An "Inland Marine Highway" for Freight

America's inland river system moves freight more safely and more efficiently than rail or truck. It is a key component of the transportation network and essential to our country's economic strength.

Connecting our communities

The inland-waterways system includes about 12,000 miles of commercially navigable channels and some 240 lock sites. America's "inland marine highways" move commodities to and from 38 states throughout the nation's heartland and Pacific Northwest, serve industrial and agricultural centers and facilitate imports and exports at gateway ports on the Gulf Coast.

Moving the nation's commodities

Waterways transport more than 40% of the nation's grain exports, about 12% of domestic petroleum and petroleum products and 25% of the coal used in electricity generation. Barges are ideal for hauling bulk commodities and moving oversized or overweight equipment.

Strengthening our economy

Every year roughly 244 million tons of waterborne cargo transit the inland waterways, a volume equal to about 14% of all intercity freight and valued at nearly $70 billion.

America’s Waterways Are Ready to Meet Growing Demands

Except for a few congested locks scheduled for replacement, our navigable inland-waterways system has an abundance of unused capacity. Waterways will transport the bulk commodities needed today and tomorrow while also moving an increasing share of intermodal cargo in the years to come. By relieving growing transportation congestion with the least impact of any surface mode on air quality, public safety and the environment, waterways really are our transportation solution for the future.

This brochure summarizes the study titled "A Modal Comparison of Freight Transportation Effects on the General Public" by the Texas Transportation Institute, Center for Ports and Waterways. It was conducted over a one-year period and was peer-reviewed by independent university-based experts. For the full report, visit our website: www.nationalwaterwaysfoundation.org

The mission of the National Waterways Foundation is to develop the intellectual and factual arguments for an efficient, well-funded and secure inland waterways system.

The Foundation needs your support. To find out how to get involved, learn how your organization can benefit from the Foundation's research, or to make a tax-deductible donation, please call or visit our website.

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This study was co-sponsored by the U.S. Department of Transportation Maritime Administration (MARAD).

Waterways transportation keeps commerce on the move, with fewer societal impacts than truck or rail.
**Advantages of Inland Waterways Transport:**

**Safeguarding Our Health and the Environment:**

- **Maintaining Safety:** Inland waterways transport has a low injury and fatality record compared to rail or truck.
- **Protecting Communities:** Inland waterways transport moves hazardous materials safely.

**Ensuring Cleaner Air:** Inland waterways transport generates fewer emissions than rail or truck.

- **Rate of Spills in Gallons per Million Ton-miles:**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Spills/million ton-miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail</td>
<td>0.03</td>
</tr>
<tr>
<td>Highway</td>
<td>1.37</td>
</tr>
<tr>
<td>Waterway</td>
<td>0.88</td>
</tr>
</tbody>
</table>

**Increasing Cargo Capacity:** A typical cargo barge carries much more cargo than a single truck or rail car.

- **Units to Carry:**
  - **Waterway:** 27,500 barrels of liquid cargo
  - **Truck:** 576 miles per gallon
  - **Rail:** 1,050 Large semi tractor-trailers

- **Modal Freight Use:**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Cargo Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway</td>
<td>22.7%</td>
</tr>
<tr>
<td>Waterway</td>
<td>14.4%</td>
</tr>
<tr>
<td>Rail</td>
<td>62.9%</td>
</tr>
</tbody>
</table>

**Advantages of Inland Waterways Transport:**

- **Moving Forward, saving energy:** The most energy-efficient way to move commodities such as coal, grain, iron, steel and chemical products is to use waterways. A single barge can move one ton of cargo 413 miles per gallon of fuel. A rail car would move the same ton of cargo 413 miles, and a truck only 155 miles.

