

## RESEARCH & MARKET INFORMATION



**TITLE:**

Regional Freight Data  
Collection Project

**CLIENT:**

Portland State University  
Center for Transportation  
Studies

**PREPARED BY:**

Scott Drumm  
Derek Jaeger

**DATE:**

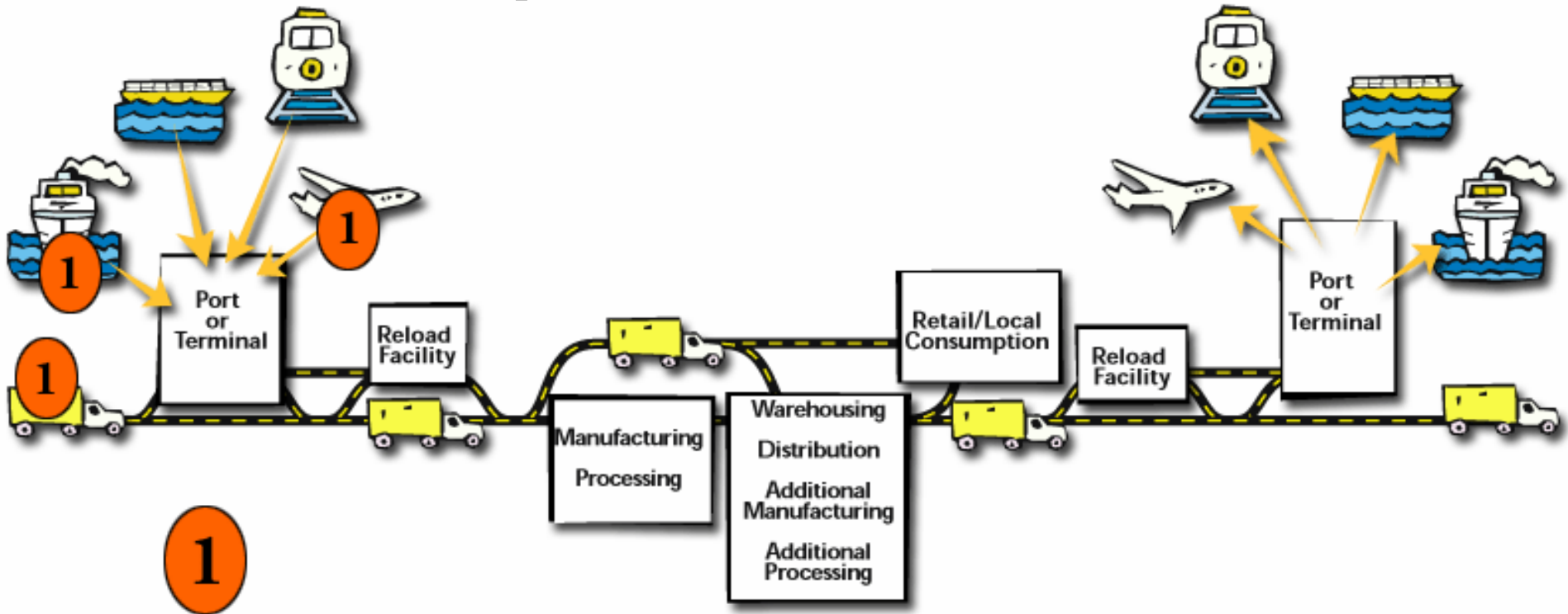
May 13, 2005

# Freight Is Important to the Economy

- Transportation/distribution a niche industry for *this* region
  - Geography
  - Multi-modal transportation system
  - Creates jobs, generates income
- Freight transportation-dependent businesses account for 60% of Oregon jobs
- Transportation and logistics account for 20-25% of product cost
- Average delivery time today: 2-3 days vs. 30 days in 1960s, 10 days in 1980s



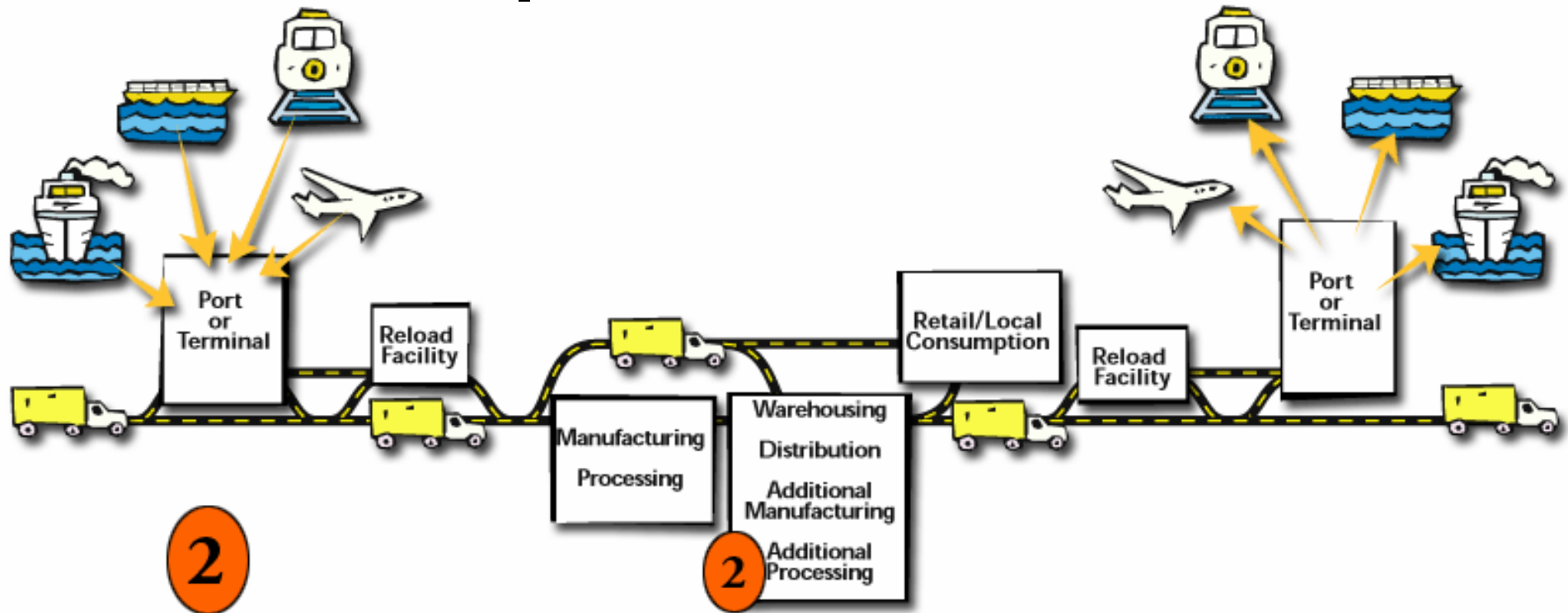
# Columbia Sportswear



## Inbound movement

- Apparel, footwear, and accessories arrive via ship from Asia at T-6, transported by truck to the Rivergate DC; some move through Seattle and Tacoma
- Air shipments arrive both at PDX and Seattle/Tacoma.
- Ocean/air shipments arriving in Puget Sound transported by truck to Rivergate

