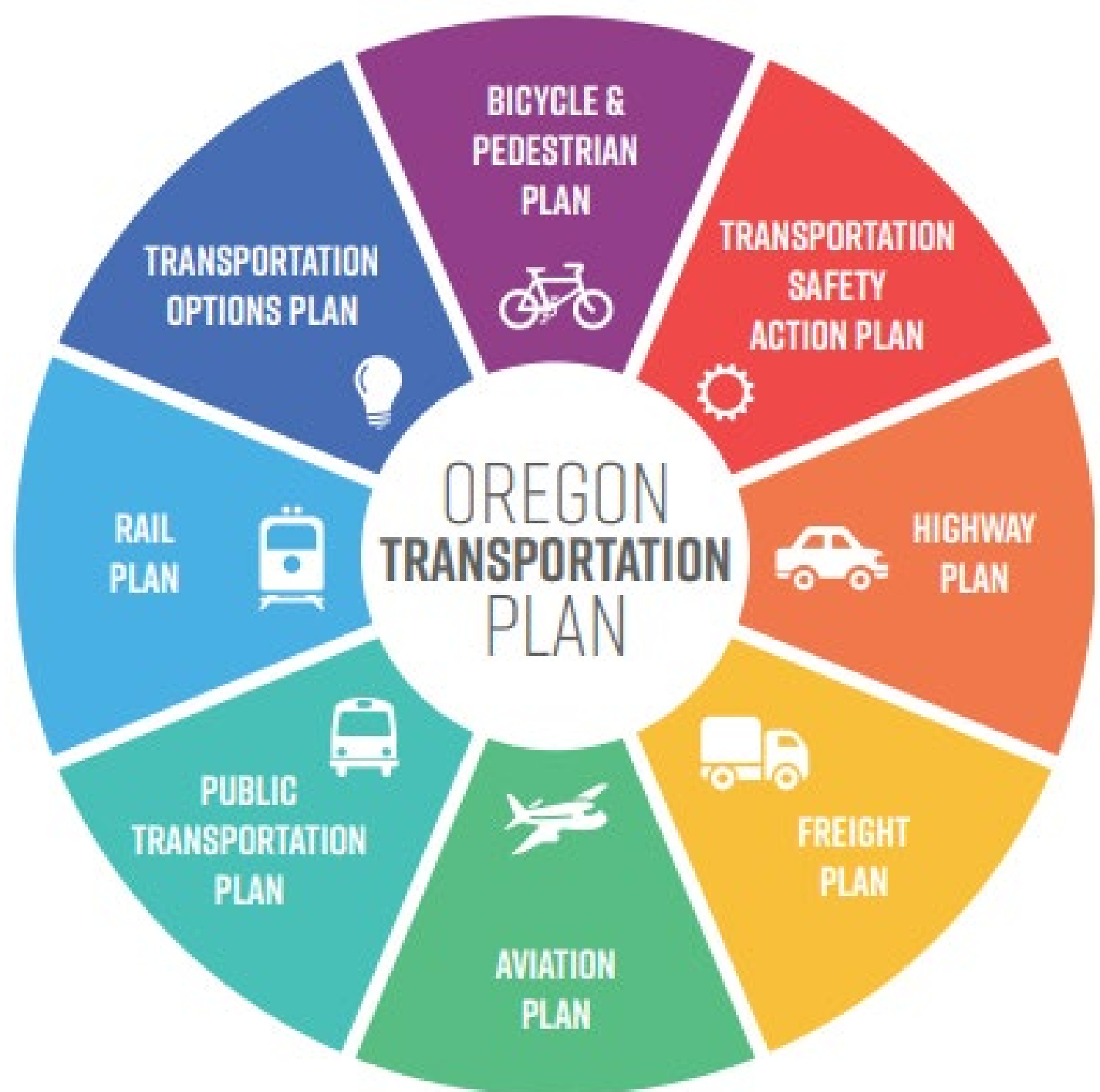
# Long Range Planning



OTP is the umbrella plan...

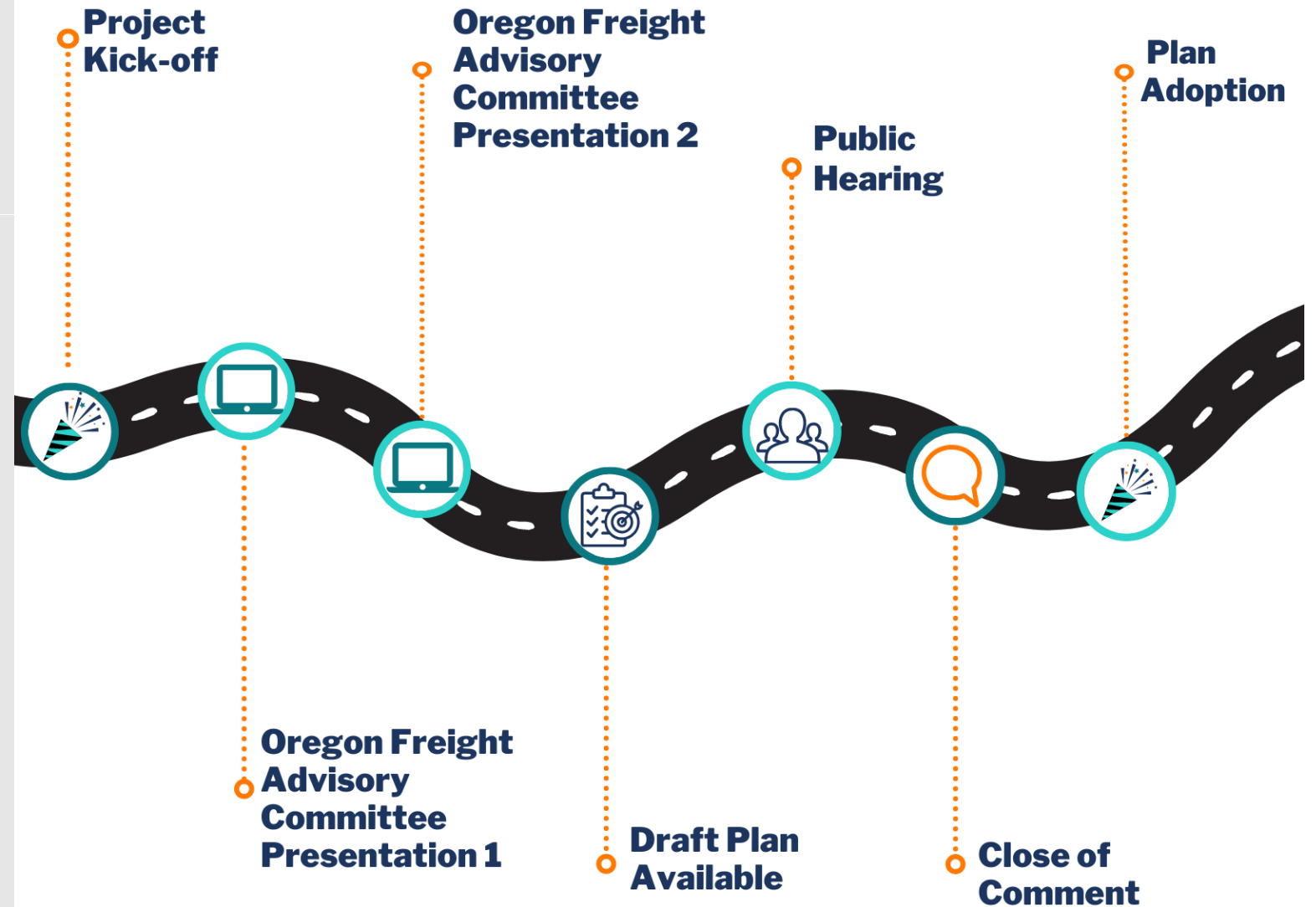


Implemented via  
modal plans



# Oregon Freight Plan Update

- ✓ 20 year plan;
- ✓ Must meet FHWA mandates;
- ✓ Policies supporting progress toward goals;
- ✓ Highlight key aspects related to:
  - Supporting freight movement
  - Supporting businesses and households depending on freight



# Importance of Economic Context

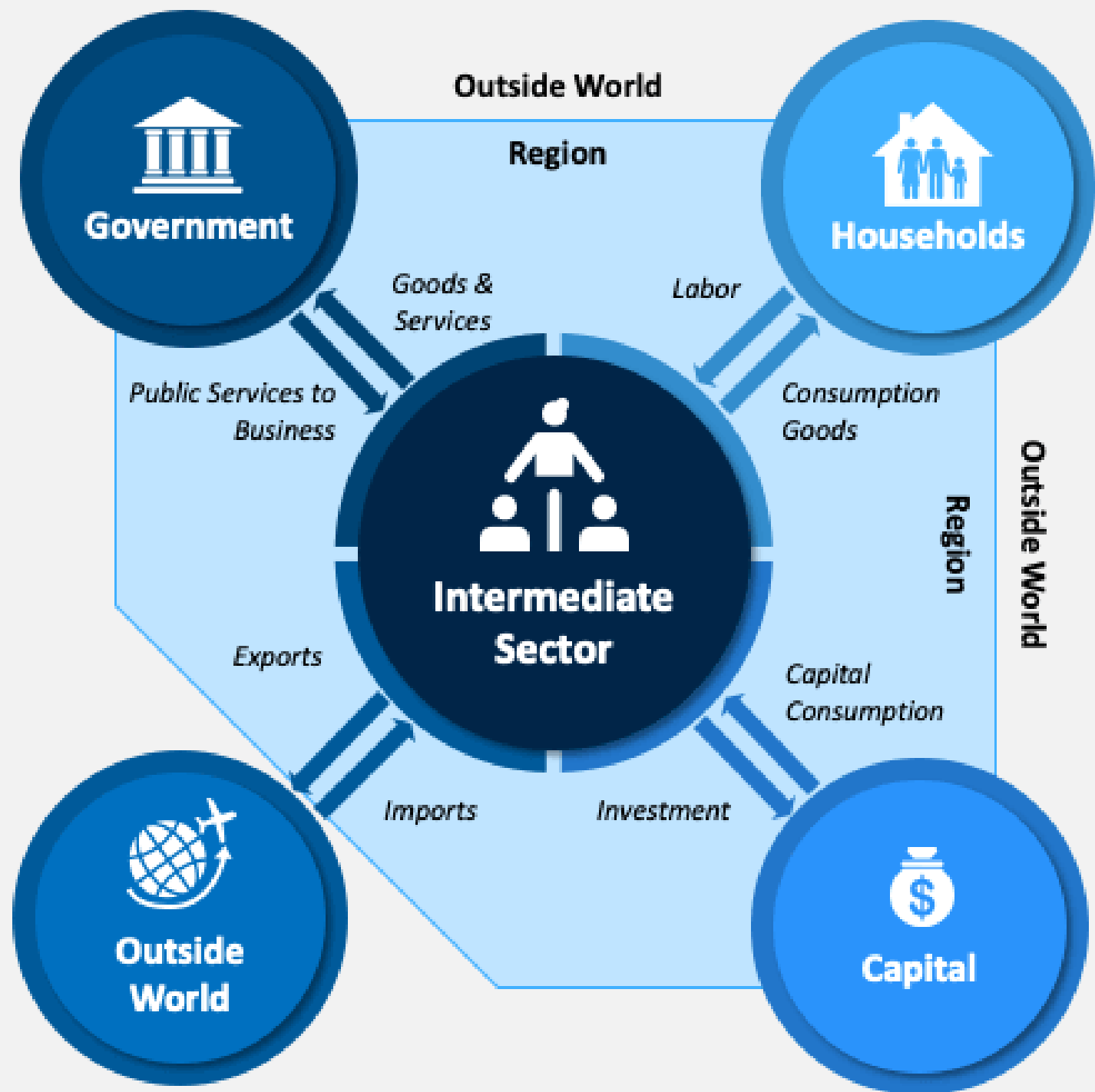


*There is economics in biology, nothing is free, everything has to be paid for, there are costs as well as benefits to everything in life*

