



**Washington State
Department of Transportation**

WASHINGTON DEPARTMENT OF TRANSPORTATION

Freight Customer Study

Summary Report

May 2007



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TABLE OF CONTENTS

RESEARCH BACKGROUND	2
Goal and Objectives.....	2
Methodology – Statewide	4
Methodology – National Freight.....	8
Multivariate Analysis.....	10
INDUSTRY PROFILE.....	12
Sample Map Where Company is Located.....	12
General Background - Employees	13
General Background - Revenue	14
Volume of Outbound Freight Moved.....	15
Handling Shipping and Freight Transport	16
IMPORTANCE OF STATE FREIGHT SYSTEM.....	18
SUPPLY CHAIN REQUIREMENTS AND PERFORMANCE.....	20
Single Most Important Requirement.....	20
“ON-TIME” Considerations	22
Satisfaction with Current Freight Performance (on the Most Important Requirement).....	23
How Shipping Problems Negatively Affect Business.....	25
Percent of Time Incurring Additional Expenses	27
MANUFACTURERS AND WHEAT GROWERS	29
Cost of Goods Sold and Cost of Logistics	29
FREIGHT DESTINATIONS WITHIN WA STATE - MAP.....	53
INBOUND FREIGHT DIRECTION.....	54
Freight Origins within WA State	54
Freight Origins Outside of WA State.....	55
NATIONAL FREIGHT COMPANIES	56
Single Most Important Requirement.....	56
Port that is Doing Best Job Meeting Expectations.....	57
Greatest Influence on Cargo Routing Decisions	58
Degree to Which Delays Affect Business.....	59
Satisfaction with On Time Performance.....	60
Number of Shipments	61
Frequency of Delays per Month	62
Percent of Time Incurred Additional Costs from Delays.....	63
Likelihood to Move Business Toward Seattle/Tacoma	64
Likelihood to Shift Business Away from Seattle/Tacoma	65
Impact of Tariffs on Foreign Port Decision	67
Importance of Attributes in Port Selection.....	68
Rating Quality of Rail Service by Major Port.....	69
Evaluating Likelihood to Cause Delay	70
Current and Preferred Delivery Time and On Time Definition	71
CONCLUSIONS	72
APPENDIX	77
Questionnaire – Statewide	77
Questionnaire – National Shippers	83

RESEARCH BACKGROUND

Goal and Objectives

The overall goal of this study was to understand how well the state transportation system is working for companies that rely heavily on shipping and/or receiving goods via truck, rail, sea or air – either singularly or in multi-modal forms. The results of the study will be used to propose improvements that will help reduce delays and improve efficiency in the state transportation system. This year the study included not only firms based in Washington and Portland but also national freight users who route freight shipments from Asia through West Coast ports.

Research Objectives – Statewide

The following objectives were addressed in conducting research for WA Department of Transportation:

- ◆ Determine the overall importance of the freight system to the operation of each business, including roads, rail, sea, barge or air.
- ◆ Examine if companies are internally transporting products or externally transporting their products by outsourcing to a freight carrier.
- ◆ Measure the volume of loads moved per month.
- ◆ Identify the single most important requirement of the supply chain.
- ◆ Analyze the satisfaction of the current performances in the single most important supply chain requirement and how it adversely affects business.
- ◆ Determine to what extent freight users are affected by the lack of performance in Washington State on their key service outcome.
- ◆ Identify how often firms incur additional expense from shipping problems.
- ◆ Examine definitions of “on time” deliveries.
- ◆ Understand what is the share of cost of goods sold that is transportation and what share is total logistics.
- ◆ Examine the general direction of travel of freight after leaving the local facility, the share of shipments and method of travel. Develop profiles of freight shipments originating in each industry cluster statewide.
- ◆ Analyze inbound freight points of origin and share based on location of businesses statewide that receive the freight.
- ◆ Understand the different needs of the industries based on regional locations.
- ◆ Examine how the freight industry has changed since the last study in 2004.

Research Objectives – National Freight User

- ◆ Examine sources of influence regarding cargo routing decisions.
- ◆ Evaluate the elements of the entry port decision, such as past experiences, cost, regulatory agencies, contract requirements, etc.
- ◆ Examine the causes of shipment delays and the ramifications of a late shipment.
- ◆ Gather firms’ definition of “on-time.”

- ◆ Measure satisfaction with level of current “on-time” delivery performance.
- ◆ Determine which West Coast port is currently performing the best job meeting needs.
- ◆ Evaluate the likelihood of switching business to the Ports of Seattle/Tacoma based on improved performance.
- ◆ Analyze the likelihood of shifting business away from Ports of Seattle/Tacoma under several scenarios of increased cost.
- ◆ Examine how the freight industry has changed since the last study in 1999.



Source: Google Graphics

RESEARCH BACKGROUND

Methodology – Statewide

A total of 450 businesses of a stratified probability sample were randomly interviewed by Hebert Research during the months of February and March, 2007. This method of sampling involves dividing the population into homogeneous subgroups, shown below, and then taking a simple random selection within each subgroup. Firms included represented higher-volume business users (i.e. “customers”) of the Washington State freight transportation system. A range of different industries were selected, all of which are directly or indirectly involved in making or receiving regular shipments of freight using the statewide transportation infrastructure of roads, highways, systems, rules and policies. The response rate, which represents the proportion of individuals who agreed to participate in the research, was 70.9%. The overall incidence rate, which represents the proportion of respondents who qualified to participate in the research was 67.0%.

Companies were selected from the following 4 industry groupings:

- Trucking
- Agriculture and wood products
- Manufacturing
- Wholesale

The sample was further segmented by the following geographic regions within Washington State and the Portland metro area:

- Spokane County
- SE Washington
- Vancouver/SW WA/Portland
- North Central Washington
- Northwest Washington (Whatcom, Skagit and San Juan Counties)
- Puget Sound
- Coastal Counties

The decision to include Portland firms in the Southwest Washington sample cell was based on the interconnectedness of the Portland and Vancouver/Southwest Washington economies. They are actually considered one metro area (Portland MSA) by the Census Bureau. Portland is one of the most important regional transportation hubs on the West Coast. Portland shippers such as manufacturers, common carrier trucking firms and distribution centers have a particular interest in Washington’s freight transportation system since their day-to-day business and future growth depends on maintaining cost-effective shipping routes that meet customer and market needs.

Companies were randomly selected both from among industry lists provided by the Washington State Department of Transportation and from available business databases maintained by Dun &

Bradstreet. Emphasis was placed on obtaining representative samples of the higher-volume freight users.

Quotas were established by industry cluster in order to obtain sufficient minimum sample cell sizes for analysis purposes. Within each cell, the interviews were conducted randomly and each individual sample is thus representative of the larger grouping of qualified businesses specified earlier.

The following table lists the industry clusters and number of interviews in each:

Segment	Interviews
NE WA Spokane manufacturers	23
NE WA/Spokane wood	7
NE WA/Spokane trucking	11
NE WA/Spokane wholesale	24
SE Agriculture	24
SW WA/Portland manufacturing	25
SW WA/Portland trucking	19
SW WA/Portland wholesale	25
N. Central WA manufacturing	27
N. Central WA agriculture	25
N. Central WA trucking	15
N. Central WA wholesale	26
NW Washington manufacturing	26
NW Washington wood	7
NW Washington trucking	15
Eastside manufacturing	25
South King/Pierce manufacturing	28
Eastside/South King trucking	30
Eastside/South King wholesale	36
Coastal Counties manufacturing	19
Coastal Counties wood	16
Total	453

Analysis of Freight Shipments and Direction by Cluster

Each of the 21 clusters profiled were independently analyzed based on their volume of freight and destinations. Estimates of freight volume for the cluster were made based on total companies in the population and an analysis of the distribution of volumes given by all firms in a cluster, adjusted for outliers. A “high” and a “low” confidence interval were also provided indicating the range of estimates within 2 Standard Deviations, at the 95 percent confidence level. A profile of the share of freight headed to various destination points was developed based on an analysis of the destinations noted by respondents along with the accompanying share of their total freight headed to each location named. Finally, an overall profile of freight shipped by destination was prepared for Washington State destinations, combining the profiles for each of the 21 clusters, weighted by the total volumes of shipments represented by each cluster.

Research Controls Used

Hebert Research applies a variety of research controls to help ensure that the research and analysis offered is of the highest quality that can be provided within the research budget. The primary research controls that were employed in the Center for Advanced Manufacturing feasibility study include the following:

Statistical Weighting

For the sample cells that were repeated from the 2004 study (10 out of 21), comparisons were made in this analysis in such areas as changes in cost of goods sold. Because of the relatively small sample sizes for individual industry/regional clusters, statistical weighting was used by size of firm (revenues and employees) to ensure that each of these 10 clusters in 2007 were statistically similar to the distribution found in the 2004 study.

Pre-Testing Interview Instrument

Hebert Research pre-tests the initial interview questionnaire among a small group of respondents to examine the effectiveness of the approach and questions, and develop minor improvements if needed to increase the quality of answers and ensure that the project objectives are met. In this case the pre-test involved over 20 manufacturing firms and revealed no significant problems.

Internal Peer Review

Hebert Research uses a “CERA” process—similar to academic peer review—to ensure that each study meets or exceeds rigorous quality control standards. Through this process, both junior and senior analysts review each analysis and offer critical feedback designed to reduce error and heighten the ability to generalize and apply research findings.

Research Assistant Training and Internal Controls

Hebert Research uses experienced Research Assistants both during working and after business hours to conduct telephone interviews among executives and managers of area firms. Each Research Assistant is trained when they begin working with the firm and they receive additional project-specific training at the beginning of each study. Only those interviewers with a past history of successful work on related types of projects were approved to work on this study. This helps to ensure that experienced and competent staff is involved in all phases of the project, thereby reducing the probability of error. Research Assistants are closely supervised throughout the data collection process. All data collection activities are overseen by the Director of Operations, who keeps the Senior Research Analyst, Research Director, and President apprised of the status of the project. A Research Analyst regularly reviews incoming data to ensure that they are accurate to the best of the firm’s knowledge and are being gathered in a manner that is consistent with quality control standards.

Avoiding Bias in Awareness of Hypotheses

Research Assistants, Junior Analysts and others within the firm remain “blind” (i.e., unaware) to hypotheses that have been developed by Senior Analysts, Directors and the President. This ensures that conscious and unconscious bias does not have an effect on the data-collection process.

The data were analyzed using generally accepted univariate measures of central tendency and dispersion. In questions where multiple responses were indicated, the totals in the graphs or charts may be greater than 100%, and only the most frequently stated responses may be reported. A complete list of responses can be found in the technical documentation. Questions for which multiple responses were accepted will be identified throughout the summary. Hebert Research has made every effort to produce the highest quality research product within the agreed specifications, budget and schedule. The customer understands that Hebert Research uses those statistical techniques, which, in its opinion, are the most accurate possible. However, inherent in any statistical process is a possibility of error, which must be taken into account in evaluating the results. Statistical research can predict consumer reaction and market conditions only as of the time of the sampling, within the parameters of the project, and within the margin of error inherent in the techniques used. Evaluations and interpretations of statistical research findings and decisions based on them are solely the responsibility of the customer and not Hebert Research. The conclusions, summaries and interpretations provided by Hebert Research are based strictly on the analysis of the data gathered, and are not to be construed as recommendations; therefore, Hebert Research neither warrants their viability nor assumes responsibility for the success or failure of any customer actions subsequently taken.



Source: Google Graphics

RESEARCH BACKGROUND

Methodology – National Freight

Hebert Research conducted 48 random interviews with logistics managers at national shipping companies that arrange for shipments of freight and make decisions on which ports to use. These interviews were conducted during March 2007 by Hebert Research's in-house business data collection staff. The companies contacted were selected from two sources. In order to reduce variability and increase comparability between the 1999 Hebert Research freight survey and the current one, the list of companies included in the previous survey were re-contacted and a segment of the 2007 sample consisted of these firms. The remaining companies included in the current sample were randomly selected from the comprehensive national database purchased by the Washington Department of Transportation called PIERS. The import section of the PIERS database was edited to isolate firms that shipped freight from Asia through West Coast ports on the way to their final destinations outside the West Coast.

The response rate for the national interviews was 90.0% and the incidence rate, of percentage of firms contacted that qualified by the freight usage criteria, was 87.0%.

The only demographic variable asked in the 1999 study was monthly shipments made. As the following table indicates, the 2007 sample is statistically similar to the previous sample.

Monthly Shipments	1999	2007
5 or less	34.0%	34.9%
6-10	13.7%	11.6%
11-15	6.8%	11.6%
16-20	13.5%	7.0%
21-50	14.0%	16.3%
51-100	12.5%	7.0%
More than 100	5.5%	11.6%
Median	11.7	12.0

One-half of the national shippers interviewed in 2007 classified themselves as a wholesale company, while 31.3% were manufacturers.

Type of Shipping Company	Percent
Wholesale	50.0%
Manufacturing	31.3%
Broker/Freight Company/Other	12.5%
Retail	6.3%

Annual revenues of the companies sampled in 2007 ranged from a few firms under \$1 million to 27.3% with \$100 million or more.

Annual Revenues	Percent
Under \$1 million	3.0%
\$1 - \$2.4 million	6.1%
\$2.5 - \$4.9 million	12.1%
\$5 - \$19.9 million	33.3%
\$20 to \$49.9 million	12.1%
\$75 to \$99.9 million	6.1%
\$100 million or more	27.3%



Source: Google Graphics

RESEARCH BACKGROUND

Multivariate Analysis

Multivariate analysis was conducted in order to examine differences among respondents according to specific pre- and post-classified segments, or groupings.

STATEWIDE

The statewide multivariates were as follows:

1. *Satisfaction with a company's performance in shipping and freight on the system requirement (such as "on time delivery") that was most important to their business*

- Highly satisfied (10)*
- Satisfied (8-9)
- Low or moderately satisfied (0-7)

2. *Major Geographic Region*

- NW WA/Central Puget Sound
- Vancouver: SW Washington
- Central Washington
- Eastern Washington
- Coastal Counties

3. *Major Industry*

- All Manufacturing (Puget Sound/SW WA/Spokane)
- All Trucking (Puget Sound/SW WA/Spokane)
- All Wholesale
- Wood and agriculture

**Note: Normally the 8-10 range of ratings is considered the "high" segment in analysis and reporting. However, the goal of multivariate analysis is to examine and test for differences between major segments of the population for a given question, and when one is trying to understand differences and segmentation, the size of the segments is actually more important than the ranges used. For example, if there are not enough cases in a standard grouping (i.e. 0-3, 4-7 or 8-10) to break it out separately, it will be merged with another group, and when the number of cases for a single standard segment (such as the "high" 8-10 group) is sufficiently large to support breaking out sub-groups, the analysis will be conducted with additional segments to test for any differences. In this case, there were enough businesses giving "10" ratings to justify testing for any differences between that sub-group and those giving ratings of 8-9 on the 0-10 scale.*

NATIONAL INTERVIEWS

1. *Level that business is adversely affected by shipping delays*

- Low to moderate effect (0-7)
- Highly affected (8-10)

2. Likelihood of Moving Business to Ports of Seattle/Tacoma with Improved Performance

- Low to moderate likelihood (0-7)
- High likelihood (8-10)

3. Major Industry

- Manufacturing
- Wholesale

Multivariate analysis is an advanced statistical technique used in the testing of hypotheses and measuring the degree of association between variables. It involves Chi Square, analysis of variance and appropriate tests of independence and association.

When differences between groups or variables are significant, the level of significance is reported as a “P” value. These values are commonly used in hypothesis testing and are relied upon to determine the reliability (i.e., the degree to which one can be certain) of a given finding or difference. This value describes the probability that an effect—for instance a difference between age—occurred due to chance or error. Thus, *low P values (i.e., those at or below .05) are indicative of high levels confidence and establish that the effect being observed can be relied upon in decision-making.* P values of .000 are the lowest commonly reported in the social sciences and thus are indicative of a very high level of decision-making reliability.

Interpretations and inferences set forth in the analysis are intended to provide an independent statistical perspective. The statistical procedures utilized were applied with a 0.95 confidence level for estimating values and/or providing significant inferences. A 0.05 significance level was used as the criterion to test hypotheses. Multivariate findings, when they are significant and meaningful, are indicated at the end of each section.

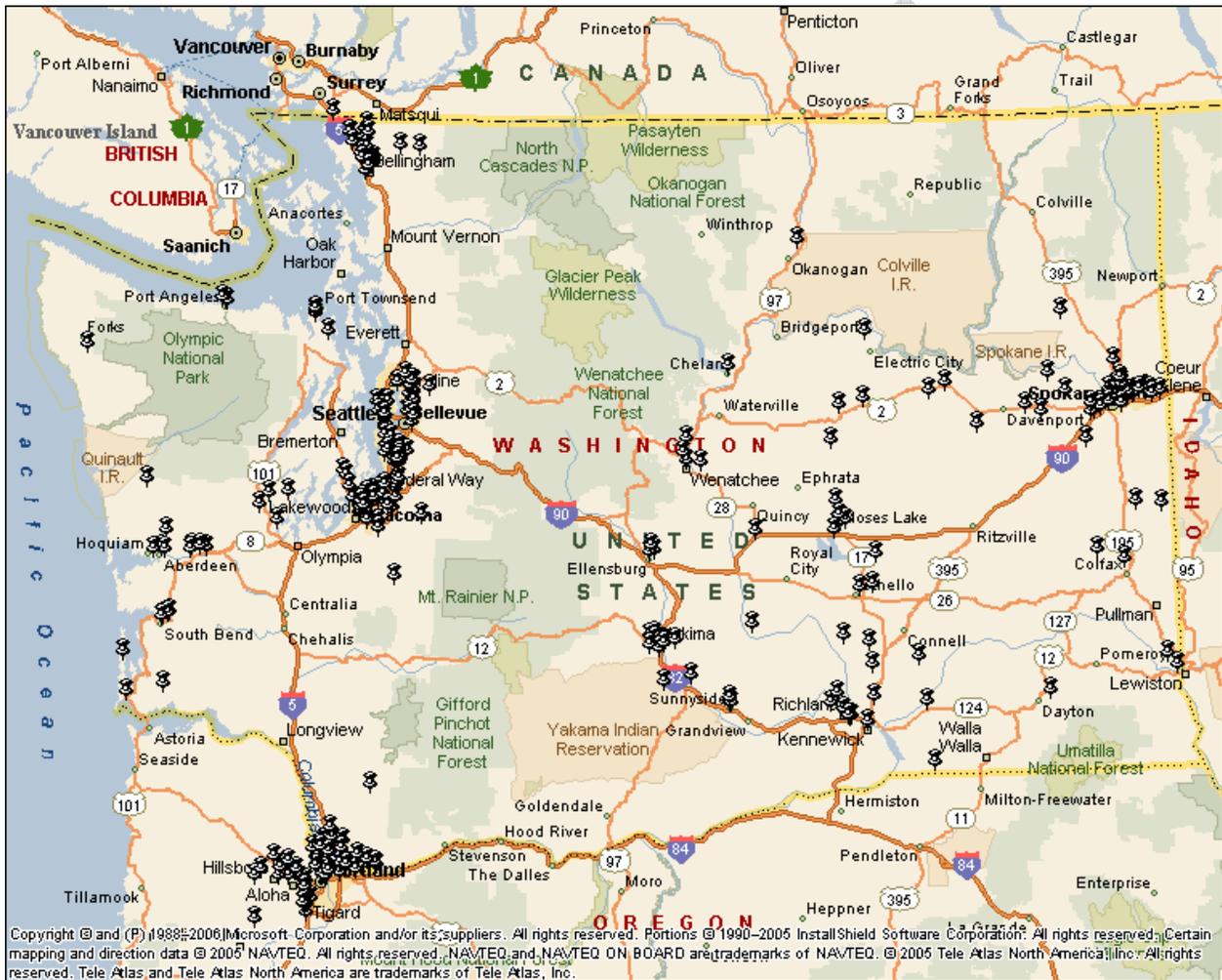
In addition to measures of significance in which differences have been determined at the 0.05 level, a measurement of association will also be reported. These measurements vary between 0 and 1. A measurement of 0 indicates the variable in question does not explain (or is not associated with) the dependent variable, and a measurement of 1 indicates that the variable explains all of the dependent variable.



INDUSTRY PROFILE

Sample Map Where Company is Located

The map shows the parameters of the sampling frame initially determined by Hebert Research and the client. The pushpins represent the location of those companies interviewed.



INDUSTRY PROFILE

General Background - Employees

The survey included a wide range of industries with varying sizes. The following table summarizes the distribution of firms by employee size across the major sectors and geographic regions. The median employment level generally ranged from 10 to 50.

Employees	Under 10	10-19 jobs	20-49 jobs	50-99 jobs	100-199 jobs	200+ jobs	Median
Eastern Washington							
Spokane Manufacturing	4.8%	9.5%	28.6%	23.8%	19.0%	14.3%	59.9
Spokane Wood	28.6%	14.3%	14.3%	14.3%	28.6%	0.0%	30.0
Spokane Trucking	11.1%	11.1%	33.3%	44.4%	0.0%	0.0%	32.0
Spokane Wholesale	0.0%	4.8%	52.4%	9.5%	19.0%	14.3%	40.0
SE WA Agriculture	27.3%	4.5%	13.6%	27.3%	13.6%	13.6%	55.0
Vancouver: SW Washington/Portland							
Vancouver: SW WA Manufacturing	31.8%	4.5%	27.3%	22.7%	13.6%	0.0%	33.9
Vancouver: SW WA Trucking	6.7%	13.3%	26.7%	20.0%	6.7%	26.7%	58.7
Vancouver: SW WA Wholesale	45.5%	22.7%	22.7%	9.1%	0.0%	0.0%	10.0
N. Central Washington							
N. Central Manufacturing	4.0%	12.0%	32.0%	28.0%	20.0%	4.0%	50.0
N. Central Agriculture	26.9%	3.8%	15.4%	53.8%	0.0%	0.0%	50.0
N. Central Trucking	14.3%	42.9%	21.4%	0.0%	0.0%	21.4%	16.5
N. Central Wholesale	30.4%	26.1%	17.4%	4.3%	13.0%	8.7%	15.0
Northwest Washington/Puget Sound							
Northwest WA Manufacturing	17.4%	17.4%	30.4%	17.4%	4.3%	13.0%	30.0
Northwest WA Wood	71.4%	0.0%	14.3%	14.3%	0.0%	0.0%	6.0
Northwest WA Trucking	0.0%	9.1%	36.4%	36.4%	18.2%	0.0%	50.0
Eastside/Central Puget Sound Manufacturing	0.0%	8.3%	50.0%	20.8%	8.3%	12.5%	33.2
South King Manufacturing	3.8%	19.2%	34.6%	23.1%	0.0%	19.2%	43.6
Eastside/Central Puget Sound Trucking	3.6%	17.9%	42.9%	21.4%	7.1%	7.1%	30.0
Eastside/Central Puget Sound Wholesale	40.0%	20.0%	26.7%	3.3%	3.3%	6.7%	12.0
Coastal Counties							
Coastal Counties Manufacturing	36.8%	10.5%	36.8%	5.3%	5.3%	5.3%	22.0
Coastal Counties Wood	60.0%	13.3%	13.3%	6.7%	0.0%	6.7%	9.0

INDUSTRY PROFILE

General Background - Revenue

The distribution of company revenues was summarized in the following table. The typical business surveyed had less than \$5 million in annual revenues, but a minority of firms in many industry clusters reported higher revenues up to \$75 million or more.