# Columbia Sportswear



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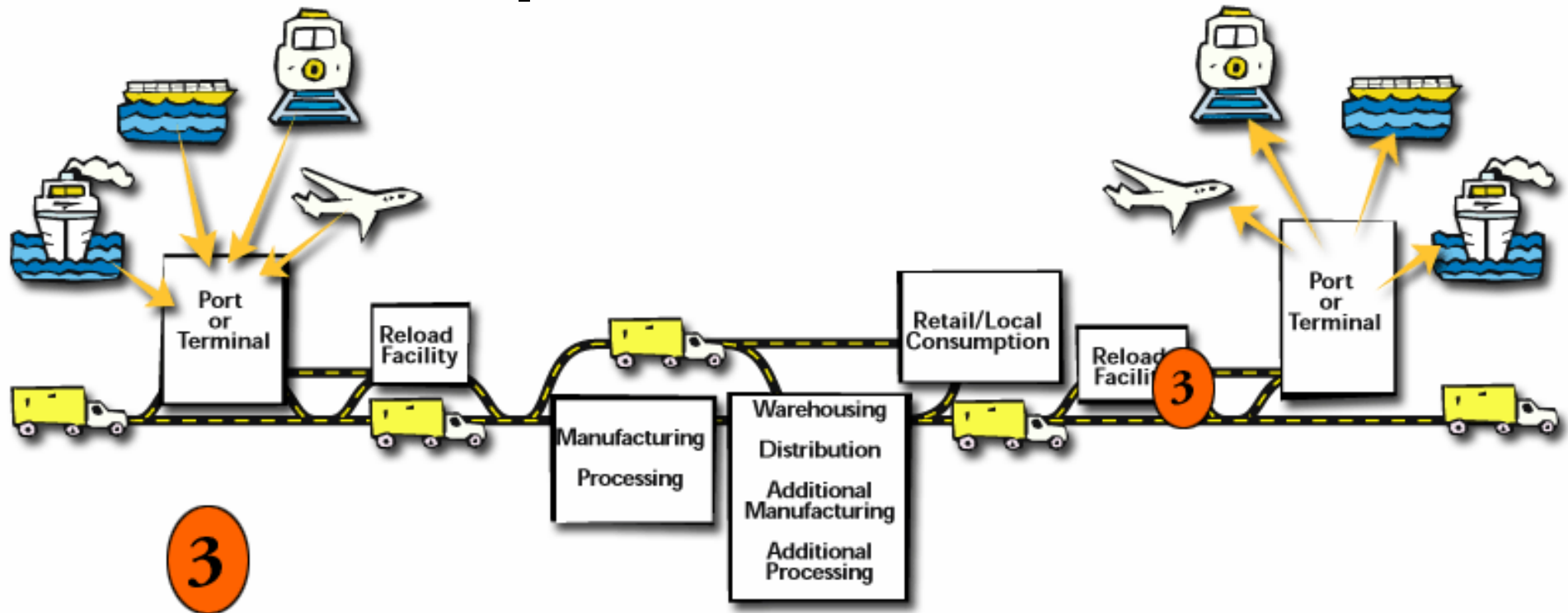
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## Warehousing

- Ocean containers unstuffed; airfreight unpacked. Products sorted/stored by SKU.
- Once all SKUs for a customer's order arrive, shipment packed for delivery.
- Customers provide routing instructions; shipments prepared for truck or air shipment accordingly.
- The Rivergate DC also handles returns.



# Columbia Sportswear

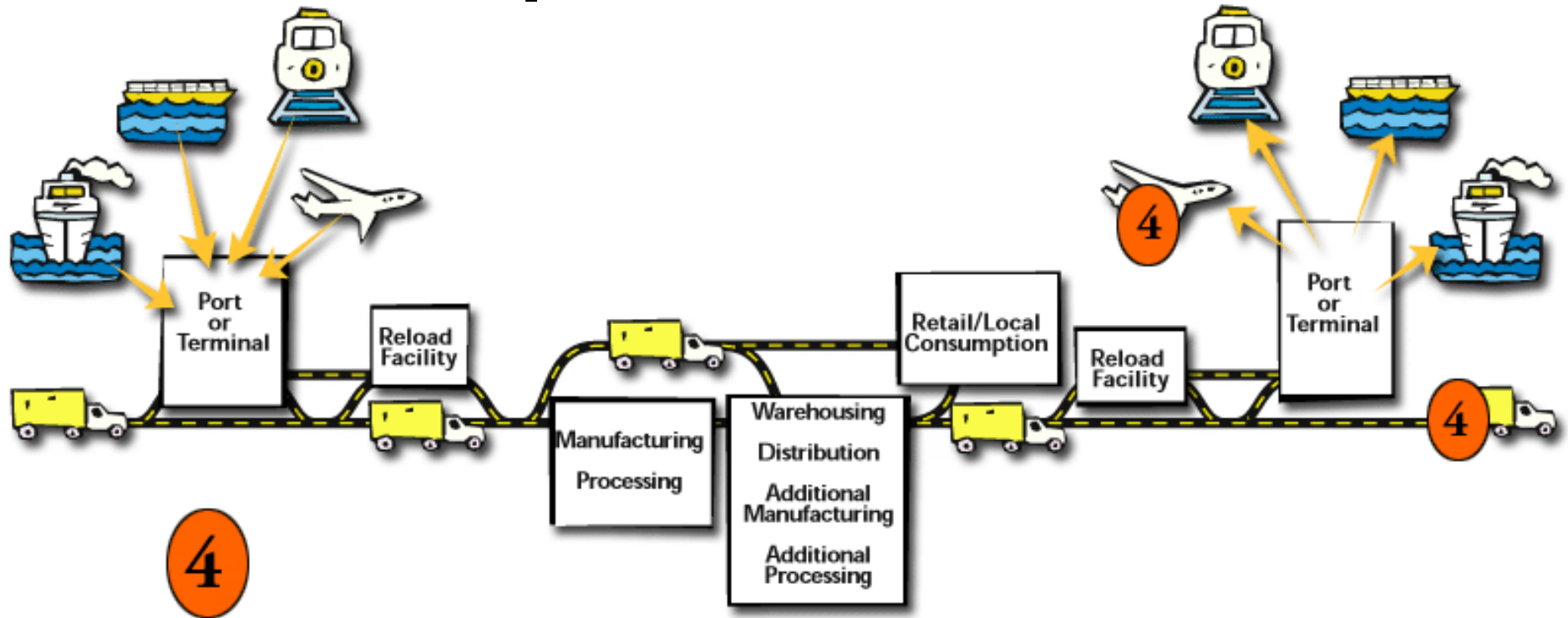


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## Reload Facility

- Freight forwarders transport shipments by truck to reload facility for air shipment.
- LTL carriers take shipments by truck from DC to the LTLs' local hubs in Portland for consolidation with other loads to same cities.

# Columbia Sportswear



## Outbound Movement

- All three product lines (apparel, footwear, and accessories) shipped out by air or truck.
- Air cargo shipped out of PDX primarily using integrated carriers (such as FedEx, UPS, Emery, etc.) for domestic delivery.
- LTL shipments, once consolidated at carrier's hub move through carrier's hub and spoke network throughout North America.
- Full truckload shipments move directly from DC to customers' warehouses or stores.

