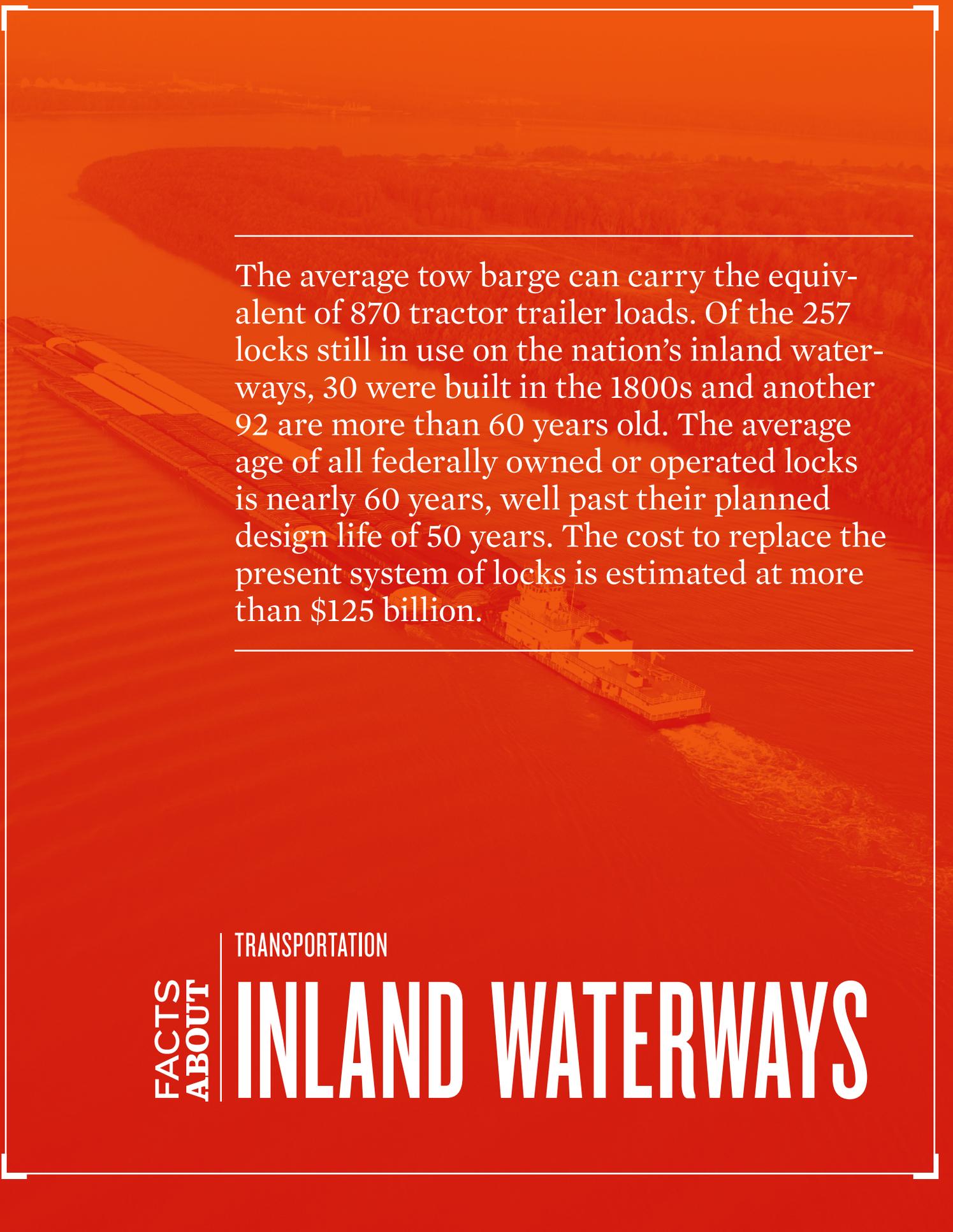


2009

INFRASTRUCTURE FACT SHEET



The average tow barge can carry the equivalent of 870 tractor trailer loads. Of the 257 locks still in use on the nation's inland waterways, 30 were built in the 1800s and another 92 are more than 60 years old. The average age of all federally owned or operated locks is nearly 60 years, well past their planned design life of 50 years. The cost to replace the present system of locks is estimated at more than \$125 billion.