Revenues	Under \$5 million	\$5-\$19.9 million	\$20-\$49.9 million	\$50-\$74.9 million	\$75 million or more
Eastern Washington					
Spokane Manufacturing	42.2%	21.1%	26.3%	0.0%	10.5%
Spokane Wood	80.0%	0.0%	0.0%	0.0%	20.0%
Spokane Trucking	50.0%	37.5%	12.5%	0.0%	0.0%
Spokane Wholesale	40.0%	40.0%	6.7%	0.0%	13.3%
SE WA Agriculture	50.1%	0.0%	33.3%	16.7%	0.0%
Vancouver: SW Washington/Portland					
Vancouver: SW WA Manufacturing	44.4%	33.3%	0.0%	22.2%	0.0%
Vancouver: SW WA Trucking	36.4%	27.3%	0.0%	36.4%	0.0%
Vancouver: SW WA Wholesale	78.6%	14.3%	7.1%	0.0%	0.0%
N. Central Washington					
N. Central Manufacturing	62.0%	28.6%	4.8%	0.0%	4.8%
N. Central Agriculture	54.1%	8.3%	4.2%	33.3%	0.0%
N. Central Trucking	75.0%	8.3%	8.3%	8.3%	0.0%
N. Central Wholesale	73.8%	21.1%	5.3%	0.0%	0.0%
Northwest Washington/Puget Sound					
Northwest WA Manufacturing	70.5%	11.8%	11.8%	5.9%	0.0%
Northwest WA Wood	100.0%	0.0%	0.0%	0.0%	0.0%
Northwest WA Trucking	70.0%	20.0%	0.0%	0.0%	10.0%
Eastside/Central Puget Sound Manufacturing	42.8%	38.1%	14.3%	0.0%	4.8%
South King Manufacturing	57.1%	28.6%	4.8%	0.0%	9.5%
Eastside/Central Puget Sound Trucking	56.4%	21.7%	4.3%	0.0%	17.4%
Eastside/Central Puget Sound Wholesale	70.8%	16.7%	0.0%	4.2%	8.3%
Coastal Counties					
Coastal Counties Manufacturing	88.1%	5.9%	5.9%	0.0%	0.0%
Coastal Counties Wood	77.0%	15.4%	7.7%	0.0%	0.0%

INDUSTRY PROFILE

Volume of Outbound Freight Moved

Analysis:

The volume of freight moved or shipped each month directly relates to the type of industry and the function of each industry within the supply chain. Manufacturing firms' median shipments per month ranged from 15 to 50 loads depending on region. The agricultural industry averages 130 to 350 loads per month. The trucking industry (70-530 loads) is generally moving or shipping the most freight per month (p=.000). Examining differences by seasonality or time of year was not part of the scope of the research and therefore was not specially examined in this questionnaire.

Number of Outbound Loads per month	Under 5	5-9	10-29	30-49	50-99	100-499	500+	Median
Eastern Washington								
Spokane Manufacturing	27.3%	4.5%	36.4%	4.5%	4.5%	22.7%	0.0%	15
Spokane Wood	14.3%	14.3%	28.6%	14.3%	0.0%	28.6%	0.0%	20
Spokane Trucking	33.3%	0.0%	16.7%	0.0%	33.3%	16.7%	0.0%	69
Spokane Wholesale	9.1%	4.5%	18.2%	18.2%	4.5%	40.9%	4.5%	45
SE WA Agriculture	5.0%	5.0%	15.0%	0.0%	5.0%	70.0%	0.0%	130
Vancouver: SW Washington/Portland								
Vancouver: SW WA Manufacturing	31.8%	0.0%	9.1%	0.0%	31.8%	27.3%	0.0%	50
Vancouver: SW WA Trucking	0.0%	0.0%	13.3%	6.7%	0.0%	20.0%	60.0%	532
Vancouver: SW WA Wholesale	25.0%	12.5%	12.5%	8.3%	12.5%	25.0%	4.2%	28
N. Central Washington								
N. Central Manufacturing	37.5%	12.5%	8.3%	12.5%	12.5%	12.5%	4.2%	14
N. Central Agriculture	4.5%	0.0%	0.0%	4.5%	4.5%	45.5%	40.9%	350
N. Central Trucking	7.1%	0.0%	0.0%	14.3%	7.1%	35.7%	35.7%	300
N. Central Wholesale	30.4%	4.3%	13.0%	17.4%	8.7%	17.4%	8.7%	30
Northwest Washington/Puget Sound								
Northwest WA Manufacturing	14.3%	9.5%	28.6%	4.8%	23.8%	4.8%	14.3%	25
Northwest WA Wood	33.3%	0.0%	33.3%	0.0%	0.0%	33.3%	0.0%	15
Northwest WA Trucking	0.0%	9.1%	9.1%	0.0%	18.2%	27.3%	36.4%	200
Eastside/Central Puget Sound Manufacturing	47.8%	0.0%	4.3%	4.3%	21.7%	17.4%	4.3%	15
South King Manufacturing	17.9%	7.1%	25.0%	0.0%	7.1%	32.1%	10.7%	54
Eastside/Central Puget Sound Trucking	8.0%	0.0%	12.0%	8.0%	12.0%	28.0%	32.0%	141
Eastside/Central Puget Sound Wholesale	15.6%	9.4%	15.6%	9.4%	12.5%	37.5%	0.0%	45
Coastal Counties								
Coastal Counties Manufacturing	41.2%	11.8%	23.5%	11.8%	0.0%	5.9%	5.9%	8
Coastal Counties Wood	20.0%	13.3%	0.0%	20.0%	13.3%	20.0%	13.3%	30

INDUSTRY PROFILE

Handling Shipping and Freight Transport

Analysis:

Manufacturing and wholesalers are more likely to outsource for freight transportation. The trucking industry represents transportation service providers classified as contract carriers, which are more likely to handle their freight transportation needs internally (p=.000). However, even in the trucking industry there appears to be a segment that will at least occasionally outsource some part of their services to clients, especially in Spokane where firms may be working with national long-haul trucking vendors for shipments across country.

Handling Shipping and Freight Transportation	Internal	Outsource	Both	At Least Some Outsource
Eastern Washington				
Spokane Manufacturing	30.4%	65.2%	4.3%	69.5%
Spokane Wood	28.6%	28.6%	42.9%	71.5%
Spokane Trucking	36.4%	18.2%	45.5%	63.7%
Spokane Wholesale	13.0%	26.1%	60.9%	87.0%
SE WA Agriculture	54.2%	33.3%	12.5%	45.8%
Vancouver: SW Washington/Portland				
Vancouver: SW WA Manufacturing	32.0%	56.0%	12.0%	68.0%
Vancouver: SW WA Trucking	50.0%	50.0%	0.0%	50.0%
Vancouver: SW WA Wholesale	25.0%	41.7%	33.3%	75.0%
N. Central Washington				
N. Central Manufacturing	20.0%	44.0%	36.0%	80.0%
N. Central Agriculture	20.0%	8.0%	72.0%	80.0%
N. Central Trucking	60.0%	13.3%	26.7%	40.0%
N. Central Wholesale	19.2%	50.0%	30.8%	80.8%
Northwest Washington/Puget Sound				
Northwest WA Manufacturing	23.1%	53.8%	23.1%	76.9%
Northwest WA Wood	50.0%	33.3%	16.7%	50.0%
Northwest WA Trucking	73.3%	20.0%	6.7%	26.7%
Eastside/Central Puget Sound Manufacturing	37.5%	33.3%	29.2%	62.5%
South King Manufacturing	17.9%	46.4%	35.7%	82.1%
Eastside/Central Puget Sound Trucking	61.5%	15.4%	23.1%	38.5%
Eastside/Central Puget Sound Wholesale	47.2%	52.8%	0.0%	52.8%
Coastal Counties				
Coastal Counties Manufacturing	27.8%	33.3%	38.9%	72.2%
Coastal Counties Wood	31.3%	37.5%	31.3%	68.8%

Further analysis with the 2004 study indicated that the percentage of firms who only handle their shipments internally has been decreasing (40.7% to 35.1% averaging the 10 clusters). This means that the percentage of businesses that are doing at least some outsourcing has been on the increase among these 10 clusters. However, this trend was not seen in the case of Spokane manufacturers, Central Washington agriculture, Vancouver/SW Washington manufacturing and Eastside manufacturing. In these 4 clusters, the trend was toward more internal shipping. Shifts toward internal shipping can occur when the trucking industry in an area is able to raise prices significantly, and this causes the costs of internal shipping to appear more favorable.

Percent Handle Internally Only	2004	2007
Spokane Manufacturing	11.1%	30.4%
SE WA wheat growers	60.0%	54.2%
Columbia Basin/N. Central WA Ag.	13.3%	20.0%
Spokane Trucking	71.4%	36.4%
Vancouver: SW WA Manufacturing	11.7%	20.0%
Vancouver: SW WA Trucking	83.3%	50.0%
Eastside/Central Puget Sound Manufacturing	19.5%	37.5%
South Puget Sound Manufacturing	40.5%	17.9%
Puget Sound Trucking	71.4%	61.5%
NW Washington Manufacturing	25.0%	23.1%
Average	40.7%	35.1%

Further analysis demonstrated a significant relationship between satisfaction with the state’s freight system and whether a firm handles their freight internally. This can be attributed to the greater control, predictability, and convenience that internal freight allows. Those who gave the highest satisfaction rating of 10 were more likely to only do internal shipping (44.6%) while those with lower satisfaction (0-7 ratings) were significantly less likely (32.6%) as were those with moderately high ratings of 8-9 (33.1%). [p = .022; Cramer’s V = .119] This finding suggests that the internal/external decision is a critical one that will affect costs as well as general satisfaction with the state’s infrastructure.

There were significant differences by geographic region in the percentage handling their freight internally. Those firms from NW Washington (40.4%) and SE Washington (58.3%) were much more likely to say “internally only” to this question. [p=.001; Cramer’s V = .191]

Not surprisingly, trucking firms were much more likely to report handling their shipping in-house (57.5%) compared to 37.2% of wood/agriculture, 29.8% of manufacturing and 28.4% of wholesalers. [p=.000; Cramer’s V = .186]

IMPORTANCE OF STATE FREIGHT SYSTEM

Analysis:

Overall, the state freight system and infrastructure is perceived as being “highly important” (8-10 rating) to the success and growth of each company interviewed, however, this does not hold true across every specific geographic area and industry. A lower rating was found in the Spokane and Northwest WA wood industries, 8.43 and 7.29 respectively, as well as the Spokane wholesale industry (7.91). The average (mean) rating ranged from 7.29 to 9.93.

Importance Ratings of the States Freight System	Not Important (0-3 rating)	Moderately Important (4-7 rating)	Highly Important (8-10 rating)	Mean
Eastern Washington				
Spokane Manufacturing	4.3%	4.3%	91.3%	9.08
Spokane Wood	0.0%	14.3%	85.7%	8.43
Spokane Trucking	0.0%	0.0%	100.0%	9.93
Spokane Wholesale	13.0%	17.4%	69.6%	7.91
SE WA Agriculture	0.0%	0.0%	100.0%	9.77
Vancouver: SW Washington/Portland				
Vancouver: SW WA Manufacturing	0.0%	12.0%	88.0%	9.14
Vancouver: SW WA Trucking	0.0%	5.3%	94.7%	9.63
Vancouver: SW WA Wholesale	4.0%	4.0%	92.0%	8.92
N. Central Washington				
N. Central Manufacturing	0.0%	14.8%	85.2%	8.89
N. Central Agriculture	0.0%	0.0%	100.0%	9.83
N. Central Trucking	0.0%	6.7%	93.3%	9.33
N. Central Wholesale	3.8%	3.8%	92.3%	9.27
Northwest Washington/Puget Sound				
Northwest WA Manufacturing	0.0%	15.4%	84.6%	8.88
Northwest WA Wood	14.3%	14.3%	71.4%	7.29
Northwest WA Trucking	0.0%	0.0%	100.0%	9.87
Eastside/Central Puget Sound Manufacturing	0.0%	26.1%	73.9%	8.31
South King Manufacturing	3.6%	14.3%	82.1%	8.63
Eastside/Central Puget Sound Trucking	0.0%	10.0%	90.0%	9.59
Eastside/Central Puget Sound Wholesale	5.7%	11.4%	82.9%	8.83
Coastal Counties				
Coastal Counties Manufacturing	5.6%	22.2%	72.2%	8.33
Coastal Counties Wood	0.0%	12.5%	87.5%	9.38

Further analysis showed significant differences by major industry. Trucking firms (9.65 mean) and Wood/agriculture firms (9.39 mean) gave significantly higher ratings than did manufacturers (8.80) and wholesalers (8.76). [p=.000; Eta Squared = .040]

Comparisons with the 2004 study revealed minimal differences that were within the margin of error for the research. The most significant mean ratings have increased over SE WA Agriculture and SW WA Manufacturing.

Avg. Importance Rating	2004	2007
Spokane Manufacturing	9.19	9.08
SE WA Agriculture	9.53	9.77
N. Central Agriculture	9.60	9.83
Spokane Trucking	9.86	9.93
Vancouver: SW WA Manufacturing	8.73	9.14
Vancouver: SW WA Trucking	9.37	9.63
Eastside/Central Puget Sound Manufacturing	8.73	8.31
South Puget Sound Manuf.	8.45	8.63
Puget Sound Trucking	9.21	9.59
NW Washington Manufacturing	9.31	8.88
Average	9.20	9.28

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SUPPLY CHAIN REQUIREMENTS AND PERFORMANCE

Single Most Important Requirement

Analysis:

The majority of firms (across geographic and industry lines) reported that their single most important supply chain requirement was either cost, “on-time” deliveries or predictable travel time. Very few other requirements were mentioned with the exception of the agricultural producers. Twenty-two percent of SE Washington agriculture producers named capacity in refrigerated trucks to ensure product quality and 29.2% of North Central agriculture producers named rail capacity. When asked about the average speed of move at a certain level only the South King County manufacturing (3.7%) identified it as a requirement. Similarly, 3.7% of South King County manufacturing listed adequate storage at the right location as a requirement. These are two of the requirements needed for businesses using Just-In-Time inventories. Adequate storage was also seen within the Northwest WA wood industry (16.7%).

Requirement	Cost per move	On time delivery w/in window	Predictable travel time	Average speed of move at certain level	Flexibility	All weather freight system accessible year round	Capacity in refrigerated trucks year round	General rail capacity	Adequate storage at the right location
Eastern Washington									
Spokane Manufacturing	31.8%	45.5%	13.6%	0.0%	0.0%	9.1%	0.0%	0.0%	0.0%
Spokane Wood	28.6%	57.1%	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%	0.0%
Spokane Trucking	0.0%	75.0%	16.7%	0.0%	8.3%	0.0%	0.0%	0.0%	0.0%
Spokane Wholesale	23.8%	57.1%	9.5%	0.0%	9.5%	0.0%	0.0%	0.0%	0.0%
SE WA Agriculture	21.7%	39.1%	0.0%	0.0%	13.0%	4.3%	21.7%	0.0%	0.0%
Vancouver: SW Washington/Portland									
Vancouver: SW WA Manufacturing	18.2%	72.7%	4.5%	0.0%	4.5%	0.0%	0.0%	0.0%	0.0%
Vancouver: SW WA Trucking	5.9%	52.9%	29.4%	0.0%	5.9%	5.9%	0.0%	0.0%	0.0%
Vancouver: SW WA Wholesale	29.2%	62.5%	8.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
N. Central Washington									
N. Central Manufacturing	44.4%	44.4%	3.7%	0.0%	3.7%	3.7%	0.0%	0.0%	0.0%
N. Central Agriculture	50.0%	4.2%	0.0%	0.0%	0.0%	8.3%	4.2%	29.2%	0.0%
N. Central Trucking	23.1%	61.5%	7.7%	0.0%	7.7%	0.0%	0.0%	0.0%	0.0%
N. Central Wholesale	26.1%	60.9%	0.0%	0.0%	8.7%	4.3%	0.0%	0.0%	0.0%
Northwest Washington/Puget Sound									
Northwest WA Manufacturing	18.2%	54.5%	13.6%	0.0%	9.1%	4.5%	0.0%	0.0%	0.0%
Northwest WA Wood	33.3%	33.3%	0.0%	0.0%	16.7%	0.0%	0.0%	0.0%	16.7%
Northwest WA Trucking	6.7%	80.0%	6.7%	0.0%	6.7%	0.0%	0.0%	0.0%	0.0%
Eastside/Central Puget Sound Manufacturing	20.0%	64.0%	4.0%	0.0%	12.0%	0.0%	0.0%	0.0%	0.0%
South King Manufacturing	37.0%	33.3%	7.4%	3.7%	7.4%	3.7%	3.7%	0.0%	3.7%
Eastside/Central Puget Sound Trucking	15.4%	53.8%	23.1%	0.0%	3.8%	0.0%	0.0%	3.8%	0.0%
Eastside/Central Puget Sound Wholesale	22.6%	64.5%	6.5%	0.0%	3.2%	3.2%	0.0%	0.0%	0.0%
Coastal Counties									
Coastal Counties Manufacturing	27.8%	27.8%	27.8%	5.6%	5.6%	0.0%	5.6%	0.0%	0.0%
Coastal Counties Wood	28.6%	50.0%	7.1%	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%

Additional analysis indicated a statistically significant relationship between the system requirement chosen and satisfaction with the state’s freight system. Those with the highest satisfaction (10 rating) were much more likely to name “on-time delivery” (71.4%) as compared to those with moderate (51.8%) or low (34.6%) satisfaction. Cost per move was also cited more frequently among those with lower satisfaction than by those with higher satisfaction ratings. [p = .000; Cramer’s V = .287]

Preferences for system requirements also varied significantly by geographic region. Firms from N. Central Washington were more likely to mention cost per move (37.9%). On-time delivery was mentioned less often among N. Central WA (40.2%), Coastal Counties (37.5%) and SE WA (31.8%) and more often among Spokane (55.7%), SW WA (59.4%), NW WA (61.4%) and Puget Sound (56.5%). [p=.000; Cramer's V = .238]

Wood or agricultural firms were significantly more likely to cite cost per move as their top requirement (33.8%) and were significantly less likely to mention on-time performance (29.7%). [p=.000; Cramer's V = .274]

Cost per move appears to have become less important since 2004 as a requirement, which can be attributed to increased delays and the importance of predictable and timely deliveries (which were also highly rated). The trucking industry has seen the largest change in importance of cost per move because of the time sensitivity of the deliveries with an average of 32.6% in 2004 to 7.1% in 2007 among all regions. The one major exception was Central Washington producers, who shifted from mentioning other factors first to mentioning cost per move as a top criteria.

Percent Citing Cost per Move	2004	2007
Spokane Manufacturing	25.90%	31.80%
SE WA wheat growers	53.30%	21.70%
Columbia Basin/N. Central WA Ag.	16.70%	50.00%
Spokane Trucking	35.70%	0.00%
Vancouver: SW WA Manufacturing	30.00%	18.20%
Vancouver: SW WA Trucking	30.00%	5.90%
Eastside/Central Puget Sound Manufacturing	17.10%	20.00%
South Puget Sound Manufacturing	31.00%	37.00%
Puget Sound Trucking	32.10%	15.40%
NW Washington Manufacturing	31.30%	18.20%
Average	30.31%	21.82%

SUPPLY CHAIN REQUIREMENTS AND PERFORMANCE

“ON-TIME” Considerations

Analysis:

What is considered “on-time” in one industry does not always hold true for other industries. Manufacturing firms are generally content to deal with 24 hour windows of delivery time, while common carrier trucking firms are generally much more time-sensitive in their expectation for delivery times (i.e. 1-2 hour delivery windows).

Amount of Time Late a Delivery is Considered to be "On Time"	Under 30 min	30-59 min	1-1.9 hours	2-2.9 hours	3-7.9 hours	8-11.9 hours	12-23.9 hours	24 hours	More than 24 hours	Median Hours
Eastern Washington										
Spokane Manufact.	0.0%	0.0%	28.6%	0.0%	0.0%	9.5%	0.0%	52.4%	9.5%	24.0
Spokane Wood	14.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	71.4%	14.3%	24.0
Spokane Trucking	18.2%	0.0%	54.5%	9.1%	9.1%	0.0%	0.0%	9.1%	0.0%	1.5
Spokane Wholesale	4.2%	0.0%	20.8%	4.2%	8.3%	8.3%	0.0%	50.0%	4.2%	24.0
SE WA Agriculture	12.5%	0.0%	41.7%	0.0%	0.0%	0.0%	0.0%	41.7%	4.2%	1.5
Vancouver: SW Washington/Portland										
Vancouver: SW WA Manuf.	0.0%	0.0%	36.0%	0.0%	0.0%	8.0%	4.0%	44.0%	8.0%	18.0
Vancouver: SW WA Trucking	5.6%	0.0%	27.8%	0.0%	0.0%	0.0%	0.0%	38.9%	27.8%	19.4
Vancouver: SW WA Wholesale	0.0%	0.0%	32.0%	4.0%	0.0%	8.0%	0.0%	52.0%	4.0%	24.0
N. Central Washington										
N. Central Manufacturing	7.7%	0.0%	34.6%	0.0%	3.8%	0.0%	0.0%	53.8%	0.0%	24.0
N. Central Agriculture	4.0%	0.0%	12.0%	4.0%	4.0%	0.0%	0.0%	68.0%	8.0%	24.0
N. Central Trucking	20.0%	6.7%	40.0%	0.0%	6.7%	0.0%	0.0%	26.7%	0.0%	1.5
N. Central Wholesale	8.3%	0.0%	45.8%	0.0%	0.0%	0.0%	0.0%	41.7%	4.2%	1.5
NW Washington/Puget Sound										
Northwest WA Manufacturing	8.3%	8.3%	12.5%	0.0%	4.2%	8.3%	0.0%	50.0%	8.3%	24
Northwest WA Wood	0.0%	0.0%	57.1%	0.0%	0.0%	0.0%	0.0%	28.6%	14.3%	1.5
Northwest WA Trucking	0.0%	13.3%	40.0%	6.7%	0.0%	0.0%	0.0%	40.0%	0.0%	1.5
Eastside/Central Puget Sound Manuf.	0.0%	0.0%	25.0%	0.0%	8.3%	0.0%	0.0%	54.2%	12.5%	24
South King Manufacturing	9.7%	0.0%	29.0%	3.2%	3.2%	3.2%	3.2%	45.2%	3.2%	19.8
Eastside/Central Puget Sound Trucking	3.4%	3.4%	48.3%	0.0%	0.0%	0.0%	0.0%	37.9%	6.9%	1.5
Eastside/Central Puget Sound Wholesale	5.7%	0.0%	48.6%	2.9%	2.9%	0.0%	0.0%	34.3%	5.7%	1.5
Coastal Counties										
Coastal Counties Manufacturing	5.9%	0.0%	23.5%	11.8%	11.8%	5.9%	0.0%	35.3%	5.9%	5.5
Coastal Counties Wood	0.0%	6.3%	50.0%	6.3%	6.3%	6.3%	0.0%	12.5%	12.5%	1.5

SUPPLY CHAIN REQUIREMENTS AND PERFORMANCE

Satisfaction with Current Freight Performance (on the Most Important Requirement)

Analysis:

On average, the satisfaction of industries with their current level of shipping/freight performance on the supply chain requirement most important to them (see page 20) was generally moderate to high (ranging from 6.15 to 8.79 on the 0-10 scale). Only two industry clusters were below 7.0 in average ratings: North Central agriculture and Coastal Counties wood products.

