THOUGHTS ON THE PANAMA CANAL EXPANSION

Bruce Lambert
Executive Director
Institute for Trade and Transportation Studies
Disclaimer

- Run a Research Institute for 13 State Departments of Transportation
  - Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, West Virginia, Virginia
- Institute is to be “Forward Thinking” on freight planning and policy needs
- Represent a region that is both a partner and a competitor to Canadian maritime interests
- This represents beginning of a research effort...
THE CHALLENGE BEFORE US...

- What we want...
  
    “The puck is in, the Home Team Wins”
    Stompin’ Tom Connors

- Can we get there...
  
    I skate to where the puck is going to be, not where it has been.
    Wayne Gretzky
OUTLINE

- The Canal Expansion Itself
- Trends in Canal Traffic
- Where are We Going?
- What is the Contestable Market?
- What is the Perceptions of the Panama Canal?
- How does one respond?
Why Expand the Canal?

- Overall strong growth over past few years
  - Ports were big investment areas for private capital
  - U.S.-Chinese trade transformed the game
- Seem as obsolete, but critical, bottleneck
- Coastal Competition
  - Suez Canal
  - Intermodalism
- West Coast Port Strike
- Environmental Actions
- Vessel Characteristics
- Logistics Revolution
- Vessel Economics
HISTORY OF PANAMA CANAL EXPANSION

- **1914** - Opened
- **1930’s** - First consideration for expanding third locks considered
- **1977** - Signing of the Panama Canal Treaty (Torrijos-Carter Treaty)
- **1999** - All canal properties transferred to the Republic of Panama.
- **2006** - Panamanian Voters approved Referendum authorizing expansion of Canal
- **2014** - Target Date for 3rd Locks
Vessel Markings in the Lower Chamber of the Miraflores Locks
Panamax Ship Locking in Gatun Locks
Comparison between Panamax and Post-Panamax Container Vessels

- Length of Post-Panamax Vessel: 366m
  - Draft: 15m
- Length of Panamax Vessel: 294m
  - Draft: 12m
- Length of Post-Panamax Vessel: 366m
  - Beam: 49m
- Length of Panamax Vessel: 294m
  - Beam: 32m

<table>
<thead>
<tr>
<th></th>
<th>Panamax</th>
<th>Post-Panamax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Containers(TEUs)</td>
<td>4,500</td>
<td>12,000</td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beam</td>
<td>32m (106')</td>
<td>49m (160')</td>
</tr>
<tr>
<td>Length</td>
<td>294m (965')</td>
<td>366m (1,200')</td>
</tr>
<tr>
<td>Draft</td>
<td>12m (39.5')</td>
<td>15m (50')</td>
</tr>
</tbody>
</table>
How Big is Big?
ARE THE PROJECTS ASSOCIATED WITH THE PANAMA CANAL EXPANSION

Components of Third Set of Locks Project

1. Deepening and widening of the Atlantic entrance channel
2. New approach channel for the Atlantic Post-Panamax locks
3. Atlantic Post-Panamax locks with 3 water saving basins per lock chamber
4. Raise the maximum Gatun lake operating water level
5. Widening and deepening of the navigational channel of the Gatun lake and the Culebra Cut
6. New approach channel for the Pacific Post-Panamax locks
7. Pacific Post-Panamax locks with 3 water saving basins per lock chamber
8. Deepening and widening of the Pacific entrance channel
PICTURE OF THIRD LOCK WORK NEAR MIRAFLORES- CENTENNIAL BRIDGE
What everyone seems to forget

Existing locks will still be in service

Panama Canal handles more than just container vessels (although a big part of traffic and revenue stream)

Stepwise increase in all traffic capacity

Not just a US Trade link

Expansion work will not close the Canal
Regional Transshipment Center

- Port volumes in Panama have exploded in the past ten years
  - Pacific
  - Atlantic
- More feeder vessels and port services in region
- Regional telecommunications and banking center
- Canada signed a Free Trade Agreement – US has not...
TRENDS IN CANAL TRAFFIC
## Transits and Tolls Through the Panama Canal, FY 2007 and FY 2008

