



## Congestion and Competitiveness – Portland, OR

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*Using Payment Innovations to Improve Transportation Networks*

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The findings for the presentation today were developed through extensive interviews and analysis conducted by the presenter, Steve Fitzroy, and EDRGroup, Inc. for the Portland Business Alliance, the Port of Portland, Portland Metro and the Oregon Department of Transportation.

The information developed through the interviews and the insights gained by these interviews led to a substantial reconfiguration and analysis of the metropolitan region's methods of determining the effects of congestion using their travel demand models. EDRGroup developed the estimates of economic impact using their economic models for the Portland region.

This study concluded, among other things, that the effects of congestion are already producing consequences on the regional and national competitiveness of the Portland region that will have long-term and significant effects. While congestion has a deleterious effect on daily commuters with significant impacts on their daily travel costs that may also affect their overall expenditures, congestion effects on business competitiveness have already produced decisions on capital investments, location of new facilities, and employment that may influence growth and economic viability of the region for decades to come.

All conclusions and content included in this presentation are those of the author and do not necessarily reflect the opinions of the sponsoring organizations or EDRGroup, Inc.



## Four Questions

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- What is the relationship between transportation and the regional economy?
- What are the effects of congestion on the economy?
- What are the effects of transportation investment on the region?
- What are the costs of congestion to the Portland, OR regional economy?

At the current Planned System improvement level of \$4 Billion over 20 years the results are:

- 212,000 hrs of additional vehicle time per day
- 55 million hrs of additional vehicle time per year
- 50 hours of additional lost time per household annually
- 6,500 permanent jobs

Additional investments in transportation system of \$6.2 billion

- Saves 118,000 hrs of delay per day
- Saves 30 million vehicle hrs of delay per year
- Saves 28 hrs of delay annually, per household

Also:

- Saves 6,500 Permanent jobs
- Provides 2,000-3,000 construction jobs annually
- \$844 million/yr total benefit
- At least a 2 to 1 return on investment



## Context of Business Study

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- What are the relationships between supply of transportation services and demands of businesses?
- What are the effects of congestion on business practices and decision-making?
- What have businesses done to manage their costs under current congested conditions?



## Cross-Cutting Issues

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- Closing “Window of Opportunity” in the Morning Peak Period
- Increased Costs of Inventory Management and Control
- Localized Effects of Land Use and New Development
- Externalized Effects of Start Times

### **Closing “Window of Opportunity” in the Morning Peak Period.**

Businesses have adjusted to the long-term effects of evening congestion by shifting operations to the early morning hours. This has proven effective for a variety of reasons and across a number of sectors. However, as morning travel demand continues to grow, available highway capacity is shrinking sufficiently to affect the operations of most of the businesses that have become dependent on efficiencies of operating in this time period. As there is no other feasible time period in which to operate, the effects of a saturated morning peak will result in a much more serious impact on business operations than the effective elimination of the evening peak hours.

### **Increased Costs of Inventory Management and Control.**

Most of the efficiencies in supply chain management over the past decade have been attributable to advances in inventory control and management of the flow of reliable information about the location of materials, components, and finished goods in the supply chain. Tight inventory controls and accurate accounting for inventory flows are a factor in both achieving profit margins and, arguably, in the ability of the national and regional economies in many parts of the US to weather the business cycle. The effects of congestion are eroding the significant progress that has been made in inventory management and control by re-introducing uncertainty in shipping and receiving attributable to the over-the-road and “last mile” portion of the supply chain system.

**Localized Effects of Land Use and New Development** - Warehousing was traditionally located in former “edge” areas of the region. Several firms that located in these relatively low-density, open spaces – even as recently as 7 to 10 years ago – are now facing congested roadways and difficulty with access to major arterials (turning movements from gates, ramp congestion). Expansion is limited both by new and proposed non-commercial land uses and by significantly higher land costs. Using existing facilities with greater intensity is limited to the physical capacity of existing space in transportation and warehousing operations (e.g., most trailers in use have increased from the 28’ to 40’ range to 53’).

Retailers and distributors located in and serving urban centers cite increasing difficulty with both deliveries and parking operations as residential activity and traffic congestion associated with “Smart Growth” increases. Early deliveries of merchandise made necessary by afternoon congestion (as noted above) means that complaints from nearby residential areas (e.g., noise, lack of on-street loading areas) have also increased. Increased mixed use, such as residential development near active port areas, have produced roadway congestion that is becoming more noticeable to businesses and manufacturing firms presently operating in these areas.

