



NAVIGATION

US ARMY CORPS OF ENGINEERS ★ MISSISSIPPI VALLEY DIVISION ★ BUILDING STRONG®

INTRODUCTION

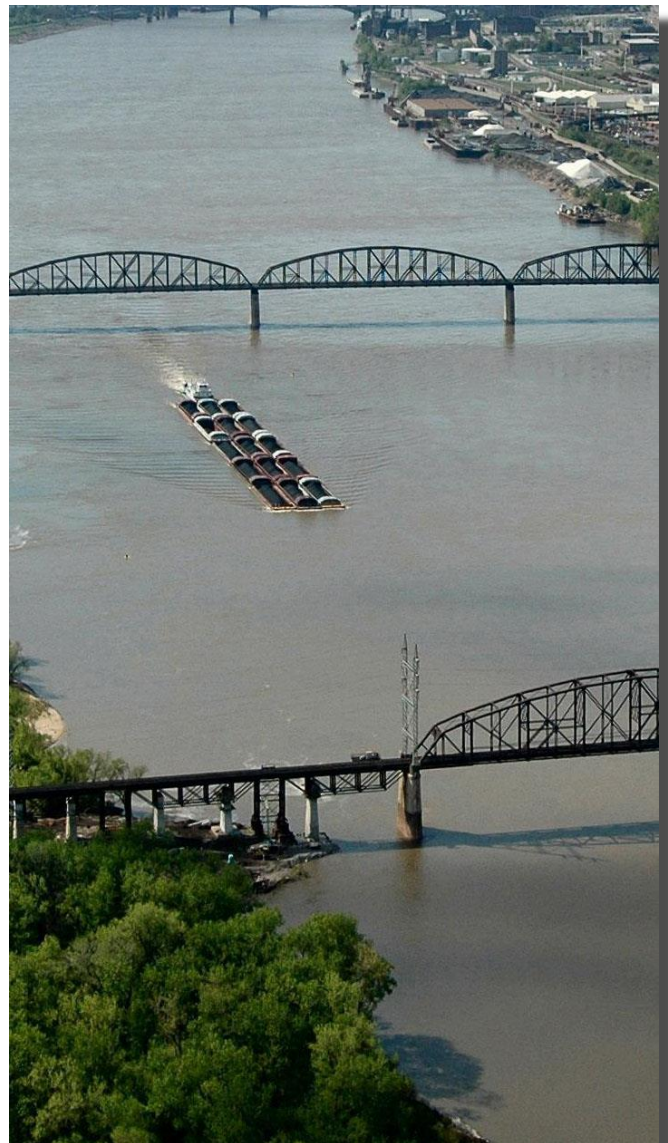
As the world's leading maritime and trading nation, the United States relies on an efficient Maritime Transportation System to maintain its role as a global power. The federal government's involvement in navigation projects dates to the early days of the United States, when rivers and coastal harbors were the primary paths of commerce in the new country.

Today, navigable inland waterways provide a cost-effective means for moving major bulk commodities, such as grain, coal and petroleum. Inland navigation is a key element of state and local government economic development and job-creation efforts, and is essential in maintaining economic competitiveness and national security.

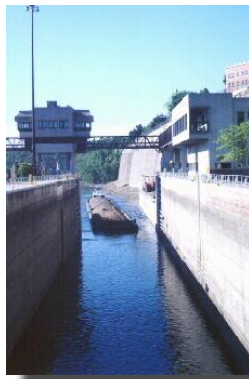
The responsibility of the U.S. Army Corps of Engineers is to facilitate the safe, reliable and economically efficient movement of vessels, and it does so by constructing and maintaining navigation channels and harbors, and regulating water levels on inland waterways.

NAVIGATION

- 4,267 miles of commercial waterways
 - 11 Inland Waterway systems
 - 19 other waterway systems
 - 1/3 of U.S. inland waterways
 - Moves 47% of U.S. inland waterborne commerce
- 669 million tons of cargo move on the Mississippi River system each year
- Main Commodities: petroleum & petroleum products, crude materials, food & farm products, chemicals and related products, primary manufactured goods, and coal
- 7 deep-draft ports
- 51 shallow-draft ports
- \$6.2 billion in domestic transportation savings.



