

FREIGHT

POLICY

TRANSPORTATION

INSTITUTE

# Newsletter

Washington State University



## FROM THE DIRECTORS

It's been a busy and productive three months since the Winter edition FPTI newsletter, as the institute has been actively engaged in several regional and national freight research efforts, including research projects with the WSDOT, USDOT, USDA and the Region 10 PacTrans center. Highlights from some of these research activities are summarized in this newsletter and have also been presented as papers and posters at transportation conferences nationally as FPTI strives to disseminate research findings to the broader academic and stakeholder community. Since the beginning of 2017, papers and posters from FPTI efforts have been presented at the Transportation Research Board (Washington DC), Transportation Research Forum Conference (Chicago, IL) and the Pacific Northwest Regional Economic Conference (Bend, OR). We will also be presenting findings at the Western Economics Association International conference in San Diego, CA at the end of June 2017.

There has been a noticeable increase in freight volumes and a subsequent tightening of freight capacity since the beginning of the year and certainly compared to this period last year. On rail, this has mostly been attributed to very strong grain exports, improved coal shipments and renewed demand for frac sand. Intermodal container shipments on rail have also increased significantly over the past 4 weeks, creating some bottlenecks at PNW ports. Truck freight rates for fruit and vegetable shipments out of Washington to all destinations exceeded historical averages for the first 13 weeks of 2017, but have decreased over the past several weeks. And ocean freight rates, while still struggling with excess capacity, have increased since the beginning of the year.

The institute has also made significant strides on the development of the FPTI Freight Data Warehouse, now available at <http://ses.wsu.edu/freight-data-warehouse/>. This freight data repository represents a primary focus for the institute as we bring together and organize data from a variety of public sources and develop data visualization tools that allows for enhanced understanding of real-time freight capacity and performance across various freight modes. With plans for additional data feeds, there are currently two primary data sources being leveraged, including the weekly Surface Transportation Board rail performance reports and the weekly USDA Fresh Fruit and Vegetable Truck Rate Report. We encourage you to peruse the Freight Data Warehouse and also provide suggestions for additional data and recommendations for improving the data visualization tools available.

## Freight Data Warehouse Initiative

### \* What is it?

The foundation of supporting scientific research, educational outreach and technology transfer activities begins with improved access and availability to freight data. This research theme aims to make freight data and information available to a broader audience of impacted constituents, researchers, policy analyst and industry participants through the development of a freight data repository and warehouse that coalesces freight specific data from a variety of sources. The need for improved freight data has been highlighted in several national research efforts, including the Strategic Highway Research Program (SHRP2 Report S2-C20-RW-2, Freight Demand Modeling and Data Improvement Strategic Plan) and the National Cooperative Freight Research Program (NCHRP Report 26, Guidebook for Developing Subnational Commodity Flow Data).

### \* What will be available?

A variety of freight data, primarily focused on weekly volumes or rates for the primary freight modes (rail, truck, water). This information is presented relative to levels experienced last year and also relative to within one, two or three standard deviations (user may choose) from the historical average. This helps provide more meaningful interpretation of capacity and performance. Users may also choose specific origins / destinations, to narrow geographical scope.

### \* When it will be available?

The initial FPTI data warehouse is available now at <http://ses.wsu.edu/freight-data-warehouse/>

### \* Next Steps?

We will continue to add more data and make modifications to improve the website, based upon user feedback!

## Technical Advisory Committee Meets

The FPTI Technical Advisory Committee convened for a meeting on March 2, 2017 at the Sea-Tac Airport to discuss the following agenda items.

Meeting Agenda Included:

- \* Introductions (updated committee, new faces)
- \* Synopsis of FPTI activities and budget timeline
- \* Review of recently completed FPTI projects
- \* Discussion of current ongoing projects
- \* Identification of future direction and research priorities

The committee will reconvene for a meeting later this fall, with future meetings occurring approximately twice per year.



## Outreach Activities

Freight Policy Transportation Institute (FPTI) researchers have recently presented their findings at a number regional and national conferences and symposia. Below are highlights of those presentations.

### Posters Presentations

#### WSU Academic Showcase, Pullman, WA, March 31, 2017

- \* **Improved Methodology for Benefit Estimation of Preservation Projects;** Primary Author: Eric Lang, Co-Authors: You Zhou, Eric Jessup (also presented at TRF Conference).

The objective of this research was to evaluate and analyze the process for calculating road preservation benefits and to develop improved methods for measuring the benefits of these highway projects. After a thorough assessment of the WSDOT's current process and estimation procedure for benefit/cost analysis of highway and bridge preservation projects, the authors suggested modifications to the HERS-ST model.

