



**NATIONAL WATERWAYS  
FOUNDATION**



# **WATERWAYS: Working for America**

*Waterways transportation keeps our nation's commerce on the move in the safest, most fuel-efficient, environmentally sound way.*



Highlights of "A Modal Comparison of Domestic Freight Transportation Effects on the General Public: 2001-2009"

February 2012

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

# 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 192 lock sites that serve navigation. 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 60% of the nation’s grain exports, about 22% of domestic petroleum and petroleum products and 20% of the coal used in electricity generation.

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

- Coal
- Iron & Steel
- Chemicals
- Petroleum
- Grain
- Aggregates
- Project Cargoes
- Intermodal Containers

## Strengthening our economy

In 2010, our inland waterways system handled over 566 million tons of freight valued at more than \$180 billion (2009). The average cost savings of \$11/ton compared with other transportation modes (truck and rail) means the waterways saved the nation \$6.2 billion in transportation costs just in 2010.



## America's Waterways:

# 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 51 million truck trips each year.

### Carrying the Nation's Commodities:

#### Effects of a Major Waterway Closure

Cargoes moved on the inland waterways are typically bulk commodities such as coal, crude materials, petroleum, chemicals, and food and farm products. But in the event that a waterway closure requires diversion of cargo to highway or rail, transportation costs would increase along with highway bottlenecks and rail transport delays.

#### Increased Roadway Congestion

Transporting cargo over major waterways helps to avoid burdening our highway system with the equivalent of 51 million truck trips annually, based on a cargo weight of 25 tons per load.

##### Example: The Shift to Long-distance Trucking

The transport of waterborne cargo typically involves long-distance movements, and the corresponding transport by truck occurs primarily on rural interstates between urban areas. Current statistics indicate that in 2009, 887 combination trucks capable of carrying waterborne freight represented 18% of Average Daily Vehicles per lane on these rural interstates. If current waterway freight traffic were to be diverted, another 742 trucks would be required per day, per lane. In other words, without barges, there would be an 83% increase in trucks on these highways.

Source: U.S. Army Corps of Engineers, Navigation Data Center, *Waterborne Commerce of the United States 2009*.

#### Added Railroad Burdens

Diverting river traffic would add nearly 25% more tonnage to the national rail system. This would increase demand for railroad equipment; cause higher freight rates and slower, less reliable delivery times.

##### Example: Diverting Ohio River Coal Traffic

In 2009, the coal traffic on the Ohio River (which represents 57% of total commodity tonnage) was 118.06 million tons. If shifted to rail transport, most of this traffic would be handled by CSX railroad whose lines essentially parallel the river. CSX would have to manage:

- an additional **1,054,160** car loadings of coal annually
- an additional **26.7** train movements per day
- an additional **8,650** new coal cars

Source: "A Modal Comparison of Domestic Freight Transportation Effects on the General Public: 2001-2009," February 2012, P. 26



## Advantages of Inland Waterways Transport:

# Safeguarding Our Health and the Environment

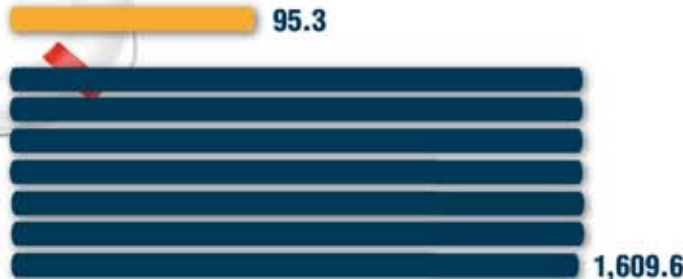
### Maintaining Safety

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

Safety related statistics for all modes of freight transportation between 2001 and 2009 show 1 injury in the inland marine sector for every 95.3 in the rail sector and 1,609.6 in the highway sector. The same 9-year period shows 1 fatality in the inland marine sector for every 18.1 in the rail sector and 132 in the highway sector.



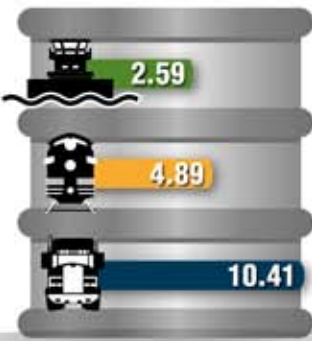
### Injuries in Freight Transportation



### Fatalities in Freight Transportation



### Rate of Spills in Gallons per Million Ton-miles



Spills of more than 1,000 gallons

### Protecting Communities

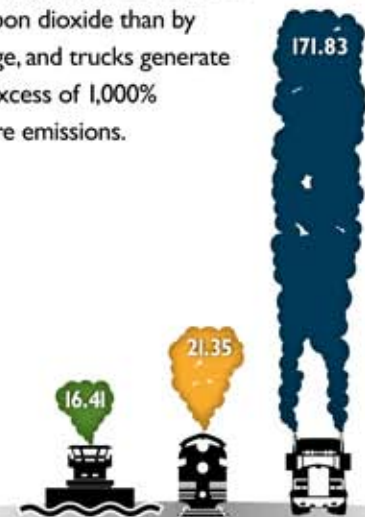
Inland waterways transport moves hazardous materials safely.

All transport modes work hard to prevent accidents, human errors and other causes of spills. Overall, spill rates are very low. Statistics for 2001-2009 show trucks losing 10.41 gallons per million ton-miles, rail cars 4.89 gallons and barges only 2.59 gallons.