Richard Dawkins



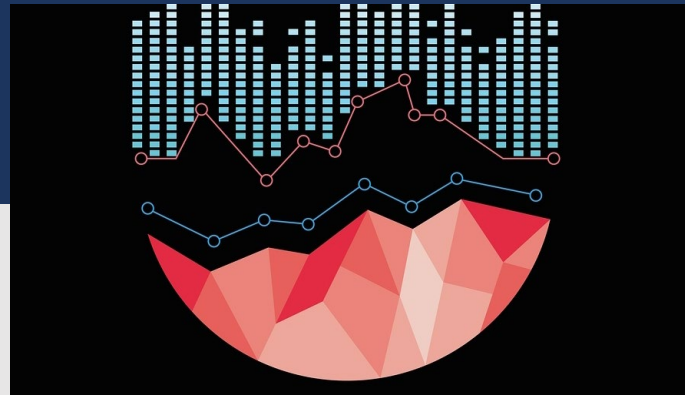
# Economic Activity is Impacted by Transportation Systems



# Data and Tools



Supporting Fact-Based  
Decision Making



Economic Data

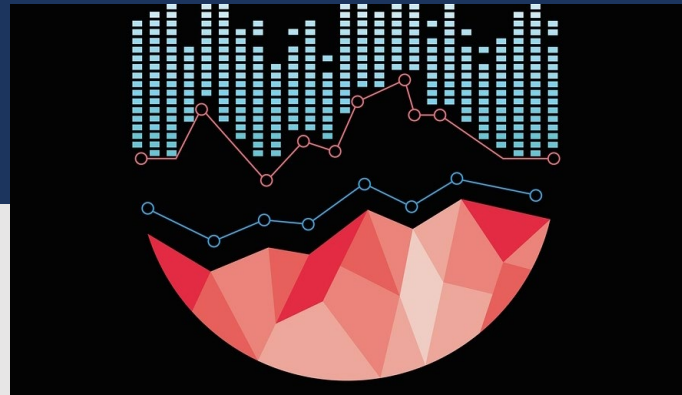


Transportation Data

# Data and Tools



Supporting Fact-Based  
Decision Making



Economic Data



Transportation Data

**CAUTION**

Data and tools used in poorly designed processes will be immaterial

# Transportation Data

Traffic volumes

Traffic speeds

Crash rates

Travel surveys

Commodity flow survey



# Economic Data

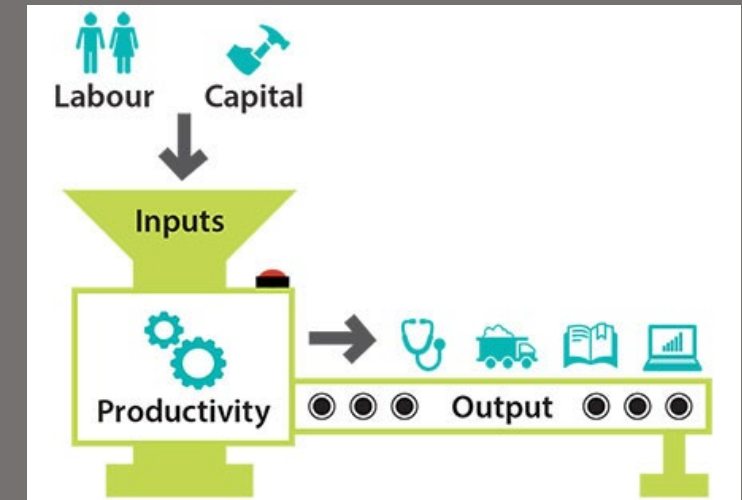
Population

Employment

Factors of Production

Gross State Product

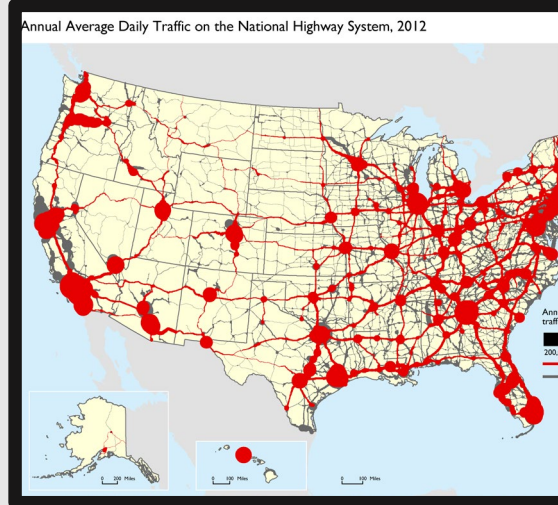
Inflation rate



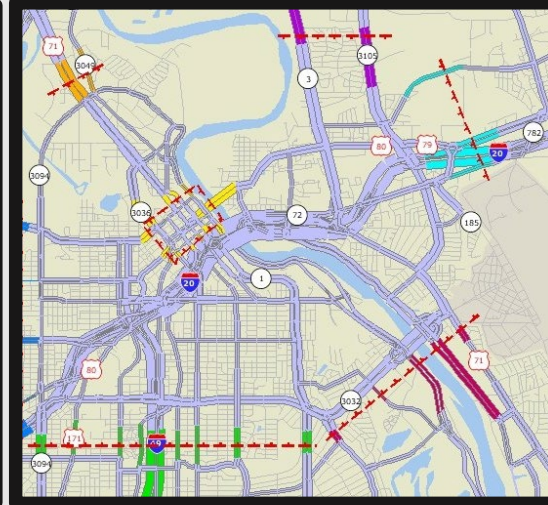
# Tools



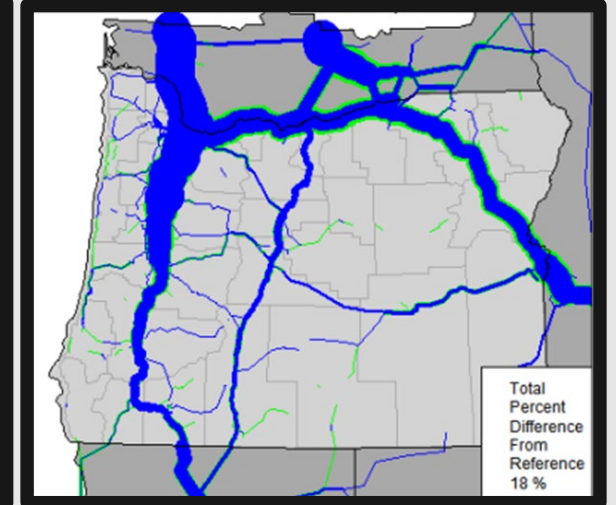
Regional Integrated  
Transportation  
Information System  
(RITIS)



FHWA Freight  
Analysis  
Framework (FAF)



Travel Demand  
Models



Statewide Integrated  
Economic/Land  
Use/Transportation  
Model (SWIM)

# Transportation Planning Toolbox



## Analysis Tools

The [Analysis Procedures Manual](#) provides the current methodologies, practices and procedures for conducting long term analysis of ODOT plans and projects.

Safety Analysis Tools



Signalized Intersection Tools



Unsignalized Intersection Tools



Volume Development Tools



Multimodal Analysis Tools



Segment Analysis Tools



## Modeling Tools

Statewide Integrated Model



VisionEval Strategic Planning Model



Highway Economic Requirements System - HERS-ST



Urban Travel Demand Models



Modeling Resources



<https://www.oregon.gov/odot/Planning/Pages/Technical-Tools.aspx>



Stories matter

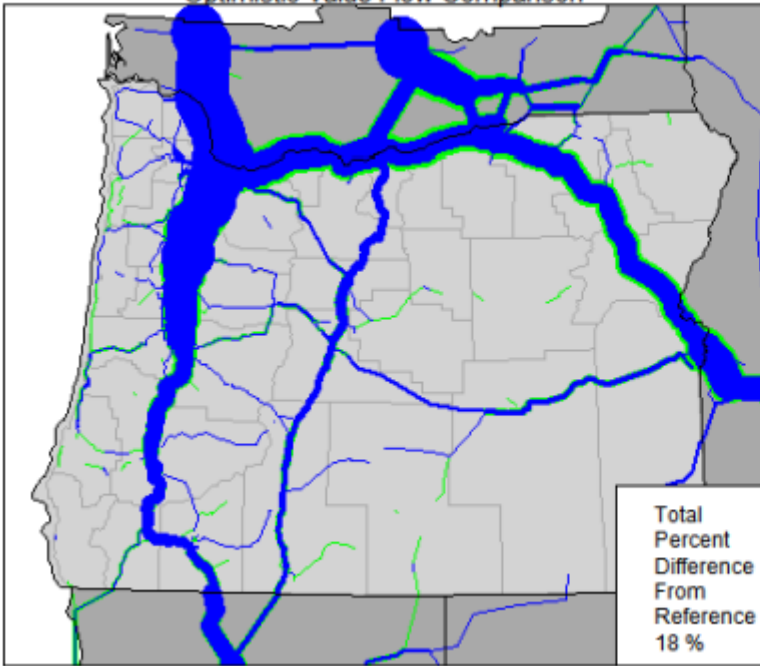


# #1 The First Oregon Freight Plan and the Great Recession

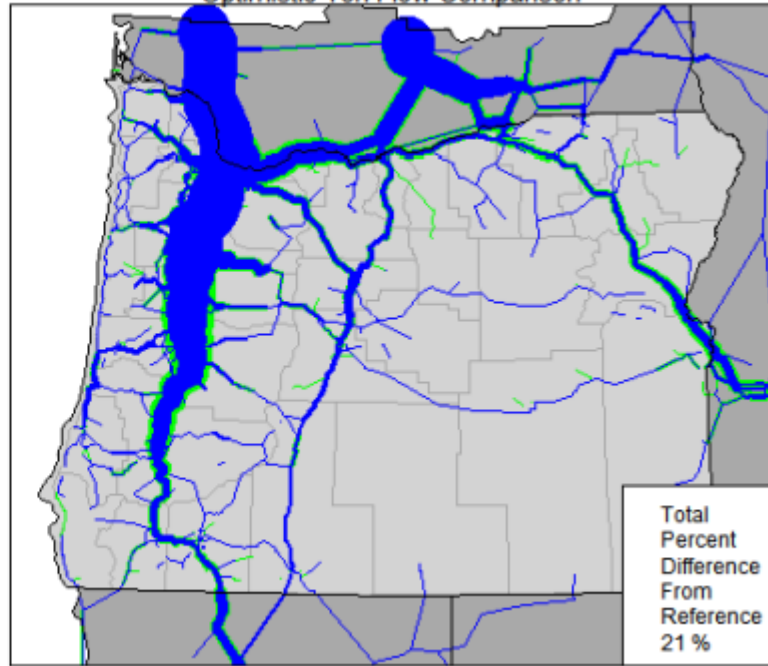
- **Objective:** support the development of a long range freight plan
- **Challenge:** oversight committee distracted by high fuel prices and deep recession
- **Analysis:** demonstrate the need for freight movement whether economy fully recovers or growth is slow;
- **Tool:** Oregon Statewide Integrated Model