FACTS
ABOUT

TRANSPORTATION

INLAND WATERWAYS

TRANSPORTATION
INLAND WATERWAYS | **2009 GRADE** | **D-**

RAISING THE GRADES SOLUTIONS
 THAT WILL WORK **NOW**

- A** = Exceptional
- B** = Good
- C** = Mediocre
- D** = Poor
- F** = Failing

AMERICA'S INFRASTRUCTURE G.P.A. **D**

ESTIMATED 5-YEAR FUNDING REQUIREMENTS FOR **INLAND WATERWAYS**

Total investment needs
\$50 BILLION

Estimated spending
\$29.475 BILLION

Projected shortfall
\$20.5 BILLION



- ★ **ESTABLISH** a program to improve and maintain ports, harbors, and waterways;
- ★ **CREATE** a predictable and reliable source of maintenance funding with a dedicated source of revenue, such as a portion of U.S. Customs receipts;
- ★ **DEEPEN** and widen ship channels to accommodate the world fleet's new, larger ships;
- ★ **CONTINUE** maintenance dredging of ship channels for the efficient handling of maritime commerce;
- ★ **LIMIT** erosion and sedimentation in ports, harbors, and waterways;
- ★ **CONTINUE** the development of the navigation engineering specialty within the engineering profession.

CONDITIONS

Because of their ability to move large amounts of cargo, the nation's inland waterways are a strategic economic and military resource. A recent analysis by the U.S. Army War College concluded that "the strategic contributions of these inland waterways are not well understood. The lack of adequate understanding impacts decisions contributing to efficient management, adequate funding, and effective integration with other modes of transportation at the national level. Recommendations demonstrate that leveraging the strategic value of U.S. inland waterways will contribute to building an effective and reliable national transportation network for the 21st century."¹

Forty-one states, including all states east of the Mississippi River and 16 state capitals, are served by commercially navigable waterways. The U.S. inland waterway system consists of 12,000 miles of navigable waterways in four systems—the Mississippi River, the Ohio River Basin, the Gulf Intercoastal Waterway, and the Pacific Coast systems—that connect with most states in the U.S. The system comprises 257 locks, which raise and lower

The U.S. inland waterway system consists of 12,000 miles of navigable waterways in four systems—the Mississippi River, the Ohio River Basin, the Gulf Intercoastal Waterway, and the Pacific Coast systems.

river traffic between stretches of water of different levels.

Three-quarters of the nation's inland waterways, or approximately 9,000 miles, are within the Mississippi River system. The next largest segment is the Ohio River system with 2,800 miles. The Gulf Coast Intercoastal Waterway system comprises 1,109 miles and the Columbia River system, the shortest of the four major systems, is only 596 miles long.

The nationwide network includes nearly 11,000 miles of waterways funded by federal user fees through an excise tax on fuel. Commercial waterway operators on these designated waterways pay a fuel tax of 20 cents per gallon, which is deposited in the Inland Waterways Trust Fund (IWTF). The IWTF, which was created in 1978, funds half the cost of new construction and major rehabilitation of the inland waterway infrastructure.

Forty-seven percent of all locks maintained by the U.S. Army Corps of Engineers were classified as functionally obsolete in 2006. Assuming that no new locks are built within the next 20 years, by 2020, another 93 existing locks will be obsolete—rendering more than 8 out of every 10 locks now in service outdated.²

Currently, the Corps has \$180 million per year available for lock repairs—half comes from the IWTF revenues and half comes from congressional appropriations. With an average rehabilitation cost of \$50 million per lock, the current level allows the Corps to fully fund only two or three lock projects each year.

There is no recognized engineering specialty to comprehensively address the

TABLE 9.1 ★ The Nation's Busiest Inland Ports

INLAND PORT	DOMESTIC		FOREIGN		TOTAL	
	TONS*	% INCREASE**	TONS*	% INCREASE**	TONS*	% INCREASE**
Huntington-Tristate, WV	76.5	-0.9	0	0	76.5	-0.9
Duluth-Superior, MN & WI	31.4	-3.5	15.1	4.7	46.5	-1.0
Pittsburgh, PA	38.1	-9.3	0	0	38.1	-9.3
St. Louis, MO & IL	32.1	2.6	0	0	32.1	2.6
Chicago, IL	21.1	-6.3	3.4	6	24.5	-4.8
Memphis, TN	18.8	-1.4	0	0	18.8	-1.4
Indiana Harbor, IN	14.5	-7.5	0.5	6	15	-7.0
Detroit, MI	11.4	-12	3.5	-19.4	14.9	-13.9
Two Harbors, MN	13.1	-2.2	0.6	942.7	13.7	1.9
Cincinnati, OH	13.2	-0.9	0	0	13.2	-0.9
Cleveland, OH	10.4	-9.5	2.4	-35	12.8	-15.8
Toledo, OH	4.5	95.3	8	-9.9	12.5	11.7
Presque Isle, MI	7	0.8	1.8	-15.7	8.8	-3.1
Gary, IN	7.9	-6.4	0.2	-73.6	8.1	-11.5
Louisville, KY	7.8	6.4	0	0	7.8	6.4