<table>
<thead>
<tr>
<th>Market Segment</th>
<th>Transits</th>
<th>Tolls (Thousands)</th>
<th>TEUs (Thousands)</th>
<th>Long tons (Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container</td>
<td>3,544</td>
<td>3,622</td>
<td>712,507</td>
<td>645,947</td>
</tr>
<tr>
<td>Dry Bulk</td>
<td>2,420</td>
<td>2,406</td>
<td>163,094</td>
<td>147,483</td>
</tr>
<tr>
<td>Refrigerated</td>
<td>2,166</td>
<td>2,188</td>
<td>65,996</td>
<td>56,080</td>
</tr>
<tr>
<td>Tankers</td>
<td>2,066</td>
<td>1,969</td>
<td>137,851</td>
<td>111,530</td>
</tr>
<tr>
<td>General Cargo</td>
<td>766</td>
<td>818</td>
<td>27,272</td>
<td>26,090</td>
</tr>
<tr>
<td>Vehicle Carriers</td>
<td>817</td>
<td>835</td>
<td>122,583</td>
<td>111,584</td>
</tr>
<tr>
<td>Passengers</td>
<td>241</td>
<td>205</td>
<td>31,070</td>
<td>26,235</td>
</tr>
<tr>
<td>Others</td>
<td>1,127</td>
<td>1,190</td>
<td>55,669</td>
<td>57,578</td>
</tr>
<tr>
<td>Total</td>
<td>13,147</td>
<td>13,233</td>
<td>1,316,042</td>
<td>1,182,527</td>
</tr>
</tbody>
</table>

Source: Panama Canal Authority
## Country Flows through the Canal, 2008 (Long Tons)

<table>
<thead>
<tr>
<th>Country</th>
<th>Origin</th>
<th>Destination</th>
<th>Intercoastal</th>
<th>Total</th>
<th>Total exc. Intercoastal</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>73,219,464</td>
<td>62,190,326</td>
<td>1,803,753</td>
<td>135,409,790</td>
<td>133,606,037</td>
</tr>
<tr>
<td>People's Republic of China</td>
<td>28,192,062</td>
<td>15,572,161</td>
<td>0</td>
<td>43,764,223</td>
<td>43,764,223</td>
</tr>
<tr>
<td>Chile</td>
<td>13,010,080</td>
<td>13,728,728</td>
<td>0</td>
<td>26,738,808</td>
<td>26,738,808</td>
</tr>
<tr>
<td>Japan</td>
<td>5,884,876</td>
<td>18,811,504</td>
<td>0</td>
<td>24,696,380</td>
<td>24,696,380</td>
</tr>
<tr>
<td>South Korea</td>
<td>8,017,982</td>
<td>9,292,913</td>
<td>0</td>
<td>17,310,895</td>
<td>17,310,895</td>
</tr>
<tr>
<td>Peru</td>
<td>7,118,715</td>
<td>6,972,476</td>
<td>0</td>
<td>14,091,191</td>
<td>14,091,191</td>
</tr>
<tr>
<td>Colombia</td>
<td>9,381,569</td>
<td>4,229,563</td>
<td>58,942</td>
<td>13,611,132</td>
<td>13,552,190</td>
</tr>
<tr>
<td>Ecuador</td>
<td>6,788,875</td>
<td>6,747,003</td>
<td>0</td>
<td>13,535,878</td>
<td>13,535,878</td>
</tr>
<tr>
<td>Panama</td>
<td>3,123,754</td>
<td>9,862,036</td>
<td>164,102</td>
<td>12,985,790</td>
<td>12,821,688</td>
</tr>
<tr>
<td>Mexico</td>
<td>5,469,701</td>
<td>6,478,054</td>
<td>117,588</td>
<td>11,947,755</td>
<td>11,830,167</td>
</tr>
<tr>
<td>Canada</td>
<td>7,140,047</td>
<td>2,734,626</td>
<td>0</td>
<td>9,874,673</td>
<td>9,874,673</td>
</tr>
</tbody>
</table>

Source: Panama Canal Authority
# Top Trade Routes, FY 2007-2008, in Long Tons (Thousands)