# A Multi-modal Transportation System Attracts & Retains Industry

	Truck	Rail	Barge	Ship	Air
Grains		X	X	X	
Minerals	X	X		X	
Electronic Equipment	X	X		X	X
Transportation Equipment	X	X		X	X
Food Products	X	X	X	X	X
Lumber/Paper	X	X	X	X	

# Impacts of System Failure

- Unreliability forces businesses to adjust
  - Extra time for pick-up & delivery, less production time
  - Extra vehicles to meet customer “JIT” demands
  - Use of neighborhood streets to lessen delays
- Firms may relocate out of region if transportation costs affect ability to compete



# Sustaining & Supporting the Economy

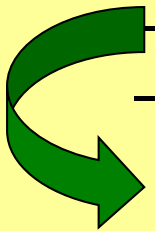
- Understanding the needs of freight
- Collecting data to make informed decisions
- Investing in infrastructure improvements to benefit freight movement



# Understanding the Needs of Freight

- Research

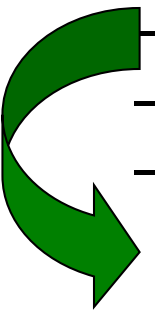
- Collect information about freight movement
- Identify how much of what moves and how
- Describe interrelationships between the modes



Commodity Flow Forecast

- Planning

- Project freight movement on the road network
- Identify chokepoints
- Analyze solutions
- Set priorities



Regional Truck Travel Model

- Approach recognized nationally as innovative

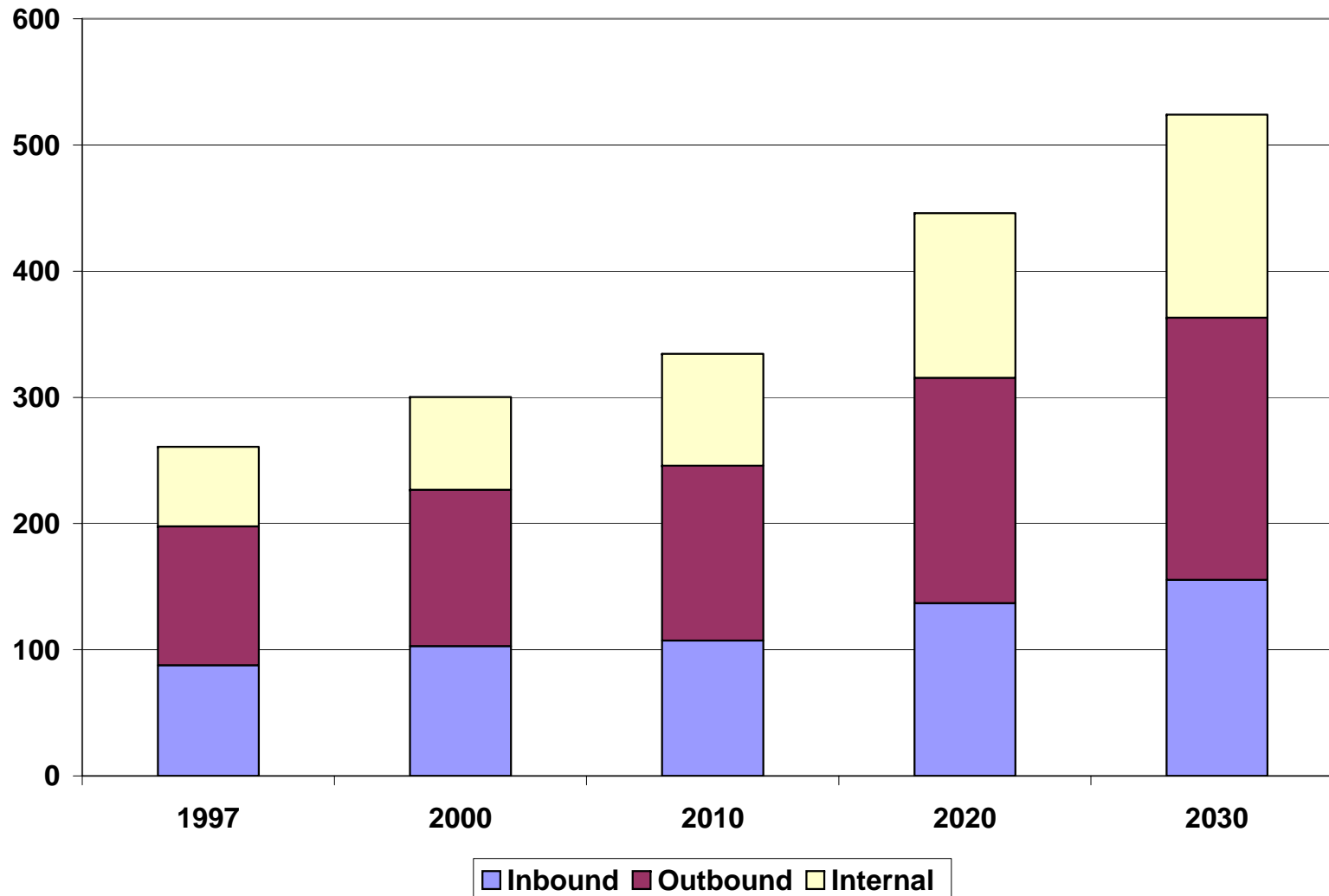


# 2002 Commodity Flow Update

- Regional project “sponsors”
  - Metro
  - Oregon Department of Transportation
  - Port of Vancouver
  - Regional Transportation Council (Clark County)
  - Port of Portland
- 1997 baseline; forecasts to 2010, 2020, 2030
- Tonnage and dollar value
- Freight moving to, from, within, or through metropolitan area



# Portland/Vancouver Region Tonnage Doubles from 1997 to 2030

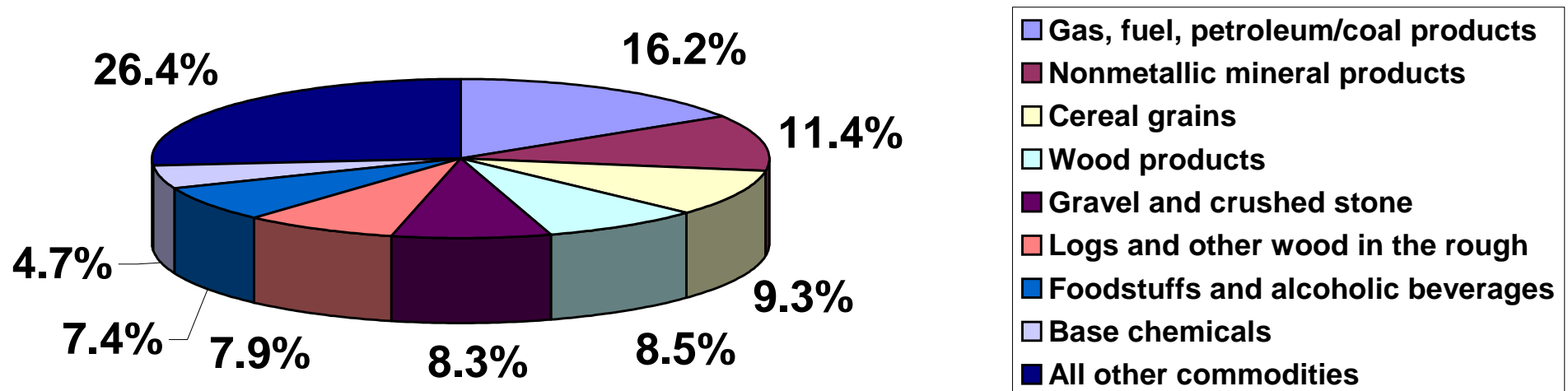


- 1997 - 2030 average annual growth rate 2.1%



# Commodity Share of Portland/Vancouver Region Tonnage

(Percent Share of Total Tonnage in 1997)



- Eight commodity categories comprise 74% of all tonnage shipped in the region on all modes.

