U. S. Army Corps of Engineers

# Inland Marine Transportation System Improvement Report

## Appendix I

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# PART A – IMPORTANCE TO THE NATION

This part augments the IMTS Improvement Report Section I paragraph 2.0 – Importance to the Nation.

## 1.0 Government Accounting Office

The following Government Accountability Office (hereafter referred to as the GAO) reports refer to topics relating to waterway transportation. The extracts from the reports are intended to provide a glimpse into the importance of waterway transportation to the Nation and related challenges. GAO reports and opinions are available at http://www.gao.gov/legal/index.html.

### 1.1 Freight Transportation and National Policy

In its January 2008 report on Freight Transportation, National Policy and Strategies Can Help Improve Freight Mobility[1] to the ranking member of the Committee on Environment and Public Works, U.S. Senate, the GAO notes the following:

(1) *"The Maritime Administration (MARAD) established 10 offices in U.S. ports to help promote and coordinate solutions across jurisdictional lines and provide local, state, and regional stakeholders with a local link to MARAD. Additionally, MARAD established the office of Marine Highways and Passenger Vessel Services to focus efforts to relieve road and rail congestion by shifting some cargoes to* ***coastal and inland waterways****. [Emphasis added]"*

(2) *"According to a DOT (Department of Transportation) study, freight moving through the nation's largest international gateway ports may quadruple by 2025.[2] Volume growth is expected across all major modes of surface transportation – truck, rail and* ***water*** *[emphasis added] – and intermodal shipments are expected to be a larger proportion of the value of total shipments than today."*

(3) *"Short sea shipping – Short sea shipping encompasses* ***waterborne*** *[emphasis added] transportation of commercial freight between domestic ports through the use of inland and coastal waterways. Moving freight in this manner could potentially relieve some highway and rail congestion while increasing freight mobility.[3] For example, the Port Authority of New York*

[1] GAO-08-287, Freight Transportation, National Policy and Strategies Can Help Improve Freight Mobility.
[2] Cambridge Systematics, An Initial Assessment of Freight Bottlenecks on Highways, prepared for the Department of Transportation, October 2005.
[3] GAO-05-768, July 29, 2005.

*and New Jersey has proposed to expand the Port Inland Distribution Network (PIDN) system to include service to water-accessible ports further north, such as Bridgeport, Conn.; Providence, R.I.; and Boston Mass. PIDN is a planned system for distributing containers moving through the Port of New York and New Jersey by barge and rail."*

## 1.2 Petroleum Products

In its December 2007 report entitled Increasing Globalization of Petroleum Products Markets, Tightening Refining Demand and Supply Balance, and Other Trends Have Implications for U.S. Energy Supply, Prices, and Price Volatility[4], the GAO noted:

(1) *"Much of the recent growth in refining capacity in the United States has been concentrated in the Gulf Coast. This growth in capacity in the Gulf Coast is consistent with the view of many industry experts we spoke with that the Gulf Coast provides one of the most competitive environments for U.S. refiners. Experts cited several factors, including ready access to imported crude oil supplies, numerous options for shipping product to the rest of the United States by pipeline and* ***waterways*** *[emphasis added], and a concentration of highly skilled workers."*

(2) *"Industry representatives and federal studies also report that many of the nation's port facilities are operating at or near capacity. For example, one-fourth of the ports in a U.S. Maritime Administration (MARAD) survey described their infrastructure impediments as "severe." Officials from the interagency U.S. Committee on the Maritime Transportation System, which includes MARAD, the National Oceanic and Atmospheric Administration, and the* ***U.S. Army Corps of Engineers told us that U.S. ports and waterways are constrained in capacity and utilization, and anticipate marine supply infrastructure will become more constrained in the future****. [Emphasis added]"*

## 1.3 Federal Funding for Transportation

The GAO looked at the differences in federal funding for different transportation modes and found:[5]

(1) *"Differences in federal funding for different transportation modes have created a competitive disadvantage for freight railroads. Because the federal government has an interest in an efficient national freight transportation system, the federal role in freight transportation needs to recognize that the freight transportation system encompasses many modes that operate in a competitive marketplace and are owned, funded, and operated by both the private and the public sectors. However, current federal transportation policy treats each freight transportation mode differently, thereby creating competitive advantages for some modes over others. For example, trucking companies and* ***barges*** *[emphasis added] use infrastructure that is owned and*

[4] GAO-08-14, December 20, 2007.
[5] GAO-07-770, Railroad Bridges and Tunnels, Federal Role in Providing Safety Oversight and Freight Infrastructure Investment Could Be Better Targeted, August 2007.

*maintained by the government, while railroads use infrastructure that they pay taxes on, own, and maintain. Trucking and barge companies pay fees and taxes for government-funded infrastructure they use, but their payments generally do not cover the costs they impose on highways and waterways. The federal subsidy that makes up the difference between the government's costs and users' payments gives trucking and barge companies a competitive advantage over the railroads.*[6] *CBO (Congressional Budget Office) has observed that if all modes do not pay their full costs, the result is inefficient use of roads and waterways and greater government spending than otherwise would be necessary if capacity investments are made in anticipation of demand that does not occur."*

(2) *"In light of the federal government's long-term fiscal imbalance, it is important for federal policy makers to determine how the federal government can support efficient, mode-neutral, transparent, and sustainable investments in freight-related infrastructure."*

(3) *"With respect to the federal role in freight-related infrastructure, including railroad bridges and tunnels, the federal approach to such investments needs to be better structured to maximize achieving national public benefits such as increased freight mobility, reduced congestion, and improved environmental quality."*

## 1.4 Intermodal Transportation

On June 20, 2007 the GAO reported to the Chairman, Committee on Transportation and Infrastructure regarding intermodal transportation that:[7]

(1) *"As required by Congress, DOT has taken several actions that were designed to increase intermodal collaboration. For example, in February 2007, DOT established an Intermodal Council, which is the fulfillment of the Intermodal Transportation Advisory Board required by 49 U.S.C. 5502."*

(2) *"Also, in the Coast Guard Authorization Act of 1998, Congress directed DOT to convene a task force to assess the adequacy of the Marine Transportation System (MTS), which consists of waterways, ports, and their intermodal connections. The task force reported a set of recommendations to Congress in 1999, which led to the creation of two entities – an advisory council and an interagency committee. The advisory council is designed to provide an avenue for the maritime industry to have input into issues regarding the MTS, while the interagency committee is designed to improve coordination among the 18 federal agencies with responsibilities related to the MTS. The interagency committee also is designed to ensure the development and implementation of national MTS policies consistent with national needs and report its views and recommendations for improving the MTS to the President."*

[6] GAO-07-94, Freight Railroads: Industry Health has Improved but Concerns About Competition and Capacity Should be Addressed, October 2006, page 62..
[7] GAO-07-718, Intermodal Transportation: DOT Could Take Further Actions to Address Intermodal Barriers, June 2007.

## 1.5 Transportation Challenges

In March 2007 the GAO reported on the results of its study on transportation challenges.[8] Highlights from that study follow.

(1) *The GAO conducted the study because, "A safe, efficient, and convenient transportation system is integral to the health of our economy and quality of life. Our nation's vast transportation system of airways, railroads, roads, pipelines, transit, and* ***waterways*** *[emphasis added] has served this need, yet is under considerable strain from (1) increasing congestion, (2) the large costs to maintain and improve it, and (3) the human cost of over 44,000 people killed and over 2.5 million injured each year in transportation-related accidents."*

(2) *"Freight traffic is projected to grow substantially, putting strain on ports, highways, railroads, and airports, but current public planning and financing impede strategies to address capacity investment, and industry's ability to fund its capacity increases to meet growth is largely uncertain.[9] Freight mobility – the ability to move goods – is a driver of economic growth, and increasing congestion and unreliability of transportation systems can have severe economic consequences. In the future, Congress is likely to receive funding requests for additional freight projects and face decisions about the federal role in the nation's freight infrastructure."*

(3) *"The nation faces a growing fiscal crisis that challenges it to fundamentally reexamine existing government programs and commitments and to make tough choices in setting priorities and linking resources to results."*

(4) *"Furthermore, transportation programs and funding mechanisms are largely stovepiped by modes of transportation. For example, while passenger and freight travel occurs on all modes, federal funding and planning requirements focus largely on highway, transit, and aviation passenger travel. This framework makes it difficult for intermodal projects and other modal projects (e.g., freight or passenger rail) to be integrated into the transportation system. We have found, for example, that the limited visibility that freight projects receive in the process for planning and prioritizing transportation projects as well as the lack of a comprehensive evaluation approach, such as a cost-benefit framework, impedes the implementation of improvements to better ensure that systemwide, multimodal solutions are considered and adopted where appropriate. It is unlikely that mobility can be enhanced unless major modes – air, highway, rail, transit, and* ***water*** *[emphasis added} – are well connected."*

[8] GAO-07-545T, Transportation Challenges Facing Congress and the Department of Transportation, March 6, 2007.
[9] GAO, Freight Railroads: Industry Health Has Improved, but Concerns about Competition and Capacity Should be Addressed, GAO-07-94 (Washington, D.C.; Oct. 6, 2006) and Freight Transportation: Strategies Needed to Address Planning and Financing Limitations, GAO-04-165 (Washington, D.C.; Dec. 19, 2003).

## 1.6 Short Sea Shipping

The GAO reviewed Short Sea Shipping (SSS) options in July 2005. [10] "Broadly defined, short sea shipping encompasses waterborne transportation of commercial freight between domestic ports through the use of **inland and coastal waterways** [emphasis added]." The report addressed "(1) why short sea shipping is being considered as an option for addressing freight mobility concerns and the factors that affect its viability as an approach, (2) the Department of Transportation's role in the development of short sea shipping, and (3) issues that should be considered by public transportation decision makers when making public investment decisions about short sea shipping or other types of projects for addressing freight mobility challenges."

(1) The report found that:

(a) *"The Department of Transportation has established short sea shipping as a high priority component of the federal freight transportation strategy and has drafted a policy proposal to provide targeted incentives for short sea shipping projects."*

(b) *"As the federal role is being defined and clarified, public transportation decision makers at the state and local levels are also activity considering short sea shipping and other options to address the freight mobility challenges affecting their jurisdictions."*

(c) Given *"increased funding constraints and compartmentalized funding programs"… "in setting transportation priorities and linking resources to results" … "(A) systematic investment approach to guide public investment decisions at all levels – federal, state, and local – could help public decision makers in making those tough difficult choices."*

(2) The GAO recommended that the Secretary of the Department of the Interior:

(a) *"develop a more thorough understanding of SSS issues before defining a federal role involving substantial federal infrastructure investment"* and

(b) *"Use current mechanisms to encourage other public decision makers to use a systematic approach for making investment decisions on freight mobility projects."*

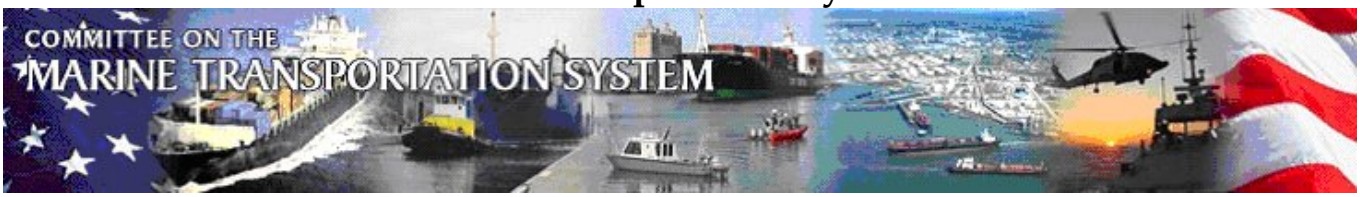
## 1.7 Infrastructure

On 8 May 2008, the GAO published Physical Infrastructure: Challenges and Investment Options for the Nation's Infrastructure. Among other infrastructure assets, the report addressed the aging dam infrastructure and noted that it *"continues to be a critical issue for dam safety because the age of dams is a leading indicator of potential dam*

[10] GAO-05-768, Freight Transportation: Short Sea Shipping Option Shows Importance of Systematic Approach to Public Investment Decision, July 2005.