Optimistic Value Flow Comparison



Optimistic Ton Flow Comparison

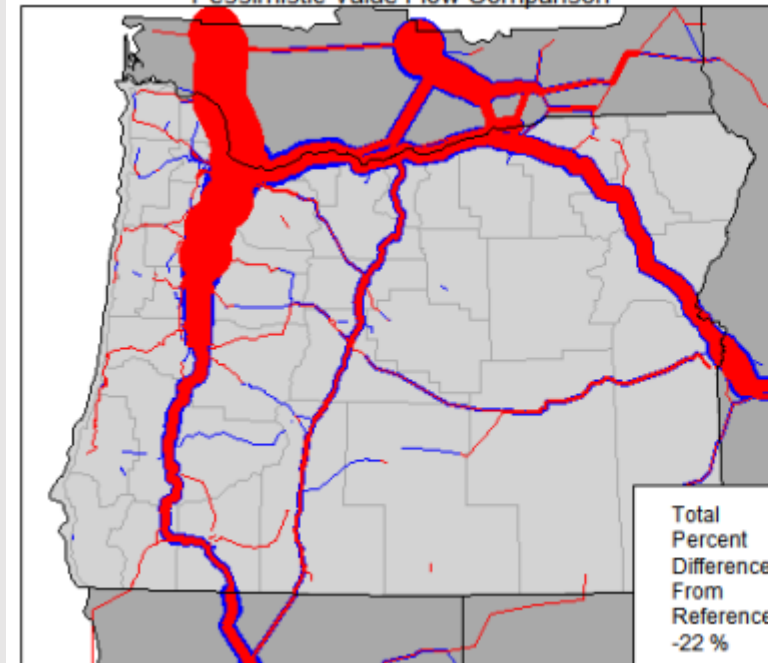


# Oregon Depends on Freight

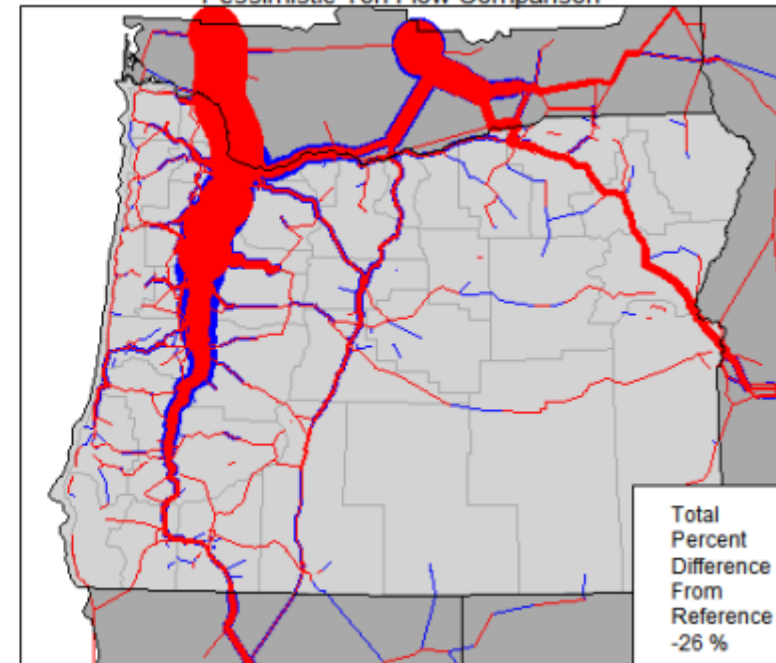
## Bottom Line

Freight will flow regardless of fuel price or slow economic growth

Pessimistic Value Flow Comparison



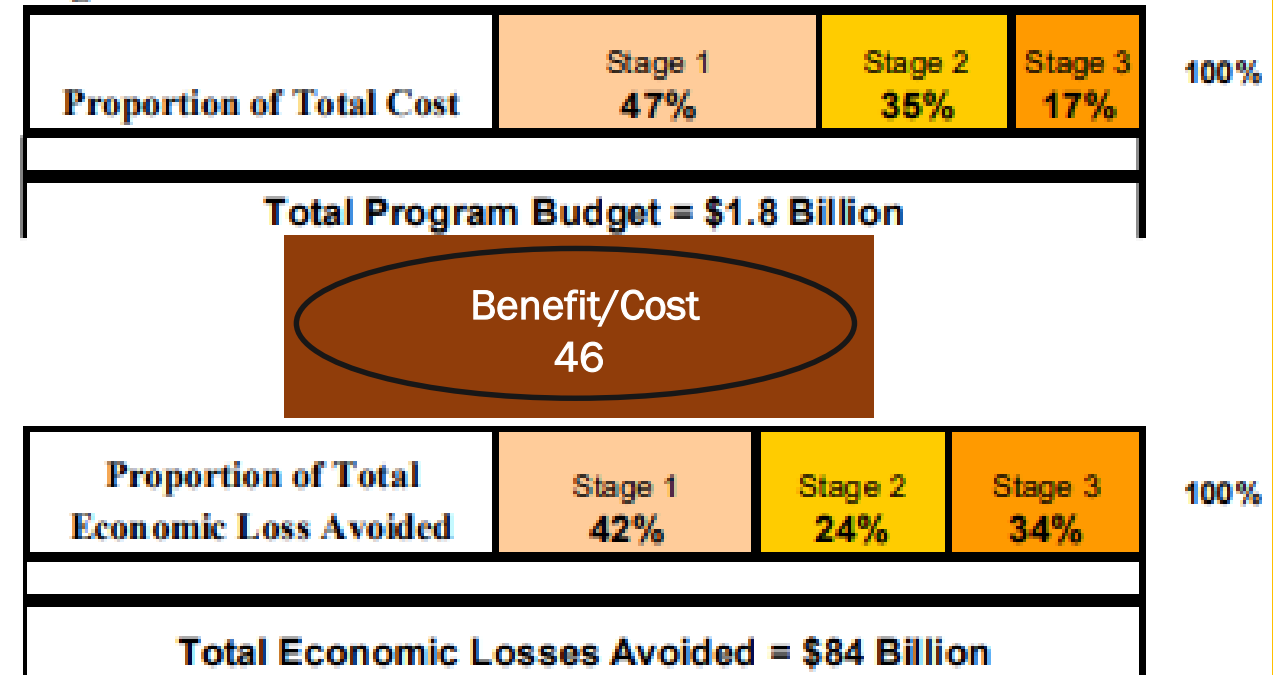
Pessimistic Ton Flow Comparison



## #2 Preparing for a Cascadia Subduction Zone Earthquake

- **Objective:** Develop a business case for investing in seismic prep
- **Challenge:** expensive
- **Analysis:** estimate the economic impacts of not making the investment
- **Tool:** Oregon Statewide Integrated Model

Figure 1.