* Short Tons in Millions

** Percent Increase 2006–2007

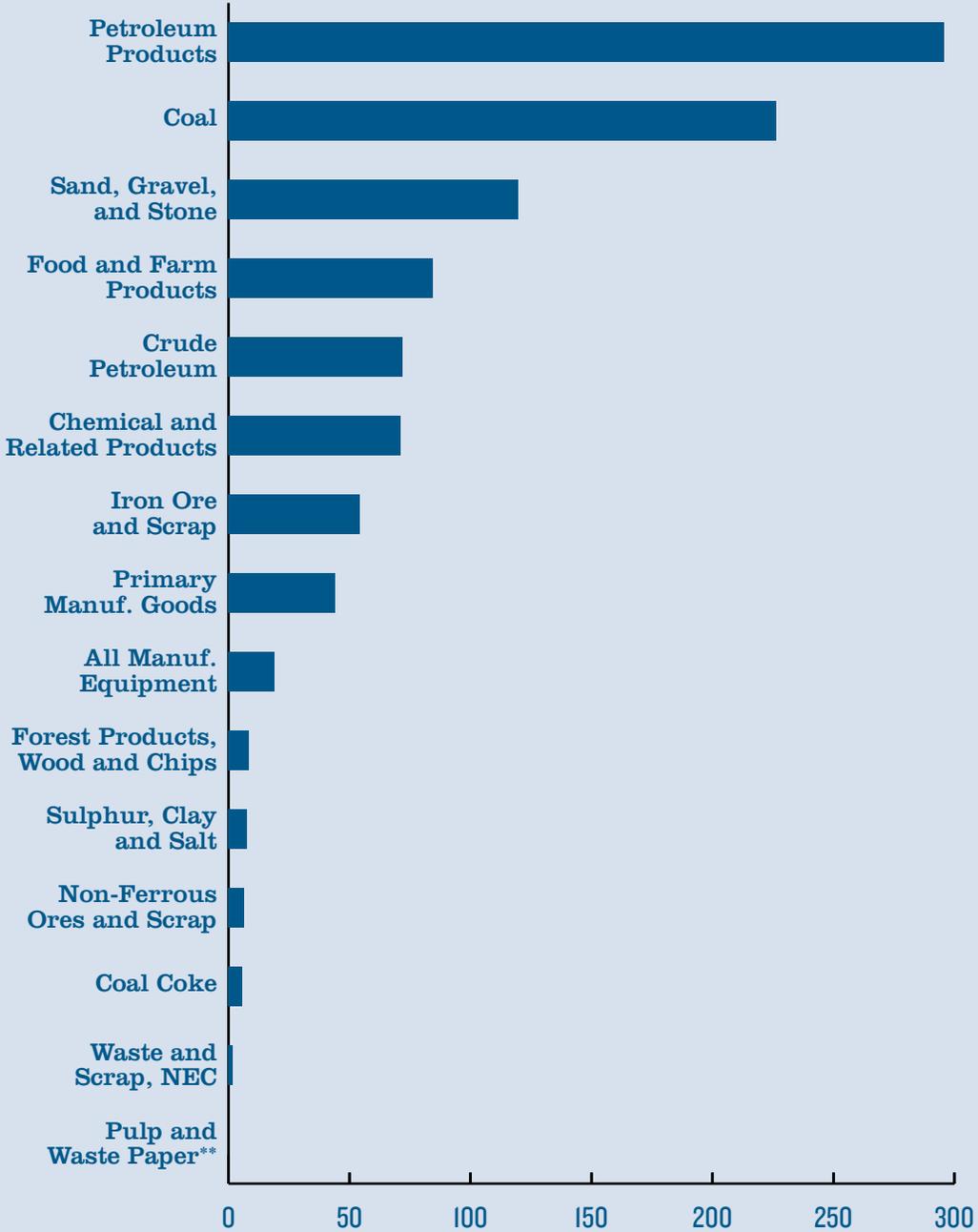
SOURCE Leading U.S. Ports—Inland Waterways (Including Great Lakes), USACE, 2007

current and future waterways systems challenges. In the past, systems were basically designed and maintained by the Corps and therefore most of the engineering knowledge and experience has been self-contained. Now much of that mission is contracted and other related functions are privatized. These factors and the loss of experienced engineers in and outside

the Corps result in the urgent need to formally educate a new audience in the developing specialty of navigation engineering.