- **Load of Hundreds of Rail Cars or Trucks:**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Load Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail</td>
<td>216 Rail Cars + 6 Locomotives</td>
</tr>
<tr>
<td>Highway</td>
<td>1,050 Large Semi-Traintainers</td>
</tr>
</tbody>
</table>

**Easing Rail and Highway Congestion in Our Communities:**

- **Standard Capacity:**
  - **27,500 Barrels**
  - **25 Tons**

- **Fatalities:**
  - **1,750 Tons**

- **Ohio River System, CSX railroad would need 156 new locomotives and 5,616 new coal cars.**

- **Traffic congestion:** The system’s average train velocity would drop by one-third.

- **Ohio, Mississippi and Columbia-Snake River systems, carries the equivalent of 58 million truck trips each year.**

- **Hypothetical Case Study:**

  - **Traffic delays would increase by almost 36% to 45%**
  - **Truck traffic on St. Louis roadways would increase by 200%**
  - **Injuries and fatalities on Interstate would increase by 36% to 45%**
  - **Emissions would increase by 80% to 93%**

- **While a permanent river shutdown cannot be anticipated, this case study demonstrates that the loss of river transportation would have a dramatic negative impact.**

**Creative: Howell Creative Group**

**Spills of more than 1,000 gallons:**

- **Gallons per Million Ton-miles:**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Gallons/million ton-miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterway</td>
<td>6.06</td>
</tr>
<tr>
<td>Truck</td>
<td>3.86</td>
</tr>
<tr>
<td>Rail</td>
<td>3.60</td>
</tr>
</tbody>
</table>

**Emissions (Grams/Truck-mile):**

- **PM (Particulate matter)**
  - **Hydrocarbons (HC)**
  - **Carbon monoxide (CO)**
  - **Nitrogen oxides (NOx)**
  - **Particulate matter (PM2.5)**
  - **Particulate matter (PM10)**
  - **Carbon monoxide (CO)**
  - **Hydrocarbons (HC)**
  - **Nitrogen oxides (NOx)**

**Moving Forward, saving Energy:**

- **Transporting freight by water is the most energy-efficient way.**

- **Load of Hundreds of Rail Cars or Trucks:**

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Easing Rail and Highway Congestion in Our Communities

Our waterways provide great capacity to ease congestion by carrying cargo that would otherwise travel by truck or rail. The annual traffic on America’s inland navigation system, including the Gulf Intracoastal Waterway and the Ohio, Mississippi and Columbia-Snake River systems, carries the equivalent of 58 million truck trips each year.

### Hypothetical Case Study

**Waterways Closure on the Mississippi & Illinois Rivers**

What would happen if the Mississippi and Illinois Rivers were shut down in the vicinity of St. Louis? Using the Federal Highway Administration’s HERS model, the Texas Transportation Institute estimated the resulting impacts of shifting millions of tons of cargo from the river system to the highway sector for every 22.7 in the rail sector and 2,171.5 in the highway sector.

- **Maintaining Safety**
  - Injuries and fatalities on Interstates would increase by 40%-
  - Truck traffic on St. Louis roadways would increase by 80%-
  - Truck accidents would increase by 36%-
  - Maximum cargo cart would increase by 80%-

While a permanent river shutdown cannot be anticipated, this case study demonstrates that the loss of river transportation would have a dramatic negative impact.

### Advantages of Inland Waterways Transport:

- **Ensuring Cleaner Air**
  - Inland waterways transport generates fewer air pollutants than rail or truck.
  - The emission comparison between inland towing, rail and truck transportation shows that fewer pollutants are generated by moving products on America’s inland navigation system.
  - These pollutants include:
    - **Particulate matter (PM)**
    - **Hydrocarbons (HC)**
    - **Carbon monoxide (CO)**
    - **Nitrogen oxides (NOx)**

- **Safeguarding Our Health and the Environment**
  - Injuries and fatalities on Interstates would increase by 40%-
  - Truck traffic on St. Louis roadways would increase by 80%-
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  - Maximum cargo cart would increase by 80%-

While a permanent river shutdown cannot be anticipated, this case study demonstrates that the loss of river transportation would have a dramatic negative impact.