<table>
<thead>
<tr>
<th>Trade Route</th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Coast U.S. - Asia</td>
<td>83,661</td>
<td>87,392</td>
</tr>
<tr>
<td>East Coast U.S. - W.C. South America</td>
<td>24,095</td>
<td>19,658</td>
</tr>
<tr>
<td>Round-the-World</td>
<td>168</td>
<td>85</td>
</tr>
<tr>
<td>Europe - West Coast South America</td>
<td>13,671</td>
<td>14,437</td>
</tr>
<tr>
<td>Europe - Asia</td>
<td>2,962</td>
<td>1,882</td>
</tr>
<tr>
<td>Europe - West Coast U.S./Canada</td>
<td>8,433</td>
<td>10,700</td>
</tr>
<tr>
<td>East Coast U.S. - W.C. Central America</td>
<td>11,025</td>
<td>10,885</td>
</tr>
<tr>
<td>South America Intercoastal</td>
<td>10,707</td>
<td>9,356</td>
</tr>
<tr>
<td>West Indies - W.C. Central America</td>
<td>5,265</td>
<td>5,445</td>
</tr>
<tr>
<td>U.S. Intercoastal (including Alaska and Hawaii)</td>
<td>5,859</td>
<td>5,646</td>
</tr>
<tr>
<td>East Coast U.S./Canada - Oceania</td>
<td>2,701</td>
<td>2,911</td>
</tr>
<tr>
<td>E.C. South America - West Coast U.S./Canada</td>
<td>3,482</td>
<td>2,303</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td>172,029</td>
<td>170,700</td>
</tr>
<tr>
<td><strong>All Other Routes</strong></td>
<td>37,686</td>
<td>37,516</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>209,714</td>
<td>208,217</td>
</tr>
</tbody>
</table>

Source: Panama Canal Authority
Based on the capacity of transiting vessels – Source: ComPair Data - April 2009.

GROWTH OF CONTAINER TRAFFIC THROUGH THE PANAMA CANAL (1998 – 2009 EST.)
PROJECTIONS OF VESSEL TONNAGE
(FY2009 – FY2014)

Source: Panama Canal Authority
SUMMARY – WHY EXPAND THE CANAL

- Canal Expansion has been considered in past
- Changing World markets need expanded canal to reduce costs and improve efficiencies
- Expansion allows larger vessels and doubles Canal capacity
WHERE ARE WE GOING?
The world economy has suffered the worst recession of the postwar era

(Percent change)

Source: IHSGlobal Insight
PURCHASING MANAGERS’ INDEXES FOR MANUFACTURING: SOME SIGNS OF IMPROVEMENT AROUND THE WORLD

(Index, over 50 indicates expansion)

Source: IHSGlobal Insight
Industrial Materials Prices Are Recovering Though Not to 2007 – 2008 Bubble Levels

(IHS Global Insight Indexes, 2002:1=1.0)

Source: IHS Global Insight
After Rally, the U.S. Dollar Depreciates Long-Term

(Real Trade-Weighted Dollar Index, 2000=1.0)

The Drop in the Dollar Boosts U.S. Export Competitiveness; Dampens Imports

Source: IHSGlobal Insight
SUMMARY - ECONOMIC RECOVERY IS DAWNING

- Asia is leading the upturn; U.S. following soon; Europe will lag
- Leading indicators are improving across regions
- The global inventory correction is winding down
- Wage and price inflation is likely to remain tame
- U.S. container exports are starting recovery with Asian demand
- U.S. container imports will start weak recovery this year
- Financial markets have stabilized though credit remains tight, limiting spending to satisfy pent-up demand
- The timing and speed of recovery will vary globally, with Asia leading, the U.S. coincident, and Europe lagging
- Bottom Line: deep recession in 2009, modest recovery in 2010, and a stronger rebound in 2011-2012
What is the Contestable Market?
Source: IHSGlobal Insight
The boom in shipping trade


KEY: TEUs = twenty-foot equivalent units. One 20-foot container equals one TEU, and one 40-foot container equals two TEUs.

NOTE: The data in this figure include only loaded containers in U.S. international maritime activity and cover U.S. imports, exports, and transshipments. Therefore, the trade levels will be greater than those reported from U.S. international trade statistics, which exclude transshipments. The data also exclude military shipments.