Satisfaction Ratings of Current Performance with the Most Important Supply Chain Requirement	Not Satisfied (0-3 rating)	Moderately Satisfied (4-7 rating)	Satisfied (8-10 rating)	Mean
Eastern Washington				
Spokane Manufacturing	0.0%	9.10%	90.90%	8.79
Spokane Wood	0.0%	14.30%	85.70%	8.00
Spokane Trucking	0.0%	36.40%	63.60%	8.06
Spokane Wholesale	0.0%	23.80%	76.20%	8.33
SE WA Agriculture	19.00%	14.30%	66.70%	7.05
Vancouver: SW Washington/Portland				
Vancouver: SW WA Manufacturing	0.0%	15.00%	85.00%	8.66
Vancouver: SW WA Trucking	0.0%	25.00%	75.00%	8.47
Vancouver: SW WA Wholesale	8.30%	16.70%	75.00%	7.67
N. Central Washington				
N. Central Manufacturing	3.70%	48.10%	48.10%	7.44
N. Central Agriculture	0.0%	60.00%	40.00%	6.75
N. Central Trucking	0.0%	35.70%	64.30%	7.79
N. Central Wholesale	4.30%	34.80%	60.90%	7.78
Northwest Washington/Puget Sound				
Northwest WA Manufacturing	0.0%	22.70%	77.30%	8.29
Northwest WA Wood	0.0%	50.00%	50.00%	8.00
Northwest WA Trucking	0.0%	13.30%	86.70%	8.73
Eastside/Central Puget Sound Manufacturing	0.0%	50.00%	50.00%	7.77
South King Manufacturing	3.70%	44.40%	51.90%	7.11
Eastside/Central Puget Sound Trucking	12.00%	36.00%	52.00%	7.27
Eastside/Central Puget Sound Wholesale	0.0%	15.60%	84.40%	8.44
Coastal Counties				
Coastal Counties Manufacturing	0.0%	38.90%	61.10%	7.61
Coastal Counties Wood	23.10%	23.10%	53.80%	6.15

Additional analysis found significant differences in ratings by geographic region. The regions giving the lowest ratings included Coastal Counties (7.00), followed by N. Central Washington (7.39) and SE Washington (7.41). Spokane (8.39) and NW Washington (8.39) gave the highest ratings. [p=.001; Eta Squared = .053]

Differences by major industry were also significant. Trucking (8.04), wholesale (8.08) and manufacturing firms (7.95) were generally more satisfied and wood/agriculture firms were less satisfied (7.06). [p=.000; Eta Squared = .035]

While there were some apparent shifts in satisfaction ratings within certain industry clusters, these were generally within the margin of error for the research. Overall, satisfaction in the 10 clusters were relatively consistent between 2004 and 2007. The only exceptions were in the N. Central WA agriculture industry and SW WA Trucking industry, both of which shifted the importance of requirements to the business.

Avg. Satisfaction Rating	2004	2007
Spokane Manufacturing	8.33	8.79
SE WA wheat growers	7.43	7.05
Columbia Basin/N. Central WA Ag.	7.72	6.75
Spokane Trucking	7.38	8.06
Vancouver: SW WA Manufacturing	8.23	8.66
Vancouver: SW WA Trucking	7.43	8.47
Eastside/Central Puget Sound Manufacturing	7.73	7.77
South Puget Sound Manufacturing	7.58	7.11
Puget Sound Trucking	6.89	7.27
NW Washington Manufacturing	7.94	8.29
Average	7.67	7.82

SUPPLY CHAIN REQUIREMENTS AND PERFORMANCE

How Shipping Problems Negatively Affect Business

Analysis:

Companies were asked to rate the extent to which problems with their performance in the most important area (such as cost per move or on-time delivery) negatively affected their business. As can be expected, the results generally varied by industry. Firms that primarily exist to move freight generally were affected to a greater degree than firms who perform other functions, but manufacturing firms were also heavily impacted due to their greater cost competitiveness, efficiencies from lean manufacturing, and general traffic issues and its affect on travel times. In particular, the heavy congestion and unpredictability of travel times in the Puget Sound corridor contributed to South King County manufacturing firms giving higher ratings. Spokane trucking is also adversely affected, due to a farther distance to travel, by traffic congestions and conditions of mountain passes. One exception was Central Washington agriculture; because of their low margins, special shipping needs, reliance on trucks and global price competition, they tend to be more sensitive to problems in shipping. Average ratings ranged from 4.3 to 9.2 on the 0-10 scale, with common carrier trucking firms, North Central agriculture and South Puget Sound manufacturing firms giving the highest ratings. Eastside/Central Puget Sound wholesale and manufacturing gave the lowest ratings of impact.

Degree to which problems or difficulties adversely affect business	Not Affected (0-3 rating)	Moderately Affected (4-7 rating)	Affected (8-10 rating)	Mean
Eastern Washington				
Spokane Manufacturing	28.60%	28.60%	42.90%	5.60
Spokane Wood	0.00%	66.70%	33.30%	6.33
Spokane Trucking	0.00%	10.00%	90.00%	9.24
Spokane Wholesale	33.30%	23.80%	42.90%	5.38
SE WA Agriculture	21.10%	21.10%	57.90%	6.51
Vancouver: SW Washington/Portland				
Vancouver: SW WA Manufacturing	15.80%	26.30%	57.90%	6.38
Vancouver: SW WA Trucking	31.30%	18.80%	50.00%	5.70
Vancouver: SW WA Wholesale	29.20%	33.30%	37.50%	5.54
N. Central Washington				
N. Central Manufacturing	33.30%	29.60%	37.00%	5.74
N. Central Agriculture	8.30%	12.50%	79.20%	7.93
N. Central Trucking	28.60%	14.30%	57.10%	6.29
N. Central Wholesale	39.10%	17.40%	43.50%	5.57
Northwest Washington/Puget Sound				
Northwest WA Manufacturing	27.30%	31.80%	40.90%	5.85
Northwest WA Wood	33.30%	0.00%	66.70%	5.67
Northwest WA Trucking	33.30%	6.70%	60.00%	6.13
Eastside/Central Puget Sound Manufacturing	39.10%	34.80%	26.10%	4.53
South King Manufacturing	3.70%	37.00%	59.30%	7.44
Eastside/Central Puget Sound Trucking	25.00%	8.30%	66.70%	6.99
Eastside/Central Puget Sound Wholesale	53.60%	25.00%	21.40%	4.25
Coastal Counties				
Coastal Counties Manufacturing	29.40%	47.10%	23.50%	5.12
Coastal Counties Wood	21.40%	28.60%	50.00%	6.50

Overall, freight users noted increases in impacts on their business, comparing the 2007 study with the previous 2004 study. The average statewide rating rose from 5.65 to 6.62 on the 0-10 scale. Some of the factors that are impacting business are travel times, traffic congestion, as well as general mobility and the affects on delivery times, productivity, and in the case of the agriculture industry, product quality. Increases were seen in every cluster except Eastside manufacturing.

Avg. Rating of Impact	2004	2007
Spokane Manufacturing	4.25	5.60
SE WA wheat growers	5.50	6.51
Columbia Basin/N. Central WA Ag.	6.68	7.93
Spokane Trucking	6.75	9.24
Vancouver: SW WA Manufacturing	4.93	6.38
Vancouver: SW WA Trucking	5.69	5.70
Eastside/Central Puget Sound Manufacturing	4.83	4.53
South Puget Sound Manufacturing	6.27	7.44
Puget Sound Trucking	6.48	6.99
NW Washington Manufacturing	5.13	5.85
Average	5.65	6.62

Further analysis showed that those firms highly satisfied with the state’s freight system (10 rating) gave significantly lower ratings of impact (mean = 4.22) than did those with moderately high (6.37) or lower satisfaction (7.03). [p=.000; Eta Squared = .102] The measure of association (Eta Squared) indicates that 10% of satisfaction is a function of how negatively they are impacted.

Wood/agriculture firms (6.82) and trucking firms (6.58) gave significantly higher ratings of impact (mean 6.82) compared to manufacturing (5.97) and wholesale (5.14) firms. [p=.007; Eta Squared = .030]

SUPPLY CHAIN REQUIREMENTS AND PERFORMANCE

Percent of Time Incurring Additional Expenses

Analysis:

Companies that indicated greater adverse impacts on their business from shipping problems also tended to encounter these problems more often than other firms. Common carrier trucking firms, manufacturers, wholesalers and N. Central Washington growers indicated the highest percentages that they typically encounter additional expenses from shipping delays and other problems (12-23 percent of the time).

Percent of Time Spend Incurring Additional Expenses to Recover from Shipping Problems	0%	1-4%	5-9%	10-19%	20-49%	50-100%	Mean
Eastern Washington							
Spokane Manufacturing	11.1%	50.0%	16.7%	11.1%	5.6%	5.60%	6.89
Spokane Wood	20.0%	20.0%	40.0%	20.0%	0.0%	0.0%	4.40
Spokane Trucking	0.0%	10.0%	40.0%	20.0%	20.0%	10.00%	19.80
Spokane Wholesale	19.0%	23.8%	14.3%	23.8%	9.5%	9.50%	12.57
SE WA Agriculture	50.0%	14.3%	0.0%	7.1%	28.6%	0.00%	11.08
Vancouver: SW Washington/Portland							
Vancouver: SW WA Manufacturing	20.0%	20.0%	5.0%	20.0%	20.0%	15.0%	14.78
Vancouver: SW WA Trucking	8.3%	41.7%	8.3%	33.3%	8.3%	0.0%	8.08
Vancouver: SW WA Wholesale	33.3%	23.8%	0.0%	23.8%	9.5%	9.5%	11.76
N. Central Washington							
N. Central Manufacturing	19.0%	33.3%	9.5%	28.6%	4.8%	4.80%	9.52
N. Central Agriculture	38.9%	0.0%	5.6%	22.2%	16.7%	16.70%	22.50
N. Central Trucking	33.3%	16.7%	16.7%	8.3%	16.7%	8.30%	9.67
N. Central Wholesale	15.0%	25.0%	25.0%	10.0%	20.0%	5.00%	11.95
NW Washington/Puget Sound							
Northwest WA Manufacturing	7.70%	15.40%	7.70%	23.10%	38.50%	7.70%	16.30
Northwest WA Wood	28.60%	42.90%	14.30%	0.00%	0.00%	14.30%	8.29
Northwest WA Trucking	7.10%	57.10%	14.30%	7.10%	7.10%	7.10%	12.07
Eastside/Central Puget Sound Manufacturing	24.00%	32.00%	16.00%	8.00%	12.00%	8.00%	10.33
South King Manufacturing	0.00%	8.70%	60.90%	8.70%	21.70%	0.00%	8.45
Eastside/Central Puget Sound Trucking	17.40%	43.50%	4.30%	21.70%	4.30%	8.70%	11.09
Eastside/Central Puget Sound Wholesale	16.00%	52.00%	8.00%	16.00%	4.00%	4.00%	7.32
Coastal Counties							
Coastal Counties Manufacturing	26.70%	13.30%	13.30%	20.00%	13.30%	13.30%	15.00
Coastal Counties Wood	37.50%	12.50%	25.00%	0.00%	25.00%	0.00%	7.19

Comparisons with the 2004 study showed no significant differences for the overall state. There were some apparent shifts within individual industry clusters, in some cases toward improvement and in other cases growing worse, but these were generally within the margin of error. One of the reasons for decreases in percentage is that trucking firms, such as in the Puget Sound, are able to adapt their pricing and services to clients to adjust for increasing costs of delays. Conversely, some of the increases in percentage are in regions that are being affected more by travel times and traffic congestion, and these industries have yet to adjust and adapt their pricing and services to clients. Once these changes have been priced into their business model, they incur fewer “additional” expenses because a greater percentage of delays have become “normal.”

Percent of Time Incur Expense	2004	2007
Spokane Manufacturing	7.2%	6.9%
SE WA wheat growers	15.0%	11.1%
Columbia Basin/N. Central WA Ag.	17.2%	22.5%
Spokane Trucking	12.2%	19.8%
Vancouver: SW WA Manufacturing	5.5%	14.8%
Vancouver: SW WA Trucking	12.1%	8.1%
Eastside/Central Puget Sound Manufacturing	8.3%	10.3%
South Puget Sound Manufacturing	8.8%	8.5%
Puget Sound Trucking	23.9%	11.1%
NW Washington Manufacturing	10.4%	16.3%
Average	12.1%	12.9%

Additional analysis showed that those with the highest satisfaction (10 rating) for the state’s freight system incurred the additional expenses the least amount of time (5.09%). In contrast, those with lower (0-7 ratings) satisfaction indicated that 22.6% of the time they incurred additional expenses. [p=.000; Eta Squared = .105]

MANUFACTURERS AND WHEAT GROWERS

Cost of Goods Sold and Cost of Logistics

Analysis:

Manufacturers and wheat growers were asked about the relative share of cost of goods sold (COGS) that represents the transportation and total logistics cost. While there were a few differences in transportation costs, total logistics costs were not significantly different across the industry clusters. Transportation costs varied from 6-20 percent and total logistics costs varied between 5 and 24 percent of the total cost of goods sold. The highest logistics cost appears to be borne by agricultural producers in SE Washington and N. Central Washington. Comparisons with the previous survey point to across the board increases in costs over the last three years.

Area	Transp. Cost 2004	Transp. Cost 2007	Total Logistics Cost 2004	Total Logistics Cost 2007
NE WA Spokane manufacturers	6.4%	12.8%	11.2%	20.0%
NE WA/Spokane wood	na	10.0%	na	15.0%
SE Agriculture	8.4%	14.4%	12.3%	23.6%
SW WA/Portland manufacturing	11.9%	13.5%	12.7%	20.9%
N. Central WA manufacturing	na	14.9%	na	18.6%
N. Central WA agriculture	na	20.2%	na	23.0%
NW Washington manufacturing	8.9%	16.6%	11.9%	22.2%
Eastside manufacturing	8.5%	7.4%	11.7%	11.9%
South King/Pierce manufacturing	14.1%	14.2%	16.0%	18.0%
Coastal Counties manufacturing	na	9.9%	na	13.4%
Coastal Counties wood	na	6.0%	na	5.0%

Note: Outliers were removed above 50% for transportation and above 60% for total logistics in both samples

Multivariate analysis indicated significant differences in the transportation share of cost of goods sold by region. Firms in the Central Washington region (including clusters not shown in the comparison table above) indicated a higher average percentage (25.87%) than did companies in the other regions of the state. [p=.000; Eta Squared = .285]

Significant differences were also seen for total logistics costs, with Central Washington and SE Washington reporting higher shares (28.41%, 29.14% respectively). [p=.001; Eta Squared = .169]

Wood/agriculture firms reported significantly higher percentages for transportation (23.19) and logistics (29.71) compared to manufacturing firms (11.46, 17.48). [p=.000; Eta Squared = .170 and .132, respectively]

OUTBOUND FREIGHT DIRECTION & METHOD

NE WA/Spokane Manufacturers

The 227 Spokane manufacturing firms ship an estimated 5,257 loads per month. They generally ship twice as many loads of freight out of state (64.7%) as within Washington (35.3%). The top two destinations within the state are Tri-Cities (11.0%) and Central Puget Sound (10.3%). California through Oregon was the largest specified area out of state, with 14.6%, followed by Midwest (4.5%). Two-thirds (65.9%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	23.16	227	5,257

Destination in Washington State	Share
Tri - Cities (road or rail)	11.0%
Central Puget Sound (road or rail)	10.3%
Spokane Airport	9.0%
Ports of Seattle/Tacoma (sea)	5.1%
Spokane (road or rail)	3.5%
Greater Bellingham area/Whatcom or Skagit County (road or rail)	2.1%
N. Central WA	1.7%
Canada Border (Road or rail)	1.0%
Tri - Cities (road or rail)	0.6%
TOTAL	44.3%
Destination Out of State	Share
Nationwide	22.3%
California through Oregon (road and rail)	14.6%
Worldwide	4.4%
The Midwest (road or rail)	4.5%
East coast	3.5%
Mountain States (ID, CO, NE, ETC.)	2.9%
Portland area (road or rail)	2.3%
Alaska	0.6%
South (road or rail)	0.3%
Other Southwest states (road or rail)	0.2%
TOTAL	55.7%

The following table profiles the methods of transport used by Spokane manufacturers:

Method of Transport	Share
Truck to customer or destination	68.1%
Truck to truck	14.1%
Truck to rail	1.0%
Truck to barge or ship	6.2%
Truck to air	9.0%
Rail to truck	1.0%
Rail to barge	0.6%



Source: Google Graphics

OUTBOUND FREIGHT DIRECTION & METHOD

NE WA/Spokane Wood

The 64 NE WA/Spokane wood firms ship an estimated 1,227 loads per month. They ship around twice as many loads of freight out of state (67.1%) as within Washington (32.9%). The top three destinations within the state are Spokane, Ports of Seattle/Tacoma and Tri Cities (each at 10.1%). The South was the largest specified area out of state, with 53.2%, followed by Portland (13.9%). All of the freight shipped is sent by truck.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	19.17	64	1,227

Destination in Washington State	Share
Spokane (road or rail)	10.1%
Ports of Seattle/Tacoma (sea)	10.1%
Tri - Cities (road or rail)	10.1%
SeaTac International Airport (air)	2.5%
TOTAL	32.9%
Destination Out of State	Share
South (road or rail)	53.2%
Portland area (road or rail)	13.9%
TOTAL	67.1%

Method of Transport	Share
Truck to customer or destination	50.0%
Truck to truck	50.0%

OUTBOUND FREIGHT DIRECTION & METHOD

NE WA/Spokane Trucking

The 48 Spokane manufacturing firms ship an estimated 3,082 loads per month. Three out of four loads are generally shipped to out of state destinations (75.2%) while 24.8% are sent to the Puget Sound region within Washington. California through Oregon was the largest specified area out of state, with 23.4%, followed by East coast (12.4%). A total of 94.2% of the freight shipped is made by truck to the customer or to another truck. Six percent is sent by truck to barge or ship.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	64.20	48	3,082

Destination in Washington State	Share
Central Puget Sound (road or rail)	24.8%
TOTAL	24.8%
Destination Out of State	Share
Nationwide	37.2%
California through Oregon (road and rail)	23.4%
East coast	12.4%
South (road or rail)	1.6%
Other Southwest states (road or rail)	0.6%
TOTAL	75.2%

Method of Transport	Share
Truck to customer or destination	57.2%
Truck to truck	37.0%
Truck to barge or ship	5.9%

OUTBOUND FREIGHT DIRECTION & METHOD

NE WA/Spokane Wholesale

The 130 Spokane wholesale firms ship an estimated 10,884 loads per month. They generally ship twice as many loads of freight within the state (67.3%) as outside of Washington (32.7%). The top two destinations within the state are Spokane (31.7%) and Central Puget Sound (10.4%). The Portland area was the largest specified area out of state, with 10.0%, followed by Mountain States (9.5%). Seventy-nine percent (79.3%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	83.72	130	10,884

Destination in Washington State	Share
Spokane (road or rail)	31.7%
Central Puget Sound (road or rail)	10.4%
Spokane Airport	9.2%
Tri - Cities (road or rail)	5.4%
Ports of Seattle/Tacoma (sea)	5.0%
N. Central WA	3.7%
Greater Bellingham area /Whatcom or Skagit County (road or rail)	1.5%
SE WA	0.5%
TOTAL	67.3%
Destination Out of State	Share
Portland area (road or rail)	10.0%
Mountain States (ID, CO, NE, ETC.)	9.5%
Nationwide	7.6%
East coast	1.8%
Oregon (road or rail)	1.5%
California through Oregon (road and rail)	1.5%
The Midwest (road or rail)	0.7%
TOTAL	32.7%

Method of Transport	Share
Truck to customer or destination	79.3%
Truck to truck	7.7%
Truck to barge or ship	3.8%
Truck to air	9.2%

OUTBOUND FREIGHT DIRECTION & METHOD

SE WA Agriculture

The 116 SE Washington agriculture firms ship an estimated 13,642 loads per month. They generally ship twice as many loads of freight in state (69.4%) as out of state (30.6%). The top two destinations within the state are the Ports of Seattle/Tacoma (39.3%) and N. Central Washington (15.1%). The Portland area was the largest specified area out of state, with 12.6%, followed by Mountain states (3.1%). The freight volume was roughly split into truck to customer (45.8%) and truck to barge (42.0%).