*failure."* The report also noted that, *". . . according to the Congressional Research Service, most federal agencies do not have funding available to immediately undertake all nonurgent repairs, and at some agencies, dam rehabilitation projects must compete for funding with other construction projects."*[11]

## 2.0 Committee on the Marine Transportation System




In its December 2007 draft entitled *National Strategy for the Marine Transportation System: A Framework for Action, Committee on the Marine Transportation System* the Committee on the Marine Transportation System (hereafter referred to as the CMTS) noted the following:

(1) Navigable waters, ports, points where changes in modes of transportation take place (intermodal connections), vessels, and commercial, military, and recreational users make up the Marine Transportation System (hereafter referred to as the MTS).

(2) While efficiency improvements and technology can improve productivity without the need to expand infrastructure, projected growth in freight volumes will require additional infrastructure. Anticipated are increased infrastructure costs and challenges in the navigation area will be the need for maintenance dredging and channel deepening.

(3) Expanded Short Sea Shipping, including establishing an America's Marine Highway pilot program, is one of eight priority actions endorsed by the Committee. For the purpose of relieving congestion, this pilot would designate waterways to be part of the Marine Highway Corridors.

(4) Safety and security are among the challenges the MTS will address in relation to business, recreational, and military traffic on oceans, harbors, ports, Great Lakes, and inland waterways. The CMTS endorsed six priority actions relating to safety and security:

(a) *"Coordinate existing Federal navigation programs to ensure collaboration, reduce duplication and standardize terminology and presentation;"*

(b) *"Deliver timely, relevant, accurate navigation safety information to mariners, including real time information systems such as the Physical Oceanographic Real Time*

[11] http://www.gao.gov/new.items/d08763t.pdf

*Systems, e-navigation, under keel clearance, air gap technology and those associated with development of the Integrated Ocean Observing System to improve navigation safety and efficiency;"*

(c) *"Encourage, coordinate, and support navigation technology research and development to enhance navigation safety;"*

(d) *"Ensure coordination between maritime transportation and maritime security policy-making bodies and programs;"*

(e) *"Consider ways in which security measures impacting the movement of trade by water between the United States and Canada can be streamlined, and where economies and coordination can be realized between safety and security imperatives; and"*

(f) *"Work closely with state and local boating authorities and entities, recreational boating organizations, commercial shipping interests, and ports to reduce the conflicts from competing users of navigation channels and increase and manage safety of the MTS."*

(5) The quality of sediments, dredging, dredged material, and dredged material management for maintaining, sustaining, and expanding the MTS are major environmental stewardship concerns. A key challenge faced in addressing this area is that protection of the MTS environment is spread across 18 Federal agencies, 50 states, many local, and some Tribal governments. The Federal government sets national environmental standards but states and local jurisdictions also regulation pollution and the use of land and wetlands. A system-wide approach to planning for environmental protection and the effective implementation of environmental protection is a goal of the National Strategy. Ensuring *"timely and effective dredging and dredged material management"* is one of eight priority environmentally related actions endorsed by CMTS.

The CMTS endorsed five priority actions to increase the resilience and reliability of the MTS:

(1) *"Provide coordination, expertise, and resources to ensure continuity of operations, essential public services, and the resumption of commercial marine activities following disruption;"*

(2) *"Analyze the ways in which reserve and surge capacity can be developed in the MTS and coordinate with industry on response and recovery operations;*

(3) *Develop a coordinated approach to and streamlined emergency permitting for channel restoration following a large scale sediment deposition in navigation channels, such as recovery from natural disasters, hurricanes, etc. that obstruct the channel and disrupt port activities;"*

(4) *"Work collaboratively to resolve cross-cutting jurisdictional issues surrounding abandoned and wrecked vessels and bridges; and"*

(5) *"Develop and conduct national and international strategies for addressing potential climate change impacts on ports, waterways and other vulnerable elements of the MTS."*

The CMTS addressed the issues of finance and economics noting that, *"The National Strategy envisions a coordinated and detailed exploration of specific options for increasing the efficiency of the existing MTS system, developing better methods for prioritizing investments, and developing ways of attracting more private sector investments."* The CMTS noted that, *"Increases in Federal funding should be considered only after a thorough exploration of opportunities for increasing the efficient use of existing infrastructure, prioritizing investments so that increased funds are used effectively, and an identification of both private and public sources of funds so that any additional public funds leverage additional private investments."* While recognizing the difficulty in quantifying environmental costs, the CMTS nevertheless endorsed accounting for such costs. Five finance-related priority actions are endorsed by the CMTS to maintain and improve the MTS infrastructure:

(1) *"Study alternative approaches to financing maintenance and infrastruture projects and enviornmental impact mitigation. This study will consider the appropriate tools (including fees, taxes, and general revenue contributions) for financing infrastructure projects depending on the characteristics of the projects and involve high-level discussions to promote those funding strategies;"*

(2) *"Study approaches to prioritizing how Federal dollars should be allocated among competing priorities;"*

(3) *"Ensure cost allocation takes into consideration environmental and human health costs, and does not create competitive disadvantage through unfair pricing;"*

(4) *"Study how best to coordinate the allocation of Federal funds for projects across agencies and, in particular, the CMTS role in that process; and"*

(5) *"Coordinate a CMTS membership policy recommendation to the President for congestion prices, which should be charged when appropriate. The revenues collected from congestion pricing can offset fixed costs and thereby reduce distortions."*

The CMTS is comprised of:

*Secretary of Transportation, Chair*
*Secretary of Commerce*
*Secretary of Defense*
*Secretary of Homeland Security*
*Secretary of the Treasury*
*Secretary of State*
*Secretary of Agriculture*
*Attorney General*
*Secretary of Labor*
*Secretary of Energy*
*Chairman of the Joint Chiefs of Staff*
*Administrator of the Environmental Protection Agency*

*and "The head of any other Federal agency that the Committee Chair, with the approval of a majority of the voting members of the Committee, determines can further the purpose and activities of the Committee" )*

The Assistant Secretary of the Army for Civil Works represents the Secretary of Defense on the CMTS and a member of HQUSACE sits the working group of the committee.

## 3.0 Economic Significance of the Inland Waterways Navigation System

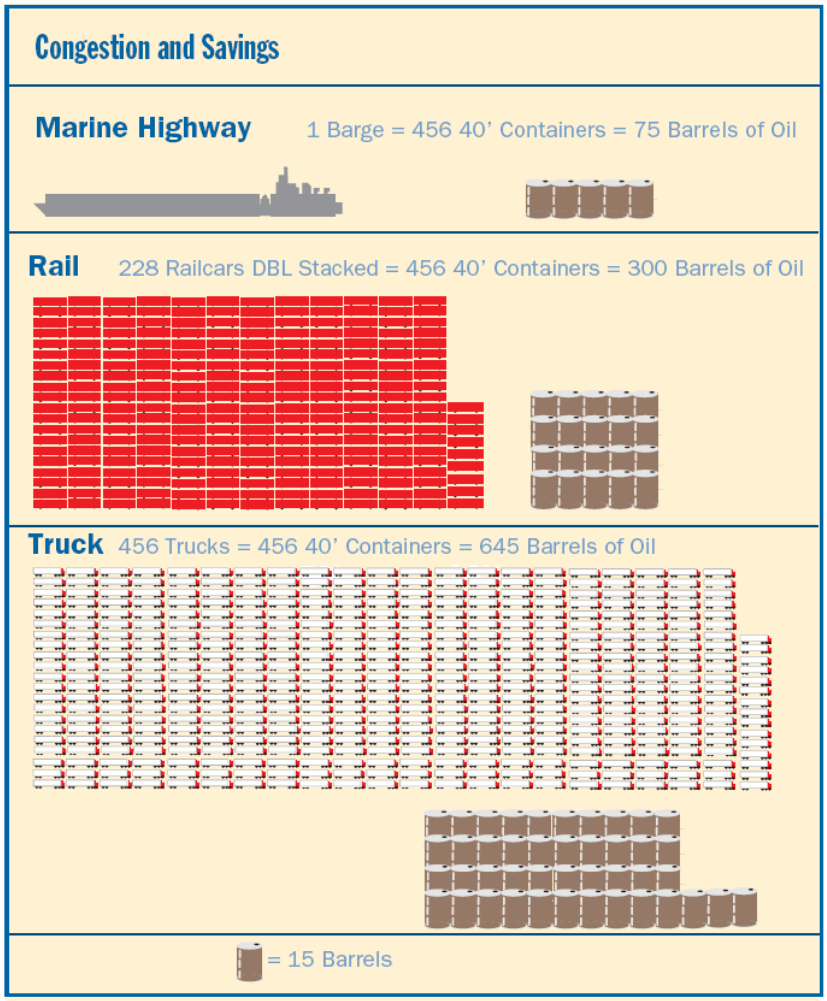
The following is intended to convey a sense of the involvement and interest of various Federal agencies and State and local governments in the important economic contribution of inland waterways.

## 3.1 The Maritime Administration

In a 2007 report[12] the Maritime Administration noted that *"America's principal Marine Highway, the 25,000 mile U.S. inland and inter-coastal waterway system, is one of our greatest national resources and adds $5 billion a year to the U.S. economy. Employing mostly tugs and barges, transportation on our inland watereways is the most economical mode of commercial transportation. Today's fleet of nearly 4,000 modern tugboats and towboats and more than 27,000 barges moves over 800 million tons each year of raw material and finished goods and directly serves 87 percent of all major U.S. cities."*

The same report points to *"The Great Lakes and Saint Lawrance Seaway, espcially the region encompassing New York, Pennsylvania, Ohio, Indiana, Michigan, Illinois, Wisconsin, Minnesota, Ontario and Quebec where industrial raw materials and gram from the Upper Midwest are trnsported by water to regional and international markets."* The aforementioned region posses the *"greatest concentration of manufacturing" in the U.S. and Canada. Those eight states "contributed 26 per cent to the U.S. Gross Domestic Product in 2004."*
In its report the Maritime Administration also noted that transport by barge reduces congestion and saves energy stating that, *"The use of Marine Highways can reduce overall fuel consumption and limit the amount of air pollution. Moreover, studies have shown the fuel efficiency and pollution reduction benefits by switching to newer, environmentally friendly vessels."* The following chart is from the report and compares cargo and fuel transportation by barge, rail, and truck.

