



Regional Economic Effects of the I-5 Corridor/Columbia River Crossing Transportation Choke Points

prepared for
Oregon Department of Transportation

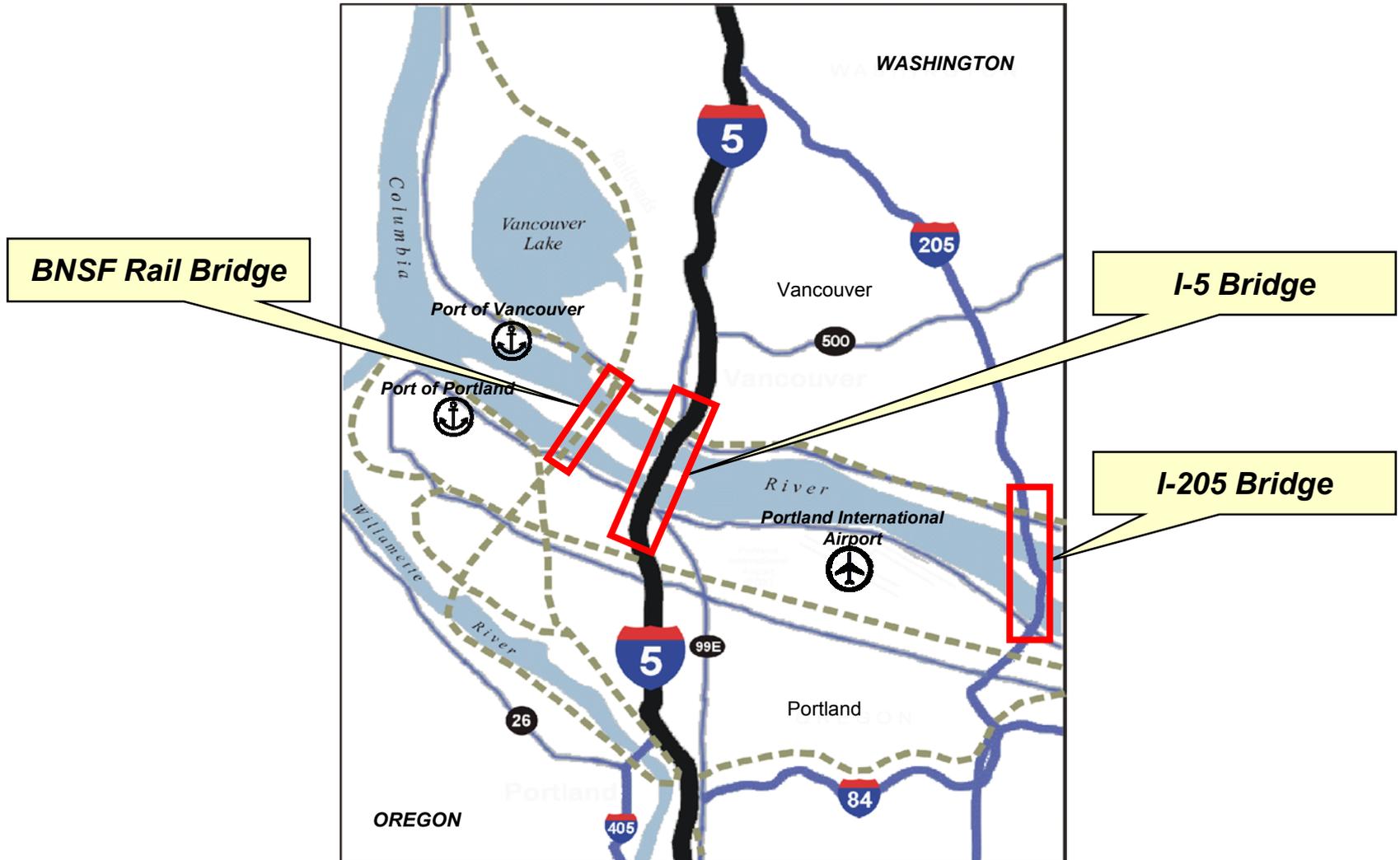
presented by
Lance R. Grenzeback
Cambridge Systematics, Inc.

May 2003

Presentation

- **I-5 Corridor/Columbia River Crossings**
- **Regional Economic Effects**
 - **Oregon-Washington**
 - **National**
 - **Global**
- **Economic Effects by Industry**
- **Choices for the Future**

Columbia River Crossings at Portland-Vancouver



Comparison of River Crossings in Selected U.S. Metropolitan Areas of Similar Size

| Metro Area | Population | Body of Water | Hwy Xings | Rail Xings |
|--------------------------------|---------------------|----------------------------------|------------------|-------------------|
| Norfolk | 1.57 million | Hampton Roads/ Chesapeake Bay | 4 | 0 |
| Cincinnati | 1.65 million | Ohio River | 7 | 2 |
| Kansas City | 1.78 million | Missouri River | 10 | 3 |
| Portland- Vancouver | 1.92 million | Columbia River | 2 | 1 |
| Pittsburgh | 2.36 million | Three Rivers | >30 | 3 |
| St. Louis | 2.60 million | Mississippi River | 8 | 2 |

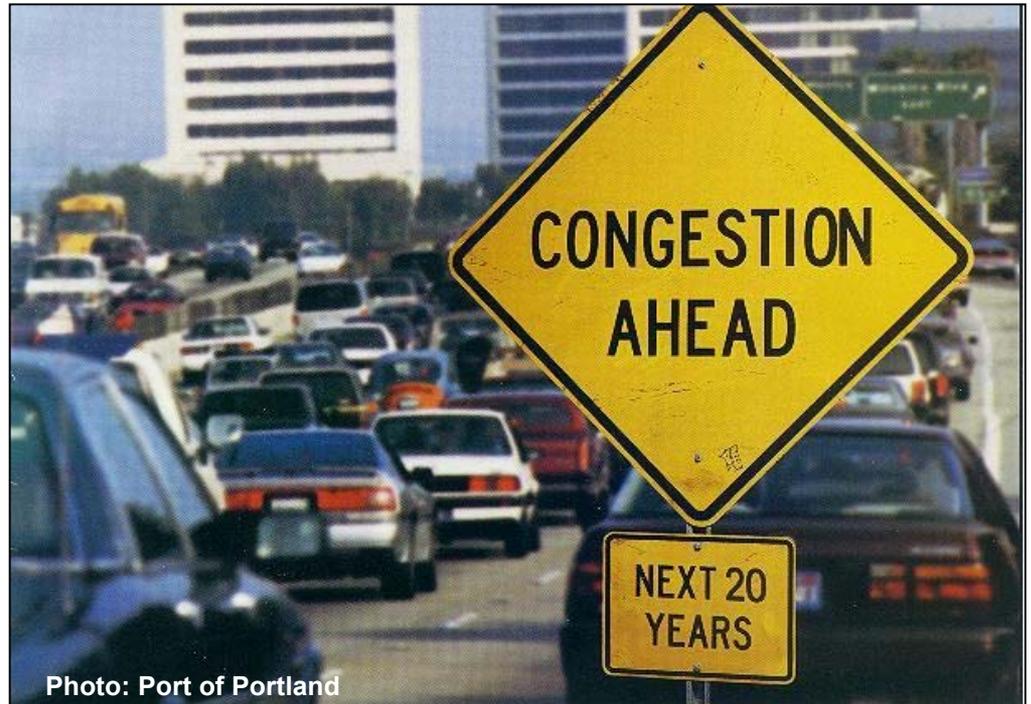
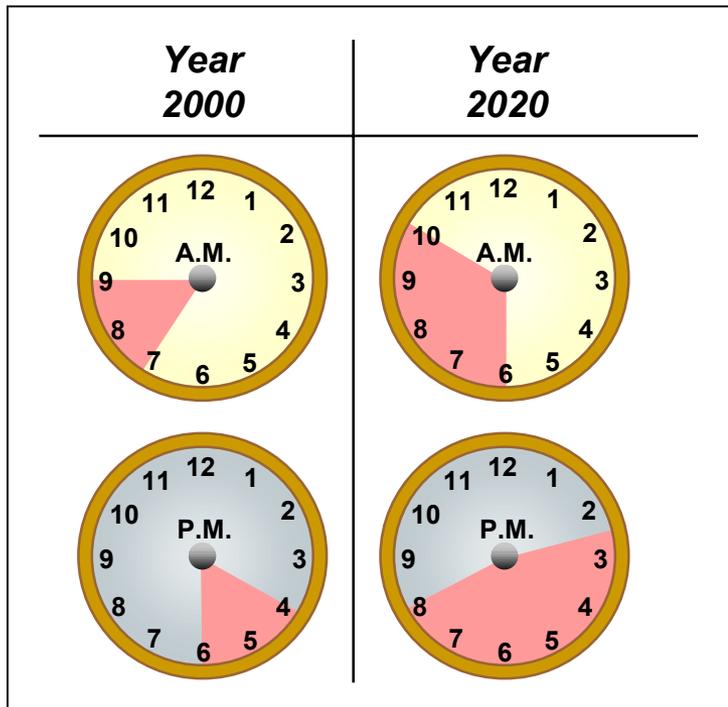
I-5/Columbia River Bridge



***Peak-Period Traffic
on I-5 Southbound Approaching
the I-5/Columbia River Bridge***



Duration of Morning and Evening Peak-Period Traffic on the I-5/Columbia River Bridge and Approaches in 2000 and 2020



I-5 Partnership Recommended Improvements

■ Highway

- Widen I-5 to a maximum of three **through lanes** in each direction from the Fremont Bridge in Portland to the I-205 junction north of Vancouver
- Add a new **supplemental or replacement bridge** across the Columbia River with up to two auxiliary or arterial lanes in each direction and provision for two light-rail tracks, and
- Add **auxiliary lanes** between interchanges on I-5 and modify the interchanges to increase safety and capacity and discourage the use of I-5 for local trips

■ Transit

- Construct a **light-rail loop** connecting the existing transit lines in Portland with the communities across the Columbia River in Clark County, Washington, and
- Initiate premium, **peak-hour express bus services** in the I-5 and I-205 corridors, consistent with existing regional transportation plans

Portland-Vancouver Rail “Triangle”



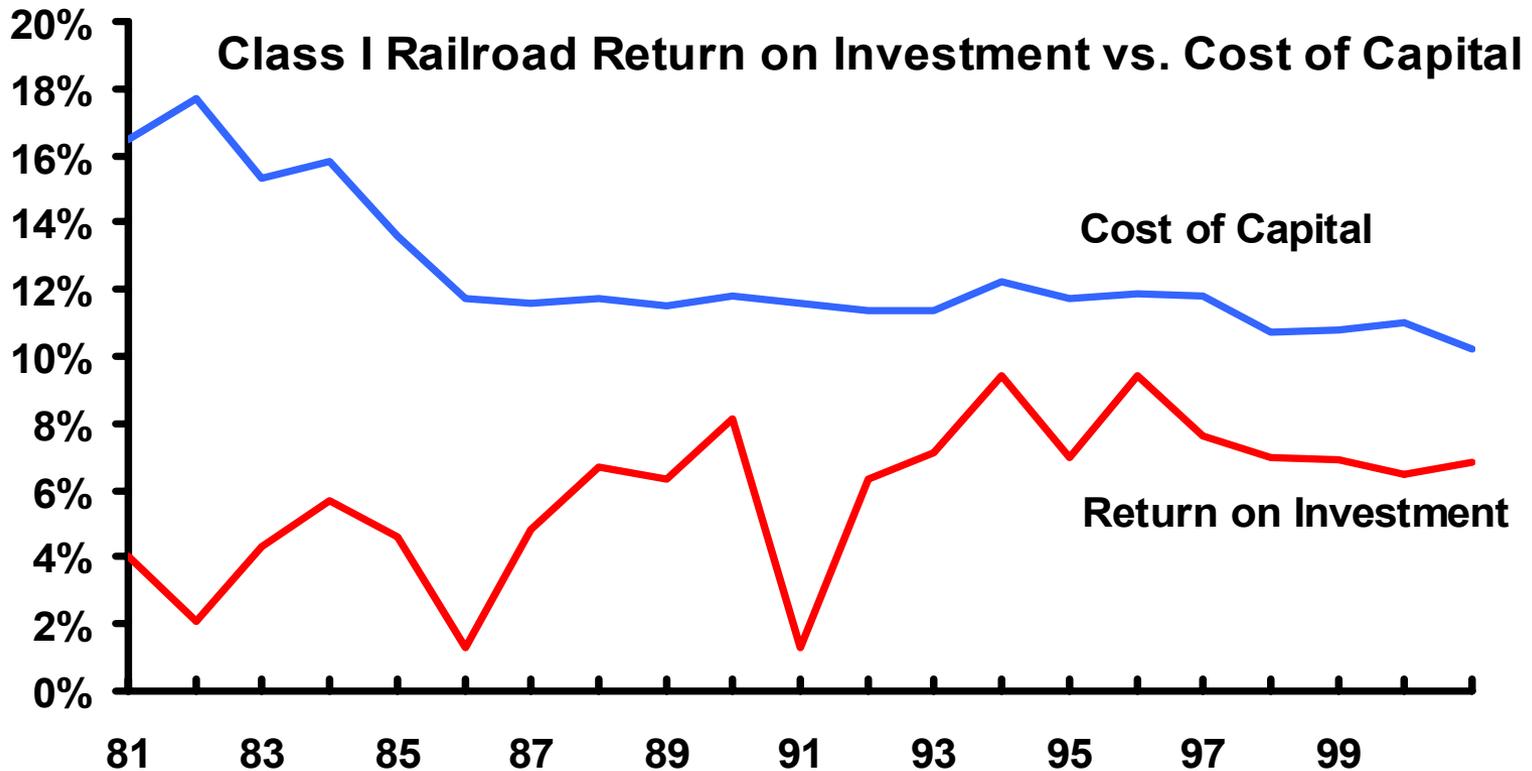
I-5 Partnership Recommended Improvements

■ Rail

- Expand **yard capacity** and construct **bypass tracks** so that local trains do not block through trains
- Increase **track speeds** in the Portland-Vancouver area by improving track conditions and repairing or replacing junctions;
- Add a **second track** to single-track sections, permitting simultaneous bi-directional movement of trains; and
- Add **sidings** to congested sections to allow for temporary storage of trains and locomotives that are waiting to enter terminals and yards and now block other freight and passenger trains.