- \* **Know Your Neighbor: Spatial Effects of State Export Promotion and Infrastructure Investment;** Primary Author: You Zhou, Co-Authors: Jeremy Sage, Eric Jessup, Ken Casavant.

Highway infrastructure investment decisions are increasingly multifaceted with environmental concerns rising to be an important factor. This research investigated the impact of investment in highway infrastructure on emissions from freight transportation increases. A panel data model was employed to analyze state-level freight carbon dioxide emissions from 1995-2011. The results showed both direct, and indirect, increases in emissions relative to increases in freight transportation.

- \* **Reroute or Wait It Out? Estimating Optimal Routh Decisions in the Presence of Unexpected Delays;** Primary Author: James Eustice, Co-Authors: Jeremy Sage, Eric Jessup, Ken Casavant.

On rural roads, unexpected delays significantly impact freight movement as there is rarely a practical alternate route that minimally impacts travel time. This is particularly evident in western states with mountain passes experiencing frequent weather related closures. As a result of 4,600 origin/destination intercept surveys of drivers on Snoqualmie Pass, the authors found that only 46% of the drivers chose the optimal route determined by the model based on Google Maps API. This paper develops a model for drivers to use in making rerouting decisions.

#### Pacific Northwest Regional Economics Conference, Bend, OR, May 17, 2017

- \* **Spatial Price Competition between Barge and Rail Service in the Pacific Northwest;** Primary Author: Eric Jessup.

This analysis focuses on the spatial price competition between shuttle rail and barge services in the Pacific Northwest, particularly during the extended lock outages that have occurred recently on the Columbia/Snake river, and also during 2010-2011. The analysis illustrates how the introduction of two large shuttle rail facilities has improved grain basis levels regionally, but the impact varies spatially and those producers close to shuttle rail facilities experience weaker basis levels during outages.



## Additional Outreach

### Papers Presented

#### Transportation Research Forum Annual Conference, Chicago, IL, April 17, 2017

- \* **Uncovering Confounding Factors of Large Trucks Crashes and Safety Critical Events: An Exploratory Analysis of a Northwest Truck Driver Survey;** Primary Author: Salvador Hernandez, Co-Authors: Eric Jessup, Jason Anderson, Eric North.

This paper focuses on the availability of parking for freight vehicles which is one of the confounding important variables involved with large truck crashes and safety critical events. The authors used a geographically focused survey of drivers and freight activity throughout the Pacific Northwest. The results showed that drivers of less-than-truckload (LTL) shipments, weekend shipments, and older drivers have fewer challenges finding safe and available parking.

#### Pacific Northwest Regional Economic Conference, May 23-25, 2017, Bend, OR.

- \* **The Effects of Mega Airline Mergers on Consumer Welfare Through Price and Flight Frequency;** Primary Author: Tan Xinlong, Co-Author: Jia Yan.

The authors found that in the short run, both the United/Continental and the Delta/Northwest mergers have little impact on consumer welfare. However, in the long run the D/NW merger generates \$1.5 billion in annual gains to travelers in selected markets associated with lower price and higher frequency. The findings are consistent with DOJ's conclusion that the mergers would benefit passengers by optimizing aircraft utilization, providing a wider variety of service, and being a strong competitor for existing mega carriers.

- \* **U.S. Rail Freight Demand, Service, Capacity, and Performance;** Primary Author: Ken Casavant, Co-Authors: Jesse Gastelle, Peter Caffarelli, Eric Jessup.

This paper evaluates recent Class I rail performance and expectations related to forecasted increases in freight volumes by 2045. USDOT expects rail tonnage will increase by 24% between 2015 and 2045; primary tonnage increases is attributed to coal, chemicals, and agricultural products; slight decrease in rail rates over past 10 years; and record spending by freight railroads to maintain, and improve their infrastructure and equipment.

- \* **Economic and Environmental Impacts from the Columbia Snake River Extended Lock Outage: 2016-2017;** Primary Author: Erika Briscoe, Co-Authors: Eric Jessup, Ken Casavant

The paper outlined the effects of the 2010 Lock Outage. Key findings were that 93% of the wheat was moved by rail during the lock outage and that there was a 37.9% increase in shipping and storage costs. The recent outage lasted for 14 weeks from December 12, 2016 to March 20, 2017 and was analyzed in real time including grain elevator surveys and other commodity movement surveys. The outages, planned for every five to seven years, have general impacts on a variety of stakeholders, and effect transportation costs and services.

- \* **Transportation System Resiliency: A National Perspective of Potential Infrastructure Impacts from Climate Change;** Primary Author: Jeremy Sage, Co-Authors: Austin Miller, Eric Jessup.