### Advantages of Inland Waterways Transport:

- **Increasing Cargo Capacity**
  - A typical cargo barge carries much more cargo than a single truck or rail car.
  - A loaded tank barge carries 1,050 large semi tractor-trailers.
  - A 15-barge tow can carry 27,500 barrels of liquid cargo.
  - A loaded covered hopper rail car carries almost 2,000 bushels of grain.
  - A loaded covered hopper truck carries 237.5 tons of limestone.

- **Lower Costs**
  - Diverting waterborne cargo to the nation’s Interstates would cause heavy truck traffic to nearly double.
  - Spills of more than 1,000 gallons
    - Inland barge: 3.6 gallons per one million ton-miles.
    - Rail: 3.86 gallons.
    - Truck: 6.06 gallons.

- **Moving Freight efficiently throughout America**
  - Moving Forward, saving energy and protecting communities.
Advantages of Inland Waterways Transport:

- Inland waterways transport has a low injury and fatality record compared to rail or truck.

- Safety-related statistics for all modes of freight transportation show one injury in the inland marine sector for every 155 in the highway sector and one fatality in the inland marine sector for every 2,171.5 in the highway sector.

- Spills of more than 1,000 gallons:
  - Hydrocarbons (HC): 3.86 gallons per one million ton-miles.
  - Carbon monoxide (CO): 0.01621 grams/ton-mile
  - Nitrogen oxides (NOx): 0.46907 grams/ton-mile
  - Particulate matter (PM): 0.01737 grams/ton-mile

- The emission comparison between inland towing, rail and truck transportation shows that inland towing moves cargo with lower emissions.

- A typical cargo barge moves much more cargo than one truck or rail car:
  - A load of hundreds of rail cars or trucks:
    - 216 rail cars + 6 locomotives
  - One Common Barge Tow:
    - 2,500 Barrels of Liquid Cargo

- Inland waterways transport is the most energy-efficient choice.

- The most energy-efficient way to move commodities, such as coal, grain, iron ore, steel and chemical products is to use inland waterways.

- A typical cargo barge can move one ton of cargo 413 miles, whereas rail can only move 368 miles and barges 3.6 miles per one million ton-miles.

- Inland waterways transport is a key element to moving freight efficiently throughout America.
Waterways transportation keeps commerce on the move, with fewer societal impacts than truck or rail.

An “Inland Marine Highway” for Freight

America’s inland river-barge system moves freight more safely and more efficiently than rail or truck. It is a key component of the transportation network and essential to our country’s economic strength.

Connecting our communities

The inland-waterways system includes about 12,000 miles of commercially navigable channels and some 240 lock sites. America’s “inland marine highways” move commerce to and from 38 states throughout the nation’s heartland and Pacific Northwest, serve industrial and agricultural centers and facilitate imports and exports at gateway ports on the Gulf Coast.

Moving the nation’s commodities

Waterways transport more than 41% of the nation’s grain exports, about 22% of domestic petroleum and petroleum products and 23% of the coal used in electricity generation. Barges are ideal for hauling bulk commodities and moving oversized or overweight equipment.

Strengthening our economy

Every year roughly 348 million tons of waterborne cargo transit the inland waterways, a volume equal to about 14% of all intercity freight and valued at nearly $70 billion. Waterways transport more than 60% of the nation’s grain exports, about 22% of domestic petroleum and petroleum products and 23% of the coal used in electricity generation. Barges are ideal for hauling bulk commodities and moving oversized or overweight equipment.

Highlights of “A Modal Comparison of Freight Transportation Effects on the General Public”

A study by the Texas Transportation Institute, Center for Ports and Waterways

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Waterways transport more than 60% of the nation’s grain exports, about 12% of domestic petroleum and petroleum products and 25% of the coal used in electricity generation.

Barges are ideal for handling bulk commodities and moving oversized or overweight equipment.

- Coal
- Iron & Steel
- Project Cargoes
- Coal
- Aggregates
- Project Cargoes
- Intermediate Containers

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Every year roughly 624 million tons of waterborne cargo transit the inland waterways, a volume equal to about 14% of all intercity freight and valued at nearly $70 billion.

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