**Weighted Benefit/Cost  
5.5**

12% chance next 50 Years

**Weighted Benefit/Cost  
17.5**

38% chance next 50 Years

Figure 4. Isolated Zones and Repair Phasing: Stage 1 Scenario

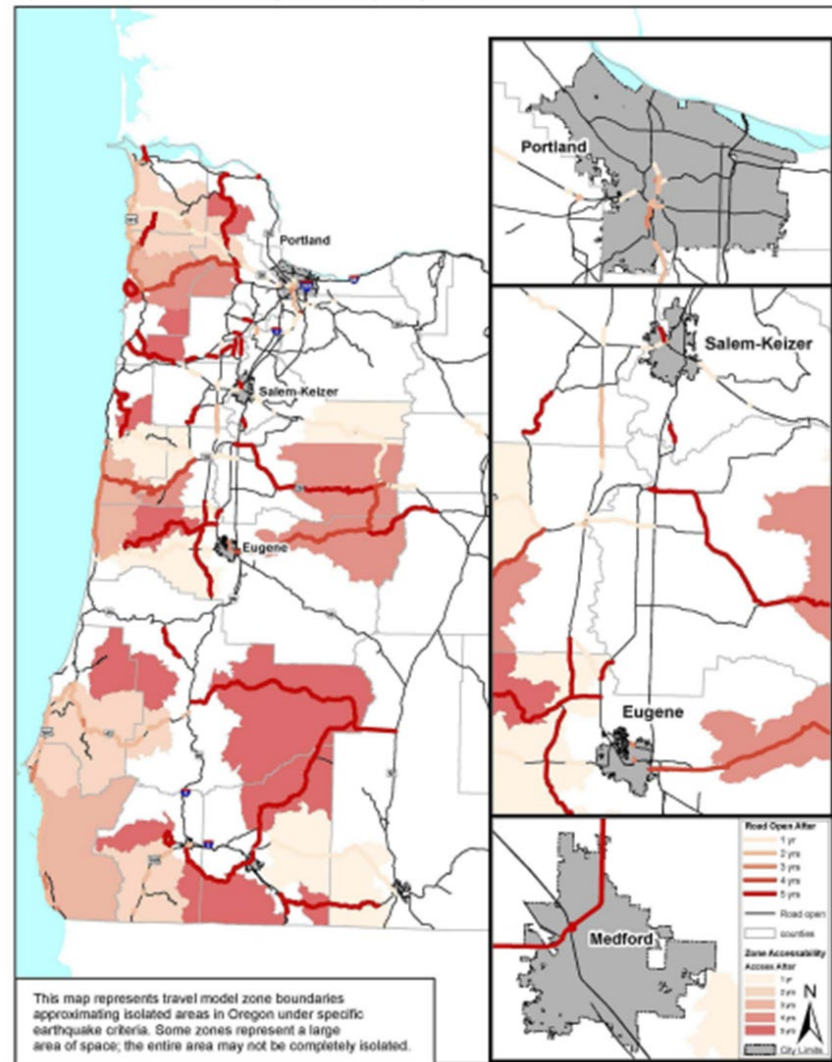


Figure 5. Isolated Zones and Repair Phasing: Stage 1 and 2 Scenario

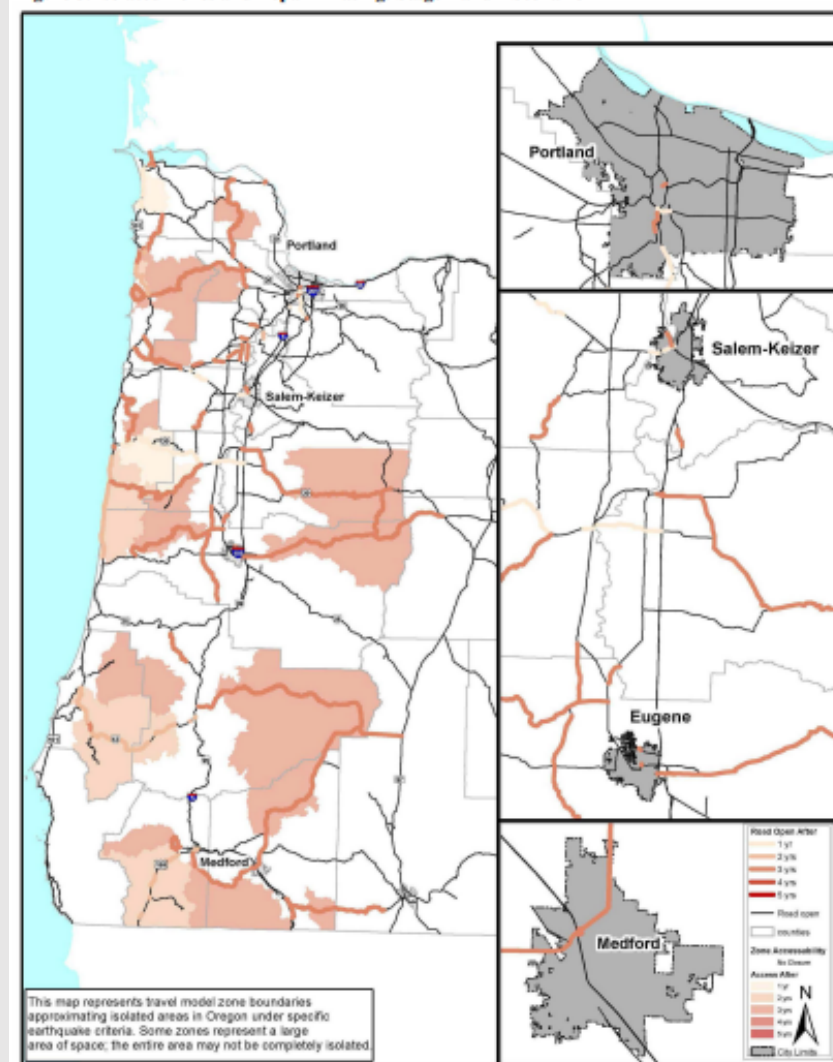
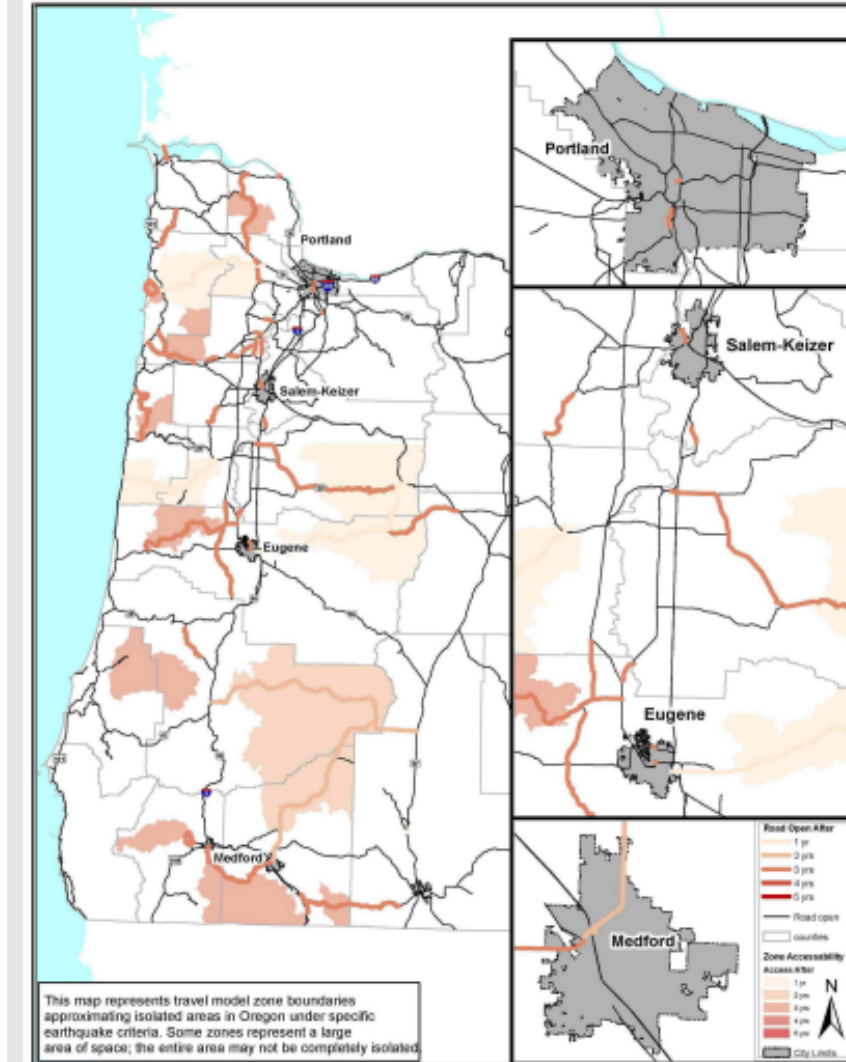


Figure 6. Isolated Zones and Repair Phasing: Full Seismic Program Scenario (Stages 1, 2, & 3)



Information reported: potential reduction in gross state product, employment, and population by region, economic isolation maps

# #3 Eagle Creek Wildfire



- Began Sept 2, 2017
- 2.5 miles west of Cascade Locks
- 48,831 acres burned

- 176 hikers rescued
- 35 miles of fire-line
- 5000 homes & buildings threatened
- \$20M+ fire fighting cost

- I-84 Westbound closed 10 days
- I-84 Eastbound closed 19 days
- Historic Columbia River Hwy closed 11 weeks



## Question from Legislator:

“I would like to know the economic impact of closing I-84 to commercial traffic”

### Economic Impacts of One Weekday Closure of I-84 Mile Points 17 to 62 Due to Eagle Creek Fire

Estimated Cost of One Day Closure to Heavy Trucks Due to I-84 Eagle Creek Fire		
	Range of Estimated Costs	
Additional Time Costs	\$160,000	\$180,000
Additional Truck Operating Costs	\$ 90,000	\$110,000
<b>Total Cost</b>	<b>\$250,000</b>	<b>\$290,000</b>

## #4 Coastal Landslides: Agency is Perpetually in Reactive Mode



Arizona Inn



Hooskanaden



Hubbard Creek



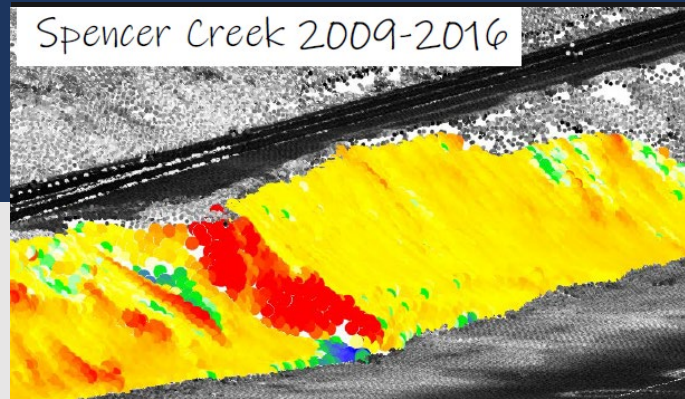
Ophir Beach

Preventive mitigation is beyond funding capabilities.

# ODOT Research Study SPR 843: US Highway 101 Coastal Hazard Vulnerability and Risk Assessment for Mitigation Prioritization



**Tsunami Risk, Flooding,  
Rising Precipitation**



**Rising Sea Level, Wave  
Intensity**



**Erosion and Landslides**

**Lead Researchers Oregon State University:**

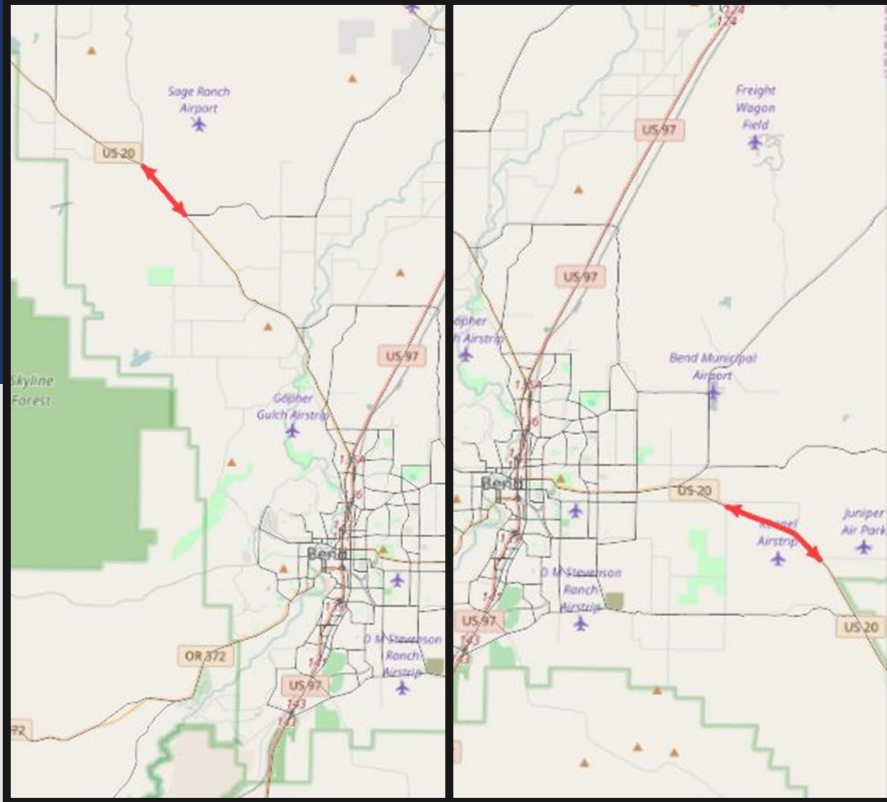
Mike Olsen, PhD, School of Civil and Construction Engineering

Ben Leshchinsky, PhD, P.E., Dept of Forest Engineering, Resources and Management

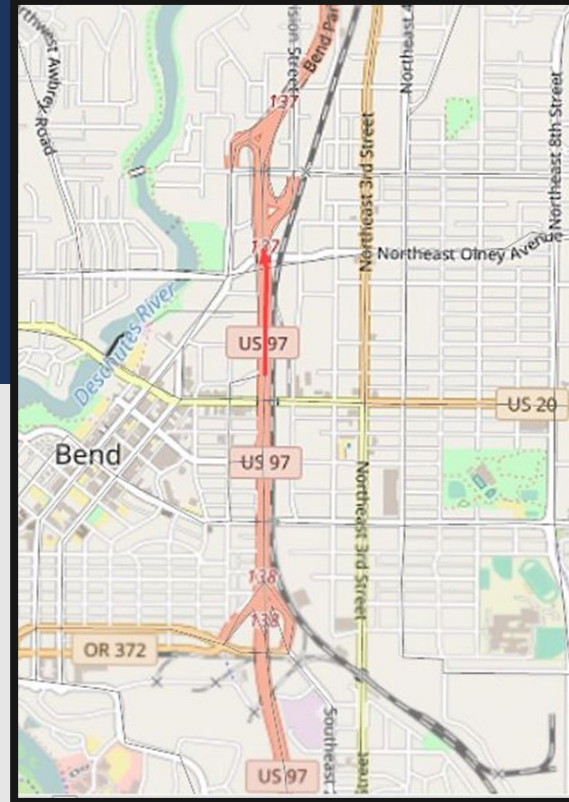
**ODOT Project Manager:** Kira Glover-Cutter, PhD, Research Analyst and Coordinator