Volume Shipped per Month	Average	Firms	Total
Number of Loads	117.6	116	13,642

Destination in Washington State	Share
Ports of Seattle/Tacoma (sea)	39.3%
N. Central WA	15.1%
SE Washington	7.3%
Spokane (road or rail)	3.4%
Tri - Cities (road or rail)	2.7%
Canada Border (road or rail)	1.0%
Central Puget Sound (road or rail)	0.6%
TOTAL	69.4%
Destination Out of State	Share
Portland area (road or rail)	12.6%
Nationwide	7.7%
Mountain States (ID, CO, NE, ETC.)	3.1%
World wide	2.7%
Ports of Portland, Kalama, Vancouver	2.6%
California through Oregon (road or rail)	1.6%
Oregon (road or rail)	0.4%
TOTAL	30.6%

Method of Transport	Share
Truck to truck	10.6%
Truck to rail	0.7%
Truck to barge or ship	87.8%
Rail to truck	0.8%

Note: Approximately 45% of those shipping supplies designated locations such as grain terminals as a customer or final destination. However, to correspond with the reality of the SE WA Agricultural region, these methods would later be transferred to barge or ship providing the largest share (87.8%).

OUTBOUND FREIGHT DIRECTION & METHOD ***SW WA/Portland Manufacturing***

The 1281 SW Washington/Portland manufacturing firms ship an estimated 66,202 loads per month. They generally ship twice as many loads of freight out of state (64.7%) as within Washington (35.3%). The top two destinations within the state are Tri-Cities (11.0%) and Central Puget Sound (10.3%). California through Oregon was the largest specified area out of state, with 14.6%, followed by Midwest (4.5%). Two-thirds (65.9%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	51.68	1281	66,202

Destination in Washington State	Share
SW WA/Vancouver Area	6.2%
Central Puget Sound (road or rail)	6.1%
Ports of Seattle/Tacoma (sea)	6.0%
SeaTac International Airport (air)	4.5%
Greater Bellingham area /Whatcom or Skagit County (road or rail)	0.2%
TOTAL	23.0%
Destination Out of State	Share
Nationwide	19.7%
Portland International Airport (air)	12.5%
Portland area (road or rail)	11.5%
East coast	10.3%
The Midwest (road or rail)	9.5%
Oregon (road or rail)	7.6%
California through Oregon (road and rail)	2.5%
South (road or rail)	1.5%
Ports of Portland , Kalama, Vancouver	1.0%
Mountain States (ID, CO, NE, ETC.)	1.0%
TOTAL	77.1%

Method of Transport	Share
Truck to customer or destination	48.4%
Truck to truck	21.6%
Truck to barge or ship	12.9%
Truck to air	17.0%

OUTBOUND FREIGHT DIRECTION & METHOD

SW WA/Portland Trucking

The 113 firms in the SW Washington/Portland manufacturing cluster ship an estimated 44,809 loads per month. They generally ship twice as many loads of freight out of state (62.2%) as within Washington (37.8%). The top two destinations within the state are the Ports of Seattle/Tacoma (37.8%) and Central Puget Sound (16.1%). Oregon was the largest specified area out of state, with 9.5%, followed by Portland International Airport (6.7%) and the Portland area (6.7%). Seventy-two percent (71.5%) of the freight shipped follows the truck to customer or truck to truck method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	396.54	113	44,809

Destination in Washington State	Share
Ports of Seattle/Tacoma (sea)	16.6%
Central Puget Sound (road or rail)	16.1%
Canada Border (road or rail)	1.7%
Greater Bellingham area /Whatcom or Skagit County (road or rail)	1.7%
SW WA/Vancouver area	1.7%
TOTAL	37.8%
Destination Out of State	Share
Nationwide	28.2%
Oregon (road or rail)	9.5%
Portland International Airport (air)	6.7%
Portland area (road or rail)	6.7%
East coast	4.7%
Ports of Portland, Kalama, Vancouver	2.7%
California through Oregon (road and rail)	2.2%
Other Southwest states (road or rail)	1.3%
TOTAL	62.2%

Method of Transport	Share
Truck to customer or destination	37.5%
Truck to truck	34.4%
Truck to rail	1.5%
Truck to barge or ship	18.9%
Truck to air	6.7%
Rail to truck	0.6%
Rail to barge	0.4%

OUTBOUND FREIGHT DIRECTION & METHOD ***SW WA/Portland Wholesale***

The 2,386 wholesale firms in the SW Washington/Portland area ship an estimated 144,926 loads per month. One-quarter (24.6%) of their freight is generally shipped in state compared to 75.4% that leaves the state. The top destinations within the state include Central Puget Sound (17.4%), followed by Coastal Counties (3.4%) and Canada border (3.3%). Portland was the largest specified area out of state, with 23.9%, followed by the east coast (8.0%). Three-quarters (75.8%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	60.74	2386	144,926

Destination in Washington State	Share
Central Puget Sound (road or rail)	17.4%
Coastal Counties	3.4%
Canada Border (Road or rail)	3.3%
Spokane (road or rail)	0.3%
N Central WA	0.2%
Greater Bellingham area /Whatcom or Skagit County (road or rail)	0.1%
TOTAL	24.6%
Destination Out of State	Share
Portland area (road or rail)	23.9%
Nationwide	15.2%
East coast	8.0%
Oregon (road or rail)	7.0%
The Midwest (road or rail)	6.6%
Mountain States (ID, CO, NE, ETC.)	6.0%
Ports of Portland , Kalama, Vancouver	3.9%
California through Oregon (road and rail)	3.5%
Alaska	0.7%
South (road or rail)	0.5%
Other Southwest states (road or rail)	0.2%
TOTAL	75.4%

Method of Transport	Share
Truck to customer or destination	75.8%
Truck to truck	19.2%
Truck to rail	0.4%
Truck to barge or ship	4.5%
Truck to air	0.1%

OUTBOUND FREIGHT DIRECTION & METHOD

Central WA Manufacturing

The 106 Central WA manufacturing firms ship an estimated 3,203 loads per month. They generally ship almost three times as many loads of freight out of state (72.4%) as within Washington (27.6%). The top destination within the state is the Central Puget Sound (17.7%). Portland area was the largest specified area out of state, with 24.4%, followed by Oregon (7.2%). Seventy-nine percent (79.2%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	30.22	106	3,203

Destination in Washington State	Share
Central Puget Sound (road or rail)	17.7%
Coastal Counties	3.5%
Canada Border (Road or rail)	3.3%
SeaTac International Airport (air)	2.6%
Spokane (road or rail)	0.3%
N Central WA	0.2%
TOTAL	27.6%
Destination Out of State	Share
Portland area (road or rail)	24.4%
Nationwide	14.4%
Oregon (road or rail)	7.2%
East coast	6.7%
The Midwest (road or rail)	6.2%
Mountain States (ID, CO, NE, ETC.)	5.0%
Ports of Portland , Kalama, Vancouver	3.9%
California through Oregon (road and rail)	3.2%
Alaska	0.7%
South (road or rail)	0.5%
Other Southwest states (road or rail)	0.2%
TOTAL	72.4%

Method of Transport	Share
Truck to customer or destination	79.2%
Truck to truck	11.4%
Truck to rail	2.4%
Truck to barge or ship	4.0%
Truck to air	2.6%
Rail to truck	0.4%

OUTBOUND FREIGHT DIRECTION & METHOD

Central WA Agriculture

The 177 Central Washington agriculture firms ship an estimated 38,144 loads per month. They generally ship 69% of their loads of freight in state and another 31% out of state. The top two destinations in Washington are the Canada border (29.8%), Spokane (14.5%) and Ports of Seattle/Tacoma (10.7%). The Ports of Portland/Kalama/Vancouver was the top out of state destination (18.1%). Forty percent (40.0%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	215.50	177	38,144

Destination in Washington State	Share
Canada Border (Road or rail)	29.8%
Spokane (road or rail)	14.5%
Ports of Seattle/Tacoma (sea)	10.7%
N. Central WA	8.5%
N Central WA	3.1%
SeaTac International Airport (air)	1.7%
Tri - Cities (road or rail)	0.3%
Central Puget Sound (road or rail)	0.3%
TOTAL	68.8%
Destination Out of State	Share
Ports of Portland, Kalama, Vancouver	18.1%
Nationwide	7.9%
South (road or rail)	4.6%
Oregon (road or rail)	0.6%
TOTAL	31.2%

Method of Transport	Share
Truck to customer or destination	40.0%
Truck to truck	1.6%
Truck to rail	26.7%
Truck to barge or ship	24.7%
Truck to air	1.7%
Rail to truck	0.3%
Rail to barge	5.1%

OUTBOUND FREIGHT DIRECTION & METHOD

Central WA Trucking

The 47 Central Washington trucking firms ship an estimated 15,201 loads per month. They generally ship 72% of their freight in state and 28% out of state. The top two destinations within the state are the Central Puget Sound (32.4%) and Ports of Seattle/Tacoma (19.0%). California through Oregon was the largest specified area out of state, with 5.7%, followed by Mountain states (4.7%). Nearly three-fourths (73.4%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	323.43	47	15,201

Destination in Washington State	Share
Central Puget Sound (road or rail)	32.4%
Ports of Seattle/Tacoma (sea)	19.0%
N. Central WA	17.1%
SW WA/Vancouver area	1.4%
Tri - Cities (road or rail)	1.0%
Spokane (road or rail)	1.0%
TOTAL	71.9%
Destination Out of State	Share
Worldwide	13.8%
California through Oregon (road and rail)	5.7%
Mountain States (ID, CO, NE, ETC.)	4.7%
Portland area (road or rail)	3.0%
Oregon (road or rail)	1.0%
TOTAL	28.1%

Method of Transport	Share
Truck to customer or destination	73.6%
Truck to truck	3.6%
Truck to rail	3.8%
Truck to barge or ship	19.0%

OUTBOUND FREIGHT DIRECTION & METHOD

Central WA Wholesale

The 956 Central Washington wholesale firms ship an estimated 25,210 loads per month. Three quarters (75.1%) of this volume is sent to a location in state while 24.9% is sent elsewhere. The top destination within the state is the local North Central Washington region (51.0%), which is to be expected given that wholesalers typically serve their own region primarily. Out of state locations mentioned included the Mountain states and East coast. Sixty-one percent (61.7%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	26.37	956	25,210

Destination in Washington State	Share
N. Central WA	51.0%
Spokane (road or rail)	5.2%
SW WA/Vancouver area	6.3%
Central Puget Sound (road or rail)	3.8%
SeaTac International Airport (air)	3.5%
Ports of Seattle/Tacoma (sea)	2.7%
Tri - Cities (road or rail)	2.5%
TOTAL	75.1%
Destination Out of State	Share
Nationwide	9.2%
Mountain States (ID, CO, NE, ETC.)	4.8%
East coast	4.6%
Portland area (road or rail)	4.1%
Oregon (road or rail)	1.1%
California through Oregon (road and rail)	1.1%
TOTAL	24.9%

Method of Transport	Share
Truck to customer or destination	61.7%
Truck to truck	25.8%
Truck to rail	0.8%
Truck to barge or ship	6.9%
Truck to air	3.5%
Rail to truck	0.8%
Rail to barge	0.6%

OUTBOUND FREIGHT DIRECTION & METHOD

NW WA Manufacturing

The 381 manufacturing firms in the NW Washington (greater Bellingham) region ship an estimated 9,075 loads per month. They generally ship 60% of their freight in state and 40% out of state. The top two destinations within the state are the local NW Washington area (28.5%), followed by Central Puget Sound (11.5%). California through Oregon was the largest specified area out of state, with 21.9%, followed by the East coast (9.9%). Three-quarters (76.2%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	23.82	381	9,075

Destination in Washington State	Share
NW Wash. Area (Road or Rail)	28.5%
Central Puget Sound (road or rail)	11.5%
Ports of Seattle/Tacoma (sea)	7.2%
Bellingham Airport (air)	7.1%
Greater Bellingham area /Whatcom or Skagit County (road or rail)	3.3%
Canada Border (Road or rail)	2.8%
TOTAL	60.4%
Destination Out of State	Share
California through Oregon (road and rail)	21.9%
Nationwide	9.9%
East coast	7.9%
TOTAL	39.6%

Method of Transport	Share
Truck to customer or destination	76.4%
Truck to truck	9.4%
Truck to rail	3.8%
Truck to barge or ship	3.2%
Truck to air	7.1%

OUTBOUND FREIGHT DIRECTION & METHOD

NW WA Wood

The 28 NW Washington timber and wood products companies ship an estimated 797 loads per month. The majority of their freight remains within the state (54.2%). The top two destinations within the state are Spokane (47.0%) and North Central Washington (7.2%). Among the out of state freight shipped, no one area was specified. Three quarters (74.5%) of the freight shipped follows the truck to customer method and 20.5% is moved from truck to ship or barge.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	28.45	28	797

Destination in Washington State	Share
Spokane (road or rail)	47.0%
N. Central WA	7.2%
TOTAL	54.2%
Destination Out of State	Share
Nationwide	45.8%
TOTAL	45.8%

Method of Transport	Share
Truck to customer or destination	74.5%
Truck to barge or ship	20.5%
Rail to barge	5.0%

OUTBOUND FREIGHT DIRECTION & METHOD

NW WA Trucking

The 50 Northwest Washington trucking firms ship an estimated 14,150 loads per month. They generally ship more loads in state (57.0%) as compared to out of state (43.0%). The top three destinations within the state are the local NW Washington area (14.4%), Ports of Seattle/Tacoma (9.0%) and Spokane (9.0%). Among the out of state locations, most mentioned having customers broadly distributed nationwide or worldwide. A smaller segment mentioned Midwest, Portland or California through Oregon. Forty-four percent (44.3%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	283.00	50	14,150

Destination in Washington State	Share
NW Wash. Area (Road or Rail)	14.4%
Ports of Seattle/Tacoma (sea)	9.0%
Spokane (road or rail)	9.0%
Central Puget Sound (road or rail)	8.1%
Canada Border (Road or rail)	8.1%
Bellingham Airport (air)	7.4%
Greater Bellingham area /Whatcom or Skagit County (road or rail)	0.9%
TOTAL	57.0%
Destination Out of State	Share
Nationwide	21.6%
Worldwide	7.2%
The Midwest (road or rail)	6.8%
Portland area (road or rail)	3.6%
California through Oregon (road and rail)	2.3%
Mountain States (ID, CO, NE, ETC.)	1.5%
TOTAL	43.0%

Method of Transport	Share
Truck to customer or destination	44.4%
Truck to truck	29.6%
Truck to barge or ship	4.8%
Truck to air	7.5%
Rail to truck	8.5%
Rail to barge	5.2%

OUTBOUND FREIGHT DIRECTION & METHOD

Eastside Manufacturing

The 279 Eastside manufacturers ship an estimated 10,298 loads per month. Over seventy percent (71.1%) of this volume is sent to a location statewide, with the remainder send out of state (28.9%). The single major destination within the state is Central Puget Sound (44.6%), followed by SeaTac International Airport (14.4%) and Ports of Seattle/Tacoma (9.5%). California through Oregon (13.9%) was the largest specified area out of state. Fifty-nine percent (58.6%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	36.91	279	10,298

Destination in Washington State	Share
Central Puget Sound (road or rail)	44.6%
SeaTac International Airport (air)	14.4%
Ports of Seattle/Tacoma (sea)	9.5%
Greater Bellingham area /Whatcom or Skagit County (road or rail)	1.4%
Canada Border (Road or rail)	1.1%
N Central WA	0.1%
TOTAL	71.1%
Destination Out of State	Share
California through Oregon (road and rail)	13.9%
Nationwide	6.1%
World wide	3.1%
East coast	1.4%
South (road or rail)	1.3%
The Midwest (road or rail)	1.3%
Other Southwest states (road or rail)	1.0%
Oregon (road or rail)	0.8%
TOTAL	28.9%

Method of Transport	Share
Truck to customer or destination	58.6%
Truck to truck	16.8%
Truck to rail	0.8%
Truck to barge or ship	9.5%
Truck to air	14.4%

OUTBOUND FREIGHT DIRECTION & METHOD

South King/Pierce Manufacturing

The 1301 South King/Pierce County manufacturing firms ship an estimated 111,704 loads per month. The majority of it (58.0%) is headed within the state and 42.0% is headed out of state. The top two destinations within the state are the local Central Puget Sound region (31.2%), followed by the Ports of Seattle/Tacoma (13.4%) and SeaTac International Airport (9.0%). California through Oregon was the largest specified area out of state (17.0%). Two-thirds (65.0%) of the freight shipped follows the truck to customer method, with smaller segments using marine and air transport.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	85.86	1301	111,704

Destination in Washington State	Share
Central Puget Sound (road or rail)	31.2%
Ports of Seattle/Tacoma (sea)	13.4%
SeaTac International Airport (air)	9.0%
NW Wash. Area (Road or Rail)	3.3%
Canada Border (Road or rail)	0.9%
Spokane (road or rail)	0.2%
TOTAL	58.0%
Destination Out of State	Share
California through Oregon (road and rail)	17.0%
Nationwide	16.9%
The Midwest (road or rail)	8.0%
Mountain States (ID, CO, NE, ETC.)	0.1%
TOTAL	42.0%

Method of Transport	Share
Truck to customer or destination	65.0%
Truck to truck	6.7%
Truck to rail	3.3%
Truck to barge or ship	13.4%
Truck to air	9.8%
Rail to truck	1.4%
Rail to barge	0.4%

OUTBOUND FREIGHT DIRECTION & METHOD

Eastside/South King Trucking

The 239 Eastside and South King County trucking firms ship an estimated 95,820 loads per month. They ship the majority of their freight (59.1%) in state and 40.8% out of state. The top two destinations within the state are the Central Puget Sound (20.5%) and SeaTac International Airport (17.2%). California through Oregon was the largest specified area out of state, with 8.2%, followed Mountain states (3.7%). Fifty-three percent (53.1%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	400.92	239	95,820

Destination in Washington State	Share
Central Puget Sound (road or rail)	20.5%
SeaTac International Airport (air)	17.2%
Ports of Seattle/Tacoma (sea)	7.3%
Spokane (road or rail)	4.7%
Tri - Cities (road or rail)	3.9%
Vancouver, WA area (north of Columbia River)	1.9%
NW Wash. Area (Road or Rail)	1.6%
Greater Bellingham area /Whatcom or Skagit County (road or rail)	1.3%
N Central WA	0.8%
TOTAL	59.1%
Destination Out of State	Share
Nationwide	26.0%
California through Oregon (road and rail)	8.2%
Mountain States (ID, CO, NE, ETC.)	3.7%
Oregon (road or rail)	1.6%
Portland area (road or rail)	1.3%
TOTAL	40.9%

Method of Transport	Share
Truck to customer or destination	53.1%
Truck to truck	19.8%
Truck to rail	0.8%
Truck to barge or ship	7.0%
Truck to air	17.2%
Rail to truck	1.2%
Rail to barge	0.9%

OUTBOUND FREIGHT DIRECTION & METHOD

Eastside/South King Wholesale

The 2799 Eastside/South King County wholesalers ship an estimated 205,279 loads per month. This volume of freight is generally evenly split between in state and out of state destinations. The single dominant destination within the state is the local Central Puget Sound region (40.1%). Most out of state freight is broadly distributed across the nation and world. Of the specified locations, Mountain states, Midwest and Portland were mentioned. Fifty-nine percent (58.9%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	73.34	2799	205,279

Destination in Washington State	Share
Central Puget Sound (road or rail)	40.1%
SW WA/Vancouver area	3.8%
SeaTac International Airport (air)	3.7%
N Central WA	1.4%
Spokane (road or rail)	1.2%
TOTAL	50.1%
Destination Out of State	Share
Nationwide	29.3%
World wide	8.8%
Mountain States (ID, CO, NE, ETC.)	4.5%
The Midwest (road or rail)	4.2%
Portland area (road or rail)	1.2%
Oregon (road or rail)	0.9%
East coast	0.9%
TOTAL	49.9%

Method of Transport	Share
Truck to customer or destination	58.9%
Truck to truck	31.6%
Truck to rail	0.9%
Truck to barge or ship	3.5%
Truck to air	3.7%
Rail to truck	0.6%
Rail to barge	0.7%

OUTBOUND FREIGHT DIRECTION & METHOD

Coastal Counties Manufacturing

The 165 manufacturing firms in the Coastal Counties ship an estimated 2,155 loads per month. They generally ship twice as many loads of freight in state (63.7%) as out of state (36.3%). The top two destinations within the state are the local Coastal Counties area (25.8%) and Ports of Seattle/Tacoma (14.6%). Another 12.9% goes to the Central Puget Sound region. California through Oregon was the largest specified area out of state, with 7.7%, followed by East coast (6.4%). Sixty-two percent (61.9%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	13.06	165	2,155

Destination in Washington State	Share
Coastal Counties	25.8%
Ports of Seattle/Tacoma (sea)	14.6%
Central Puget Sound (road or rail)	12.9%
SeaTac International Airport (air)	6.4%
Canada Border (Road or rail)	4.0%
TOTAL	63.7%
Destination Out of State	Share
Nationwide	18.5%
California through Oregon (road and rail)	7.7%
East coast	6.4%
The Midwest (road or rail)	1.6%
Mountain States (ID, CO, NE, ETC.)	1.2%
Other Southwest states (road or rail)	0.4%
South (road or rail)	0.4%
TOTAL	36.3%

Method of Transport	Share
Truck to customer or destination	61.9%
Truck to truck	11.1%
Truck to rail	2.5%
Truck to barge or ship	6.4%
Truck to air	18.1%

OUTBOUND FREIGHT DIRECTION & METHOD

Coastal Counties Wood

The 117 Coastal Counties timber and wood companies ship an estimated 6,298 loads per month. A total of 60.3% of this freight is sent to location in state and 39.7% is sent out of state. The top two destinations within the state are Central Puget Sound (32.4%) and the local Coastal Counties area (24.7%). California through Oregon was the largest specified area out of state, with 10.4%, followed by Midwest (2.3%). The vast majority (81.5%) of the freight shipped follows the truck to customer method.

Volume Shipped per Month	Average	Firms	Total
Number of Loads	53.83	117	6,298

Destination in Washington State	Share
Central Puget Sound (road or rail)	32.4%
Coastal Counties	24.7%
SW WA/Vancouver area	2.9%
Ports of Seattle/Tacoma (sea)	0.3%
TOTAL	60.3%
Destination Out of State	Share
United States	23.5%
California through Oregon (road and rail)	10.4%
The Midwest (road or rail)	2.3%
Oregon (road or rail)	1.9%
Portland area (road or rail)	0.8%
South (road or rail)	0.8%
TOTAL	39.7%

Method of Transport	Share
Truck to customer or destination	81.5%
Truck to truck	11.7%
Truck to rail	1.0%
Truck to barge or ship	5.0%
Rail to truck	0.5%
Rail to barge	0.2%

OUTBOUND FREIGHT DIRECTION & METHOD

Freight Destinations within WA State - Summary

The following table summarizes the aggregate loads of freight delivered to Washington State destination points each month, as reported by each of the industry clusters studied. These figures take into account the total freight volumes estimated for each industry cluster, the destinations reported and the share of freight to each destination.