- 62 locks:
 - 29 on Mississippi River
 - 8 on Illinois River
 - 6 on Gulf Intracoastal Waterway, LA
 - 5 on Red River, LA
 - 4 on Ouachita & Black Rivers, AR & LA
 - 1 on Kaskaskia River, IL
 - 1 on Old River, LA
 - 1 on Bayou Teche, LA
 - 3 on Atchafalaya Basin, LA
 - 1 on Freshwater Bayou, LA
 - 3 on West Pearl River, LA



NAVIGATION BENEFITS

- \$1.75 trillion value of cargo moved through seaports in 2015.
- 1.4 billion metric tons of overseas cargo handled by seaports in 2015.
- 23 million American jobs supported by seaports each year.
- 26 percent of the United States economy is related to seaports.
- \$320+ billion in federal, state and local tax revenues.
- 95 percent of overseas trade is via ship.
- Inland navigation provides a safe and cost efficient alternative to truck and train and provides billions in transportation savings annually. It also reduces highway congestion and pollution.
- New Orleans area is the #1 port in the United States based on tonnage.

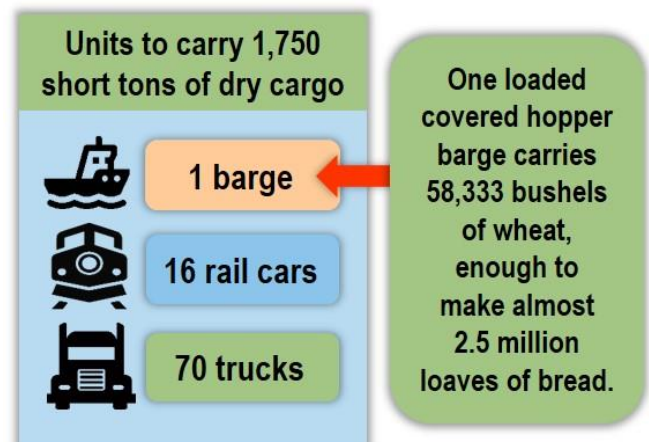
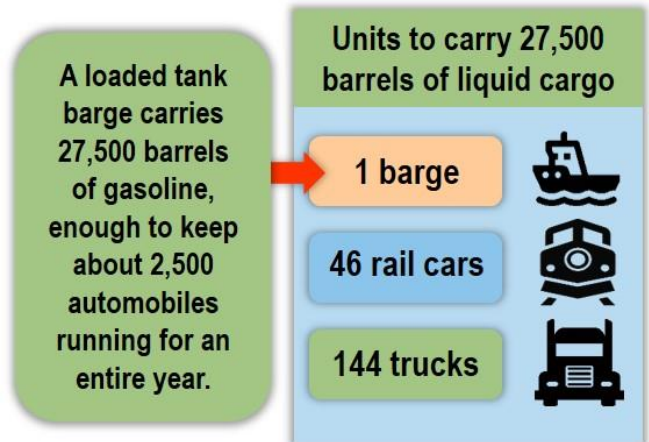


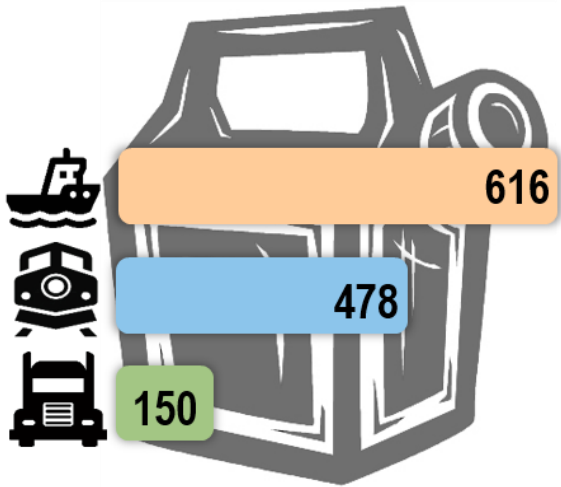
WATERWAYS TRANSPORTATION ... IT'S EFFICIENT, ENVIRONMENTALLY RESPONSIBLE AND SAFE

Waterways provide great cargo capacity and move freight more safely than truck or rail. In fact, they carry the equivalent of 58 million truck trips per year, with room to spare.

