Maritime Trade & Transportation

2007

U.S. Department of Transportation
Research and Innovative Technology Administration
Bureau of Transportation Statistics
Maritime Administration
U.S. Coast Guard
Saint Lawrence Seaway Development Corporation

Maritime Trade & Transportation

2007

U.S. Department of Transportation
Research and Innovative Technology Administration
Bureau of Transportation Statistics

Research and Innovative Technology Administration
Bureau of Transportation Statistics

To obtain *Maritime Trade & Transportation, 2007* and other BTS publications

Mail: Product Orders
Research and Innovative Technology Administration
Bureau of Transportation Statistics
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Internet: www.bts.gov

BTS Information Service

E-mail: answers@bts.gov
Phone: 800-853-1351

Recommended citation

U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *Maritime Trade & Transportation, 2007* (Washington, DC: 2008)

Acknowledgments

U.S. Department of Transportation

Mary E. Peters
Secretary

Thomas J. Barrett
Deputy Secretary

Research and Innovative Technology Administration

Paul R. Brubaker
Administrator

Cheryl McQueary
Deputy Administrator

Bureau of Transportation Statistics

Steven D. Dillingham, Ph.D.
Director

Steven K. Smith, Ph.D.
Deputy Director

Produced under the direction of:
Deborah Johnson
Program Manager for Transportation Analysis

Project Manager
Matthew Chambers

Contributors
Felix Ammah-Tagoe,
Research and Innovative Technology Administration

Robert Brown,
Maritime Administration

Tom Bryan,
Maritime Administration

Russ Byington,
Maritime Administration

Cristin Finkel,
Transportation Security Administration

Lennis Fludd,
Maritime Administration

Deborah Johnson,
Research and Innovative Technology Administration

Richard Lolich,
Maritime Administration

Wassel Mashagbeh,
Maritime Administration

Doug McDonald,
U.S. Army Corps of Engineers

William H. Moore,
Research and Innovative Technology Administration

Kevin O'Malley,
Saint Lawrence Seaway Development Corporation

Roy Pearson,
Federal Maritime Commission

Gail Perkins,
Maritime Administration

Denise Williams,
U.S. Coast Guard

Alpha Glass Wingfield,
Research and Innovative Technology Administration

Ernie Worden,
Federal Maritime Commission

Preface

The *Maritime Trade and Transportation* report is a cooperative effort of the members of the Maritime Data Group sponsored by the Bureau of Transportation Statistics of the Research and Innovative Technology Administration. Group members include the Bureau of Transportation Statistics, Committee on the Marine Transportation System, Federal Maritime Commission, Maritime Administration, Saint Lawrence Seaway Development Corporation, Transportation Security Administration, U.S. Army Corps of Engineers, U.S. Coast Guard, and U.S. Department of Agriculture.

This latest edition of *Maritime Trade and Transportation* follows two prior reports released in 1999 and 2002. These reports reflect an ongoing effort by the Maritime Data Working Group to provide quality, timely, comprehensive, and relevant maritime-related data and information to federal, state, and local government and maritime industry stakeholders.

The Marine Transportation System (MTS) contributes to U.S. economic growth, enhances our global competitiveness, and supports national security objectives, among many other things. The MTS consists of an extensive network of waterways, ports, channels, cargo handlers and other transportation workers, intermodal facilities, and vessels. Each component of this system is dependent on the other for the smooth and efficient flow of waterborne trade, transportation, and U.S. foreign and domestic commerce.

This report provides an update on major trends in marine infrastructure, maritime-related transportation services, domestic and international freight and passenger trade, the economic impact of the MTS, safety and environment, national security, and shipbuilding. In addition, this report presents information about the St. Lawrence Seaway and the U.S. Coast Guard.

Table of Contents

Infrastructure—Capacity and System Performance

Matthew Chambers

The U.S. marine transportation system carries domestic and international freight. It also handles national and global transport of people. The needs of freight and passenger transportation are many and varied, and the capacity of the system to handle both has been constrained and congested due to increased need for freight and passenger capacity in different regions of our nation. Millions of Americans take cruises every year. Maritime vessels from the around the world call at U.S. ports delivering goods bound for the consumer market and material for industry. This chapter assesses the lock, port, terminal, vessel, and passenger capacity and performance of U.S. maritime transportation.

TABLE 1-1 Top 25 U.S. Port Calls by Port and Selected Vessel Type, 2005

	All types		Tanker*		Product tanker		Crude tanker		Container			Dry bulk	
Port/State	Calls	Capacity	Calls	Capacity	Calls	Capacity	Calls	Capacity	Calls	Capacity	Capacity (TEU)	Calls	Capacity
Houston, TX	5,891	250,823,769	3,392	163,907,841	2,578	82,225,743	814	81,682,098	874	30,284,761	2,196,390	765	29,671,250
LA/Long Beach, CA	5,178	289,014,533	1,070	92,444,602	649	28,294,632	421	64,149,970	2,812	150,299,154	11,537,927	640	30,640,580
New York, NY	4,902	221,032,610	1,380	77,476,160	1,030	43,248,457	350	34,227,703	2,370	108,546,934	7,882,071	348	13,096,095
San Francisco, CA	3,871	202,746,382	692	56,985,135	389	16,385,435	303	40,599,700	1,930	101,207,703	7,836,474	792	31,987,827
New Orleans, LA	3,749	177,678,399	1,121	69,525,042	677	24,406,604	444	45,118,438	310	11,208,260	797,579	1,962	85,156,384
Philadelphia, PA	2,998	177,613,791	1,534	136,614,201	707	27,211,013	827	109,403,188	390	12,390,890	892,680	435	16,755,196
Virginia Ports, VA	2,547	119,456,161	147	10,153,242	102	4,017,071	45	6,136,171	1,731	77,240,883	5,581,313	391	20,105,086
Savannah, GA	2,333	101,035,995	273	10,773,237	261	9,895,812	12	877,425	1,386	67,581,318	4,900,973	264	8,643,968
Columbia River, OR	2,189	84,708,904	132	4,977,977	127	4,347,035	5	630,942	85	4,306,017	344,772	1,586	65,043,911
Charleston, SC	2,046	87,739,000	166	7,387,247	163	7,123,230	3	264,017	1,464	67,307,416	4,864,293	138	6,200,222
Baltimore, MD	1,825	61,557,398	165	6,161,186	163	6,005,335	2	155,851	376	14,857,892	1,054,436	408	19,049,942
Port Arthur, TX	1,563	111,666,129	1,270	100,067,287	436	16,542,973	834	83,524,314	1	20,191	1,024	179	7,220,348
Miami, FL	1,299	45,829,262	6	206,117	6	206,117	0	0	907	39,985,279	2,943,294	3	98,754
Tacoma, WA	1,270	56,751,144	67	4,174,218	35	1,060,968	32	3,113,250	618	28,224,289	2,218,535	280	17,976,685
Jacksonville, FL	1,237	37,179,183	299	13,058,974	296	12,778,334	3	280,640	244	6,971,362	480,204	191	8,325,983
Seattle, WA	1,186	64,053,660	8	350,548	7	258,531	1	92,017	808	44,315,123	3,510,414	295	16,423,024
Port Everglades, FL	1,182	41,893,470	440	19,798,979	429	18,801,575	11	997,404	460	14,653,190	1,047,372	113	4,486,107
Texas City, TX	1,142	72,948,527	1,074	69,639,438	605	21,317,567	469	48,321,871	0	0	0	59	2,709,290
San Juan, PR	1,086	23,494,456	109	5,325,560	100	4,552,645	9	772,915	485	10,071,314	698,637	55	1,823,835
Tampa, FL	1,003	36,366,002	401	14,912,990	398	14,637,575	3	275,415	38	586,624	38,413	396	15,884,888
Corpus Christi, TX	989	66,777,408	788	55,676,311	437	19,236,670	351	36,439,641	0	0	0	145	5,927,968
Mobile, AL	811	42,256,516	187	11,628,925	108	3,833,426	79	7,795,499	35	492,282	39,936	415	23,386,644
Freeport, TX	760	43,823,547	561	38,406,357	274	8,929,203	287	29,477,154	87	1,269,997	83,610	30	1,443,059
Lake Charles, LA	701	45,495,866	434	33,267,389	161	6,015,030	273	27,252,359	1	12,652	428	164	7,021,240
Wilmington, NC	600	21,888,523	267	10,040,314	266	9,956,274	1	84,040	96	4,271,444	320,492	108	3,217,061
Total, top 25	**52,358**	**2,483,830,635**	**15,983**	**1,012,959,277**	**10,404**	**391,287,255**	**5,579**	**621,672,022**	**17,508**	**796,104,975**	**59,271,267**	**10,162**	**442,295,347**
Total, all	**113,405**	**5,541,221,238**	**36,101**	**2,462,583,341**	**22,621**	**854,992,070**	**13,480**	**1,607,591,271**	**36,050**	**1,622,899,669**	**120,842,770**	**21,568**	**935,897,336**

*Tanker includes product tanker and crude tanker.

SOURCE: U.S. Department of Transportation, Maritime Administration, data and statistics, available at http://www.marad.dot.gov/marad%5Fstatistics/ as of July 30, 2007.

TABLE 1-2 Top 25 North American Cruises by Departure Port, 2003–2006

Port/State	2003	2004	2005	2006
Miami, FL	738	641	656	705
Fort Lauderdale, FL	593	637	618	534
Port Canaveral, FL	450	466	455	525
Galveston, TX	203	208	222	248
Los Angeles, CA	229	193	263	245
New York, NY	236	253	171	231
San Juan, PR	258	322	264	230
Tampa, FL	216	198	192	222
Vancouver, CA	269	241	238	220
Seattle, WA	79	135	151	187
Long Beach, CA	70	166	150	157
Honolulu, HI	80	90	121	155
San Diego, CA	65	104	133	94
Jacksonville, FL	5	65	83	77
Mobile, AL	0	18	52	60
Cape Liberty, NJ	0	0	59	53
Whittier, AK	0	42	51	52
San Francisco, CA	51	54	54	50
Seward, AK	90	53	44	42
Boston, MA	43	47	49	39
St. Thomas, VI	75	57	43	38
Philadelphia, PA	16	22	34	35
New Orleans, LA	143	178	121	34
Houston, TX	8	55	56	31
Charleston, SC	17	24	25	29
Total, top 25	**3,934**	**4,269**	**4,305**	**4,293**
Top 25, % of all	**96.1%**	**95.6%**	**96.5%**	**96.8%**
Total, all	**4,094**	**4,465**	**4,463**	**4,435**

SOURCE: U.S. Department of Transportation, Maritime Administration, North American Cruises, available at www.marad.dot.gov/marad statistics as of 4th quarter 2006.

- Since 2003, Miami has maintained its number one rank among all North American cruise departure ports. The top 25 cruise departure ports have accounted for at least 96% of all North American cruise departures over the last 4 years.
- The Port of New Orleans had 72% less cruise departures from 2005 to 2006. Over the same period, 45% fewer cruises departed from the Port of Houston.

TABLE 1-3 U.S. Maritime Port Activity and Landside Traffic Delay Per Traveler in Surrounding Urban Area, 2003
(dwt, millions)

			Port calls and capacity by all vessel types		Overall maritime cargo tonnage (domestic and international)		Landside annual traffic delay per traveler in surrounding urban area*	
Ranked by port calls by all vessel types	Port	State	Calls	Capacity (dwt, millions)	Total short tons (millions)	Rank by tonnage	Hours of delay	Rank
1	Los Angeles/Long Beach	CA	5,130	265	121	4	93	1
2	Houston	TX	4,857	212	191	2	63	5
3	New York	NY	4,853	216	146	3	49	18
4	New Orleans	LA	4,464	213	84	7	18	54
5	San Francisco Bay Area Ports[1]	CA	3,623	184	41	20	72	2
6	Philadelphia/Delaware River Ports[2]	PA	2,486	141	101	5	38	27
7	Savannah	GA	2,087	88	23	31	NA	NA
8	Charleston	SC	2,024	85	25	29	25	45
9	Port Arthur	TX	1,732	130	27	27	14	63
10	Baltimore	MD	1,635	53	40	21	50	7
11	Virginia Ports[3]	VA	1,539	70	43	18	26	46
12	Columbia River Ports[4]	OR	1,505	54	46	17	39	26
13	Jacksonville	FL	1,401	40	22	35	34	32
14	Miami	FL	1,184	41	9	52	51	13
15	Tacoma	WA	1,174	52	23	33	46	20
16	Texas City	TX	1,101	70	61	10	63	5
17	Seattle	WA	1,016	52	19	36	46	20
18	Corpus Christi	TX	977	67	77	9	7	80
19	Port Everglades	FL	921	32	23	32	NA	NA
20	Tampa	FL	769	26	48	16	46	20
21	Freeport	TX	734	38	31	25	NA	NA
22	Lake Charles	LA	690	43	53	13	NA	NA
23	Valdez	AK	681	75	50	15	NA	NA
24	Mobile	AL	606	31	50	14	NA	NA
25	Boston	MA	583	25	25	30	51	13

KEY: dwt = deadweight tons; NA = Not available in the Texas Transportation Institute 2005 Annual Mobility Study.

*Annual delay per Traveler = Extra travel time for peak period travel during the year divided by the number of travelers who begin a trip during the peak period (6 to 9 am and 4 to 7 p.m.). These are compared to free-flow speeds (60 mph on freeways and 35 mph on principal arterials).

[1] San Francisco Bay Area Ports (Oakland, Redwood City, Richmond, San Francisco, and Stockton)

[2] Philadelphia/Delaware River Ports (Philadelphia, Paulsboro, Marcus Hook, Camden-Gloucester, Chester, and Wilmington)

[3] Virginia Ports (Norfolk, Richmond, and Newport News)

[4] Columbia River Ports (Portland, Longview, Vancouver, and Kalama)

SOURCES: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, based on:
Ports calls data: Maritime Administration, Ports Calls Data, at www.marad.dot.gov as of May 23, 2007.
Cargo weight data: U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center, at http://www.iwr.usace.army.mil/ndc/wcsc/wcsc.htm as of May 23, 2007.
Traffic delay data: Texas Transportation Institute, 2005 Annual Mobility Study, Table 1 Key Mobility Measures, at http://mobility.tamu.edu/ums/ as of May 23, 2007.

continued on next page...

continued...

- Traffic bottlenecks on the landside transportation system serving the nation's seaports impact the ports' performance and efficient movement of goods.
- In 2003, the most recent year for which data on both port freight activity and landside traffic delay are available, the top seaports ranked by port vessel calls were the ports of Los Angeles and Long Beach. The Los Angeles-Long Beach metropolitan area was also the top ranked urban area in terms of annual traffic delay per traveler, averaging about 93 hours of delay in 2003.
- Growing traffic delays on the access routes serving the nation's largest seaports combined with the rising volumes of inbound and outbound cargo may result in increased congestion in the surrounding communities.

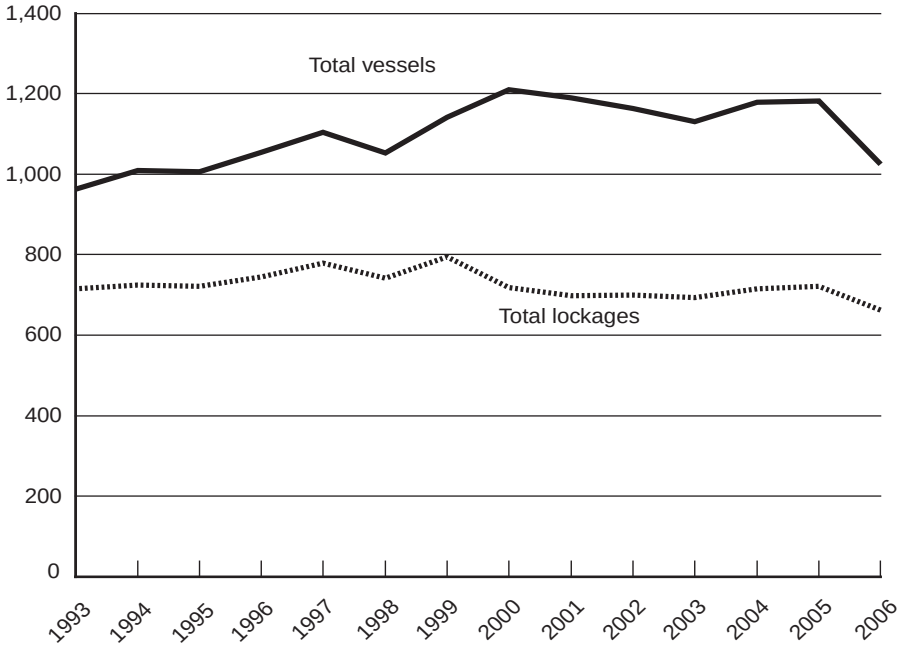
TABLE 1-4 Number of North American Cruises by Destination, 2003–2006

Destination	2003	2004	2005	2006
Western Caribbean	1,341	1,374	1,335	1,293
Bahamas	536	597	591	654
Eastern Caribbean	527	541	556	554
Alaska	449	473	487	493
Mexico (Pacific)	327	430	491	457
Southern Caribbean	362	454	377	357
Hawaii	110	127	161	200
Bermuda	146	143	137	136
Transatlantic	67	71	91	82
Canada/New England	100	112	98	79
Trans-Panama Canal	75	82	83	69
Pacific Coast	20	28	32	30
South America	17	10	7	15
South Pacific/Far East	10	10	11	9
Nowhere	7	13	5	6
Far East	0	0	0	1
Atlantic Coast	0	0	1	0
Total	**4,094**	**4,465**	**4,463**	**4,435**

SOURCE: U.S. Department of Transportation, Maritime Administration, North American Cruises, available at www.marad.dot.gov/marad statistics as of 4th quarter 2006.

- In 2006, the Western Caribbean maintained its number one rank for North American cruise destinations over the past several years. The number two ranked Bahamas had about half the number of cruises by destination.
- The top six North American cruise destinations accounted for about 86% of market share for the last 4 years.