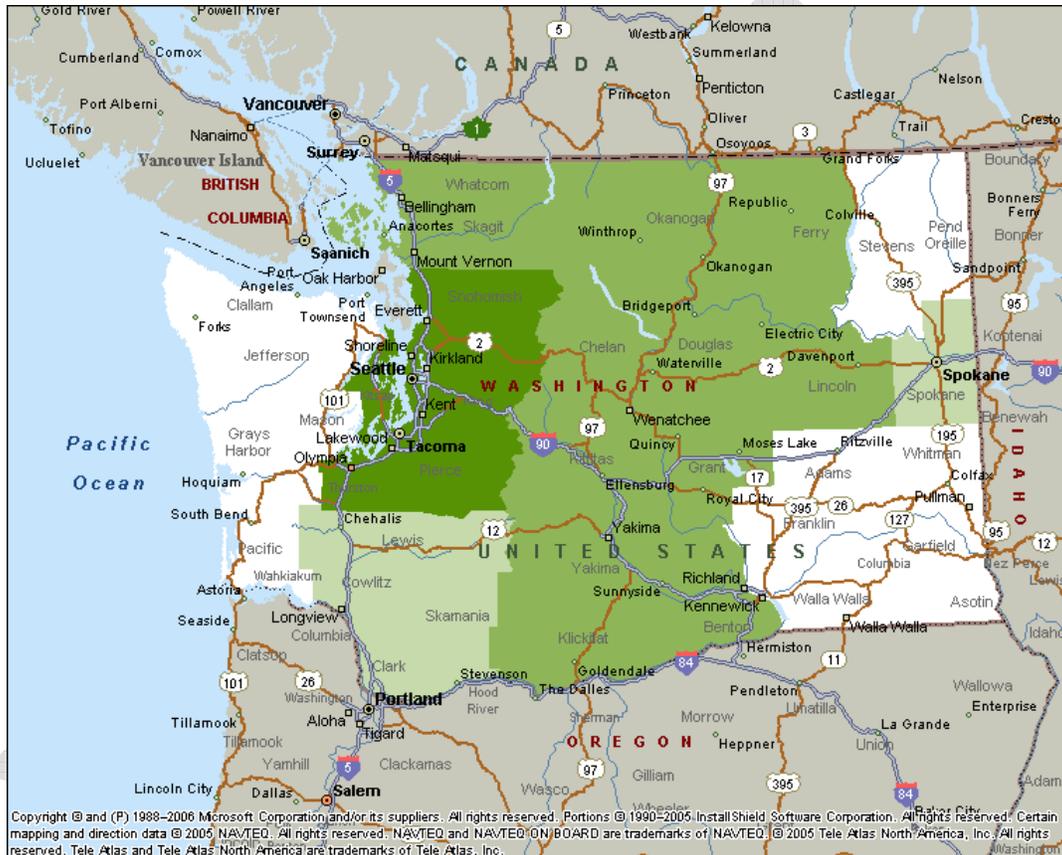
The Central Puget Sound region (not including port facilities) was by far the largest destination, representing 48.8% of all freight loads. The Ports of Seattle/Tacoma (12.8%) and SeaTac International Airport (10.5%) were next, with 12.8% and 10.5%, respectively.

Destination Within Washington State	Loads per month	Share
Central Puget Sound (road or rail)	198,622	48.8%
Ports of Seattle/Tacoma (sea)	52,156	12.8%
SeaTac International Airport (air)	42,762	10.5%
N. Central WA	26,419	6.5%
Spokane (road or rail)	20,388	5.0%
Canada Border (Road or rail)	19,913	4.9%
SW WA/Vancouver area	16,407	4.0%
NW Wash./Bellingham Area (Road or Rail)	13,091	3.2%
Coastal Counties	7,163	1.8%
Tri - Cities (road or rail)	6,266	1.5%
Bellingham Airport (air)	1,694	0.4%
Spokane Airport	1,474	0.4%
SE Washington	1,045	0.3%
Total	407,399	100.0%

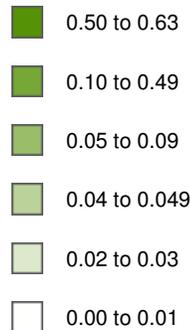
OUTBOUND FREIGHT DIRECTION & METHOD

Freight Destinations within WA State - Map

The following map graphically illustrates the density of freight shipments by point of destination within Washington State. The darkest green shading in the Puget Sound region reflects 72.1% of statewide freight, including port facilities. Northwest Washington and Canadian border was next, with 8.5%, followed by Central Washington, with 6.5%. SW Washington and Spokane had 4.0% - 5.4%, respectively. The Coastal counties and SE Washington each had 1.8%.



Share by County



INBOUND FREIGHT DIRECTION

Freight Origins within WA State

Businesses were asked to indicate the origins of inbound freight and deliveries from vendors. The following table reports the percentage share of all inbound freight for a given industry cluster, and includes points of origin within Washington State. For example, 10.7% of the freight received by NE Washington/Spokane manufacturers originated from the Puget Sound region. These figures were adjusted for volume of incoming freight. The “total” column reflects the combined share of all incoming freight that comes from within Washington, and it varies between 9% and 100%. The two agricultural clusters had the highest share of inbound deliveries coming from in-state locations (70.2% from SE Washington agriculture and 100% from North Central WA Agriculture). Wholesale clusters generally had the lowest share of deliveries from within the state.

Segment	Puget Sound	Vancouver, WA area	Canada Border	Greater Bellingham area/Whatcom or Skagit County	Tri-Cities	Spokane	Central WA	Coastal Counties	TOTAL
NE WA Spokane manufacturers	10.7%	1.9%	8.9%	4.5%	0.0%	4.5%	0.0%	0.0%	30.4%
NE WA/Spokane wood	32.3%	0.0%	16.2%	0.0%	0.0%	16.2%	0.0%	0.0%	64.6%
NE WA/Spokane trucking	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%
NE WA/Spokane wholesale	10.1%	0.0%	4.9%	0.0%	6.1%	9.2%	0.0%	0.0%	30.4%
SE Agriculture	6.4%	0.0%	0.0%	0.0%	63.9%	0.0%	0.0%	0.0%	70.2%
SW WA/Portland manufacturing	6.9%	1.9%	0.0%	0.0%	6.9%	0.0%	0.0%	0.0%	15.7%
SW WA/Portland trucking	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%
SW WA/Portland wholesale	1.6%	0.0%	4.7%	1.6%	0.0%	1.6%	0.0%	0.0%	9.4%
N. Central WA manufacturing	22.0%	0.0%	5.1%	0.0%	2.5%	0.0%	0.0%	0.0%	29.6%
N. Central WA agriculture	0.0%	0.0%	0.0%	8.6%	69.7%	17.1%	4.7%	0.0%	100.0%
N. Central WA trucking	40.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.1%
N. Central WA Wholesale	9.4%	0.0%	11.9%	2.5%	4.7%	0.0%	0.0%	0.0%	28.5%
NW Washington manufacturing	33.7%	0.0%	5.0%	4.4%	0.0%	0.0%	0.0%	0.0%	43.1%
NW Washington wood	0.0%	0.0%	11.4%	0.0%	0.0%	0.0%	0.0%	0.0%	11.4%
NW Washington trucking	28.3%	0.0%	0.0%	10.2%	0.0%	0.0%	0.0%	0.0%	38.5%
Eastside manufacturing	20.6%	0.0%	29.5%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%
South King/Pierce manufacturing	23.5%	0.0%	14.1%	0.0%	0.0%	0.0%	0.0%	0.0%	37.5%
Eastside/South King trucking	25.0%	1.5%	0.0%	6.9%	0.0%	3.2%	0.0%	0.2%	36.9%
Eastside/South King wholesale	3.6%	0.0%	3.6%	2.4%	0.0%	3.6%	0.0%	0.0%	13.2%
Coastal Counties manufacturing	41.8%	0.0%	6.6%	1.2%	0.0%	0.0%	0.0%	1.2%	50.8%
Coastal Counties wood	39.9%	3.6%	20.0%	0.0%	0.0%	0.0%	0.0%	5.7%	69.2%

INBOUND FREIGHT DIRECTION

Freight Origins Outside of WA State

Inbound deliveries originating from outside Washington State ranged from 0% to 90.6% of total inbound freight. The following table summarizes the share of total freight originating from major geographic areas outside of Washington State. The “total” column reflects the combined share of all inbound freight that originates from the points of origin outside the state. Most clusters received between 30 and 90 percent of their incoming deliveries from point of origin outside of Washington State. The exception was N. Central Washington agricultural producers, who did not have any incoming freight from out of state suppliers.

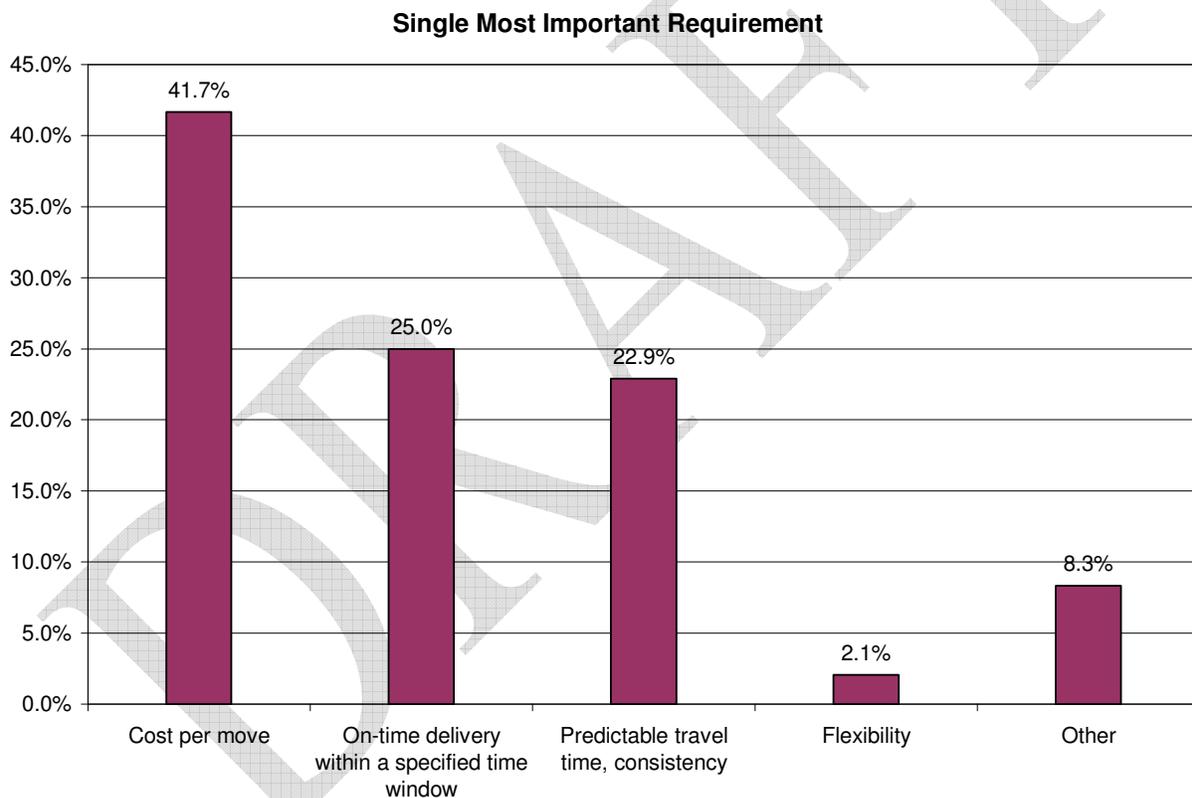
Segment	Oregon	Mountain States	The midwest	California through Oregon	Other Southwest states	South	East Coast	Nation-wide	OverSeas	West Coast/ NW	TOTAL
NE WA Spokane manufacturers	4.5%	4.5%	16.4%	17.7%	0.0%	6.9%	6.3%	13.3%	0.0%	0.0%	69.6%
NE WA/Spokane wood	0.0%	12.8%	0.0%	0.0%	0.0%	0.0%	22.6%	0.0%	0.0%	0.0%	35.4%
NE WA/Spokane trucking	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	66.7%	0.0%	0.0%	66.7%
NE WA/Spokane wholesale	12.2%	6.8%	4.8%	7.8%	1.9%	11.0%	6.1%	17.1%	0.0%	1.9%	69.6%
SE Agriculture	0.0%	29.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	29.8%
SW WA/Portland manufacturing	10.7%	0.0%	0.0%	28.2%	0.0%	1.9%	8.8%	34.6%	0.0%	0.0%	84.3%
SW WA/Portland trucking	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	50.0%
SW WA/Portland wholesale	20.3%	6.3%	10.9%	17.2%	0.0%	0.0%	9.4%	18.7%	6.3%	1.6%	90.6%
N. Central WA manufacturing	32.1%	6.8%	4.3%	13.6%	0.0%	5.0%	0.0%	4.3%	4.3%	0.0%	70.4%
N. Central WA agriculture	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
N. Central WA trucking	13.4%	5.2%	0.0%	8.2%	4.3%	0.0%	0.0%	20.7%	0.0%	8.2%	59.9%
N. Central WA Wholesale	2.6%	0.0%	7.6%	23.4%	4.7%	5.0%	0.0%	14.0%	4.7%	9.4%	71.5%
NW Washington manufacturing	4.0%	9.0%	8.4%	28.4%	0.0%	0.0%	0.0%	2.0%	5.0%	0.0%	56.9%
NW Washington wood	11.4%	20.3%	11.4%	11.4%	0.0%	0.0%	0.0%	34.2%	0.0%	0.0%	88.6%
NW Washington trucking	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	61.5%	0.0%	0.0%	61.5%
Eastside manufacturing	11.9%	3.0%	0.0%	5.8%	0.0%	0.0%	5.8%	17.5%	5.8%	0.0%	50.0%
South King/Pierce manufacturing	0.0%	9.3%	0.0%	14.1%	0.0%	0.0%	11.0%	14.1%	9.3%	4.7%	62.5%
Eastside/South King trucking	0.1%	0.5%	8.8%	3.8%	2.3%	2.3%	3.2%	38.9%	3.2%	0.0%	63.1%
Eastside/South King wholesale	3.6%	0.0%	11.8%	13.1%	3.6%	4.7%	12.0%	28.5%	9.5%	0.0%	86.8%
Coastal Counties manufacturing	7.8%	0.0%	3.6%	18.0%	2.1%	7.8%	9.9%	0.0%	0.0%	0.0%	49.2%
Coastal Counties wood	20.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	30.8%

NATIONAL FREIGHT COMPANIES

Single Most Important Requirement

This section begins the national freight shippers segment of the summary report and reports on the findings from the random survey of shippers who route freight from Asia through West Coast ports.

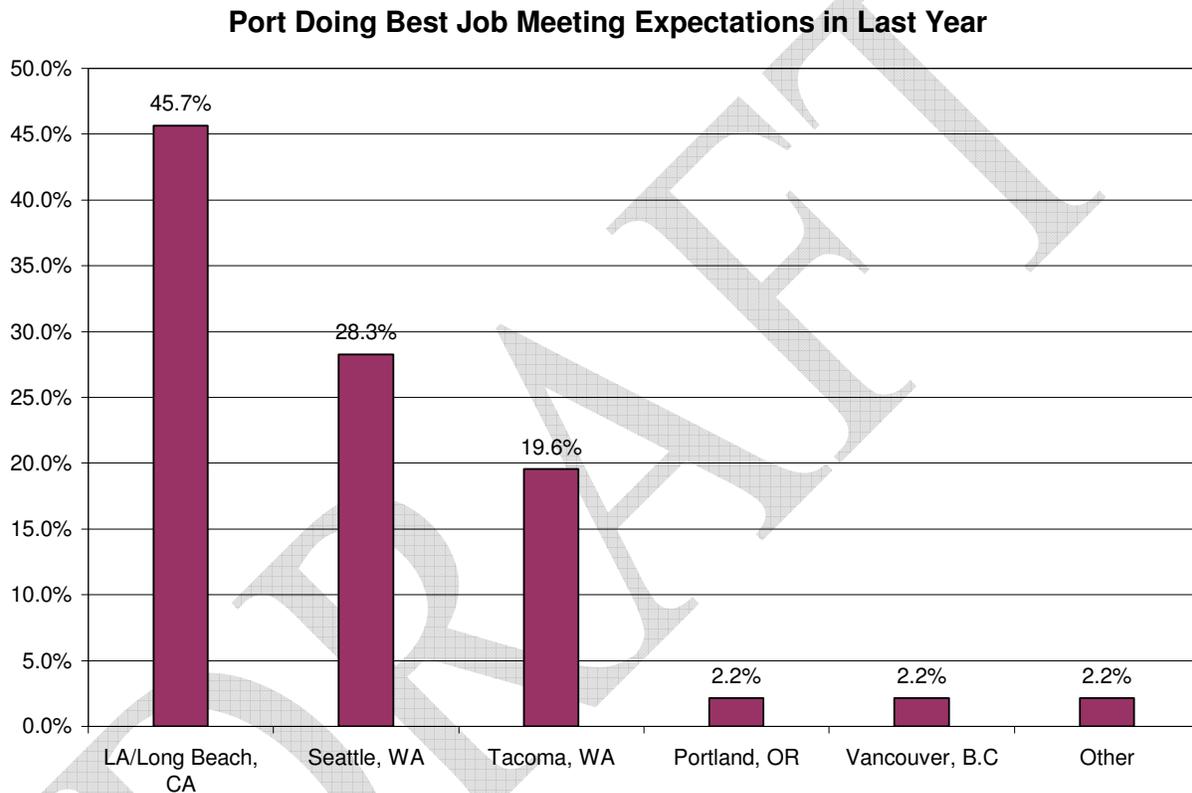
National shippers indicated that their single most important requirement of the freight system was cost per move, named by 41.7%. On-time delivery within a specified time window was second, at 25.0%, followed closely by predictable or consistent travel time (22.9%). Definitions of terms changed since the 1999 study making comparisons difficult for this question.



NATIONAL FREIGHT COMPANIES

Port that is Doing Best Job Meeting Expectations

LA/Long Beach was the most frequently named West Coast port in terms of meeting expectations in the past year. Port of Seattle was second, at 28.3%, followed by Port of Tacoma, with 19.6%. This question was new for 2007.

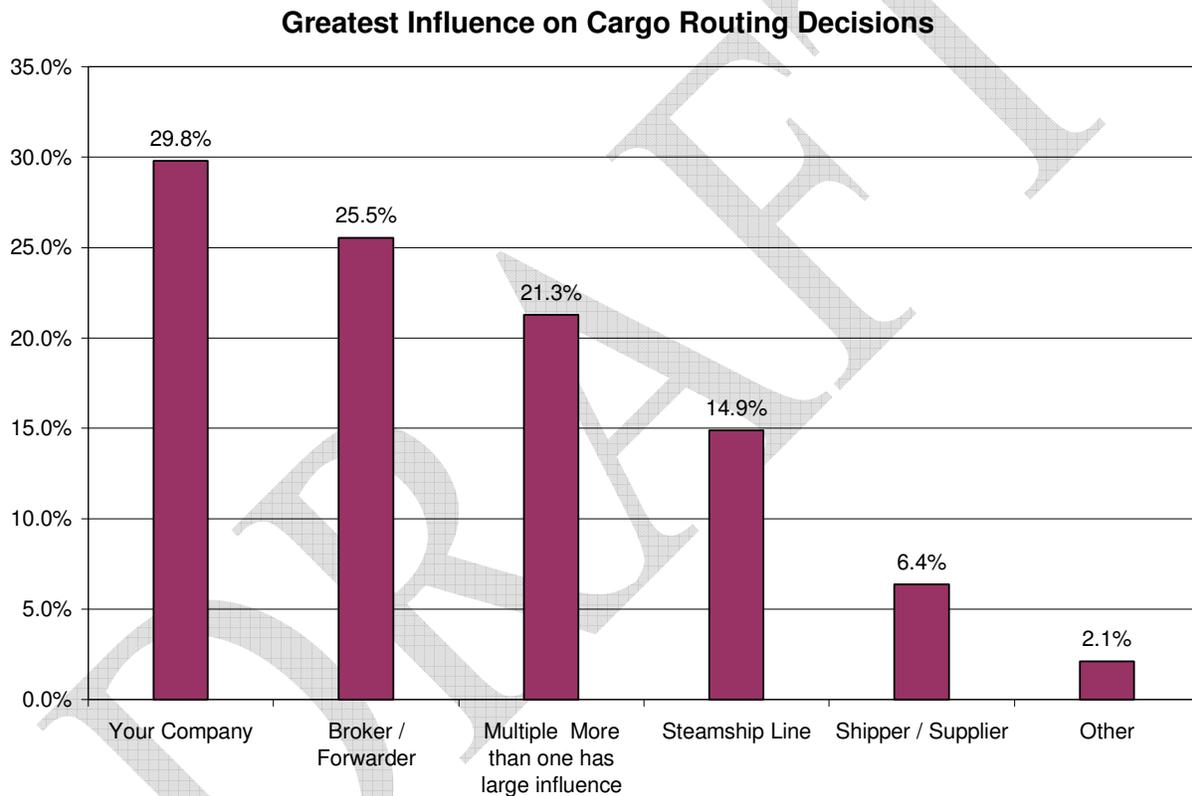


Differences by single most important requirement of the freight system were not significant ($p=.583$).