If waterborne cargo were diverted to highway or rail:

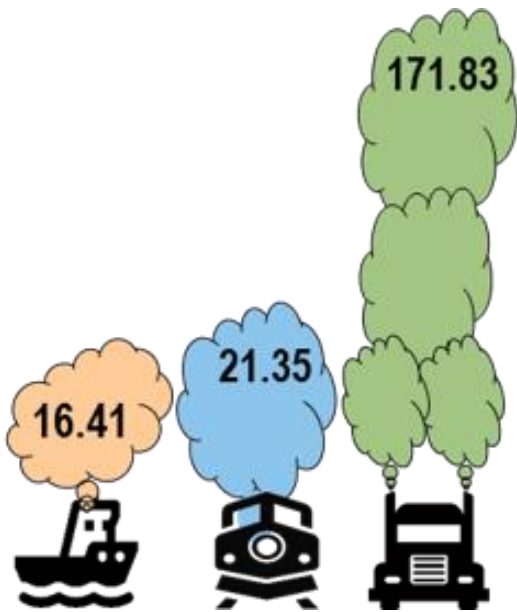
- Truck traffic would double on the Interstates
- Rail tonnage would increase by 25 percent





Ton-miles traveled per gallon of fuel

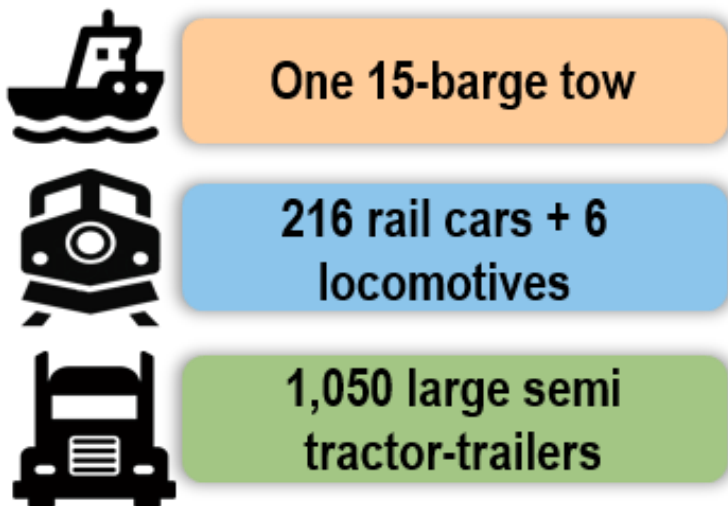
Barges can move one ton of cargo 616 miles per gallon of fuel. A rail car would move the same ton of cargo 478 miles, and a truck only 150 miles.



Tons of CO₂ per million ton-miles

Barges have the smallest carbon footprint among other transportation modes.