# Top Tonnage Growth Commodities Portland/Vancouver Region 2000-2030

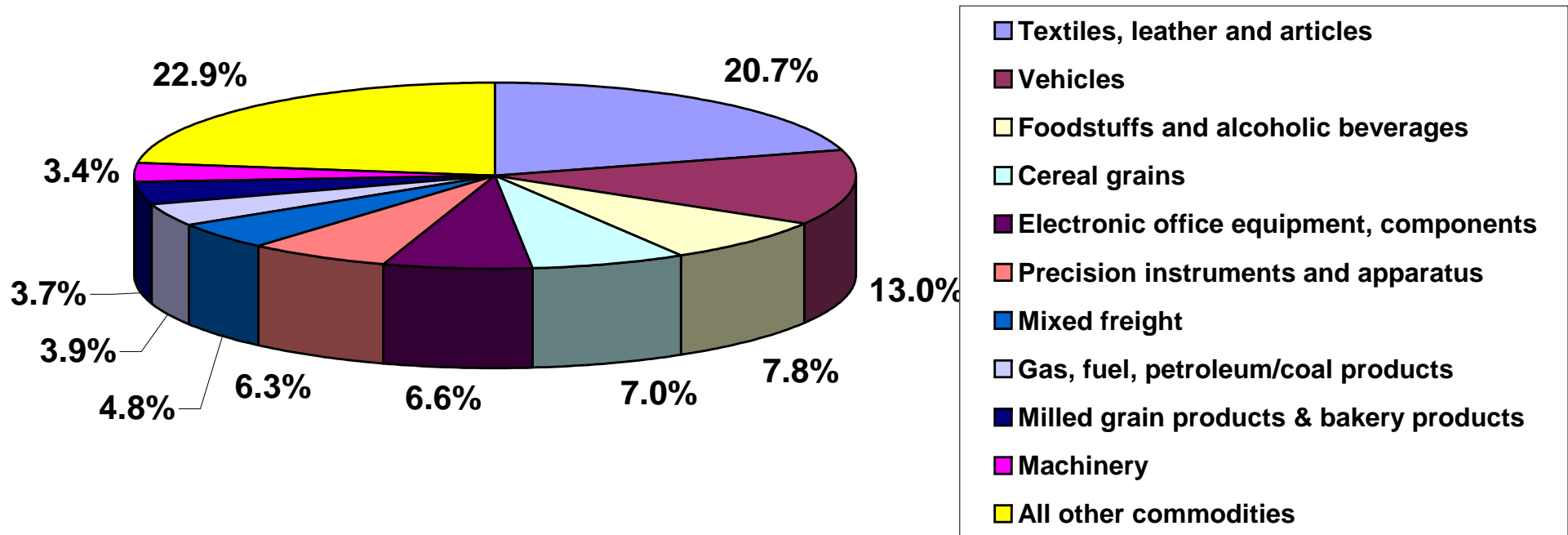
Commodity Category Description	CAGR, (%) 2000-2030	Typcial Mode
Machinery	3.7%	Truck, rail, ocean, air
Meat, fish, seafood, and preparations	3.5%	Truck, ocean, rail, air
Milled grain products and preparations and bakery products	3.3%	Truck, rail
Foodstuffs and alcoholic beverages	3.3%	Truck, rail
Mail and Express Traffic	3.3%	Truck, rail, air
Electronic and other electrical equipment and components, and office equipment	3.3%	Truck, air, ocean
Precision instruments and apparatus	3.1%	Truck, air
Printed products	2.9%	Truck, rail, air
Nonmetallic mineral products	2.7%	Truck, rail, ocean
Miscellaneous manufactured products	2.7%	Truck, rail, ocean

- High value manufactures and foods grow fastest



# Commodity Share of Portland/Vancouver Region Value

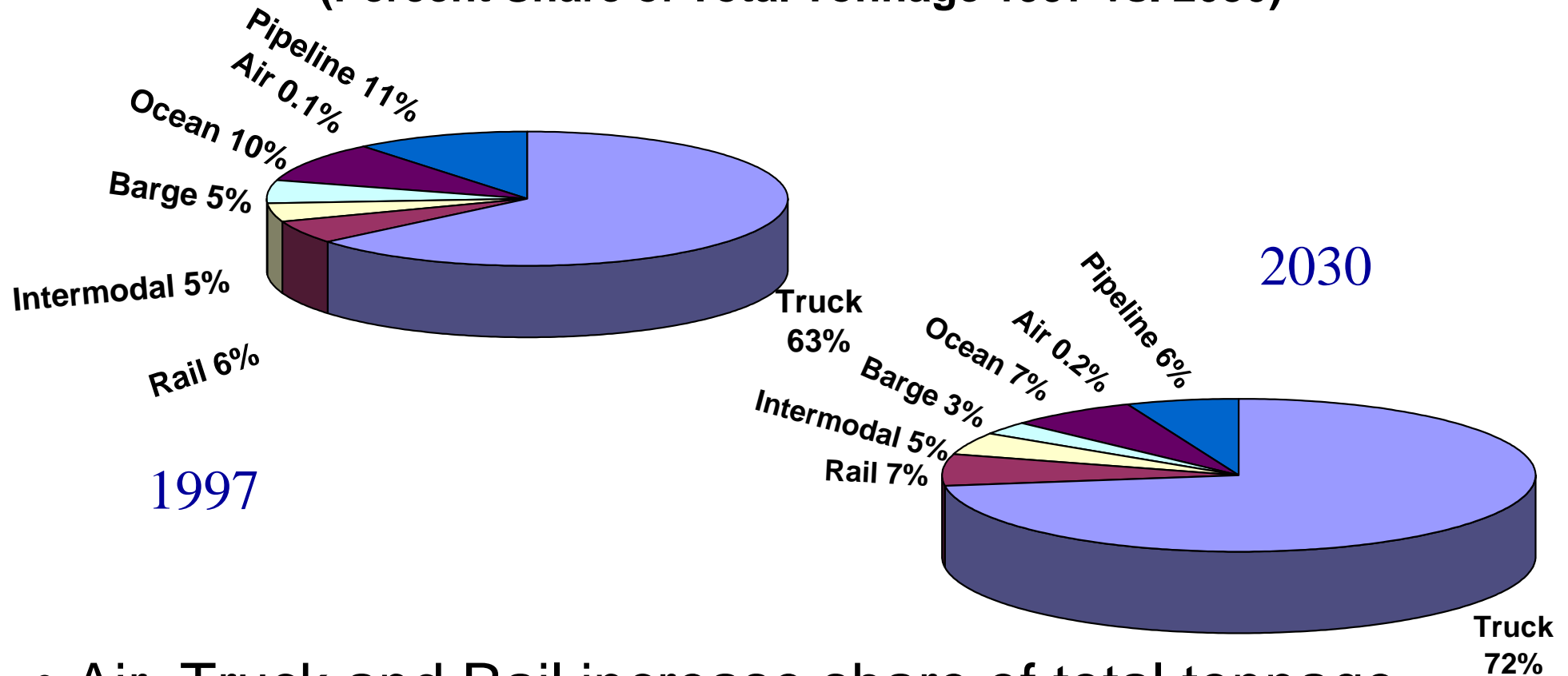
(Percent Share of Total Value in 1997)



- Ten commodity categories comprise 77% of all value shipped in the region on all modes
- Air cargo goods appear on this list

# Modal Shares of Portland/Vancouver Region Total Tonnage

(Percent Share of Total Tonnage 1997 vs. 2030)



- Air, Truck and Rail increase share of total tonnage
- Barge and Ocean lose share, but still grow



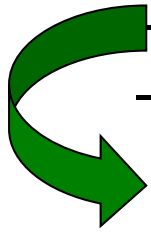
# Implications of Forecast

- Freight to remain a central element of region's economy
- Increased volumes will put additional pressure on transportation system
- Need all modes to function effectively