FIGURE 1-1 Number of Lockages and Vessels, 1993–2006
(thousands)

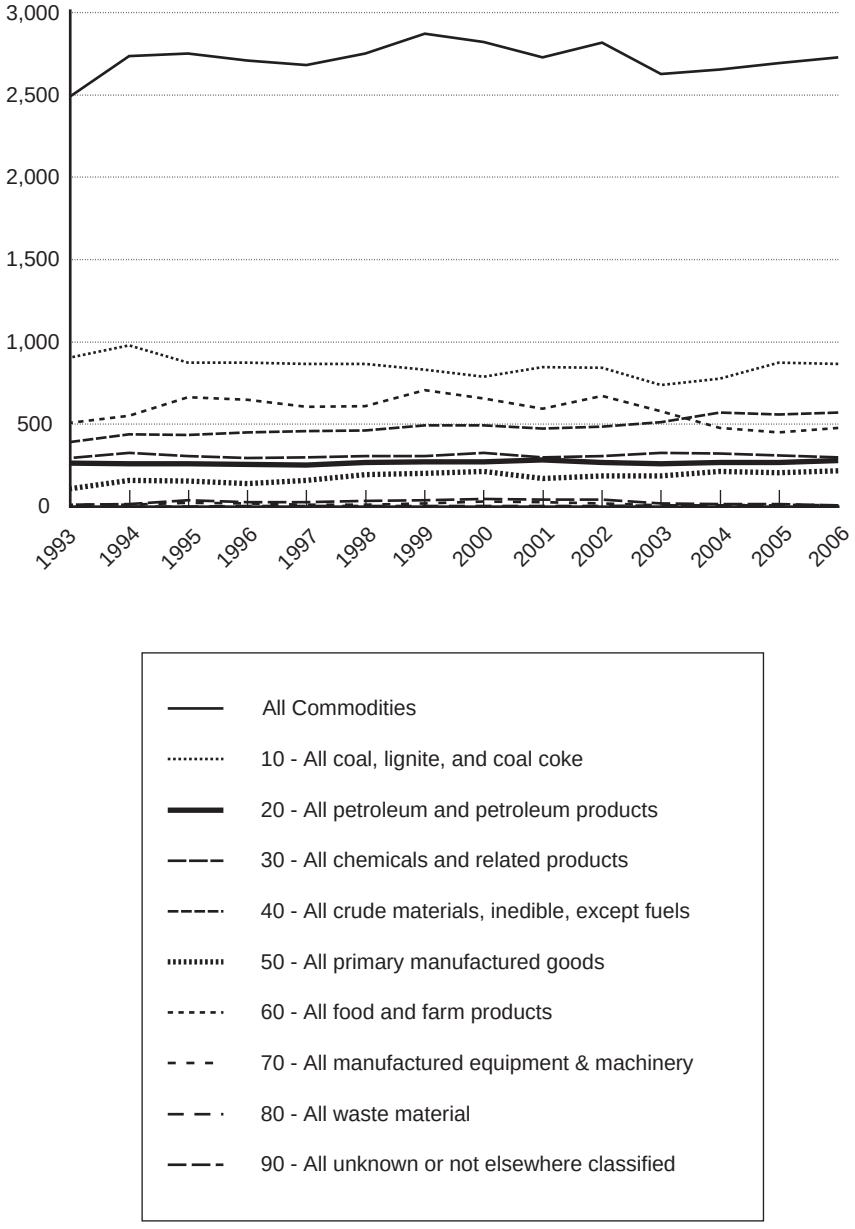


NOTE: A lockage is the transfer of a vessel(s), or that part of the tow that can be contained in the lock chamber, through a chamber in a single direction.

SOURCE: U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center, Navigation Data Center, available at www.iwr.usace.army.mil/ndc as of April 2007.

- The number of lockages has remained basically flat over the past several years.
- The number of vessels traversing the locks has declined since the peak in the late 1990s.
- Barges (loaded and empty) remain the major vessel type traveling on the U.S. inland waterways.

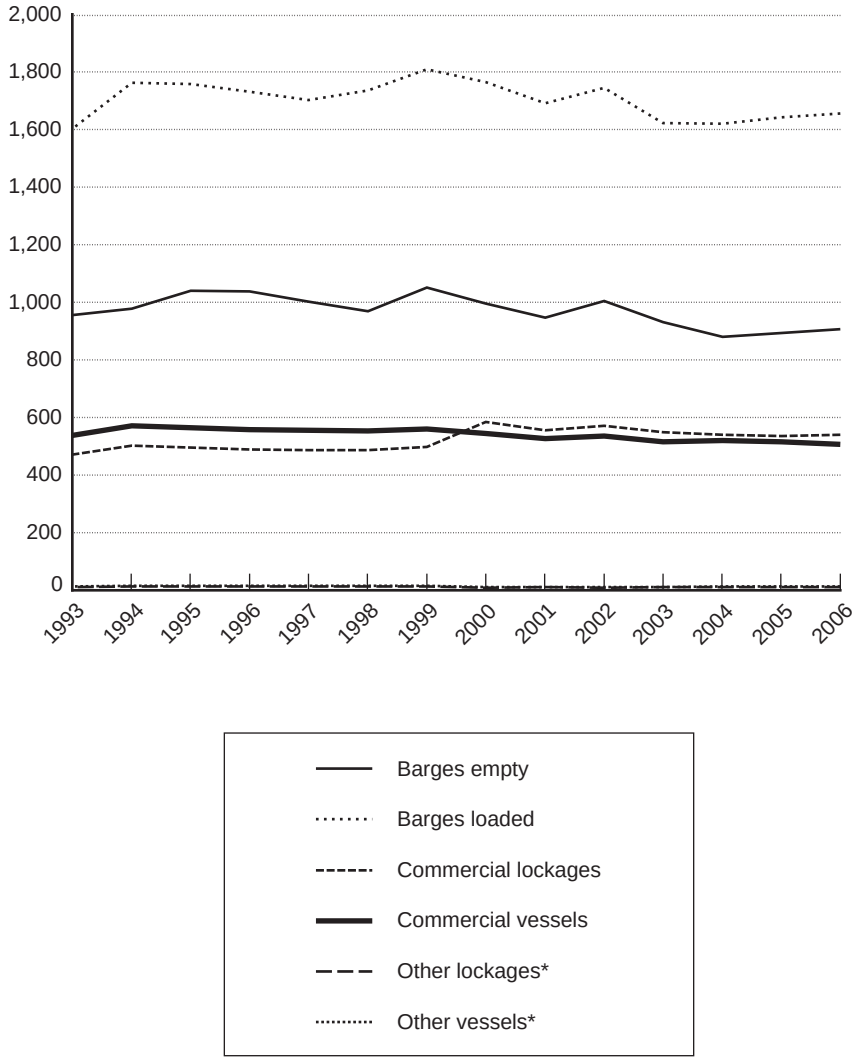
FIGURE 1-2 Total Tons Passing Through U.S. Locks by Major Commodity Groups, 1993-2006
(millions)



NOTES: 80 - All waste material, 90 - All Unknown or Not Elsewhere Classified, and 70 - All Manufactured Equipment & Machinery are too close to the x-axis to be seen.

SOURCE: U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center, Navigation Data Center, available at www.iwr.usace.army.mil/ndc as of April 2007.

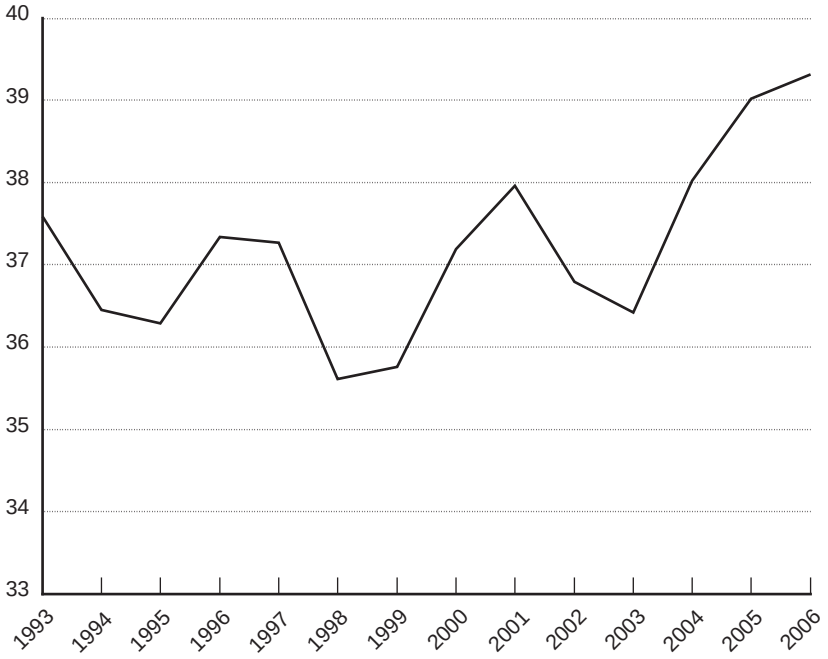
FIGURE 1-3 U.S. Lock Usage by Type, 1993–2006
(thousands)



* "Other lockages" and "other" vessels are too close to the x axis to be seen.

SOURCE: U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center, Navigation Data Center, available at www.iwr.usace.army.mil/ndc as of April 2007.

FIGURE 1-4 U.S. Locks Percent Vessels Delayed, 1993–2006



NOTE: The percentage of all vessels delayed before passing through a lock chamber.

SOURCE: U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center, Navigation Data Center, available at www.iwr.usace.army.mil/ndc as of April 2007.

- Vessel delays have increased dramatically since 2003.
- Age of locks is considered to be a major factor in vessel delays.

TABLE 1-5 U.S. Seaway International Trade Through December 31, 2006
(metric tons)

U.S. imports from overseas				U.S. exports to overseas			
Commodity	**2005**	**2006**	**Percent change**	**Commodity**	**2005**	**2006**	**Percent change**
Other agricultural	0	0	N/A	Wheat	1,229,457	1,184,990	-3.6%
Other agricultural (transshipped)	0	0	N/A	Corn	336,751	1,309,658	288.9%
Coal	0	0	N/A	Barley	37,594	0	-100.0%
Iron ore	0	0	N/A	Soybeans	272,385	569,888	109.2%
Iron ore (transshipped)	690,368	932,549	35.1%	Beans & peas	100,632	99,028	-1.6%
Ores & concentrates	73,983	97,082	31.2%	Sunflowers	0	0	N/A
Ores & concentrates (transshipped)	0	93,576	N/A	Canola (rapeseed)	0	0	N/A
Clay & bentonite	6,004	0	-100.0%	Wheat (transhipped)	860,906	111,795	-87.0%
Misc. mne products	47,668	18,600	-61.0%	Corn (transhipped)	217,989	138,585	-36.4%
Lumber	98,424	0	-100.0%	Barley (transhipped)	0	0	N/A
Chemicals	46,981	34,406	-26.8%	Soybeans (transhipped)	509,306	618,735	21.5%
Coke	38,754	102,780	165.2%	Beans & peas (transshipped)	66,889	0	-100.0%
Coke (transshipped)	241,931	415,066	71.6%	Other agricultural	209,378	201,359	-3.8%
Salt	0	0	N/A	Other agricultural (transshipped)	0	0	N/A
Metal & alloys	3,066	0	-100.0%	Forest products	7,006	0	-100.0%
Aluminium	0	0	N/A	Iron ore	0	208,510	N/A
Pig iron	42,027	89,956	114.0%	Clay & bentonite	99,637	154,658	55.2%
I&s billets, blooms & ingots	153,993	98,158	-36.3%	Coal	0	0	N/A
I&s slabs	63,829	318,096	398.4%	Coke	17,915	132,135	637.6%
I&s bars & rods	65,798	87,206	32.5%	Ores & concentrates	9,816	19,074	94.3%
I&s nails and wires	509	0	-100.0%	Misc. mine products	0	0	N/A
I&s manufactured	1,136,880	1,950,309	71.5%	Chemicals	0	0	N/A
I&s pipes & fittings	14,012	46,955	235.1%	Tar, pitch, creosote	5,249	0	-100.0%
Machinery, machines & parts	58,337	46,685	-20.0%	I&s manufactured	15,648	0	-100.0%
Woodpulp	92,679	105,818	14.2%	I&s pipes & fittings	0	397	N/A
Forest products	0	49,455	N/A	Pig iron	0	0	N/A
Sugar	32,000	66,174	106.8%	Machinery, machines & parts	9,527	9,027	-5.2%
Cement & clinkers	0	0	N/A	Vehicule & parts	0	131	N/A
Cement & clinkers (transshipped)	102,892	0	-100.0%	Woodpulp	12,206	0	-100.0%
Slags	173,991	140,108	-19.5%	Slags	0	0	N/A
Scrap i&s / waste material	12,271	55	-99.6%	Scrap i&s / waste material	0	0	N/A
Vehicules & parts	54	400	640.7%	Misc. manufactures	0	713	N/A
Misc. manufactures	1,350	6,479	379.9%	**Subtotal, exports**	**4,018,291**	**4,758,683**	**18.4%**
Subtotal, imports	**3,197,801**	**4,699,913**	**47.0%**	**Grand total**	**7,216,092**	**9,458,596**	**31.1%**

KEY: N/A = Not available.

SOURCE: Saint Lawrence Seaway Management Corporation, Apr. 30, 2007.

TABLE 1-6 Changes in Panama Canal Traffic Along Principal Trade Routes, FY2006-2007[1]
(thousands)

	FY2006		FY2007		Percent change	
Vessel trade route	**PC/UMS net tons**	**Long tons cargo**	**PC/UMS net tons**	**Long tons cargo**	**PC/UMS net tons**	**Long tons cargo**
East Coast U.S.–Asia	135,187	92,798	140,434	87,380	3.9%	-5.8%
East Coast U.S.–W.C. South America	21,724	21,713	19,761	19,658	-9.0%	-9.5%
Round-the-World	163	136	141	85	-13.7%	-37.5%
Europe–West Coast South America	23,088	14,196	24,000	14,437	4.0%	1.7%
Europe–Asia	6,329	2,866	4,188	1,882	-33.8%	-34.3%
Europe–West Coast U.S./Canada	10,629	10,767	11,631	10,700	9.4%	-0.6%
East Coast U.S.–W.C. Central America	9,648	10,535	9,917	10,879	2.8%	3.3%
South America Intercoastal	7,669	6,517	10,075	9,356	31.4%	43.6%
West Indies–W.C. Central America	8,108	4,134	11,345	5,445	39.9%	31.7%
U.S. Intercoastal (including Alaska and Hawaii)	8,374	4,215	13,883	5,646	65.8%	34.0%
East Coast U.S./Canada–Oceania	5,031	3,808	5,609	2,911	11.5%	-23.6%
E.C. South America–West Coast U.S./Canada	2,773	3,178	2,205	2,303	-20.5%	-27.5%
Subtotal	**238,723**	**174,863**	**253,189**	**170,682**	**6.1%**	**-2.4%**
All other routes	58,353	36,743	58,930	37,546	1.0%	2.2%
Total	**297,076**	**211,606**	**312,118**	**208,228**	**5.1%**	**-1.6%**

[1] Oceangoing commerical

NOTE: In thousands. This amount also includes the conversion of the number of TEU that transited the Canal.

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, derived from data published by the Office of Market Research and Analysis, Panama Canal Authority, available at http://www.pancanal.com/eng/maritime/reports/table00.pdf as of Mar. 4, 2008.

Long ton - a measure of weight equal to 2,240 pounds or 1,016 kilograms.
Panama Canal/Universal Measurement System (PC/UMS) - the tonnage measurement system used by the Panama Canal, following the rules of the 1969 International Convention on Tonnage Measurement of Ships, when assessing tolls.

TABLE 1-7 Panama Canal Traffic by Type, FY2005-2007

	Total traffic			Traffic assessed tolls on net tonnage basis		Traffic assessed tolls on displacement tonnage basis	
Fiscal Year	Number of transits	Tolls	Long tons of cargo	Number of transits	Panama canal/ UMS net tonnage *	Number of transits	Displacement tonnage
Oceangoing commerical traffic [1]							
2005	12,636	846,262,259	193,804,429	12,544	278,507,918	92	456,297
2006	12,763	1,025,042,828	211,605,295	12,694	297,075,614	69	391,169
2007	13,223	1,182,528,570	208,227,994	13,144	312,118,330	79	475,297
Free oceangoing traffic [2]							
2005	11	0	0	0	0	11	22,668
2006	8	0	0	0	0	8	19,859
2007	11	0	0	0	0	11	24,457
Total oceangoing traffic [3]							
2005	12,647	846,262,259	193,804,429	12,544	278,507,918	103	478,965
2006	12,771	1,025,042,828	211,605,295	12,694	297,075,614	77	411,028
2007	13,234	1,182,528,570	208,227,994	13,144	312,118,330	90	499,754
Small commerical traffic [1]							
2005	1,355	1,303,544	35,866	1,306	491,211	49	30,046
2006	1,413	1,356,011	929	1,388	516,369	25	19,567
2007	1,480	1,400,638	3,578	1,430	530,804	50	24,270
Small free traffic [2]							
2005	9	0	0	6	3,498	3	3,144
2006	10	0	0	6	3,498	4	2,970
2007	7	0	0	4	2,332	3	3,144
Total small traffic [4]							
2005	1,364	1,303,544	35,866	1,312	494,709	52	33,190
2006	1,423	1,356,011	929	1,394	519,867	29	22,537
2007	1,487	1,400,638	3,578	1,434	533,136	53	27,414
Total panama canal traffic							
2005	14,011	847,565,803	193,840,295	13,856	279,002,627	155	512,155
2006	14,194	1,026,398,839	211,606,224	14,088	297,595,481	106	433,565
2007	14,721	1,183,929,208	208,231,572	14,578	312,651,466	143	527,168

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, derived from data published by the Office of Market Research and Analysis, Panama Canal Authority, available at http://www.pancanal.com/eng/maritime/reports/table01.pdf as of Mar. 4, 2008.

Long ton - a measure of weight equal to 2,240 pounds or 1,016 kilograms.

Panama Canal/Universal Measurement System (PC/UMS) - the tonnage measurement system used by the Panama Canal, following the rules of the 1969 International Convention on Tonnage Measurement of Ships, when assessing tolls.

* The tonnage measurement system for Panama Canal tolls assessment, the Panama Canal/Universal Measurement System (PC/UMS).

This amount also includes the conversion of the number of TEU that transited the Canal.

[1] As of Jan. 1, 2000, vessels categorized as commercial include those previously categorized as U.S. Government vessels.

[2] Free traffic includes ships of the Colombian and Panamanian Governments and ships transiting for repairs by the Panama Canal Authority.

[3] Oceangoing vessels are those paying tolls greater than the minimum tariffs implemented on June 1, 1998.

[4] Vessels assessed minimum toll amounts as established by criteria implemented on June 1, 1998.