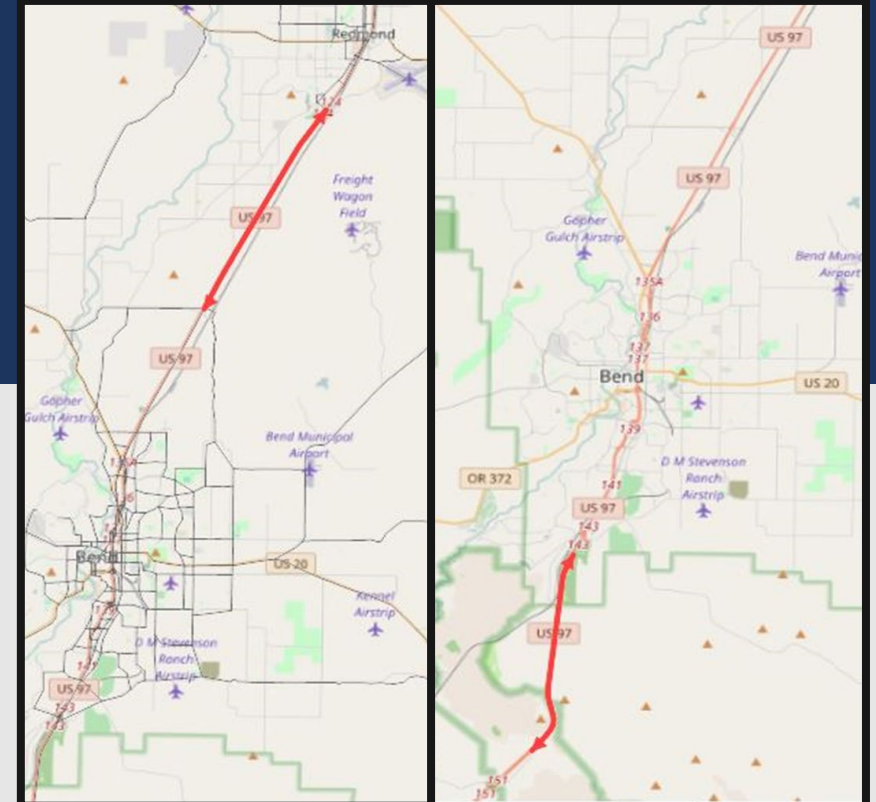
# #5 Commodity Flows Through Bend, 2016



US20 West & East



US97 within Bend



US97 North & South



# Average Daily Commodity Flows 2016

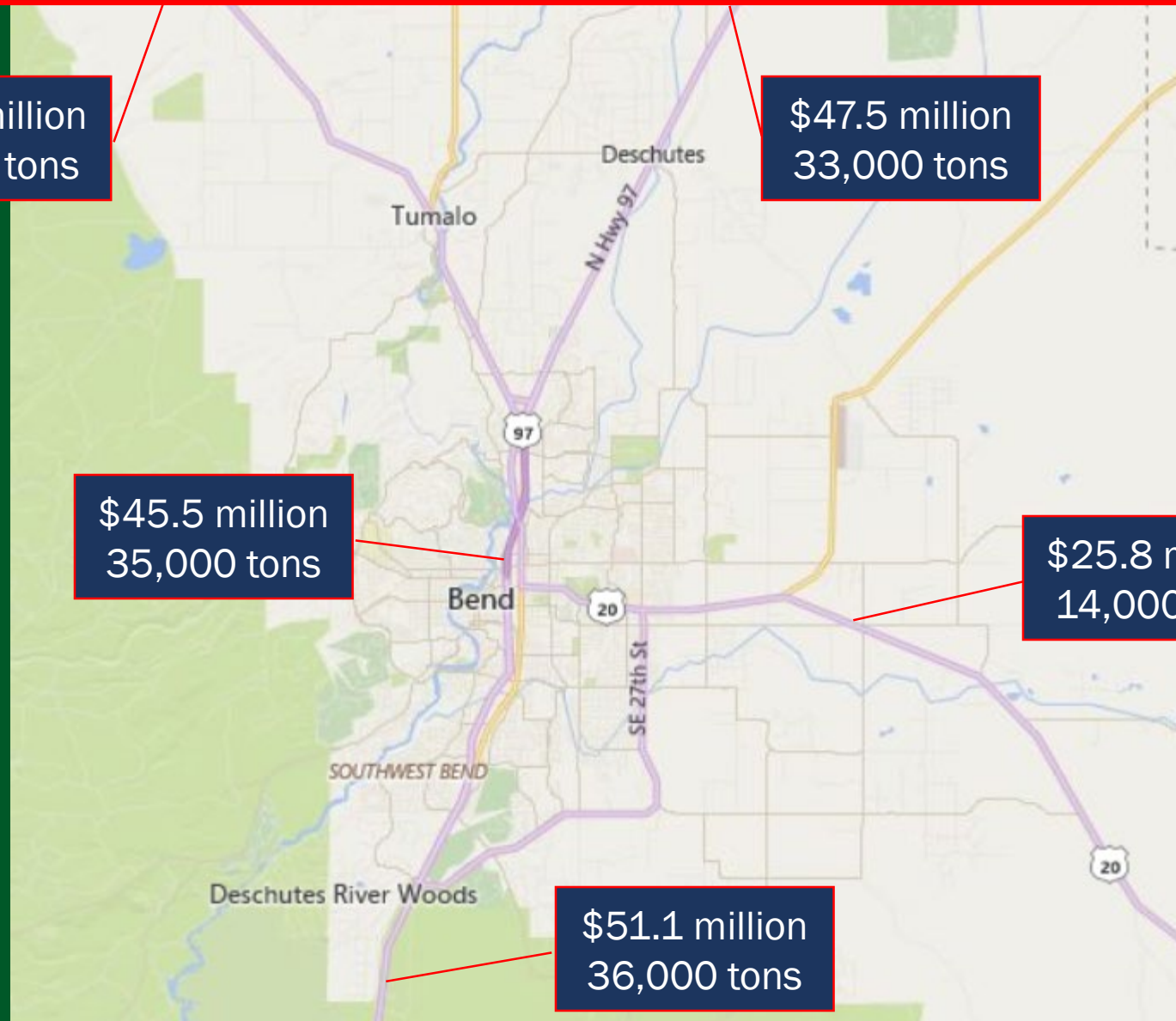
\$19.8 million  
19,000 tons

\$47.5 million  
33,000 tons

\$45.5 million  
35,000 tons

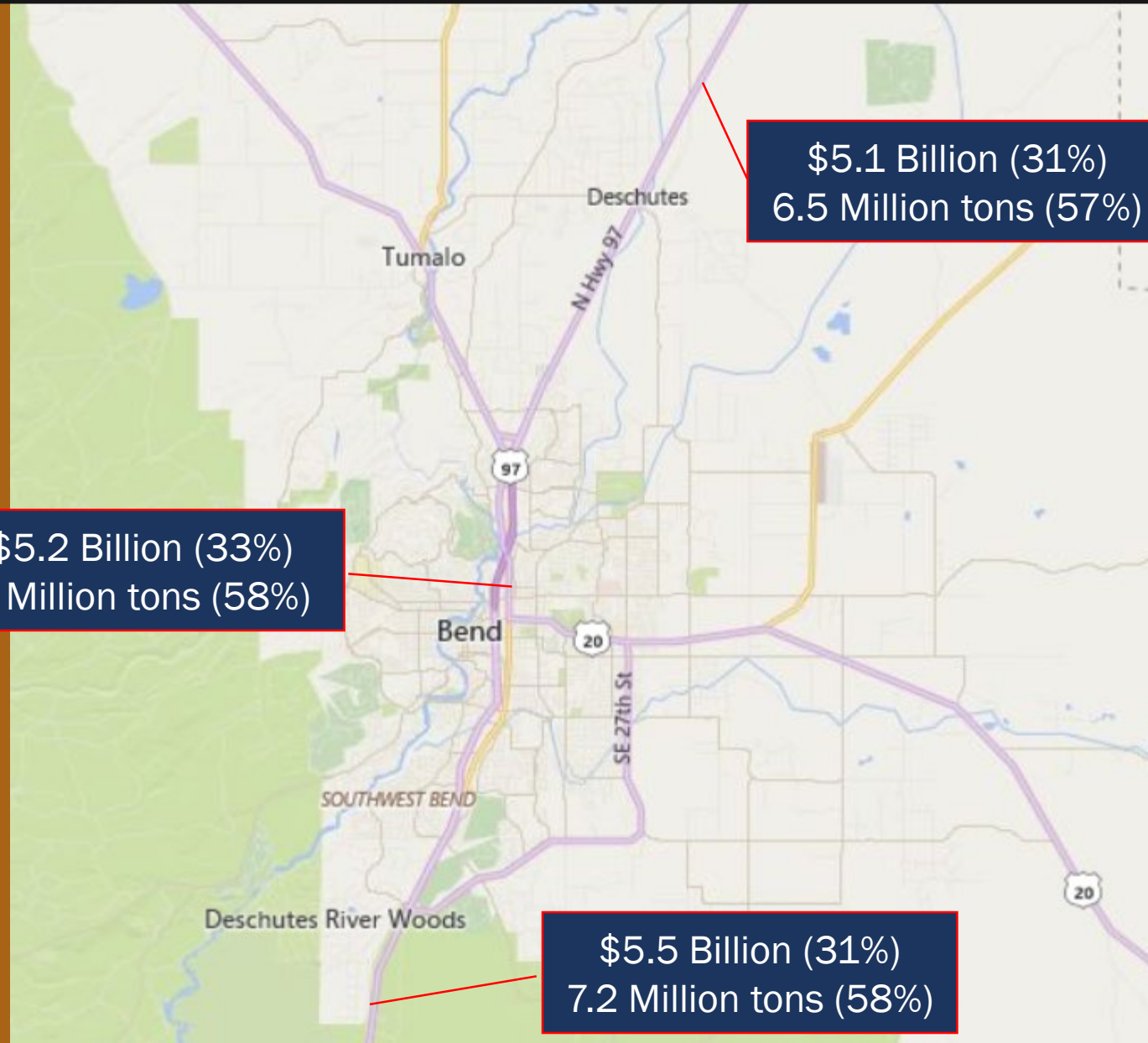
\$25.8 million  
14,000 tons

\$51.1 million  
36,000 tons



# #6 Average Annual Agricultural Commodity Flows, 2017

Includes SCTG Codes  
1-7 and 25-26;  
Data from FAF4



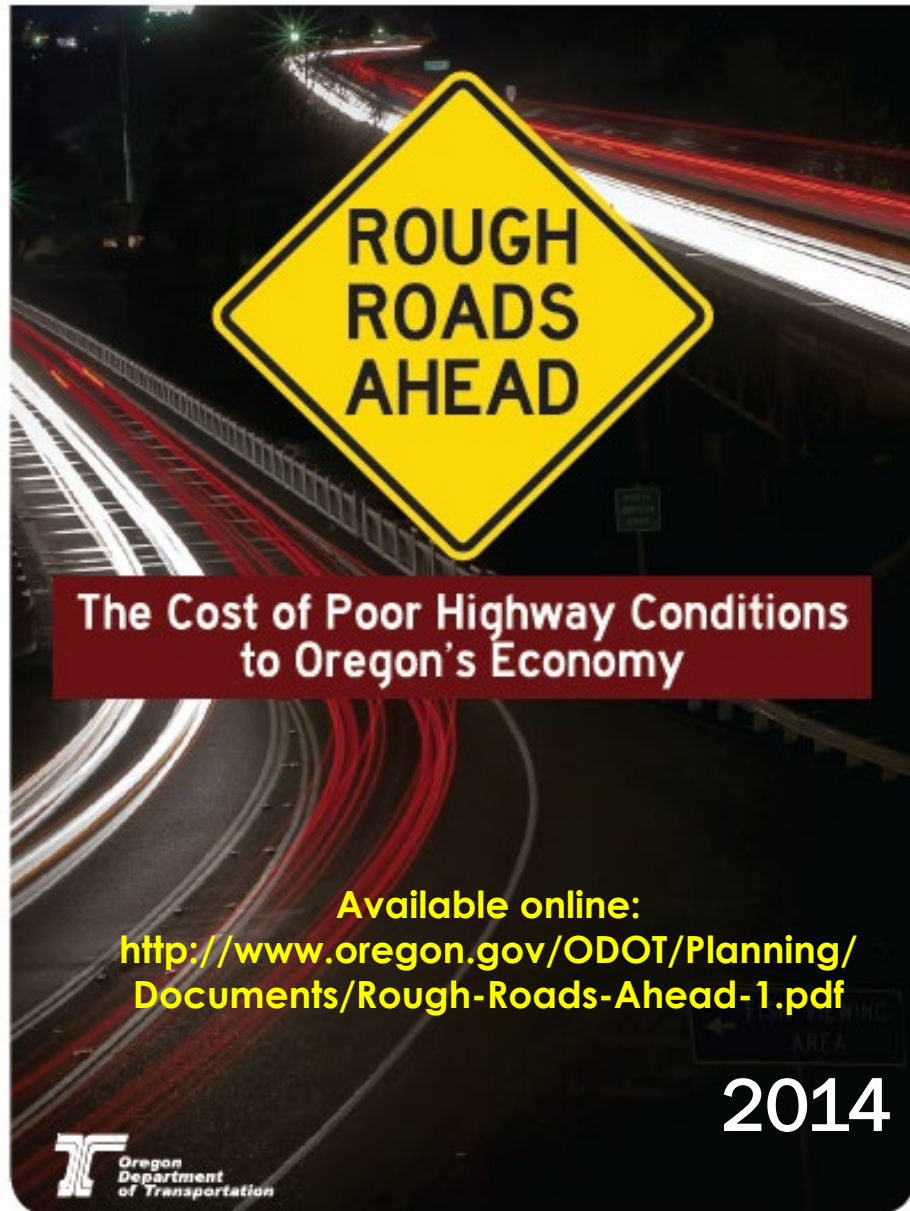
\$5.1 Billion (31%)  
6.5 Million tons (57%)

