AN INTRODUCTION TO THE BARGE INDUSTRY

September 03, 2009

Business of Towing

By Arnie Rothstein
Presentation Outline

I  Transportation’s Role in the US Economy
II  Marine Assets
III  Today’s Barge Industry
IV  Margin Drivers
Transportation’s Role in the US Economy

Transportation is an Integral Part of U.S. Economic Activity

Transportation Bill Share of the GNP

By any measure, the U.S. has the most well-developed Freight Transport Infra-Structure in the World and it is a global competitive advantage.
Transportation’s Role in the US Economy

While water carriage requires just 3% of freight costs, it accounts for 13% of the ton-miles produced.

By any measure, the U.S. has the most well-developed Freight Transport Infra-Structure in the World and it is a global competitive advantage.

*Source: AAR*
## Transportation’s Role in the US Economy

### Comparison: Barge Industry versus Rail Industry

<table>
<thead>
<tr>
<th></th>
<th>Barge Industry</th>
<th>Class I Railroads</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Miles of Right-of-Way</strong></td>
<td>25,000</td>
<td>155,000</td>
</tr>
<tr>
<td><strong>Barges</strong></td>
<td>27,000</td>
<td>474,000</td>
</tr>
<tr>
<td><strong>Towboats</strong></td>
<td>4,000</td>
<td>22,000</td>
</tr>
<tr>
<td><strong>Annual Revenue</strong></td>
<td>$5 billion</td>
<td>$40 billion</td>
</tr>
<tr>
<td></td>
<td></td>
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</table>
## Modal Comparison

<table>
<thead>
<tr>
<th></th>
<th>Barge</th>
<th>Rail</th>
<th>Pipeline</th>
<th>Truck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic Coverage</td>
<td>Limited to navigable</td>
<td>Limits shipper</td>
<td>limited to build</td>
<td>ALL</td>
</tr>
<tr>
<td></td>
<td>channels</td>
<td>options</td>
<td>network</td>
<td></td>
</tr>
<tr>
<td>Shipment size</td>
<td>1,500 ton minimum</td>
<td>100 ton</td>
<td>very large</td>
<td>40 ton minimum</td>
</tr>
<tr>
<td>Speed</td>
<td>5-10 MPH</td>
<td>25 MPH</td>
<td>---</td>
<td>50 MPH</td>
</tr>
<tr>
<td>Capital cost</td>
<td>moderate</td>
<td>high</td>
<td>very high</td>
<td>low</td>
</tr>
<tr>
<td>Operating cost</td>
<td>low</td>
<td>moderate</td>
<td>very low</td>
<td>very high</td>
</tr>
<tr>
<td>Environmental hospitality</td>
<td>good</td>
<td>poor</td>
<td>good for existing</td>
<td>bad</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>very bad for new</td>
<td></td>
</tr>
<tr>
<td>Cargo Types</td>
<td>bulk liquid or dry</td>
<td>ALL</td>
<td>bulk liquid</td>
<td>ALL</td>
</tr>
</tbody>
</table>
Transportation’s Role in the US Economy
Presentation Outline

I  Transportation’s Role in the US Economy

II  Marine Assets

III  Today’s Barge Industry

IV  Margin Drivers
A BARGE is an unmanned vessel that is loaded with the products we carry.

There are two main types:

- Dry Cargo Hopper Barges
- Liquid Tank Barges
Marine Assets

Dry Cargo Hopper Barges

- **Capacity:** 1,400 to 1,600 tons when loaded to a 9’ draft
- **Size:** 195’ to 200’ long, 35’ wide, 10’ to 14’ deep
- **Useful Life:** 20-30 years, depending on type of service and construction quality
- **Unit Cost:**
  - Opens: $500,000
  - Covers: $550,000

**Industry Fleet Size & Age:**

<table>
<thead>
<tr>
<th></th>
<th>Barges</th>
<th>Average Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opens</td>
<td>6,197</td>
<td>15</td>
</tr>
<tr>
<td>Covers</td>
<td>11,015</td>
<td>17</td>
</tr>
</tbody>
</table>
Marine Assets
Marine Assets

Liquid Tank Barges

- More diversity than hoppers, but 2 main types
  - Clean petrochemical linehaul barges
  - Oversized petrochemical barges

- Subject to periodic Coast Guard inspection/certification
Marine Assets

Liquid Tank Barges

Capacity: 1,500 to 4,000 tons (10,000 bbls to 30,000 bbls) when loaded to a 9' draft
Size: 150’ to 300’ long, 35’ to 54’ wide, 10’ to 13’ deep
Useful Life: 20 - 40 years
Hull Type: Mix of single hull and double hull
Cost: $1,500,000 to $3,000,000 depending on size and
Marine Assets

10,000 bbls
Marine Assets

30,000 bbls
Marine Assets

30,000 bbls
Barge Size

*Question:* Why are barges such odd sizes?