TABLE 1-8 U.S. Cargo Transiting the Panama Canal from the Atlantic to the Pacific Ocean by Origin and Destination, FY2007 (long tons)

To:	West Coast of the United States				West Coast Canada	West Coast Central America								
From East Coast of the United States:	**Alaska**	**Hawaii**	**Mainland**	**Total**	**Total**	**Costa Rica**	**El Salvador**	**Guatemala**	**Mexico**	**Nicaragua**	**Panama**	**Other Central America [1]**	**Balboa, RP [2]**	**Total**
North Atlantic ports	0	0	12,205	**12,205**	0	0	14,805	285	107,721	130	0	0	101,829	**224,770**
South Atlantic ports	0	12,032	71,233	**83,265**	**321**	63,654	28,953	92,317	70,017	21,532	0	0	227,100	**503,573**
Great Lakes ports	0	0	10,454	**10,454**	0	0	0	0	0	0	0	0	884	**884**
Gulf ports	487	1,569	831,462	**833,518**	**29,803**	1,441,939	1,948,874	1,150,270	436,458	975,883	262,344	66,019	720,335	**7,002,123**
United States (Other) [1]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total U.S.	**487**	**13,601**	**925,354**	**939,442**	**30,125**	**1,505,593**	**1,992,632**	**1,242,873**	**614,196**	**997,545**	**262,344**	**66,019**	**1,050,148**	**7,731,350**

To:	West Coast South America						Oceania				
From East Coast of the United States:	**Chile**	**Colombia**	**Ecuador**	**Peru**	**Other South America [1]**	**Total**	**Australia**	**French Oceania**	**New Zealand**	**Other Oceania [1]**	**Total**
North Atlantic ports	643,688	28,801	158,628	123,039	0	**954,156**	61,428	0	8,616	3,126	**73,170**
South Atlantic ports	463,226	170,006	394,762	323,887	0	**1,351,881**	582,988	0	104,933	84,623	**772,544**
Great Lakes ports	5,058	520	262	5,653	0	**11,494**	104,341	0	49,798	52	**154,191**
Gulf ports	3,029,246	1,832,271	2,074,295	2,106,883	0	**9,042,695**	176,501	0	32,556	986	**210,043**
United States (Other) [1]	0	0	0	0	0	0	0	0	0	0	0
Total U.S.	**4,141,218**	**2,031,598**	**2,627,948**	**2,559,462**	0	**11,360,226**	**925,258**	0	**195,903**	**88,787**	**1,209,948**

To:	Asia											
From East Coast of the United States:	**China (inc. Hong Kong)**	**Taiwan**	**Indonesia**	**Japan**	**Philippine Islands**	**Singapore**	**South Korea**	**Thailand**	**Russian Federation**	**Other Asia [1]**	**Total**	**Grand Total**
North Atlantic ports	2,933,990	582,418	10,332	359,489	7,158	2,970	507,423	13,042	150	11,747	4,428,720	**5,693,021**
South Atlantic ports	3,952,815	709,713	15,974	2,057,113	25,966	54,283	1,245,875	27,932	656	39,376	8,129,702	**10,841,286**
Great Lakes ports	16,271	34,378	0	37,212	0	0	2,537	0	0	34	90,432	**267,454**
Gulf ports	6,261,075	1,134,404	39,625	18,493,233	100,358	425,971	5,132,201	100,527	0	60,383	31,747,777	**48,865,960**
United States (Other) [1]	0	0	0	0	0	0	0	0	0	0	0	0
Total U.S.	**13,164,152**	**2,460,913**	**65,931**	**20,947,047**	**133,482**	**483,224**	**6,888,036**	**141,501**	**806**	**111,539**	**44,396,631**	**65,667,721**

SOURCE: U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration (RITA), Bureau of Transportation Statistics (BTS), derrived from data published by the Office of Market Research and Analysis, Panama Canal Authority, available at http://www.pancanal.com/eng/maritime/reports/table08.pdf as of Mar. 4, 2008.

Long ton—a measure of weight equal to 2,240 pounds or 1,016 kilograms.

[1] Includes cargo not routed to permit segregation between specific countries.

[2] Includes both local and transshipped cargo.

[3] Totals do not include cargo from countries with the same coast.

TABLE 1-9 U.S. Cargo Transiting the Panama Canal from the Pacific to the Atlantic Ocean by Origin and Destination, FY2007 (long tons)

To:	East Coast of the United States						East Coast Central America				
From West Coast of the United States:	North Atlantic Ports	South Atlantic Ports	Great Lakes Ports	Gulf Ports	Other United States [1]	Total	Mexico	Panama	Other Central America [1]	Cristobal, RP [2]	Total
Alaska	0	0	0	0	0	0	0	86,008	0	0	**86,008**
Hawaii	0	0	0	0	0	0	0	0	0	0	0
Mainland	40,492	211,950	0	432,492	0	**684,934**	14,129	128,360	167	49,604	**192,260**
Total U.S.	**40,492**	**211,950**	0	**432,492**	0	**684,934**	**14,129**	**214,368**	**167**	**49,604**	**278,268**

To:	East Coast South America					East Coast Canada	Caribbean							
From West Coast of the United States:	Brazil	Colombia	Venezuela	Other South America [1]	Total	Total	Cuba	Haiti/ Dominican Republic	Jamaica	Nether-lands West Indies	Puerto Rico	Trinidad and Tobago	Other West Indies [1]	Total
Alaska	0	0	0	0	0	**60,727**	0	0	0	0	0	0	0	0
Hawaii	0	0	0	0	0	0	0	0	0	0	11,329	0	0	**11,329**
Mainland	281,473	106,577	50,238	0	**438,288**	**128,466**	5,466	29,109	0	12,406	71,851	25,388	186,123	**330,343**
Total U.S.	**281,473**	**106,577**	**50,238**	0	**438,288**	**189,193**	**5,466**	**29,109**	0	**12,406**	**83,180**	**25,388**	**186,123**	**341,672**

To:	Europe													
From West Coast of the United States:	Belgium	Denmark	Finland	France	Italy	Netherlands	Spain and Portugal	Sweden	United Kingdom	Russian Federation	Yugoslavia	Germany	Other Europe [1]	Total
Alaska	48,853	0	0	0	49,080	9,371	55,330	0	0	0	0	33,907	0	**196,541**
Hawaii	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mainland	708,803	0	0	137,684	116,904	484,350	679,232	18,214	110,880	14,773	0	184,953	5,459	**2,461,251**
Total U.S.	**757,656**	0	0	**137,684**	**165,984**	**493,722**	**734,562**	**18,214**	**110,880**	**14,773**	0	**218,860**	**5,459**	**2,657,792**

To:	Asia (Middle East)								
From West Coast of the United States:	Asia (Middle East)	Algeria	Egypt	Morocco	South Africa	Tunisia	Other Africa [1]	Total	Grand Total
Alaska	0	0	0	0	0	0	0	0	**343,276**
Hawaii	0	0	0	0	0	0	0	0	**11,329**
Mainland	0	0	460,567	0	0	0	907	**461,474**	**4,697,015**
Total U.S.	**0**	**0**	**460,567**	**0**	**0**	**0**	**907**	**461,474**	**5,051,621**

SOURCE: U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration (RITA), Bureau of Transportation Statistics (BTS), derived from data published by the Office of Market Research and Analysis, Panama Canal Authority, available at http://www.pancanal.com/eng/maritime/reports/table09.pdf as of Mar. 4, 2008.

Long ton—a measure of weight equal to 2,240 pounds or 1,016 kilograms.

[1] Includes cargo not routed to permit segregation between specific countries.

[2] Includes both local and transshipped cargo.

[3] Totals do not include cargo from countries with the same coast.

TABLE 1-10 Top 25 Countries Using the Panama Canal by Origin and Destination of Cargo, FY2007 (long tons)

Rank	Country	Origin	Destination	Intercoastal	Total	Total (except intercoastal)
1	United States	72,383,144	66,287,163	1,781,228	138,670,307	136,889,079
2	People's Republic of China	27,420,264	16,278,638	0	43,698,902	43,698,902
3	Japan	6,491,814	22,709,351	0	29,201,165	29,201,165
4	Chile	12,512,670	9,472,873	0	21,985,543	21,985,543
5	South Korea	9,647,126	7,637,096	0	17,284,222	17,284,222
6	Ecuador	7,186,904	6,384,233	0	13,571,137	13,571,137
7	Peru	6,723,344	6,343,398	0	13,066,742	13,066,742
8	Mexico	5,234,053	5,692,436	213,835	10,926,489	10,712,654
9	Colombia	5,321,087	4,861,810	67,238	10,182,897	10,115,659
10	Canada	7,778,550	2,331,303	26,874	10,109,853	10,082,979
11	Panama	3,889,162	8,418,757	129,799	12,307,919	12,178,120
12	Taiwan	4,252,900	2,903,096	0	7,155,996	7,155,996
13	Venezuela	4,868,889	1,819,543	0	6,688,432	6,688,432
14	Germany	1,687,860	3,115,368	0	4,803,228	4,803,228
15	Netherlands	1,756,025	2,812,328	0	4,568,353	4,568,353
16	Spain	1,063,167	3,288,948	0	4,352,115	4,352,115
17	Belgium	1,522,788	2,525,087	0	4,047,875	4,047,875
18	Guatemala	916,887	2,942,495	1,963	3,859,382	3,857,419
19	Jamaica	1,424,939	2,423,292	0	3,848,231	3,848,231
20	Brazil	3,108,449	680,722	0	3,789,171	3,789,171
21	El Salvador	598,375	2,932,145	0	3,530,520	3,530,520
22	Not Specified West Indies	1,871,773	1,552,970	0	3,424,743	3,424,743
23	Italy	992,610	2,385,195	0	3,377,805	3,377,805
24	United Kingdom	1,130,299	1,906,728	0	3,037,027	3,037,027
25	Australia	1,378,607	1,553,685	0	2,932,292	2,932,292

NOTES: Overall, the United States generated the most long tons of cargo transiting the Panama Canal in FY2007, followed by the People's Republic of China, Japan, Chile, and South Korea. In addition, the U.S. generated the most intercoastal cargo.

The United States originated the most long tons of cargo passing through the canal, followed by the People's Republic of China, Chile, South Korea, and Canada.

The United States was the leading destination for long tons of cargo routed through the canal, followed by Japan, People's Republic of China, Chile, and Panama.

SOURCE: U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration (RITA), Bureau of Transportation Statistics (BTS), derrived from data published by the Office of Market Research and Analysis, Panama Canal Authority, available at http://www.pancanal.com/eng/maritime/reports/table09.pdf as of Mar. 4, 2008.

Long ton - a measure of weight equal to 2,240 pounds or 1,016 kilograms.

TABLE 1-11 Containership Calls at U.S. Ports, 2001-2005

Type	2001	2002	2003	2004	2005	Percent change 2001-2005
Calls	17,076	17138	17,287	18,279	18,542	8.6
TEU/call	2,801	3,020	3,144	3,241	3,321	18.6
Millions of TEU	48	52	54	59	62	29.2

KEY: TEU = Twenty-foot equivalent unit.

SOURCE: U.S. Department of Transportation, Maritime Administration, *Vessel Calls at U.S. and World Ports, 2005*

- As container trade has increased so has the size of containerships calling at U.S. ports. From 2001 through 2005, containership calls at U.S. ports increased by 9%, but the average size of containerships per call increased by 19%. Also, in 2005, the average size of containerships calling at U.S. ports was 17% larger than for container ships calling at ports around the world. The difference was due largely to a scarcity of U.S. feeder and short-sea services. These services, which use smaller vessels than line-haul services, are common in intra-European and intra-Asian trades.

Transportation Services

Matthew Chambers

The U.S. water transportation services industry comprises companies that carry freight or passengers on the open seas, the Great Lakes, or U.S. inland waterways; offer lighterage[1] and towing services; operate canals and terminals; and own and charter vessels and handle cargo and passengers. The major segments of the industry are domestic and international freight transportation, passenger transportation, and port and terminal services. This chapter displays information on vessel and terminal operating agreements, vessel types, and the world and U.S. fleet. Finally, port facilities, locations, and port calls data are shown.

[1] Lighterage is the carriage of goods by a lighter (a ship or barge used to load or unload a vessel) and charges assessed therefrom.

TABLE 2-1 Top 15 Ranking of World Merchant Fleet by Country of Owner, Year-End 2006

Number of vessels

Country	Tanker	Liquid gas	Dry bulk	Container	Roll-on/ Roll-off	Combination	Other[a]	Total
Japan	728	276	1,041	242	377	0	337	3,001
Greece	827	73	1,326	168	69	20	318	2,801
Germany	169	56	182	1,209	56	6	659	2,337
China P.R.	319	75	979	324	40	6	587	2,330
Norway	309	93	175	16	121	27	145	886
South Korea	220	61	224	140	44	0	119	808
Singapore	341	41	175	153	8	5	67	790
United States	316	19	197	63	91	12	74	772
United Kingdom	232	45	142	107	56	1	91	674
Taiwan	48	6	209	203	8	3	86	563
Netherlands	49	19	15	49	38	0	375	545
Italy	214	42	75	21	93	2	63	510
Russia	179	0	72	24	16	0	194	485
Turkey	151	7	146	44	26	1	104	479
Denmark	142	58	24	151	35	0	59	469
Total, top 15	**4,244**	**871**	**4,982**	**2,914**	**1,078**	**83**	**3,278**	**17,450**
Total, all flags	**6,042**	**1,190**	**6,225**	**3,641**	**1,600**	**102**	**4,815**	**23,615**

Deadweight (thousands)

Country	Tanker	Liquid gas	Dry bulk	Container	Roll-on/ Roll-off	Combination	Other[a]	Total
Greece	71,220	1,339	76,555	6,242	538	1,416	3,429	160,739
Japan	42,758	4,878	75,234	9,201	4,626	0	2,698	139,394
China P.R.	16,951	257	51,555	8,872	290	423	7,313	85,661
Germany	7,555	444	10,096	36,225	395	1,112	4,732	60,558
United States	24,999	1,127	9,757	1,816	1,827	1,002	900	41,428
Singapore	23,726	849	9,723	3,255	73	423	797	38,845
United Kingdom	17,436	2,001	10,138	4,235	429	79	878	35,196
Norway	17,826	3,247	7,787	329	1,750	2,556	959	34,454
South	7,971	1,546	15,881	2,935	591	0	811	29,734
Taiwan	5,693	132	14,301	7,309	49	220	583	28,286
Bermuda	17,374	0	153	0	0	1,353	31	18,911
Denmark	5,922	499	1,140	8,278	371	0	441	16,651
Italy	7,011	425	4,852	666	1,249	137	656	14,995
India	8,773	560	4,875	109	16	123	217	14,674
Monaco	4,227	269	4,932	2,303	66	130	120	12,047
Total, top 15	**279,442**	**17,573**	**296,979**	**91,775**	**12,270**	**8,974**	**24,565**	**731,573**
Total, all flags	**356,488**	**24,150**	**348,089**	**111,418**	**17,012**	**9,718**	**42,288**	**909,147**

[a] Breakbulk, partial containerhships, refrigerated cargo, barge carriers, and specialized ships.

NOTES: The top 13 countries have held their same position since 2003, and the top 3 countries, Greece, Japan, and China, have gained a 7.2% growth rate by deadweight over the same time period. However, the top 20 countries by deadweght has accounted for 81% of the total.

Since 2003, the United States has ranked in fifth place by deadweight, except, the United States ranked fourth in 2004.

SOURCE: Clarksons Research Services Limited, Shipping Vessel Registers, London: Clarkson Shipbrokers, available at: www.clarksonresearch.com.

TABLE 2-2 U.S. Privately Owned Fleets, 2001-2005 (Vessels)

Trade	2001	2002	2003	2004	2005	Percent change 2001-05
Ocean	740	685	701	714	736	-0.5
Tanker	286	271	287	290	275	-3.8
Double-hull	131	138	173	187	193	47.3
Dry bulk	198	174	163	175	201	1.5
Lakers	52	51	50	49	48	-7.7
Container	84	80	82	85	86	2.4
Roll on/roll off	54	53	54	53	58	7.4
Gas	16	17	17	17	18	12.5
Combination	13	13	15	11	12	-7.7
General cargo	37	26	33	34	38	2.7
Offshore supply	465	479	490	518	532	14.4
Coastal & waterways	38,769	38,094	37,082	37,209	38,098	-1.7
Tugs	5,180	5,150	5,172	5,314	5,510	6.4
Dry cargo barges	28,888	28,281	27,272	27,197	27,690	-4.1
Tank barges	4,122	4,068	4,031	4,069	4,254	3.2
Double-hull	2,717	2,820	2,809	2,895	3,045	12.1
Ferries	579	595	607	629	644	11.2

SOURCES: Clarksons Research Services Limited, Shipping Vessel Register for ocean and offshore; U.S. Army Corps of Engineers, Transportation Lines of the United States for coastal and waterways.

TABLE 2-3 Number of Licensed and/or Bonded Ocean Transportation Intermediaries (OTIs), 2000–2006

Fiscal year ending	U.S.-based OTIs holding only a freight forwarder license	U.S.-based OTIs holding only a non-vessel operating common carrier license	U.S.-based OTIs holding both a freight forwarder and non-vessel operating common carrier license	Foreign-based bonded and/or licensed non-vessel operating common carriers	Total
2000	1,396	1,287	761	575	**4,019**
2001	1,331	1,251	844	637	**4,063**
2002	1,294	1,298	873	694	**4,159**
2003	1,262	1,317	900	761	**4,240**
2004	1,242	1,401	946	811	**4,400**
2005	1,186	1,488	1,035	863	**4,572**
2006	1,157	1,561	1,119	928	**4,765**

SOURCE: Federal Maritime Commission, Office of Passenger Vessels and Information Processing, special tabulation, May 30, 2007.

- An ocean transportation intermediary (OTI) is an ocean freight forwarder or a non-vessel operating common carrier.
- An ocean freight forwarder is a person, in the United States, who dispatches shipments from the United States via a common carrier and books or otherwise arranges space for those shipments on behalf of shippers and processes the documentation or performs related activities to those shipments.
- A nonvessel operating common carrier is a common carrier that does not operate the vessels by which the ocean transportation is provided and is the shipper in its relationship with an ocean common carrier.
- All U.S.-based OTIs must be licensed by and demonstrate financial responsibility to the Federal Maritime Commission. U.S.-based OTIs can elect to offer freight forwarding services, nonvessel operating common carrier services, or both. The license issued by the Federal Maritime Commission indicates which services the OTI is licensed to perform. In addition to obtaining a license, all U.S.-based nonvessel operating common carriers must publish a tariff and notify the Federal Maritime Commission of the location of the tariff.
- All foreign-based nonvessel operating common carriers must demonstrate financial responsibility to the Federal Maritime Commission and publish a tariff. They can also elect to be licensed by the Federal Maritime Commission and publish a tariff.
- A list of all currently licensed and/or bonded OTIs can be found at: http://www.fmc.gov.

TABLE 2-4 Vessel Operating Common Carriers' Service Contracts and Amendments on File with the Federal Maritime Commission, 2006

Month	Original contracts	Amendments
January	3,448	18,768
February	3,519	18,159
March	4,945	23,955
April	8,116	23,747
May	7,482	21,199
June	4,126	24,861
July	2,752	21,427
August	2,603	22,098
September	2,544	20,646
October	2,629	19,781
November	2,313	20,009
December	2,757	20,855
Total	**47,234**	**255,505**

SOURCE: Federal Maritime Commission, Office of Service Contracts and Tariffs, special tabulation, May 30, 2007.

- The Federal Maritime Commission (FMC) is an independent regulatory agency responsible for the regulation of oceanborne transportation in the foreign commerce of the United States. The principal statutes or statutory provisions administered by the Commission are: the Shipping Act of 1984; the Foreign Shipping Practices Act of 1988; section 19 of the Merchant Marine Act, 1920; and Public Law 89-777.[1]
- An ocean common carrier is defined in the Shipping Act of 1984 as a vessel operating common carrier (VOCC). VOCCs are required to keep tariffs (a showing of its rates, charges, classifications, rules, and practices between all points or ports) open for public inspection (46 CFR Part 520).[2]
- Vessel operating common carriers may enter into agreements under the Shipping Act of 1984. The rules for this can be found in 46 CFR Part 535. In addition, VOCCs may enter into service contracts with one or more shippers (46 CFR Part 530).

[1] Federal Maritime Commission, *About Us*, available at http://www.fmc.gov/ as of August 2007.

[2] Federal Maritime Commission, *Vessel Operating Common Carriers*, available at http://www.fmc.gov/home/VesselOperatingCommonCarriers.asp as of August 2007.