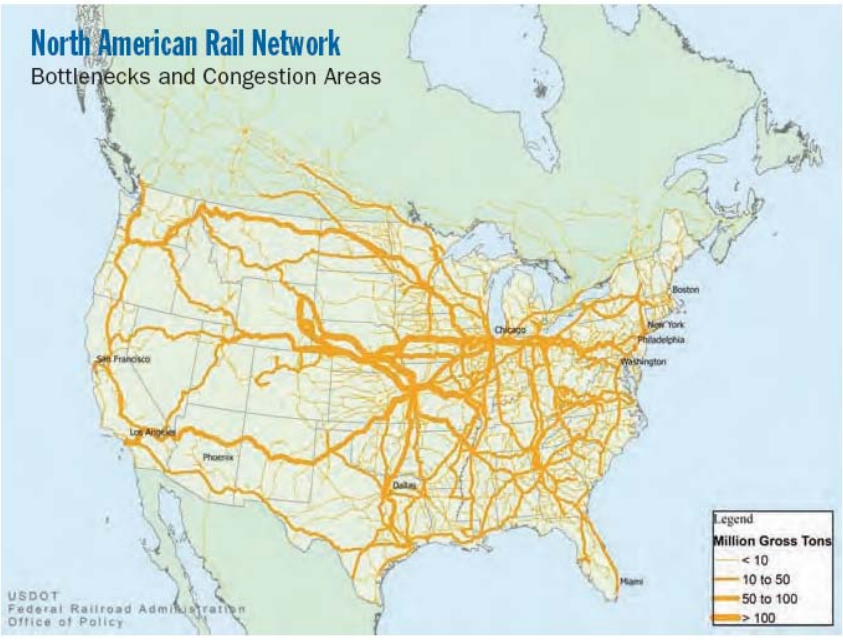
[12] The Maritime Administration and the U.S. Marine Transportation System: A vision for the 21st Century, U.S. Department of Transportation, Maritime Administration, November 2007.



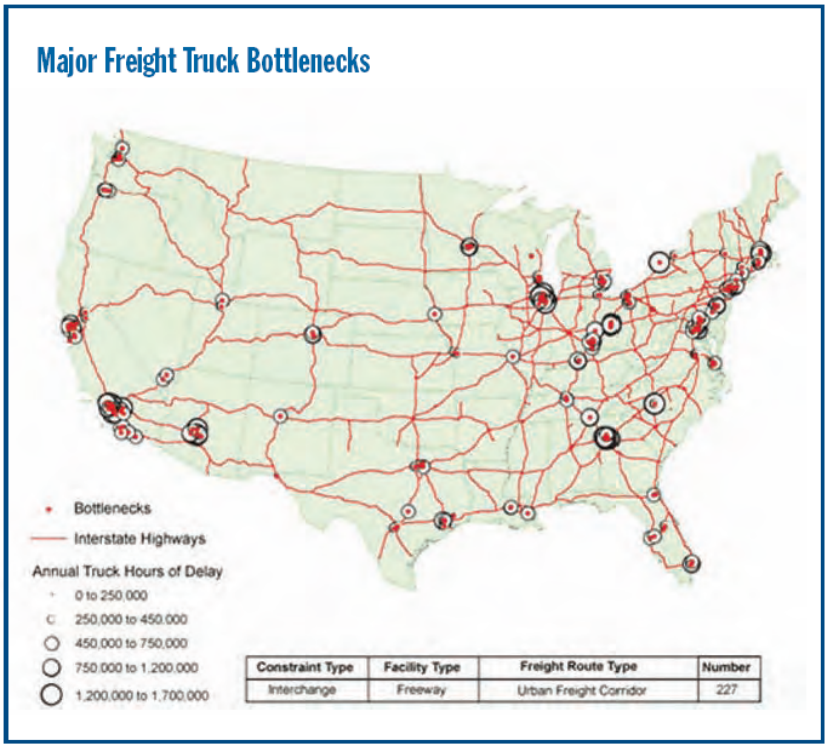

*Source: U.S. Department of Transportation, Maritime Administration*

In its report the Maritime Administration opined that, *"The greater use of America's Marine Highways is one answer to congestion on our highways and railroads. The use of vessels could reduce major bottlenecks, such as bridges and tunnel, as well as congested interstates, such as I-95 which parallels the U.S. Atlantic coastwise routes. Properly developed, the Marine Highway can greatly relieve the increased stress on the overall transportation system."* The following charts of the Marine Highway, North American Rail Network, and Major Freight Truck Bottlenecks are taken from the report.

*Source: U.S. Department of Transportation, Maritime Administration*

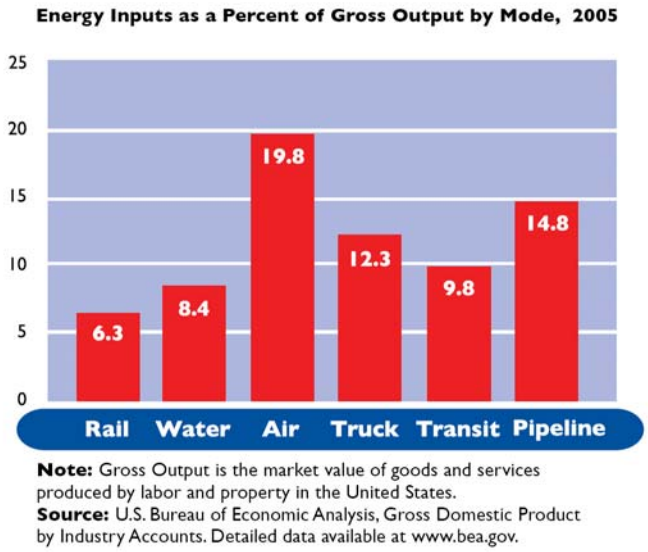



*Source: U.S. Department of Transportation, Federal Railroad Administration*




*Source: U.S. Department of Transportation, Federal Highways Administration*

In a separate statistical snapshot, the Maritime Administration stated that: *"Water transportation ranks second among modes in energy efficiency (energy costs per dollar of gross output."*[13]




[13] U.S. Water Transportation Statistical Snapshot, U.S. Department of Transportation, Office of Policy and Plans, Office of Congressional and Public Affairs, Maritime Administration, May 2007. http://www.marad.dot.gov/MARAD_statistics/2007%20STATISTICS/USWTSR%20bOOKLET.pdf

## 3.2 Department of Agriculture

USDA United States Department of Agriculture

In Waterways Facts 01-16-08[14], January 2008, the Department of Agriculture reported that:

(1) *"The United States exports approximately one-quarter of the grain it produces, including nearly 45 percent of the wheat, 35 percent of the soybeans, and 20 percent of the corn."*

(2) *"Approximately 48 percent of the total grain exports departed from the Mississippi Gulf."*

(3) *"The Pacific Northwest (PNW) ports accounted for 24 percent of U.S. grain exports in 2007. PNW handled over 1 billion bushels of grain in 2007."*

(4) *"Barges move an estimated 120 percent of ethanol. Main terminals include Chicago, IL, New Orleans, LA, Houston, TX, and Albany, NY."*

(5) *"A large number of ethanol plants are planned near the inland waterway system, several are under construction, and several are operational."*

(6) *"Increased ethanol production means increased corn acreage, and transportation of fertilizer to grow the corn."*

The following are facts regarding barge and rail competition extracted from that report:

(1) In calendar year 2007, total upbound and downbound traffic at Mississippi Lock 27, Ohio Loc 52, and Arkansas Lock 1 included[15]:

- Corn 27.6 million short tons
- Oilseeds – soybeans, flaxseed, and others – 7.2 million short tons
- All chemical fertilizers – 8.5 million short tons
- Animal feed, grain mill products, processed grain – 6.5 million short tons
- Wheat – 1.8 million short tons
- Rye, barley, rice sorghum and oats – 0.67 million short tons

[14] A Reliable Waterway System Is Important to Agriculture, May 2008.
http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5063401
[15] USACE OMNI RPT 06 Waterway Traffic Report.

(2) Railroads originate approximately 35 percent of U.S. grain shipments.

(3) Railroads take into account barge rates and the spread between U.S. Gulf and Pacific Northwest ocean vessel freight rates, and price their services accordingly

(4) U.S. Department of Agriculture Transportation of U.S. Grains, A Model Analysis, 1978-2004, showed that:

- Barges moved 64 percent of corn to ports and 2 percent of corn to processors, feed lots, and dairies in 2004. Rail shares were 33 percent for exports and 32 percent for domestic moves

- Barges moved 56 percent of soybeans to ports and 4 percent of soybeans to processors in 2004. Rail shares were 34 percent for exports and 16 percent for domestic moves.

- Barges moved 35 percent of wheat to ports and 2 percent of wheat to processors. Rail shares were 65 percent for exports and 55 percent for domestic moves.

- Barges moved 17 percent of sorghum to ports. Rail shares were 37 percent for exports and 8 percent for domestic moves.

- Studies* have shown that without barge competition, agricultural shippers pay higher rail transportation costs, the further they are from an inland waterway. (*See footnote 1 of the source document)

### 3.3 Department of Transportation

RITA U.S. Department of Transportation Research and Innovative Technology Administration

The following are statistics from 2006 Transportation Statistics Annual Report[16], produced by the Department of Transportation (DOT), Research and Innovative Technology Administration, Bureau of Transportation Statistics. The information is presented as an example of comparisons of the various modes of transportation.

[16] http://www.bts.gov/publications/transportation_statistics_annual_report/2006/pdf/entire.pdf

(1) The value and weight of U.S. commercial freight shipments for 2002 is shown in the following table from the report. As indicated in the table, the value of water transportation for 2002 was $673B.

| | Value (billion $) | | | Tons (million) | | |
|---|---|---|---|---|---|---|
| | CFS 2002 | Non CFS | Total | CFS 2002 | Non CFS | Total |
| **All Modes** | **8,397** | **4,655** | **13,052** | **11,668** | **7,819** | **19,487** |
| **Single modes** | **7,049** | **4,549** | **11,599** | **11,087** | **7,807** | **18,894** |
| Truck | 6,235 | 2,840 | 9,075 | 7,843 | 3,870 | 11,712 |
| Rail | 311 | 81 | 392 | 1,874 | 105 | 1,979 |
| Water | 89 | 584 | 673 | 681 | 987 | 1,668 |
| Air (incl. truck and air) | 265 | 298 | 563 | 4 | 3 | 6 |
| Pipeline | 149 | 747 | 896 | 685 | 2,844 | 3,529 |
| **Multiple modes** | **1,079** | **42** | **1,121** | **217** | **12** | **229** |
| Parcel, post, or courier | 988 | 34 | 1,022 | 26 | 2 | 27 |
| Truck and rail | 70 | 7 | 77 | 43 | 9 | 52 |
| Other multiple modes | 22 | 1 | 22 | 148 | 2 | 150 |
| **Unknown modes** | **269** | **62** | **331** | **365** | **—** | **365** |

**KEY:** — = data cell equal to zero or less than 1 unit of measure; CFS=Commodity Flow Survey.

**NOTES:** *Truck* as a single mode includes shipments that were made by only private truck, only for-hire truck, or a combination or private and for-hire truck. *Pipeline* includes shipments of crude petroleum. *Other multiple modes* include combination of truck and water, rail and water, and other combinations. The composite estimates include Commodity Flow Survey (CFS) data and out-of-scope shipments for sectors that are not included in the CFS such as imports, logging, construction, retail, services, publishing, municipal solid waste, and household and business moves. The composite estimates also include estimates of in-scope shipments for sectors that are covered in CFS but may have been under-estimated due to small sample size, such as exports, intermodal, and petroleum products.