# Understanding the Needs of Freight

- Research

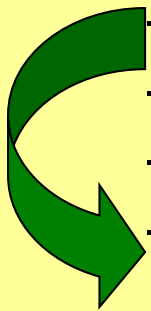
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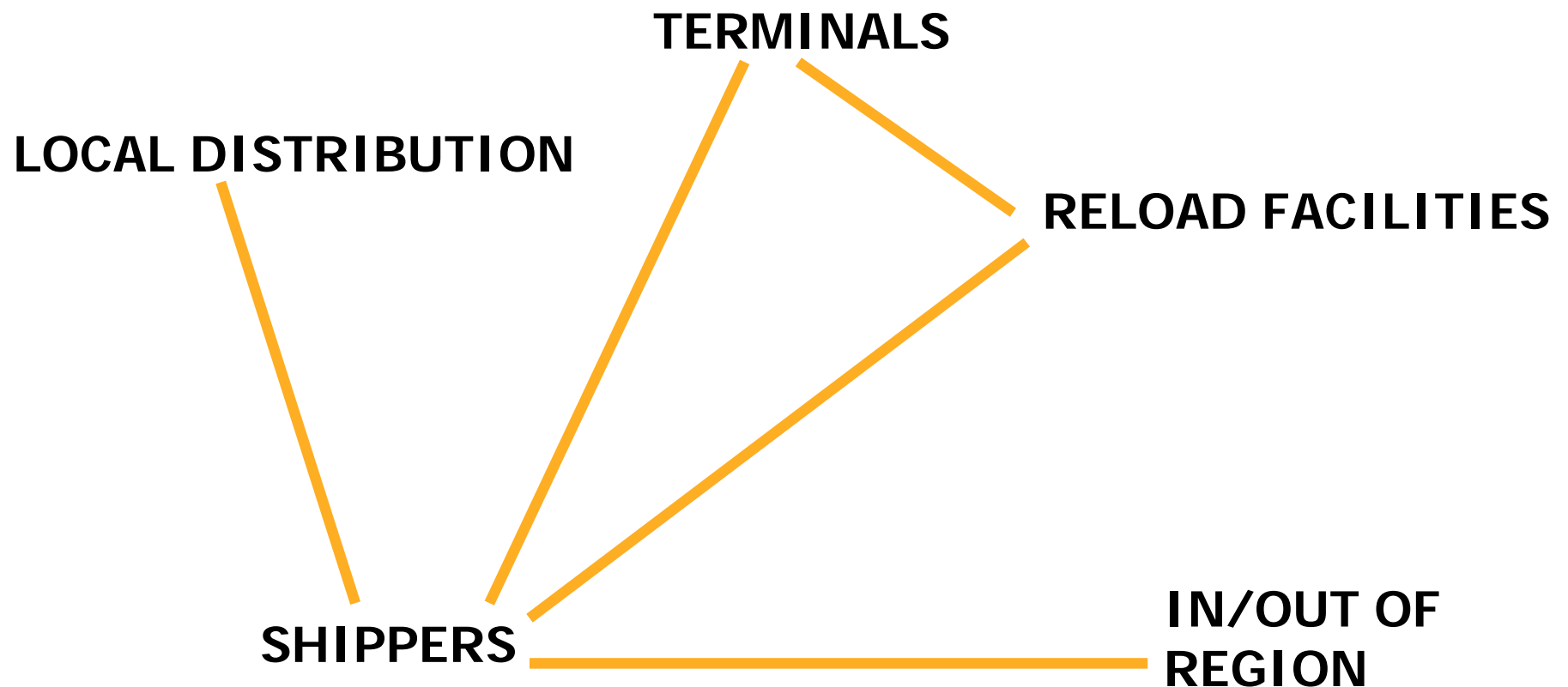


# Commodity Based Model

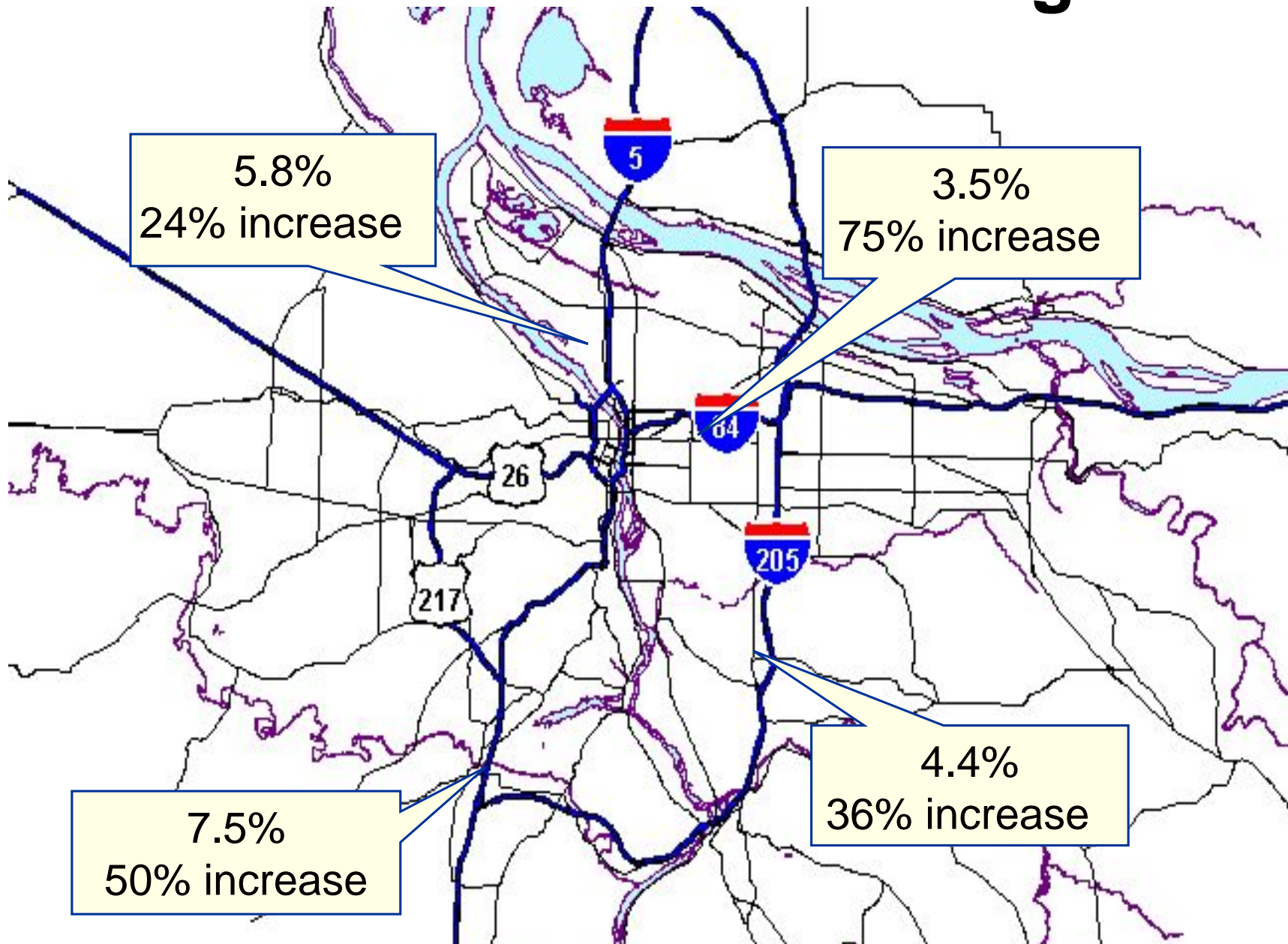
- Commodity volumes, not employment, drive the number of truck trips
- Commodity type influences transport decisions
  - Type of vehicle
  - Load factors
  - Time of day

# Logic for the Modeling System

- Truck movement more complex than passenger vehicle movement



# 2020 PM 2 HR Truck Percentage



# Data Gaps

- What commodities (and how much of them) are trucked across the Interstate Bridge every day?
- How much cargo moves from Washington County to PDX?
- What time of day are there the most trucks on the road in Clackamas near all the distribution facilities?