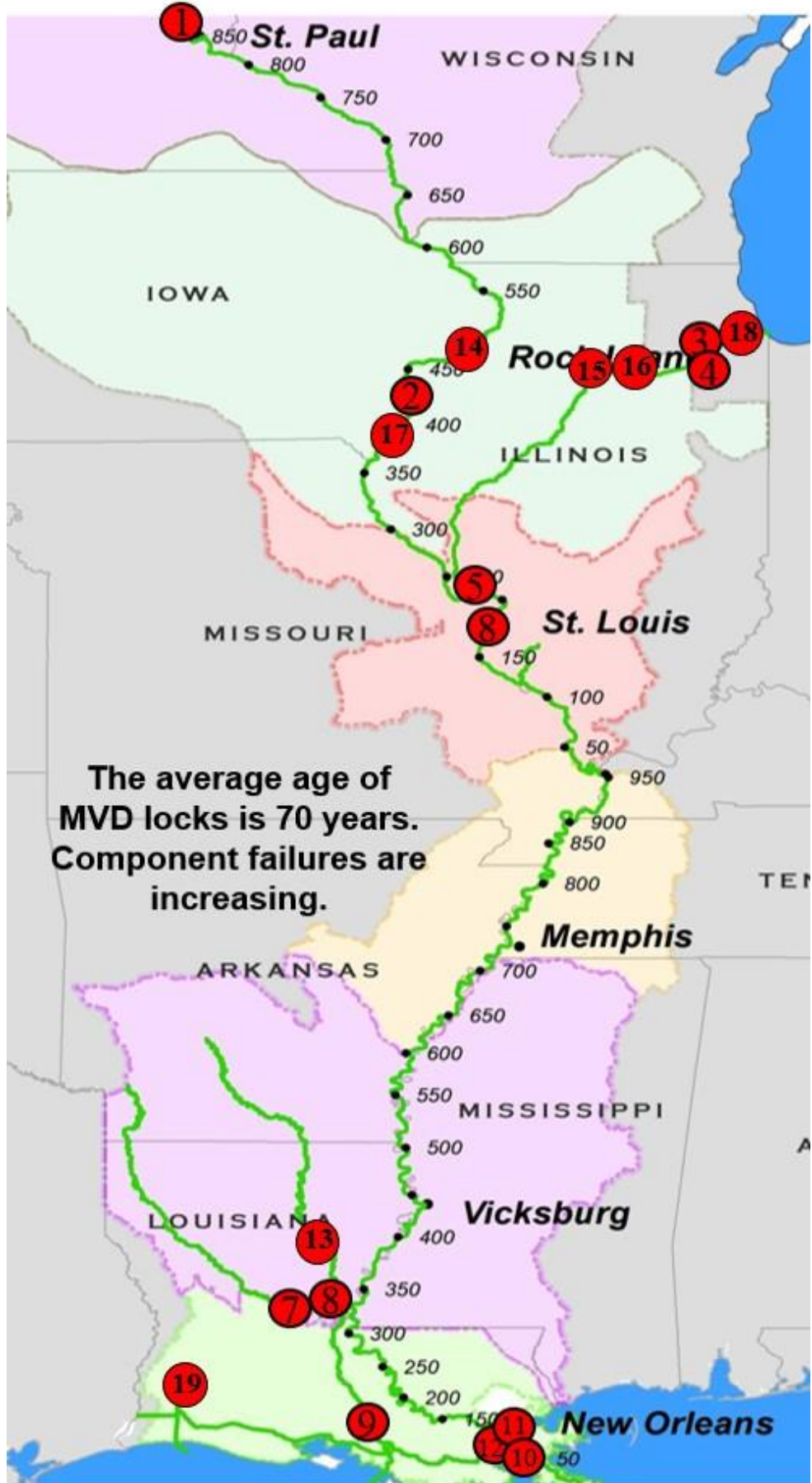
To move an identical amount of cargo by rail generates 30 percent more carbon dioxide than by barge, and 1,000 percent more emissions by trucks than by barge.



One common barge tow carries the load of hundreds of rail cars or trucks

2012-2019 MAJOR LOCK OUTAGES

1. Upper St. Anthony Falls, missing contact block, Oct. 9-11, 2014.
2. Lock 18, anchor bar, June 25-26, 2014.
3. Lockport, emptying valve failure, June 21-22, 2015; debris blocking miter gate, Nov. 25-26, 2017.
4. Dresden Island, strut arm failure, Nov. 3-4, 2015.
5. Mel Price, main chamber lift gate cables, Dec. 28, 2013, to Aug. 8, 2014 (closed 224 days); main chamber upstream lift gate cracked, (closed 15 days between Feb. 2016 & Dec. 2017).
6. Lock 27, protection cell, Sep. 2012 (closed six days), \$16 million in transportation impacts. May 4, 2019 Aux. lock closed due to failure of miter gate anchorage
7. Red River Lock 2, strut arm bushing failure, April 2012 (closed 15 days).
8. Jonesville Lock, hydraulic cylinder failure, Sep. 22-26, 2014.
9. Bayou Sorrel Lock, hydraulic pump failure, Jan. 28-29, 2014.
10. Algiers, closed March 27, 2013, to July 18, 2013, (112 days, \$146 million in transportation impacts).
11. Inner Harbor Navigation Canal, queue 86+ days; Jan. 4-14, 2014; May 29-30, 2014.
12. Harvey Lock, gate machinery, Feb. 15-18, 2013; March 17-31, 2014; June 26-30, 2014.
13. Columbia L&D, sand boil in lock chamber, Nov. 12, 2015, to Dec. 16, 2016.; Jul. 10, 2018 to ~ July 2019.
14. Lock 15, miter gate limit switch and strut arm, March 26-28, 2015; March 2016.
15. Starved Rock, broken strut arm, Nov. 16-17, 2016.
16. Marseilles, miter gate, March 2013 (closed seven days) & miter gate machinery, Feb. 8-10, 2014.
17. Lock 19, PLC errors, Oct. 29-30, 2017.
18. Brandon Road, miter gate, Aug. 1-2, 2017.
19. Calcasieu River, saltwater barrier tainter gate failure, Jan. 1, 2018.



Averaging one failure every 2.7 months; a total of 506 days, which equates to \$600 million + economic impacts.

May 2019