**SOURCE:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *Freight in America* (Washington, DC: 2006), table 3.

(2) Table C-2 from the report shows Federal revenues by transportation mode for the fiscal year 2003. These revenues consist of user taxes to finance transportation programs. These revenues do not include revenues directed to the general fund and used for nontransportation purposes, nontransportation general fund revenues used to finance transportation programs, or "proceeds from borrowing."

**TABLE C-2 Federal Government Transportation Revenues by Mode: Fiscal Year 2003**

| | Chained 2000 dollars (billions) | Percentage of total |
|---|---|---|
| Highway | 26.9 | 64.62 |
| Air | 9.4 | 22.51 |
| Transit | 4.4 | 10.62 |
| Water | 0.9 | 2.11 |
| Pipeline | 0.1 | 0.13 |
| General support | 0.0 | 0.02 |
| **Total** | **41.6** | **100.0** |

**NOTES:** Data may not add to total and percentages may not add to 100 because of independent rounding. To eliminate the effects of inflation over time, the Bureau of Transportation Statistics converted current dollars to chained 2000 dollars.

**SOURCE:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2003*, available at http://www.bts.gov/, as of December 2006.

(3) Table C-4 from the report depicts Federal transportation expenditures by mode for the fiscal year 2002.

**TABLE C-4 Federal Government Transportation Expenditures by Mode: Fiscal Year 2002**

| | Chained 2000 dollars (billions) | Percentage of total |
|---|---|---|
| Highway | 31.6 | 54.7 |
| Transit | 7.3 | 12.7 |
| Rail | 1.2 | 2.1 |
| Air | 12.4 | 21.4 |
| Water | 5.0 | 8.6 |
| Pipeline | 0.1 | 0.1 |
| General support | 0.2 | 0.4 |
| **Total** | **57.7** | **100.0** |

**NOTES:** Data may not add to total and percentages may not add to 100 because of independent rounding. To eliminate the effects of inflation over time, the Bureau of Transportation Statistics converted current dollars to chained 2000 dollars.

**SOURCE:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2003*, available at http://www.bts.gov/, as of December 2006.

(4) The "Ton-Miles" of freight by the various transportation modes is shown in the next table from the report.

In 2004, waterborne transportation accounted for 621.2B ton miles.

**TABLE B-3 Ton-Miles of Freight: 1994–2004**
Billions

| | Air | Truck | Railroad | Water | Oil and Oil Products Pipeline | Natural Gas pipeline | Total |
|---|---|---|---|---|---|---|---|
| 1994 | 12.0 | 987.9 | 1,221.1 | 814.9 | 591.4 | 317.6 | 3,945.0 |
| 1995 | 12.7 | 1,034.0 | 1,317.0 | 807.7 | 601.1 | 331.6 | 4,104.2 |
| 1996 | 13.8 | 1,062.0 | 1,377.1 | 764.7 | 619.2 | 337.4 | 4,174.1 |
| 1997 | 13.9 | 1,110.6 | 1,391.1 | 707.4 | 616.5 | 340.0 | 4,179.4 |
| 1998 | 14.1 | 1,139.8 | 1,448.4 | 672.8 | 619.8 | 333.7 | 4,228.6 |
| 1999 | 14.5 | 1,176.4 | 1,503.7 | 655.9 | 618.0 | 332.2 | 4,300.6 |
| 2000 | 15.8 | 1,192.8 | 1,546.3 | 645.8 | 577.0 | 350.9 | 4,328.6 |
| 2001 | 13.3 | 1,213.2 | 1,599.3 | 621.7 | 576.0 | 334.0 | 4,357.5 |
| 2002 | 13.8 | 1,245.5 | 1,605.5 | 612.1 | 586.0 | 346.0 | 4,409.0 |
| 2003 | 15.1 | 1,264.8 | 1,603.6 | 606.1 | 590.0 | 335.2 | 4,414.8 |
| 2004 | 16.5 | 1,314.6 | 1,684.5 | 621.2 | 599.6 | 338.4 | 4,574.7 |

**NOTE:** Data may not add to total because of independent rounding.

**SOURCE:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, special tabulation.

(5) As can be seen in the emissions table from the report, of the four principal types of freight transportation (trucks, planes, rail, and water) excluding other modes, ships and boats were the second lowest generator of carbon dioxide emissions in 2004.

**TABLE K-4 Carbon Dioxide Emissions by Mode: 1994–2004**
Teragrams of carbon dioxide equivalent

| | Passenger cars | Light-duty trucks | All other trucks | Buses | Aircraft | Ships and boats | Loco-motives | Other | Total, all modes | International bunker fuels |
|---|---|---|---|---|---|---|---|---|---|---|
| 1994 | 596.3 | 386.3 | 258.8 | 9.0 | 176.1 | 49.9 | 40.4 | 50.6 | 1,567.5 | 94.2 |
| 1995 | 599.0 | 401.1 | 268.5 | 8.9 | 171.8 | 51.9 | 41.8 | 51.1 | 1,594.1 | 98.0 |
| 1996 | 604.7 | 414.0 | 277.3 | 9.2 | 180.1 | 49.5 | 42.5 | 51.4 | 1,628.8 | 99.3 |
| 1997 | 601.8 | 426.7 | 298.0 | 9.7 | 179.0 | 34.0 | 42.7 | 54.2 | 1,646.2 | 106.1 |
| 1998 | 621.5 | 437.3 | 306.5 | 9.8 | 181.3 | 27.3 | 43.0 | 48.8 | 1,675.6 | 103.3 |
| 1999 | 631.2 | 455.0 | 322.4 | 11.0 | 186.8 | 37.5 | 44.6 | 49.4 | 1,737.8 | 102.6 |
| 2000 | 633.4 | 458.3 | 337.9 | 10.8 | 193.2 | 55.1 | 44.6 | 48.9 | 1,782.3 | 102.2 |
| 2001 | 636.5 | 462.2 | 337.0 | 9.9 | 183.5 | 48.1 | 44.8 | 46.2 | 1,768.1 | 98.5 |
| 2002 | 651.6 | 474.8 | 351.0 | 9.5 | 174.9 | 57.0 | 45.2 | 49.0 | 1,813.1 | 89.5 |
| 2003 | 631.3 | 509.6 | 347.3 | 10.3 | 171.8 | 49.7 | 47.1 | 48.4 | 1,815.5 | 84.1 |
| 2004 | 636.4 | 526.0 | 365.3 | 10.3 | 179.6 | 54.4 | 49.8 | 48.7 | 1,870.4 | 94.5 |

**KEY:** 1 teragram = 1 trillion grams.

**NOTES:** *Other* carbon dioxide emissions are from motorcycles, pipelines, and lubricants. *International bunker fuel* emissions (not included in the total) result from the combustion of fuels purchased in the United States but used for international aviation and maritime transportation. Thus, *aircraft* and *ships* and *boats* data included in U.S. total emissions involve only domestic activities of these modes as do all other data shown. *Aircraft* emissions consist of emissions from all jet fuel (less bunker fuels) and aviation gas consumption. Alternative-fuel vehicle emissions are allocated to the specific vehicle types in which they were classified (i.e., passenger cars, light-duty trucks, and other trucks and buses).

**SOURCE:** U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks* (Washington, DC: Annual Issues), table 2-17.

(6) According to the same DOT report, in 2004 waterborne commerce experienced 36 vessel-related fatalities and recreational boating fatalities numbered 676 souls.

**TABLE J-2 Distribution of Transportation Fatalities: 2004**

| | Number of fatalities | Percentage of all transportation fatalities |
|---|---|---|
| Passenger-car occupants | 19,091 | 42.61 |
| Light-truck occupants | 12,602 | 28.13 |
| Pedestrians struck by highway vehicles | 4,641 | 10.36 |
| Motorcyclists | 4,008 | 8.95 |
| Heavy-truck occupants | 761 | 1.70 |
| Pedalcyclists struck by motor vehicle | 725 | 1.62 |
| Recreational boating | 676 | 1.51 |
| Other and unknown motor vehicle occupants | 639 | 1.43 |
| General aviation | 558 | 1.25 |
| Railroad trespassers (excluding grade crossing) | 478 | 1.07 |
| Other nonoccupants struck by motor vehicles | 128 | 0.29 |
| Grade crossings, not including motor vehicles | 83 | 0.19 |
| Air taxi | 64 | 0.14 |
| Heavy rail transit | 59 | 0.13 |
| Waterborne, not related to vessel casualties | 57 | 0.13 |
| Bus occupants | 41 | 0.09 |
| Waterborne, commercial vessel-related | 36 | 0.08 |
| Private grade crossings, with motor vehicles | 33 | 0.07 |
| Railroad employees, contractors, and volunteers on duty | 25 | 0.06 |
| Light rail transit | 22 | 0.05 |
| Railroad-related, not otherwise specified | 20 | 0.04 |
| Gas transmission and distribution pipeline | 18 | 0.04 |
| Transit buses, fatalities not related to accidents | 16 | 0.04 |
| Air carriers | 14 | 0.03 |
| Hazardous liquid pipeline | 5 | 0.01 |
| Passengers on railroad trains | 3 | 0.01 |
| Total Fatalities | 44,803 | |

## 3.4 USACE Navigation Data Center (NDC)

The USACE Navigation Data Center (NDC) also produces statistics for Waterborne Container Traffic for U.S. Ports and all 50 States and U.S. Territories.[17] The following table shows twenty foot equivalent units (TEUs) for waterborne container traffic in 2006.

### U.S. Waterborne Container Traffic by Port/Waterway in 2006

| Port or Waterway Name | ST | Domestic[18] | | | | | Foreign[19] | | | Grand Total Loaded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Inbound | | Outbound | | Total | Inbound | Outbound | Total | |
| | | Loaded | Empty | Loaded | Empty | | Loaded | Loaded | | |
| Anchorage | AK | 227,126 | 523 | 47,641 | 3,216 | 278,506 | 0 | 2,342 | 2,342 | 277,109 |
| Chatham Strait | AK | 2,079 | 310 | 565 | 1,635 | 4,588 | 0 | 0 | 0 | 2,643 |
| Clarence Strait | AK | 2,227 | 313 | 1,134 | 1,360 | 5,034 | 0 | 0 | 0 | 3,361 |
| Cordova | AK | 1,721 | 1,478 | 2,167 | 874 | 6,241 | 0 | 0 | 0 | 3,889 |
| Haines | AK | 2,430 | 466 | 1,073 | 1,684 | 5,652 | 0 | 0 | 0 | 3,502 |
| Icy Strait | AK | 510 | 618 | 690 | 421 | 2,239 | 0 | 0 | 0 | 1,200 |
| Juneau | AK | 27,849 | 6,233 | 13,435 | 21,586 | 69,103 | 0 | 0 | 0 | 41,284 |
| Ketchikan | AK | 18,619 | 4,930 | 14,429 | 13,162 | 51,139 | 5 | 0 | 5 | 33,052 |
| Kodiak | AK | 4,563 | 0 | 6,699 | 0 | 11,262 | 0 | 880 | 880 | 12,142 |
| Metlakatla | AK | 650 | 328 | 408 | 638 | 2,024 | 0 | 0 | 0 | 1,058 |
| Naknek River | AK | 1,999 | 16 | 1,306 | 115 | 3,436 | 0 | 0 | 0 | 3,305 |
| Other Alaskan Ports/Wtwys | AK | 8,137 | 710 | 2,831 | 4,365 | 16,042 | 0 | 0 | 0 | 10,967 |
| Petersburg | AK | 13,850 | 7,629 | 13,025 | 7,496 | 42,000 | 0 | 0 | 0 | 26,875 |
| Sitka | AK | 7,923 | 2,438 | 4,611 | 5,554 | 20,527 | 0 | 0 | 0 | 12,535 |
| Skagway | AK | 2,841 | 495 | 477 | 1,730 | 5,542 | 0 | 0 | 0 | 3,317 |