# Filling in the Gaps

- Collection of origin/destination data
- Refine truck routing patterns
- Establish comprehensive freight vehicle classification count program



# Regional Freight Data Collection Project

- Purpose: address as many as the data and information gaps as possible
- Regional in nature
  - Metro & RTC
  - ODOT & WSDOT
  - Port of Portland & Port of Vancouver
  - Cities and Counties



# Regional Freight Data Collection: Phase 1

- Completed April 2003
- Needs assessment
  - Questions region needs to answer
  - Issues region needs to address
  - General freight data needs
- Analysis of data required
- Analysis of data collection methods
- Recommended approaches



# Interview Process

- Focus-group style sessions conducted with several transportation/planning agencies and private sector representatives
- Stakeholders assessed the kinds of questions and data needs that freight data collection would ideally address
- 13 groups with representatives of more than 50 different firms, agencies, organizations



# Agencies and Firms Interviewed

- Metro
- FHWA
- City of Portland
- Multnomah County
- Clackamas County
- ODOT
- City of Tualatin
- Washington County
- City of Gresham
- Port of Portland
- Westside Economic Alliance
- Columbia Corridor Assoc.
- Schnitzer Steel
- Portland Business Alliance
- Oregon Trucking Assoc.
- Traffic/Transportation Engineers



# Agencies and Firms Interviewed

- WSDOT
- SW Washington RTC
- Port of Vancouver
- Clark County
- City of Vancouver
- Puget Sound Regional Council
- Washington State University



# Key Policy Issues & Freight Questions

- What is the value of freight (for economic development and business development projects)?
- Why is it more important if trucks are delayed?
- Why is it not possible to use rail for more freight?
- Can trucks be pushed to off-peak times? Can truck-only lanes be developed?
- What is the capacity for other modes?

# Key Policy Issues & Freight Questions

- How do trucks get to terminals?
- Where does freight consolidation occur?
- What percent of freight passes through Portland, but is being shipped out of other marine and airports?
- What percent of activity at airport are actually truck-truck moves?



# Examples of Data Needs

- Truck-rail diversions
- Backhaul opportunities (currently using 1996 O-D survey)
- Possibility of using freight rail for intra-city moves (e.g. logs)
- Fine-tuning of commodity flow data to reflect known patterns, particularly for north-south data
- More truck count data
- Through trips



# Regional Freight Data Collection: Phase 2

- Primary Objectives
  - Origin/Destination
  - Truck Counts
  - Routing
- Timing
  - Kick-off: May 2005
  - Initial data available: Spring 2006?
  - Project completion: Fall 2006



# Project Sponsors

- Metro MTIP Allocation
- Oregon Department of Transportation
- SW Washington Regional Transportation Council
- Washington State Department of Transportation
- Multnomah County
- Port of Portland