Railroad Return on Investment

Railroads' return on investment improved through the early 1990s, but is now trending downward; ROI is still below the cost of capital; productivity benefits have gone to shippers more than to investors

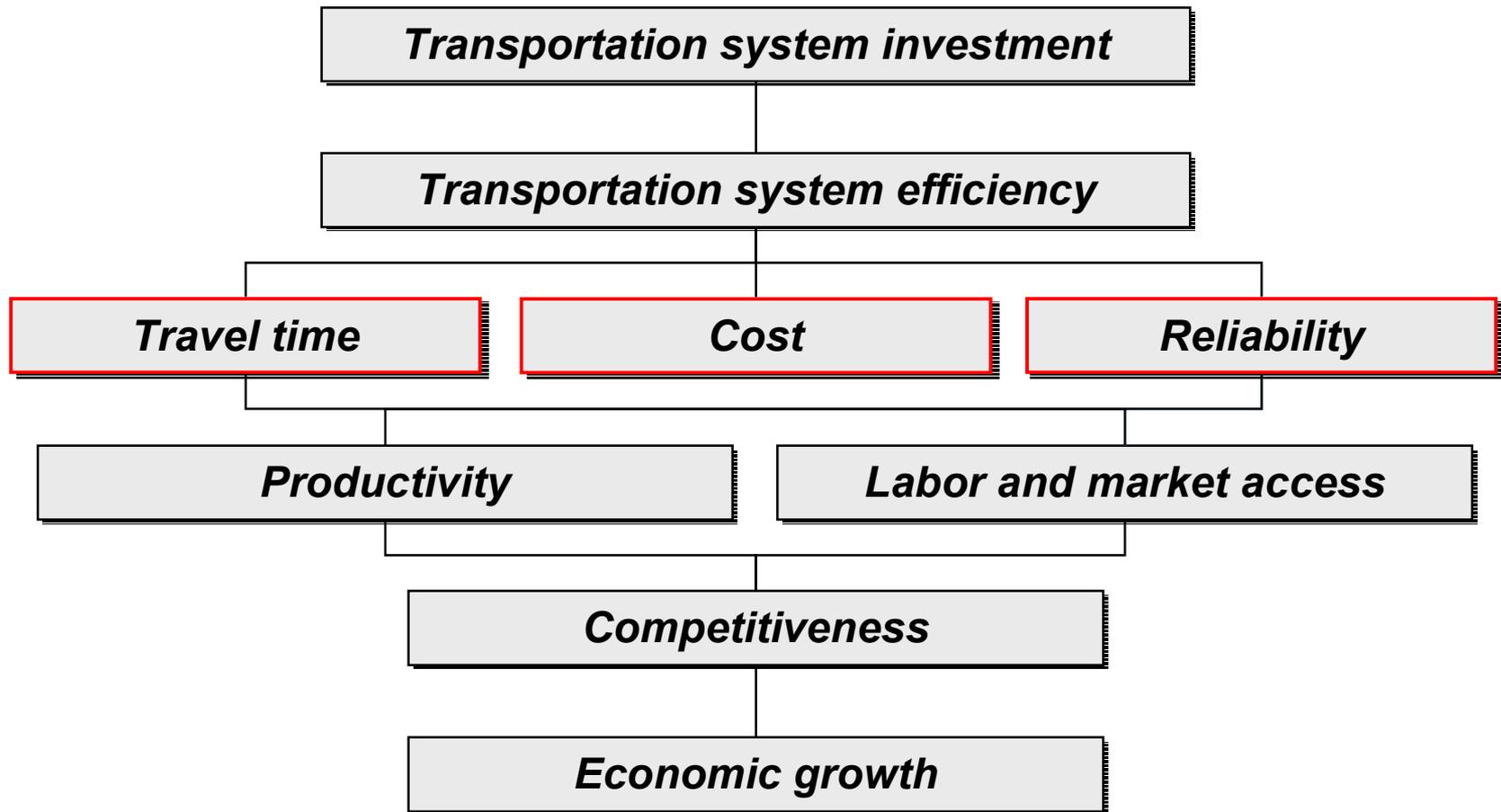


Source: American Association of Railroads

Freight Impacts

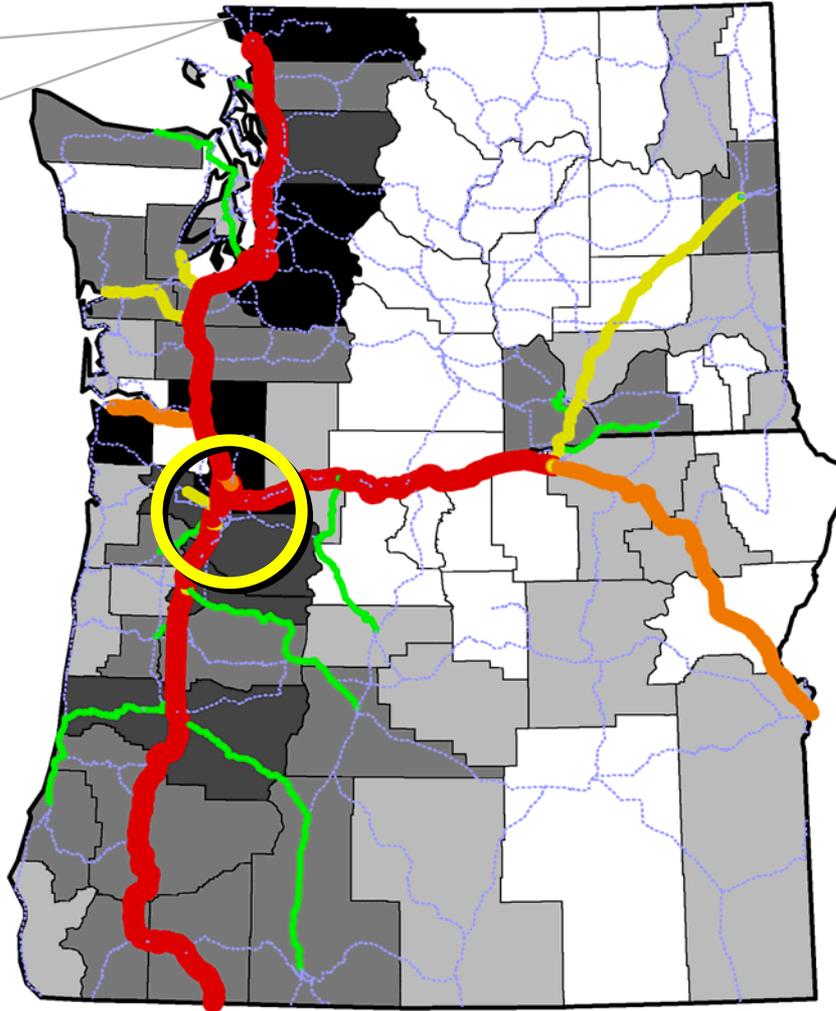
- **Congestion will spread into the midday period, which is the peak-travel period for trucks**
- **Reliability – the ability to hit delivery windows predictably – will decrease**
- **Annual vehicle hours of delay on truck routes in the I-5 corridor will increase by 93 percent from 13,400 hours in 2000 to 25,800 hours by 2020**
- **Congested lane-miles on truck routes will increase by 58 percent,**
- **The cost of truck delay will increase by 140 percent to nearly \$34 million**

Economic Effects of Transportation

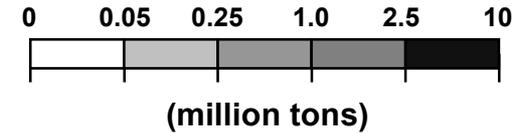


Oregon-Washington Origins and Destinations for Truck Freight Crossing the I-5 and I-205 Bridges at Portland-Vancouver With Tonnage of Freight on Truck Routes Used to Access Bridge

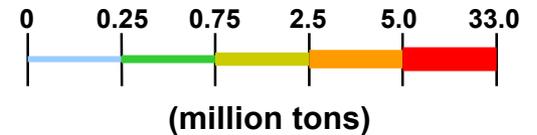
Note:
Commodities shipped to or from British Columbia are assigned to Whatcom County



Origins and Destinations of Truck Freight Crossing I-5 and I-205 Columbia River Bridges, 1998, All Commodities



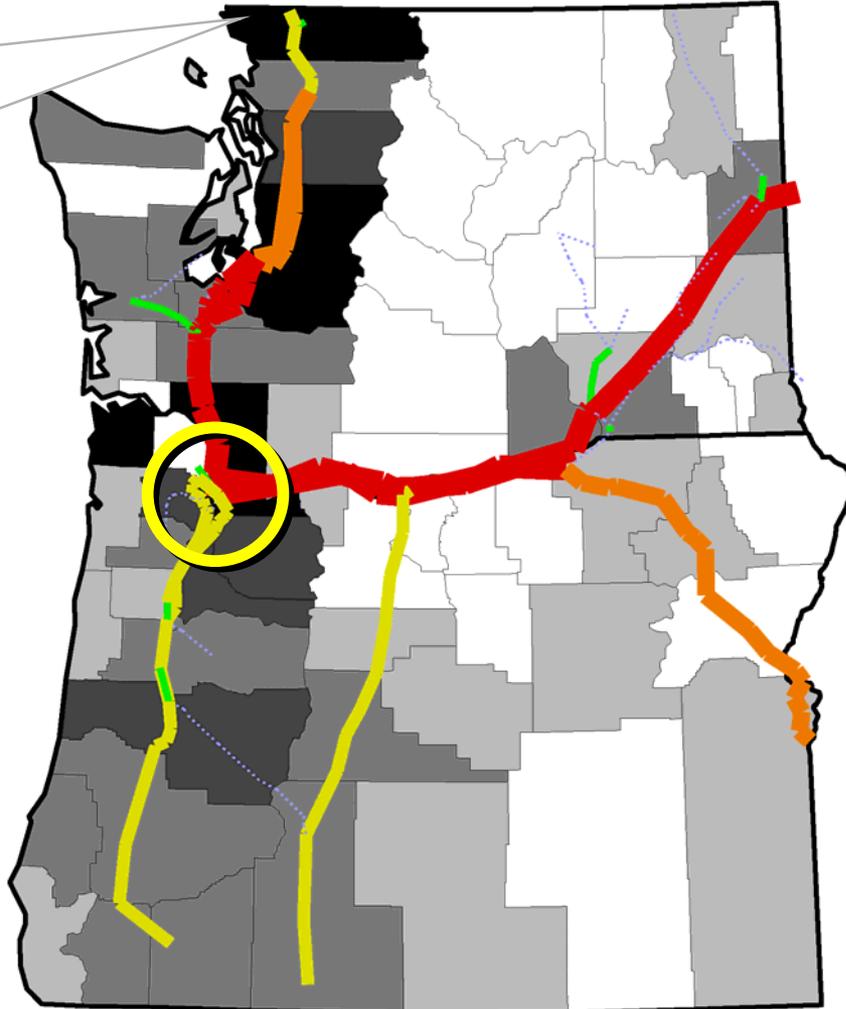
Volume of Truck Freight on Routes Used to Access I-5 and I-205 Columbia River Bridges, 1998, All Commodities



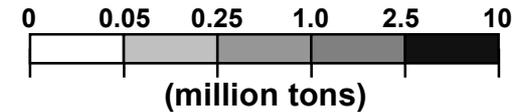
Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

Oregon-Washington Origins and Destinations for Rail Freight Using the Portland-Vancouver Rail Triangle With Tonnage of Freight on Rail Lines Used to Access Triangle

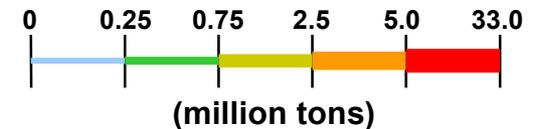
Note:
Commodities
shipped to or
from British
Columbia are
assigned to
Whatcom
County



Origins and Destinations of Rail Freight
Shipped via Portland-Vancouver Rail
Triangle, 1998, All Commodities