[17] http://www.iwr.usace.army.mil/ndc/wcsc/wcsc.htm#2005%20Waterborne%20Commerce%20of%20the%20United%20States%20(WCUS).
[18] Domestic Source: USACE, Waterborne Commerce Statistics Center.
[19] Foreign Source: Commonwealth Business Media, Inc., Port Import Export Reporting Service.

| Port or Waterway Name | ST | Domestic[18] | | | | | Foreign[19] | | | Grand Total Loaded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Inbound | | Outbound | | Total | Inbound | Outbound | Total | |
| | | Loaded | Empty | Loaded | Empty | | Loaded | Loaded | | |
| Unalaska Bay and Island | AK | 7,516 | 2,072 | 12,369 | 234 | 22,192 | 118 | 26,183 | 26,301 | 46,187 |
| Whittier | AK | 15,407 | 1,707 | 1,723 | 1,721 | 20,558 | 0 | 0 | 0 | 17,130 |
| Wrangell | AK | 1,546 | 469 | 817 | 1,308 | 4,139 | 0 | 0 | 0 | 2,363 |
| Mobile | AL | 0 | 0 | 0 | 0 | 0 | 24,486 | 19,089 | 43,574 | 43,574 |
| Long Beach | CA | 44,461 | 66,368 | 267,267 | 1,624 | 379,719 | 3,713,617 | 1,017,774 | 4,731,391 | 5,043,119 |
| Los Angeles | CA | 418 | 355 | 683 | 4 | 1,460 | 4,330,695 | 1,240,449 | 5,571,144 | 5,572,245 |
| Oakland | CA | 35,929 | 76,665 | 169,029 | 1,568 | 283,190 | 809,088 | 565,100 | 1,374,188 | 1,579,146 |
| Port Hueneme | CA | 0 | 0 | 0 | 0 | 0 | 15,619 | 2,791 | 18,410 | 18,410 |
| San Diego | CA | 0 | 0 | 0 | 0 | 0 | 46,218 | 1,192 | 47,410 | 47,410 |
| San Francisco | CA | 0 | 0 | 0 | 0 | 0 | 748 | 409 | 1,157 | 1,157 |
| Bridgeport | CT | 0 | 0 | 0 | 0 | 0 | 2,448 | 0 | 2,448 | 2,448 |
| Wilmington | DE | 0 | 0 | 0 | 0 | 0 | 126,498 | 43,876 | 170,374 | 170,374 |
| Fernandina Beach | FL | 0 | 0 | 0 | 0 | 0 | 7,481 | 11,138 | 18,619 | 18,619 |
| Fort Pierce | FL | 0 | 0 | 0 | 0 | 0 | 1,146 | 2,176 | 3,322 | 3,322 |
| Jacksonville | FL | 60,591 | 1 | 315,795 | 26 | 376,413 | 44,387 | 90,975 | 135,362 | 511,748 |
| Miami | FL | 0 | 0 | 0 | 0 | 0 | 426,092 | 314,015 | 740,107 | 740,107 |
| Palm Beach | FL | 0 | 0 | 0 | 0 | 0 | 28,074 | 95,636 | 123,710 | 123,710 |
| Panama City | FL | 0 | 0 | 0 | 0 | 0 | 21,885 | 22,361 | 44,246 | 44,246 |
| Port Everglades | FL | 0 | 0 | 13,179 | 0 | 13,179 | 294,319 | 325,636 | 619,955 | 633,134 |
| Port Manatee | FL | 0 | 0 | 0 | 0 | 0 | 4,647 | 436 | 5,083 | 5,083 |
| Tampa | FL | 0 | 0 | 0 | 0 | 0 | 10,362 | 4,964 | 15,326 | 15,326 |
| Savannah | GA | 0 | 0 | 0 | 0 | 0 | 857,526 | 716,896 | 1,574,422 | 1,574,422 |
| Apra Harbor | GU | 48,433 | 1,408 | 4,812 | 8,429 | 63,082 | 0 | 0 | 0 | 53,245 |
| Hilo | HI | 30,791 | 610 | 7,505 | 18,511 | 57,417 | 312 | 284 | 596 | 38,892 |
| Honolulu | HI | 549,802 | 111,416 | 304,124 | 189,257 | 1,154,599 | 23,226 | 12,802 | 36,028 | 889,954 |
| Kahului, Maui | HI | 72,908 | 1,229 | 21,479 | 37,469 | 133,084 | 0 | 0 | 0 | 94,386 |
| Kaunakakai Harbor | HI | 1,200 | 39 | 130 | 706 | 2,075 | 0 | 0 | 0 | 1,330 |
| Kawaihae Harbor | HI | 51,533 | 922 | 12,563 | 30,902 | 95,920 | 0 | 0 | 0 | 64,096 |
| Nawiliwili, Kauai | HI | 31,321 | 777 | 6,009 | 18,437 | 56,544 | 6 | 0 | 6 | 37,336 |
| Other | HI | 911 | 77 | 149 | 377 | 1,514 | 15 | 0 | 15 | 1,074 |

| Port or Waterway Name | ST | Domestic[18] | | | | | Foreign[19] | | | Grand Total Loaded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Inbound | | Outbound | | Total | Inbound | Outbound | Total | |
| | | Loaded | Empty | Loaded | Empty | | Loaded | Loaded | | |
| Hawaiian Islands Ports | | | | | | | | | | |
| Clearwater River | ID | 156 | 5,101 | 10,967 | 1,780 | 18,004 | 0 | 0 | 0 | 11,123 |
| Baton Rouge | LA | 21 | 0 | 44 | 0 | 65 | 180 | 2,594 | 2,774 | 2,839 |
| Lake Charles | LA | 282 | 737 | 1,229 | 108 | 2,356 | 7 | 227 | 234 | 1,745 |
| New Orleans | LA | 8,406 | 4,193 | 9,374 | 856 | 22,828 | 67,709 | 99,438 | 167,147 | 184,926 |
| South Louisiana, Port of | LA | 0 | 0 | 0 | 0 | 0 | 982 | 240 | 1,223 | 1,223 |
| Boston | MA | 12,921 | 3,458 | 7,689 | 8,995 | 33,063 | 78,180 | 59,653 | 137,833 | 158,443 |
| Baltimore | MD | 40,612 | 1,094 | 39,551 | 17,827 | 99,083 | 253,253 | 149,249 | 402,502 | 482,665 |
| Portland | ME | 0 | 0 | 0 | 0 | 0 | 958 | 634 | 1,592 | 1,592 |
| Gulfport | MS | 0 | 0 | 0 | 0 | 0 | 97,116 | 64,319 | 161,435 | 161,435 |
| Wilmington | NC | 0 | 0 | 0 | 0 | 0 | 78,317 | 47,400 | 125,717 | 125,717 |
| Camden-Gloucester | NJ | 2,688 | 0 | 21,177 | 10 | 23,875 | 24,459 | 3,420 | 27,879 | 51,744 |
| Salem River | NJ | 0 | 0 | 0 | 0 | 0 | 222 | 6,452 | 6,674 | 6,674 |
| New York (NY and NJ) | NY | 75,557 | 28,816 | 112,277 | 24,657 | 241,307 | 2,576,823 | 1,047,086 | 3,623,909 | 3,811,743 |
| Columbia River, Dalles-McNary | OR | 20,958 | 3,019 | 8,907 | 19,817 | 52,701 | 0 | 0 | 0 | 29,865 |
| Other Columbia Riv (OR,WA,ID) | OR | 476 | 1,221 | 622 | 73 | 2,392 | 0 | 0 | 0 | 1,098 |
| Portland | OR | 19,064 | 1,959 | 420 | 9,156 | 30,599 | 85,840 | 78,160 | 163,999 | 183,484 |
| Pacific Islands excl. Hawaii | OT | 3,417 | 131 | 575 | 2,680 | 6,803 | 0 | 0 | 0 | 3,991 |
| Chester | PA | 0 | 0 | 0 | 0 | 0 | 51,437 | 51,230 | 102,667 | 102,667 |
| Philadelphia | PA | 0 | 0 | 0 | 0 | 0 | 127,688 | 20,562 | 148,250 | 148,250 |
| Mayaguez | PR | 0 | 0 | 0 | 0 | 0 | 14,825 | 11,791 | 26,616 | 26,616 |
| San Juan | PR | 410,084 | 36 | 83,605 | 1 | 493,726 | 149,657 | 46,548 | 196,205 | 689,894 |
| Charleston | SC | 0 | 0 | 0 | 0 | 0 | 870,755 | 611,950 | 1,482,705 | 1,482,705 |
| Memphis | TN | 5,804 | 232 | 5,033 | 3,154 | 14,223 | 0 | 0 | 0 | 10,837 |
| Cedar Bayou | TX | 0 | 0 | 3,786 | 0 | 3,786 | 0 | 0 | 0 | 3,786 |
| Freeport | TX | 0 | 0 | 0 | 0 | 0 | 26,112 | 27,758 | 53,870 | 53,870 |
| Galveston | TX | 0 | 0 | 0 | 0 | 0 | 5,059 | 2,070 | 7,129 | 7,129 |

| Port or Waterway Name | ST | Domestic[18] | | | | | Foreign[19] | | | Grand Total Loaded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Inbound | | Outbound | | Total | Inbound | Outbound | Total | |
| | | Loaded | Empty | Loaded | Empty | | Loaded | Loaded | | |
| Houston | TX | 24,316 | 3,927 | 33,971 | 4,110 | 66,323 | 653,032 | 605,194 | 1,258,225 | 1,316,511 |
| Little River | VA | 0 | 0 | 0 | 0 | 0 | 1,456 | 446 | 1,902 | 1,902 |
| Newport News | VA | 0 | 0 | 0 | 0 | 0 | 43,377 | 30,376 | 73,753 | 73,753 |
| Norfolk Harbor | VA | 48,235 | 19,239 | 43,337 | 1,128 | 111,938 | 824,733 | 576,061 | 1,400,794 | 1,492,366 |
| Richmond | VA | 0 | 0 | 0 | 0 | 0 | 20,367 | 16,670 | 37,037 | 37,037 |
| Everett | WA | 666 | 34 | 36 | 2,140 | 2,876 | 27,032 | 1,865 | 28,897 | 29,599 |
| Seattle | WA | 51,375 | 100,354 | 156,595 | 12,973 | 321,297 | 742,397 | 430,053 | 1,172,450 | 1,380,420 |
| Tacoma | WA | 50,633 | 616 | 241,726 | 0 | 292,975 | 745,134 | 342,176 | 1,087,309 | 1,379,669 |
| Vancouver | WA | 1,108 | 19,534 | 20,846 | 8 | 41,496 | 163 | 26 | 189 | 22,143 |
| Great Lakes Ports | | 0 | 102 | 0 | 144 | 246 | 130 | 0 | 130 | 130 |
| Other Atlantic Ports/Wtwys | | 0 | 0 | 0 | 0 | 0 | 661 | 203 | 863 | 863 |
| Other Gulf Coast Ports/Wtwys | | 617 | 10 | 86 | 829 | 1,542 | 400 | 395 | 795 | 1,498 |
| Other Pacific Ports/Wtwys | | 750 | 438 | 3,459 | 1 | 4,648 | 2,815 | 809 | 3,625 | 7,833 |
| **Total** | | **2,053,434** | **484,853** | **2,053,434** | **484,853** | **5,076,573** | **18,360,295** | **8,852,457** | **27,212,752** | **31,319,620** |