*Answer:* The navigable channel is maintained by the Army Corps of Engineers using Lock and Dam structures. The standard lock chamber size limits the barge length, width, and depth.
Marine Assets

Lock Chamber - 600'

Linehaul Tow

Unit Tow
Marine Assets
Marine Assets
A TOWBOAT is a manned vessel that transports/pushes barges

- There is a large variation in:
  - size
  - power
  - construction, and
  - area of operation

- Generally there are 3 main groups of TOWBOATS
  - Linehaul
  - Locking River
  - Canal
Marine Assets

Linehaul Towboats

- **Power**: 4,000 hp to 11,000 hp
- **Towing Capacity**: Up to 60,000 tons (25 to 40 loaded barges)
- **Cost**: $10,000,000 to $25,000,000 depending on power and configuration
- **Useful Life**: 35 years, extendable to 50 years with major rehab at mid-life
- **Crew Size**: 8 - 10 person
- **Fuel Consumption**: 1 gallon per horsepower per day
- **Area of Operation**: Lower Mississippi and Lower Ohio Rivers
Marine Assets

Linehaul Towboat
Marine Assets

Locking River Towboats

Power: 1,800 hp to 6,000 hp

Towing Capacity: 15,000 to 25,000 tons (9 to 16 loaded barges)

Cost: $5,000,000 to $15,000,000 depending on power and configuration

Useful Life: 35 years, extendable to 50 years with major rehab at mid-life

Crew Size: 7 - 10 person

Fuel Consumption: 3/4 gallon per horsepower per day

Area of Operation: Upper Ohio, Upper Mississippi, Tennessee and Illinois Rivers
Marine Assets

Locking River Towboats
Marine Assets

Locking River Towboats
Marine Assets

Canal Towboats

- **Power:** 1,000 hp to 2,000 hp
- **Towing Capacity:** 3,000 to 8,000 tons (2 to 4 loaded barges)
- **Cost:** $2,000,000 to $6,000,000 depending on power and configuration
- **Useful Life:** 30 years, extendable to 45 years with major rehab at mid-life
- **Crew Size:** 4 - 7 persons
- **Fuel Consumption:** 3/4 gallon per horsepower per day
- **Area of Operation:** Gulf Intracoastal Waterways and Tributaries
Canal Towboat
**Cargo Capacity**

- **ONE BARGE**
  - 1,500 TON
  - 52,500 BUSHELS
  - 453,600 GALLONS

- **ONE 15 BARGE TOW**
  - 22,500 TON
  - 787,500 BUSHELS
  - 6,804,000 GALLONS

- **JUMBO HOPPER CAR**
  - 100 TON
  - 3,500 BUSHELS
  - 30,240 GALLONS

- **100 CAR TRAIN**
  - 10,000 TON
  - 350,000 BUSHELS
  - 3,024,000 GALLONS

- **LARGE SEMI**
  - 26 TON
  - 910 BUSHELS
  - 7,865 GALLONS

**Equivalent Units**

- **ONE BARGE**
- **15 JUMBO HOPPER CARS**
- **58 LARGE SEMIS**

- **ONE 15 BARGE TOW**
- **2.25 100 CAR TRAIN**
- **870 LARGE SEMIS**

**Equivalent Lengths**

- **ONE 15 BARGE TOW**
  - .25 MILE

- **2.25 100 CAR TRAIN**
  - 2.75 MILES

- **870 LARGE SEMIS**
  - 11.5 MILES
  - (BUMPER TO BUMPER)
Water transportation is efficient

One gallon of fuel can move one ton of freight

- Truck, 59
- Rail, 386
- Barge, 514

Fuel Efficiency in Freight Transportation - Samuel Ewer Eastman
Water transportation is environmentally friendly

Pounds of emissions produced moving one ton of freight 1,000 miles

<table>
<thead>
<tr>
<th>Mode</th>
<th>Hydro-Carbons</th>
<th>Carbon Monoxide</th>
<th>Nitrogen Oxides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barge</td>
<td>0.09</td>
<td>0.2</td>
<td>0.53</td>
</tr>
<tr>
<td>Rail</td>
<td>0.46</td>
<td>0.64</td>
<td>1.83</td>
</tr>
<tr>
<td>Truck</td>
<td>0.63</td>
<td>1.9</td>
<td>10.17</td>
</tr>
</tbody>
</table>

Source: Environmental Protection Agency, Emission Control Lab
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Economic Impact of Barge Transportation