INTERMODAL RAIL TRAFFIC OUTLOOK FOR NORTH AMERICA IS FOR WEAK GROWTH

(Loadings – 1000s of Containers and Trailers)

Containers (Left)  Trailers (Right)

Full Rebound in Container Volumes Only After 2011
# Drewry – Transpacific Intermodal White Paper

## West Coast 8000 TEU Ship vs East & Gulf 6400 TEU Ship

<table>
<thead>
<tr>
<th>Destination</th>
<th>20′</th>
<th>40′</th>
<th>20′</th>
<th>40′</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta</td>
<td>$595</td>
<td>$580</td>
<td>$665</td>
<td>$720</td>
</tr>
<tr>
<td>Chicago</td>
<td>$185</td>
<td>$270</td>
<td>$255</td>
<td>$410</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>$185</td>
<td>$120</td>
<td>$255</td>
<td>$280</td>
</tr>
<tr>
<td>Cleveland</td>
<td>$85</td>
<td>$70</td>
<td>$155</td>
<td>$210</td>
</tr>
<tr>
<td>Columbus</td>
<td>$480</td>
<td>$370</td>
<td>$530</td>
<td>$510</td>
</tr>
<tr>
<td>Dallas</td>
<td>-$65</td>
<td>-$255</td>
<td>$1</td>
<td>-$115</td>
</tr>
<tr>
<td>Detroit</td>
<td>$85</td>
<td>$220</td>
<td>$155</td>
<td>$360</td>
</tr>
<tr>
<td>Indianapolis</td>
<td>$630</td>
<td>$670</td>
<td>$955</td>
<td>$810</td>
</tr>
<tr>
<td>Kansas City</td>
<td>$335</td>
<td>$70</td>
<td>$405</td>
<td>$210</td>
</tr>
<tr>
<td>Louisville</td>
<td>$885</td>
<td>$670</td>
<td>$955</td>
<td>$810</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>-$15</td>
<td>-$55</td>
<td>$55</td>
<td>$85</td>
</tr>
<tr>
<td>Memphis</td>
<td>$260</td>
<td>$70</td>
<td>$330</td>
<td>$210</td>
</tr>
<tr>
<td>Saint Louis</td>
<td>$1,070</td>
<td>$875</td>
<td>$1,140</td>
<td>$995</td>
</tr>
</tbody>
</table>

Note: Positive numbers favour East Coast and Gulf routing  
Source: Drewry Supply Chain Advisors

## West Coast 8000 TEU Ship vs East & Gulf 8000 TEU Ship

<table>
<thead>
<tr>
<th>Destination</th>
<th>20′</th>
<th>40′</th>
<th>20′</th>
<th>40′</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta</td>
<td>$410</td>
<td>$320</td>
<td>$415</td>
<td>$460</td>
</tr>
<tr>
<td>Chicago</td>
<td>-$40</td>
<td>-$230</td>
<td>$30</td>
<td>-$90</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>$410</td>
<td>$220</td>
<td>$480</td>
<td>$360</td>
</tr>
<tr>
<td>Cleveland</td>
<td>$385</td>
<td>$195</td>
<td>$455</td>
<td>$335</td>
</tr>
<tr>
<td>Columbus</td>
<td>$285</td>
<td>$195</td>
<td>$355</td>
<td>$225</td>
</tr>
<tr>
<td>Dallas</td>
<td>-$115</td>
<td>-$205</td>
<td>$45</td>
<td>-$85</td>
</tr>
<tr>
<td>Detroit</td>
<td>$260</td>
<td>$95</td>
<td>$330</td>
<td>$235</td>
</tr>
<tr>
<td>Indianapolis</td>
<td>$585</td>
<td>$470</td>
<td>$665</td>
<td>$610</td>
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<tr>
<td>Kansas City</td>
<td>-$140</td>
<td>-$330</td>
<td>-$70</td>
<td>-$190</td>
</tr>
<tr>
<td>Louisville</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>-$15</td>
<td>-$180</td>
<td>$55</td>
<td>-$140</td>
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<tr>
<td>Memphis</td>
<td>$335</td>
<td>-$55</td>
<td>$405</td>
<td>$85</td>
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<tr>
<td>Saint Louis</td>
<td>-$15</td>
<td>-$230</td>
<td>$55</td>
<td>-$90</td>
</tr>
</tbody>
</table>

Note: Positive numbers favour East Coast and Gulf routing  
Source: Drewry Supply Chain Advisors
**How will Vessel Fleets and Operations Respond?**

- **Known**
  - Vessels will be deployed as quickly as possible to cover fixed costs
  - Will take several years for vessel demand and capacity to normalize from a carrier perspective

- **Unknown**
  - Vessel Rotations and Port Calls based on Ship Calls
  - Understanding cascading effects of vessels and equipment movements
  - What is future of inland distribution facilities
FORECAST OF U.S. CONTAINERIZED TRADE WITH ASIA (MILLIONS OF TEUS)