1. TEU = Twenty Foot Equivalent Units. Foreign empties not included.
2. Includes Snake River.

## 3.5 Council of Governments

The following are examples of the types of transportation-related statistics available at that the East-West Gateway Council of Governments website. [20]

### Share of U.S. Freight Shipments by Mode

| All modes | Value (% of total) | Tons (% of total | Ton-miles (% of total) |
|---|---|---|---|
| Truck | 74.3 | 67.2 | 40.0 |
| for-hire truck | 44.7 | 31.3 | 30.6 |
| private truck | 29.1 | 35.6 | 9.3 |
| Rail | 3.7 | 16.1 | 40.2 |
| Water | 1.1 | 5.8 | 9.0 |
| Air (including truck and air) | 3.2 | 0 | 0.2 |
| Pipeline | 1.8 | 5.9 | S |
| Multiple Modes | 12.8 | 1.9 | 7.2 |
| parcel, U.S.P.S. or courier | 11.8 | 0.2 | 0.6 |
| other multiple modal combinations | 1.0 | 1.7 | 6.6 |
| Other and unknown modes | 3.2 | 3.1 | 1.4 |

***Source:*** 2002 Commodity Flow Survey, undertaken as a partnership between the U.S. Dept of Commerce, Bureau of the Census and the Bureau of Transportation Statistics of the Department of Transportation.

Notes: The value of goods measured includes the market value of goods used in production & final demand.. Hence, the goods may be counted more than once in the production cycle. The tonnage could also be counted multiple times.

S= Estimate does not meet publication standards.

The Commodity Flow Survey is estimated to capture approximately 80% of the value of goods shipped and over 70% of tons and ton-miles. Multiple modal combinations include truck & rail, truck & water, rail & water and others.

For-hire includes trucks that carry freight for a fee collected from the shipper, recipient of the shipment or an arranger of the transportation.

Private trucks are those operated by a temporary or permanent employee of an establishment or the buyer/receiver of the shipment.

[20] East-West Gateway Council of Governments : http://www.ewgateway.org/

## Freight Carried on Major US Waterways (in millions of tons)

| Item | 1980 | 1990 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|---|---|
| Atlantic Intracoastal Waterway | 4.0 | 4.2 | 3.1 | 2.5 | 1.9 | 1.9 | 2.3 | 2.7 |
| Great Lakes | 183.5 | 167.1 | 187.5 | 171.4 | 167.2 | 156.5 | 178.4 | 169.4 |
| Gulf Intracoastal Waterway | 94.5 | 115.4 | 113.8 | 112.2 | 107.7 | 117.8 | 123.3 | 116.1 |
| Mississippi River System* | 584.2 | 659.1 | 715.5 | 714.8 | 712.8 | 676.8 | 699.8 | 678.0 |
| Mississippi River Mainstem | 441.5 | 475.3 | 515.6 | 504.2 | 501.7 | 478.0 | 496.9 | 464.6 |
| Ohio River System** | 179.3 | 260.0 | 274.4 | 281.8 | 280.9 | 261.3 | 271.5 | 280.1 |
| Columbia River | 49.2 | 51.4 | 55.2 | 50.3 | 45.0 | 47.2 | 53.5 | 51.5 |
| Snake River | 5.1 | 4.8 | 6.7 | 5.6 | 4.3 | 5.3 | 5.7 | 5.3 |

*Main channels and all tributaries of the Mississippi, Illinois, Missouri and Ohio Rivers.
**Main channels and all navigable tributaries and embayments of the Ohio, Tennessee and Cumberland Rivers.

Source: U.S. Army Corps of Engineers

## National Freight Movement

| Mode | 1993 | 1997 | 2002 |
|---|---|---|---|
| Million Tons | | | |
| All | 9,688.5 | 11,089.7 | 11,667.9 |
| Single | 8,922.3 | 10,436.5 | 11,086.7 |
| Truck* | 6,385.9 | 7,700.7 | 7,842.8 |
| Rail | 1,544.1 | 1,549.8 | 1,873.9 |
| Water | 505.4 | 563.4 | 681.2 |
| Pipeline(excludes most crude oil) | 483.6 | 618.2 | 685.0 |
| Air(includes truck and air) | 3.1 | 4.5 | 3.8 |
| Multiple | 225.7 | 216.7 | 216.7 |
| Parcel, USPS or courier | 18.9 | 23.7 | 25.5 |
| Truck and rail | 40.6 | 54.2 | 43.0 |
| Truck and water | 68.0 | 33.2 | 23.3 |
| Rail and water | 79.2 | 79.3 | 105.1 |
| Other multiple modes | 18.9 | 26.2 | 19.8 |
| Other and unknown modes | 540.5 | 436.5 | 364.6 |
| Percent of all modes | | | |
| All modes | 100.0 | 100.0 | 100.0 |
| Single | 92.1 | 94.1 | 95.0 |
| Truck* | 65.9 | 69.4 | 67.2 |
| Rail | 15.9 | 14.0 | 16.1 |
| Water | 5.2 | 5.1 | 5.8 |

| Mode | 1993 | 1997 | 2002 |
|---|---|---|---|
| Pipeline(excludes most crude oil) | 5.0 | 5.6 | 5.9 |
| Air (includes truck and air) | 0.0 | 0.0 | 0.0 |
| Multiple | 2.3 | 2.0 | 1.9 |
| Parcel, USPS or courier | 0.2 | 0.2 | 0.2 |
| Truck and rail | 0.4 | 0.5 | 0.4 |
| Truck and water | 0.7 | 0.3 | 0.2 |
| Rail and water | 0.8 | 0.7 | 0.9 |
| Other multiple modes | 0.2 | 0.2 | 0.2 |
| Other and unknown modes | 5.6 | 3.9 | 3.1 |
| Single and Multiple modes | | | |
| Single modes | | | |
| Truck* | 71.6 | 73.9 | 70.7 |
| Rail | 17.3 | 14.8 | 16.9 |
| Water | 5.7 | 5.4 | 6.1 |
| Pipeline (excludes most crude oil) | 5.4 | 5.9 | 6.2 |
| Air (includes truck and air) | 0.0 | 0.0 | 0.0 |
| Total | 100.0 | 100.0 | 99.9 |
| Multiple modes | | | |
| Parcel, USPS or courier | 8.4 | 10.9 | 11.8 |
| Truck and rail | 18.0 | 25.0 | 19.8 |
| Truck and water | 30.1 | 15.3 | 10.8 |
| Rail and water | 35.1 | 36.7 | 48.5 |
| Other multiple modes | 8.4 | 12.1 | 9.1 |
| Total | 100.0 | 100.0 | 100.0 |

*"Truck" as single mode includes shipments by either private truck only, for-hire truck only or a combination of the two.

Source: 1993 and 1997 Commodity Flow Surveys, conducted as partnerships between the Census Bureau, Department of Commerce and the Department of Transportation, and the 1997 Economic Census.

2002 data are preliminary

## National Domestic Intercity Freight Traffic

| Mode | 1990 | 1995 | 2000 |
|---|---|---|---|
| | Billion ton miles | | |
| Railroads | 1,091 | 1,375 | 1,534 |
| Truck (both ICC and non-ICC) | 735 | 921 | 1,074 |
| Oil pipelines | 584 | 601 | 617 |
| Water (rivers/canals and Great Lakes) | 475 | 497 | 506 |
| Domestic airways* | 10 | 13 | 16 |
| Total | 2,895 | 3,407 | 3,747 |
| | Percent | | |
| Railroads | 37.7 | 40.4 | 40.9 |
| Truck (both ICC and non-ICC) | 25.4 | 27.0 | 28.7 |
| Oil pipelines | 20.2 | 17.6 | 16.5 |
| Water (rivers/canals and Great Lakes) | 16.4 | 14.6 | 13.5 |
| Domestic airways | 0.3 | 0.4 | 0.4 |
| Total | 100.0 | 100.0 | 100.0 |

**Source: Eno Transportation Foundation.**

**Notes: * includes both scheduled and nonscheduled carriers**

## 3.6 State of Arkansas

A 2002 ecominc study[21] of the value of water transportation for the state of Arkansas is an example of studies conducted by the various states. The University of Arkansas study cites the following:

(1) *"With its abudance of navigable waterways and strategic location, it is imperative that Arkansas continues to develop its ports and waterways to remain competitive. There is regional competition for federal funds allocated for watrerways; those states that are active proponents receive more anntention and more funding."*[22]

[21] Economic Evaluation of the Impact of Waterways on the State of Arkansas, Department of Industrial Engineering, University of Arkansas, Dr. Heather Nachtmann, PhD., July 31, 2002. www.waterways.dina.org/impact.pdf.
[22] W.R. Coles and Associates, *"General Assessment of Ports and Waterways in Arkansas,"* August 1998.

(2) *"similar economic impact studies of the waterways have been conducted by other states. Indiana, Louisiana, Mississippi, and Oklahoma are four states that have recently conducted studies to analyze the economic impacts of their waterways."*

(3) Economic studies conducted for other states on the subject of waterborne commerce such as the following -

(a) A 1997 study conducted by the Center for Urban Policy and the Environment at Indiana University: http://www.portsofindiana.com/newsroom/publications/economic%20impact%20study.pdf

(b) A 1997 study conducted by the Unversity of New Orleans (updated in 2005, see summary at: http://www.nationalaglawcenter.org/assets/crs/RS22297.pdf)

(c) A state of Mississippi survey in January 2000 to model the economic impact of port development (for an updated 2001 report on Mississippi's industrial gulf ports see http://64.233.169.104/search?q=cache:LLpMfwgU034J:www.ise.msstate.edu/ncit/NCIT_WEB_UPDATE/Mississippi%27s%2520Industrial%2520Gulf%2520Ports%2520FinalProjectrpt.Couvillion.doc+%E2%80%9CComprehensive+Assessment+of+the+Ports+of+Mississippi+State+of+Mississippi&hl=en&ct=clnk&cd=1&gl=us)

## 4.0 Service Provider Groups

Service provider groups also maintain statistics and provide information about waterways and their contribution to intermodal freight transportation.

### 4.1 American Waterways Operators

The American Waterways Operators

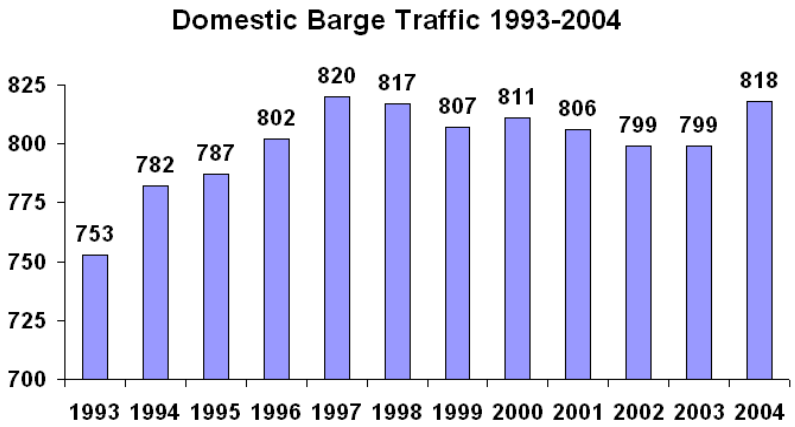
The Amercian Waterways Operators (AWO) is the national trade association for the Nation's tugboat, towboat, and barge industry.