Due to a lack of adequate data, ASCE was unable to assess the condition of, or assign a grade to, the infrastructure of the nation's more than 300 ports and harbors. Ports, which are owned and operated largely by state, local, and private entities,

FIGURE 9.1 ★ Commodities Shipped Via Inland Waterway (by tons*)



* Short Tons in Millions

** Tonnage less than 50,000 tons or extreme percent change

SOURCE U.S. Waterborne Traffic by Commodity, 2007, USACE

UNITED STATES ★ Real-Time Current Velocity System

The Corps is bringing new technology online to make waterways navigation safer. The latest innovation is called the real-time current velocity system. This system alerts waterways users to the real-time speed of wind and currents on inland waterways. The additional current information, which will be transmitted automatically to tows on approach, will allow tow pilots to improve safety and prevent collisions when tows are approaching locks. A total of six systems are expected to be implemented by the end of 2009.

LOUISVILLE, KY ★ McAlpine Lock, Ohio River



In March 2009, the Corps will open a new 1,200-foot lock on the Ohio River to replace a single, shorter lock built in 1921. The new lock chamber at Louisville, Ky.—originally built to transport commodities over the Falls of Ohio—will enable the facility to meet projected increases in commercial barge traffic during the next 30 years.⁸ According to the Corps' Louisville District, in calendar year 2006, 55 million tons of freight passed through McAlpine, 39% of which was coal. *Photo courtesy of the U.S. Army Corps of Engineers, Louisville District.*

are not required to report on the condition of their infrastructure to the federal government. Nevertheless, U.S. ports connect to 1,000 federally maintained harbor channels and 12,000 miles of taxpayer-funded inland waterways, and their land-side port infrastructure facilities include terminals, wharves, rail yards, and roadways within the harbor districts.⁶ In 2007, the American Association of Port Authorities (AAPA), which represents ports in the U.S., Canada and Mexico, reported that public ports in the U.S. must invest \$1.7 billion annually to update and modernize their facilities. The AAPA report contained no assessment of the physical condition of individual ports or of port infrastructure generally.⁴

RESILIENCE

The current system of inland waterways lacks resilience. Waterway usage is increasing, but facilities are aging and many are well past their design life of 50 years. Recovery from any event of significance would be negatively impacted by the age and deteriorating condition of the system, posing a direct threat to the American economy.

CONCLUSION

Inland and intracoastal waterways directly serve 38 states including the states on the Atlantic seaboard, the Gulf Coast, and the Pacific Northwest. Shippers and consumers in these states depend on the inland waterways to move approximately 630 million tons of cargo valued at more than \$73 billion annually. States on

the Gulf Coast and throughout the Midwest and Ohio Valley especially depend on the inland and intracoastal waterways. Texas and Louisiana each ship more than \$10 billion worth of cargo annually, while Illinois, Pennsylvania, West Virginia, Kentucky, Mississippi, Alabama, and Washington State each ship between \$2 billion and \$10 billion annually. Another 8 states ship at least \$1 billion annually.

This system provides an average transportation savings of \$10.67 per ton over the cost of shipping by alternative modes. This translates into more than \$7 billion annually in transportation savings to the U.S. economy. Future investment must focus on life-cycle maintenance, system interdependencies, redundancy, security, and recovery from natural and man-made hazards. ★

SOURCES

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- 4 American Association of Port Authorities, *America's Ports Today*, 2007.
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- 6 U.S. Maritime Administration, *U.S. Water Transportation Statistical Snapshot*, 2008.
- 7 U.S. Army Corps of Engineers, Institute for Water Resources, at www.vtn.iwr.usace.army.mil/navigation/navrecentprojects.htm.
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RAISING THE GRADES CASE STUDIES

PHILADELPHIA, PA ★ Delaware River Channel Deepening Project



In June 2008, an agreement was signed between the U.S. Army Corps of Engineers and the Philadelphia Regional Port Authority to begin a five-year, \$379-million project to deepen the Delaware River's shipping channel. The deeper channel, which is being increased from 40 to 45 feet, will allow ports on the Delaware River to compete more effectively for cargo, provide safe passage for vessels and increase jobs in the region. Approximately 26 million cubic yards of dredging material will be removed, 7.4 million cubic yards of which will be used for wetland creation and beach nourishment. *Photos courtesy of the U.S. Army Corps of Engineers, Philadelphia District.*

SAVERTON, MO ★ Lock 22, Upper Mississippi River System



The U.S. Army Corps of Engineers' new 1,200-foot Lock 22 will allow a tow with a full accompany of barges to move through the lock without having to break the tow's load into two pieces. Keeping a tow's load in one piece minimizes environmental impact, increases worker safety and reduces transit times. The lock's design is largely transferable to four other lock sites, saving both time and money. The existing 600-foot lock will remain in place and will become an auxiliary lock serving primarily recreational traffic. *Photo courtesy of the U.S. Army Corps of Engineers, Rock Island District.*