Source: IHSGlobal Insight
What is the perceptions of the Panama Canal Expansion
**What Are the Views of the Panama Canal Expansion in North America?**

<table>
<thead>
<tr>
<th>“Eastern”</th>
<th>“Western”</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Christmas Tree” Syndrome</td>
<td>Yet another gateway competitor, especially with Mexican gateways coming online</td>
</tr>
<tr>
<td>West Coast is “dead”</td>
<td>Asia is our “market”</td>
</tr>
<tr>
<td>See land and lower capacity costs as plus</td>
<td>Still important despite recent events</td>
</tr>
<tr>
<td>Geography favors us</td>
<td>Geography favors us</td>
</tr>
</tbody>
</table>
Panama Canal Agreements with US Ports

- Broward County's Port Everglades Department
- Georgia Ports Authority
- Manatee County Port Authority
- Maryland Port Administration
- Massachusetts Port Authority
- Philadelphia Regional Port Authority
- Port of Houston
- Port of Miami
- Port of New Orleans
- South Carolina State Ports Authority
- Tampa Port Authority
- The Port Authority of New York and New Jersey
- Virginia Port Authority

Omission – Where are the Canadian ports?
PANAMA CANAL TRANSIT

Saturday, September 19, 2009

Let it be known to all Ditch Diggers, Mosquito Swatters and Adventure Lovers, that I have transited the Panama Canal on board the good ship Pacific Queen.

Been There..... Done That!
Ports in the east must be ready to receive these cargos for canal to reach potential

- Dredging
- Understand relationship of ports within coastal regions (parochial fighting does nothing...)
- Railroad connections
- Understand these are strategic investments, not isolated “pork projects”

- Competition from other overland corridors
PORTS MUST WORK WITH PARTNERS TO BE SUCCESSFUL

- Determine what is acceptable
- Play to Markets – Reach Chicago
- Play with Partners - Railroads

- Turning oysters into a string of pearls
SUMMARY – INTERMODAL MARKET

- Complex drivers to various gateways
- Container volumes will recover in 2010, followed by return to lower growth rates
- Cargo will flow through gateways that are competitive
- Port Range Share may change over time as new vessels jump into service if enough pieces are in place
Final Thoughts...
# The Sum of Knowledge

## The Known
- The Canal is expanding
- Trade has shifted from West Coast
- Total Trade will recover in the next few years
- Globalization continues at a slower pace

## The Unknown
- Will S. Cal ports push trade away?
- Will Eastern U.S. ports receive dredging?
- How much more cargo is divertible? (25%?)
- How (when) will vessels be deployed?
- Who wins in battle between tolls and railroad costs?
- External Shocks?
EXTERNAL SHOCKS

- Security risks and asymmetric disruptions
  - 100% Screening of containers
- Opening of Cuba
- Expansion of Transshipment hubs in region
- China – “Insourcing”
- Near Sourcing to Latin America
- Free Trade negotiations
- Price of fuel – Energy
- Drayage and local hauling rules
- Labor discussions
- Environmental concerns
CO2 FOOTPRINTS PER TEU: CONTAINER ROUTE SHANGHAI - NEW YORK

<table>
<thead>
<tr>
<th>Route</th>
<th>CO2 Emissions</th>
<th>Panamax</th>
<th>Post-Panamax 8000 TEU</th>
<th>Post-Panamax 8700 TEU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panama Canal</td>
<td>2.62</td>
<td>2.18</td>
<td>2.23</td>
<td>1.92</td>
</tr>
<tr>
<td>Landbridge</td>
<td>2.64</td>
<td>2.38</td>
<td>2.23</td>
<td>2.38</td>
</tr>
<tr>
<td>Cape Horn</td>
<td>4.07</td>
<td>3.37</td>
<td>2.98</td>
<td>3.37</td>
</tr>
<tr>
<td>Cape of Good Hope</td>
<td>2.86</td>
<td>2.86</td>
<td>2.53</td>
<td>2.86</td>
</tr>
<tr>
<td>Suez Canal</td>
<td>3.02</td>
<td>2.51</td>
<td>2.21</td>
<td>2.51</td>
</tr>
</tbody>
</table>
Panama Canal Expansion

- Is it needed?
- Does it fundamentally change North American flows?
  - Bulks
  - Containers
  - Ports
  - Vessels
  - Transshipment Opportunities

- Will external events strengthen or dampen its influence in world shipping?