A Real Time Assessment of a Major Transportation Disruption
Sara Simmons, Eric Jessup and Ken Casavant
A REAL TIME ASSESSMENT OF A MAJOR TRANSPORTATION DISRUPTION
Freight Policy Transportation Institute
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Research Team

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Columbia-Snake River Extended Lock Closure (Dec 2010 – Mar 2011)

Planned outage to rehabilitate an aging infrastructure

Replacing downstream gates for three locks (The Dalles, John Day and Lower Monumental)
Transportation Disruption Study

- **Purpose**
  - Determine
    - Historical use of the river system
    - Preparations of industry and government entities
    - Impacts of the outage
    - Return of traffic to the river system
  - Evaluate the economic and environmental impacts
  - Produce a guide for other planned disruptions
Our Approach

- 4 Phases (Interim Reports)
  1. Historical use of the navigation system (1991-2010)
  2. Industry, shipper and government preparations
  3. Actual impacts and changes during the outage
  4. Monitoring the traffic return and evaluating environmental and economic impacts
Historical Waterborne Commerce on the Columbia-Snake River System, 1991-2010

- **Phase I**
  - **Objectives**
    - Describe waterborne commodity movements between 1991 and June 2010
    - Identify the general trends and seasonality of commodity movements
    - Identify major commodities that could be affected by the extended lock outage
  - **Data Source**
    - U.S. Army Corps of Engineers’ Waterborne Commerce Statistics Center
      - Lock Performance Monitoring System
Annual Downbound and Upbound Tonnage of All Commodities, 1991-2010

Source: U.S. Army Corps of Engineers Monthly Lock Tonnage Reports

* Indicates that 2010 data consists of the months January through June
# Major Commodities Moving on the Columbia-Snake River System, 1991-2010

**Downriver**
- Wheat
- Forest products
- Sand, gravel and stone
- Rye, barley, rice, sorghum and oats
- Vegetable products
- Paper and allied products

**Upriver**
- Gasoline
- Distillate fuels (diesel)
- Garbage
- Fertilizer
- Smelted products
Seasonality in Major Downriver Commodities, 2008 – 2010

- □ 75% of all downriver shipments
- □ Harvest in August
  - □ High volume movements from August – April
- □ March is a low volume month
  - □ Routine 2 week outages

Note: July-December averages do not include 2010 data.
Seasonality in Major Downriver Commodities, 2008 – 2010

Note: July-December averages do not include 2010 data.

- **High volume months:**
  - February, June and October
- **March is a low volume month**
  - Routine 2 week outages
- **Wave-like pattern**
Seasonality in Major Upriver Commodities, 2008 – 2010

- Consistent movements throughout the year
- High volume months: July and August
- Low volume month: March
  - Routine 2 week outages

Note: July-December averages do not include 2010 data.
Seasonality in Major Upriver Commodities, 2008 – 2010

- **High volume months:** May – September
  - Vacations and road trips

- **Low volume months:** November – March
  - Less traveling due to weather

**Note:** July-December averages do not include 2010 data.
Average Movements Through Bonneville, December – March

### Average Downbound Movements, 2008-2010

<table>
<thead>
<tr>
<th>Commodity by Ton</th>
<th>Tonnage</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Products</td>
<td>161,498</td>
<td>9.59</td>
</tr>
<tr>
<td>Sand, Gravel and Stone</td>
<td>44,417</td>
<td>2.64</td>
</tr>
<tr>
<td>Iron Ore</td>
<td>19,989</td>
<td>1.19</td>
</tr>
<tr>
<td>Smelted Products</td>
<td>11,042</td>
<td>0.66</td>
</tr>
<tr>
<td>Wheat</td>
<td>1,327,614</td>
<td>78.86</td>
</tr>
<tr>
<td>Corn, Rye, Barley and Oats</td>
<td>15,098</td>
<td>0.90</td>
</tr>
<tr>
<td>Vegetable Products</td>
<td>45,128</td>
<td>2.68</td>
</tr>
<tr>
<td>Other Minor (27) Commodities</td>
<td>58,758</td>
<td>3.49</td>
</tr>
<tr>
<td>Total</td>
<td>1,683,543</td>
<td>100.00</td>
</tr>
</tbody>
</table>

### Average Up Bound Movements, 2008-2010

<table>
<thead>
<tr>
<th>Commodity by Ton</th>
<th>Tonnage</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline</td>
<td>208,407</td>
<td>33.01</td>
</tr>
<tr>
<td>Distillate Fuels</td>
<td>282,002</td>
<td>44.67</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>18,527</td>
<td>2.93</td>
</tr>
<tr>
<td>Forest Products</td>
<td>19,983</td>
<td>3.17</td>
</tr>
<tr>
<td>Smelted Products</td>
<td>10,539</td>
<td>1.67</td>
</tr>
<tr>
<td>Garbage</td>
<td>81,077</td>
<td>12.84</td>
</tr>
<tr>
<td>Other Minor (31) Commodities</td>
<td>10,746</td>
<td>1.70</td>
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<tr>
<td>Total</td>
<td>631,281</td>
<td>100.00</td>
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</tbody>
</table>
Industry Preparations for the Columbia-Snake River Extended Lock Outage