NATIONAL FREIGHT COMPANIES

Greatest Influence on Cargo Routing Decisions

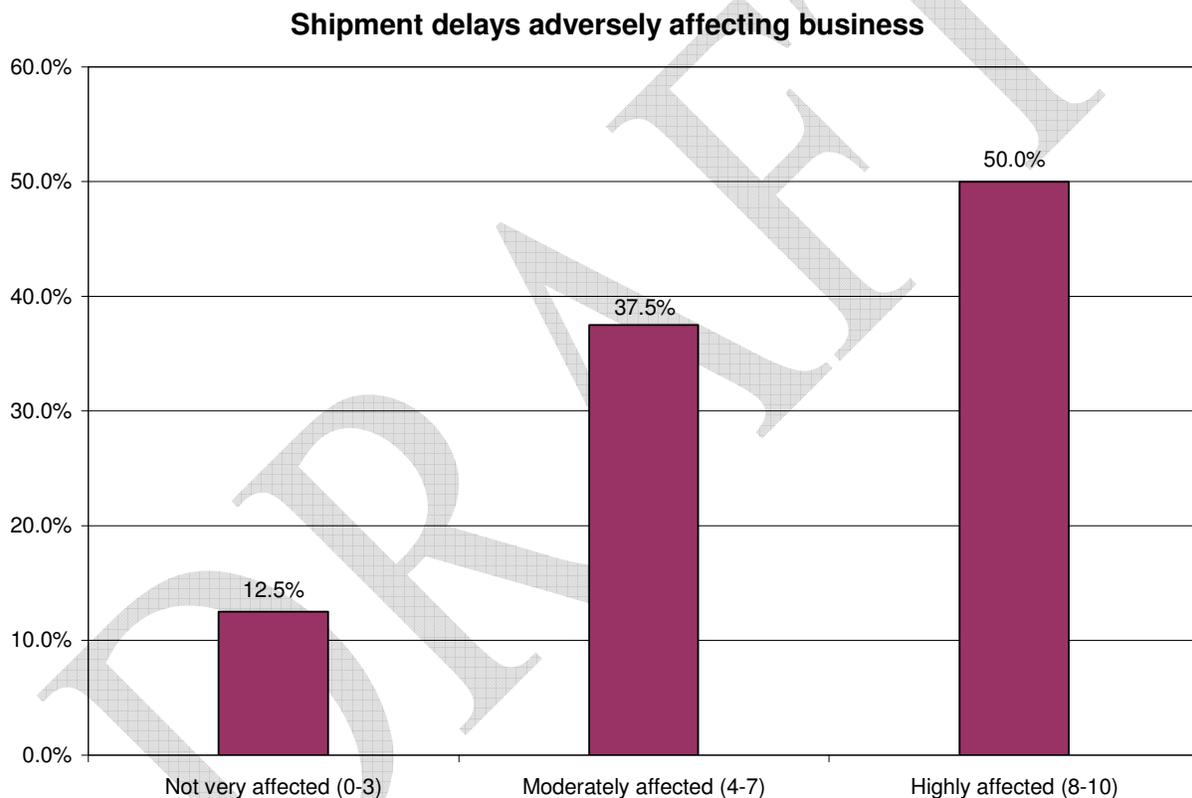
Companies interviewed were read a list of possible sources of influence regarding routing decisions for incoming deliveries. Nearly thirty percent (29.8%) of the respondents indicated their own company had the most influence. The broker or forwarder was the second most frequent response, named by 25.5% of firms. Twenty-one percent of firms (21.3%) indicated having more than one point of influence. The question wording and format changed for 2007.



NATIONAL FREIGHT COMPANIES

Degree to Which Delays Affect Business

The firms interviewed rated how much shipment delays adversely affected their business. A 0-10 scale was used, where 0 meant “not at all affected” and 10 meant “highly affected.” One-half of the firms interviewed (50.0%) gave a high rating of 8-10, indicating a large degree of impact. Only 12.5% had a low level of impact. The average mean rating was 6.98, suggesting a moderately high overall effect of shipping delays on their business. Ratings were similar between the 1999 and 2007 studies (6.90 to 6.98).

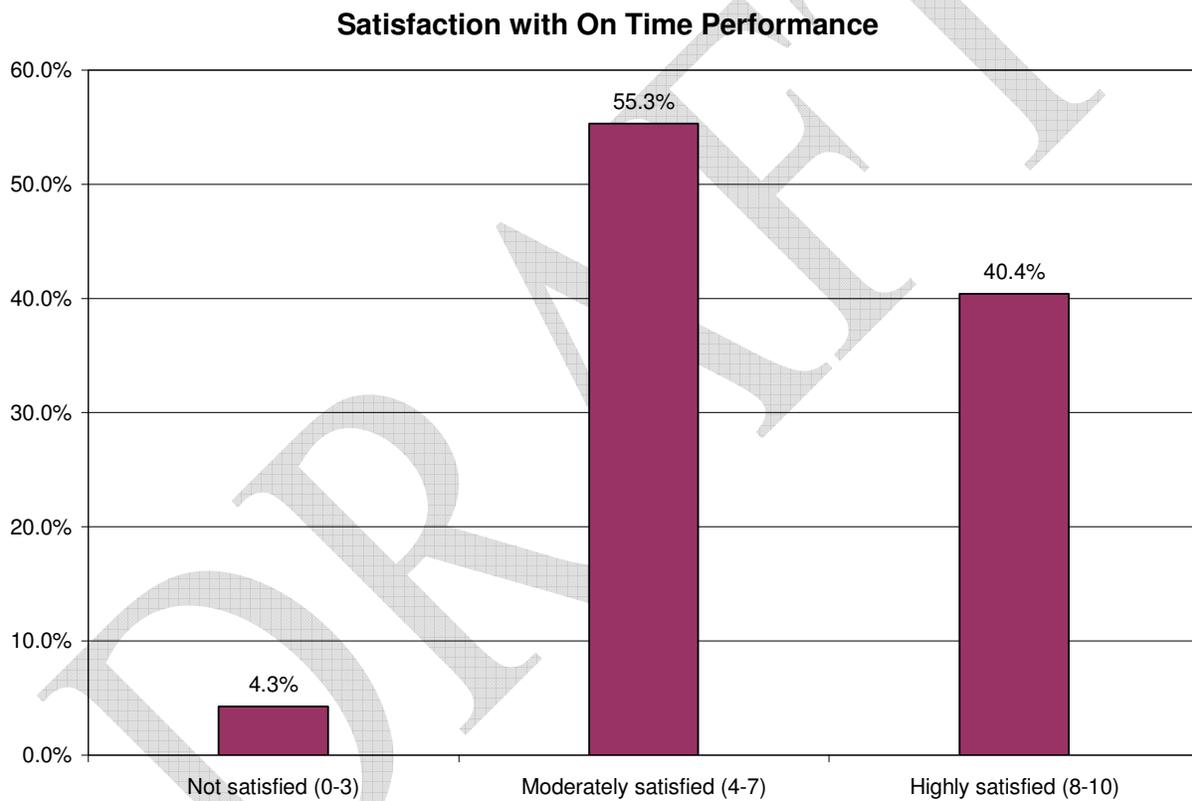


Firms with a high likelihood to move business toward Seattle/Tacoma with improvement demonstrated gave significantly higher ratings for being negatively affected (8.05) as compared to those with less likelihood (6.05). [p=.022; Eta Squared = .133]

NATIONAL FREIGHT COMPANIES

Satisfaction with On Time Performance

The managers interviewed were asked to rate how satisfied they were with their current “on-time” performance on a 0-10 scale where 0 meant “not at all satisfied” and 10 meant “highly satisfied.” Forty percent (40.4%) of these companies indicated being highly satisfied, giving a rating of 8, 9 or 10. Only 4.3% were not at all satisfied. The overall mean rating was 7.15. Ratings of satisfaction shifted somewhat between 1999 and 2007, but the overall mean rating was statistically similar (7.10 to 7.15).



There were no statistically significant differences between firms based on which port they thought was doing the best job at meeting their needs ($p=.996$), or what was their single most important requirement of the freight system ($p=.528$).

NATIONAL FREIGHT COMPANIES

Number of Shipments

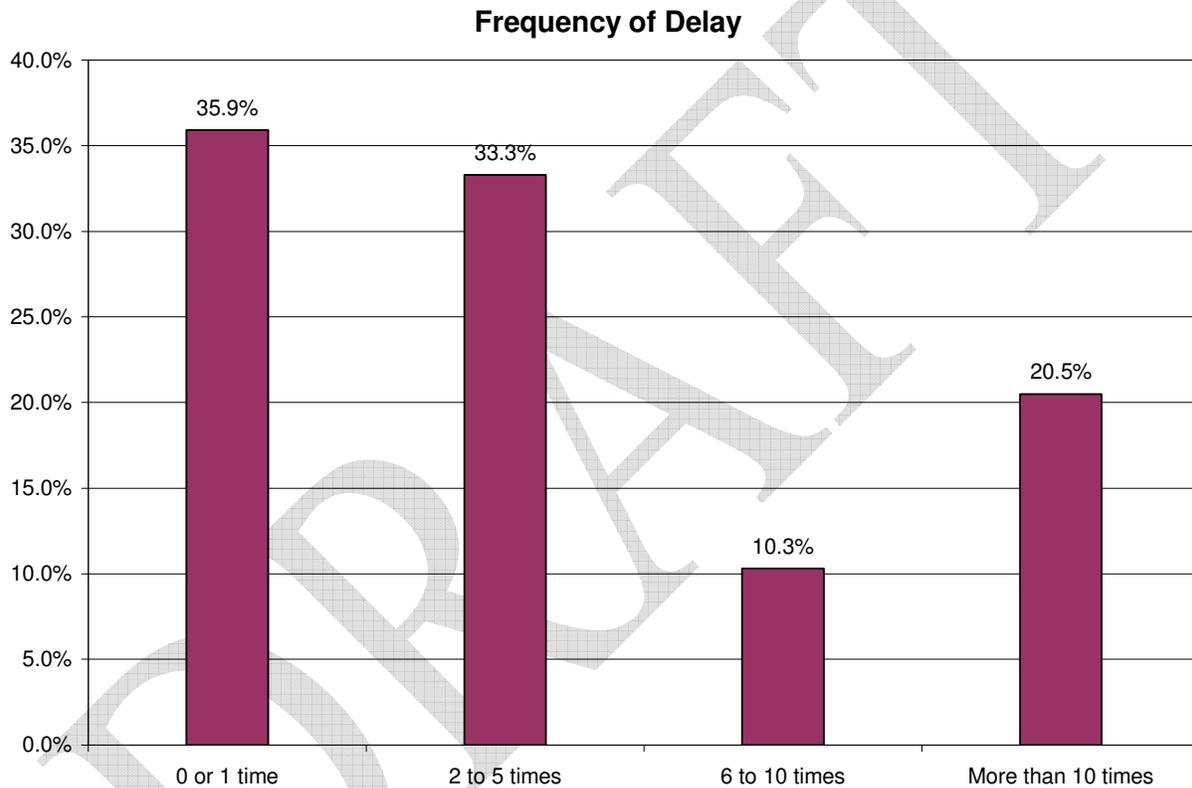
The typical national freight user receives around 12 shipments per month (median), which compares with 11.7 shipments in the 1999 survey. The mean average was 71.07 shipments, which was skewed by the 11.6% of firms that reported volumes over 100 per month.

Monthly Shipments	1999	2007
5 or less	34.0%	34.9%
6-10	13.7%	11.6%
11-15	6.8%	11.6%
16-20	13.5%	7.0%
21-50	14.0%	16.3%
51-100	12.5%	7.0%
More than 100	5.5%	11.6%
Median	11.7	12.0

NATIONAL FREIGHT COMPANIES

Frequency of Delays per Month

The frequency of delays per month experienced by national freight companies appears to be increasing. The median number of times a freight user has a delay per month was 4.0, up from 2.5 in the 1999 study. More than one out of five, or 20.5%, of firms currently reported delays more than 10 times per month, up from 5.6% in 1999.

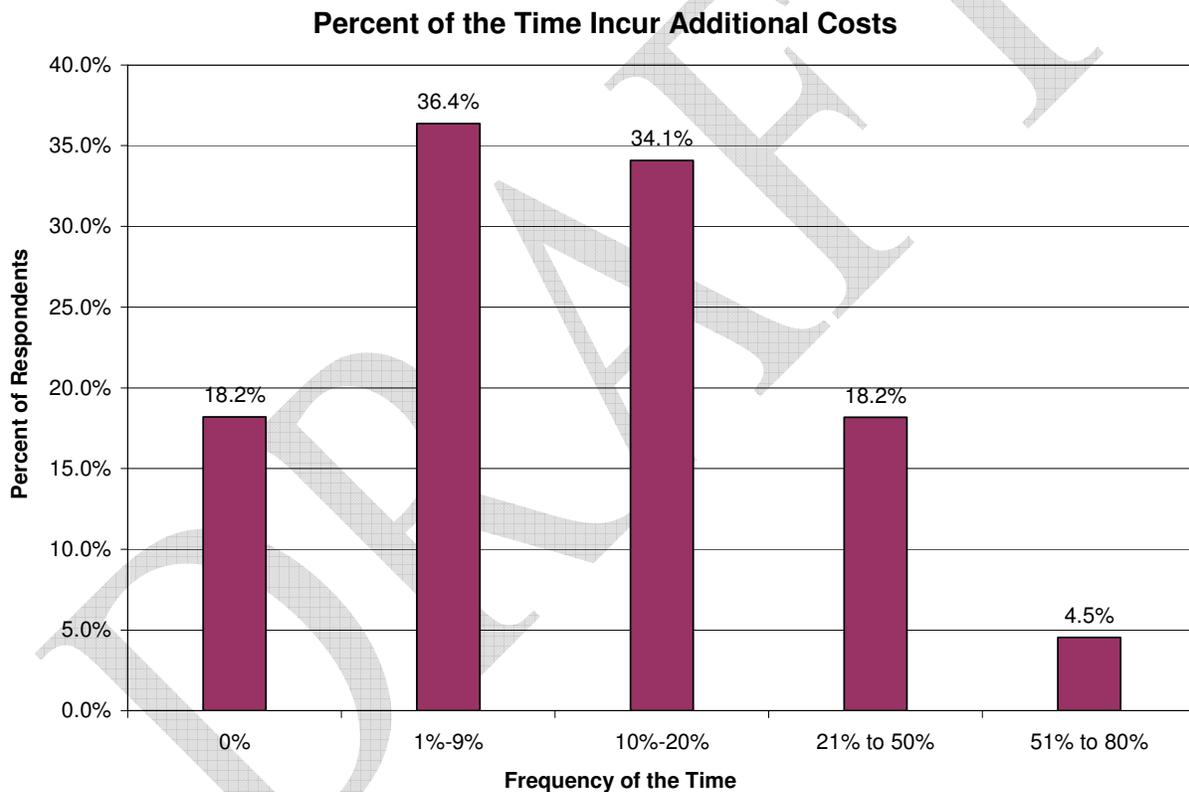


Frequency of Delays	1999	2007
0 or 1 time	42.3%	35.9%
2 to 5 times	45.5%	33.3%
6 to 10 times	6.7%	10.3%
More than 10 times	5.6%	20.5%
Median Times	2.5	4.0

NATIONAL FREIGHT COMPANIES

Percent of Time Incurred Additional Costs from Delays

Freight users were asked, “approximately what percentage of the time do you incur additional expenses from delays.” The mean average was 12.02% and the median (midpoint) was 5.0%. Only 18.2% indicated not encountering any additional costs while 81.8% reported some percentage. The two largest segments were 1%-9% of the time (36.4%) and 10%-20% of the time (34.1%). A very small group reported additional costs 51% or more of the time. Comparisons with the previous study revealed a similar distribution of responses and any minor differences were within the margin of error.

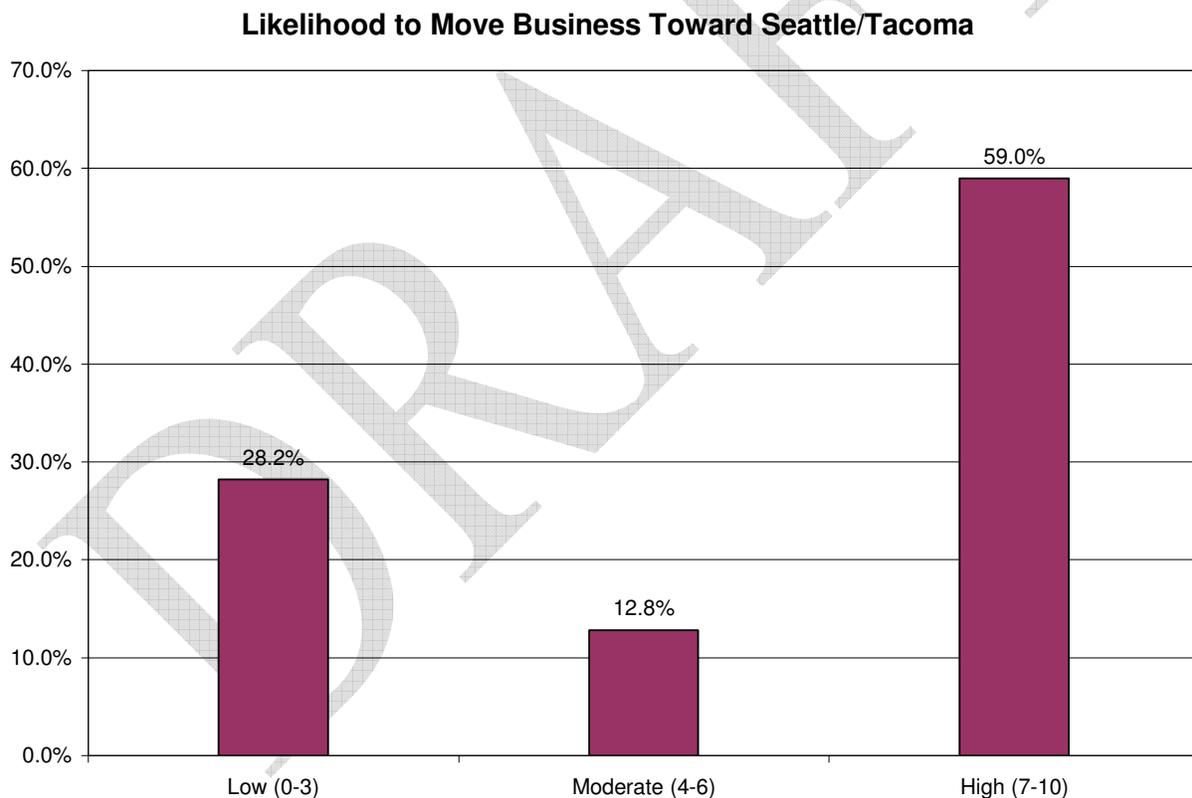


Those firms who were highly likely to move business toward Seattle/Tacoma ports indicated a significantly higher percentage (21.53%) as compared to those less likely (6.5%). [p=.013; Eta Squared = .163]

NATIONAL FREIGHT COMPANIES

Likelihood to Move Business Toward Seattle/Tacoma

The majority of national freight users indicated being highly likely to move business toward the Ports of Seattle/Tacoma based on improved performance over other ports. A 0-10 scale was used and the “high” range was defined as 7-10 for this question and subsequent questions about shifting business away from Seattle/Tacoma. The 7-10 range is appropriate whenever the subject matter reflects a major purchase decision and carries with it a greater uncertainty than other survey questions about attitudes and satisfaction. In these situations respondents typically give more conservative ratings than they otherwise would give. The mean average rating of likelihood was 6.03, which can also be stated as an overall probability of 60% that a firm would shift business. The high segment of 59.0% was just below this level. A total of 28.2% of firms gave low ratings of 0-3, and will not be expected to change their freight routing plans based on an improvement. This was a new question for 2007.

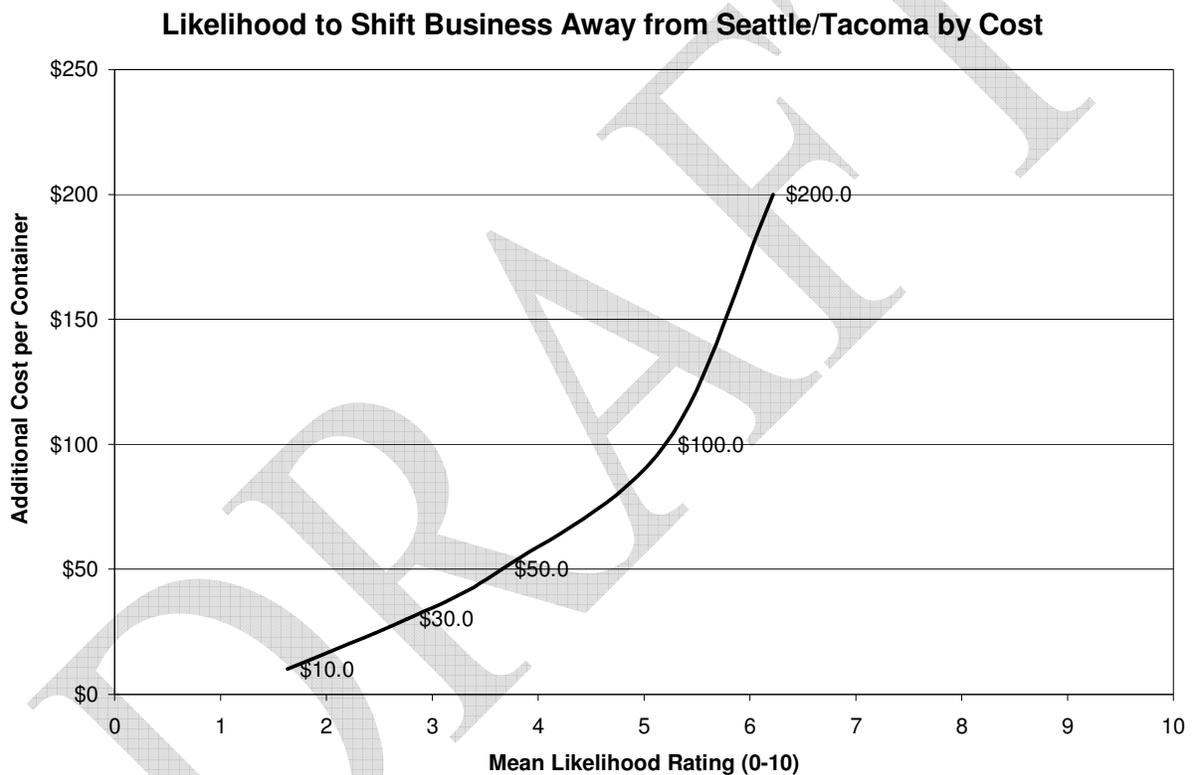


Additional analysis indicated that those likely to move business toward Seattle/Tacoma were less likely to say their top requirement was on-time delivery (11.1% versus 45.0%) and were more likely to state predictable, consistent travel time was their goal (33.3% versus 20.0%). [p=.051, Cramer’s V = .452]

NATIONAL FREIGHT COMPANIES

Likelihood to Shift Business Away from Seattle/Tacoma

Differences in likelihood to shift business away from the Ports of Seattle and Tacoma based on specific cost increases per container were statistically significant (see table on following page). Starting at a hypothetical \$10 increase per container, only 2.4% of firms would be highly likely to take business away from these ports. By \$50, this segment increased to 14.6% and at \$200 the majority of firms (58.5%) would go elsewhere or reduce their port usage. This section was new for the 2007 study.