**Externalized effects of start times** - Most employers require employees to bear the costs of shifting start times to earlier hours. Any difficulty getting transportation to meet these demands is borne by the employees. Many employees are constrained in their ability to use transit because service cannot be economically offered early in the morning or late in the evenings – typically when early morning and swing shifts begin and end. As warehousing and transportation (driver) employees are dispersed around the region, and because route assignments often change throughout the year, the consistency of reporting times and more importantly return times for drivers in the afternoons, has seriously reduced the feasibility of car- and van-pools in the logistics and transportation industry, as well as the adoption of other traditional TDM strategies.



## Key Findings for Retail/Wholesale & Distribution

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- Regional Distribution Centers Moving Out Of Metro Region
- Shift Support Functions to Earlier Start Times
- Growth Constrained by Physical and Logistical Capacity
- Adding Smaller And More Numerous Delivery Vehicles
- Increased Inventory



### **Serving Growing Markets from Portland Is Becoming More Difficult**

Continued growth requires more efficient and expanding service to large markets in the Mid-West and East. Some firms (Columbia) have opened facilities as far away as Kentucky. Others, (Fisher Farms) serving customers 1,000 miles away find local congestion a major factor in extending market area.

### **Distribution Centers Generate Significant Traffic**

Over 6,000 truckloads per week (inbound + outbound) are required just to operate the Fred Meyer Distribution Warehouses on Highway 212.

### **Retailers Dictate Deliveries**

Home Depot cut back their 24/7 operating hours. Now, suppliers must deliver at pre-specified times during the day. As major retailers consolidate, they exert more pricing power and a greater ability to dictate delivery times based on their internal stocking schedules and staffing levels.

### **Growth Constrained by Physical and Logistical Capacity**

Future growth for many retailers in the region is being constrained by both physical expansion and logistics capacity. Most retailers have set goals for growth at 5% to 10% annually to maintain profit margins and market share. The addition of larger product inventory and more volume also contribute to this need for greater capacity. This requires more productivity from their fixed assets (space, labor and vehicles).

### **Vans and Outsourcing Loads**

Missed orders and delays mean lost customers. When larger trucks are held up or delayed, distributors dispatch small delivery vans or hire common carriers to fill missed or delayed shipments. While this keeps customers happy, it adds to costs and increases congestion on the region's roadways. Outsourcing can add 35% to delivery costs.

### **Increased Congestion Requires Increased Inventory**

Ore Pac Estimates that the effects of congestion in the past 3 to 4 years have forced them to increase inventory by 7% to 8%.



## Key Findings for Manufacturing Businesses

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- Earlier Start Times for Shift Workers
- More Conflicts with Non-Commercial Traffic
- Earlier Scheduled Deliveries/Shipments
- Increased Inventory
- Affects Production Elsewhere



### **Congestion Issue for Workers**

Manufacturing workers in Portland are reportedly more likely to complain about congestion because they have seen their commute times lengthen and their commute options as shift-workers are limited.

### **Local Street Design Factors**

Boeing must use smaller trucks to serve Northwest Portland because local streets and on-street parking limit available space for larger trucks. Gunderson and Schnitzer face significant delays while making turns into or out of manufacturing facilities near their waterfront operations. These areas are becoming more residentially oriented as Smart Growth initiatives are pursued at the regional level.

### **The Productivity Problem**

Schnitzer Steel supplies its McMinnville plant using scrap metal barged into the region and off-loaded to Terminal 4 at the Port of Portland. Maintaining production in McMinnville requires that 40 trucks make 3 round-trips (turns) per day. When congestion increases the time “per turn” either extra trucks or later runs have to be scheduled. Costs go up and productivity goes down.

### **“Last Call” for Outbound Shipments**

Intel has moved their last shipment departure time from 5:30PM to 3:30PM for outbound shipments through PDX in response to increased congestion. A missed flight means loss of inventory and production at the receiving location. Adjusting production for wafer manufacturing is extremely expensive. Intel is considering significant operational changes.