Project funding: \$730,000

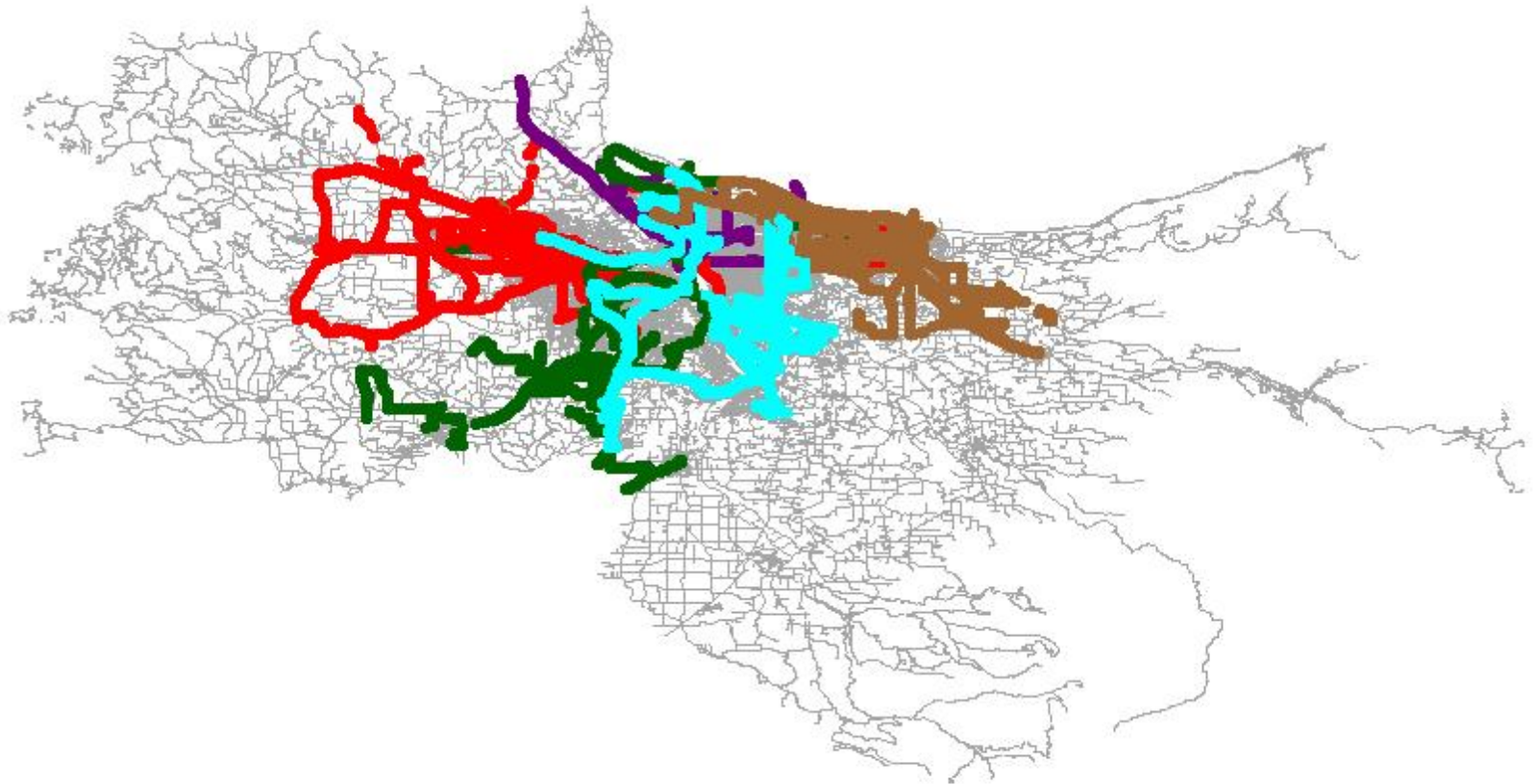


# Leveraging Other Research

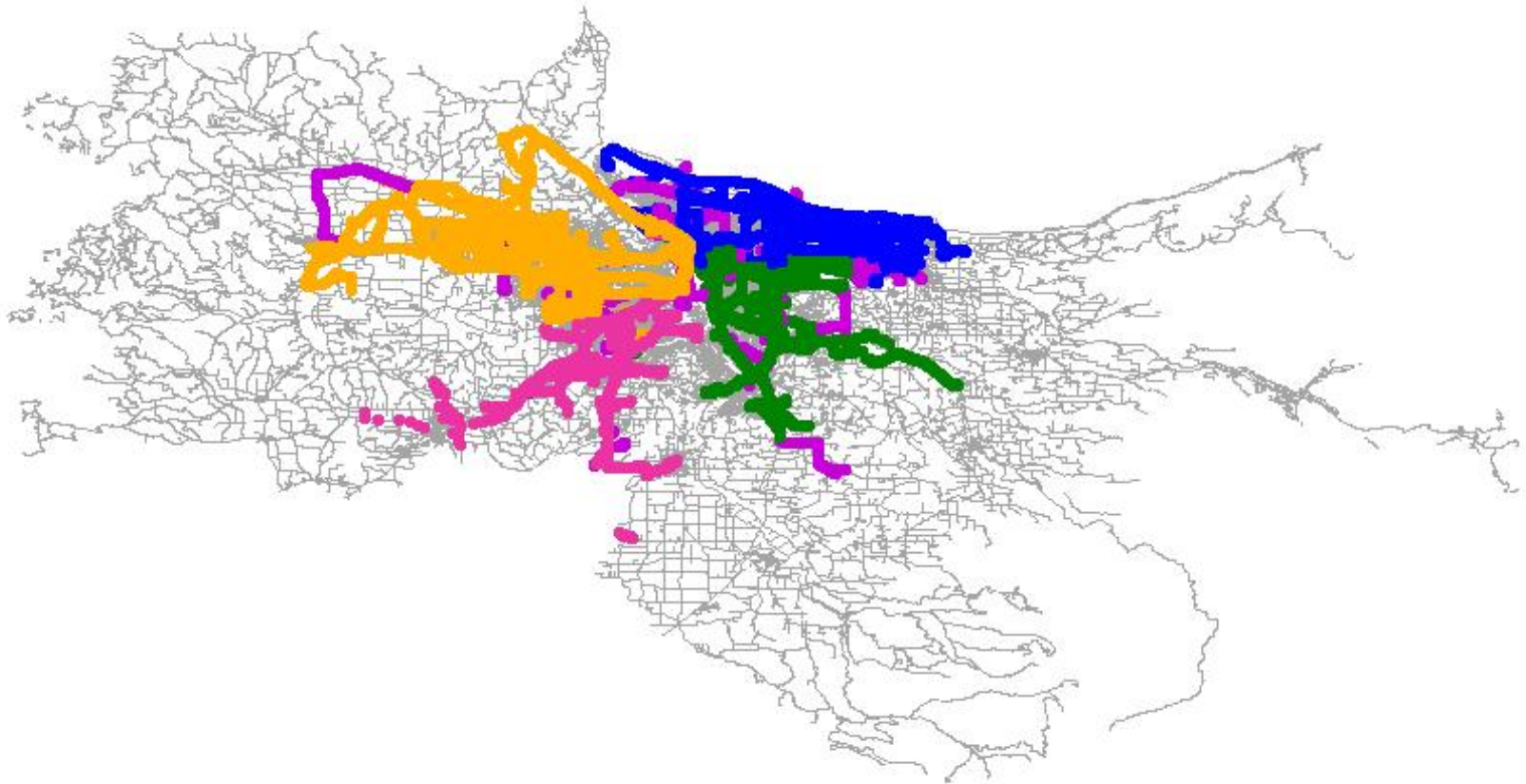
- Washington State University/ODOT
  - Effective survey instruments for truck drivers
  - How and where to best survey truck drivers
  - Other methods of collecting data
- Oregon State University/Metro/Port of Portland
  - GPS data collection technology
  - Data accuracy
  - TransNow grant