### Environmentally Advantageous

Barges have the smallest carbon footprint among competitive transportation modes.

To move an identical amount of cargo by rail generates 30% more carbon dioxide than by barge, and trucks generate in excess of 1,000% more emissions.



Tons of CO2 per Million Ton-miles

### Ensuring Cleaner Air

Inland waterways transport generates fewer emissions than rail or truck.

The emission comparison between inland towing, rail and truck transportation shows that fewer air pollutants are generated by moving products on America's inland navigation system. These pollutants include:

- Particulate matter (PM)
- Carbon monoxide (CO)
- Hydrocarbons (HC)
- Nitrogen oxides (NOx)

### Emissions (Grams/Ton-mile)



PM = Particulate matter ■ HC = Hydrocarbons ■ CO = Carbon monoxide ■ NOx = Nitrogen oxides

## Advantages of Inland Waterways Transport:

# Moving Freight Efficiently Throughout America

### Increasing Cargo Capacity

A typical cargo barge moves much more cargo than a single truck or rail car.

Modal Freight Use	Standard Capacity
Barge - Liquid Bulk	27,500 Barrels
Barge - Dry Bulk	1,750 Tons
Rail - Bulk Car	110 Tons
Highway Tractor-Trailer	25 Tons

**Units to Carry 1,750 Short Tons of Dry Cargo**

- 1 barge
- 16 rail cars
- 70 trucks

One loaded covered hopper barge carries 58,333 bushels of wheat, enough to make almost 2.5 million loaves of bread.

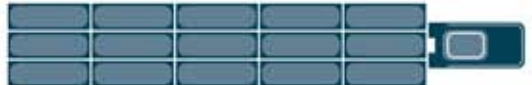
A loaded tank barge carries 27,500 barrels of gasoline, enough to keep about 2,500 automobiles running for an entire year.

**Units to Carry 27,500 Barrels of Liquid Cargo**

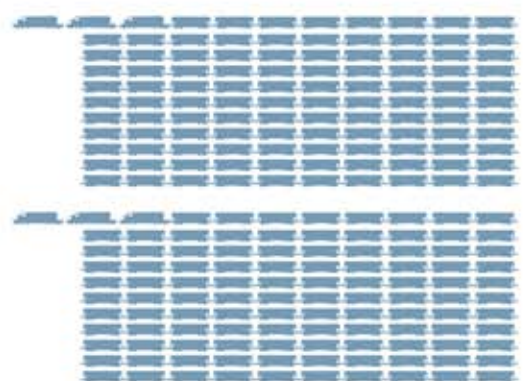
- 1 barge
- 46 rail cars
- 144 trucks

### One Common Barge Tow Carries the Load of Hundreds of Rail Cars or Trucks

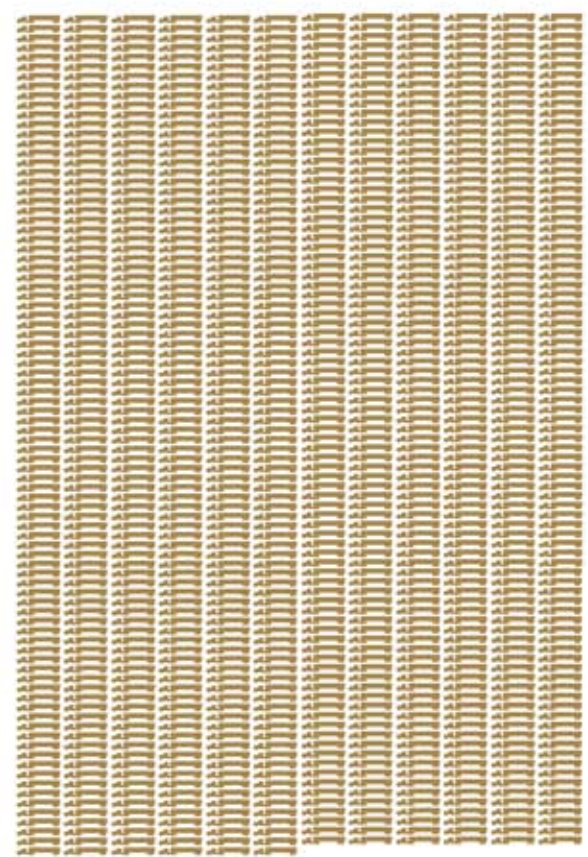
One 15-Barge Tow



216 Rail Cars + 6 Locomotives



1,050 Large Semi Tractor-Trailers



### Moving Forward, Saving Energy

Transporting freight by water is the most energy-efficient choice.



The most energy-efficient way to move commodities such as coal, grain, iron, steel, aggregates, petroleum and chemical products is to use the nation's navigable rivers. Barges can move one ton of cargo 616 miles per gallon of fuel. A rail car would move the same ton of cargo 478 miles, and a truck only 150 miles.

Ton-miles Traveled per Gallon of Fuel

## 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 can 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.

The information provided in this brochure was extracted from a February 2012 study titled "A Modal Comparison of Domestic Freight Transportation Effects on the General Public: 2001-2009" prepared by the Texas Transportation Institute, Center for Ports and Waterways.

For the full report, visit our website:  
[www.nationalwaterwaysfoundation.org](http://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.



© Robert J. Hurt