### **Delays in Portland Affect Global Production**

If Intel experiences delays or missed shipments, it can shut down a production line as far away as Costa Rica, China or the Philippines. These shutdowns can produce a ripple effect on world-wide production and testing operations. They may also have to pay inventory surcharges for various “non-chip” components and other penalties tied to production delays.



## Key Issues for Transportation & Warehousing Industries

- Warehousing Practices
- Delivery/Shipment Patterns
- Shift Starts and Relief Drivers
- Impaired Cross-Docking Operations
- Less Backhaul Efficiency
- Increased Stem Times
- Reduced Out-of-Region Capacity



### Warehousing Practices

While costs for drivers and equipment have increased as a share of overall expenditures, warehousing operations have become more efficient (using scanners, reducing labor per unit moved, and applying advanced methods for inventory control and management) compensating for congestion costs for the past several years. These efficiencies have approached their practical limits and future congestion is more likely to add to non-fuel costs and reduce productivity industry-wide.

### Delivery Productivity is Key to Efficiency

USF Reddaway depends on each driver making 15 to 20 deliveries per 8-hour shift. Increases in stem times and/or delays along the route of even ½ hour can mean missing 2 or more deliveries – even if there are no more congestion-related delays for the rest of the run.

### Delays Can Drive Up Costs If Hours-of-Service are Exceeded

The total cost per hour for a driver is between \$35 and \$55. Sending out a “rescue driver” can double or triple the hourly costs. Rescue driver dispatch usually occurs during periods of heavy congestion. So, costs for these operations can become very expensive. Assessments of cost of complying with safety initiative such as these neglect effects of congestion.

### Impaired Cross-Docking Operations

Efficiency and feasibility of cross-docking operations are tied to the ability of originators to deliver inbound loads within the window of time needed to reposition loads for outbound customers. Cross-docking operations are becoming widespread and more critical to lowering costs of transportation and logistics. Late inbound delivery creates storage and loading problems. As the communications and inventory control infrastructure improves, delivery reliability will become an even greater issue in the successful adoption of cross-docking in warehouse and logistics management.

### Less Backhaul Efficiency

Backhaul efficiencies are important to many transportation and logistics operations as the ability to support efficient backhauls reduces the number of vehicles, number of operators and time required for normal operations by these firms. Backhaul opportunities and efficiencies are more significantly impacted by afternoon congestion than outbound shipments. Thus, the vulnerability of backhauls to afternoon congestion is also greater. Many firms that developed sophisticated routing and logistics management practices integrating backhaul management into their processes have more recently noted increased overtime and the need for “rescue drivers” to conform to the new “hours of operation” requirements.

### Increased “Stem Times”

The time it takes to get from the warehouse to the first stop/delivery (stem time) has increased by about 50% in the past 5 to 8 years. This means that there are more vehicles on the road (to maintain and grow distribution and trucking markets) and routes are changed more often.

### New Warehouses Serve Markets Formerly Covered from Portland

SYSCO has recently opened a Spokane warehouse to serve eastern Washington and the Tri-Cities, as well as places in Oregon such as Pendleton and Milton-Freewater. These areas were historically served from Portland.



## Business & Transportation Choices

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- Public transit forecast to increase – especially for work commute trips
- Not all work trips – especially those in distribution/ transportation/ warehousing industries occur during normal transit hours of service
- Transit is not a solution for on-the-clock business travel





## Regional Competitiveness at Stake

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Focus of congestion reduction is on commuters and alternatives available to them. Most commuter “solutions” do not address the effects of congestion on competitiveness.

Business trips, especially trucks and service vehicles, remain ***“prisoners of congestion”***.



## Reports and Additional Documentation

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### The Cost of Congestion to the Economy of the Portland Region (December 2005)

- [http://www.portlandalliance.com/pdf/Congest\\_Exec\\_Summary.pdf](http://www.portlandalliance.com/pdf/Congest_Exec_Summary.pdf)
- [http://www.portlandalliance.com/pdf/Congestion\\_Report.pdf](http://www.portlandalliance.com/pdf/Congestion_Report.pdf)

### The Cost of Highway Limitations and Traffic Delay to Oregon's Economy (March 2007)

- <http://www.oregonbusinessplan.org/pdf/Statewide%20Study%20Exec%20Summary.pdf>
- <http://www.oregonbusinessplan.org/pdf/Statewide%20Study.pdf>

Also, see EDRGroup, Inc. Web Site at:

- <http://www.edrgroup.com/>