The following chart is an example of the type of statistics available at http://www.americanwaterways.com/.

## Type and Amount of Commodities Moved by Barge

### Total Tons Moved by Barge, 1993-2004

The towing industry transported 818 million tons of cargo in 2004. As the chart shows, this is largest amount of volume since 1997. *Source: U.S. Army Corps of Engineers, "Waterborne Commerce of the U.S., 2003 Edition," Table 2-3.*




## 4.2 American Society of Civil Engineers

In its 2005 Infrastructure Report Card[23] the American Society of Civil Engineers (ASCE) noted the following regarding the Nation's waterways:

(1) *"Waterways are excellent ways to move large volumes of bulk commodities over long distances. The cargo capacity of a typical barge is equivallent to that of 15 large railforad cars, or 58 semi-trucks. A representative 15-barge tow on a main stem waterwy moves the same cargo as 870 trucks stretching 35 miles on the interstate highway system. That same 15-barge tow would require two 100-car unit trains, extending nearly three miles in length."*

(2) *"Waterway usage is increasing, but the facilities are aging; many Corps-owned or operated locks are well past their planned design life of 50 years. Of the 257 locks still in use in the United State, 30 were built in the 19th Century, another 92 locks are more than 60 years old. In other words, nearly 50% of all Corps-maintained locks were functionally obsolete by the beginning of 2005. Assuming that no new locks are built in the next 20 years, by 2020, another 93 existing locks will be obsolete - - rendering more than 8 of every 10 locks now in service archaic."*

*(3) "The Inland Waterway Trust Fund, created in 1978, pays half the cost of the construction and major rehabilitation costs for specified federal inland waterways projects. It receives money from a tax on fuel (currently set at 20 cents per gallon) on vessels engaged in commercial transportation on inland waterways."*

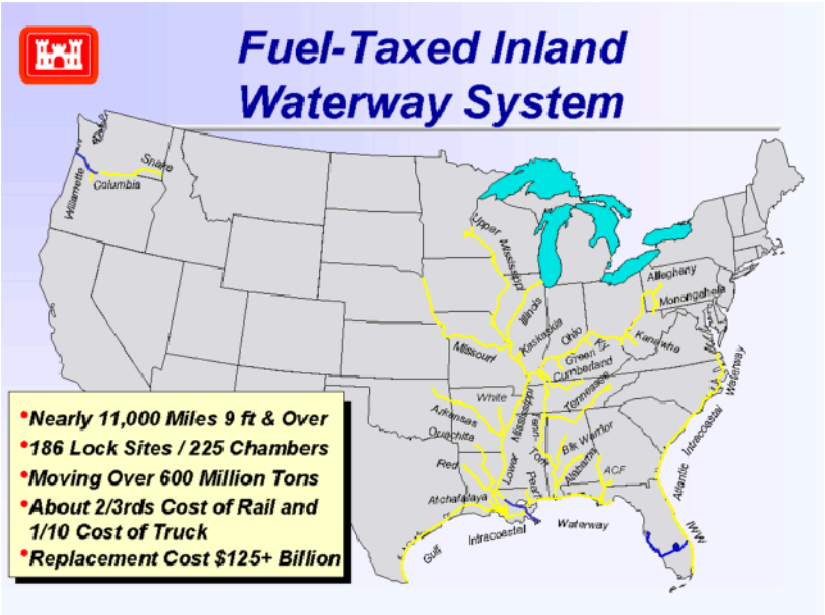
[23] http://www.asce.org/files/pdf/reportcard/Category_Fact_Sheets.pdf.

*(4) "The fund earned $106 million in FY 2005, inlcuding approximately $91 million paid by the barge and towing industry, and $15 million in interest. The Corps of Engineers received $149 million for construction projects, leaving a balance of approximately $307 million. In FY 2006, the Corps is planning to spend $394 million on current maintenance projects, a sum that will not reduce the backlog of pending repairs that exceed $600 million."*

## 5.0 Intermodal Marine and Inland Waterways Transportation System

The following information is taken directly from the Institute of Water Resources (IWR) website at http://www.iwub.iwr.usace.army.mil/FuelTaxedWaterways.htm as it relates to the Public Law 95-502, October 21, 1978 and Public Law 99-662, November 17, 1986.

**Statutory Definitions of Inland and Intracoastal Fuel Taxed Waterways of the United States (as of September 2007)**




Statutory Definitions of Inland and Intracoastal Fuel Taxed Waterways of the United States

1. Alabama-Coosa Rivers: From junction with the Tombigbee River at river mile (hereinafter referred to as RM) 0 to junction with Coosa River at RM 314.
2. Allegheny River: From confluence with the Monongahela River to form the Ohio River at RM 0 to the head of the existing project at East Brady, Pennsylvania, RM 72.
3. Apalachicola-Chattahoochee and Flint Rivers (ACF): Apalachicola River from mouth at Apalachicola Bay (intersection with the Gulf Intracoastal Waterway) RM 0 to junction with Chattahoochee and Flint Rivers at RM 107.8. Chattahoochee River from junction with Apalachicola and Flint Rivers at RM 0 to Columbus, Georgia at RM 155 and Flint River, from junction with Apalachicola and Chattahoochee Rivers at RM 0 to Bainbridge, Georgia, at RM 28.

4. Arkansas River (McClellan-Kerr Arkansas River Navigation System): From junction with Mississippi River at RM 0 to Port of Catoosa, Oklahoma, at RM 448.2.
5. Atchafalaya River: From RM 0 at its intersection with the Gulf Intracoastal Waterway at Morgan City, Louisiana, upstream to junction with Red River at RM 116.8.
6. Atlantic Intracoastal Waterway: Two inland waterway routes approximately paralleling the Atlantic coast between Norfolk, Virginia, and Miami, Florida, for 1,192 miles via both the Albermarle and Chesapeake Canal and Great Dismal Swamp Canal routes.
7. Black Warrior-Tombigbee-Mobile Rivers: Black Warrior River System from RM 2.9, Mobile River (at Chickasaw Creek) to confluence with Tombigbee River at RM 45. Tombigbee River (to Demopolis at RM 215.4) to port of Birmingham, RM's 374-411 and upstream to head of navigation on Mulberry Fork (RM 429.6), Locust Fork (RM 407.8), and Sipsey Fork (RM 430.4).
8. Columbia River (Columbia-Snake Rivers Inland Waterways): From the Dalles at RM 191.5 to Pasco, Washington (McNary Pool), at RM 330, Snake River from RM 0 at the mouth to RM 231.5 at Johnson Bar Landing, Idaho.
9. Cumberland River: Junction with Ohio River at RM 0 to head of navigation, upstream to Carthage, Tennessee, at RM 313.5.
10. Green and Barren Rivers: Green River from junction with the Ohio River at RM 0 to head of navigation at RM 149.1.
11. Gulf Intracoastal Waterway: From St. Mark's River, Florida, to Brownsville, Texas, 1,134.5 miles.
12. Illinois Waterway (Calumet-Sag Channel): From the junction of the Illinois River with the Mississippi River RM 0 to Chicago Harbor at Lake Michigan, approximately RM 350.
13. Kanawha River: From junction with Ohio River at RM 0 to RM 90.6 at Deepwater, West Virginia.
14. Kaskaskia River: From junction with Mississippi River at RM 0 to RM 36.2 at Fayetteville, Illinois.
15. Kentucky River: From junction with Ohio River at RM 0 to confluence of Middle and North Forks at RM 258.6.
16. Lower Mississippi River: From Baton Rouge, Louisiana, RM 233.9 to Cairo, Illinois, RM 953.8.
17. Upper Mississippi River: From Cairo, Illinois, RM 953.8 to Minneapolis, Minnesota, RM 1,811.4.
18. Missouri River: From junction with Mississippi River at RM 0 to Sioux City, Iowa, at RM 734.8.
19. Monongahela River: From junction with Allegheny River to form the Ohio River at RM 0 to junction of the Tygart and West Fork Rivers, Fairmont, West Virginia, at RM 128.7.
20. Ohio River: From junction with the Mississippi River at RM 0 to junction of the Allegheny and Monongahela Rivers at Pittsburgh, Pennsylvania, at RM 981.

21. Ouachita-Black Rivers: From the mouth of the Black River at its junction with the Red River at RM 0 to RM 351 at Camden, Arkansas.
22. Pearl River: From junction of West Pearl River with the Rigolets at RM 0 to Bogalusa, Louisiana, RM 58.
23. Red River: From RM 0 to the mouth of Cypress Bayou at RM 236.
24. Tennessee River: From junction with Ohio River at RM 0 to confluence with Holstein and French Rivers at RM 652.
25. White River: From RM 9.8 to RM 255 at Newport, Arkansas.
26. Willamette River: From RM 21 upstream of Portland, Oregon, to Harrisburg, Oregon, at RM 194.
27. Tennessee-Tombigbee Waterway: From its confluence with the Tennessee River to the Warrior River at Demopolis, Tennessee.

# PART B – CIVIL WORKS STRATEGIC PLAN, FISCAL YEAR 2004 – FISCAL YEAR 2009

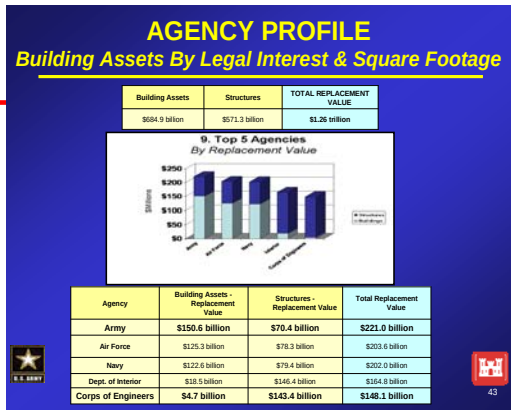
This part augments the Improvement Report Section I paragraph 3.0 – U.S. Army Corps of Engineers Civil Works Program Areas. It provides the hyperlink to the Civil Works Strategic Plan, Fiscal Year 2004 – Fiscal Year 2009.

http://www.vtn.iwr.usace.army.mil/pdfs/cw_strat.pdf

# PART C - INFRASTRUCTURE ASSET MANAGEMENT

This part augments the Improvement Report Section I paragraph 4.2 – Managing Assets. Presented below are a fact sheet and briefing slides with accompanying talking points used in discussions regarding infrastructure asset management.

## 1.0 Fact Sheet - A Roadmap to Longevity




### Background Drivers

Asset Management initiatives at the Federal level became requirements of Public Law 101-576, the "Chief Financial Officers Act of 1990 and amended by Public Law 103-256, the "Federal Financial Management Act of 1994".