- **Phase II**
  - **Objectives**
    - To describe the major waterborne commodity movements for the six month period prior to the extended lock outage
    - To learn how the actors prepared
  - **Data Sources**
    - U.S. Army Corps of Engineers’ Waterborne Commerce Statistics Center
    - Shippers, government divisions, industry personnel and ports
Above Average Downriver Commodities, Jul – Dec 2010

- Above average months: August – November
- December 2010: shipped almost as much as an average December
- Early shipments to preposition and fill early international orders

**Note:** December 2010 data only includes the first ten days of the month.
Above Average Upriver Commodities, Jul – Dec 2010

- Above average months: September – November
- December 2010: shipped almost as much as an average December
- Prepositioning and storing prior to outage

**Note:** December 2010 data only includes the first ten days of the month.
Pacific Northwest Wheat Case Study

- **Background**
  - Wheat is the largest volume commodity that moves on the Columbia-Snake River
    - 75 percent of all downriver movements
    - The Pacific Northwest has a 3 pronged transportation system

- **Purpose**
  - To capture the options and decisions of wheat elevator managers
  - To provide a baseline scenario to evaluate possible changes brought on by the lock outage
# Pacific Northwest Wheat Case Study

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Firms</th>
<th>Annual Tonnage Shipped in Bushels</th>
<th>Percentage of Total Tonnage Shipped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Oregon</td>
<td>5</td>
<td>32,800,000</td>
<td>12.68%</td>
</tr>
<tr>
<td>Northern Idaho</td>
<td>5</td>
<td>40,600,000</td>
<td>15.69%</td>
</tr>
<tr>
<td>Southern Idaho</td>
<td>3</td>
<td>7,500,000</td>
<td>2.90%</td>
</tr>
<tr>
<td>Northern Washington</td>
<td>5</td>
<td>87,900,000</td>
<td>33.98%</td>
</tr>
<tr>
<td>Southern Washington</td>
<td>8</td>
<td>89,912,000</td>
<td>34.75%</td>
</tr>
<tr>
<td><strong>Pacific Northwest</strong></td>
<td><strong>26</strong></td>
<td><strong>258,712,000</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
Pacific Northwest Wheat Case Study

Percentage Per Year of Wheat Shipped via Various Transportation Modes

- Eastern Oregon
- Northern Idaho
- Southern Idaho
- Northern Washington
- Southern Washington
- Pacific Northwest

Transportation Modes:
- Direct Truck to Final Market
- Truck-Barge
- Rail
Industrial and Regional Preparations

Barge Line Preparations
- Expected to take the brunt of the economical impact
- Expected to benefit from the safer, more efficient and more reliable transportation system
- Implementation of a “business interruption surcharge”
- Prepared customers and employees

Rail Line Preparations
- Prepared for an increase in cargo loads
- Helped customers, producers and industries in continuing shipments through the extended lock outage
- Advertised, identified inland markets and partnered with local ports to aid in the movement of products
Industrial and Regional Preparations

- Petroleum companies
  - “Evaluating all fuel supply points and distribution options throughout the region to ensure adequate supply”
  - 3 alternatives to barging fuel
    - Use excess terminal storage
    - Use excess capacity on pipelines
    - Increase use of tanker trucks and rail cars
Forestry Industry

- Increased movements prior to December 2010 to build up inventories
  - Forest product shipment volumes were consistently 75% above average from July – December 2010
- Plans to use truck and rail transportation as an alternative to barge
  - Woodchips, logs, lumber and pulp
Industrial and Regional Preparations

- **Wheat Industry**
  - Notified customers and producers
  - Customers were given options for alternative delivery dates
  - Increased elevator storage
    - Wheat exporters’ headquarters in Portland and Vancouver
    - Wheat elevator near The Dalles
Governmental and Institutional Preparations

- Pacific Northwest Waterways Association (PNWA)
  - The leader of preparations for the extended lock outage
  - A non-profit organization that supports regional economic development
  - Preparations
    - Notified its members of the extended lock outage
    - Conducted conferences justifying the importance of the lock outage
    - Suggested alternative means of transportation
    - Spoke to the public and press
Governmental and Institutional Preparations

- U.S. Army Corps of Engineers
  - Preparations
    - Risk analysis
    - Notified individuals of the extended lock outage
    - Continually host teleconferences for stakeholders discussing progress made
    - Planned the extended lock outage around salmon runs and heavy cargo months
    - Moved accessories, lock gate equipment and other necessary supplies for the extended lock outage by barge
Questions?

Check out the Freight Policy Transportation Institute’s website!
www.fpti.wsu.edu

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