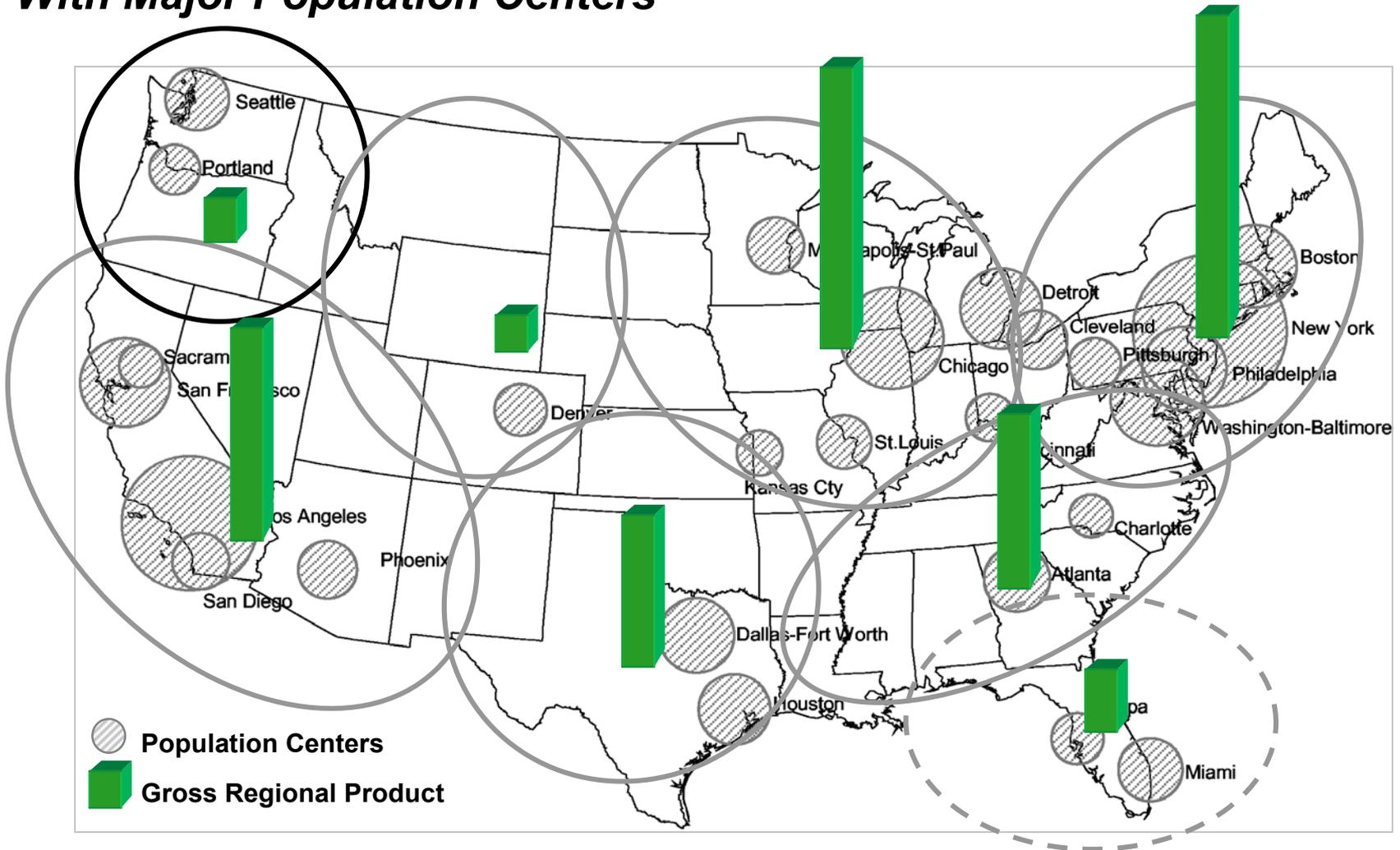


Volume of Freight on Portland-
Vancouver Rail Triangle Access
Routes, 1998, All Commodities



Source: Cambridge Systematics based on
Reebie Associates TRANSEARCH data, 1998

Gross Regional Products of Eight U.S. Trade Blocs With Major Population Centers

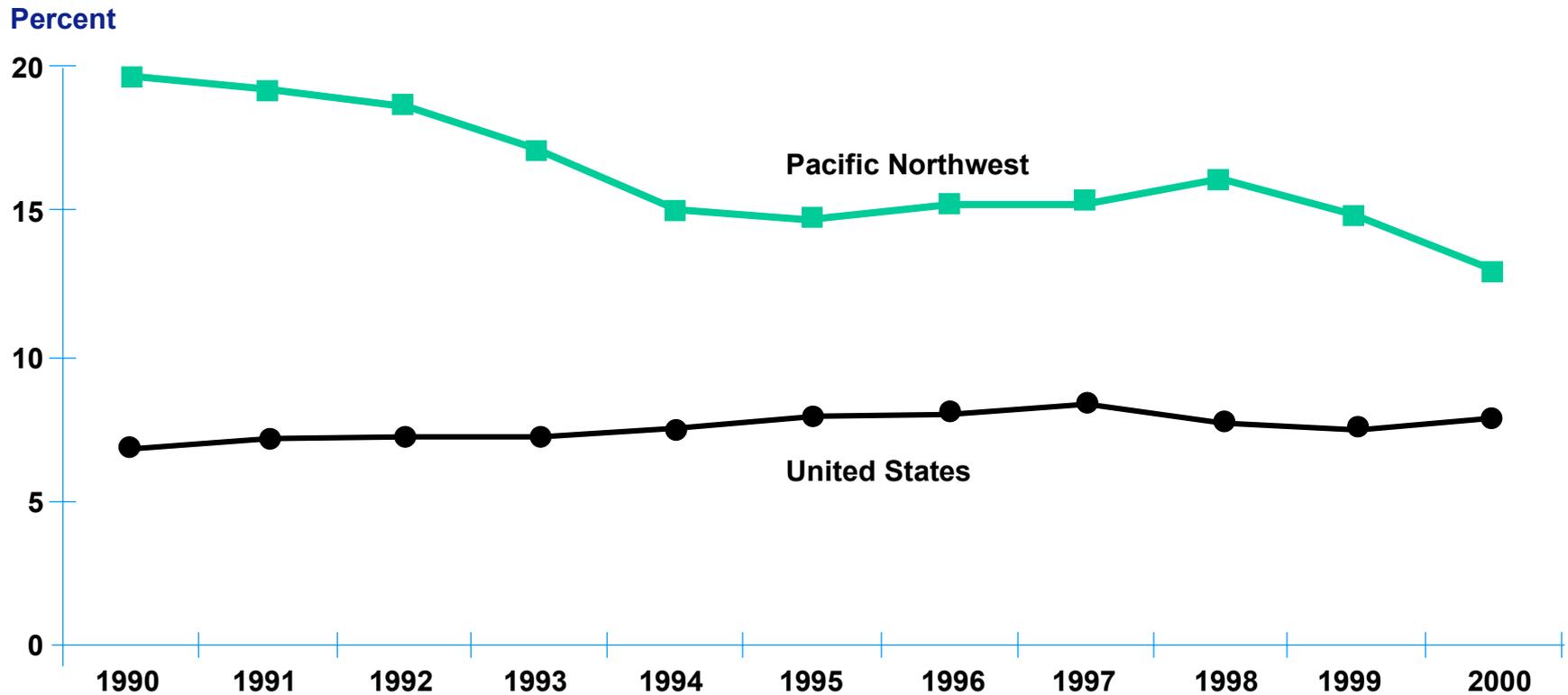


National Freight Flows for Goods with Origins or Destinations in Oregon or Washington

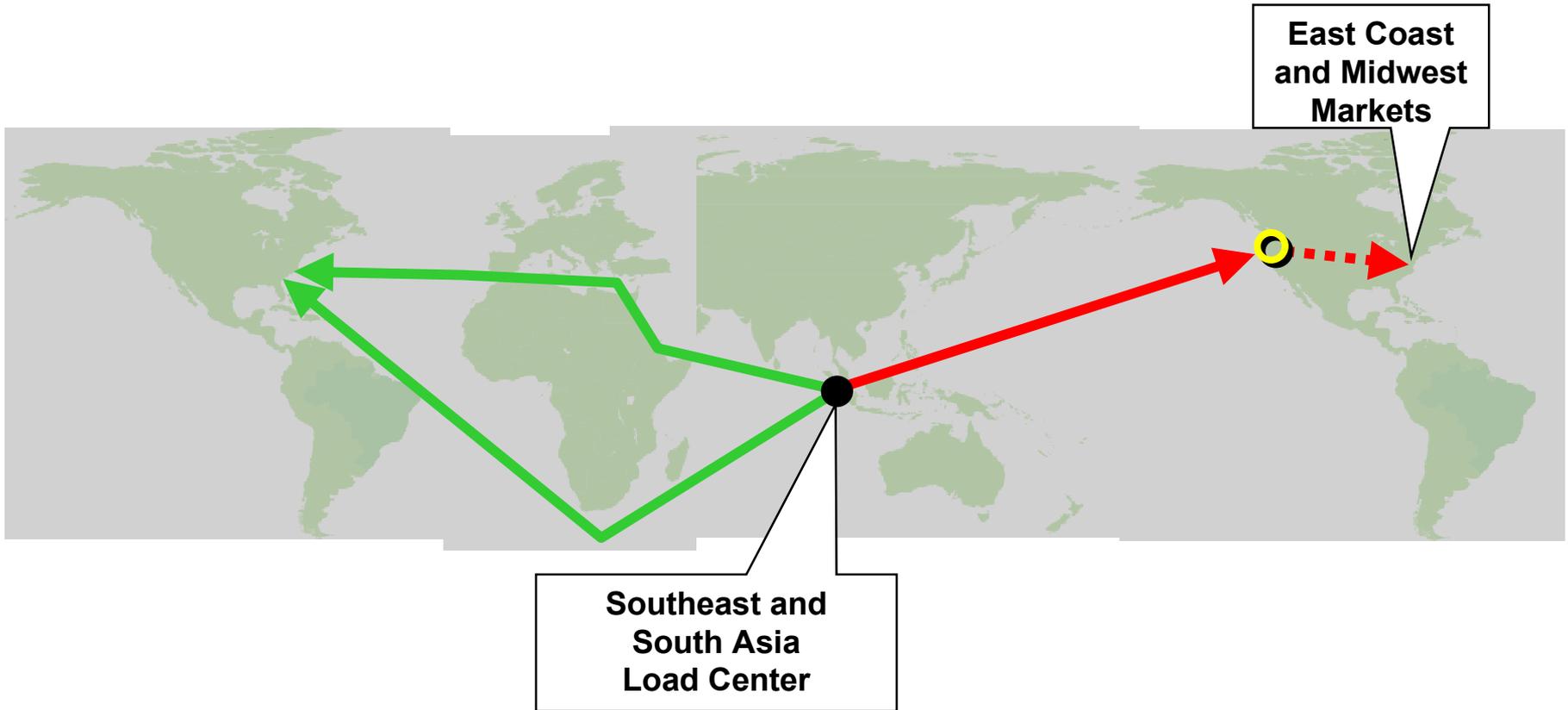


Source: Cambridge Systematics based on
Reebie Associates TRANSEARCH data, 1998

Oregon-Washington Exports as a Percentage of Oregon-Washington Gross Regional Product and U.S. Exports as a Percentage of U.S. Gross Domestic Product

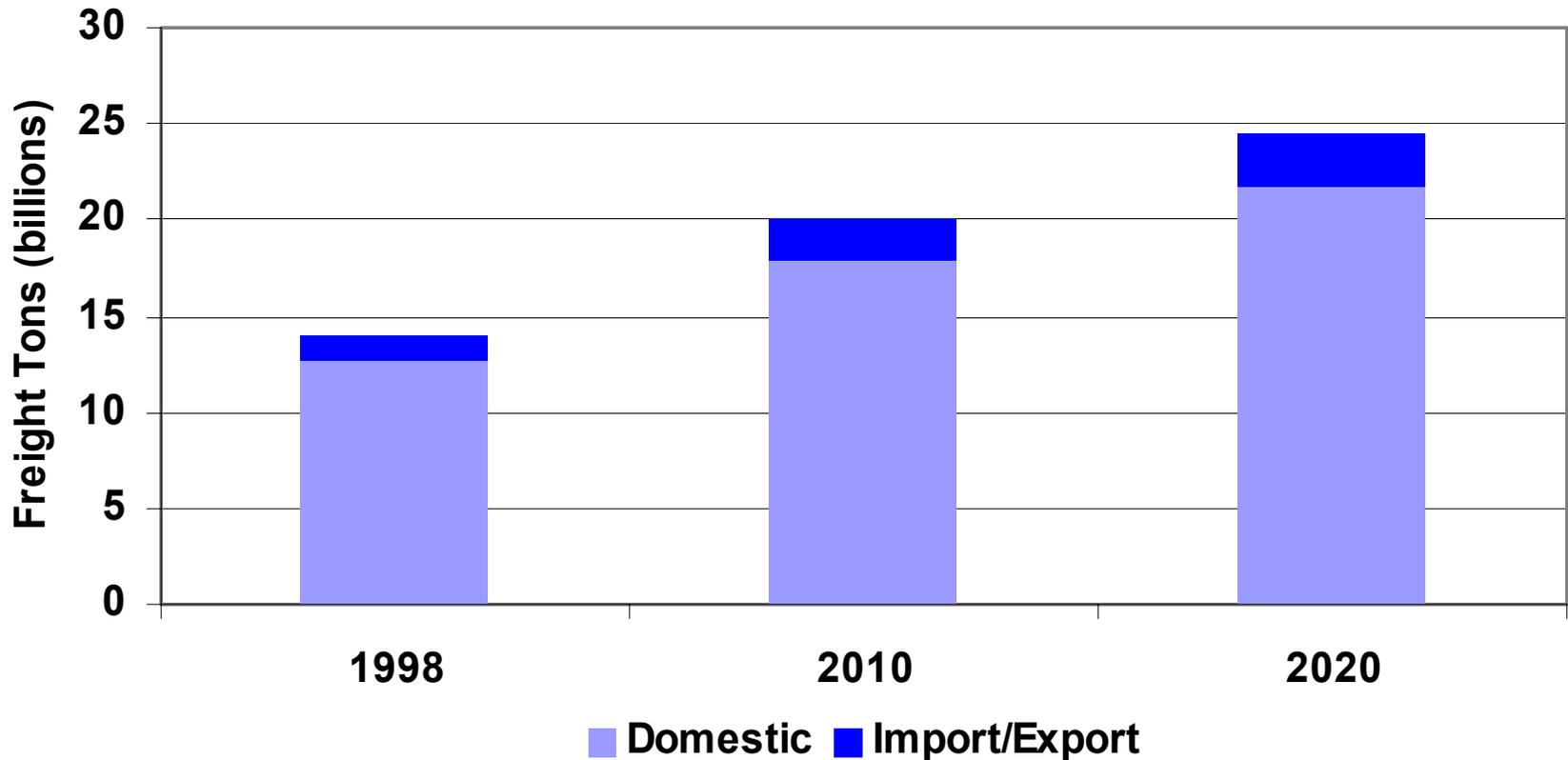


Shipping Routes from Southeast and South Asia Load Center to East Coast and Midwest Markets in U.S.



