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

Planned outage to rehabilitate an aging infrastructure

Replaced downstream gates for three locks

15 weeks
Transportation Disruption Study

- **Purpose**
  - Determine
    - Historical use of the river system
    - Preparations for the outage
    - Impacts of the outage
    - Return of traffic to the river system
  - Evaluate the economic and environmental impacts
  - Produce a guide for other planned disruptions
Historical Use of the Columbia-Snake River System

Phase I

Objectives
- Describe historical waterborne commodity movements
- Identify the general trends in 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
- 1991 – June 2010
Annual Downbound and Upbound Tonnage of All Commodities, 1991-2010

Source: U.S. Army Corps of Engineers Monthly Lock Tonnage Reports
## Major Commodities Moving on the Columbia-Snake River System

<table>
<thead>
<tr>
<th>Downriver</th>
<th>Upriver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>Gasoline</td>
</tr>
<tr>
<td>Forest products</td>
<td>Distillate fuels (diesel)</td>
</tr>
<tr>
<td>Sand, gravel and stone</td>
<td>Garbage</td>
</tr>
<tr>
<td>Rye, barley, rice, sorghum and oats</td>
<td>Fertilizer</td>
</tr>
<tr>
<td>Vegetable products</td>
<td>Smelted products</td>
</tr>
<tr>
<td>Paper and allied products</td>
<td></td>
</tr>
</tbody>
</table>
Seasonality in Major Downriver Commodities, 2008 – 2010

- 75% of all downriver shipments
- Harvest in August
  - High volume shipments through the winter
- March is a low volume month
  - Routine 2 week outages
Industry Preparations for Extended Lock Outage, July – December 2010

- Phase II

  - Objectives
    - To describe the major waterborne movements 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 Movements, 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 orders
Pacific Northwest Wheat Case Study

- **Background**
  - Wheat is the largest volume commodity that moves on the Columbia-Snake River

- **Purpose**
  - To capture the options and decisions of the wheat industry
  - To provide a baseline scenario for wheat transportation
Pacific Northwest Wheat Case Study

### Annual Wheat Tonnage Shipped by Survey Respondents

<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>Pacific Northwest</td>
<td>26</td>
<td>258,712,000</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Industrial Preparations

Barge Line Preparations

- Implementation of a “business interruption surcharge”
- Prepared customers and employees
  - Continued benefits
  - Layoffs for outage

Rail Line Preparations

- Prepared for an increase in cargo loads
- Advertised, identified inland markets and partnered with local ports to aid in the movement of products
Institutional Preparations

- Pacific Northwest Waterways Association (PNWA)
  - The leader of preparations for the extended lock outage
  - Preparations
    - Conducted conferences justifying the importance of the lock outage
    - Suggested alternative means of transportation
    - Spoke to the public and press
Impacts of the Extended Lock Outage

- Phase III
  - Objectives
    - To learn how the actors were impacted
    - To describe the major commodity movements by barge, rail and truck during the lock outage
  - Data Sources
    - U.S. Army Corps of Engineers’ Waterborne Commerce Statistics Center
    - Shippers, government divisions, industry personnel and ports
Percentage of Wheat Shipped via Various Modes by Survey Respondents

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

Modes:
- Truck
- Truck-Barge
- Rail
## Pacific Northwest Wheat Case Study

<table>
<thead>
<tr>
<th>Region</th>
<th>Average Tonnage Shipped in Bushels, Dec - Mar</th>
<th>Actual Tonnage Shipped in Bushels, Dec ‘10 - Mar ‘11</th>
<th>Percentage Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Oregon</td>
<td>12,136,000</td>
<td>9,681,700</td>
<td>-20.22%</td>
</tr>
<tr>
<td>Northern Idaho</td>
<td>17,052,000</td>
<td>2,428,000</td>
<td>-85.76%</td>
</tr>
<tr>
<td>Southern Idaho</td>
<td>2,375,000</td>
<td>1,620,000</td>
<td>-31.79%</td>
</tr>
<tr>
<td>Northern Washington</td>
<td>33,929,400</td>
<td>20,315,826</td>
<td>-40.12%</td>
</tr>
<tr>
<td>Southern Washington</td>
<td>29,221,400</td>
<td>1,433,200</td>
<td>-95.10%</td>
</tr>
<tr>
<td>Pacific Northwest</td>
<td>94,050,436</td>
<td>35,478,726</td>
<td>-62.28%</td>
</tr>
</tbody>
</table>
# Percentage Difference in Shipping Rates for Wheat Elevator Managers

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage Difference during Lock Outage</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Direct Truck to Final Market</td>
<td>Rail</td>
</tr>
<tr>
<td>Eastern Oregon</td>
<td>11%</td>
<td>-7%</td>
</tr>
<tr>
<td>Northern Idaho</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Southern Idaho</td>
<td>7%</td>
<td>8%</td>
</tr>
<tr>
<td>Northern Washington</td>
<td>-13%</td>
<td>1%</td>
</tr>
<tr>
<td>Southern Washington</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Pacific Northwest</td>
<td>4%</td>
<td>2%</td>
</tr>
</tbody>
</table>
Industrial Impacts and Activities

Barge Line Impacts
- Laid off employees
- Reduced employees’ work hours
- Continued service below The Dalles
- Barging tugs were called to Portland

Rail Line Impacts
- Increased cargo loads (going east and west)
- Increased employees’ hours to handle large loads and increased railcar numbers
- Increased fuel and employees’ costs
Governmental Impacts and Activities

- **U.S. Army Corps of Engineers (USACE)**
  - **Impacts and Activities**
    - Hosted teleconferences
    - Documented progression made
    - Made plans for potential disruptions
    - Announced delays and revisions in construction and opening dates
    - Hosted several tours at various Columbia-Snake River locks
Questions?

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

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