Cost Increase per Container	Likelihood to Shift Away from Seattle/Tacoma	Not at all likely (0-3)	Moderately likely (4-6)	Very likely (7-10)
\$10.0	1.63	85.4%	12.2%	2.4%
\$30.0	2.76	61.0%	34.1%	4.9%
\$50.0	3.66	48.8%	36.6%	14.6%
\$100.0	5.20	31.7%	22.0%	46.3%
\$200.0	6.22	24.4%	17.1%	58.5%

Note: The likelihood listed in the above chart is the mean likelihood rating (typical firm). This number corresponds directly as a percentage of those with a likelihood to shift from Seattle/Tacoma. For example, if the cost per container increases by \$10, 16.3% have a likelihood to shift their business from the area. Of the respondents 2.4% are very likely.

The following tables indicate the statistical relationships between likelihood to shift business away at each price level, based on a T-test for differences between means. P values of .05 or less are considered statistically significant at the 95 percent confidence level. As the first set of data shows in the table, differences between each individual level of cost increase and the next do not show significance.

Cost Increase	P value
\$10-30	0.153
\$30-50	0.357
\$50-100	0.184
\$100-200	0.368

However, between \$10 and \$50, the differences were significant ($p=.042$) as were differences between \$50 and \$200 ($p=.026$). This shows that businesses are willing to accept price increases per container only at small increments.

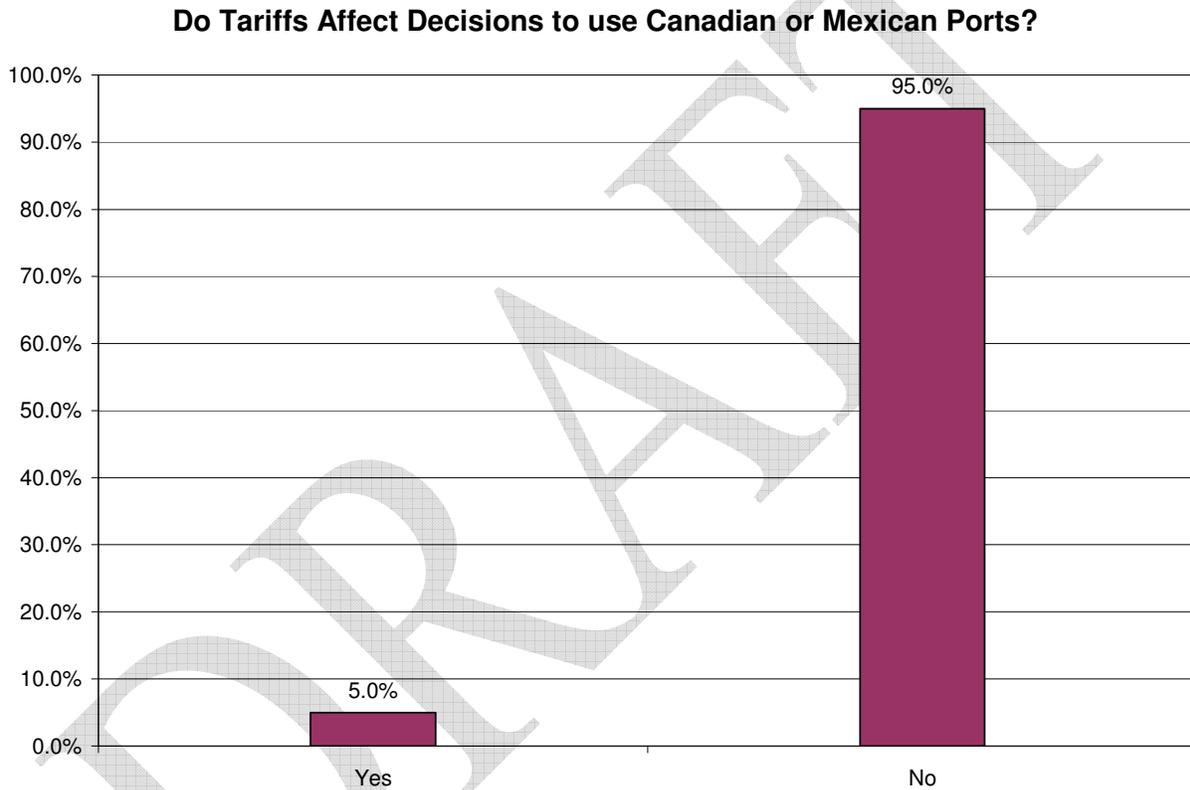
Cost Increase	P value
\$10-50	0.042
\$50-200	0.026

Additional analysis found that those firms that reported being highly impacted by delays gave higher likelihood ratings of switching away from Seattle/Tacoma ports. This was statistically significant at the \$50, \$100 and \$200 level. [$p=.027, .012, .034$ and Eta Squared = .119, .150, .111]

NATIONAL FREIGHT COMPANIES

Impact of Tariffs on Foreign Port Decision

Nearly all (95.0%) freight users indicated that tariffs had no impact on their decisions whether or not to use Canadian or Mexican ports for their West Coast shipments. This was not tested in the previous study.



NATIONAL FREIGHT COMPANIES

Importance of Attributes in Port Selection

Timeliness was rated as the most important attribute in port selection by national shippers, who gave an average mean rating of 7.81 on the 0-10 scale. More than two-thirds (68.1%) gave high ratings of 8-10 on this variable. Past experiences was rated second, at 6.80, closely followed by cost of port fees and services, at 6.25. Contractual requirements, regulatory agencies were similar with 5.36-5.67 mean ratings, and diverse ports of entry was least important, at 4.64 on average. This series was not tested in 1999.

Attribute	Average Rating (0-10)	Low (0-3)	Moderate (4-7)	High (8-10)
Timeliness	7.81	8.5%	23.4%	68.1%
Past Experiences	6.80	10.9%	45.7%	43.5%
Cost of port fees and services	6.25	20.8%	35.4%	43.8%
Contractual Requirements	5.67	21.4%	57.1%	21.4%
Influence of Regulatory Agencies	5.36	31.8%	40.9%	27.3%
Diverse Ports of Entry	4.64	35.6%	46.7%	17.8%

There were significant differences by major industry for cost of port fees. Manufacturing firms rated the cost of port fees (7.60) significantly higher than did wholesalers (5.29). [p=.015; Eta Squared = .148]

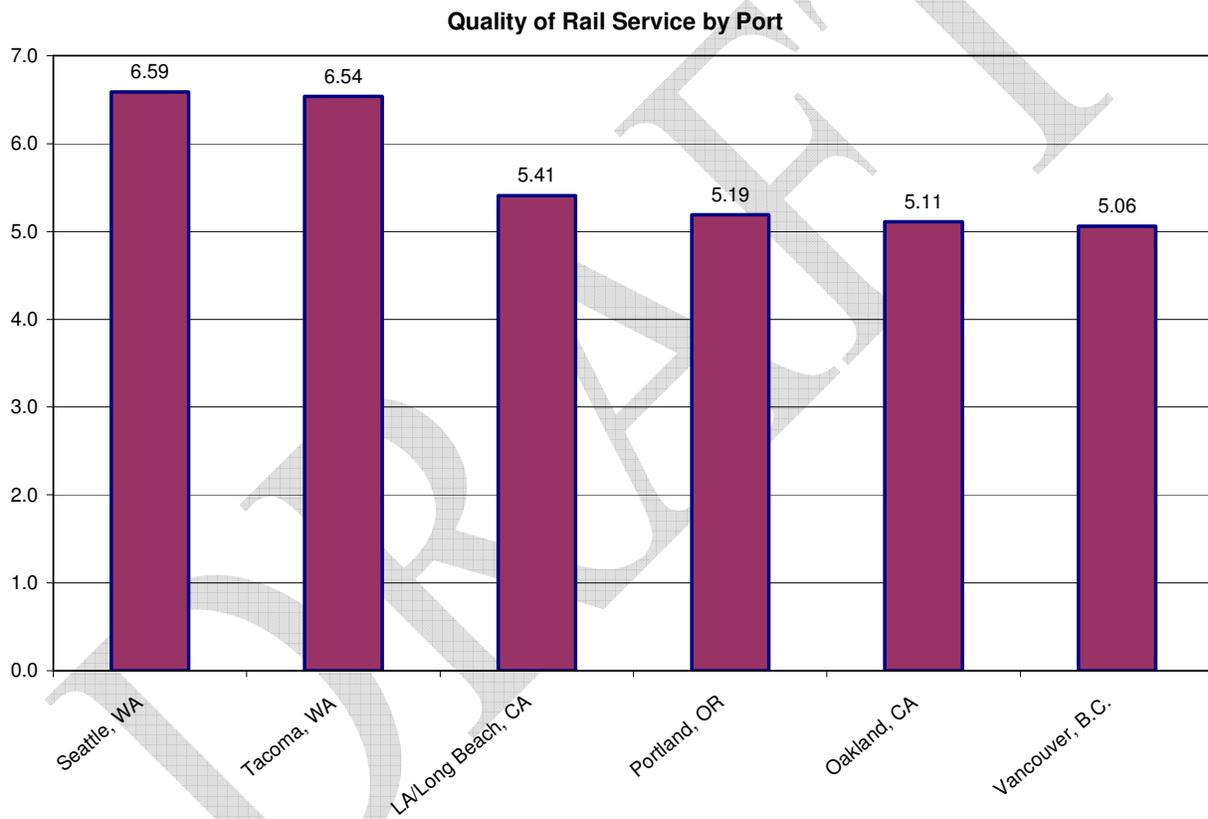
Firms that reported being highly impacted (8-10 rating) by shipping delays gave significantly higher ratings for the importance of diverse ports of entry (6.18) as compared to those less impacted (3.17). [p=.000; Eta Squared = .312] Highly impacted firms also gave significantly higher ratings for regulatory agencies (6.55) versus other firms (4.37). [p=.019; Eta Squared = .123] Highly impacted firms also gave significantly higher ratings for past experiences (7.55) and cost of port fees (7.21). [p=.048 and .027, respectively; Eta Squared = .086 and .101]

Those companies that were highly likely to shift business toward Seattle/Tacoma ports with improved performance gave significantly higher ratings to timeliness (8.67) than did other firms (7.20). [p=.047; Eta Squared = .105] The measure of association indicates that 10.5% of the probability of moving business toward Seattle/Tacoma is a function of timeliness.

NATIONAL FREIGHT COMPANIES

Rating Quality of Rail Service by Major Port

Seattle and Tacoma were rated highest in the quality of their rail service by the national shippers surveyed. Over forty-one percent gave high ratings for each (8-10) and only 13-14% gave low ratings. LA/Long Beach was second, with a mean average of 5.41. Portland, Oakland and Vancouver, B.C. were all similarly rated, although Vancouver had a greater share of high ratings, as well as low ratings. Note that only 3 firms were able to give a rating for Lazaro Cardenas and Prince Rupert, B.C so these ports were not included. This series was not tested in the last study.



Port of Entry	Average Rating (0-10)	Low (0-3)	Moderate (4-7)	High (8-10)
Seattle, WA	6.59	13.8%	44.8%	41.4%
Tacoma, WA	6.54	12.5%	45.8%	41.7%
LA/Long Beach, CA	5.41	23.5%	55.9%	20.6%
Portland, OR	5.19	18.8%	75.0%	6.3%
Oakland, CA	5.11	26.3%	63.2%	10.5%
Vancouver, B.C.	5.06	37.5%	25.0%	37.5%

NATIONAL FREIGHT COMPANIES

Evaluating Likelihood to Cause Delay

Rail was rated highest as a possible cause of shipping delays, with nearly forty percent (39.5%) giving a high likelihood rating of 8-10 and a mean rating of 6.00. The point of discharge and customs/regulatory issues were both rated similarly (5.10 and 5.23 on average), with 28-29% giving high ratings. Final delivery to the destination was given a 4.65 mean rating and 20.8% thought this was very likely to cause delays. Comparisons with the previous study (see second table) revealed that likelihood of delay has been increasing in every category tested in both years except for point of origin where the difference was minimal.

Possible Cause of Delay	Average Rating (0-10)	Low (0-3)	Moderate (4-7)	High (8-10)
Rail	6.00	23.3%	37.2%	39.5%
Point of discharge	5.23	25.5%	46.8%	27.7%
Customs/regulatory issues	5.10	29.2%	41.7%	29.2%
Final delivery to destination	4.65	37.5%	41.7%	20.8%
Ocean transit	4.23	41.7%	43.8%	14.6%
Long distance trucking	4.16	43.2%	37.8%	18.9%
Point of origin	3.56	54.2%	33.3%	12.5%

Differences between manufacturing and wholesale firms were statistically significant for point of origin. Manufacturing firms rated this cause 4.80 on average, well above the ratings of wholesale firms (2.67). [p=.035; Eta Squared = .114]

Firms that were highly impacted by delays gave significantly higher ratings to four of the categories, as listed below:

- Port of discharge (6.38, 4.04) [p=.004; Eta Squared = .174]
- Rail (6.96, 4.90) [p=.020; Eta Squared = .125]
- Long distance trucking (5.19, 2.81) [p=.024; Eta Squared = .137]
- Final delivery to destination (5.92, 3.38) [p=.003; Eta Squared = .182]

Those companies highly likely to move business toward Seattle/Tacoma gave significantly higher ratings for customs/regulatory issues (6.58), point of origin (5.00) and point of discharge (7.06). [p=.011, .008, .000; Eta Squared = .164, .176, .298]

Possible Cause of Delay	1999	2007
Rail	na	6.00
Point of discharge	4.2	5.23
Customs/regulatory issues	4.4	5.10
Final delivery to destination	3.8	4.65
Ocean transit	3.9	4.23
Long distance trucking	na	4.16
Point of origin	3.7	3.56

NATIONAL FREIGHT COMPANIES

Current and Preferred Delivery Time and On Time Definition

Respondents were asked what their current delivery window was in addition to what their preferred window was. Less than twenty percent (19.5%) of the firms indicated their current window was under 6 days, but more than half (52.6%) would prefer a delivery window of that interval. Overall, the average delivery window is currently 12.07 days, while the preference is for a window of 8.2 days. In comparison, 32.2% in 1999 indicated they had a window of under 6 days. Average days in the previous study were 10.0 currently and 7.9 preferred, which were slightly lower than the 2007 results, consistent with the evidence of greater freight delays seen elsewhere in this report.

2007 Delivery Windows	Current	Preferred
Less than 6 days	19.5%	52.6%
6-10 days	41.5%	21.1%
11-15 days	14.6%	7.9%
16-30 days	19.5%	18.4%
More than 30 days	4.9%	0.0%
Average Days	12.07	8.16

1999 Delivery Windows	Current	Preferred
Less than 6 days	32.2%	51.0%
6-10 days	40.3%	27.8%
11-15 days	13.1%	11.7%
16-30 days	12.0%	8.3%
More than 30 days	2.4%	1.2%
Average Days	10.00	7.90

When asked to define “on time” in an open-ended verbatim question, more than half of the firms indicated under 1-5 days, 24 hours, 1-2 days or 2-3 days.

Definition of “On Time”

Definition	Percent
1-5 days	20.5%
1 day/past 24 hours	15.9%
1-2 days	13.6%
2-3 days	9.1%
That same day	9.1%
1-3 days	6.8%
1-7 days	4.5%
2-4 hours	4.5%
3 days	4.5%
On time-within minutes	4.5%
1 day	2.3%
14 days	2.3%
7-10 days	2.3%

CONCLUSIONS

The state's freight system was generally seen as being highly important to the freight users included in the 2007 study, regardless of industry or geography. Overall, for industries to be regionally, nationally, and internationally competitive it is critical that the statewide freight system meets the expectations of the industries. The three most important requirements for firms are on-time delivery, travel time, and cost per move.

The freight industry in Washington is very regional. Therefore, there tend to be large variances in satisfaction within the state freight system. There are several factors that contribute to the satisfaction ratings. Typically, most agriculture comes from SE Washington and Central Washington. The manufacturing sectors are shipping from locations in the Puget Sound and Spokane areas. Most of the wood is being shipped from SW Washington and NW Washington.

Comparisons with 2004 Study

- **Outsourcing** - At least 70-80% of manufacturing and wholesale businesses reported outsourcing at least part of their shipments, as did 50-70% of wood firms. Overall, the percentage of firms that only handle shipments internally has been decreasing from 40.7% to 35.1%. Some of the shifts to partial or full outsourcing from only handling shipping internally and vice versa can be explained by changes in transportation fees from trucking and logistics firms. The statistical relationship suggests that the internal/external decision of whether to use outsourcing is an important one in measuring satisfaction.
- **Requirements of Freight Users** – The cost per move appears to have become less important to firms (with the exception of Central Washington producers, who shifted to mention cost per move as a top criteria). Replacing this variable are the affect of increased delays, importance of predicable travel time and on-time deliveries, as well as the quality of service. These factors signify that it is a very price sensitive market.
- **Affect of Problems and Expenses on Business** –
 - Overall freight users noted statewide increases in impacts on their business from an average of 5.65 in 2004 to 6.62 in 2007 on the 0-10 scale. These increases were seen in all clusters except Eastside manufacturing. Some of the primary impacts are increased traffic congestion, traffic times and its effect on predictability, as well as increased cost competition. Firms that were highly satisfied with the state's freight system gave significantly lower ratings (mean = 4.22) of impact than did those with moderately high (6.37) or lower satisfaction (7.03). Wood/agriculture firms and trucking firms gave significantly higher ratings of impact compared to manufacturing and wholesale firms.
 - Comparisons showed no significant differences for the overall state with regard to the percent of time incurring additional expenses. One of the reasons is that trucking firms are able to adapt their pricing and services to clients to adjust for

increasing costs of delays. These increases allow for fewer “additional” expenses since a greater number of delays have become “normal.”

- **Other Comparisons** – The importance of the State Freight System and the Satisfaction with Current Freight Performance (based on the most important requirement) received minimal differences between the 2004 and 2007 studies.
- **National Comparisons** – The national survey found that one-half of the companies are being “highly impacted” by shipment delays, which create additional costs 12% of the time. In contrast from the statewide survey, the cost per move remains the single most important requirement, stated by 41.7% of the national freight users. The likelihood to shift business from the Seattle/Tacoma ports was also found to be very elastic.

**Please note that there are fewer comparisons within the national survey from the previous survey in 1999 because many of the sections were either new to the survey or edited from the previous study in ways that made comparisons more difficult.*

The following conclusions were based on an analysis of the research findings:

Statewide Survey of Freight Users

With the exception of trucking firms and SE agriculture firms, the majority of freight users statewide indicated outsourcing at least some of their freight transportation. At least 70-80% of manufacturing and wholesale businesses reported outsourcing at least part of their shipments, as did 50-70% of wood firms. Since 2004, there have been some shifts from partial or full outsourcing to only handling shipping internally and vice versa. Overall, the percentage of firms that only handle shipments internally has been decreasing from 40.7% to 35.1%. Some of this can be explained by changes in transportation fees from trucking and logistics firms, which prompts changes in usage rates of outsourced services. Those who only have internal shipping tended to be more satisfied with the state freight system and this statistical relationship suggests that the internal/external decision of whether to use outsourcing is an important one for shippers.

The state’s freight system was generally seen as being highly important to the freight users included in the 2007 study, regardless of industry or geography, but it was particularly important to trucking and wood/agriculture firms. Overall, for industries to be regionally, nationally, and internationally competitive it is critical that the statewide freight system meets the expectations of the industries. Comparisons with the 2004 study were not significant.

The top three system requirements included cost per move, on-time delivery and predictable travel time. While these requirements were also the most commonly cited in 2004, there did appear to be a trend in the data (30.3% down to 21.8%) where cost per move has been growing less important relative to the time variables. Cost per move was mentioned significantly more often by those with low satisfaction levels with the state’s freight system, those from N. Central Washington and those from an agricultural or wood industry.

“On-time” was considered 24 hours by the typical manufacturing firm, but trucking firms were likely to define it as being 1-2 hours. Other industry segments varied in their definitions.

Ratings of satisfaction with the state freight system ranged from 6.15 to 8.79 by industry cluster showing that the industries are not homogeneous with regard to satisfaction. These ratings did not vary significantly since 2004. North Central agriculture and Coastal Counties wood products gave the lowest ratings, while Spokane manufacturing, Spokane wholesale, Vancouver/SW WA manufacturing, Vancouver/SW WA trucking, Northwest WA manufacturing, Northwest WA trucking and Eastside/Puget Sound wholesale each gave average ratings above 8.00. Collectively, the Spokane and NW Washington areas gave the highest ratings (both at 8.39).

Average ratings of impact from shipping problems have risen from 5.65 in 2004 to 6.62 on average for 2007, and these changes were seen across the industry clusters. These problems can be attributed to increased traffic congestion, traffic times and its effect on predictability, as well as increased cost competition. Impact ratings were found to be statistically related to overall satisfaction with the freight system (those with lowest impact were also the most satisfied).

Overall, freight users reported having additional expenses from shipping problems 12-23 percent of the time. Those most satisfied with the freight system reported the lowest percentages where additional expenses were incurred.

Since the previous study, both transportation and total logistics costs have risen as a percentage of cost of goods sold for manufacturers and agricultural firms.

In the analysis of statewide destinations for freight by individual cluster, the following were the leading 3 destinations for each:

- Spokane Manufacturers – Tri Cities, Central Puget Sound, Spokane Airport
- Spokane Wood – Spokane, Ports of Seattle/Tacoma, Tri Cities
- Spokane Trucking – Central Puget Sound
- Spokane Wholesale – Spokane, Central Puget Sound, Spokane Airport
- SE WA Agriculture – Ports of Seattle/Tacoma, N Central WA, SE Washington
- SW WA/Portland Manufacturing – Central Puget Sound, SW WA/Vancouver, Ports of Seattle/Tacoma
- SW WA/Portland Trucking – Ports of Seattle/Tacoma, Central Puget Sound, Canada Border
- SW WA/Portland Wholesale – Central Puget Sound, Coastal Counties, Canada Border
- Central WA Manufacturing – Central Puget Sound, Coastal Counties, Canada Border
- Central WA Agriculture – Canada Border, Spokane, Ports of Seattle/Tacoma
- Central WA Trucking – Central Puget Sound, Ports of Seattle/Tacoma, N. Central WA
- Central WA Wholesale – N. Central WA, Spokane, SW WA/Vancouver
- NW WA Manufacturing – NW WA area, Central Puget Sound, Ports of Seattle/Tacoma
- NW WA Wood – Spokane, N. Central WA
- NW WA Trucking – NW WA area, Ports of Seattle/Tacoma, Spokane
- Eastside Manufacturing – Central Puget Sound, SeaTac Airport, Ports of Seattle/Tacoma
- South King/Pierce Manufacturing – Central Puget Sound, Ports of Seattle/Tacoma, SeaTac Airport

- Eastside/South King Trucking – Central Puget Sound, SeaTac Airport, Ports of Seattle/Tacoma
- Eastside/South King Wholesale – Central Puget Sound, SW WA/Vancouver, SeaTac Airport
- Coastal Counties Manufacturing – Coastal Counties, Ports of Seattle/Tacoma, Central Puget Sound
- Coastal Counties Wood – Central Puget Sound, Coastal Counties, SW WA/Vancouver area

Taking into account all clusters statewide and the share of shipments traveling to each destination in Washington State, the top destination was Central Puget Sound (via road and rail), with 48.8% of all outbound freight shipments. The Ports of Seattle/Tacoma (via sea) were next, with 12.8% share of all outbound freight shipments.