\$5.2 Billion (33%)  
7 Million tons (58%)

\$5.5 Billion (31%)  
7.2 Million tons (58%)

Percentages in  
parentheses indicate  
Ag. share of total  
commodity flows

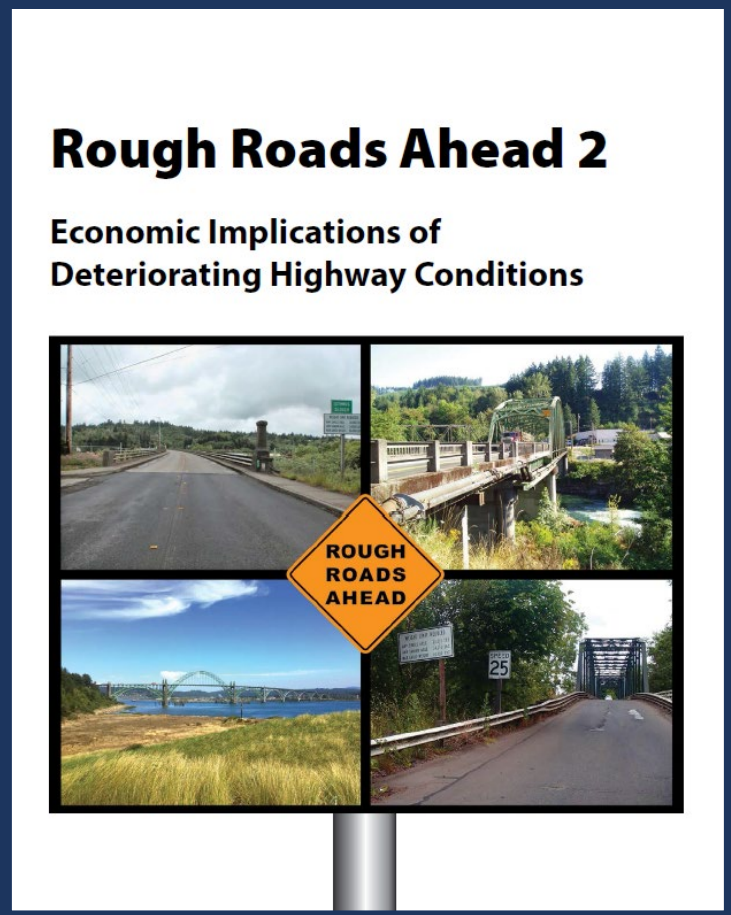
# #7 Highway Condition Impacts the Economy



The Cost of Poor Highway Conditions to Oregon's Economy

Available online:  
<http://www.oregon.gov/ODOT/Planning/Documents/Rough-Roads-Ahead-1.pdf>

2014



## Rough Roads Ahead 2

Economic Implications of Deteriorating Highway Conditions










Available online:  
<http://www.oregon.gov/ODOT/Planning/Documents/Rough-Roads-Ahead-2.pdf>

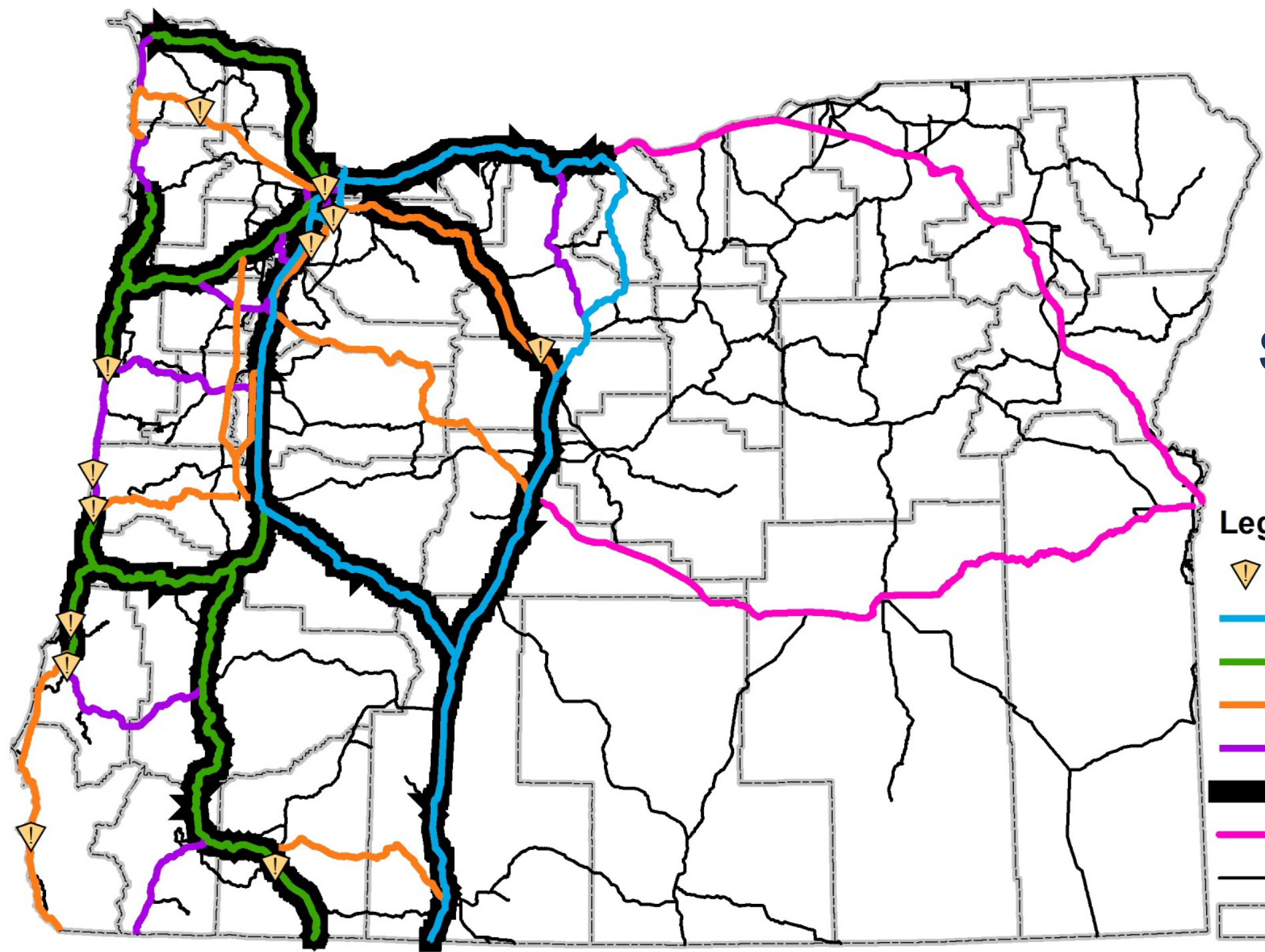
2017

N

# ODOT State System Priority Corridors

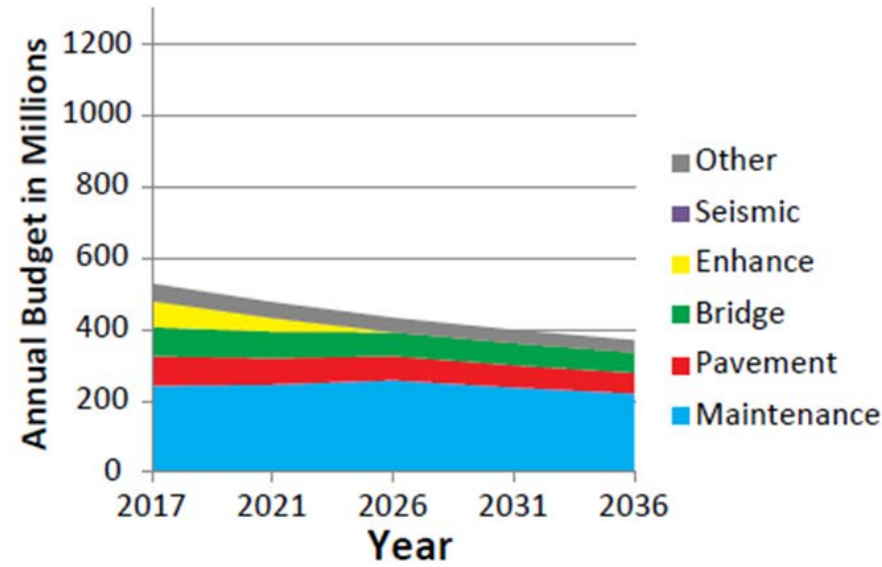
## Legend

-  Phase 5 Not Addressed - 12 Bridges
-  Seismic Phase 1 Bridges
-  Seismic phase 2 Bridges
-  Seismic Phase 3 Bridges
-  Seismic Phase 4 Bridges
-  Seismic Plus Fixit Intersect
-  Fix It Priority Corridors
-  State Highways
-  County