TABLE 2-5 Vessel Operating Common Carriers' (VOCC) Service Contracts: Number of Original Contracts and Amendments on File with the Federal Maritime Commission (FMC), 2000–2006

Fiscal year ending	Original service contracts	Amendments	Total
2000	35,190	110,780	**145,970**
2001	47,629	182,403	**230,032**
2002	48,154	210,172	**258,326**
2003	46,492	192,807	**239,299**
2004	46,025	216,526	**262,551**
2005	47,648	231,508	**279,156**
2006	46,682	252,566	**299,248**

SOURCE: Federal Maritime Commission, Office of Service Contracts and Tariffs, special tabulation, May, 30, 2007.

TABLE 2-6 Participation by Vessel Operating Common Carriers (VOCCs) in Agreements on File with the Federal Maritime Commission as of Nov. 2, 2006

VOCC*	Number of agreements in which VOCC participates	Percent**
Hapag-Lloyd AG	44	20
CMA CGM, S.A.	37	17
Nippon Yusen Kaisha	36	16
A.P. Moller-Maersk A/S	33	15
Hamburg-Sud	30	14
APL Co. PTE Ltd.	29	13
Zim Integrated Shipping Services Ltd.	29	13
Compania Sud Americana de Vapores S.A.	28	13
Mitsui O.S.K. Lines Ltd.	28	13
American President Lines, Ltd.	27	12
Kawasaki Kisen Kaisha Ltd.	27	12
China Shipping Container Lines Co. Ltd.	22	10
Crowley Liner Services Inc.	21	10
COSCO Container Lines Co. Ltd.	21	10
Hyundai Merchant Marine Co. Ltd.	21	10
Hanjin Shipping Co., Ltd.	20	9
Yang Ming Marine Transport Corp.	18	8
Seaboard Marine Ltd.	16	7
Wallenius Wilhelmsen Logistics AS	15	7
Mediterranean Shipping Company S.A.	15	7
Orient Overseas Container Lines Ltd.	14	6
Compania Libra de Navegacion Uruguay S.A.	12	5
Atlantic Container Line AB	12	5
Compania Chilena de Navegacion Interoceanica S.A.	11	5
Tropical Shipping & Construction Co.	10	5
Safmarine Container Lines NV	10	5
China Shipping Container Line (HK) Co. Ltd.	10	5

*Agreement membership may include the parent company and/or its subsidaries.

**Percent is based on the total number of active vessel operating common carrier agreements on file with the Federal Maritime Commission.

SOURCE: Federal Maritime Commission, Office of Agreements, special tabulation, May, 30, 2007.

TABLE 2-7 Types and Number of Active Marine Terminal Operator Agreements on File with the Federal Maritime Commission, 2005–2006

Fiscal year ending	Terminal lease/ use	Conference	Cooperative working	Discussion	Assessment	Services	Joint venture	Total
2005	190	14	16	7	9	47	13	**296**
2006	180	10	14	10	8	45	13	**280**

SOURCE: Federal Maritime Commission, Office of Agreements, special tabulation, May 30, 2007.

- ***Marine terminal lease/use agreement*** – an agreement under which a marine terminal operator leases terminal facilities and/or provides terminal services to one or more vessel operating common carriers.
- ***Marine terminal conference*** – an agreement between or among two or more marine terminal operators (MTOs) and/or MTOs and vessel operating common carriers that provides for setting uniform rates and conditions of service.
- ***Cooperative working agreement*** – an agreement that establishes exclusive, preferential, or cooperative working relationships.
- ***Marine terminal discussion agreement*** – an agreement between or among two or more marine terminal operators and/or marine terminal conferences and/or vessel operating common carriers for the discussion of matters of mutual interest, including in some instances, pricing and conditions of service.
- ***Assessment agreement*** – an agreement that provides for the collective bargaining of fringe benefits on other than a uniform man-hour basis.
- ***Marine terminal services agreement*** – an agreement between a marine terminal operator and a vessel operating common carrier that applies to marine terminal services.
- ***Joint venture agreement*** – an agreement that allows two or more marine terminal operators to establish a separate, distinct entity that sets its own pricing for services.

TABLE 2-8 Location of U.S.-Based Ocean Transportation Intermediaries Licensed by the Federal Maritime Commission, FY 2006

State	Number of ocean transportation intermediaries	State	Number of ocean transportation intermediaries
California	1,005	Tennessee	9
Florida	675	District of Columbia	8
New York	621	Nevada	7
New Jersey	324	Rhode Island	7
Texas	253	Utah	6
Illinois	196	Kentucky	5
Washington	92	Arizona	4
Georgia	78	New Hampshire	4
Maryland	59	Hawaii	3
Virginia	58	Iowa	3
Massachusetts	54	Kansas	3
Pennsylvania	47	Maine	3
Louisiana	41	Arkansas	2
Ohio	29	Delaware	2
Puerto Rico	29	Guam	2
North Carolina	28	Northern Mariana Islands	2
Michigan	25	Mississippi	2
Minnesota	21	Nebraska	2
South Carolina	21	Alaska	1
Alabama	18	Idaho	1
Connecticut	16	North Dakota	1
Missouri	15	Oklahoma	1
Oregon	15	Virgin Islands	1
Indiana	13	Vermont	1
Wisconsin	13	West Virginia	1
Colorado	10		

SOURCE: Federal Maritime Commission, Office of Passenger Vessels and Information Processing, May 30, 2007.

NOTE: An ocean transportation intermediary (OTI) is an ocean freight forwarder or a nonvessel operating common carrier.

TABLE 2-9 The Types and the Number of Active Vessel Operating Common Carrier Agreements on File with the Federal Maritime Commission, 2000–2006

Fiscal year ending	Conference	Discussion	Vessel sharing	Joint service	CWA	Total
2000	23	47	148	14	19	**251**
2001	21	45	150	10	17	**243**
2002	20	48	151	8	18	**245**
2003	19	43	145	7	17	**231**
2004	15	40	157	6	14	**232**
2005	12	39	158	6	15	**230**
2006	8	37	148	7	19	**219**

SOURCE: Federal Maritime Commission, Office of Agreements, special tabulation, May, 30, 2007.

- ***Conference agreement*** – an agreement between or among two or more vessel operating common carriers that provides for the fixing of, and adherence to, uniform tariff rates, charges, practices, and conditions of service.
- ***Discussion agreement*** – an agreement between or among two or more vessel operating common carriers for the discussion of matters of mutual interest, including in some instances, pricing and the conditions of service.
- ***Vessel sharing agreement*** – an agreement between any two or more vessel operating common carriers under which they agree to share, sell, or buy space on each other's vessels.
- ***Joint service agreement*** – an agreement between vessel operating common carriers operating as a joint venture.
- ***CWA*** – a cooperative working agreement in which exclusive, preferential, or cooperative working relationships are established.
- A current list and text of all active vessel operating common carrier agreements can be found at: http://www.fmc.gov.

TABLE 2-10 Number of Vessel Operating Common Carrier Agreements on File with the Federal Maritime Commission by Geographical Region as of Nov. 2, 2006

Geographic region	Number of agreements*
Caribbean	55
South America	55
Asia	50
Indian Subcontinent	37
Atlantic/Europe	36
Mediterranean	33
Oceania/Pacific Islands	21
Africa	17
Middle East	13

* The number of agreements shown are not additive because an agreement may cover more than one geographic region.

SOURCE: Federal Maritime Commission, Office of Agreements, special tabulation, Nov. 2, 2006.

TABLE 2-11 Non-Vessel Operating Common Carriers' Service Arrangements (NSAs): Number of Original Service Arrangements and Amendments on File with the Federal Maritime Commission, 2005–2006

Fiscal year ending*	Original NSAs	Amendments	Total
2005	121	54	175
2006	557	448	1,005

* The Federal Maritime Commission first allowed nonvessel operating common carriers to offer NSAs on Jan. 19, 2005.

SOURCE: Federal Maritime Commission, Office of Service Contracts and Tariffs, special tabulation, May 30, 2007.

TABLE 2-12 Concentration in the U.S. Container Shipping Industry

Concentration ratios			Rank	Shipping line	2000 TEU*
			1	Maersk Sealand	2,940,138
			2	Evergreen Line	1,419,726
			3	Hanjin Shipping	1,396,608
Top 4	CR4	36%	4	American President Lines	1,212,528
			5	China Ocean Shipping Company (Cosco)	962,995
			6	P&O Nedlloyd	805,389
			7	Hyundai Merchant Marine	750,112
Top 8	CR8	53%	8	Orient Overseas Container Line (Oocl)	689,858
			9	Yang Ming Line	636,399
			10	Mediterranean Shipping Company (Msc)	606,666
				Total, top-10 carriers	**11,422,420**
				Total, all other carriers	**7,742,122**
				Grand total	**19,164,542**

Concentration ratios			Rank	Shipping line	2006 TEU*
			1	Maersk Line	4,258,414
			2	Evergreen Line	2,400,615
			3	Mediterranean Shipping Company (Msc)	1,998,994
Top 4	CR4	36%	4	Hanjin Shipping	1,854,583
			5	American President Lines	1,777,850
			6	Hapag Lloyd	1,736,333
			7	China Ocean Shipping Company (Cosco)	1,255,327
Top 8	CR8	57%	8	Orient Overseas Container Line (Oocl)	1,230,260
			9	China Shipping Container Lines	1,159,530
			10	Nippon Yusen Kaisha (Nyk Line)	1,158,291
				Total, top-10 carriers	**18,830,198**
				Total, all other carriers	**10,376,535**
				Grand total	**29,206,732**

* Number of laden containers carried, expressed in TEU.

KEY: TEU = Twenty-foot equivalent unit. CR = Concentration ratio.

SOURCE: Federal Maritime Commission, Office of Economics and Competition Analysis, calculated using annual 2006 data from Port Import/Export Reporting Service (PIERS).

Domestic and International Freight and Passenger Trade

Matthew Chambers

The U.S. water transportation industry serves the needs of both domestic and international commerce. U.S.-international transportation includes the flow of goods and people into and out of the United States and its trading partners. U.S. domestic transportation includes the movement of goods and people on the nation's coastwise, lakes, and inland waterway systems. This chapter provides major international and domestic trends that affect water transportation.

TABLE 3-1 U.S. Waterborne Trade, 2001-2005
(million metric tons)

Trade	2001	2002	2003	2004	2005	Percent change 2001-05
Total	2,103.20	2,057.60	2,131.50	2,255.60	2,277.80	8.3
Foreign	1,157.50	1,131.30	1,209.60	1,305.70	1,348.80	16.5
Imports	830.1	813.9	879.9	954.6	995.2	19.9
Tanker	572.8	568.9	604.5	630.1	643.2	12.3
Container	80.7	91.9	98.1	112.9	122.8	52.1
Exports	327.4	317.4	329.7	351.1	353.6	8
Tanker	55.3	51.8	52.9	57.2	55.5	0.4
Container	63.8	62.3	68	74.4	79.5	24.6
Domestic	945.7	926.3	921.9	949.9	929	-1.8
Coastwise	202.8	196.3	202.8	200.1	191.8	-5.4
Tanker	85.1	80.3	81.3	78.8	73.1	-14.1
Inland	562.3	551.6	553	568.1	564.4	0.4
Lakes	90.7	92.1	81.5	93.9	87.3	-3.7
Other	89.9	86.3	84.6	87.8	85.5	-4.9

SOURCES: U.S. Department of Transportation, Maritime Administration, prepared from: U.S. Bureau of Census for foreign trade; Port Import Export Reporting Service (PIERS) for container trades; and U.S. Army Corps of Engineers, Waterborne Commerce of the United States 2005.

- The U.S. water transportation industry serves the needs of both foreign and domestic commerce. It comprises companies that carry freight or passengers on the open seas or inland waterways, offer towing services, charter vessels, and operate canals and terminals.
- In 2005, U.S. waterborne commerce amounted to 2.3 billion metric tons. International commerce accounted for 59% of the total, up from 55% 5 years earlier. The change in composition was due largely to a 12% rise in tanker imports and a 14% decline in coastal (domestic) tanker trade.
- While container trade accounted for only 15% of U.S. foreign water borne trade (metric tons), imports increased by 52% and exports rose by 25% over the last 5 years.

TABLE 3-2 Top 20 U.S. Liner Cargo Trading Partners—Exports and Imports

	FY2000		FY2001		FY2002		FY2003		FY2004		FY2005	
Rank	Country	TEUs (000)	Country	TEUs (000)	Country	TEUs (000)	Country	TEUs (000)	Country	TEUs (000)	Country	TEUs (000)
1	China (PRC)	3,587	China (PRC)	4,023	China (PRC)	5,005	China (PRC)	5,811	China (PRC)	7,521	China (PRC)	9,387
2	Japan	1,809	Japan	1,660	Japan	1,616	Hong Kong	1,672	Japan	1,644	Japan	1,699
3	Hong Kong	1,374	Hong Kong	1,329	Hong Kong	1,591	Japan	1,655	Hong Kong	1,483	Hong Kong	1,192
4	Taiwan	961	Taiwan	852	South Korea	948	Taiwan	977	South Korea	985	South Korea	1,032
5	South Korea	899	South Korea	844	Taiwan	917	South Korea	930	Taiwan	943	Taiwan	1,000
6	Germany	628	Germany	609	Germany	627	Germany	650	Germany	671	Germany	728
7	Italy	558	Italy	572	Italy	614	Italy	601	Brazil	643	Brazil	660
8	United Kingdom	505	Thailand	472	Thailand	519	Brazil	535	Italy	607	Italy	596
9	Thailand	485	United Kingdom	468	Brazil	476	Thailand	517	Thailand	544	Thailand	570
10	Brazil	427	Brazil	423	United Kingdom	457	United Kingdom	430	India	448	India	510
11	Indonesia	410	Belgium & Luxembourg	406	Netherlands	419	Indonesia	402	Indonesia	443	Indonesia	483
12	Netherlands	401	Netherlands	393	Indonesia	417	India	397	Belgium & Luxembourg	439	Belgium & Luxembourg	458
13	Belgium & Luxembourg	392	Indonesia	377	Belgium & Luxembourg	414	Belgium & Luxembourg	396	United Kingdom	438	Netherlands	447
14	Malaysia	310	India	304	India	338	Netherlands	390	Netherlands	410	United Kingdom	446
15	France	296	Malaysia	287	Malaysia	317	Malaysia	309	Malaysia	338	Malaysia	377
16	Philippines	267	France	276	France	283	France	282	Honduras	302	Honduras	305
17	India	257	Philippines	242	Guatemala	251	Honduras	273	Guatemala	277	Vietnam	292
18	Dominican Republic	241	Dominican Republic	232	Spain	242	Guatemala	266	France	276	Guatemala	272
19	Spain	229	Spain	223	Honduras	234	Spain	245	Australia	261	France	258
20	Australia	222	Costa Rica	222	Dominican Republic	234	Costa Rica	240	Spain	247	Spain	257
	All U.S. trade	**18,382**	**All U.S. trade**	**18,270**	**All U.S. trade**	**20,139**	**All U.S. trade**	**21,563**	**All U.S. trade**	**24,018**	**All U.S. trade**	**26,303**

KEY: TEU = Twenty-foot equivalent unit.

SOURCE: Federal Maritime Commission, 39th through 44th Annual Reports.

TABLE 3-3 U.S.Waterborne Foreign Trade Export by U.S. Custom District, Calendar Years 2003 through June 2007
(millions of dollars)

	Annual				
U.S. Custom District	**2003**	**2004**	**2005**	**2006**	**Jan.–June 2007**
Houston/Galveston, TX (District)	27,647	34,951	41,111	50,378	29,905
Los Angeles, CA	33,386	35,302	40,279	48,106	26,735
New York City, NY	21,734	23,599	26,964	33,527	19,721
New Orleans, LA	18,583	19,536	18,289	22,130	12,861
Miami, FL	12,009	13,449	15,790	18,264	9,985
Norfolk, VA	12,204	13,264	16,607	18,027	10,142
Charleston, SC	13,494	15,374	16,082	16,134	8,984
Seattle, WA	11,994	12,986	13,809	14,884	7,747
Savannah, GA	8,274	10,431	12,304	14,729	9,022
Tampa, FL	5,571	6,821	9,159	11,266	5,864
San Francisco, CA	8,840	9,450	10,169	11,003	6,015
Baltimore, MD	5,728	6,951	8,597	9,626	6,935
Philadelphia, PA	2,081	3,358	4,520	6,445	3,025
Columbia-Snake	5,421	5,817	4,993	5,608	3,430
Detroit, MI	3,560	4,118	4,603	4,718	2,611
Mobile, AL	3,271	3,754	3,422	4,287	1,973
Anchorage, AK	2,247	2,662	2,957	3,090	1,089
Port Arthur, TX	1,353	2,030	2,143	2,986	1,294
San Juan, PR	1,994	2,290	2,117	2,550	1,130
Norfolk, VA/Mobile, AL/ Charleston, SC	786	1,352	1,874	1,989	1,169
Wilmington, NC	1,321	1,372	1,389	1,613	802
Boston, MA	859	926	1,179	1,398	878
Buffalo, NY	303	641	757	841	336
Chicago, IL	473	498	546	643	298
Cleveland, OH	560	393	416	570	141
Ogdensburg, NY	377	378	607	558	278
Portland, ME	376	582	368	481	255
Virgin Islands US	246	345	442	449	253
Minneapolis, MN	-	-	132	368	155
Honolulu, HI	159	245	232	296	149
Laredo, TX	40	60	58	291	82
Providence, RI	61	64	60	99	115
Milwaukee, WI	52	67	67	74	32
San Diego, CA	86	107	159	63	97
Duluth, MN	640	583	453	43	21
St. Louis, MO	14	5	3	16	3
Pembina, ND	4	1	0	1	0
Washington, D.C.	19	58	2	1	15
Total	**205,764**	**233,819**	**262,662**	**307,553**	**173,548**

NOTES: The following types of shipments are included for statistical purposes in special CBP port groupings and are not reported by their geographical location: vessels under their own power or afloat (imports and exports), low-valued imports and exports, mail shipments (exports only). Norfolk, VA, Charleston, SC, Mobile, AL (Exports of bituminous coal). Wilmington, NC, Savannah, GA (Exports of cotton linter pulp).

SOURCE: U.S. Bureau of Census, USA Trade-Online, available at: www.usatradeonline.gov as of Aug. 28, 2008.

TABLE 3-4 U.S. v. World Maritime Container Traffic and Gross Domestic Product, 1995–2006

	Container traffic (total TEUs loaded and empty)				Gross Domestic Product (current U.S. dollars)			
	World (millions)	United States (millions)	U.S. share of World total (percent)	U.S. rank	World (billions)	United States (billions)	U.S. share of World GDP (percent)	U.S. rank
1995	137.2	22.3	16.3	1	29,391	7,398	25.2	1
1996	150.8	22.6	15.0	1	30,080	7,817	26.0	1
1997	160.7	24.5	15.3	1	29,928	8,304	27.7	1
1998	169.6	26.2	15.4	2	29,682	8,747	29.5	1
1999	184.6	28.0	15.2	2	30,786	9,268	30.1	1
2000	225.3	30.4	13.5	2	31,650	9,817	31.0	1
2001	236.7	30.7	13.0	2	31,456	10,128	32.2	1
2002	266.3	32.7	12.3	2	32,714	10,470	32.0	1
2003	305.0	36.3	11.9	2	36,751	10,961	29.8	1
2004	343.0	38.7	11.3	2	41,258	11,712	28.4	1
2005	378.0	42.0	11.1	2	44,455	12,456	28.0	1
2006[a]	417.0	46.3	11.1	2	NA	NA	NA	NA
Percent change, 1995-2006	203.9	107.2						
Average annual rate (percents), 1995-2006	10.6	6.8						

KEY: NA = Not available; TEU = Twenty-foot equivalent unit.