The majority of inbound freight originates from outside Washington State. Averaging all industry clusters equally, a total of 59.4% of freight came from outside, the majority of which originated from California through Oregon (10.0%). The remaining 40.6% inbound freight originated within the state with 20.9% coming from the Puget Sound area.

National Survey of Freight Users

Cost per move was the single most important requirements of the freight system, stated by 41.7% of the national freight users. On-time delivery and predictable time/consistency were both named by around 23-25%.

One-half (50.0%) of the national companies indicated being “highly impacted” by shipment delays, and mean ratings were similar between the 1999 and 2007 studies, 6.90 to 6.98 respectively.

Satisfaction ratings with “on-time” performance were moderate, at 7.15 on average, and have not changed significantly since 1999.

The typical firm (firm with a mean score) receives about 12 shipments per month and experiences 4 delays per month. The number of delays is up from 2.5 in 1999.

Additional costs from delays have been experienced by these companies around 12% of the time.

Nearly sixty percent (59.0%) of the firms surveyed indicated a high likelihood of shifting business toward Seattle/Tacoma ports with improvement in performance. A total of 28.2% of firms gave low ratings of 0-3, and will not be expected to change their freight routing plans based on an improvement. The remaining firms were at least somewhat likely to consider it. Further analysis showed that those who favored consistent, predictable travel time were more likely to shift business toward these ports.

Likelihood to shift business away from Seattle/Tacoma ports based on scenarios of cost increases was evaluated using incremental increases of \$10, \$30, \$50, \$100 and \$200 per container. Under \$50, there were few companies that were very likely to change (7.3%). The percentage of firms highly likely to move business away increased from 14.6% at \$50 to 46.3% at \$100. At \$200, the majority (58.5%) of companies were highly likely to move freight away from these ports. These differences were statistically significant. Further analysis showed that those who were most highly impacted by shipping delays also gave the highest ratings for likelihood to shift business away from Seattle/Tacoma (at \$50, \$100 and \$200 levels).

Seattle and Tacoma were rated well above other major West Coast ports in the quality of their rail service.

Rail was rated highest (6.00) as a cause of delay in the freight system, followed by point of discharge (5.23) and customs/regulations (5.10). Many of the causes of delay tested have increased since 1999 in ratings for likelihood of causing a delay.

Both current and preferred delivery windows have increased since the previous study. The average window was currently 12.07 days, while the preferred window was 8.16 days. This compares to 10.00 days and 7.90 days in 1999, respectively.

APPENDIX

Questionnaire – Statewide

INTRO – LOCAL (Quota Cell 1-21)

Hello, my name is _____. I'm calling from Hebert Research on behalf of the Washington State Dept. Of Transportation. We are an independent research firm conducting a study about how well the state transportation system works for companies that rely on shipping and/or receiving goods via truck, rail, sea and air. The results of the study will be used to propose improvements that will help reduce delays and improve efficiency. This call is for research purposes only, and will not involved sales of any kind, either now or in the future. May I please speak with the logistics manager, the person who makes the freight routing decisions for shipping or who handles outsourcing for shipping? [RE-INTRODUCE YOURSELF AND PURPOSE ABOVE IF NECESSARY] All of the information you provide us is confidential and your company will not be identified with your answers to any question. If desired, a summary of the findings can be made available to you. Do you have time to answer a few questions, or can I schedule a better time for you? This should only take a few minutes.

SI. REGION/INDUSTRY [PRECODE FROM LIST]

1. NE WA/Spokane manufacturers (quota = 25)
2. NE WA/Spokane wood (quota = 25)
3. NE WA/Spokane trucking (quota = 14)
4. NE WA/Spokane wholesale (quota = 25)
5. SE WA Agriculture (quota = 25)
6. SW WA/Portland manufacturing (25)
7. SW WA/Portland trucking (20)
8. SW WA/Portland wholesale (25)
9. N. Central WA manufacturing (25)
10. N. Central WA agriculture (25)
11. N. Central WA trucking (20)
12. N. Central WA Wholesale (25)
13. NW Washington manufacturing (25)
14. NW Washington wood (25)
15. NW Washington trucking (20)
16. Eastside manufacturing (25)
17. South King/Pierce County manufacturing (25)
18. Eastside/South trucking (30)
19. Eastside/South wholesale (35)
20. Coastal counties manufacturing (25)
21. Coastal counties wood (25)
22. National retailers manufacturing (35)
23. National retailers wholesale (25)

MAIN QUESTIONNAIRE (QUOTA CELL 1-21)

1. Does your company handle shipping and freight transport of your products internally, at least to the next major destination point, or do you outsource it to a freight carrier for picking up goods and managing the shipments?

1. Internal
2. Outsource
3. Both, directly handle some shipments but outsource others
4. Other [SPECIFY]
5. Refused
6. Don't know

2. How important to your company's business is the state freight system, including roads, rail, sea or barge and air? Please give a rating on a 0-10 scale, where 10 is "highly important" and 0 is "not at all important."

SHARE OF COST OF GOODS SOLD

[MANUFACTURERS AND AG FIRMS ONLY; OTHERS SKIP TO Q5]

3. What percentage of your cost of goods sold would you estimate is the transportation cost?

4. What percentage of your cost of goods sold would you estimate is the TOTAL logistics cost? Logistics is defined as the total cost of the transportation move including transportation, warehousing, storage, handling, damaged goods, loss of customers due to shipment failures, etc.

OUTBOUND SHIPMENTS ANALYSIS

5. About how many OUTBOUND containers, rail cars or truck loads are you moving in an average month? Please include shipments sent directly or outsourced to a freight company? **[NOTE: CONSIDER LTL OR "LESS THAN LOAD" SMALLER TRUCKS AS ONE TRUCK]**

6. Of the total shipments you make in a typical month, where are they generally headed after leaving your facility? If they are moving by air or sea please mention the port they are headed to in Washington State and if rail or truck please list the final destination. **[DON'T READ; SELECT UP TO 5]**

1. SeaTac International Airport (air)
2. Port of Seattle (sea)
3. Port of Tacoma (sea)
4. Other Central Puget Sound destination (road or rail)
5. Ports of Portland, Kalama, Vancouver (sea)
6. Portland International Airport (air)
7. Portland area (road or rail)
8. Vancouver, WA area (north of Columbia River) (road or rail)
9. Canada Border (road or rail)
10. Greater Bellingham area/Whatcom or Skagit County (road or rail)
11. Mountain States (ID, CO, NE, etc.) (road or rail)
12. The Midwest (road or rail)
13. Oregon (road or rail)
14. California through Oregon (road or rail)
15. Other Southwest states (road or rail)
16. South (road or rail)

17. Southeast (road or rail)
18. Northeast (road or rail)

19. Tri-Cities (road or rail)
20. Spokane (road or rail)

21. Evenly divided between [SPECIFY]
22. OTHER [SPECIFY]
23. Refused
24. Don't know

7. **[PROMPT FOR EACH AREA MENTIONED IN Q6]** Approximately what percentage of your outbound shipments are directed there?

[PROMPT FOR EACH AREA MENTIONED IN Q6 EXCEPT BY SEA OR AIR; MANUFACTURING AND AG SKIP] Of the shipments to that area, approximately what percentage are by truck and what percentage are by rail of the total (Note: if truck to rail, count it as rail)?

8. % by truck exclusively
9. % by rail (or truck to rail)

[MANUFACTURERS AND AG FIRMS ONLY; PROMPT FOR EACH AREA MENTIONED IN Q6 INCLUDING SEA AND AIR] When you're sending product to _____ **[SHOW AREA NAME FROM Q6]**, what percentage would you say are sent with each one of the following methods:

10. % truck to customer or destination (same class of truck)
11. % truck to truck (i.e. transfer from short to long-haul)
12. % truck to rail
13. % truck to barge or ship
14. % truck to air
15. % rail to truck
16. % rail to barge

INBOUND SHIPMENTS ANALYSIS

17. About how many INBOUND freight shipments are you "receiving" in an average month, whether by truck load, container or rail car? **[NOTE: CONSIDER LTL OR "LESS THAN LOAD" SMALLER TRUCKS AS ONE TRUCK]**

[IF NO INBOUND SHIPMENTS, SKIP TO Q26]

18. Of the total inbound shipments you receive in a typical month, where were the points of origin before being sent to you? Again, if they were moving by air or sea please mention the port they used within Washington State and if rail or truck please list the starting point. **[DON'T READ; SELECT UP TO 5]**

1. SeaTac International Airport (air)
2. Port of Seattle (sea)
3. Port of Tacoma (sea)
4. Other Central Puget Sound destination (road or rail)

5. Ports of Portland, Kalama, Vancouver (sea)
6. Portland International Airport (air)
7. Portland area (road or rail)
8. Vancouver, WA area (north of Columbia River) (road or rail)

9. Canada Border (road or rail)
10. Greater Bellingham area/Whatcom or Skagit County (road or rail)

11. Mountain States (ID, CO, NE, etc.) (road or rail)
12. The Midwest (road or rail)
13. Oregon (road or rail)
14. California through Oregon (road or rail)
15. Other Southwest states (road or rail)

16. South (road or rail)
17. Southeast (road or rail)
18. Northeast (road or rail)

19. Tri-Cities (road or rail)
20. Spokane (road or rail)

21. Evenly divided between [SPECIFY]
22. OTHER [SPECIFY]
23. Refused
24. Don't know

19. **[PROMPT FOR EACH AREA MENTIONED IN Q18]** Approximately what percentage of your inbound shipments originated from there?

[PROMPT FOR EACH AREA MENTIONED IN Q18 EXCEPT BY SEA OR AIR; ONLY FOR NON-MANUFACTURING & NON-AG FIRMS] Of the shipments coming from that area, approximately what percentage are by truck and what are by rail of the total (Note: if truck to rail, count it as rail)?

20. % by truck exclusively
21. % by rail (or truck to rail)

[MANUFACTURERS AND AG FIRMS ONLY; PROMPT FOR EACH AREA MENTIONED IN Q18 INCLUDING SEA AND AIR] When you're receiving shipments from _____ **[SHOW AREA NAME FROM Q18]**, roughly what percentage are sent with the following methods:

22. % by truck exclusively
23. % by rail (or truck to rail)
24. % by air (or truck to air)
25. % by barge or ship (can be truck to barge or truck to ship)

SYSTEM REQUIREMENTS

26. I'm going to read a list of service outcomes provided by our state's freight system. I'd like you to identify which one is your company's single most important requirement of the supply chain?

1. Competitive or affordable cost per move
2. On-time delivery within a specified time window
3. Predictable travel time, that remains within an acceptable range of variation
4. Average speed of the move being at a certain level
5. Flexibility (i.e. ability to move goods on demand to the global market and shift between routes and transport modes, or multi-modes, based on best prices and timing)
6. All-weather freight system, with truck/barge/rail routes that are accessible all year round
7. Capacity in refrigerated trucks, rail cars and/or cold storage all year round
8. Capacity in refrigerated trucks, rail cars and/or cold storage during peak shipping season
9. General rail capacity (rail cars available when and where you need them)
10. Adequate storage at the right location
11. Other [SPECIFY]
12. Refused
13. Don't know

DEFINE ON-TIME (ALL FIRMS)

Some business define 'on-time' as arrival within 1 day or 1 hour of the anticipated time, but others define 'on-time' as arrival within minutes of the expected time. How do you define 'on-time and what is that amount of time?' [**PROBE FOR LENGTH OF TIME, EITHER IN HOURS, MINUTES OR DAYS**]

27. Within ____ minutes of deadline
28. Within ____ hours of deadline
29. Within ____ days of deadline

COST OF DELAYS

30. Using a scale from 0 to 10 where 0 means “not at all satisfied,” and 10 means “extremely satisfied,” how satisfied are you with your current performance in [**INSERT ANSWER TO Q26 – SYSTEM REQUIREMENT**] within Washington State?

31. On a scale from 0 to 10 where 0 means “not at all affected,” and 10 means “extremely affected,” how much does [**INSERT ANSWER TO Q26**] within Washington State adversely affect your business?

32. What percent of the time do you incur additional expense to recover from these types of shipping problems?

BACKGROUND OF COMPANIES

I just have a few closing questions to make sure we understand the types of companies in the survey.

33. [**ALL EXCEPT NATIONAL**] How many employees work at your company within your region of Washington State?

34. Into which of the following general categories of annual gross revenue would you place your firm? Is it....? [**READ AND RECORD ONE RESPONSE**]

1. Under \$1,000,000
2. \$1 – \$2.4 million

3. \$2.5 - \$4.9 million
4. \$5 - \$19.9 million
5. \$20 to \$49.9 million
6. \$50 to \$74.9 million
7. \$75 to \$99.9 million
8. \$100 million or more
9. REFUSED
10. DON'T KNOW

35. Do you maintain a database of delivery performance?

1. Yes
2. No [SKIP TO Q37]
3. Refused [SKIP TO Q37]
4. Don't know [SKIP TO Q37]

36. Would you be willing to share the general information from that database with a freight mobility improvement team that is attempting to solve freight shipment problems? All information will be treated as confidential and no individual answers will be used.

37. Would you like to be provided with a general summary of the findings from this study?

1. Yes
2. No

In closing, I just have a few verification questions.

Can I verify the name of your company?

What is your job title?

May I have your mailing address?

Is your office phone number _____ ?

What is your E-mail Address?

[IF NOT AVAILABLE OR REFUSED, ASK:] What is your fax number?

That concludes our survey. Thank you very much for your time.

Questionnaire – National Shippers

INTRO – NATIONAL Hello, my name is _____. I'm calling from Hebert Research on behalf of the Washington State Dept. Of Transportation. We are an independent research firm conducting a study about shipments originating in Asia that are routed through West Coast ports. This call is for research purposes only, and will not involved sales of any kind, either now or in the future. May I please speak with the person who is in charge of cargo routing decisions? **[RE-INTRODUCE YOURSELF IF NECESSARY]** The main purpose of this study is to help manage freight delays at incoming ports on the West Cost. All of the information you provide us is confidential and no individual answers will be identified. If desired, a summary of the findings can be made available to you. Do you have time to answer a few questions, or can I schedule a better time for you? This should only take a few minutes.

S1. Does your firm arrange for shipments from Asia to be routed through West Coast ports?

1. Yes
2. No [THANK AND TERMINATE]
3. Refused [THANK AND TERMINATE]
4. Don't know [THANK AND TERMINATE]

S2. Would you classify your company more in the wholesale, retail or manufacturing business category?

0. Broker/Freight Company/Other
1. Wholesale
2. Retail
3. Manufacturing
4. Refused
5. Don't know

NATIONAL RETAILERS DATA SET

1. I'm going to read a list of service outcomes provided by Washington State's freight system. I'd like you to identify which one is your company's single most important requirement of the supply chain?

1. Cost per move
2. On-time delivery within a specified time window
3. Predictable travel time, consistency
4. Flexibility (i.e. ability to move goods on demand to the global market and shift between routes and transport modes, or multi-modes, based on best prices and timing)
5. Capacity in refrigerated trucks, rail cars and/or cold storage all year round
6. Capacity in refrigerated trucks, rail cars and/or cold storage during peak shipping season
7. General rail capacity (rail cars available when and where you need them)
8. Adequate storage at the right location
9. Other [SPECIFY]
10. Refused
11. Don't know

2A. [IF Q1 = 1, ASK:] What do you consider as an acceptable range of price per container move from origin to destination? **[VERBATIM; PROBE FOR LOW TO HIGH OF RANGE]**

2B. [IF Q1 = 2, ASK:] What do you consider to be "on-time" delivery? For example, is it +/- 15

minutes.... +/- 1 hour.....12 hours.....1 day? [VERBATIM]

2C. [IF Q1 = 3, ASK:] To have predictable travel times, what is the minimum and maximum number of days a container shipment should take from a West Coast port to your facility? [VERBATIM]

3. Which West Coast port, including British Columbia, is currently doing the best job meeting your expectations in this area over the last year (2006)? [PROMPT IF NEEDED WITH EXAMPLES SO THEY UNDERSTAND MID-SIZED PORTS ARE INCLUDED; IF NONE ARE SATISFACTORY, MARK NONE]

1. LA/Long Beach, CA
2. Oakland, CA
3. Portland, OR
4. Seattle, WA
5. Tacoma, WA
6. Vancouver, B.C.
7. Prince Rupert, B.C.
8. Lazaro Cardenas, Mexico
9. Other [SPECIFY]
10. NONE are satisfactory
11. REFUSED
12. DON'T KNOW

4. Which of the following entities has the greatest influence on cargo routing decisions for your incoming deliveries?

1. Broker / Forwarder
2. Shipper / Supplier
3. Steamship Line
4. Your Company
5. Multiple – More than one has large influence [DON'T READ]
6. Other [SPECIFY]
7. REFUSED
8. DON'T KNOW

I'd like you to rate the importance of several criteria when selecting a port of entry. Please use a 0-10 scale where 10 is "highly important" and 0 is "not at all important." [ROTATE]

5. Contractual Requirements
6. Diverse Ports of Entry
7. Influence of Regulatory Agencies
8. Past Experiences
9. Cost of port fees and services
10. Timeliness

11. What are the other factors, if any, that also go into port of entry decisions? [RECORD VERBATIM]

12. Does your company allocate cargo through multiple West Coast ports?

1. Yes
2. No [SKIP TO Q13i]
3. Refused [SKIP TO Q13i]

4. Don't Know [**SKIP TO Q13i**]

I'd like you to rate the quality of rail service at each of the following coastal ports, using a 0-10 scale, where 10 means "excellent" and 0 means "poor."

- 13a. LA/Long Beach, CA
- 13b. Oakland, CA
- 13c. Portland, OR
- 13d. Seattle, WA
- 13e. Tacoma, WA
- 13f. Vancouver, B.C.
- 13g. Prince Rupert, B.C.
- 13h. Lazaro Cardenas, Mexico

[NOTE: AFTER 13H SKIP TO Q14]

SINGLE PORT FIRMS

13i. Using a 0-10 scale, where 10 means "excellent" and 0 means "poor," how would you rate the quality of rail service at the West Coast port you currently use?

13j. Which port is that?

- 1. LA/Long Beach, CA
- 2. Oakland, CA
- 3. Portland, OR
- 4. Seattle, WA
- 5. Tacoma, WA
- 6. Vancouver, B.C.
- 7. Prince Rupert, B.C.
- 8. Lazaro Cardenas, Mexico
- 9. Other [SPECIFY]
- 10. NONE are satisfactory
- 11. REFUSED
- 12. DON'T KNOW

14. Using a 0 to 10 scale where 0 means 'not at all likely' and 10 means 'extremely likely,' how likely is each of the following segments of the cargo transport system to be a cause of shipment delays to your company?

- 14. Customs / Regulatory Issues
- 15. Point of Origin
- 16. Ocean Transit
- 17. Port of Discharge
- 18. Rail
- 19. Long distance trucking
- 20. Final Delivery to Destination

21. On a scale from 0 to 10 where 0 means 'not at all affected,' and 10 means 'extremely affected,' how much do shipment delays adversely affect your business?

22. What is your current delivery time for shipments to reach you coming through West Coast ports, counting the time between the port delivery to the East Coast? [**RECORD # OF DAYS**]

23. If you could be assured of having a shorter delivery time, what would the delivery time need to be for West Coast shipments in order for you to consider changing ports? **[RECORD # OF DAYS]**

24. Some business define 'on-time' as arrival within 5 days of the anticipated time, but others define 'on-time' as arrival within minutes of the expected time. How do you define 'on-time?' **[RECORD VERBATIM] [PROBE FOR LENGTH OF TIME, EITHER IN HOURS OR DAYS, BUT SPECIFY WHICH]**

25. Using a scale from 0 to 10, where 0 means 'not at all satisfied,' and 10 means 'extremely satisfied,' how satisfied are you with your current 'on-time' delivery performance?

26. About how many West Coast containers, rail cars or truck loads, do you receive per month?

27. How frequently, or how many times, per month, are shipments not received on time?

28. Approximately what percent of the time do you incur additional expense to recover from shipping delays?

29. Using a scale from 0 to 10, where 0 means 'not at all likely,' and 10 means 'extremely likely,' how likely would you be to move your business toward the Ports of Seattle or Tacoma based on improved performance over other ports?

On the same scale, how likely would you be to shift your business away from Port of Seattle or Port of Tacoma if the costs increased by...

29b. \$10

29c. \$30

29d. \$50

29e. \$100

29f. \$200

30. Why is that? **[VERBATIM]**

30b. Are the tariffs being charged at United States ports of entry influencing your decision to use Prince Rupert or the Mexican port Lazaro Cardenas?

1. Yes
2. No
3. Refused
4. Don't know

BACKGROUND OF COMPANIES

I just have a few closing questions to make sure we understand the types of companies in the survey.

31. **[ALL EXCEPT NATIONAL]** How many employees work at your company within your region of Washington State?

32. **[NATIONAL ONLY]** How many employees work at your company?

33. Into which of the following general categories of annual gross revenue would you place your firm? Is it....? **[READ AND RECORD ONE RESPONSE]**

1. Under \$1,000,000
2. \$1 – \$2.4 million
3. \$2.5 - \$4.9 million
4. \$5 - \$19.9 million
5. \$20 to \$49.9 million
6. \$50 to \$74.9 million
7. \$75 to \$99.9 million
8. \$100 million or more
9. REFUSED
10. DON'T KNOW

34. Do you maintain a current database of delivery performance?

1. Yes
2. No **[SKIP TO Q36]**
3. Refused **[SKIP TO Q36]**
4. Don't know **[SKIP TO Q36]**

35. Would you be willing to share the general information from that database with a freight mobility improvement team that is attempting to solve freight shipment problems? All information will be treated as confidential and no individual answers will be used.

1. Yes
2. No

36. Would you like to be provided with a general summary of the findings from this study?

1. Yes
2. No

In closing, I just have a few verification questions.

Can I verify the name of your company?

What is your job title?

May I have your mailing address?

Is your office phone number _____ ?

What is your E-mail Address?

[IF NOT AVAILABLE OR REFUSED, ASK:] What is your fax number?

That concludes our survey. Thank you very much for your time.