Data Requirements to Meet Freight Mobility Needs in the Portland Region

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Economic Trends

- Globalization of the Economy
- Restructuring of Traditional Manufacturing
- High Technology/Internet Trade
Freight Movement Trends

- Freight Movement occurs
  - to move products from origin to place of higher value
  - over a variety of modes
- Transportation and logistics account for 20-25% of product cost
- Average delivery time today: 2-3 days
  - compared to: 30 days in 1960s, 10 days in 1980s
- By 2001, 50% of all products will move ‘just in time’

*Port of Portland 1998*
Industry specialization and reliance on efficient transportation means industries may choose to relocate if transportation costs affect their ability to compete.

Congestion has real costs and affects business productivity

- **Hard costs**
  - Extra time for pick-up and delivery/reduced production time
  - Extra vehicles to meet “just-in-time” demands of customers and scheduling problems caused by longer delivery times

- **Soft costs**
  - Business credibility
  - Expansion decisions
Oregon’s Economy

• Oregon’s Economy Relies on an Efficient Transportation System
  – 60% of Oregon’s workers have jobs in businesses that depend on the transportation system for their operation
  – “Traded Sectors” drive the economy in the Portland region and the state
  – Wholesale/distribution jobs are the highest wage earning jobs in the state
Oregon Investment

• The relative purchasing power of Oregon Transportation dollars has decreased 50% since 1973.
• Investment in modernization of the system has diminished over the last five years.
• Of the 15 states cited as “economic overachievers,” Oregon ranks last in transportation investment.
Need for Knowledge

• Provide Region with Strategic Planning Data
  – Commodity Mix, Tonnage
  – Growth Trends

• Provide Region with Truck Flow Data
  – Identify Future Problem Areas
  – Analyze Effectiveness of Potential Solutions
  – Set Project Priorities
Why a Commodity Based Model?

• Commodity Type Influences Transport Decisions
  – Type of Vehicle
  – Load Factors
  – Time of Day

• Forecasted Changes in Commodity Mix Influences Transport Characteristics

• Reload / Consolidation Requirements
Commodity Database

- Commodity Types Stratified by:
  - Weight Class: tons, containerized tons, non-containerized tons, TEU’s
  - Origin & Destinations: north, south, east, Portland, international
  - Primary Mode: ship, barge, rail, air, truck only
  - Truck Sub-Mode: truckload, LTL, private
Converting Tons to Trucks

**Commodity Class**
- TONS
- CONTAINERIZED TONS
- NON-CONTAINERIZED TONS
- TEUs

**Weight Class**
- TONS
- CONTAINERIZED TONS
- NON-CONTAINERIZED TONS
- TEUs

**Origin**
- NORTH
- SOUTH
- OTHER
- PORTLAND
- INTERNATIONAL

**Destination**
- PORTLAND
- OTHER
- NORTH
- INTERNATIONAL

**Primary Mode**
- SHIP
- BARGE
- RAIL
- AIR
- TRUCK ONLY

**Truck Sub-Mode**
- TRUCKLOAD
- LTL
- PRIVATE
Logic for Modeling System

- Commodity Flows Linked to Points of Entry
- Assessment of Reload Requirements
- Potential Destinations Defined
- Load Factors Applied to Convert Tonnage to Trucks
- Empty Truck Flows Estimated
- Total Truck Trips Assigned to Network and Validated Against Counts
Portland Commodity Flow Model System Process

Step 1: Commodity
- Market Segment
- Total Tons

Step 2: Arrival Mode
- Air
- Ship
- Rail
- Barge
- Truck

Step 3: Arrival Facility
- T6
- T4
- Ex1
- Ex2
- D1
- D2

Step 4: Destination Facility
- T6
- T4
- Ex1
- Ex2
- D1
- D2

Step 5: Step 6: Reload Facility

Step 7: Vehicle Equivalents
- LTL%
- TL%
- OT%
- Other

Step 8: Backhaul Trips

Step 9: Assign Trip Table

Simulate Trip Table

Compare to Classification Counts
Commodity Flow Findings

- Portland origin/destination freight volume to double by 2030

![Graph showing commodity flow findings](image-url)
Freight Mobility Largely Dependent Upon Trucks

Percent of Freight by Mode Used (measured in short tons)

1996 2030

- Rail
- Truck
- Water
- Air
Truck Percentage

9.1% 54% increase

3.4% 44% increase

8.3% 83% increase

4.3% 27% increase
Port-Related Forecasts

- Ocean projected to grow 3.7% annually
- Air volume to grow 4.2% annually
Conclusions

• Commodity Flows Follow Trade Corridors - Flows are Predominately Inter-Regional
  – Only 17% of the commodity flow tonnage is intra-regional
  – 83% is linked to points outside the region

• Through movement flows necessary to assess bottlenecks

• Strong Ties to Statewide, National and Economic Region Models are Critical to Freight Modeling