[a] 2006 estimates are projections from the individual sources.

SOURCE: TEUs: World estimates—1995–1999 Containerisation International Yearbook, (London, England: Informa Group, Inc., various years, 1997–2001). 2000 - 2002 from United Nations Trade Commission, Review of Maritime Transportation, various years. 2003–2006 from Clarkson Research services, Container Intelligence Monthly, vol 8 no 10, October 2006. U.S. estimates—AAPA 2006. GDP: From International Monetary Fund, www.imf.org, January 2007.

- World container traffic has nearly doubled since 1995. Average annual growth rate between 1995 and 2006 was 10.6%.
- In 2006, the U.S. was second in the world for container traffic and first in terms of Gross Domestic Product (GDP).

TABLE 3-5 Top 25 World Container Ports, 2005 and 2006
(in millions of TEUs - domestic, international and empty repositioning)

Rank in 2006	Seaport	Country	2006 TEUs	2005 TEUs
1	Singapore[1]	Singapore	24.79	23.19
2	Hong Kong[1]	China	23.54	22.43
3	Shanghai[1]	China	21.71	18.08
4	Shenzhen[1]	China	18.47	16.20
5	Busan[1]	South Korea	12.04	11.84
6	Kaohsiung[1]	Taiwan	9.78	9.47
7	Rotterdam[1]	Netherlands	9.66	9.29
8	Dubai[1]	United Arab Emirates	8.92	7.62
9	Hamburg[1]	Germany	8.86	8.09
10	Los Angeles	United States	8.47	7.49
11	Quingdao	China	7.70	6.31
12	Long Beach	United States	7.29	6.71
13	Ningbo	China	7.07	5.21
14	Antwerp[1]	Belgium	7.02	6.48
15	Guangzhou	China	6.60	4.69
16	Port Klang[1]	Malaysia	6.33	5.54
17	Tianjin	China	5.95	4.80
18	New York/New Jersey	United States	5.09	4.79
19	Tanjung Pelepas[1]	Malaysia	4.77	4.18
20	Bremen-Bremerhaven[1]	Germany	4.45	3.74
21	Laem Chabang[1]	Thailand	4.12	3.83
22	Xiamen	China	4.02	3.34
23	Tokyo[1]	Japan	3.97	3.59
24	Jawaharlal Nehru	India	3.30	2.67
25	Tanjug Priok	Indonesia	3.28	3.28

[1]Port participates in the Container Security Initiative of U.S. Customs and Border Protection, U.S. Department of Homeland Security.

NOTES: TEU = Twenty-foot equivalent unit.

SOURCES: TEUs—American Association of Port Authorities (APAA), World Port Rankings (Alexandria, VA: annual releases 2005, 2006). CSI—Department of Homeland Security, Container Security Initiative (CSI) Ports, available at http://www.dhs.gov/ as of Oct. 5, 2007.

TABLE 3-6 Top 10 U.S. Maritime Container Ports, 2001-2006
(thousands of TEUs)

Port	2001	2002	2003	2004	2005	2006	Percent change, 2001-2006	Average annual growth rate, 2001-2006 (percent)
Los Angeles/ Long Beach, CA	6,624	7,243	7,755	8,639	9,242	10,390	56.9	9.4
New York, NY	2,355	2,627	2,803	3,163	3,387	3,629	54.1	9.0
Seattle/Tacoma, WA	1,436	1,619	1,746	1,990	2,494	2,304	60.4	9.9
Savannah, GA	813	1,014	1,124	1,290	1,469	1,581	94.5	14.2
Charleston, SC	1,159	1,197	1,250	1,421	1,509	1,493	28.8	5.2
Norfolk, VA	885	982	1,093	1,206	1,319	1,410	59.3	9.8
Oakland, CA	963	979	1,064	1,197	1,374	1,400	45.4	7.8
Houston, TX	783	851	933	1,098	1,222	1,268	61.9	10.1
Miami, FL	717	752	764	795	772	743	3.6	0.7
Port Everlades, FL	417	370	423	500	578	634	52.0	8.7
Total top 10 ports	16,152	17,634	18,955	21,299	23,366	24,852	53.9	9.0
Total all ports[1]	18,117	19,729	21,289	23,851	25,868	27,473	51.6	8.7
Top 10, percent of total	89.2	89.4	89.0	89.3	90.3	90.5		

NOTE: TEU = Twenty-foot equivalent unit.

[1] The statistics include both government and nongovernment shipments by vessel into and out of U.S. foreign trade zones, the 50 states, District of Columbia, and Puerto Rico.
The data in this table include only loaded containers in U.S. international maritime activity. It includes U.S. imports, exports, and transshipments, therefore the trade levels will be greater than those reported from U.S. international trade statistics, which excludes transshipments. The data also excludes military shipments.

SOURCE: U.S. Department of Transportation, Maritime Administration, U.S. Water Transportation Statistical Snapshot, available at www.marad.dot.gov as of May 2007.

- Ninety percent of U.S. maritime container volume is handled by 10 U.S. ports. Three of the ports are on the West Coast.
- Between 2001 and 2006, Savannah, GA container volumes grew the most at an annual growth rate of 14%.

TABLE 3-7 U.S. Related Trade in All Available NAICS2 with China for 2006—Exports
(U.S. dollars)

NAICS code		Export total trade, 2006
11	Agriculture and livestock products	$5,581,785,994
21	Oil, gas, minerals and ores	$530,834,113
31	Manufacturing, part 1	$2,318,312,340
32	Manufacturing, part 2	$8,455,361,412
33	Manufacturing, part 3	$28,111,216,857
51	Publishers' commodities	$61,310,496
91	Waste and scrap	$5,971,287,689
92	Used or second-hand merchandise	$8,656,789
99	Special classification provisions	$585,299,103
	Total NAICS	**$51,624,064,793**

KEY: NAICS = North American Industry Classification System

NOTES: Manufacturing, part 1 includes food, beverage & tobacco product, textile mills, textile product mills, apparel, and leather & allied products manufacturing.
Manufacturing, part 2 includes wood product, paper, printing & related support activities, petroleum & coal products, chemical, plastics & rubber products, nonmetallic mineral product manufacturing.
Manufacturing, part 2 includes primary metal, fabricated metal product, machinery, computer & electronic product, electrical equipment, appliance, & component, transportation equipment, furniture & related product, and miscellaneous manufacturing.

SOURCE: U.S. Census Bureau, Foreign Trade Division, Foreign Trade Statistics, available at http://www.census.gov/foreign-trade/statistics/index.html.

TABLE 3-8 U.S. Related Trade In All Available NAICS2 with China For 2006—Imports
(U.S. dollars)

NAICS code		Import total trade, 2006
11	Agriculture and livestock products	$2,143,732,195
21	Oil, gas, minerals and ores	$564,548,946
31	Manufacturing, part 1	$51,026,005,979
32	Manufacturing, part 2	$25,728,202,314
33	Manufacturing, part 3	$203,468,117,987
51	Publishers' commodities	$10,443,958
91	Waste and scrap	$133,911,824
92	Used or second-hand merchandise	$289,016,605
98	Goods returned to California; U.S. goods returned and & Reimps (Imp)	$809,379,241
99	Special classification provisions, NESOI	$2,879,057,145
	Total NAICS	**$287,052,416,194**

KEY: NAICS = North American Classification System ; NESOI = Not elsewhere specified or included.

NOTES: Manufacturing, part 1 includes food, beverage & tobacco product, textile mills, textile product mills, apparel, and leather & allied products manufacturing.
Manufacturing, part 2 includes wood product, paper, printing & related support activities, petroleum & coal products, chemical, plastics & rubber products, nonmetallic mineral product manufacturing.
Manufacturing, part 2 includes primary metal, fabricated metal product, machinery, computer & electronic product, electrical equipment, appliance, & component, transportation equipment, furniture & related product, and miscellaneous manufacturing.

SOURCE: U.S. Census Bureau, Foreign Trade Division, Foreign Trade Statistics, available at http://www.census.gov/foreign-trade/statistics/index.html.

TABLE 3-9 Top U.S. Trading Partners—Total Trade, Exports, Imports, December 2006
(data are goods only, on a census basis, in billions of dollars)

Total Trade (goods)

Country	Exports (year-to-date)	Imports (year-to-date)	Total, all trade	Rank	Percent of total trade
Total, all countries	**1,037.30**	**1,855.40**	**2,892.70**		**100.00**
Total, top 15 countries	**755.2**	**1,369.10**	**2,124.30**		**73.40**
Canada	230.6	303.4	534.0	1	18.50
China	55.2	287.8	343.0	2	11.90
Mexico	134.2	198.3	332.4	3	11.50
Japan	59.6	148.1	207.7	4	7.20
Germany	41.3	89.1	130.4	5	4.50
United Kingdom	45.4	53.4	98.8	6	3.40
Korea, South	32.5	45.8	78.3	7	2.70
France	24.2	37.1	61.4	8	2.10
Taiwan	23.0	38.2	61.2	9	2.10
Malaysia	12.6	36.5	49.1	10	1.70
Netherlands	31.1	17.3	48.4	11	1.70
Venezuela	9.0	37.2	46.2	12	1.60
Brazil	19.2	26.4	45.6	13	1.60
Italy	12.6	32.7	45.2	14	1.60
Singapore	24.7	17.8	42.5	15	1.50

Exports (goods)

Country	Exports (year-to-date)	Rank	Percent of export total
Total, all countries	**1,037.30**		**100.00**
Total, top 15 countries	**778.0**		**75.00**
Canada	230.6	1	22.20
Mexico	134.2	2	12.90
Japan	59.6	3	5.80
China	55.2	4	5.30
United Kingdom	45.4	5	4.40
Germany	41.3	6	4.00
Korea, South	32.5	7	3.10
Netherlands	31.1	8	3.00
Singapore	24.7	9	2.40
France	24.2	10	2.30
Taiwan	23.0	11	2.20
Belgium	21.3	12	2.10
Brazil	19.2	13	1.90
Australia	17.8	14	1.70
Hong Kong	17.8	15	1.70

continued on next page

TABLE 3-9 Top Trading Partners—Total Trade, Exports, Imports, 2006 *(continued)*
(data are goods only, on a census basis, in billions of dollars)

Imports (goods)

Country	Imports (year-to-date)	Rank	Percent of import total
Total, all countries	**1,855.40**		**100.00**
Total, top 15 countries	**1,395.80**		**75.20**
Canada	303.4	1	16.40
China	287.8	2	15.50
Mexico	198.3	3	10.70
Japan	148.1	4	8.00
Germany	89.1	5	4.80
United Kingdom	53.4	6	2.90
Korea, South	45.8	7	2.50
Taiwan	38.2	8	2.10
Venezuela	37.2	9	2.00
France	37.1	10	2.00
Malaysia	36.5	11	2.00
Italy	32.7	12	1.80
Saudi Arabia	31.7	13	1.70
Ireland	28.6	14	1.50
Nigeria	27.9	15	1.50

SOURCE: Foreign Trade Division, U.S. Census Bureau, Washington, D.C. 20233; available at: http://www.census.gov/foreign-trade/statistics/highlights/top/top0612.html#total as of July 5, 2007.

TABLE 3-10 Port State Control Statistics

Year (Jan 1–Dec 31st)	Distinct arrivals	Safety related detentions	Annual detention ratio	3-Year average detention ratio	Major ISPS control actions	Rolling average ISPS control action ratio
1996	7,608	476	6.26%			
1997	7,686	547	7.12%	6.64%		
1998	7,880	373	4.73%	6.02%		
1999	7,617	257	3.37%	5.08%		
2000	7,657	193	2.52%	3.55%		
2001	7,842	172	2.19%	2.69%		
2002	7,106	178	2.50%	2.40%		
2003	7,673	153	1.99%	2.22%		
2004	7,241	176	2.43%	2.30%	92	
2005	7,850	127	1.61%	2.00%	51	0.89%
2006	8,178	110	1.35%	1.78%	35	0.80%

NOTES: In 2006, a total of 8,178 individual vessels, from 80 different flag States, made 78,668 port calls. United States Coast Guard conducted 10,136 Safety of Life at Sea (SOLAS) safety exams and 9,053 International Ship and Port Facility Security security exams. The SOLAS exams resulted in 110 detentions, a 13 percent decrease, and the security exams resulted in 35 major control actions, a 31 percent decrease, while distinct arrivals grew by 328, a 4 percent increase.

SOURCE: Department of Homeland Security, United States Coast Guard, Port State Control in the United States, Annual Report 2006

TABLE 3-11 Port State Control Statistics by Port

Port	Coast Guard District	Safety Examinations	Detentions	Security Examinations	Major Control Actions
Anchorage, Alaska	17	124	0	85	0
Baltimore, Maryland	5	206	0	227	0
Boston, Massachusetts	1	168	1	66	0
Buffalo, New York	9	52	0	14	0
Charleston, South Carolina	7	142	2	139	0
Chicago, Illinois	9	17	0	9	0
Cleveland, Ohio	9	32	0	27	0
Corpus Christi, Texas	8	340	3	380	0
Detroit, Michigan	9	33	0	20	1
Duluth, Minnesota	9	28	0	24	0
Guam	14	72	0	54	0
Hampton Roads, Virginia	5	200	4	284	1
Honolulu, Hawaii	14	230	5	169	0
Houston, Texas	8	1,012	14	952	4
Jacksonville, Florida	7	284	6	255	1
Juneau, Alaska	17	30	0	43	0
Los Angeles, California	11	709	6	858	7
Miami, Florida	7	388	8	312	2
Milwaukee, Wisconsin	9	34	0	26	0
Mobile, Alabama	8	311	1	211	1
Morgan City, Louisiana	8	124	5	58	1
New Haven, Connecticut	1	88	0	70	0
New Orleans, Louisiana	8	1,189	9	992	8
New York, New York	1	810	4	743	1
Philadelphia, Pennsylvania	5	399	3	461	0
Port Arthur, Texas	8	296	1	233	0
Portland, Maine	1	114	1	94	0
Portland, Oregon	13	422	4	302	0
Providence, Rhode Island	1	104	1	50	0
San Diego, California	11	117	1	103	0
San Francisco, California	11	305	9	349	3
San Juan, Puerto Rico	7	511	2	366	1
Savannah, Georgia	7	241	5	353	1
Seattle, Washington	13	392	12	391	0
Tampa, Florida	7	492	1	216	3
Toledo, Ohio	9	21	0	22	0
Valdez, Alaska	17	3	0	0	0
Wilmington, North Carolina	5	96	2	95	0
Total		**10,136**	**110**	**9,053**	**35**

NOTES: In 2006, New Orleans, Houston, and New York were the leading ports in the number of safety and security examinations. However, Houston, Seattle, New Orleans, and San Francisco were the leading ports for safety-related detentions. New Orleans, Los Angeles, and Houston were the leading ports of Major Control Actions (MCAs), which occur when a vessel is detained, denial of entry, or expelled for violating International Ship and Port Facility Security Code (ISPS) or Maritime Transportation Security Act of 2002 (MTSA).

SOURCE: Department of Homeland Security, U.S. Coast Guard, *Port State Control in the United States, Annual Report 2006.*

TABLE 3-12 Cargo Preference Statistics

		Civilian agencies				Department of Defense (DOD)				Humanitarian food aid				Grand total			
Year	Ton type	U.S. Flag	Non-U.S. Flag	Total	Percent	U.S. Flag	Non-U.S. Flag	Total	Percent	U.S. Flag	Non-U.S. Flag	Total	Percent	U.S. Flag	Non-U.S. Flag	Total	Percent
2001	Metric	291,889	85,148	377,037	77.4	347,000	12,540	359,540	96.5	0	0	0	0	638,889	97,688	736,577	86.7
	DOD measurement					2,574,898	286,100	2,860,998	90.0					2,574,898	286,100	2,860,998	90.0
	Petroleum	414,907	1,464	416,371	99.6	5,251,947	154,432	5,406,379	97.1					5,251,947	154,432	5,406,379	97.1
2002	Metric	348,926	95,385	444,311	78.5	460,802	5,114	465,916	98.9	4,476,573	1,539,056	6,015,629	74.4	5,286,301	1,639,555	6,925,856	76.3
	DOD measurement					4,243,468	304,730	4,548,198	93.3					4,243,468	304,730	4,548,198	93.3
	Petroleum	372,780	4,390	377,170	98.8	6,237,327	139,192	6,376,519	97.8					6,237,327	139,192	6,376,519	97.8
2003	Metric	226,451	77,741	304,192	74.4	327,189	11,090	338,279	96.7	3,193,146	1,083,944	4,277,090	74.7	3,746,786	1,172,775	4,919,561	76.2
	DOD measurement					6,038,587	913,842	6,952,429	86.9					6,038,587	913,842	6,952,429	86.9
	Petroleum	434,665	466	435,131	99.9	6,395,074	4,232,304	8,827,378	72.4					6,829,739	4,232,770	11,062,509	61.7
2004	Metric	209,438	63,109	272,547	76.8	338,238	3,569	341,807	99.0	3,251,869	1,079,226	4,331,095	75.1	3,799,545	1,145,904	4,945,449	76.8
	DOD measurement					8,635,344	331,784	8,967,128	96.3					8,635,344	331,784	8,967,128	96.3
	Petroleum	375,996	0	375,996	100.0	3,607,556	1,892,152	5,499,708	65.6					3,983,552	1,892,152	5,875,704	67.8
2005	Metric	117,378	61,200	178,578	65.7	144,506	2,938	147,444	98.0	2,718,814	1,216,030	3,934,844	69.1	2,980,698	1,280,168	4,260,866	70.0
	DOD measurement					10,687,744	740,125	11,427,869	93.5					10,687,744	740,125	11,427,869	93.5
	Petroleum	211,925	0	211,925	100.0	2,616,779	2,850,353	5,467,132	47.9					2,616,779	2,850,353	5,467,132	47.9

NOTES: The cargo preference program works to promote and facilitate a U.S. maritime transportation system that is accessible and efficient in the movement of goods and people. It oversees the administration of and compliance with U.S. cargo preference laws and regulations. Those laws require shippers to use U.S.-flag vessels to transport any government-impelled ocean borne cargoes.

SOURCE: U.S. Department of Transportation, Maritime Administration, Office of Cargo Preference, personal communications, 2006.

Economic Impact

Matthew Chambers

Demand for transportation-related goods and services affects the U.S. economy, employment, and industry investment. The data in this chapter provide information on water transportation industry output, employment, and port capital infrastructure expenditures. Data are also provided on dredging activity and costs.