USACE Campaign Goal 3C, the Presidents' initiative through Executive Order 13327, Federal Real Property Asset Management, 2004, and DoD's Business Enterprise Architecture and inventory instruction, DoDi 4165.14, 2006 have further escalated importance of a sustainable infrastructure plan based on intelligent asset management.

The US Army Corps of Engineers owns and manages a diverse and extensive portfolio of infrastructure assets (encl. 1) whose value ranks among the top five of all Federal agencies (encl 2).

### Performance and Risk

As stewards for the majority of the nations' water resources infrastructure, the Corps has a tremendous responsibility to Congress and the taxpayer to sustain this infrastructure at its highest levels of performance. As service life of this aging infrastructure is often extended beyond design life, it is imperative that a proactive and sustainable approach to life cycle asset management be implemented. The reliability of

many USACE structures has been reduced and the risk of failure has been increased as a result of funding not keeping pace with requirements.

The Corps program focuses on the realism that operations and maintenance requirements to manage our aging infrastructure will continue to grow over authorization of new capital investments. Smart long term planning for operational and maintenance strategies that extend useful life must be pursued with great rigor so that limited funds are smartly invested. Critical to a successful adaptive asset management strategy is establishment of the condition and functional reliability of the asset along with the risks and consequences of poor performance or failure. Risk must be properly quantified and communicated to Congress and the public to insure the nations' critical infrastructure does not fail.

**Life Cycle Approach**

Asset management is the art of managing the life cycle cost of infrastructure assets with innovative and adaptive strategies that ensure those assets continue to provide value to the nation and meet expected levels of service while mitigating risk. It is a proactive and sustainable approach to life cycle planning, requisition, management and disposal. An asset management plan merges the agency's vision for performance and service along its business line missions with a lifecycle investment strategy. Implementation of a robust plan is the best way to identify needed infrastructure improvements and develop investment strategies. The asset management philosophy must be culturally embraced in the organization and be a fundamental part of the way we do business.

**Steps to Success**

The Corps is actively taking the follow steps to success:

**The Inventory**

To effectively manage real property it is mandatory to have a robust inventory defining attributes and metrics for each constructed asset. The Corps manages its real property inventory at the Real Estate Systems National Center in Mobile using the Real Estate Management Information System (REMIS). REMIS is the database of record for all real property and the official reporting tool to DoD and the Federal Real Property Council. Additionally, the Corps manages other databases that contain detailed information on dams, bridges, channels, and coastal structures. The Corps inventory has been approved by OMB as an accurate and complete record of real property and metrics in compliance with guidance from the Federal Real Property Council.

## Asset Management Plan

The Corps has completed two documents that establish the roadmap for a sustainable infrastructure plan. Third Quarter 06, the OMB approved the Corps Asset Management Plan. This plan sets the path for an organizational and operational strategy to assess the Corps share of the federally owned portfolio and right-size the nation's real property inventory. The Goal 3C PMP details a work breakdown structure that complements the AMP, but embraces broader objectives that incorporate a risk management methodology into the management of both the federally and non-federally owned assets that our critical to our agencies missions. Asset Management principals will be executed in a decentralized approach led by the regional business centers with direction, oversight and policy driven through a centralized team led at HQ. Optimum advantage will be taken of the USACE 2012 PMBP to develop teams across organizational and functional lines.

## Maintenance Management

To move away from a fix-as-fail paradigm in maintenance management to a preventive, and ultimately, reliability centered maintenance practice requires a business process that standardizes best practices and predicts requirements for defensible budgets. At the heart and soul of this success will be the implementation of FEM/MAXIMO, a proven industry standard in computerized facility and equipment maintenance management. Dedicated funding FY07 through FY12 ensures that the program will be deployed successfully across geographic and business functions. A fully operational national cell has been established and deployment is underway in the field through the commitment of Division Commanders and their staff.

# Critical Next Steps

## Integrated Portfolio Risk Management Framework

Risk assessments provide the detailed information that allows decision makers to manage risk. It enables investment decisions that buy down consequences (risk) and buy up service, safety or security (reliability). To effectively implement the Corps asset management plan a risk management framework needs to be developed that identifies what areas remain to be developed, what tools and metrics will be used, and how decisions will be integrated over the portfolio. Once consensus is established, this will help formulate the plan for implementation of the condition assessments and risk analysis.

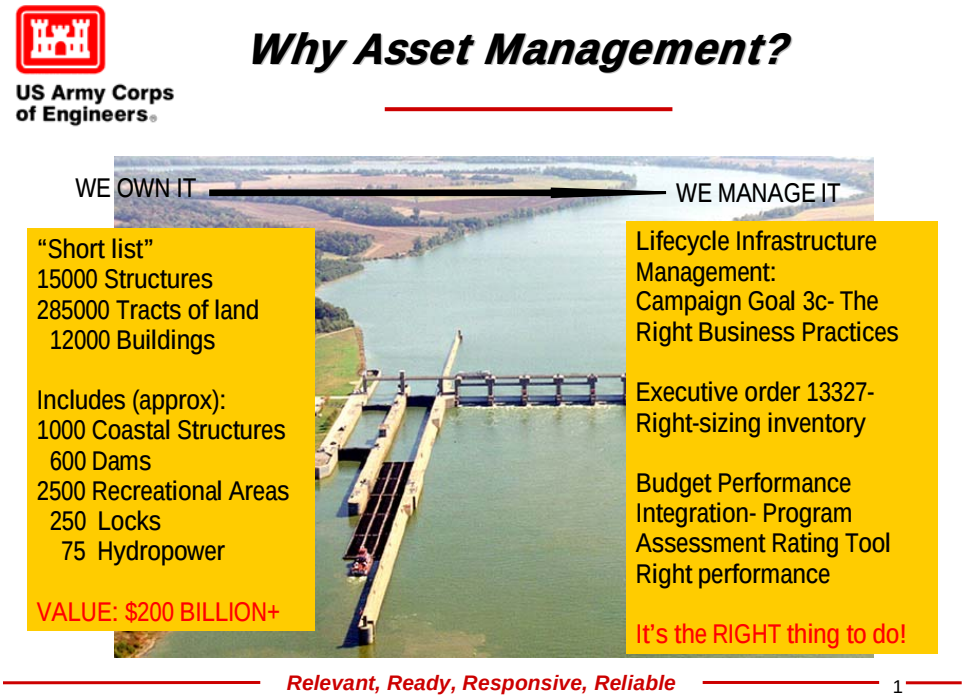
## Condition and Risk Assessments

The Corps has completed condition assessments and performed risk analysis on certain classes of assets within its portfolio. There are national assessment tools and processes for evaluating the condition of the infrastructure, setting targets for improvements and putting forward recommended investment scenarios to meet those targets. It will be important that all business line assets develop standards and implement similar processes for condition assessment. These assessments provide the baseline for more detailed risk analysis and will be critical in risk management decision making.

## Performance-based budgeting

Prior to the next budget cycle, it will be important to integrate asset management objectives with Business Performance Indicators of the President's Management Agenda and Performance Assessment Rating Tools. The objectives should be applied to all water resource infrastructure assets, across business lines and to additionally include objectives related to security and safety.

# 2.0 USACE Asset Management Program Briefing



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# Challenge: Aging Water Resources Infrastructure

- Half of locks more than 50 years old
- Investments in water resources infrastructure have declined in real terms
- Result: more frequent closures for repairs, decreased performance and costly delays

*Leaking spare miter gates, Upper Miss Lock 19*

*Crumbling lock wall, Lower Mon 3, opened in 1907*

*Concrete deterioration at Chickamauga could result in lock failure*

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## Drivers

- **Public Law 101-576, the "Chief Financial Officers Act of 1990 and amended by Public Law 103-256, the "Federal Financial Management Act of 1994"**
- **USACE Campaign Goal 3C**
- **Executive Order 13327, Federal Real Property Asset Management (2004)**
- **DoD's Business Enterprise Architecture and inventory instruction, DoDi 4165.14 (2006)**

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## Asset Management

- Asset: "an item of value owned"
  - Federal Real Property Council: Constructed asset (Dams, Locks, Hydropower plants, rec areas)
- Management: "to handle or direct with a degree of skill. To make and keep compliant"

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## Asset Management
### Defined

- USACE: ***Is the art of managing the life cycle cost of infrastructure assets with innovative and adaptive strategies to ensure those assets continue to provide value to the nation and meet expected levels of service while mitigating risk***
- Simply stated:
  - Inventory (what you own)
  - Indentify Condition (CA, RA, …)
  - Investment Strategy (min risk, max return)

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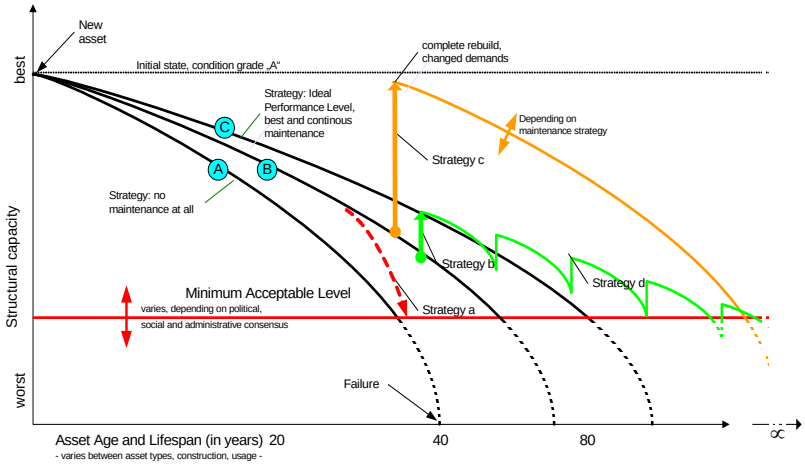
## What Asset Management Does

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## Evidence of Data for Decision-Making

- A number of examples have been identified
  - Navigation Feasibility Study
  - HydroAMP
  - RECBEST
  - Dam Safety (sPRA)
  - Other business lines still under development
- Document submitted for OMB's approval (1Q08)

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## AM Supported Efforts

- Hydropower BL Benchmarking
- LRD Condition Assessment tool
- Risk and Reliability DX (Spillway gates)
- ERDC-CERL Risk based tools survey
  - "Condition Assessment Aspects of an Asset Management Program" (REMR)
- National application of Shipper-Carrier Cost (SCC) Model for estimating NED cost impacts due to main lock chamber closures (LRH)

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## Success To Date

- **Asset Management Plan approved (revised 4Q07)**
- **Three Year Timeline with quarterly milestones approved (revised 4Q07)**
- **Improved QA/QC of data (Quality Management Plan implemented)**
- **Federal Real Property Profile submission on schedule.**
- **High score (PMA scorecard)**

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## Getting To Green

- National approach to asset management
- Evidence that real property management is consistent with agency strategic plan, Asset Management Plan, and performance measures
  - Utilized in daily decision
  - Drives budget decisions
- Accurate and current inventory
  - Utilized in daily decision making

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## O&M Performance Info

- Information needed to show marginal changes to performance from changes in funding
- Linkage between business-line performance measures and funding, and what information is available.
- What information is (or could be) available, and how can that be rolled up into performance information by business line?

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## The Road Ahead

- Continue development of AM Framework
- Continue coordinating and integrating AM principles into Business Line processes
- Continue meeting DOD real property inventory requirements
- Continue FEM deployment
- Pilot tests to support AM capabilities (MSC's)
- Alignment with R&R and other activities
- Provide national perspective on condition assessments

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