Major conclusions are that climate change will have major impacts on transportation infrastructure, goods movement, and agricultural production. The major modes of disruption include: Regional changes in productivity of agricultural goods; Gradual changes in climate conditions; Extreme precipitation events; and Sea level rises and coastal storm surges.



## Freight Snapshot

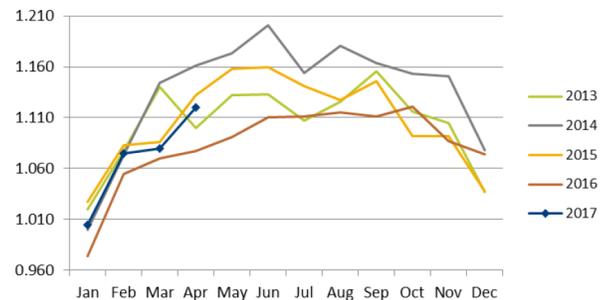
### \* Rail

The Class I railroads are slowly increasing freight volumes in 2017, a positive indication of renewed trade and economic activity and a welcome departure from the low freight volumes that plagued 2016. Total rail volumes have yet to return to the levels experienced in 2014, but volumes are showing increasing trends. A large proportion of the increase in rail tonnage is attributed to sizeable increases in coal, grain and sand shipments. Weekly coal shipments are currently near 85,000 units per week, compared with 67,000 units per week at this point in 2016 but well off the 110,000 units per week experienced in 2014. Grain shipments, primarily driven by soybean and wheat exports to PNW ports are well above levels experienced over the past three years, due to a combination of the large crop, low domestic grain prices and strong Asian market demand. The pace of rail grain shipments continues to climb over the past several weeks, countering the normal, downward seasonal trend through the spring and early summer. Grain shipments typically hit a peak during fall harvest (Sept./Oct.) at around 28,000 units per week but 2017 levels may exceed that. There has also been renewed interest in frac sand shipments, with 2017 volumes exceeding that experienced over the past three years. This is being driven from renewed domestic oil and gas development that had been stalled due to low energy prices. But energy prices have steadily improved and given the current administration's energy policies, particularly regarding approval of the Dakota Access Pipeline, investments and development have been returning to the oil and gas fields and increasing demand for frac sand.

### \* Truck

Similar to rail freight, 2017 truck freight volumes are also experiencing positive improvements and increased capacity utilization. According to the Cass Freight Index for truck shipments, 2017 is following a very similar pattern to 2015 and a healthy improvement over 2016. The underlying support for improved truck freight activity is from parcel and packaged delivery services, a result of increased e-commerce activity.

Cass Freight Index™ - Shipments



### \* Barge

Activity on the inland navigation system has mirrored that occurring on rail, with increased grain exports, increased sand movements and increased coal shipments, as compared to 2016 levels. As a result, barge freight rates have strengthened as capacity utilization increases. Grain shipments on the river system have continued to be strong, as export demand likewise remains strong.

### \* Ocean

Ocean freight is also showing moderate signs of improvement, both from dry bulk and container movements. Both the Shanghai and China Container Index is currently between 840 and 855, almost double where it was one year ago. And the Baltic Dry Index was above 1,200 at the beginning of April, 2017 but has fallen back to around 920 recently, which is still better than the mid-300s that were realized in early 2016. Expect continued excess capacity in the ocean freight market over the near future as new and bigger container and dry bulk vessels outpace retirements.

## Freight Policy Transportation Institute Faculty



**Ken Casavant**



**Eric Jessup**



**Jia Yan**



**Vicki McCracken**

## FPTI Technical Advisory Committee (TAC)

**Glen Squires, Chair**, CEO, Washington Grain Commission, Spokane, WA

**Charlie Howard**, Director of Planning, Puget Sound Regional Council, Seattle, WA

**Jonathon Berndt**, Global Account Manager, Expeditors International, Portland, OR

**Ashley Probart**, Executive Director, Transportation Improvement Board, Olympia, WA

**Bruce Blanton**, Director, Transportation Services Division, Agricultural Marketing Service, USDA

**Scott Drum**, Director, Research & Strategic Analysis, Port of Portland, Portland, OR

**Kristin Meira**, Executive Director, Pacific Northwest Waterway Association, Portland, OR

**Greg Guthrie**, Director of Agricultural Products, Burlington Northern Sante Fe Railroad, Portland, OR

**Doug Brodin**, Freight Research Manager, Washington State DOT, Olympia, WA

**Darren Timothy, Ryan Endorf**, WSDOT (By invitation)

**FPTI**



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