TABLE 4-1 U.S. Water Transportation Gross Output, 2002-2006
(billions of dollars)

Components	2002	2003	2004	2005	2006	Percent change 2002-06
Gross output	28.1	31.3	36.3	37.3	37.9	34.9
Intermediate inputs	21.1	22.6	26.8	28.0	28.0	32.7
Energy Inputs	1.1	1.5	2.4	3.5	3.4	209.1
Energy inputs as % of gross output	3.9	4.8	6.6	9.4	9.0	131.8
Materials	1.4	1.5	1.8	1.8	2.0	42.9
Services	18.6	19.7	22.6	22.8	22.6	21.5
Value added	7.0	8.7	9.5	9.2	9.9	41.4
Labor	3.8	3.8	4.3	4.6	5.0	31.6
Taxes less subsidies	0.2	0.3	-0.2	0.2	0.1	-50.0
Operating surplus	3.0	4.6	5.5	4.4	4.9	63.3

SOURCE: U.S. Bureau of Economic Analysis, Gross Domestic Product by Industry Accounts. Detailed data available at www.bea.gov.

TABLE 4-2 U.S. Water Transportation Fixed Assets and Labor, 2002-2007

Type	2002	2003	2004	2005	2006	2007	Percent change 2002-07
Fixed assets ($ billions)	42.3	44.5	46.8	49.2	52.4	NA	23.9%
Vessels	23.4	24.6	25.7	26.8	28.2	NA	20.5%
Communications	10.2	10.9	11.6	12.2	13.2	NA	29.4%
Buildings	4.5	4.6	5.0	5.6	6.1	NA	35.6%
Other	4.2	4.4	4.5	4.6	4.8	NA	14.3%
Segment							
Labor (000 jobs)	147.8	148.3	147.9	154.5	162.0	164.1	11.0 %
Transportation	52.6	54.5	56.4	60.6	62.7	64.3	22.2 %
Port services	95.2	93.8	91.5	93.9	99.3	99.8	4.8 %

NOTE: NA = Not available.

SOURCES: Fixed Assets: U.S. Bureau of Economic Analysis, Fixed Assets Accounts. Detailed data available at www.bea.gov. Labor: U.S. Bureau of Labor Statistics, Current Employment Statistics Survey, Detailed Data Files. Detailed data available at www.bls.gov.

U.S. water transportation is in a period of renewal and expansion with a 24% increase in gross output, a 22% increase in value added (gross output less intermediate inputs), a 35% increase in industry assets, and over 6,000 jobs added over the last 5 years (tables 4 and 5).

TABLE 4-3 Employment in Water Transportation and Support Services, 2001–2006

Industry segment	2001	2002	2003	2004	2005	2006	Percent change 2001-06
Water transportation	52,813	53,003	53,116	54,969	58,779	61,031	15.6
Sea, coastal, and Great Lakes transportation	33,188	32,671	32,867	34,002	37,049	38,103	14.8
Deep sea freight transportation	13,636	13,575	13,093	12,504	12,780	11,715	-14.1
Deep sea passenger transportation	4,059	4,080	4,105	4,261	4,141	4,156	2.4
Coastal and Great Lakes freight transport.	7,469	7,424	7,637	7,961	8,814	9,248	23.8
Coastal and Great Lakes passenger transport	8,023	7,592	8,032	9,276	11,314	12,984	61.8
Inland water transportation	19,625	20,332	20,249	20,968	21,731	22,927	16.8
Inland water freight transportation	16,566	16,732	16,627	17,425	18,324	19,199	15.9
Inland water passenger transportation	3,060	3,600	3,623	3,543	3,407	3,729	21.9
Support activities for water transportation	94,510	91,234	92,723	93,372	95,270	99,393	5.2
Port and harbor operations	21,293	20,388	20,559	20,723	21,482	22,788	7
Marine cargo handling	38,994	38,442	40,106	42,764	44,358	45,944	17.8
Navigational services to shipping	22,283	21,314	21,757	20,291	20,162	20,819	-6.6
Other support activities for water transport.	11,941	11,090	10,300	9,594	9,269	9,843	-17.6
Total	**147,323**	**144,237**	**145,839**	**148,341**	**154,049**	**160,424**	**8.9**

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages; available at: http://www.bls.gov as of Mar. 24, 2008.

- U.S. employment in deep sea freight declined over the 2001–2006 period.
- Between 2001 and 2006 employment in coastal and Great Lakes transportation of passengers has increased nearly 62%.

TABLE 4-4 U.S. Public Port Capital Infrastructure Expenditures, 2005

(thousands of dollars)

	On-terminal				Off-terminal				
Region	**Road**	**Rail**	**Utilities**	**Other***	**Road**	**Rail**	**Utilities**	**Other****	**Total**
North Atlantic	$45	$79,741	$7,663	$8	$3,786	0	0	0	$91,243
South Atlantic	143	2,422	782	262	3,330	0	0	0	6,939
Gulf	2,630	1,739	5,554	6,633	493	2,920	3,304	298	23,571
South Pacific	156	8,218	49	32,590	134,056	1,706	36,026	6,100	218,901
North Pacific	0	0	0	74	566	0	0	0	640
Total	**$2,974**	**$92,119**	**$14,049**	**$39,566**	**$142,231**	**$4,626**	**$39,330**	**$6,398**	**$341,293**
	2.0%	61.9%	9.4%	26.6%	73.9%	2.4%	20.4%	3.3%	
Percent		44%				56%			100%

NOTES: Totals may not add up due to rounding. *On-terminal "other" was defined by survey respondents as storm water, people mover, bridges, trucks, jet array system, and engineering/design. Several ports did not define "other" at all. **Off-terminal "other" was defined by survey respondents as barge unloaded. A number of ports did not define "other" at all. Excludes $33,658,000 in expenditures from two regions (Great Lakes and noncontiguous) that had fewer than three responses each.

SOURCE: U.S. Department of Transportation, Maritime Adminstration, Office of Policy and Plans, personal communication, Aug. 27, 2007.

TABLE 4-5 U.S. Public Port Capital Dredging Expenditures, 2005
Improvement vs. Maintenance
(thousands of dollars)

Region	Improvement	Maintenance	Total	Percent
North Atlantic	$20,862	$206	$21,069	14.00%
South Atlantic	15,765	7,339	23,103	15.40%
Gulf	6,340	7,219	13,559	9.00%
South Pacific	90,896	1,392	92,288	61.50%
North Pacific	0	4	4	0.00%
Total	**$133,863**	**$16,160**	**$150,023**	**100.00%**
Percent	89.2%	10.8%	100.0%	

NOTE: Totals may not add up due to rounding.

SOURCE: U.S. Department of Transportation, Maritime Adminstration, Office of Policy and Plans, personal communication, Aug. 27, 2007.

TABLE 4-6 U.S. Public Port Capital Expenditures by Type of Expenditure and Facility, 2005
(Thousands of dollars)

New Construction

	Type of facility							Infrastructure		Dredging			
		Special, Gen'l cargo											
Region	General cargo	Container	Ro/Ro/ auto	Dry bulk	Liquid bulk	Passenger	Other	On-terminal	Off-terminal	Improvement	Maint.	Security	Total
North Atlantic	$3,383	$50	0	0	0	$864	$2,738	$79,272	0	$20,862	0	$7,499	$114,669
South Atlantic	2,216	159,063	0	0	0	2,841	2,556	262	2,730	341	0	20,439	190,449
Gulf	36,087	36,800	5,695	5,640	426	19,811	63,214	13,332	3,218	6,331	335	21,188	212,077
South Pacific	0	265,999	81	0	0	14,625	72,913	1,353	82,355	90,896	0	5,603	533,826
North Pacific	163	12,487	0	0	0	0	11,661	74	566	0	0	181	25,132
Total	**$41,850**	**$474,399**	**$5,775**	**$5,640**	**$426**	**$38,141**	**$153,082**	**$94,293**	**$88,869**	**$118,431**	**$335**	**$54,910**	**$1,076,152**
Percent	3.9%	44.1%	0.5%	0.5%	0.0%	3.5%	14.2%	8.8%	8.3%	11.0%	0.0%	5.1%	

Modernization / Rehabilitation

	Type of facility							Infrastructure		Dredging			
		Special. Gen'l Cargo											
Region	General cargo	Container	Ro/Ro/ auto	Dry bulk	Liquid bulk	Passenger	Other	On-terminal	Off-terminal	Improvement	Maint.	Security	Total
North Atlantic	$8,843	$95,370	$10	0	0	$1,830	$1,439	$8,185	$3,786	0	$206	$25	$119,694
South Atlantic	5,658	19,728	380	404	359	2,855	2,817	3,347	600	15,423	7,339	480	59,391
Gulf	31,053	1,744	82	25	0	434	8,769	3,224	3,796	9	6,884	0	56,021
South Pacific	896	438,446	0	358	1,264	123,098	5,783	39,660	95,533	0	1,392	403	706,832
North Pacific	788	0	0	0	0	160	3,651	0	0	0	4	120	4,723
Total	**$47,239**	**$555,288**	**$472**	**$787**	**$1,623**	**$128,376**	**$22,459**	**$54,416**	**$103,715**	**$15,432**	**$15,825**	**$1,028**	**$946,661**
Percent	5.0%	58.7%	0.0%	0.1%	0.2%	13.6%	2.4%	5.7%	11.0%	1.6%	1.7%	0.1%	

NOTES: Totals may not add up due to rounding. Excludes $36,260,000 in expenditures from two regions (Great Lakes and Non-contiguous) that had fewer than three responses each.

SOURCE: U.S. Department of Transportation, Maritime Adminstration, Office of Policy and Plans, personal communication, Aug. 27, 2007.

TABLE 4-7 FY 2005 Analysis of Dredging Costs, Actual Amounts for FY 2005

	Expenditures for dredging ($ thousands)			Cubic yards dredged (thousands)		
	Federal	Non-federal	Work for others (reimburse)	Federal	Non-federal	Work for others (reimburse)
Contract (O&M, CG, MR&T)						
Maintenance:						
Hopper	$95,373.1	$1,709.8	$1,095.0	43,882.2	250.3	245.0
Nonhopper	$389,989.6	$2,084.5	$10,745.8	118,178.6	398.3	3,260.1
New work:						
Hopper	$44,201.1	$12,415.4	$0.0	8,370.8	3,060.7	0.0
Nonhopper	$182,260.1	$80,268.9	$7,150.0	21,185.8	7,051.5	1,819.0
Gov't Plant (O&M, CG, MR&T)						
Maintenance:						
Hopper	$41,615.8	$0.0	$5,433.8	14,690.1	0.0	926.5
Nonhopper	$45,537.5	$5.6	$4,013.0	23,863.2	0.6	852.0
New work:						
Hopper	$390.0	$0.0	$390.0	75.0	0.0	75.0
Nonhopper	$528.5	$0.0	$0.0	207.0	0.0	0.0
	Total PL-109-062 dollars			**Total PL-109-062 cubic yards**		
PL-109-062 Work (for Hurricane Katrina)						
Contract:						
Hopper	$2,550.0	$0.0	$0.0	435.0	0.0	0.0
Nonhopper	$2,953.0	$0.0	$0.0	847.0	0.0	0.0
Gov't plant:						
Hopper	$0.0	$0.0	$0.0	0.0	0.0	0.0
Nonhopper	$0.0	$0.0	$0.0	0.0	0.0	0.0
PL-99 Work (emergency)						
Contract:						
Hopper	$4,397.9	$0.0	$0.0	791.5	0.0	0.0
Nonhopper	$21,382.3	$0.0	$0.0	4,614.6	0.0	0.0
Gov't plant:						
Hopper	$0.0	$0.0	$0.0	0.0	0.0	0.0
Nonhopper	$0.0	$0.0	$0.0	0.0	0.0	0.0
Corpswide total	**Dollars = $956,490.7**			**Cubic yards dredged = 255,079.8**		

continued on next page

TABLE 4-7 FY 2005 Analysis of Dredging Costs, Actual Amounts for FY 2005 *(continued)*

	Dollar value	Percent	Cubic yards	Percent	Cost/CY
Total dredging for FY 2005	$956,490.7	100.00%	255,079.8	100.00%	$3.75
Total maintenance dredging for FY 2005	$597,603.5	62.48%	206,546.9	80.97%	$2.89
Total new work dredging for FY 2005	$327,604.0	34.25%	41,844.8	16.40%	$7.83
Total emergency dredging for FY 2005	$25,780.2	2.70%	5,406.1	2.12%	$4.77
Total PL 109-062 dredging for FY 2005 (for Hurricane Katrina)	$5,503.0	0.58%	1,282.0	0.50%	$4.29
Total hopper dredging for FY 2005	$209,571.9	21.91%	72,802.1	28.54%	$2.88
Maintenance	$145,227.5	15.18%	59,994.1	23.52%	$2.42
New Work	$57,396.5	6.00%	11,581.5	4.54%	$4.96
Emergency	$4,397.9	0.46%	791.5	0.31%	$5.56
PL 109-062 Katrina	$2,550.0	0.27%	435.0	0.17%	$5.86
Total nonhopper dredging for FY 2005	$746,918.8	78.09%	182,277.7	71.46%	$4.10
Maintenance	$452,376.0	47.30%	146,552.8	57.45%	$3.09
New Work	$270,207.5	28.25%	30,263.3	11.86%	$8.93
Emergency	$21,382.3	2.24%	4,614.6	1.81%	$4.63
PL 109-062 Katrina	$2,953.0	0.31%	847.0	0.33%	$3.49
Total government dredging for FY 2005	$97,914.2	10.24%	40,689.4	15.95%	$2.41
Hopper	$47,829.6	5.00%	15,766.6	6.18%	$3.03
Nonhopper	$50,084.6	5.24%	24,922.8	9.77%	$2.01
Total contract dredging for FY 2005	$858,576.5	89.76%	214,390.4	84.05%	$4.00
Hopper	$161,742.3	16.91%	57,035.5	22.36%	$2.84
Nonhopper	$696,834.2	72.85%	157,354.9	61.69%	$4.43
Total federal dredging for FY 2005	$831,178.9	86.90%	237,140.8	92.97%	$3.51
Total non-federal dredging for FY 2005	$96,484.2	10.09%	10,761.4	4.22%	$8.97
Total work for others FY 2005	$28,827.6	3.01%	7,177.6	2.81%	$4.02

KEY: CY = cubic yards; FY = fiscal year.

SOURCE: U.S. Army Corps of Engineers, Navigation Data Center, personal communication, Aug. 28, 2008.

- Dredging of sediment is carried out by the U.S. Army Corps of Engineers and U.S. port authorities.
- Sixty-two percent of total dredging in FY2005 was maintenance dredging.

Safety and Environment

Matthew Chambers

Water transportation provides economic benefits, mobility, and recreational opportunities, but it also creates unintended consequences, such as fatalities, injuries, and property damage due to accidents, and environmental damage. Hence, promoting safety and protecting the environment are key goals in the Department of Transportation's strategic plan.

This chapter offers data on the safety of commercial shipping and recreational boating and the environmental impacts associated with these activities.

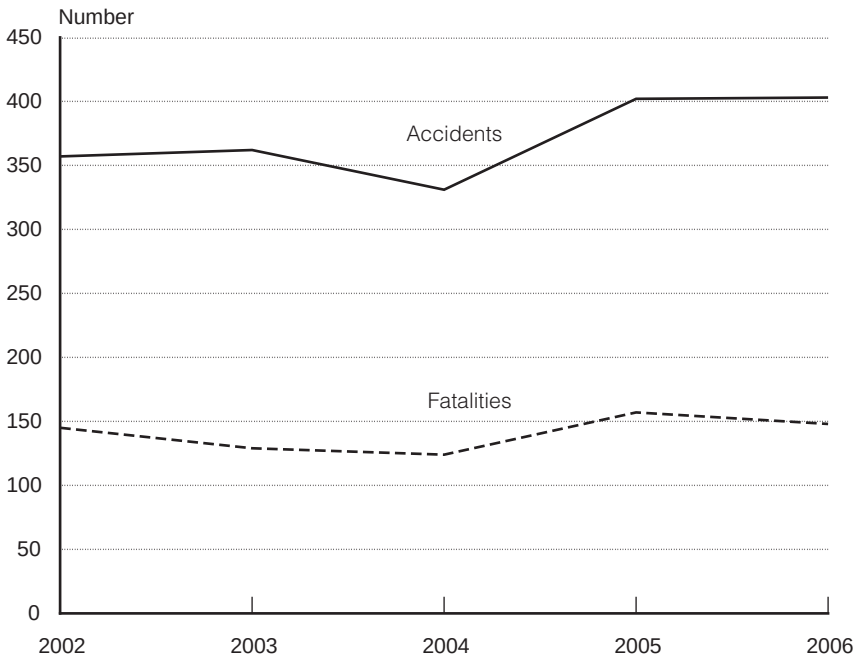
TABLE 5-1 Recreational Boating—Age of Fatality Victims and Injuries, 2006

Age of victim	Drownings	Other deaths	Total fatalities	Total injuries
12 and under	15	14	29	231
13 - 19	39	23	62	628
20 - 29	97	39	136	725
30 - 39	78	31	109	570
40 - 49	83	43	126	477
50 - 59	66	36	102	333
60 - 69	38	20	58	133
70 - 79	28	16	44	42
80 and Over	7	1	8	9
Unknown	23	13	36	326
Total	**474**	**236**	**710**	**3,474**

SOURCE: U.S. Department of Homeland Security, U.S. Coast Guard, Boating Statistics, 2006; available at: http://www.uscgboating.org as of Mar. 24, 2008.

- Most drowning victims whose ages were known were between the ages of 20 and 29, followed by the 40 to 49 age group.
- The 20 to 29 age group also had the highest number of recreational boating injuries whose ages were known, followed by the 13 to 19 age group.
- In 2006, most injuries occurred on open motorboats (1,863). Personal watercraft followed a distant second (919).

FIGURE 5-1 Alcohol Use as a Contributing Factor in Accidents, 2002–2006



SOURCE: U.S. Department of Homeland Security, U.S. Coast Guard, Boating Statistics, 2006; available at: http://www.uscgboating.org as of Mar. 24, 2008.

- Alcohol use reported as a cause of the accident implies that the use of alcohol by a boat's occupants was a cause of the accident.
- In 2006, alcohol use was either a direct or indirect contributing factor in approximately 20% of fatalities.

TABLE 5-2 Boating Accident Causes, 2006

Primary cause of accident	Accidents	Fatalities
Loading of passengers or gear	514	91
Hull failure	77	10
Machinery / machinery system failure	272	18
Equipment / equipment system failure	141	9
Operation of vessel	2,867	336
Environment	621	108
Ignition of spilled fuel or vapor	36	0
Other	166	42
Unknown	273	96
Total	**4,967**	**710**

SOURCE: U.S. Department of Homeland Security, U.S. Coast Guard, Boating Statistics, 2006; available at: http://www.uscgboating.org as of Mar. 24, 2008.

- Overall, carelessness/reckless operation, operator inattention, excessive speed, and operator inexperience are the leading contributing factors of all reported accidents. The contributing factors of accidents are subcategories that fall under the "Loading of passengers or gear" category in the above chart.
- Approximately 70% of all reported fatalities occurred on boats where the operator had not received boating safety instruction.