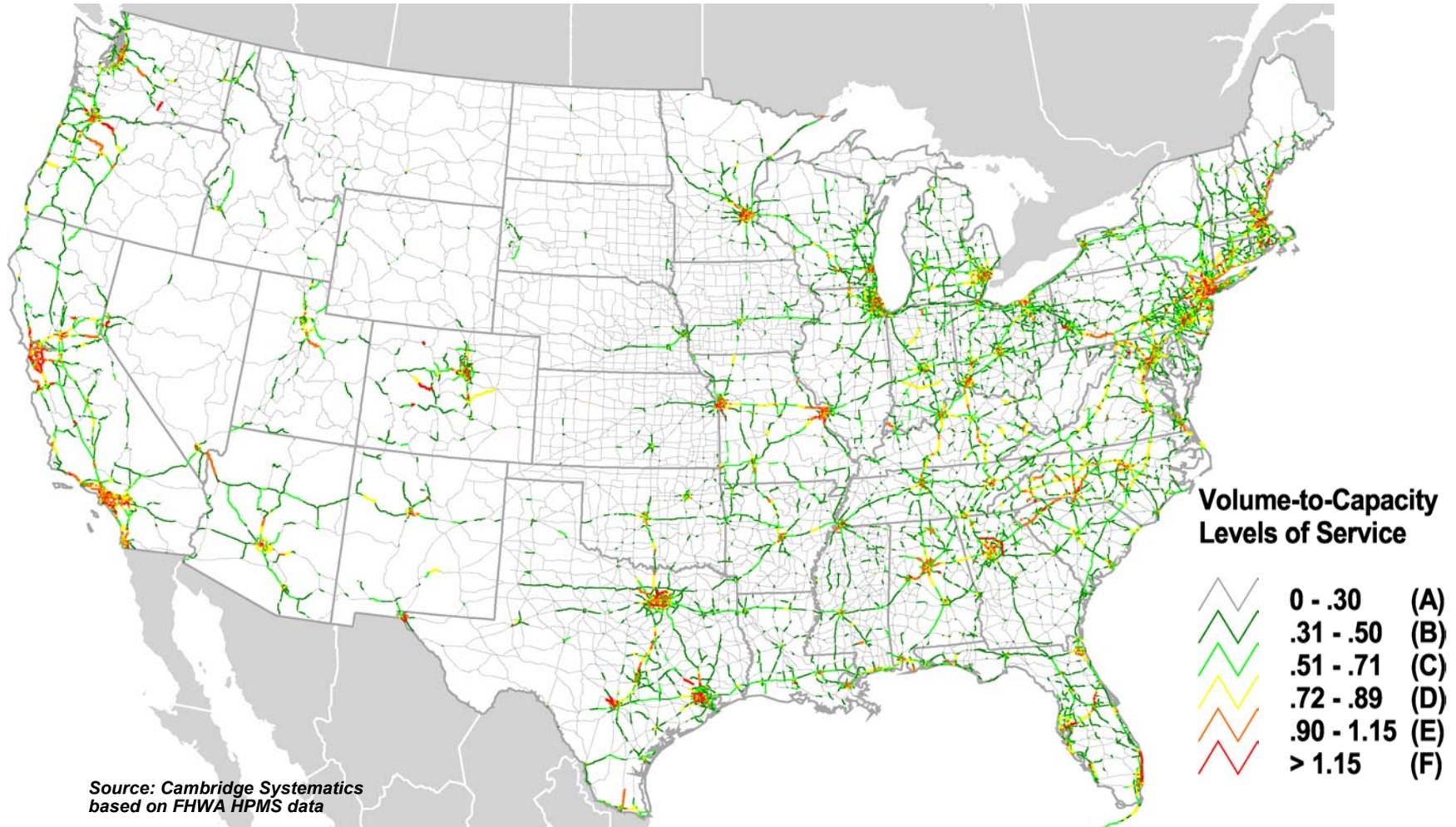
U.S. Freight Tonnage Forecast, 1998-2020

With moderate economic growth (e.g., 3.1 percent CAGR), import/export freight tonnage could double by 2020 and domestic freight tonnage could increase by about 60 percent

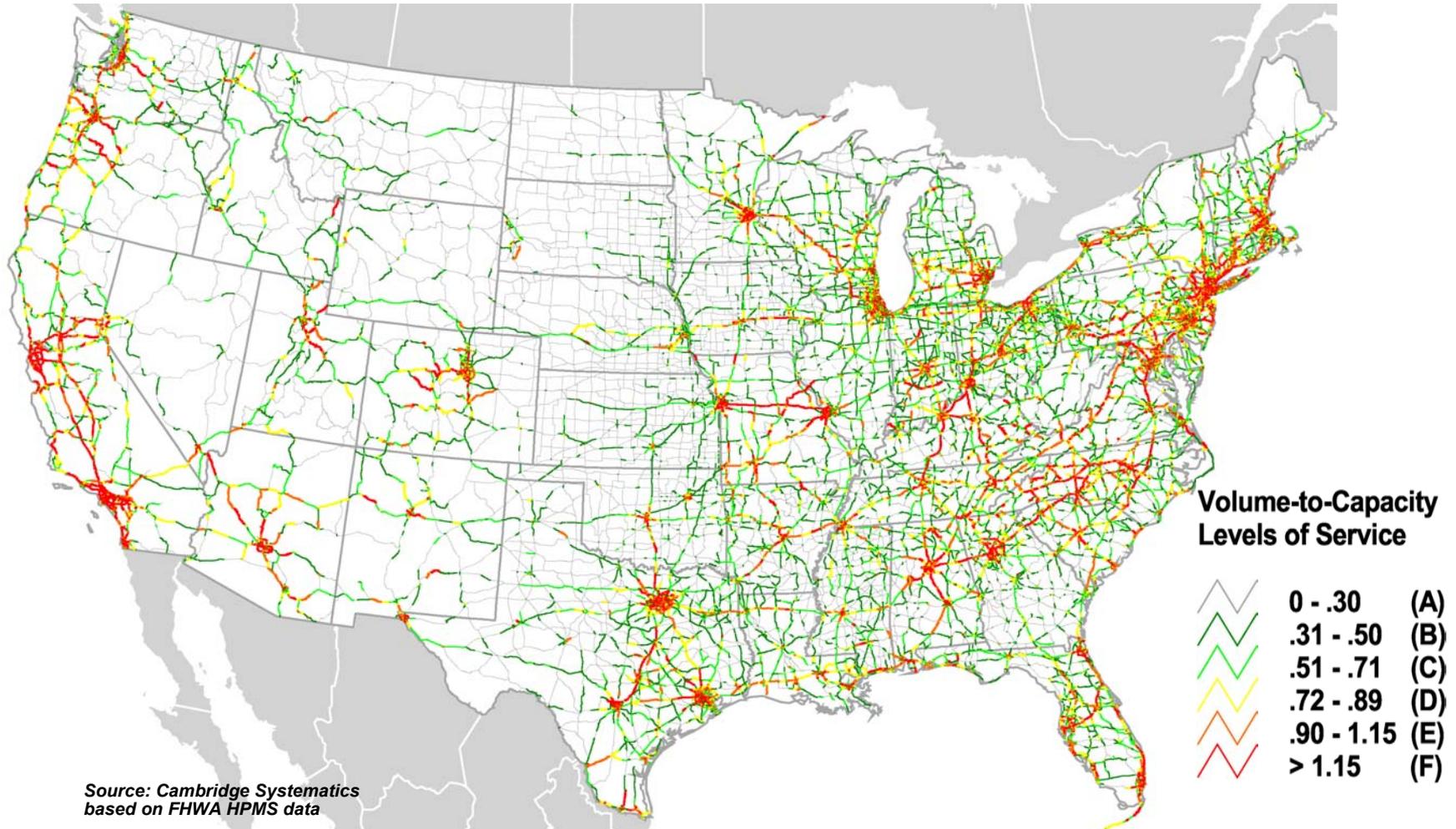


Source: FHWA Freight Analysis Framework
Project based on Global Insight forecasts

Congested Highways, 1998

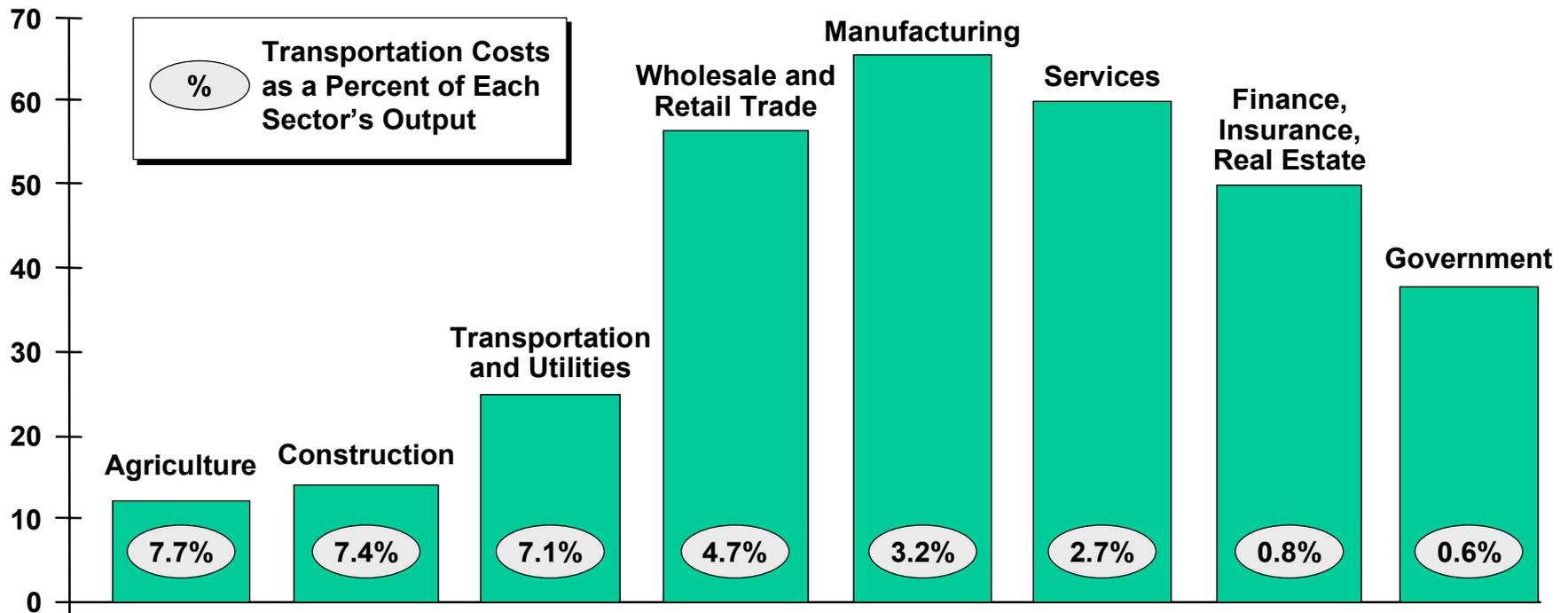


Congested Highways, 2020 (estimated)



Oregon and Washington Gross Regional Product by Industry Sector

GRP (in Billions)



Source: Bureau of Economic Analysis data and Transportation Satellite Accounts data, 1996

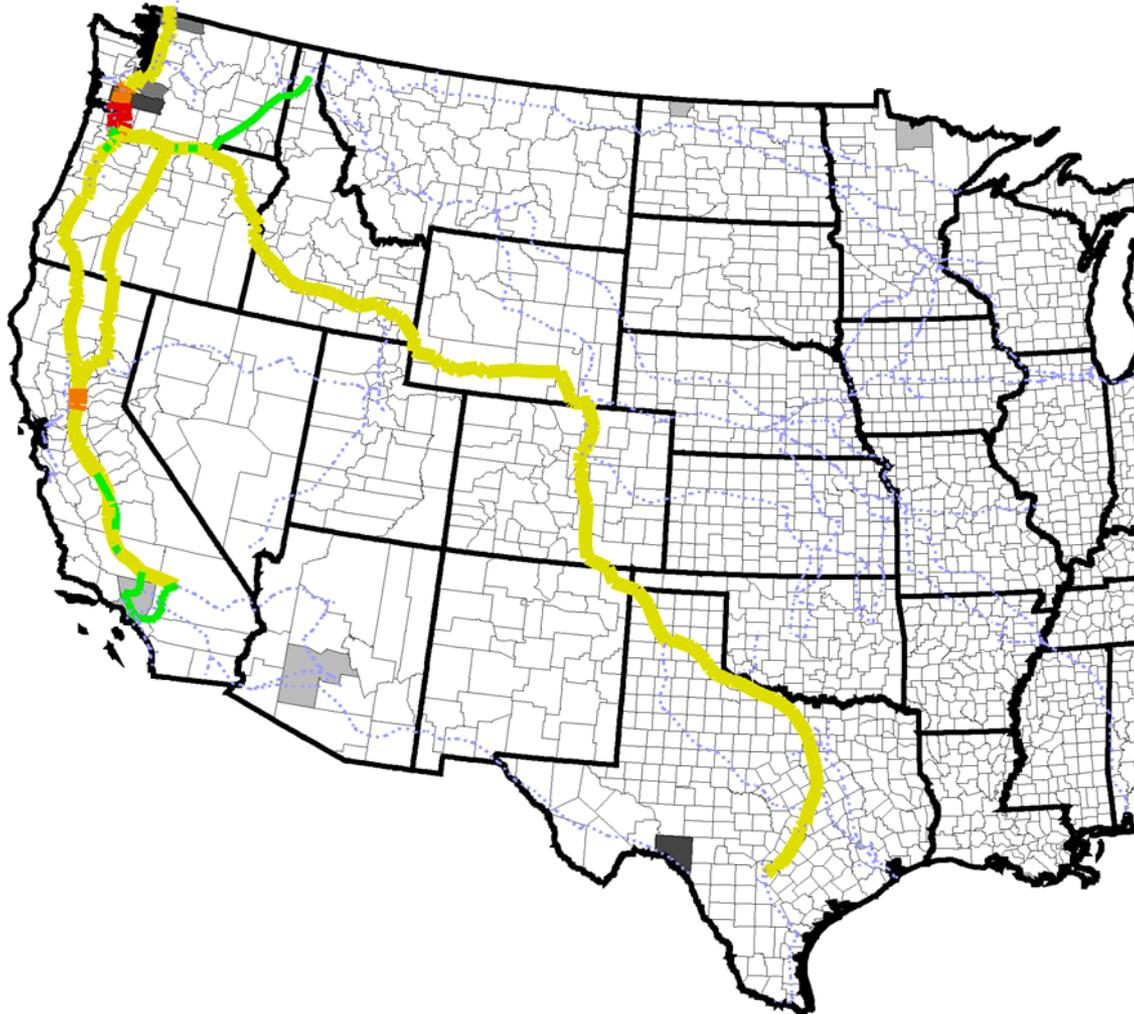
Economic Impacts by Industry

Freight-Intensive Oregon-Washington Industries

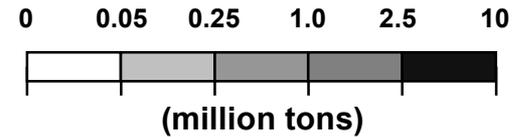
- **Lumber, wood, and paper products,**
- **Transportation equipment and steel, and**
- **Farm and food products**
 - **Traditional economic pillars of the Pacific Northwest economy**
- **High-technology manufacturing**
 - **Key emerging industry that is critical to the region's future growth**
- **Distribution and warehousing**
 - **Goods-moving sector that supply manufacturers, retailers, and the service-sector**