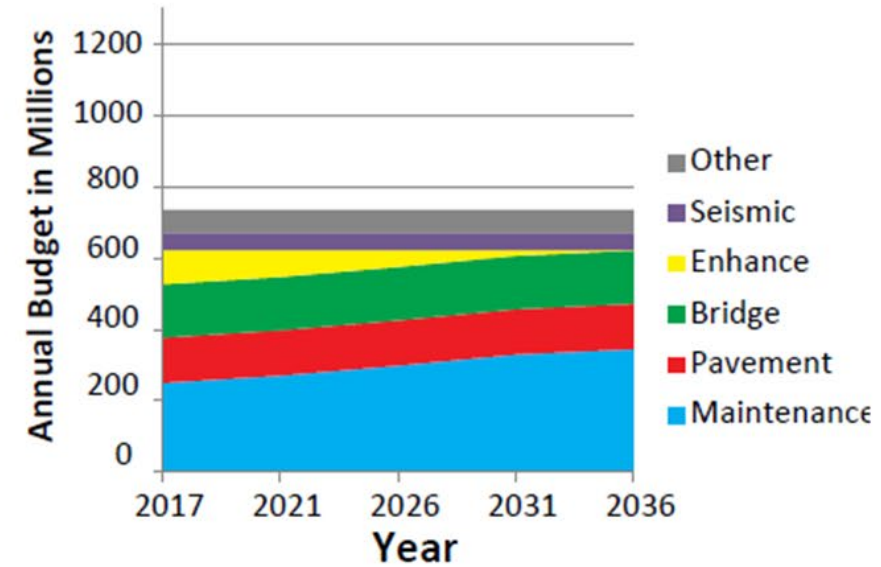


Analysis was grounded by budget realities

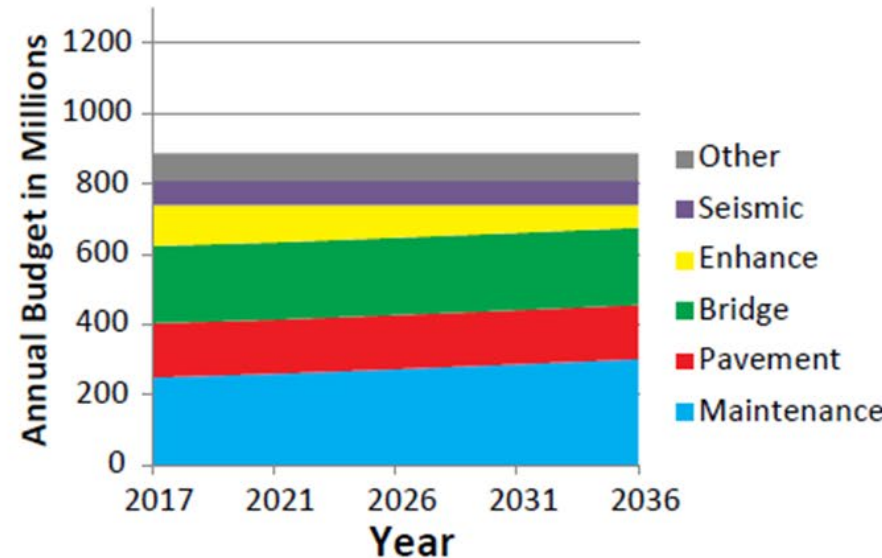
### Scenario 1 Budget



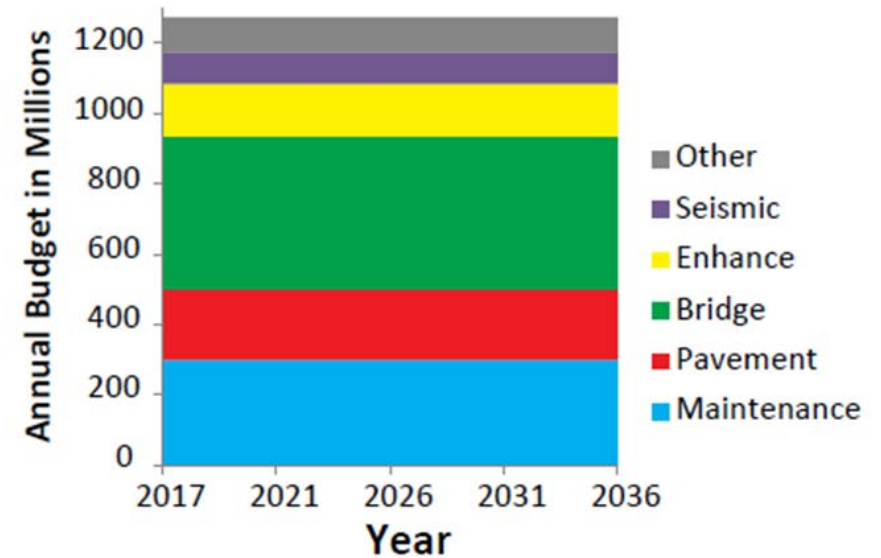
### Scenario 2 Budget



### Scenario 3 Budget

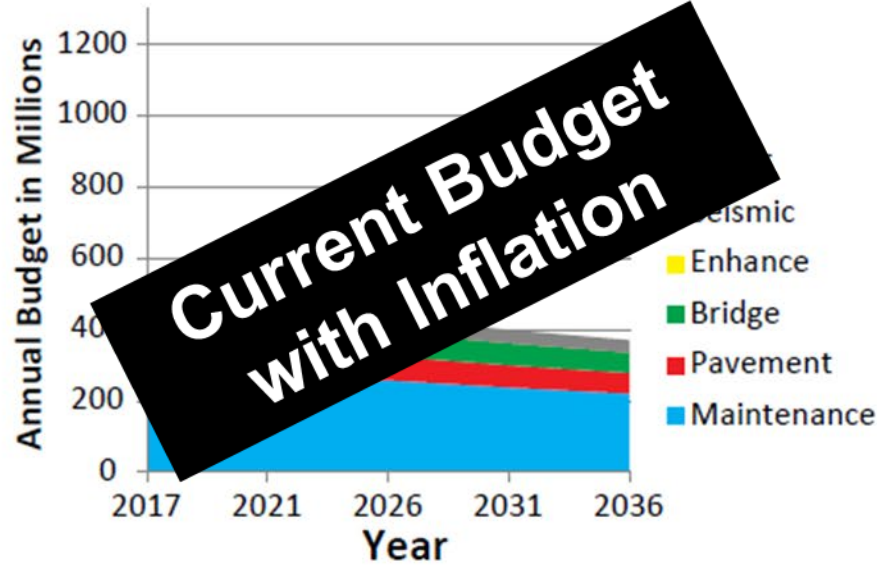


### Scenario 4 Budget

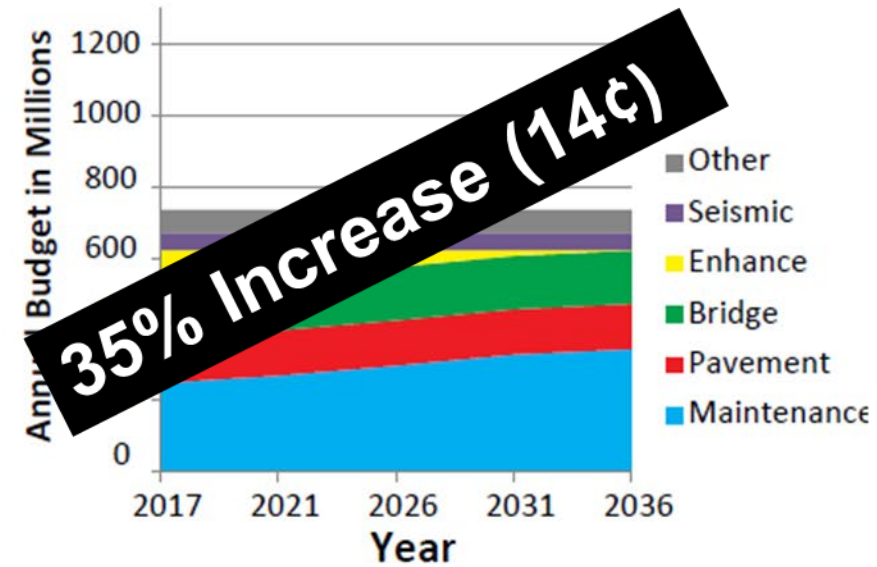


...translated  
into tangible  
actions

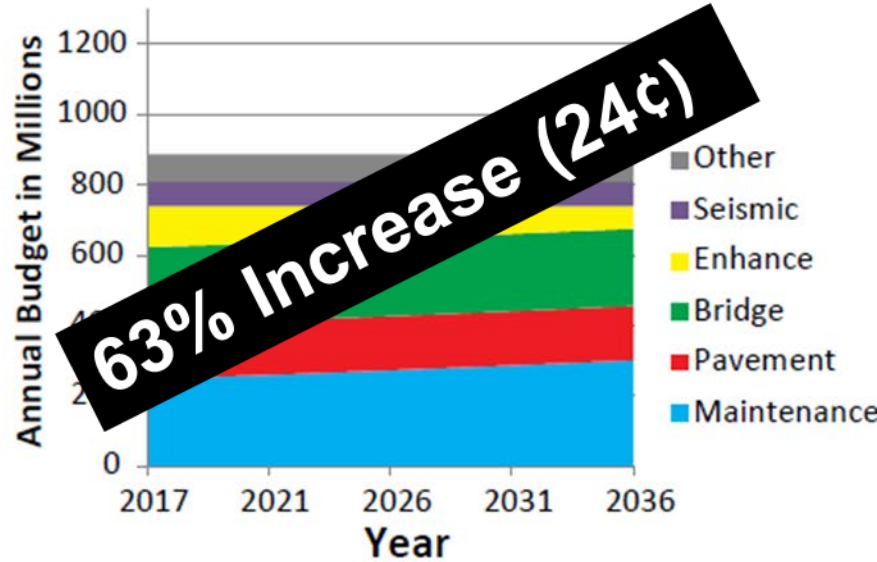
### Scenario 1 Budget



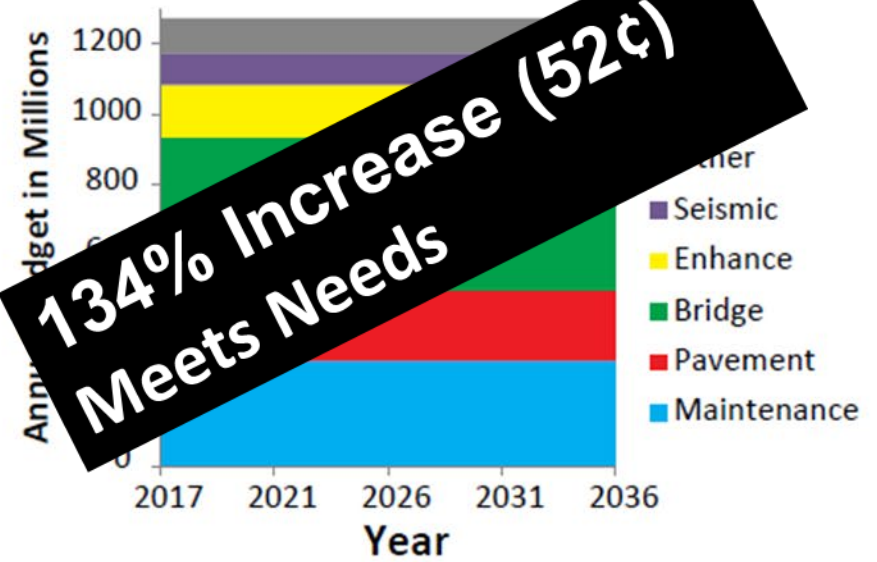
### Scenario 2 Budget



### Scenario 3 Budget

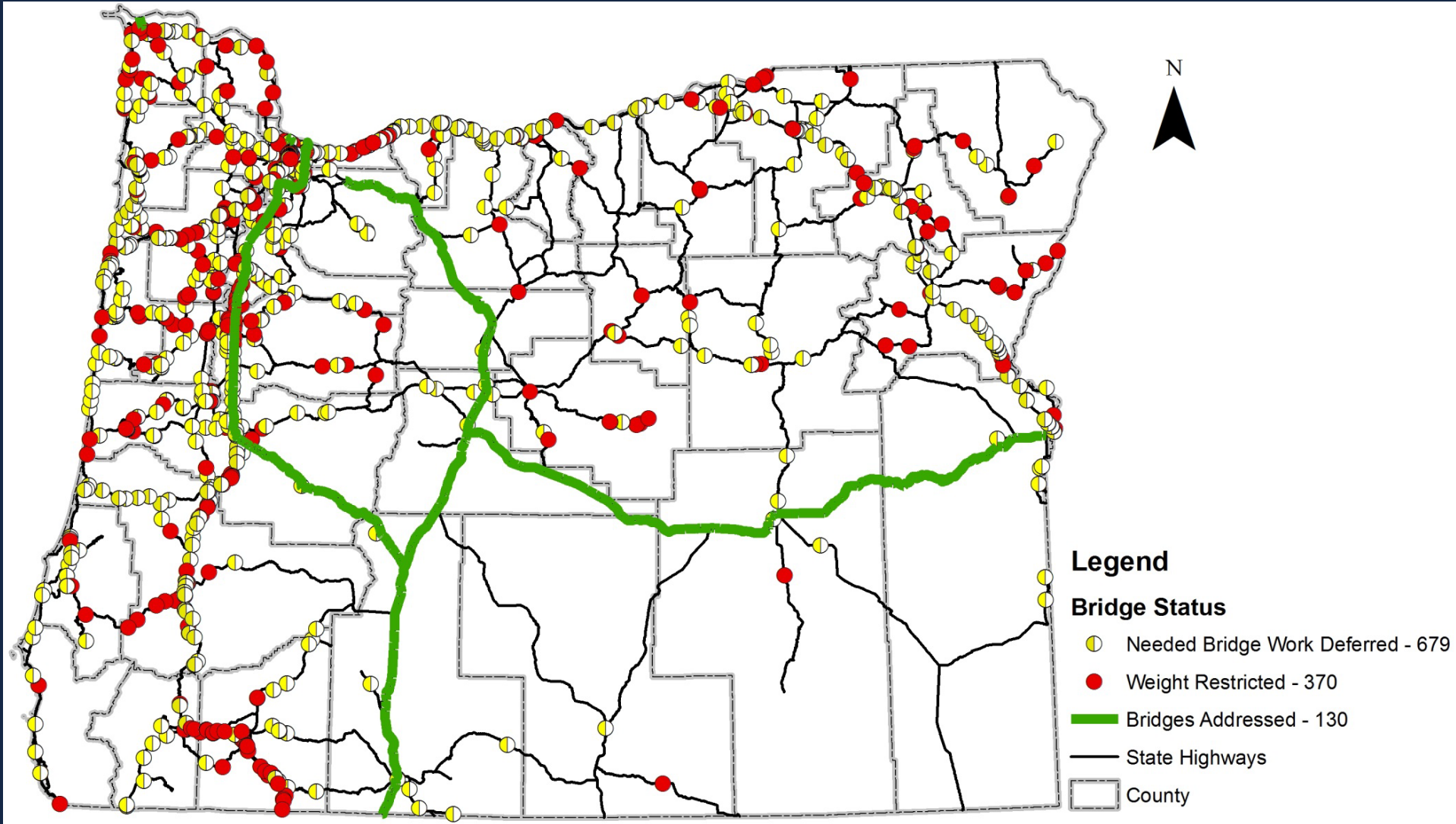


### Scenario 4 Budget



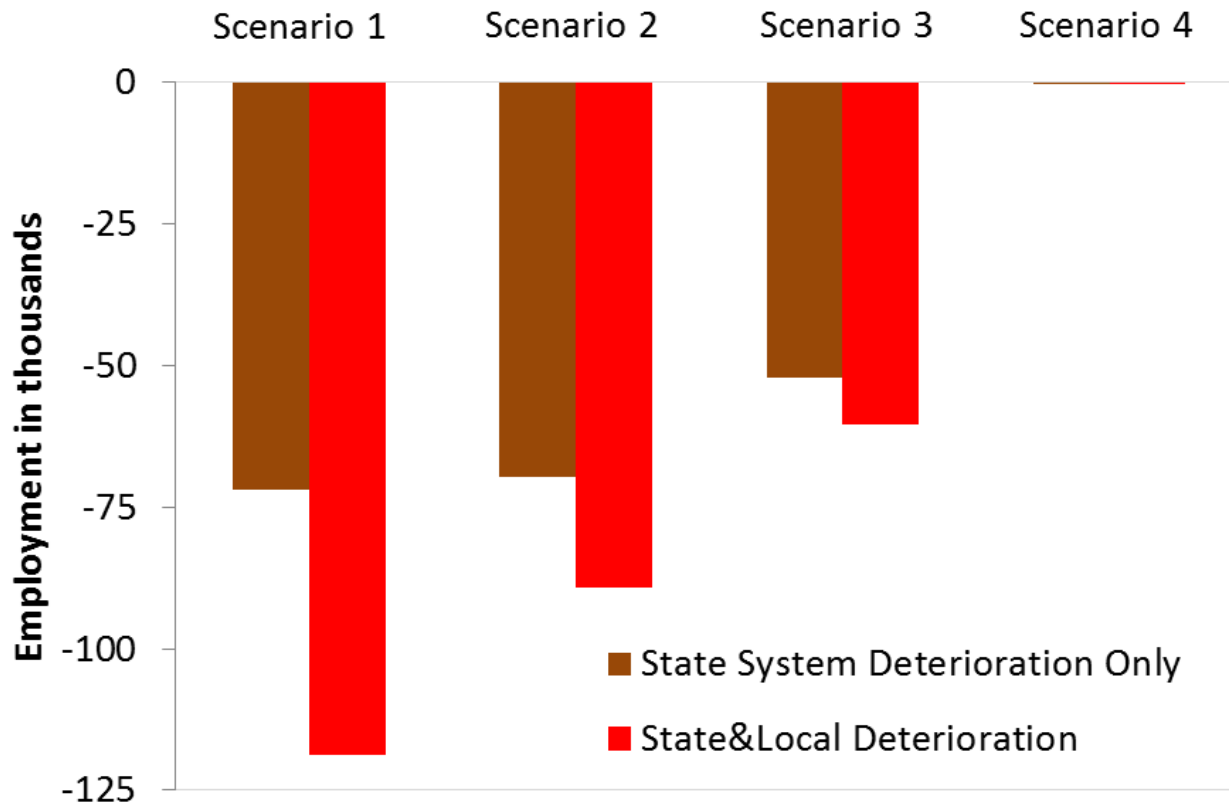
# Current Budget Scenario

Treat 130 Bridges Weight Restrict 370  