TABLE 5-3 Personal Flotation Devices (PFDs) and Drownings in Recreational Boating Accidents, 2006

	PFD status		Total
Cause of death	**Worn**	**Not worn**	**fatalities**
Carbon monoxide poisoning	0	12	12
Drowning	51	423	474
Hypothermia	6	9	15
Other	11	20	31
Cardiac arrest	5	13	18
Trauma	49	81	130
Unknown	4	26	30
Total	**126**	**584**	**710**

SOURCE: U.S. Department of Homeland Security, U.S. Coast Guard, Boating Statistics, 2006; available at: http://www.uscgboating.org as of Mar. 24, 2008.

- Approximately 70% of all fatal boating accident victims drowned (474 out of 692). Moreover, 89% of the victims who drowned were not wearing their personal flotation device (PFD or lifejacket), up from 86% in 2000 and 88% in 2005.

TABLE 5-4 Recreational Boating Accidents, Fatalities, and Injuries, 2006

Type of accident	Total	Fatalities	Injuries	Property damage
Collision with vessel	1,360	75	1,001	$9,527,059
Collision with fixed object	517	47	391	$5,073,039
Skier mishap	510	12	514	$1,803
Fall overboard	485	202	306	$363,915
Capsizing	455	215	237	$1,744,198
Grounding	252	12	165	$2,797,198
Flooding/swamping	216	26	54	$2,095,852
Fall in boat	199	4	221	$88,225
Collision with floating object	142	8	86	$1,252,054
Fire/explosion (fuel)	141	1	66	$6,022,964
Sinking	114	13	21	$2,657,135
Struck by motor/propeller	107	8	98	$19,300
Other type of accident	101	10	72	$168,337
Struck submerged object	86	2	30	$552,459
Struck by boat	66	1	68	$21,402
Fire/explosion (other)	63	1	14	$10,693,811
Ejected from vessel	40	13	33	$463,573
Departed vesssel—swimming	36	31	6	$0
Fall on boat	29	1	29	$7,050
Unknown	23	12	8	$21,550
Carbon monoxide exposure	18	12	51	$99,500
Departed vessel—retrieval	4	3	1	$0
Departed vessel	3	1	2	$0
Total	**4,967**	**710**	**3,474**	**$43,670,424**

NOTES: These data do not include: 1) accidents involving ONLY slight injury not requiring medical treatment beyond first aid; 2) accidents involving ONLY property damage to vessels and other property less than $ 2,000 per accident; 3) accidents not caused or contributed to by a vessel, its equipment, or its appendages; and 4) accidents in which the boat was used SOLELY as a platform for other activities, such as swimming or skin diving.

SOURCE: U.S. Department of Homeland Security, U.S. Coast Guard, Boating Statistics, 2006; available at: http://www.uscgboating.org as of Mar. 24, 2008.

- Capsizing was the most frequent accident type associated with recreational boating fatalities in 2006, followed by falls overboard. Collision with another vessel was a distant third.
- In 2006, recreational boating accidents caused more than $43 million worth of property damage. Fuel and nonrelated fire/explosion, collision with other vessels, and collision with fixed object lead the incidents in terms of the value property damage.

TABLE 5-5 Recreational Boating Accidents by Body of Water, 2006

	Accidents	Fatalities
Ocean/Gulf	315	44
Great Lakes (not tributaries)	82	17
Bays, inlets, sounds, harbors	729	64
Rivers, streams, creeks	1,160	221
Lakes, ponds, reservoirs, dams, gravel pits	2,478	326
Other/Not reported	203	38
Totals	**4,967**	**710**

SOURCE: U.S. Department of Homeland Security, U.S. Coast Guard, Boating Statistics, 2006; available at: http://www.uscgboating.org as of Mar. 24, 2008.

- Calm water conditions, light and moderate winds, good daytime visibility, and water temperature between 70 and 89 degrees are the weather and water conditions tied to the highest number of accidents.
- Approximately 63% of recreational boating fatalities occur in the daytime in good visibility.

TABLE 5-6 Commercial Vessel--Spills from Facilities and Vessels by Type (Volume >10,000 GALLONS), 2002-2005

	Facility							
Pollution substances count as values	Fixed platform	Non-marine facility/ location	Pipeline	Unspecified	Waterfront facility	Facility	Mystery spill	Other
2002	1	0	0	1	3	5	2	0
2003	1	0	0	0	1	2	1	1
2004	0	0	0	1	0	1	1	1
2005	0	1	1	0	8	10	0	0

	Vessel							
Pollution substances count as values	Commercial fishing vessel	Freight ship	Mobile offshore drilling unit	Offshore supply vessel	Tank barge	Tank ship	Towing vessel	Vessel
2002	0	1	0	0	3	0	0	4
2003	0	0	0	0	3	0	0	3
2004	0	2	0	1	2	6	0	11
2005	0	0	0	0	5	0	1	6

NOTE: Does not include legacy data.

SOURCE: U.S. Department of Homeland Security, U.S. Coast Guard, Personal communication, Sept. 7, 2006.

- Most spills occur on waterfront facilities.
- Tank barges are the source for most spills from vessels

TABLE 5-7 Volume of Oil Discharges (>10,000 GALLONS), 2002-2005

Discharge amount—water as values	Facility								
	Fixed platform	Non-Marine facility/location	Pipeline	Unspecified	Waterfront facility	Facility	Mystery spill	Other	All subject types
2002	42,000.0	0.0	0.0	75,600.0	95,340.0	212,940.0	80,526.0	0.0	435,091.0
2003	18,900.0	0.0	0.0	0.0	14,952.0	33,852.0	55,125.0	41,790.0	208,005.0
2004	0.0	0.0	0.0	15,000.0	0.0	15,000.0	1,302,000.0	12,000.0	2,526,446.1
2005	0.0	138,810.0	110,000.0	0.0	7,453,530.0	7,702,340.0	0.0	0.0	14,407,410.0

Discharge amount—water as values	Vessel							
	Commercial fishing vessel	Freight ship	Mobile offshore drilling unit	Offshore supply vessel	Tank barge	Tank ship	Towing vessel	Vessel
2002	0.0	12,500.0	0.0	0.0	129,125.0	0.0	0.0	141,625.0
2003	0.0	0.0	0.0	0.0	77,238.0	0.0	0.0	77,238.0
2004	0.0	335,732.0	0.0	20,000.0	209,235.6	632,478.5	0.0	1,197,446.1
2005	0.0	0.0	0.0	0.0	6,693,012.0	0.0	12,058.0	6,705,070.0

NOTE: Does not include legacy data. U.S. Department of Homeland Security, U.S. Coast Guard, personal communications, Sept. 7, 2006.

SOURCE: U.S. Department of Homeland security, U.S. Coast Guard, Personal Communication, Sept. 7, 2006.

- For 2005, most oil discharges occurred at waterfront facilities in terms of volume.
- For 2005, tank barges accounted for almost all the oil discharge in terms of volume.

TABLE 5-8 Commercial Vessel—Waterborne Transport Safety Data and Property Damage Resulting from Vessel Casualties

	2002	2003	2004	2005	2006
Deaths	61	58	53	64	64
Injuries	182	263	233	169	348
Accidents	3,658	3,250	3,232	3,189	3,675
Vessels involved	6,263	5,232	6,330	7,974	7,896
Property damage to vessels	$334,741,172	$126,709,033	$151,717,872	$170,192,689	$127,363,573

SOURCE: U.S. Department of Homeland Security, U.S. Coast Guard, Office of Information Resources, Data Division, as of September 2006.

NOTES: Fatalities include the number of people who died or were declared missing as the result of a marine casualty. Data in this table include only vessel related marine casualties verified as reportable under 46 Code of Federal Regulations 4.05. Data include incidents involving both U.S. and foreign-flag vessels in U.S. waters, but only incidents involving U.S. flag vessels outside U.S. waters. Incidents involving only a pollution release or personal injury without vessel involvement are not included. More than one vessel may be involved in a single marine casualty. Injuries and deaths resulting from existing medical condition, assault, homicide, suicide or self-inflicted injuries are not included. Incidents involving natural disasters are not included.

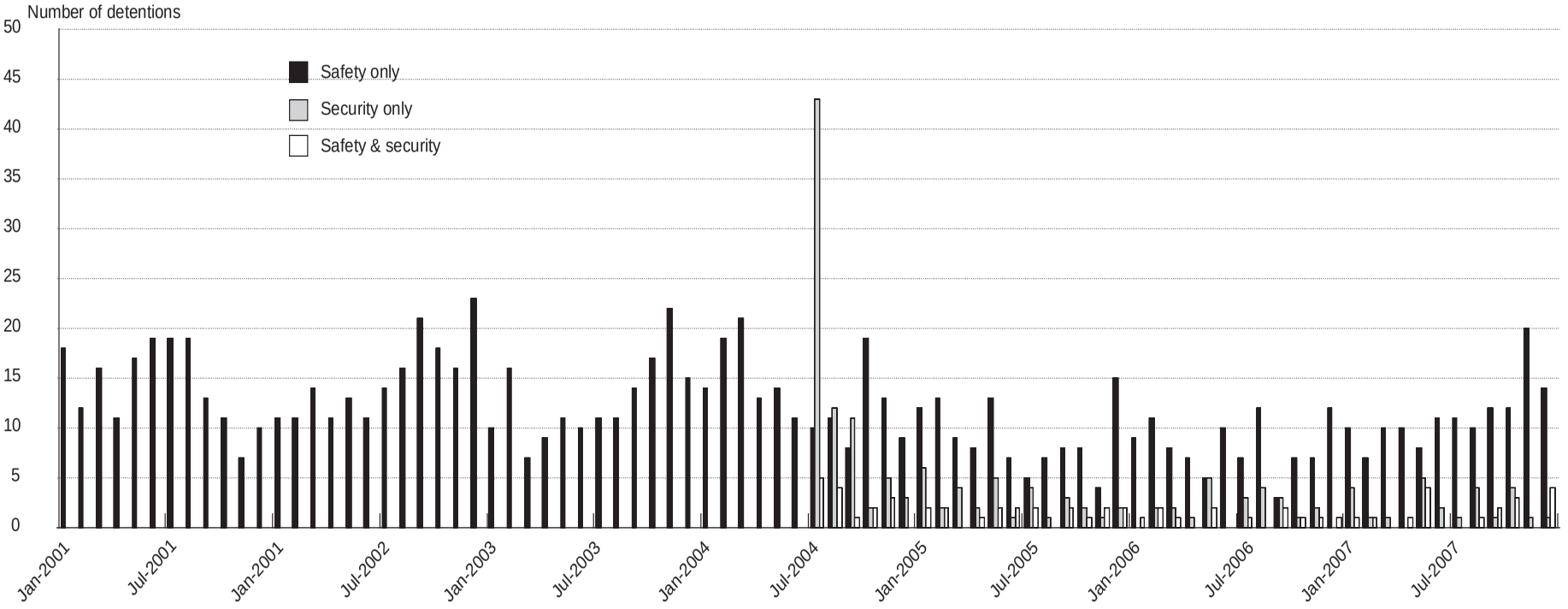
- Marine accidents result in loss of life, injuries, and millions of dollars in property damage.

National Security

U.S. Department of Homeland Security, U.S. Coast Guard

This chapter provides data and information on major U.S. maritime National Security operations programs administered by the Department of Homeland Security's U.S. Coast Guard and the Department of Transportation's Maritime Administration.

FIGURE 6-1 U.S. Coast Guard Detentions, 2001 to 2005



SOURCE: U.S. Department of Homeland Security, U.S. Coast Guard, *Port State Control in the United States, Annual Report 2005*.

- Until July 1, 2004, Coast Guard detentions were primarily for safety regulations. After July, 2004, the Maritime Transportation Security Act of 2002 extended Coast Guard enforcement to security and safety regulations. Once extended enforcement began, overall deficiencies decreased for both safety- and security-related issues.

TABLE 6-1 Safety Compliance Performance Statistics by Flag State & Safety Detentions

Flag State	Safety exams	Distinct arrivals	Safety detentions	2004-2006 Detention ratio
Panama	2,112	1,666	22	1.99%
Liberia	1,067	881	11	1.12%
Malta	429	379	11	2.95%
Bahamas	858	622	7	1.20%
Marshall Islands	605	492	6	0.75%
Saint Vincent and the Grenadines	128	66	6	14.29%
Cyprus	413	356	5	2.35%
Singapore	360	296	5	1.81%
Antigua & Barbuda	367	271	4	2.46%
Hong Kong	434	436	3	0.60%
Italy	129	108	2	2.68%
Denmark	96	90	2	2.10%
Turkey	57	57	2	1.64%
Thailand	41	44	2	2.33%
Mexico	28	22	2	7.32%
Cambodia	6	4	2	100.00%
Norway	415	300	1	1.13%
Greece	364	350	1	0.96%
Netherlands	210	149	1	1.28%
United Kingdom	186	163	1	0.86%
Germany	150	138	1	1.12%
Isle of Man	132	121	1	1.14%
China	121	122	1	0.90%
Cayman Islands	106	81	1	0.42%
Vanuatu	94	63	1	1.31%
Republic of Korea	92	76	1	0.55%
Philippines	80	78	1	0.82%
Netherlands Antilles	69	51	1	3.50%
Canada	60	64	1	0.46%
Russian Federation	53	40	1	5.63%
Honduras	44	15	1	21.21%
Lithuania	39	21	1	2.04%
Croatia	26	27	1	4.41%
Egypt	11	8	1	8.00%
Other	754	521	0	
Total	**10,136**	**8,178**	**110**	**1.78%**

SOURCE: U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration (RITA), Bureau of Transportation Statistics (BTS), derrived from data contained in the Department of Homeland Security, U.S. Coast Guard, *Port State Control in the United States, Annual Report 2006.*

- In 2006, the overall Flag State performance improved in terms of detentions, decreasing from 127 to 110, and the 3-year rolling average detention ratio decreased from 2.00% to 1.78%. The Panamanian, Liberian, and Maltese flags had the most safety-related detentions. However, their detention ratios were about average given the size of their registries. Thirty-four Flag States had one or more detentions. Of the State Flags subject to detentions this year, Cambodia, Honduras, Saint Vincent, and the Grenadines had the highest 3-year detention ratios.

TABLE 6-2 Security Compliance Performance Statistics by Flag State & ISPS Major Control Action

Flag State	Security exams	Distinct arrival	ISPS Major Control Action	Rolling average control action ratio
Panama	1,810	1,666	9	1.07%
Antigua and Barbuda	354	271	3	1.27%
Liberia	1,007	881	3	0.42%
Bahamas	734	622	2	0.49%
Cyprus	384	356	2	0.90%
Malta	401	379	2	0.87%
Marshall Islands	560	492	2	0.51%
Netherlands	203	149	2	1.81%
Bermuda	96	66	1	0.65%
Bulgaria	10	15	1	2.56%
Cambodia	5	4	1	42.86%
Croatia	24	27	1	1.56%
Denmark	83	90	1	1.50%
Hong Kong	430	436	1	0.54%
Netherlands Antilles	71	51	1	0.82%
Portugal	24	14	1	4.00%
Thailand	43	44	1	2.48%
Vanuatu	64	63	1	0.65%
Other	2,750	2,552	0	
Total	**9,053**	**8,178**	**35**	**0.80%**

SOURCE: U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration (RITA), Bureau of Transportation Statistics (BTS), derrived from data contained in the Department of Homeland Security, U.S. Coast Guard, *Port State Control in the United States, Annual Report 2006.*

- A Major Control Action (MCA) occurs when a vessel is detained, denied entry, or expelled for violating the International Ship and Port Facility Security Code (ISPS) or the Maritime Transportation Security Act of 2002 (MTSA). In 2006, the overall Flag State performance improved in terms of MCAs, decreasing from 51 to 35, and the rolling average control action ratio, decreasing from 0.89% to 0.80%. The Panamanian, Liberian, and Bahamian flags had the most MCAs. However, their rolling average control action ratios were slightly above average—Panama, or below average—Liberia and the Bahamas. Eighteen Flag States had one or more MCAs.

TABLE 6-3 Voluntary Intermodal Sealift Agreement, FY 2007 Participants

1 AAA Shipping No. 1, LLC	27 Lockwood Brothers, Inc.
2 A Way To Move, Inc.	28 Lynden Inc.
3 America Cargo Transport, Inc.	29 Maersk Line, Ltd.*
4 American President Lines, Ltd.	30 Marine Transport Management
5 American Roll-On Roll-Off Carrier, LLC	31 Matson Navigation Co., Inc.
6 American Shipping Group	32 Maybank Shipping Co., Inc.
7 APL Marine Services, Ltd.*	33 McAllister Towing and Transportation Co., Inc.
8 APL Maritime Ltd	34 Northland Services, Inc.
9 Beyel Brothers Inc.	35 OSG Car Carriers, Inc.*
10 Canal Barge Co., Inc.	36 Pasha Hawaii Transport Lines LLC
11 Central Gulf Lines, Inc.*	37 Patriot Shipping, L.L.C.*
12 Cherokee Nation Distributors	38 Patriot Titan LLC*
13 Coastal Transportation, Inc.	39 Red River Holdings LLC
14 Columbia Coastal Transport, LLC	40 Resolve Towing & Salvage, Inc.
15 CRC Marine Services, Inc.	41 Samson Tug & Barge Co., Inc.
16 Crowley Liner Services, Inc.	42 SeaTac Marine Services, LLC
17 Crowley Marine Services, Inc.	43 Sealift Inc.
18 Farrell Lines Inc.*	44 Signet Maritime Corp.
19 Fidelio Limited Partnership*	45 Smith Maritime
20 Foss Maritime Co.	46 Stevens Towing Co., Inc.
21 Hapag-Lloyd USA, LLC*	47 Strong Vessel Operators LLC
22 Horizon Lines LLC	48 Superior Marine Services, Inc.
23 Laborde Marine Lifts, Inc.	49 Trailer Bridge, Inc.
24 Laborde Marine, LLC	50 TransAtlantic Lines LLC
25 Liberty Global Logistics, LLC*	51 Troika International, Ltd.
26 Liberty Shipping Group Limited Partnership	

* Denotes Maritime Security Program operators

SOURCE: U.S. Department of Transportation, Maritime Administration, Office of Sealift Support, 2007

TABLE 6-4 Security Deficiencies Associated with Major Control Actions by Category

Access control	28
Restricted areas	14
Ship security officer	10
Ship security plan	4
Screening process	4
Logs/records	3
Communications	3
Training	2
Shipboard personnel	2
Response procedures	1
Drills	1
Other (ISPS/security related deficiencies)	1
Number of Security Deficiencies Associated with Major Control Actions	**73**

Major Control Actions by Vessel Type	
Bulk carrier	14
Containership	6
General dry cargo ship	6
Roll-on/Roll-off-cargo ship	3
Refrigerated cargo carrier	2
Chemical tankship	1
Oil tankship	1
Supply ship	1
Towboat/tug	1
Number of Major Control Actions	**35**

NOTES: A Major Control Action (MCA) occurs when a vessel is detained, denied entry, or expelled for violating International Ship and Port Facility Security Code (ISPS) or Maritime Transportation Security Act of 2002 (MTSA).