Lumber, Wood, and Paper Products Industry

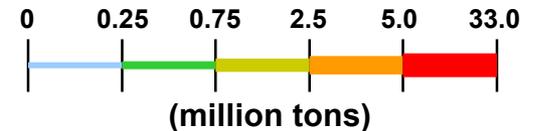
Western United States Origins and Destinations for Lumber, Wood, and Paper Products Using the Portland-Vancouver Rail Triangle With Tonnage of Freight on Rail Lines Used to Access Triangle



Origins and Destinations of Lumber, Wood, and Paper Products Shipped via Portland-Vancouver Rail Triangle, 1998



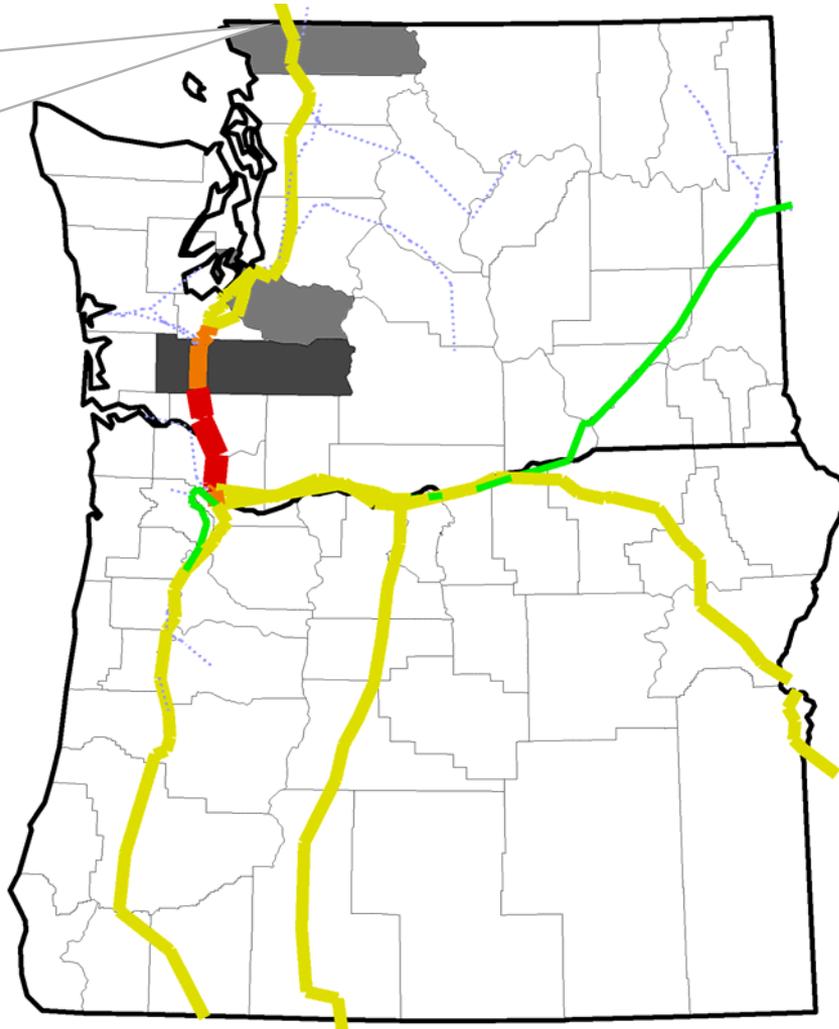
Volume of Lumber, Wood, and Paper Products on Portland-Vancouver Rail Triangle Access Routes, 1998



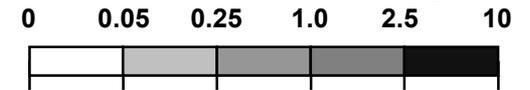
Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

Oregon-Washington Origins and Destinations for Lumber, Wood, and Paper Products Using the Portland-Vancouver Rail Triangle With Tonnage of Freight on Rail Lines Used to Access Triangle

Note:
Commodities shipped to or from British Columbia are assigned to Whatcom County

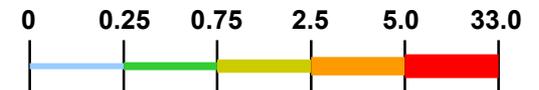


Origins and Destinations of Lumber, Wood, and Paper Products Shipped via Portland-Vancouver Rail Triangle, 1998



(million tons)

Volume of Lumber, Wood, and Paper Products on Portland-Vancouver Rail Triangle Access Routes, 1998

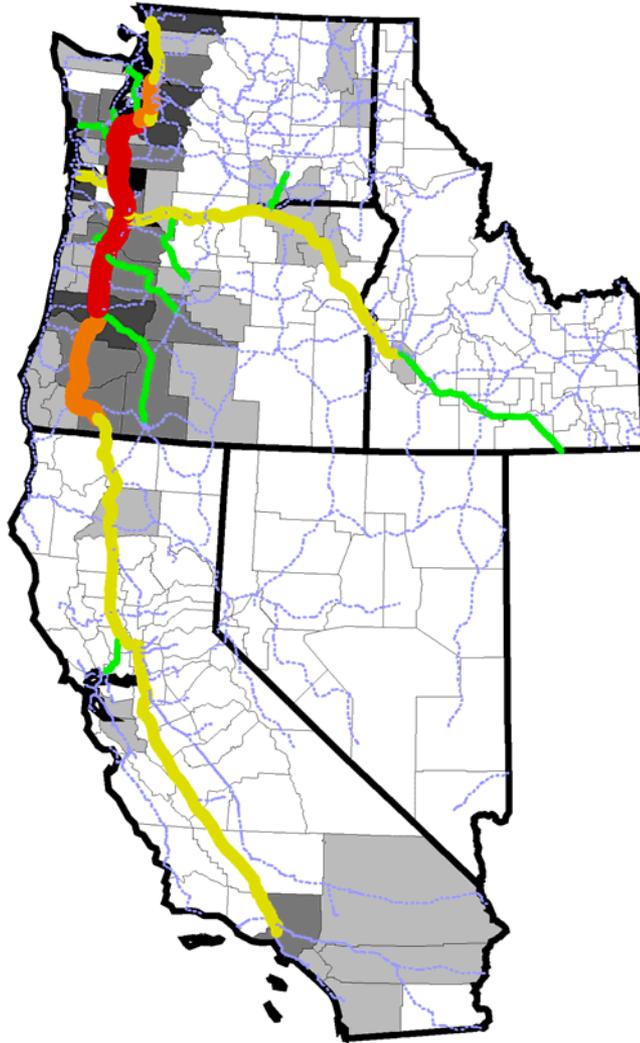


(million tons)

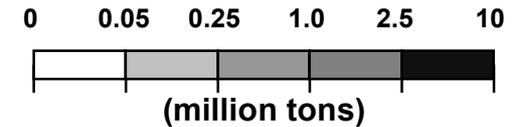
Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

West Coast Origins and Destinations for Lumber, Wood, and Paper Products Crossing the I-5 and I-205 Bridges at Portland-Vancouver With Tonnage

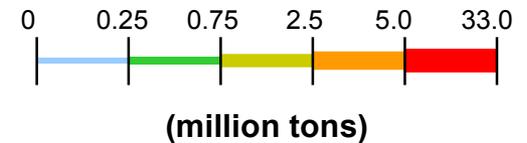
Used to Access Bridge



Origins and Destinations of Lumber, Wood, and Paper Products Crossing I-5 and I-205 Columbia River Bridges, 1998



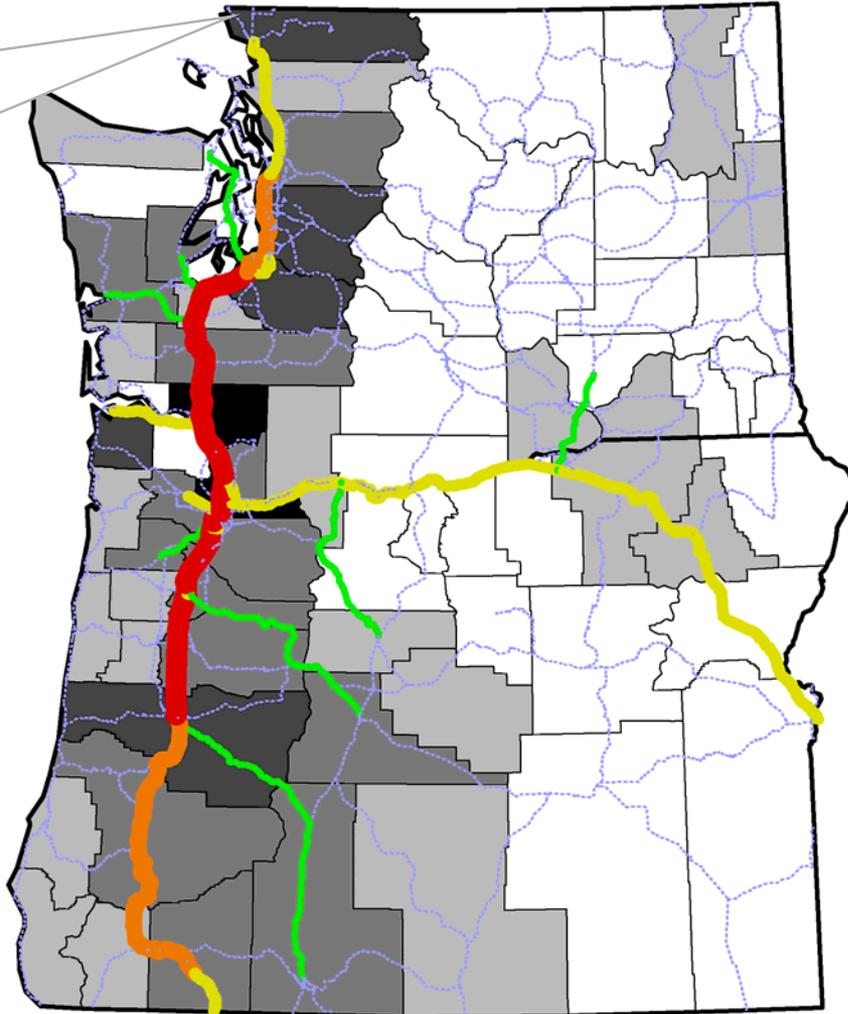
Volume of Lumber, Wood, and Paper Products on Routes Used to Access I-5 and I-205 Columbia River Bridges, 1998



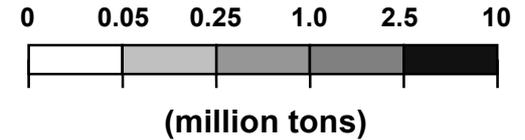
Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

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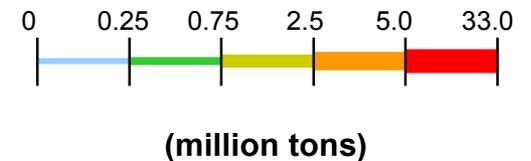
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Origins and Destinations of Lumber, Wood, and Paper Products Crossing I-5 and I-205 Columbia River Bridges, 1998



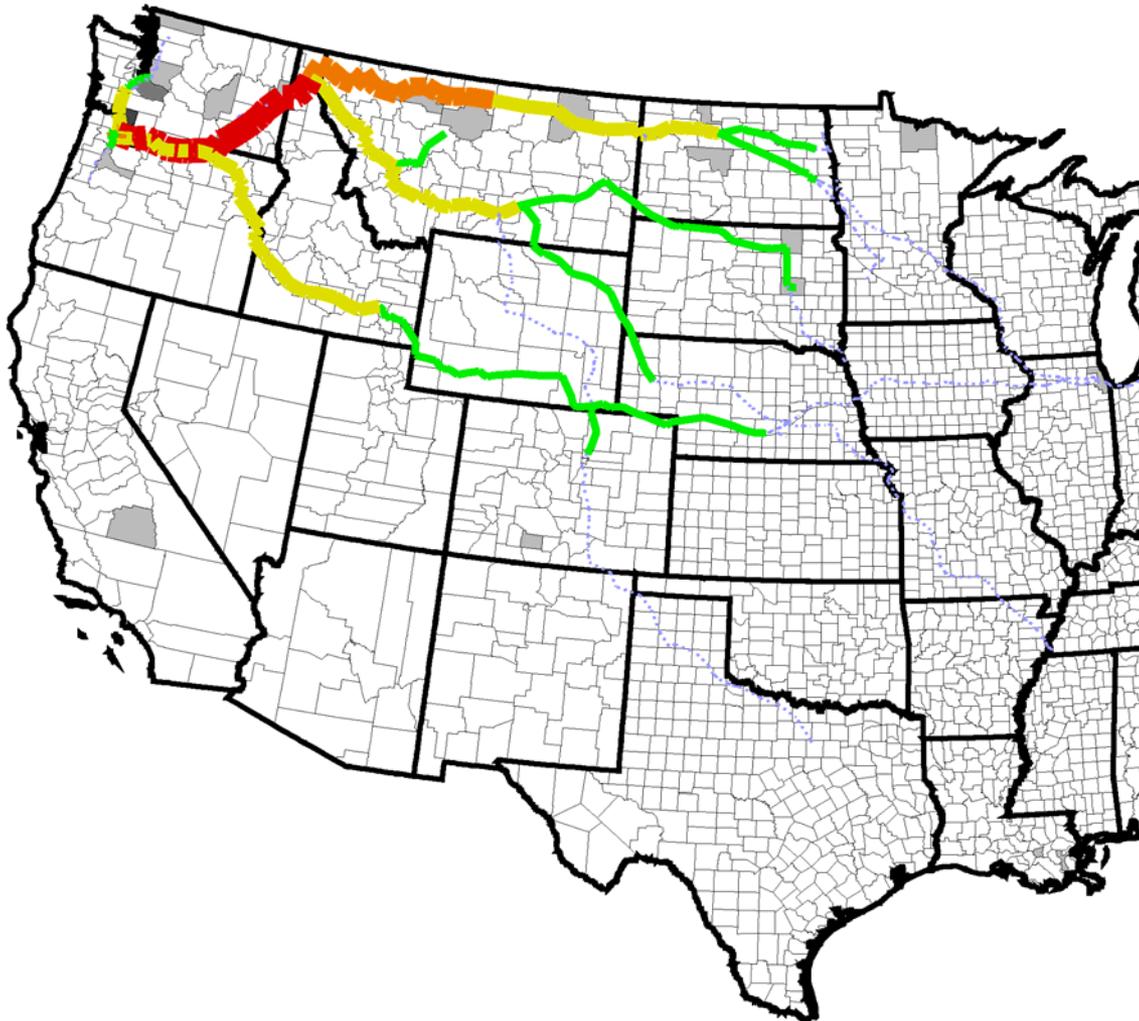
Volume of Lumber, Wood, and Paper Products on Routes Used to Access I-5 and I-205 Columbia River Bridges, (1998)



