The Importance of Maintaining Navigation Channels and the Impact of Closures

Bruce Lambert
Institute for Trade and Transportation Services
Waterways are a Safe Industry

- Incidences and fatalities
- Delay and lost productivity
- Hazmat rates
- Simulations, training
- Channel markets, ATONS
- Technology - VTS
Navigation Safety

- Federal
  - Corps of Engineers
  - NOAA
  - USCG
- Private Sector
  - Vessel operators
  - Pilots
- State and City Entities
- Navigation Associations
What is a Closure

- Two different types (failures)
  - Locks and Dams (Institutional)
  - Navigation incidents (Human)
- Who Bears these Costs?
  - Users
  - Carriers
  - Public Sector
## What Responses May Occur after a Public Sector Infrastructure Event?

<table>
<thead>
<tr>
<th>Sector</th>
<th>Short-Term</th>
<th>Medium Term</th>
<th>Long Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users</td>
<td>Prepare, Respond, Ignore</td>
<td>Prepare, Ignore</td>
<td>Move, relocate</td>
</tr>
<tr>
<td>Emergency Responders</td>
<td>Respond</td>
<td>Training, New equipment, etc., Table Top Exercises</td>
<td>Move, relocate</td>
</tr>
<tr>
<td>Vessel Operators</td>
<td>Prepare, Respond, Ignore</td>
<td>Offer different services</td>
<td>Offer different services, align infrastructure</td>
</tr>
<tr>
<td>Public Infrastructure</td>
<td>Respond Operationally</td>
<td>Improve Operational Response</td>
<td>Retrofit or repair, engineering standards, etc.</td>
</tr>
<tr>
<td>Public Planning Response</td>
<td>Forensic Studies</td>
<td>Recommendations</td>
<td>Policy/Planning Guidance, Ordinances</td>
</tr>
</tbody>
</table>
After the Fact - Forensic Economics

- Costs to Users
  - Delay, lost productivity – plant closures
  - Inventory disruptions – lost output, supply chains
  - Survey instruments – modeling behavior
- Infrastructure damage assessments
  - Damages to roadway, tracks, etc.
  - Inspection time – costs
- Non Transportation Infrastructure Affects
  - Services Disruption, Power-Power
  - Recreational Losses
  - Environmental Derogation
- A lot of this information would not necessarily be in initial planning consideration
What Does an Event Cost?

NETS (IWR-USACE)
- Greenup 2003 Closure (52 days) - $42 Million
- Hannibal Locks 2005 Closure (5 days) - $5 Million
- Lock 27 Closures
  - (August 2007) - $3.9 Million
  - (Oct 2005-Feb 2006) - $2.7 Million
- McAlpine (August 2004) - $6.3 million
- 2008 Flooding in Upper Miss?

GLOBAL Insight – Upper Miss 90 Day Closure
- $118.6 million for Waterway freight
- $482.8 million by rail
- $1.50 billion by truck
Other Recent Studies Crossing Non-Traditional Boundaries

- Black Warrior Tenn-Tom Waterway System
- Minnesota Bridge Collapse
- Business Realignment Estimates - FHWA
- (NCHRP) Report 586: Rail Freight Solutions to Roadway Congestion
- Lock and Dam Closures
  - Chickamauga Locks
  - Emsworth, Dashields, and Montgomery
- Marine Highway Program
Who benefits from transportation improvements?

- Carriers
- Ports
- Governments and other local industries
- Shippers
- Economic Development Agencies

- Who does not benefit?
System Planning Limited by Traditional Public Sector Planning Frameworks

- Shaped by demands to compare projects within a given budget (mode) or geography
- Differ by agency regarding what can be considered
  - Public Benefits and Costs
    - Reduce emissions, environmental restoration, health risks and exposure, risk management/ mitigation, etc., Job creation.
  - Externalities – limited consideration
    - First Order effects – Improved Operations
    - Second and Third Order Effects – changing capacity and routings
- Forecasting and Scenario profiles
  - Desired certainty of answers often exceed analytical capacity
  - Network effects not included
  - No pre – post study analysis done on routine basis
Are Waterways Important? Two Challenges

- First, we have to get people to think the waterways even matter.
  - Number of Studies from Corps, Marad, AASHTO, Trade Associations, etc., stating importance of Waterways
- Second, we need people to understand waterway transportation is more than products
## Tenn-Tom Waterways Economic Benefit

### Economic Impact 1996-2008 (in Millions)

<table>
<thead>
<tr>
<th>State</th>
<th>Direct</th>
<th>Indirect</th>
<th>Induced</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>$15,217.1</td>
<td>$550.3</td>
<td>$718.8</td>
<td>$16,486.2</td>
</tr>
<tr>
<td>Kentucky</td>
<td>$687.2</td>
<td>$163.1</td>
<td>$559.1</td>
<td>$1,809.4</td>
</tr>
<tr>
<td>Mississippi</td>
<td>$3,554.7</td>
<td>$1,303.0</td>
<td>$1,276.8</td>
<td>$6,134.3</td>
</tr>
<tr>
<td>Tennessee</td>
<td>$2,361.6</td>
<td>$35.1</td>
<td>$471.1</td>
<td>$2,448.8</td>
</tr>
<tr>
<td>Regional</td>
<td>$25,202.5</td>
<td>$2,083.3</td>
<td>$2,641.1</td>
<td>$30,524.9</td>
</tr>
<tr>
<td>United States</td>
<td>$25,202.5</td>
<td>$5,822.8</td>
<td>$11,380.8</td>
<td>$42,523.7</td>
</tr>
</tbody>
</table>

This table shows the impact from private investment and ports operating in the Tenn-Tom Waterway region.

### Employment Impact 1996-2008

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<th>Indirect</th>
<th>Induced</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>8,384</td>
<td>3,879</td>
<td>7567</td>
<td>19,830</td>
</tr>
<tr>
<td>Kentucky</td>
<td>8,046</td>
<td>1,201</td>
<td>5,850</td>
<td>15,097</td>
</tr>
<tr>
<td>Mississippi</td>
<td>12,145</td>
<td>7,658</td>
<td>13,440</td>
<td>33,443</td>
</tr>
<tr>
<td>Tennessee</td>
<td>507</td>
<td>271</td>
<td>493</td>
<td>1,271</td>
</tr>
<tr>
<td>Regional</td>
<td>29,181</td>
<td>13,292</td>
<td>27,800</td>
<td>70,299</td>
</tr>
<tr>
<td>United States</td>
<td>29,181</td>
<td>29,061</td>
<td>79,471</td>
<td>137,663</td>
</tr>
</tbody>
</table>

This table indicates the number of jobs that were directly and indirectly created based on industry-to-industry transactions, as well as the number of jobs that were created based on employee spending in the local economy.
Technology to Improve Navigation

- Compared to other regions, US has top tier navigation aids, charts, etc.
- Can improve work around locks
- VTS deployment for safety
- Smartrivers conference
Technology Can Help Promote the Waterway Industry

- Demonstrate Economic Importance
- Demonstrate Waterways Reliability
- Improve Safety and Emergency Response
- Use Better Information to Manage and Gauge System effects of closures
Summary

- Mitigating risks is everyone's responsibility
- Need systematic process to review economic impact of events as part of ongoing operations
- Should consider ways to improve reliability that enhances industry’s competitive position in securing support (and funding)
- Understanding linkages to other systems and users will be critical in this approach