# Sample GIS Data Display: Route Chart

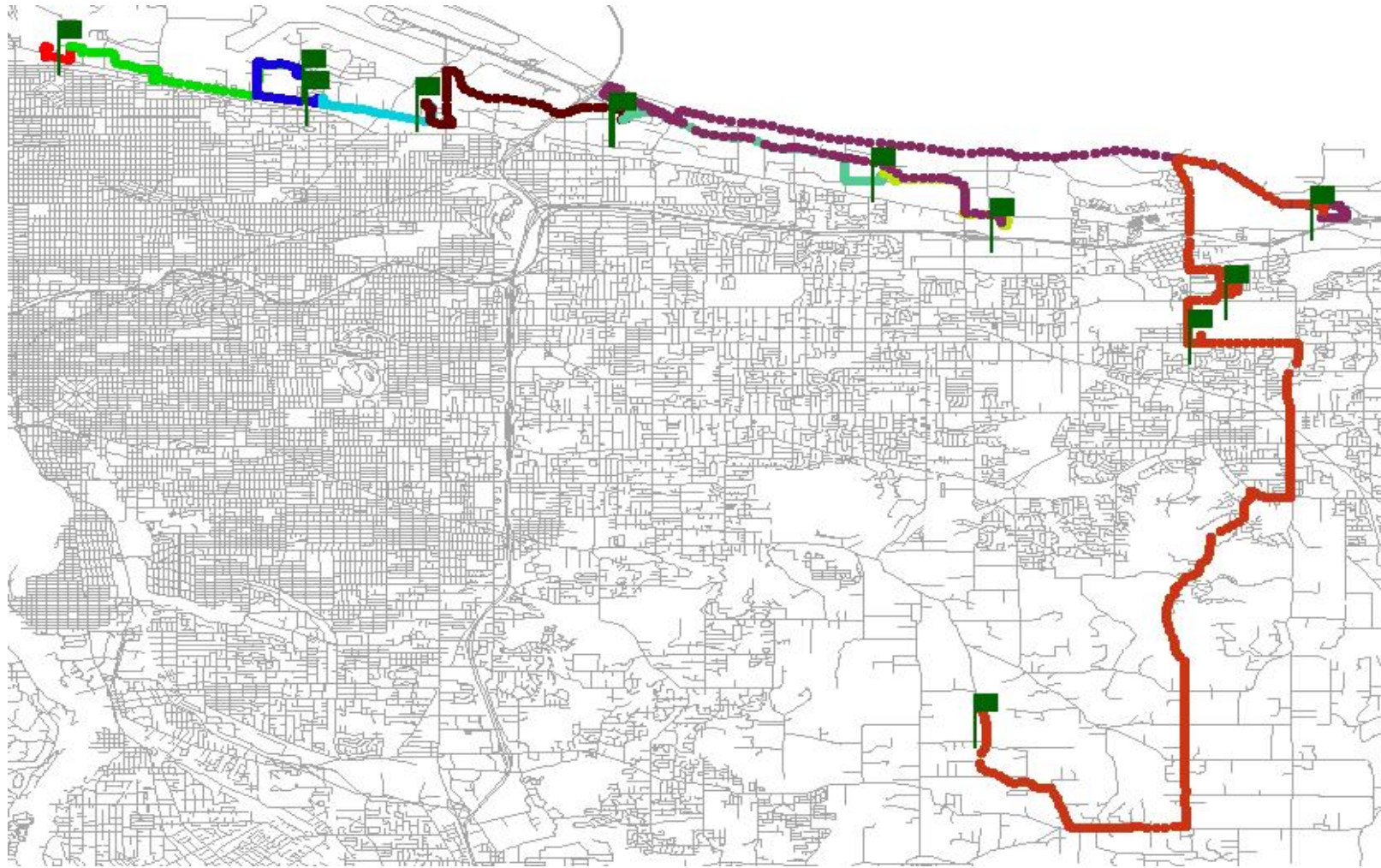


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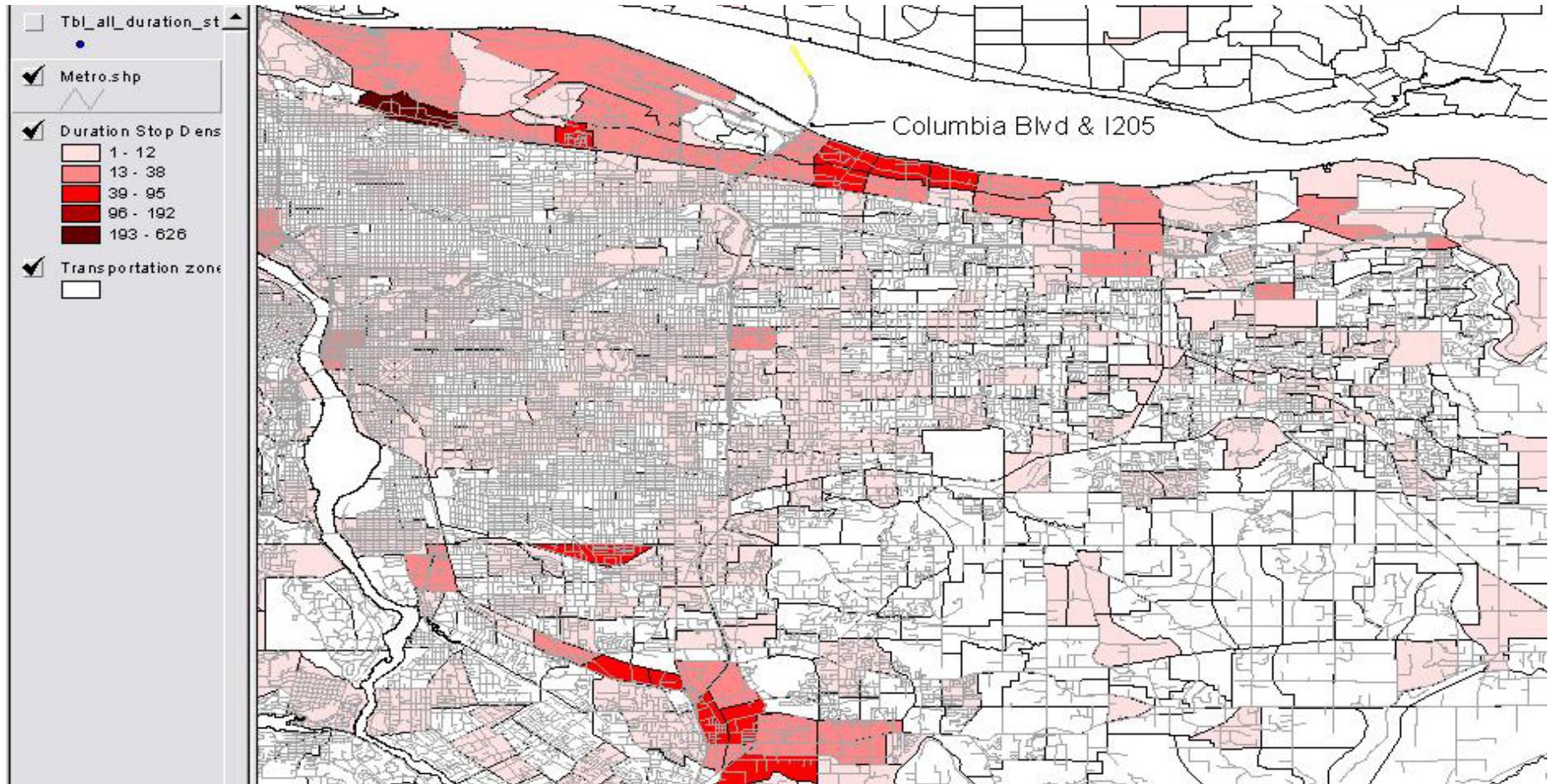




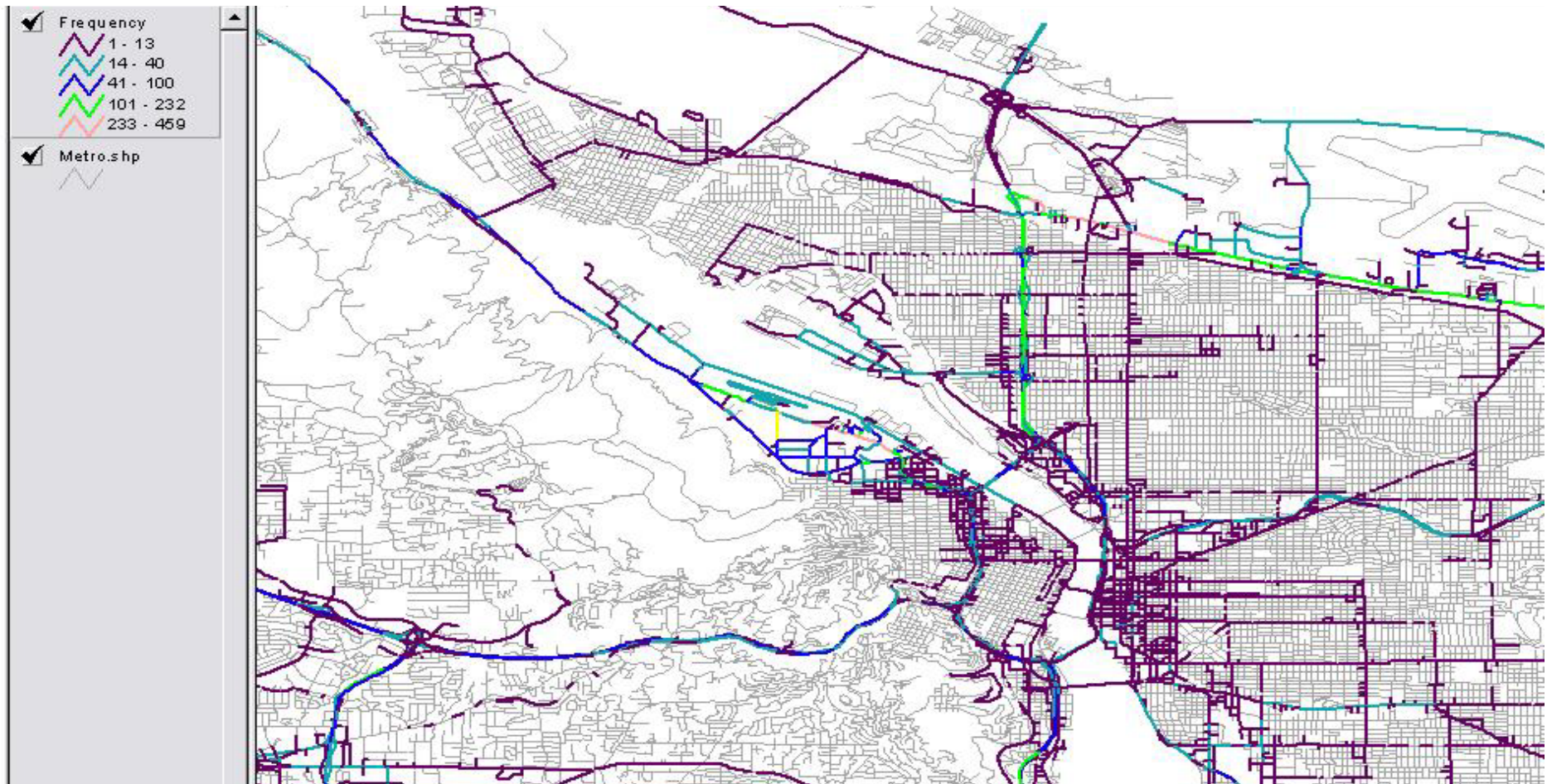
# Sample GIS Data Display: Between-Stop Route



# Sample GIS Data Display: Density by TAZ



# Sample GIS Data Display: Density by Street



# Wrap-Up

- Economy depends on ability to move freight
- Freight volumes (tonnage) will double by 2030
- Funding limited, need to prioritize investment
- Requires knowing when, where, how freight moves

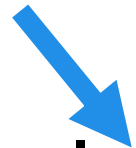
# Wrap-Up

- Data specific to region not readily available
- Region a national leader in freight data collection
- Leveraging investment in Commodity Flow Forecast by conducting Regional Freight Data Collection Project
  - Specific regional O/D points identified
  - On-going regional truck count program launched
  - Routing information generated (though limited)

Freight Research



Better Decisions



Better Investments



Better Economy