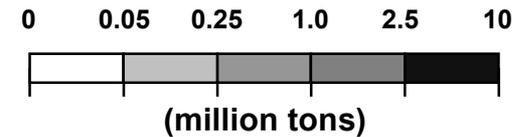
Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

Farm and Food Products Industry

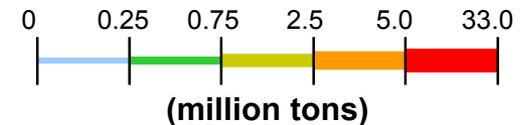
Western United States Origins and Destinations for Farm and Food Products Using the Portland-Vancouver Rail Triangle With Tonnage of Freight on Rail Lines Used to Access Triangle



Origins and Destinations of Farm and Food Products Shipped via Portland-Vancouver Rail Triangle, 1998



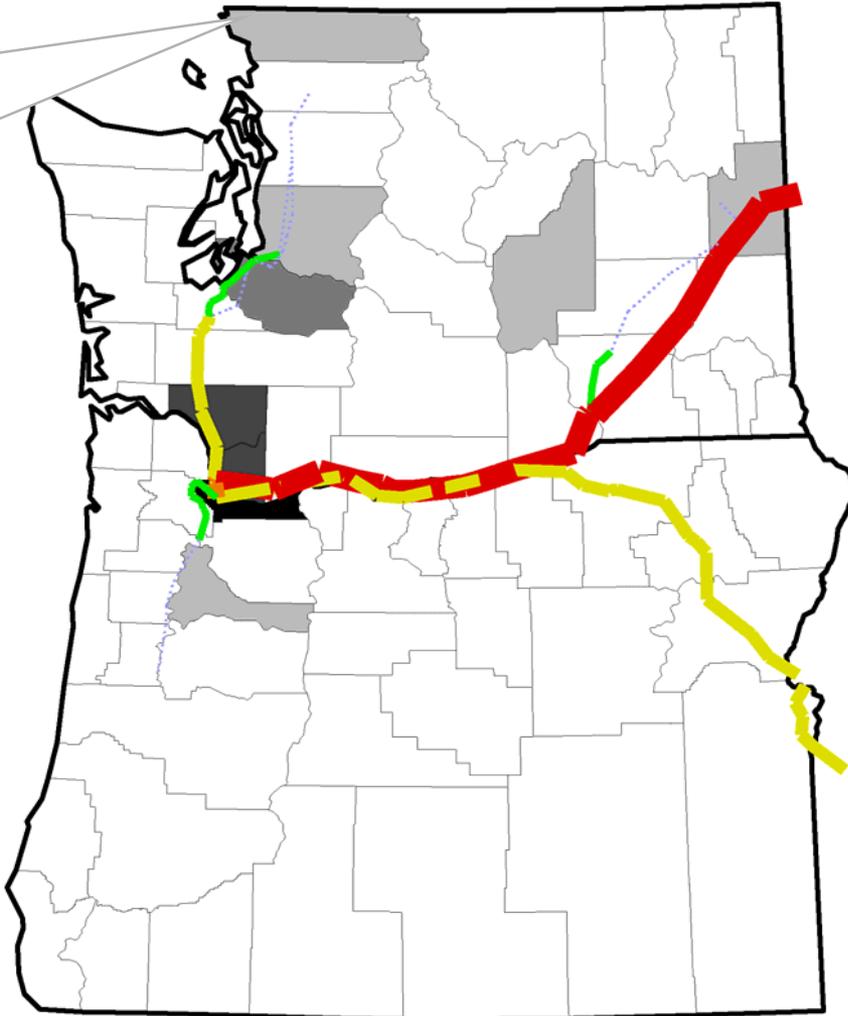
Volume of Farm and Food Products on Portland-Vancouver Rail Triangle Access Routes, 1998



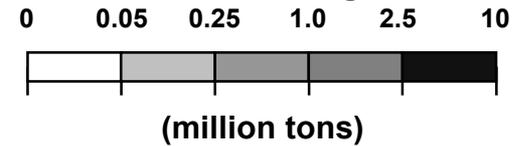
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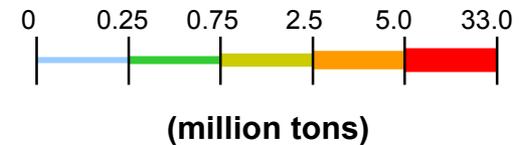
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Origins and Destinations of Farm and Food Products Shipped via Portland-Vancouver Rail Triangle, 1998



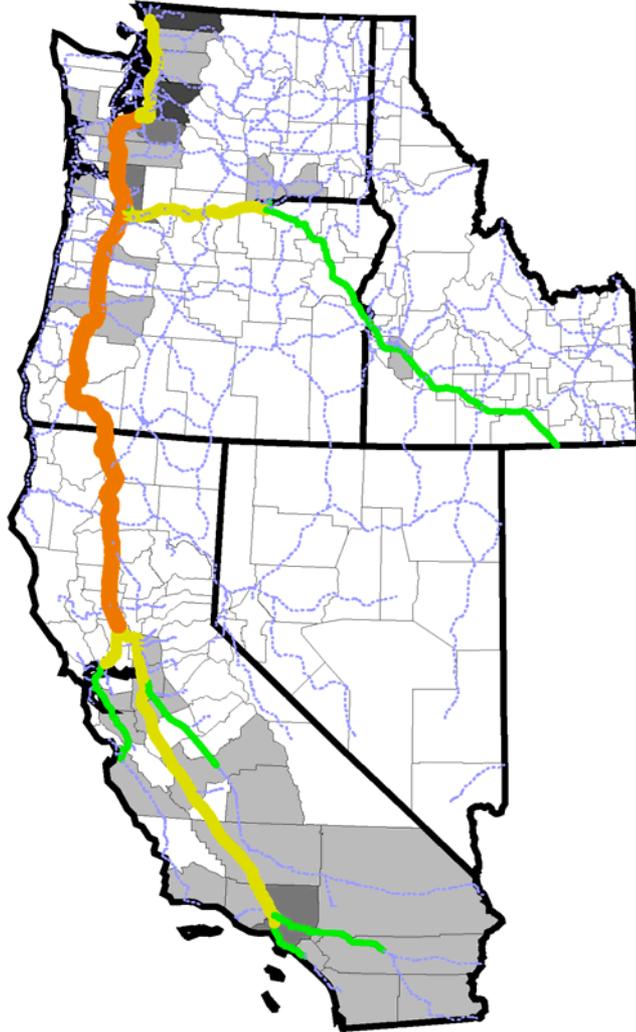
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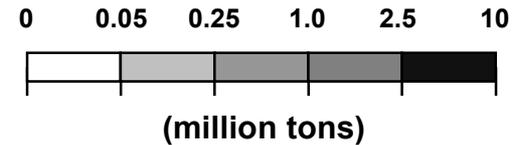
Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

West Coast Origins and Destinations for Farm and Food Products Crossing the I- 5 and I- 205 Bridges at Portland-Vancouver

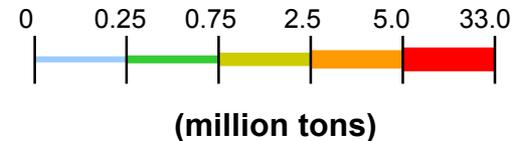
With Tonnage of Freight on Truck Routes Used to Access Bridge



Origins and Destinations of Farm and Food Products Crossing I-5 and I-205 Columbia River Bridges, 1998



Volume of Farm and Food Products on Routes Used to Access I-5 and I-205 Columbia River Bridges, 1998

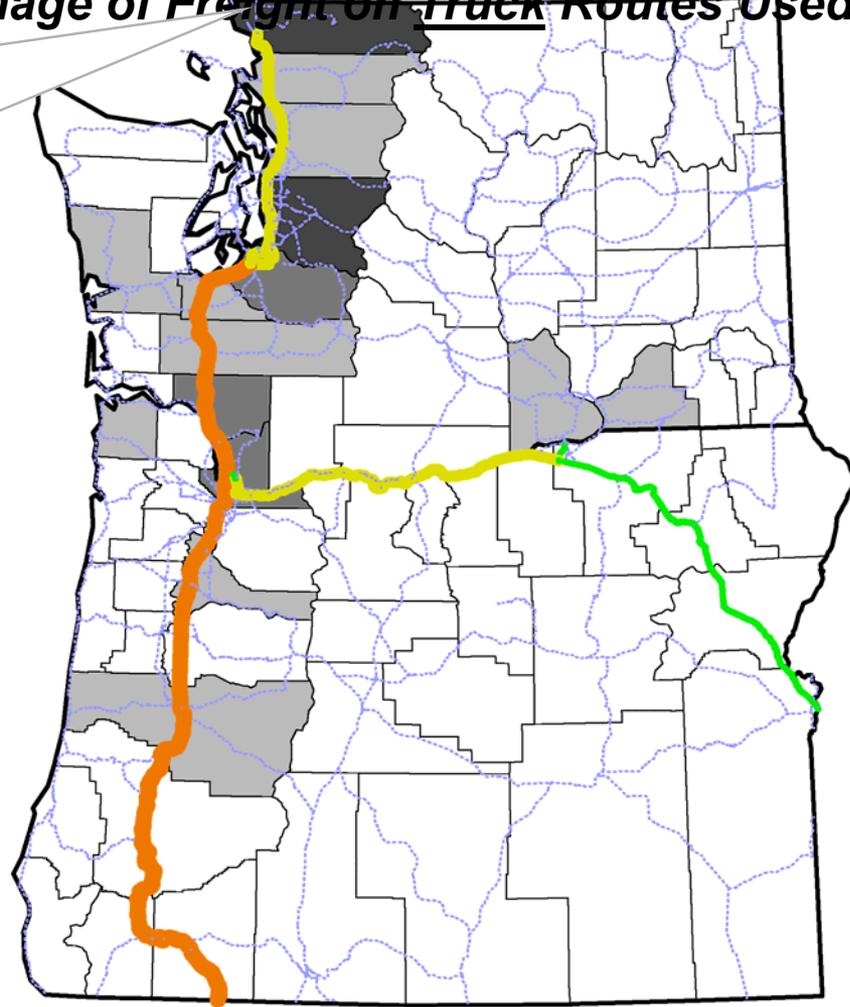


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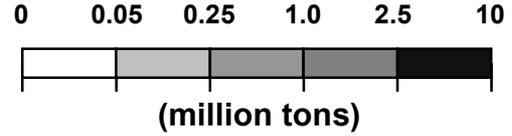
Oregon-Washington Origins and Destinations for Farm and Food Products Crossing the I- 5 and I- 205 Bridges at Portland-Vancouver

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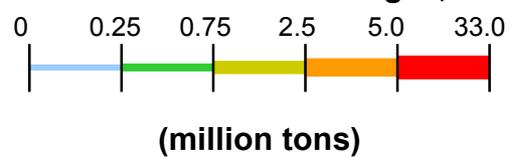
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Origins and Destinations of Farm and Food Products Crossing I-5 and I-205 Columbia River Bridges, 1998



Volume of Farm and Food Products on Routes Used to Access I-5 and I-205 Columbia River Bridges, 1998