Defer work on 679 No Seismic Investment

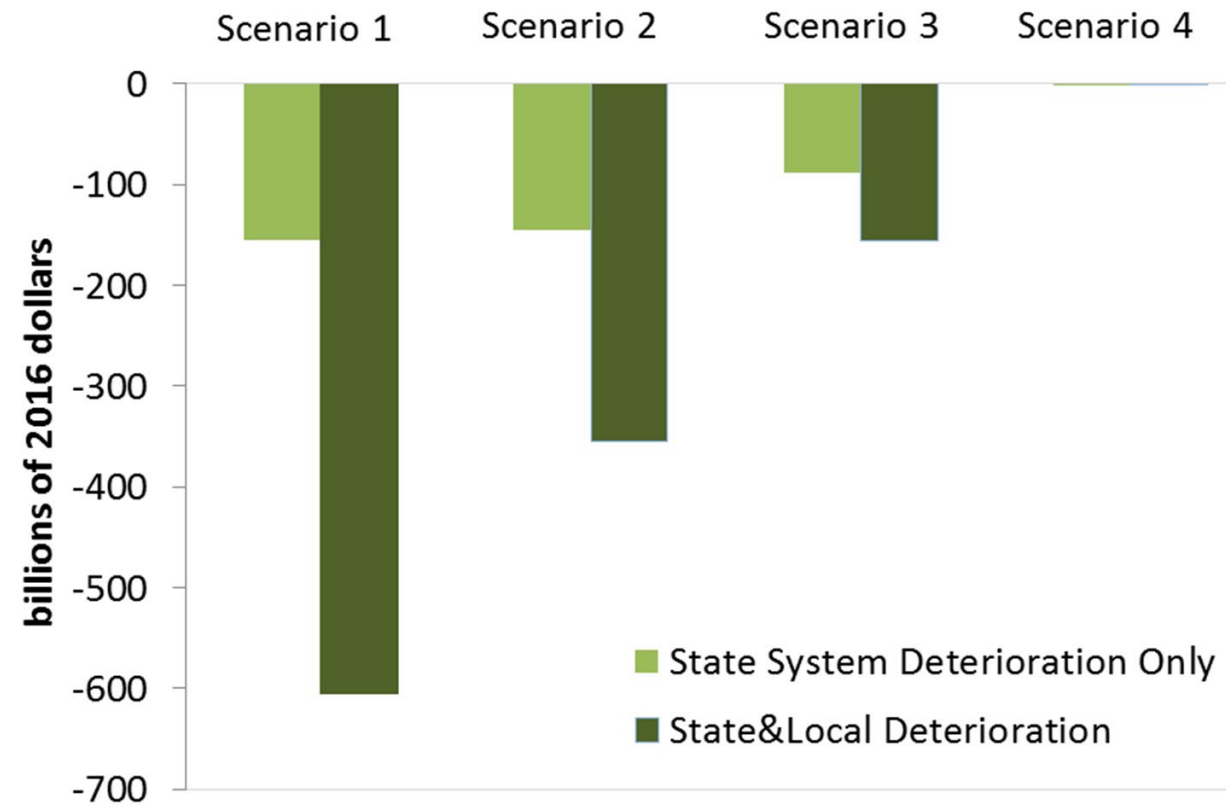


# Reported Potential Economic Implications of Deteriorating Conditions

## Forfeit Employment Statewide



## Cumulative Losses to Oregon GDP

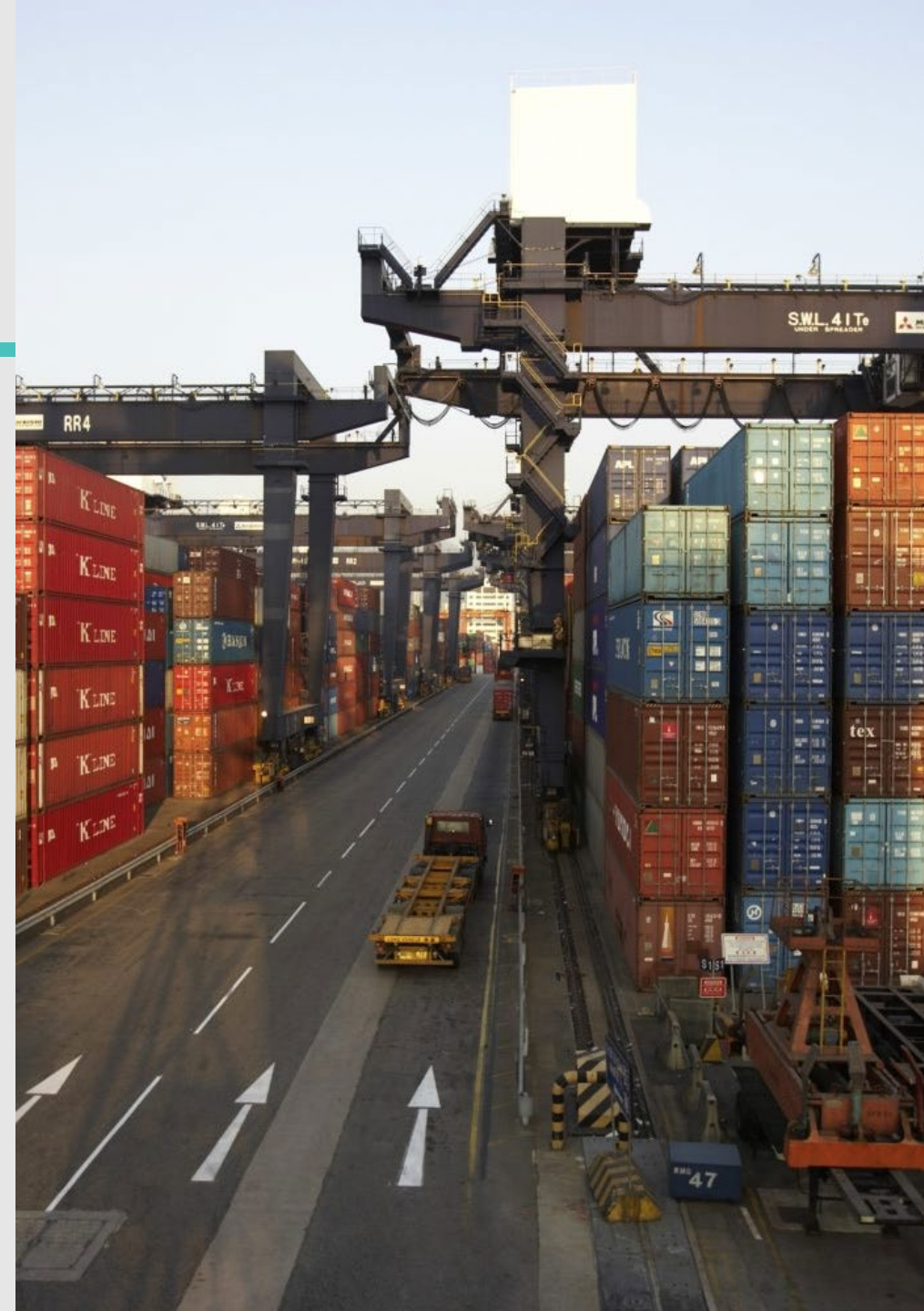




# Key Points

- Effective planning is key to utilizing scarce resources;
- Economic context is key to effective analysis;
- Effective planning process is key to implementing analytical findings;
- Effective communication is key to informing decision makers;

*Freight is the Oregon Economy in Motion*



# QUESTIONS



**Becky Knudson**

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