- More than 33,000 people employed aboard tugs and towboats
- 30,000 people employed by shipyards
- Almost 500,000 workers in industries that rely on raw materials delivered by barge
- Industry contributes over $5 billion a year to nation’s economy
- Industry pays combined yearly total of more than $750 million in payroll and corporate income taxes
Today’s Barge Industry

Number and Type of Barges Operated
(December 2006)

<table>
<thead>
<tr>
<th>Type of Barge</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>6,197</td>
<td>31%</td>
</tr>
<tr>
<td>Cover</td>
<td>11,015</td>
<td>55%</td>
</tr>
<tr>
<td>Tank</td>
<td>2,809</td>
<td>14%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20,021</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Today’s Barge Industry

Industry Volume and Mix

(million of tons transported in 2005)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>176</td>
</tr>
<tr>
<td>Petroleum</td>
<td>75</td>
</tr>
<tr>
<td>Chemicals</td>
<td>37</td>
</tr>
<tr>
<td>Crude Materials</td>
<td>100</td>
</tr>
<tr>
<td>Manufactured Goods</td>
<td>30</td>
</tr>
<tr>
<td>Food &amp; Farm Products</td>
<td>65</td>
</tr>
<tr>
<td>Manufactured Equipment</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>484</strong></td>
</tr>
</tbody>
</table>
Today’s Barge Industry

Dry Cargo Barge Market

Tons

- Coal: 45%
- Grain: 17%
- Steel: 14%
- Aggregate: 19%
- Other: 5%

Barge Days

- Coal: 38%
- Grain: 30%
- Steel: 12%
- Aggregate: 7%
- Other: 13%

*Other includes Alumina, Salt, Cement, Fertilizer, Forest Products, etc.*
Today’s Barge Industry

Today’s Barge Industry

Today’s barge industry is challenged by several issues

- Waterways Infrastructure
- Regulatory Challenge
- Safety and Stewardship
117 out of 257 Locks are over 50 years old

7 were built in the 1800s
Industries at Risk

- Fertilizer
- Aggregate
- Grain
- Cement
- Agriculture Support
- Oilseed Farming
- Petroleum
- Chemical
- Steel Manufacturing
- Coal
- Waterborne Transportation
- Power Generation
- Oilseed Farming
O&M Priorities: An Industry Perspective

Although service interruptions have been manageable so far, O&M related outages continue to concern the Barge Industry and its customers.

Concrete deterioration at Chickamauga

Crumbling lock wall, Lower Mon 3, opened in 1907

Leaking spare miter gates, Upper Miss Lock 19
**Unscheduled** outages have also become more frequent

Navigation Lock Unavailability – 1992 to 2005
Total Hours - Scheduled vs. Unscheduled without ice
Regulatory Challenge

Marine Engine Emissions

- EPA has issued proposed rules for new and “overhauled” engines

Vessel Discharge Regulations

- Last year, federal court (California) vacated existing vessel discharge exclusion of 40 CFR 122.3(a) effective September 30, 2008

Vessel Inspection

- The Coast Guard is developing a vessel inspection program for towboats
Regulatory Challenge

WRDA - Water Resources Development Act

- Would authorize Upper Miss/Illinois River Modernization
- Also authorizes projects on Gulf Intracoastal Waterway at Bayou Sorrel and Matagorda Bay

Oberstar Proposes “Maritime Safety Administration”

- All marine safety functions currently under USCG would be transferred to new agency in DOT called the “Maritime Safety Administration”
Regulatory Challenge

TWIC - Transportation Worker Identification Credential

- September 25, 2008 deadline to get cards

Medical & Physical Evaluation Guidelines for Merchant Mariners

- Coast Guard NVIC (draft) initially published summer ’06

Crew Travel Time

- Coast Guard previously considered crew travel time a “neutral time” (GMOC Policy Letter 4-00)
Today’s Barge Industry

Safety Challenge

Industry is actively involved with several public and private initiatives to further improve safety along the inland waterways:

- Safety Partnerships
- Responsible Carrier
- Simulator Training
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What are the major variables for direct cost?

- Labor
- Fuel
- External Services (e.g., cleaning, shifting, etc.)
- River operating conditions
- Ratability of shipments
- Equipment utilization level
How are barge rates calculated?

- Most spot rates are market driven with a floor near carrier’s variable operating costs.
- Long-term contract rates are also market driven, but set at a level which generates a satisfactory return on investment.
- For both spot and term contract bids, a distinction is made between fronthaul and backhaul movements, to optimize round-trip revenues and earnings.
What are the keys to improved equipment productivity?

1) Faster loadings and unloadings
2) Heavier loads per barge; bigger barges
3) Complete removal of cargo from barge so as to avoid cleaning expense and time
4) Reliable schedules and forecasts
5) Ratable shipments; less seasonality
6) Balanced traffic flows