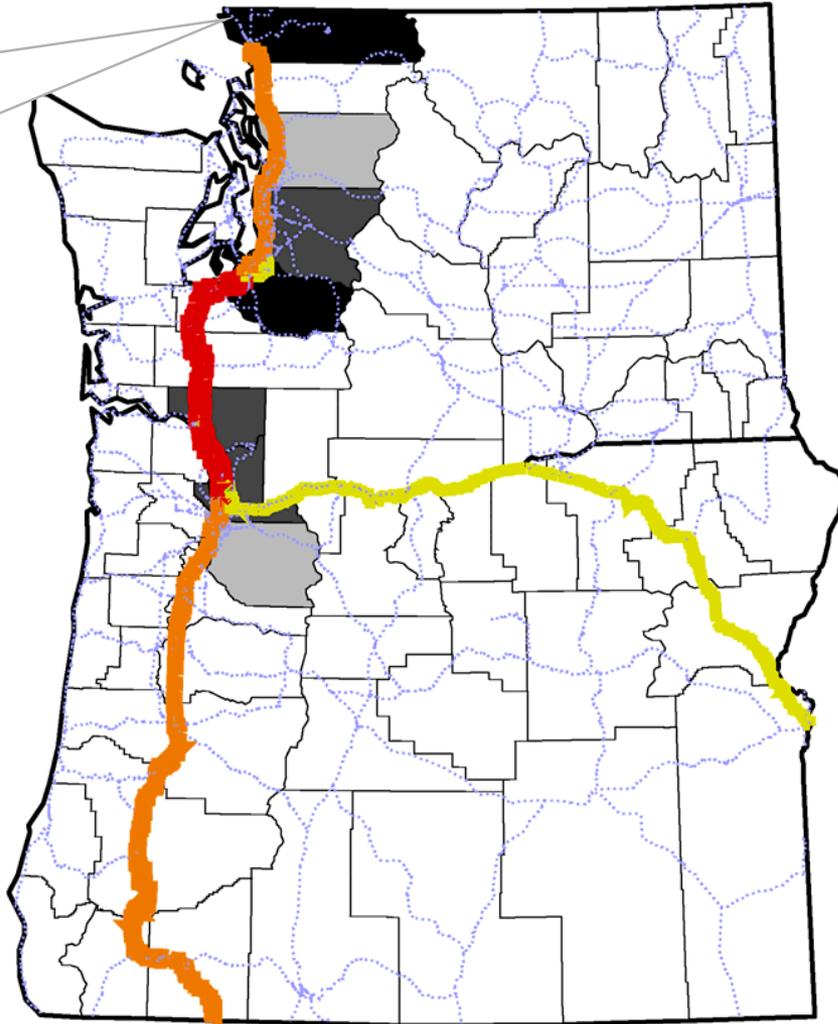


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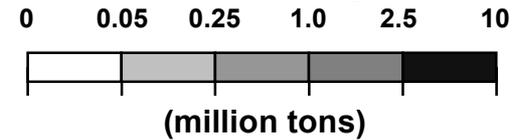
Transportation Equipment and Steel Industry

Oregon-Washington Origins and Destinations for Transportation Equipment/Steel Products Crossing I- 5/I- 205 Bridges at Portland-Vancouver With Value of Freight on Truck Routes Used to Access Bridge

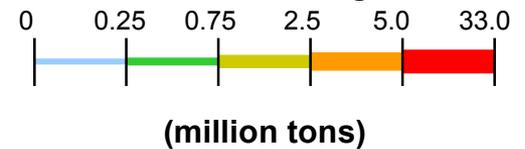
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Origins and Destinations of Transportation Equipment and Steel Products Crossing I-5 and I-205 Columbia River Bridges, 1998

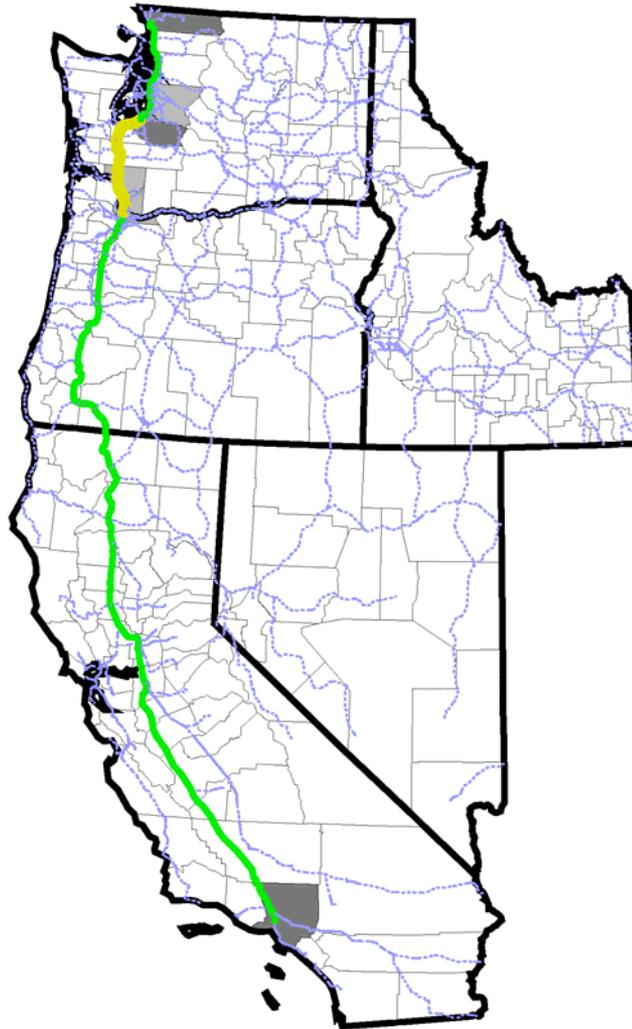


Value of Transportation Equipment and Steel Products on Routes Used to Access I-5 and I-205 Columbia River Bridges, 1998

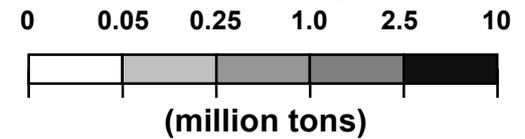


Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

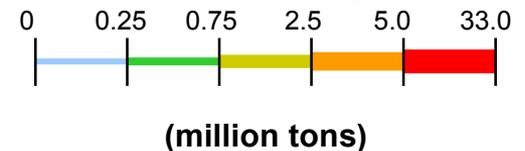
West Coast Origins and Destinations for Transportation Equipment/Steel Products Crossing I- 5/I- 205 Bridges at Portland-Vancouver With Tonnage of Freight on Truck Routes Used to Access Bridge



Origins and Destinations of Transportation Equipment and Steel Products Crossing I-5 and I-205 Columbia River Bridges, 1998

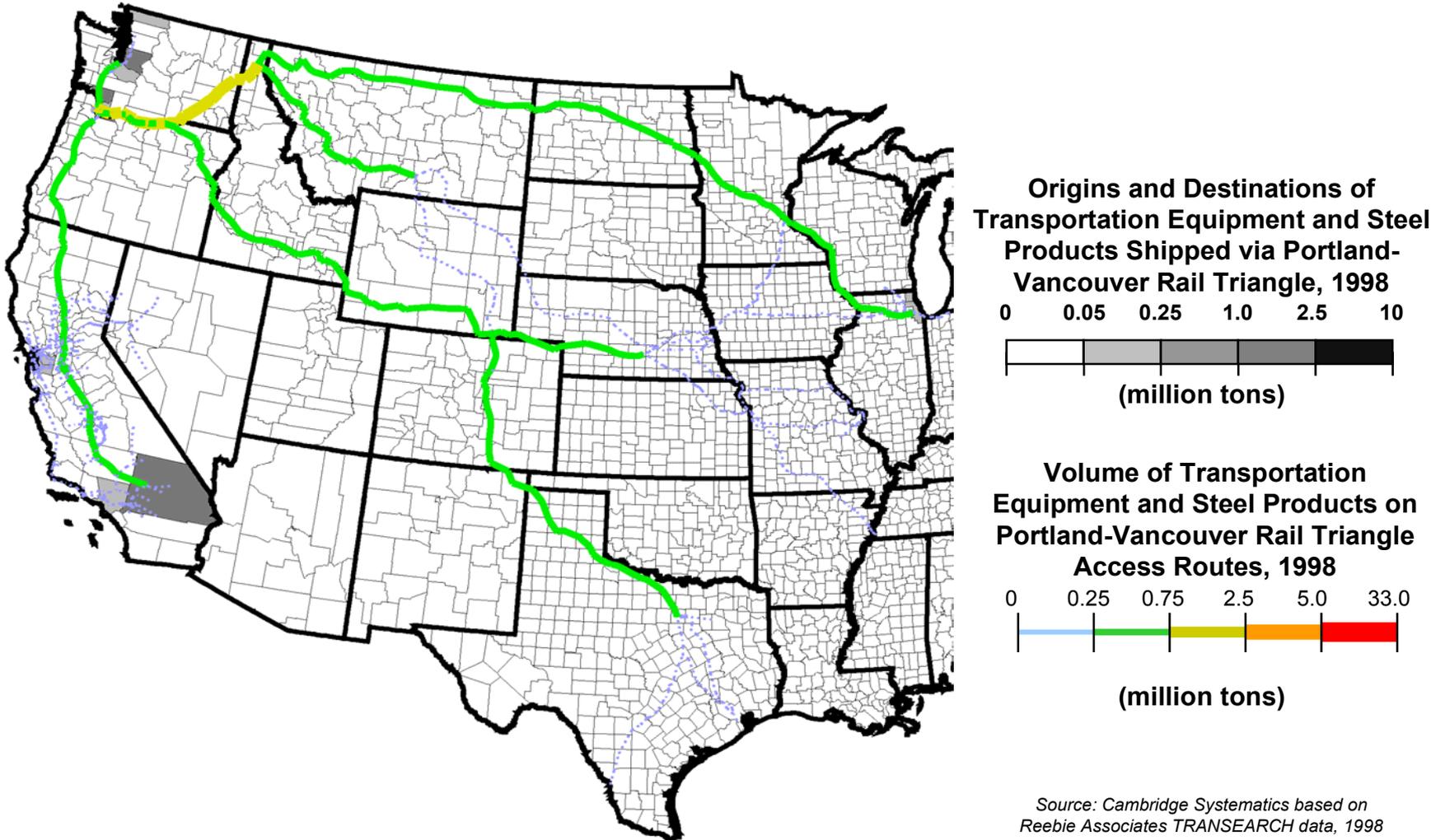


Volume of Transportation Equipment and Steel Products on Routes Used to Access I-5 and I-205 Columbia River Bridges, 1998



Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

Western United States Origins and Destinations for Transportation Equipment and Steel Products Using Portland-Vancouver Rail Triangle With Tonnage of Freight on Rail Lines Used to Access Triangle

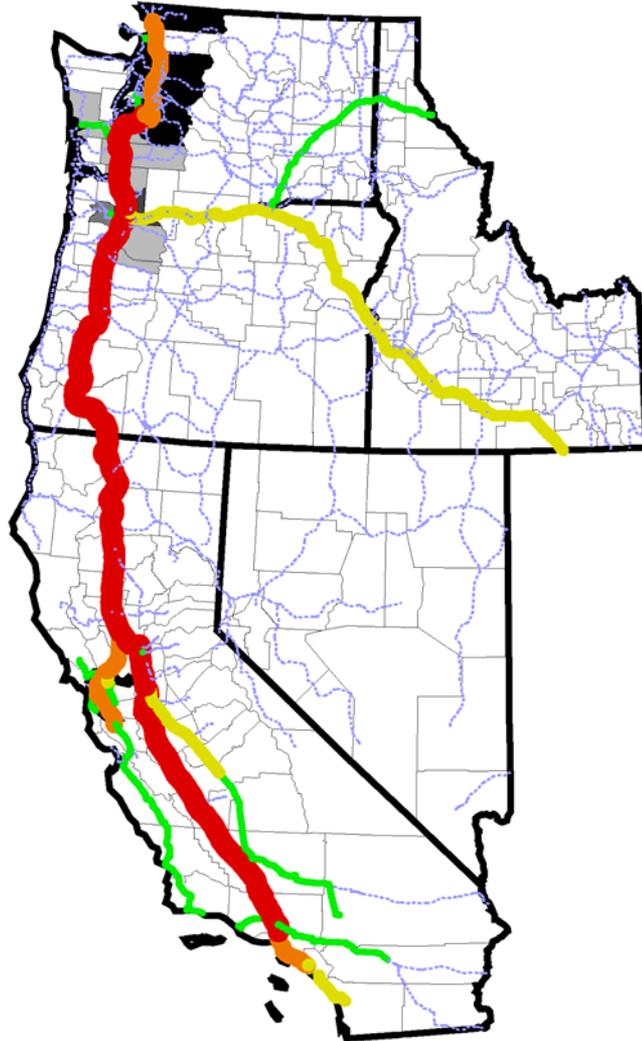


High-Tech Manufacturing Industry

West Coast Origins and Destinations for High-Tech Manufacturing Products Crossing the I- 5 and I- 205 Bridges at Portland-Vancouver

With Value of F

to Access Bridge



Origins and Destinations of High-Tech Manufacturing Products Crossing I-5 and I-205 Columbia River Bridges, 1998

0 0.05 0.25 1.0 2.5 10



(million tons)

Value of High-Tech Manufacturing Products on Routes Used to Access I-5 and I-205 Columbia River Bridges, 1998

0 0.25 0.75 2.5 5.0 33.0

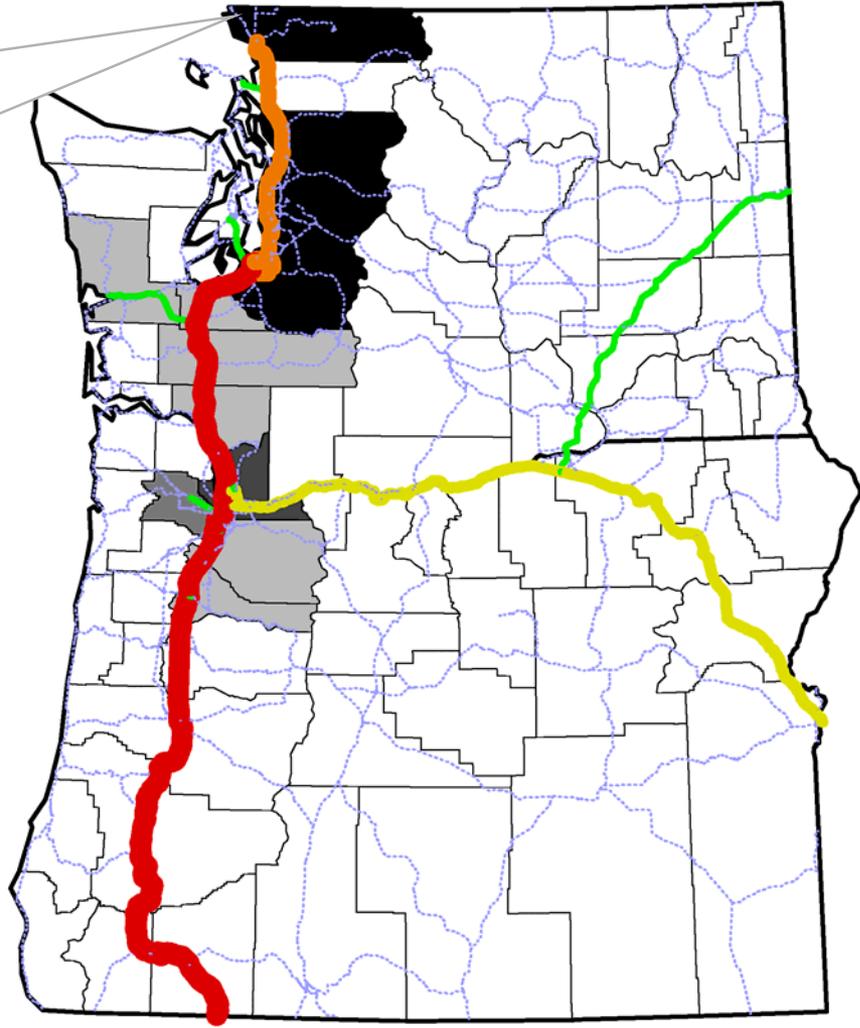


(million tons)

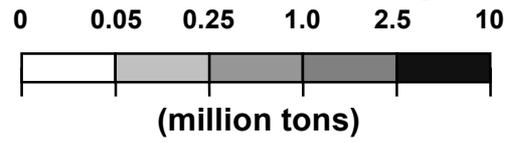
Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

Oregon-Washington Origins and Destinations for High-Tech Manufacturing Products Crossing I- 5/I- 205 Bridges at Portland-Vancouver With Value of Freight on Truck Routes Used to Access Bridge

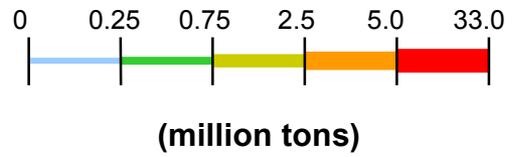
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Origins and Destinations of High-Tech Manufacturing Products Crossing I-5 and I-205 Columbia River Bridges, 1998



Value of High-Tech Manufacturing Products on Routes Used to Access I-5 and I-205 Columbia River Bridges, 1998

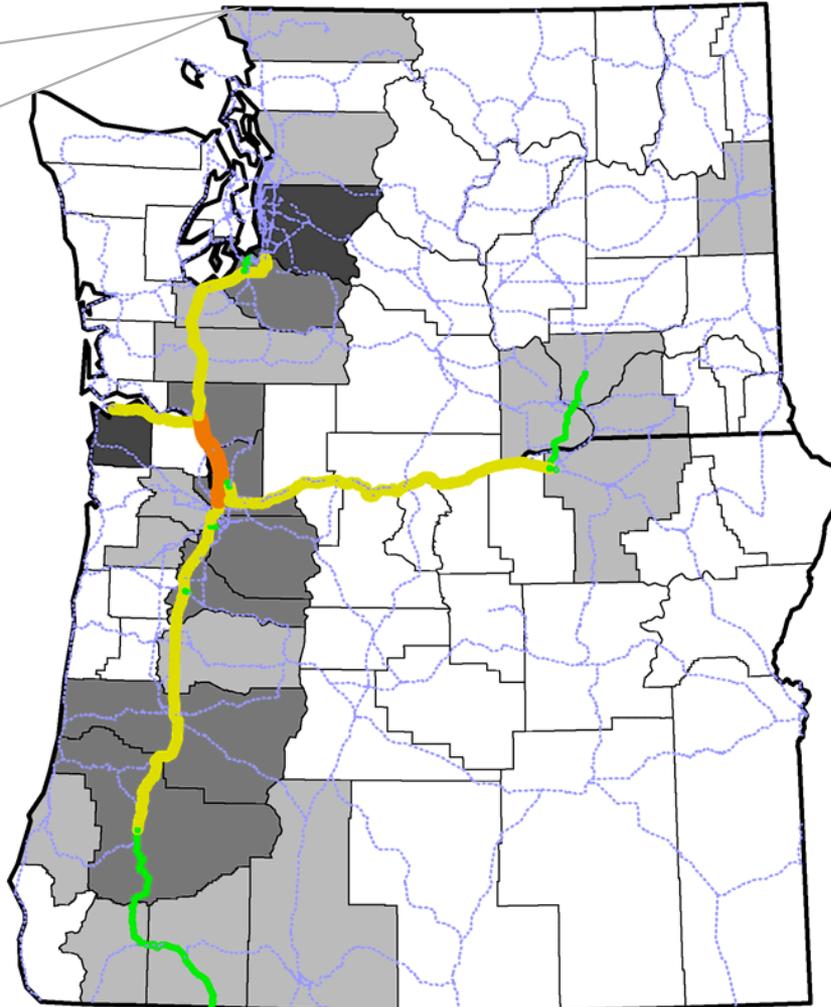


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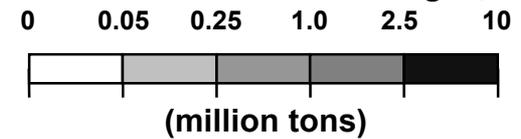
Distribution and Warehousing Industry

Oregon-Washington Origins and Destinations for Distribution and Warehouse Goods Crossing I- 5/I- 205 Bridges at Portland-Vancouver With Tonnage of Freight on Truck Routes Used to Access Bridge

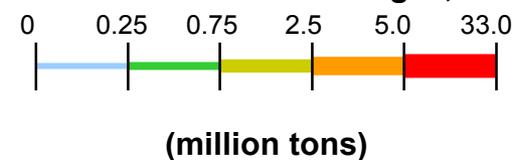
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Origins and Destinations of Distribution and Warehousing Goods Crossing I-5 and I-205 Columbia River Bridges, 1998

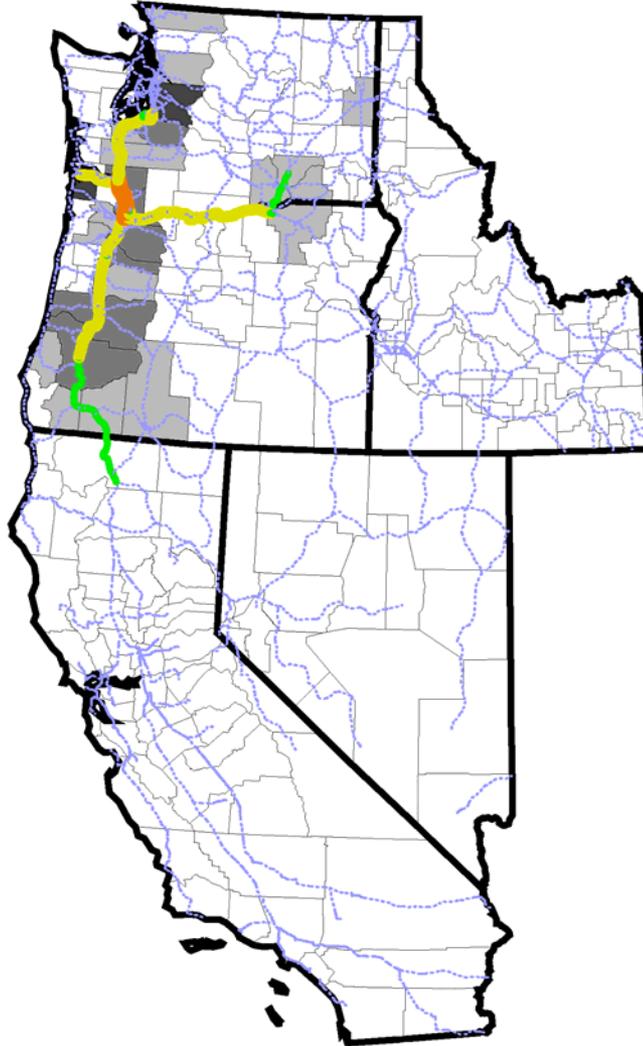


Volume of Distribution and Warehousing Goods on Routes Used to Access I-5 and I-205 Columbia River Bridges, 1998



Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

West Coast Origins and Destinations for Distribution and Warehouse Goods Crossing the I- 5 and I- 205 Bridges at Portland-Vancouver With Tonnage of Freight on Truck Routes Used to Access Bridge



Origins and Destinations of Distribution and Warehousing Goods Crossing I-5 and I-205 Columbia River Bridges, 1998

0 0.05 0.25 1.0 2.5 10



(million tons)

Volume of Distribution and Warehousing Goods on Routes Used to Access I-5 and I-205 Columbia River Bridges, 1998

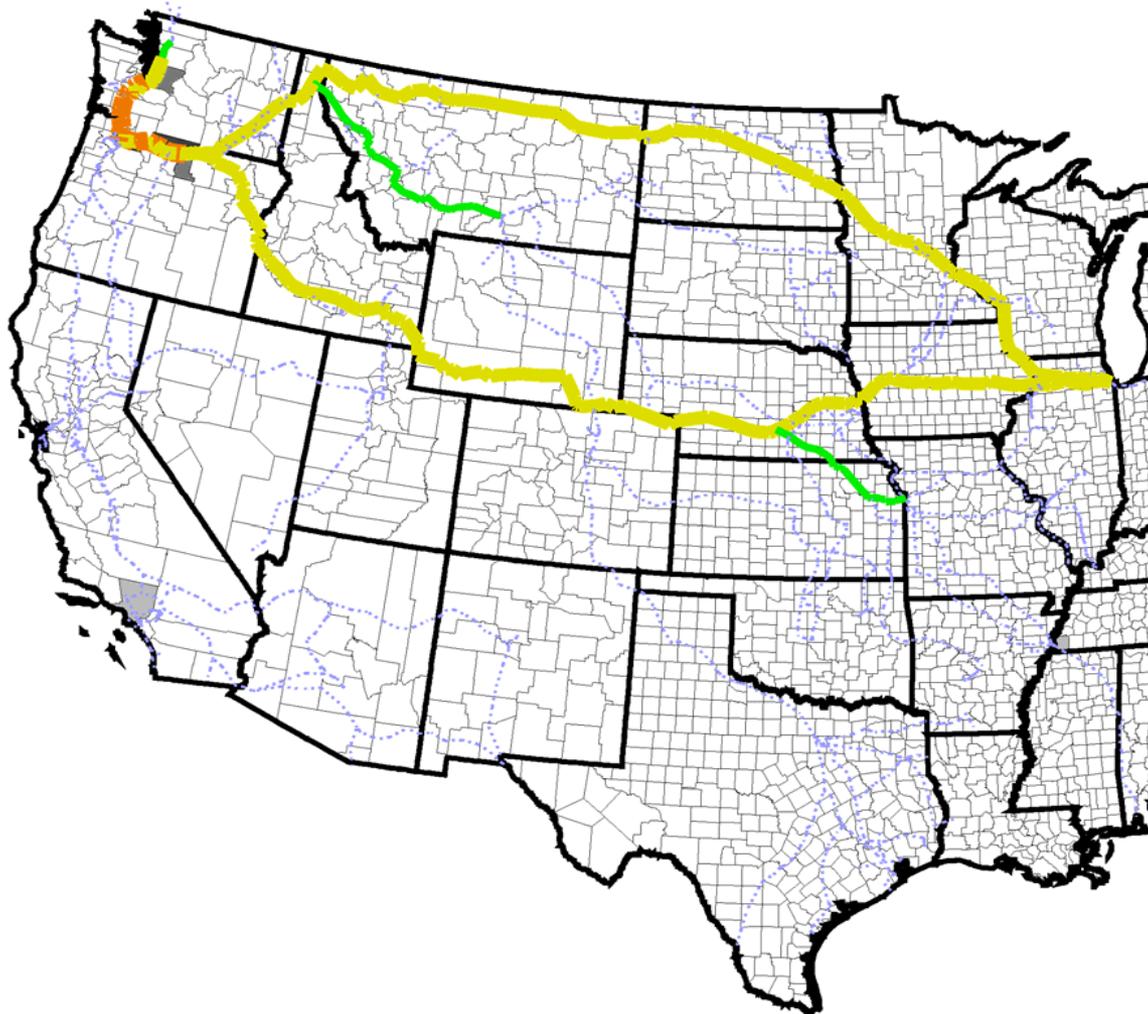
0 0.25 0.75 2.5 5.0 33.0



(million tons)

Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

Western United States Origins and Destinations for Distribution and Warehouse Goods Using the Portland-Vancouver Rail Triangle With Tonnage of Freight on Rail Lines Used to Access Triangle



Origins and Destinations of Distribution and Warehousing Goods Shipped via Portland-Vancouver Rail Triangle, 1998

0 0.05 0.25 1.0 2.5 10



(million tons)

Volume of Distribution and Warehousing Products on Portland-Vancouver Rail Triangle Access Routes, 1998

0 0.25 0.75 2.5 5.0 33.0



(million tons)

Source: Cambridge Systematics based on Reebie Associates TRANSEARCH data, 1998

The Outlook

- **Region is seeing diminishing returns from the transportation initiatives of earlier decades**
- **Capacity and congestion problems today are eroding the productivity of the transportation system**
- **Congestion at the crossings has a real and immediate cost the Portland-Vancouver residents and businesses**
- **It has a less visible, but equally real, cost to Oregon and Washington residents and businesses beyond the metropolitan area**

Choices for the Future

- **Oregon and Washington residents and businesses as well as Portland and Vancouver residents and businesses have a choice of two futures:**
 - **Positive one in which the I-5 Corridor/Columbia River highway and rail crossings are improved and make a greater contribution to the economic well being of the entire Pacific Northwest; or**
 - **Negative one in which the I-5 crossings are not improved, and the burden of congestion becomes more severe**

Choices for the Future

- **The region is weathering an economic recession, making it difficult to envision the major new transportation investments recommended by the I-5 Partnership**
- **However, the region cannot afford to postpone action**
 - **Environmental studies, negotiation of funding agreements, stakeholder involvement activities, right-of-way acquisition, design, and construction of major transportation improvements can take five to 15 years to complete**
- **Oregon and Washington must make a coordinated effort to act promptly to decide on a course of action and identify sources of funding for the recommended transportation improvements in the I-5 corridor**



Regional Economic Effects of the I-5 Corridor/Columbia River Crossing Transportation Choke Points

*prepared for
Oregon Department of Transportation*

*presented by
Lance R. Grenzeback
Cambridge Systematics, Inc.*

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