SOURCE: Department of Homeland Security, U.S. Coast Guard, Port State Control in the United States, Annual Report 2006

TABLE 6-5 Transportation Worker Identification Credential Program (TWIC)

As of date	Pre-enrollments (cumulative)	Enrollments (cumulative)
1/10/2008	100,518	43,069
1/17/2008	108,766	48,873
1/24/2008	122,490	58,719
1/31/2008	135,466	69,155
2/7/2008	148,064	78,387
2/14/2008	161,662	91,447
2/21/2008	175,875	104,649
2/28/2008	190,447	120,148
3/6/2008	209,265	138,197
3/13/2008	226,314	154,043
3/20/2008	242,876	170,472
3/27/2008	258,197	185,213
4/4/2008	276,919	203,984
4/18/2008	304,238	230,273
4/24/2008	318,739	244,470
5/1/2008	336,446	260,608
5/8/2008	353,187	277,176
5/15/2008	366,267	292,487
5/23/2008	379,574	309,472
5/29/2008	385,969	317,199
6/6/2008	397,350	331,042
6/12/2008	404,555	339,661
6/19/2008	412,527	350,115
6/26/2008	421,218	361,306
7/3/2008	429,255	371,949
7/10/2008	435,754	380,348

As of the week of 7/14/08:	
TWIC cards printed	331,588
TWIC cards activated	199,254
Average enrollment time	9 mins
Enrollment centers	140

SOURCE: U.S. Department of Homeland Security, Transportation Security Administration, personal communication, July 15, 2008.

Transportation Worker Identification Credential Program (TWIC) is a common identification credential for all personnel requiring unescorted access to secure areas of facilities and vessels regulated by the Maritime Transportation Security Act (MTSA) and all mariners holding Coast Guard-issued credentials. The Transportation Security Administration (TSA) will issue workers a tamper-resistant "smart card" containing the worker's biometric (fingerprint template) to allow for a positive link between the card itself and the individual.

The enrollment process consists of the following components: optional pre-enrollment, in-person enrollment, security threat assessment and notification of the results, and issuance of the TWIC to the applicant. The security threat assessment includes checks against criminal history records, terrorist watch lists, and immigration status.

Applicants may pre-enroll online to enter all of the biographic information required for the threat assessment and make an appointment at the enrollment center to complete the process (although appointments are not required). Then, applicants must visit the enrollment center where they will pay the enrollment fee, complete a TWIC Application Disclosure Form, provide biographic information and a complete set of fingerprints, and sit for a digital photograph. The applicant must bring identity verification documents to enrollment and non-U.S. citizen applicants must also bring documentation to verify that they meet the immigration status requirements. These documents are scanned into the electronic enrollment record. There are plans to have 147 enrollment centers nationwide, as well as employer-sponsored mobile enrollment capabilities deployed on a case-by-case basis. The applicant will be notified by email or phone, as specified during enrollment, when his/her credential is available at the enrollment center. The applicant must return to the same enrollment center to pick up his/her TWIC.

For additional information, please visit http://www.tsa.gov/twic.

Shipbuilding Section

U.S. Navy, Airman Konstandinos Goumenidis

The shipbuilding industry in the United States supports both military and commercial interests. The data in this chapter portray U.S. shipbuilding and repair activities and the world orderbook.

TABLE 7-1 U.S. Private Shipyards Major Shipbuilding and Repair Base (78)

East Coast

Active shipbuilding yards (4)

Aker Philadelphia Shipyard—Philadelphia, PA Bath Iron Works Corp.—Bath, ME Electric Boat Corp.—Groton, CT Northrop Grumman Newport News—Newport News, VA

Other shipyards with building positions (1)

Atlantic Dry Dock Corp.—Jacksonville, FL

Repair yards with drydock facilities (11)

BAE Systems Norfolk Ship Repair, Inc.—Norfolk, VA Bayonne Dry Dock & Repair Corp.—Bayonne, NJ Boston Ship Repair, Inc.—Boston, MA Caddell Dry Dock & Repair Co., Inc.—Staten Island, NY Colonna's Shipyard, Inc.—Norfolk, VA Detyens Shipyards, Inc., Main Yard—North Charleston, SC Detyens Shipyards, Inc., Wando Division—Mt. Pleasant, SC GMD Shipyard Corp.—Brooklyn, NY Metro Machine Corp.—Norfolk, VA Norfolk Shiprepair & Drydock Corp.—Norfolk, VA North Florida Shipyard, Inc.—Jacksonville, FL

Topside repair yards (10)

Associated Naval Architects, Inc.—Portsmouth, VA Earl Industries, LLC—Portsmouth, VA Kerney Service Group, Inc.—Norfolk, VA Marine Hydraulics Int., Inc.—Norfolk, VA Metal Trades, Inc.—Hollywood, SC Newport Shipyard Co., LLC—Newport, RI Promet Marine Services Corp.—Providence, RI Steel Style, Inc.—Newburgh, NY The General Ship Repair Corp.—Baltimore, MD The Hinckley Co.—Portsmouth, RI

East Coast Total = 26 yards

Gulf Coast

Active shipbuilding yards (4)

Bender Shipbuilding and Repair Co., Inc.—Mobile, AL Northrop Grumman Ship Systems, Avondale Operations—Avondale, LA Northrop Grumman Ship Systems, Ingalls Operations—Pascagoula, MS VT Halter Marine—Pascagoula Operations—Pascagoula, MS

Other shipyards with building positions (7)

Alabama Shipyard—Mobile, AL Austal USA—Mobile, AL Keppel AmFELS, Inc.—Brownsville, TX Signal Int., LLC—East Yard—Pascagoula, MS Tampa Bay Shipbuilding & Repair Co.—Tampa, FL United Marine Shipyard, Inc., Port Arthur Shipyard—Beaumont, TX VT Halter Marine—Halter Moss Point Operations—Moss Point, MS

Repair yards with drydock facilities (5)

Atlantic Marine—Mobile—Mobile, AL Bollinger Gulf Repair, LLC—New Orleans, LA Gulf Marine Repair Corp.—Tampa, FL Int. Ship Repair & Marine Services, Inc.—Tampa, FL Signal Int. Texas, LP—D.O.C. Yard—Port Arthur, TX

Topside repair yards (12)

Boland Marine & Mfg. Co., Inc.—New Orleans, LA Bollinger Algiers, LLC—New Orleans, LA Bollinger Calcasieu, LLC—Sulphur, LA Bollinger Lockport, LLC—Lockport, LA Bollinger Texas City, L.P.—Texas City, TX Buck Kreihs Co., Inc.—New Orleans, LA CBH Services, Inc.—Orange, TX Dixie Machine Welding & Metal Works, Inc.—New Orleans, LA Gulf Copper & Manufacturing Corp.—Port Arthur, TX Orange Shipbuilding Co., Inc.—Orange, TX PPL Marine—Sabine Pass, TX Signal Int. Texas, LP—Orange Yard—Orange, TX

Gulf Coast Total = 28 yards

continued on next page

TABLE 7-1 U.S. Private Shipyards Major Shipbuilding and Repair Base (78) *(continued)*

West Coast

Active shipbuilding yards (1)

General Dynamics NASSCO—San Diego, CA

Other shipyards with building positions (1)

Gunderson, Inc.—Portland, OR

Repair yards with drydock facilities (6)

BAE Systems San Diego Ship Repair, Inc.—San Diego, CA BAE Systems San Francisco Ship Repair—San Francisco, CA Cascade General, Inc.—Portland, OR Lake Union Drydock Co.—Seattle, WA Puglia Engineering, Inc. dba Fairhaven Shipyard—Bellingham, WA Todd Pacific Shipyards Corp.—Seattle, WA

Topside repair yards (6)

Bay Marine Boatworks, Inc.—Richmond, CA Bay Ship & Yacht Co., Alameda—Alameda, CA Continental Maritime of San Diego, Inc.—San Diego, CA Dakota Creek Industries, Inc.—Anacortes, WA Everett Shipyard, Inc.—Everett, WA Foss Shipyard dba Foss Maritime Co.—Seattle, WA

West Coast Total = 14 yards

Great Lakes

Other shipyards with building positions (5)

Bay Shipbuilding Co.—Sturgeon Bay, WI Erie Shipbulding, LLC—Erie, PA Fraser Shipyards, Inc.—Superior, WI Ironhead Marine, Inc.—Toledo, OH Marinette Marine Corp.—Marinette, WI

Topside repair yards (2)

H. Hansen Industries—Toledo, OH Nicholson Terminal & Dock Co.—River Rouge, MI

Great Lakes Total = 7 yards

Non-Conus

Repair yards with drydock facilities (3)

Alaska Ship & Drydock, Inc.—Ketchikan, AK Guam Shipyard—Santa Rita, Guam Pacific Shipyards Int.—Honolulu, HI

Non-Conus Total = 3 yards

SOURCE: U.S. DOT, Maritime Administration, Office of Shipbuilding and Repair, 2007.

TABLE 7-2 World Orderbook Summary, Dec. 30, 2006

Leading countries	Total			
	Number	Gross tons	Percentage of gross tonnage	Ranking
Korea (South)	1,413	77,265,016	36.991%	1
Japan	1,313	56,933,128	27.257%	2
China (Peoples Republic)	1,650	44,777,712	21.438%	3
Germany	199	4,150,951	1.987%	4
China (Republic of Taiwan)	58	2,377,552	1.138%	5
Poland	116	2,322,109	1.112%	6
Italy	96	2,174,834	1.041%	7
Vietnam	122	2,122,620	1.016%	8
Philippines	60	1,896,408	0.908%	9
Croatia	61	1,878,714	0.899%	10
Romania	127	1,680,998	0.805%	11
Turkey	247	1,615,337	0.773%	12
Denmark	11	1,423,970	0.682%	13
France	15	851,410	0.408%	14
Finland	11	850,527	0.407%	15
India	148	779,747	0.373%	16
Spain	143	744,265	0.356%	17
Russia	79	726,684	0.348%	18
United States	126	724,339	0.347%	19
Netherlands	232	621,549	0.298%	20
Ukraine	54	476,957	0.228%	21
Indonesia	91	462,402	0.221%	22
Iran	21	375,481	0.180%	23
Norway	81	347,406	0.166%	24
Singapore	77	259,442	0.124%	25
Bulgaria	31	207,843	0.100%	26
Brazil	31	189,144	0.091%	27
Argentina	11	143,441	0.069%	28
Slovakia	36	84,792	0.041%	29
Malaysia	94	68,883	0.033%	30
Portugal	9	60,201	0.029%	31
Canada	12	39,914	0.019%	32
Australia	13	32,712	0.016%	33
Sweden	4	27,480	0.013%	34
Czech Republic	11	25,396	0.012%	35
United Arab Emirates	16	20,163	0.010%	36
Greece	2	16,998	0.008%	37
Chile	7	13,624	0.007%	38
Thailand	6	13,456	0.006%	39
Egypt	14	12,865	0.006%	40

continued on next page

TABLE 7-2 World Orderbook Summary, Dec. 30, 2006 *(continued)*

Leading countries	Total			
	Number	Gross tons	Percentage of gross tonnage	Ranking
Lithuania	6	9,806	0.005%	43
Yugoslavia	3	8,995	0.004%	44
Latvia	5	8,150	0.004%	45
Serbia	1	6,300	0.003%	46
Peru	14	6,260	0.003%	47
Sri Lanka	5	4,300	0.002%	48
Saudi Arabia	2	3,242	0.002%	49
Bangladesh	3	2,930	0.001%	50
United Kingdom	4	1,648	0.001%	51
Mexico	2	1,436	0.001%	52
Hong Kong	2	740	0.000%	53
New Zealand	1	568	0.000%	54
South Africa	1	530	0.000%	55
Syria	1	233	0.000%	56
Total (all countries)	**6,908**	**208,875,004**	**100.00%**	

SOURCE: Lloyds World Shipbuilding Statistics.

TABLE 7-3 World Merchant Fleet, 10,000 Deadweight Tons and Above by Top 25 Flag and Type, 2006

		Tanker		Dry bulk		Containership			Roll-on/Roll-off		General Cargo		Total	
	Flag of Registry	**No.**	**DWT**	**No.**	**DWT**	**No.**	**TEU**	**DWT**	**No.**	**DWT**	**No.**	**DWT**	**No.**	**DWT**
1	Panama	672	61,267,978	1,718	112,676,858	541	1,601,251	22,132,290	244	3,852,650	240	3,507,351	3,415	203,437,127
2	Liberia	565	50,608,159	331	19,936,853	415	1,253,420	16,727,439	37	565,767	62	994,530	1,410	88,832,748
3	Greece	235	30,139,575	269	19,437,133	44	159,450	2,215,783	1	10,270	6	97,195	555	51,899,956
4	Hong Kong	87	11,426,647	496	32,532,381	81	272,804	3,636,167	5	83,780	52	1,060,788	721	48,739,763
5	Bahamas	235	26,413,600	319	16,175,530	68	190,795	2,692,249	30	609,661	77	1,020,756	729	46,911,796
6	Marshall Is.	335	31,943,749	153	9,264,175	118	293,241	3,860,304	5	77,182	32	903,724	643	46,049,134
7	Singapore	289	26,223,289	180	12,336,140	177	352,390	5,029,292	30	586,127	23	457,200	699	44,632,048
8	Malta	185	13,370,377	438	19,482,921	48	85,324	1,311,048	8	94,947	66	1,094,436	745	35,353,729
9	Cyprus	93	6,241,801	373	18,742,535	139	285,967	3,910,717	6	96,956	85	1,461,497	696	30,453,506
10	China P.R.	127	6,333,829	372	14,551,392	87	229,053	3,224,260	7	95,225	210	3,291,531	803	27,496,237
11	Norwegian Int'l	215	10,578,951	104	7,222,535	1	2,835	33,855	48	1,025,810	2	22,140	370	18,883,291
12	Isle of Man	112	8,828,365	42	3,466,291	15	38,315	549,409	0	0	8	133,232	177	12,977,297
13	United States	93	5,418,247	62	2,391,658	75	226,185	3,065,859	55	1,386,308	8	186,473	293	12,448,545
14	India	118	8,704,380	76	3,575,699	4	6,233	99,612	0	0	3	61,020	201	12,440,711
15	Germany	18	659,091	5	502,546	248	825,787	10,896,410	3	36,200	3	53,316	277	12,147,563
16	Italy	125	5,109,928	40	3,126,922	25	67,811	926,928	52	977,020	6	69,787	248	10,210,585
17	South Korea	10	571,390	122	8,313,809	35	78,868	1,125,888	3	67,559	7	102,512	177	10,181,158
18	Japan	48	5,310,415	48	3,961,802	11	35,180	518,994	15	227,094	1	10,756	123	10,029,061
19	Iran	35	6,170,089	40	1,789,317	11	30,748	408,942	0	0	32	654,009	118	9,022,357
20	United Kingdom	53	2,105,500	21	1,587,552	104	350,641	4,609,620	20	289,489	10	148,245	208	8,740,406
21	Danish Int'l	41	2,680,880	4	321,829	78	380,913	5,473,985	4	41,299	7	101,085	134	8,619,078
22	St. Vincent & G.	12	620,961	119	5,106,973	4	3,374	50,173	2	40,929	79	1,522,081	216	7,341,117
23	Belgium	22	4,308,245	16	2,285,998	5	11,186	161,820	0	0	0	0	43	6,756,063
24	Bermuda	23	2,121,524	26	3,626,865	19	41,961	620,046	2	28,015	15	187,772	85	6,584,222
25	Malaysia	65	4,811,853	24	856,210	27	43,827	660,157	1	11,179	5	73,485	122	6,412,884
	Top 25 registries	**3,813**	**331,968,823**	**5,398**	**323,271,924**	**2,380**	**6,867,559**	**93,941,247**	**578**	**10,203,467**	**1,039**	**17,214,921**	**13,208**	**776,600,382**
	All registries	**4,457**	**368,119,651**	**6,327**	**357,806,857**	**2,837**	**7,748,373**	**106,234,517**	**703**	**12,427,776**	**1,495**	**24,144,412**	**15,819**	**868,733,213**
	Top 25 % of total	**85.6%**	**90.2%**	**85.3%**	**90.3%**	**83.9%**	**88.6%**	**88.4%**	**82.2%**	**82.1%**	**69.5%**	**71.3%**	**83.5%**	**89.4%**

KEY: DWT = deadweight ton; TEU = twenty-foot equivalent unit.

SOURCE: Clarkson Research Studies, Vessel Registers, London: Clarkson Shipbrokers.

- Panama and Liberia have open registry fleets. An open registry is type of registry offered by a country to foreign nationals or corporations that provides favorable tax, regulatory, and other incentives.
- The United States ranks 13th in terms of flag of registry. Thirty-two percent of the U.S.-flag are tankers while 26% are containerships.

TABLE 7-4 World Merchant Fleet, 10,000 Deadweight Tons and Above by Top 25 Country of Owner and Type, 2006

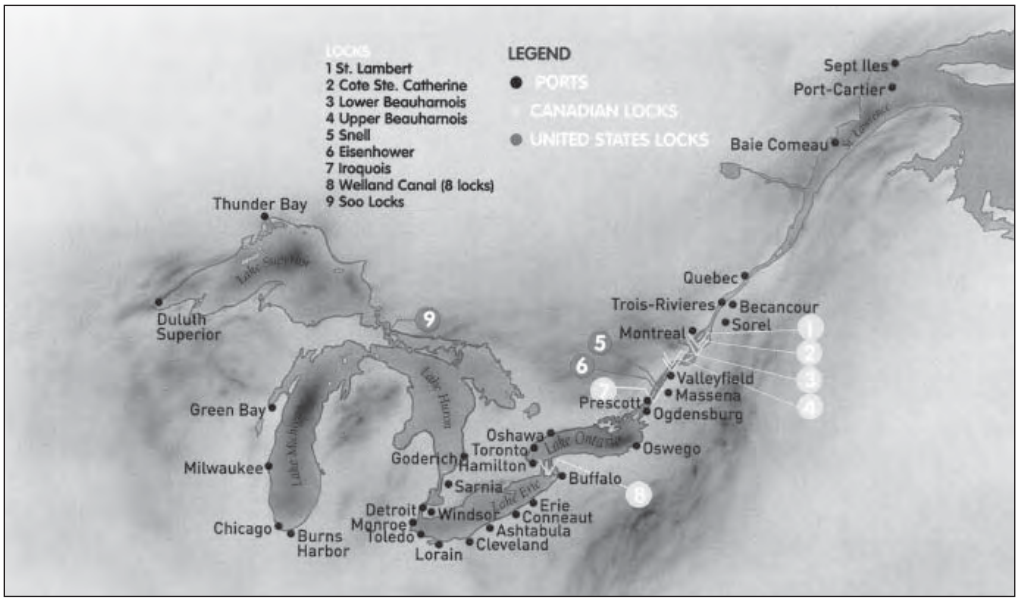
		Tanker		Dry bulk		Containership			Roll on/Roll off		General cargo		Total	
	Country Owner	**No.**	**DWT**	**No.**	**DWT**	**No.**	**TEU**	**DWT**	**No.**	**DWT**	**No.**	**DWT**	**No.**	**DWT**
1	Greece	759	71,854,799	1,346	77,970,940	157	426,150	6,177,452	19	303,732	148	2,329,651	2,429	158,636,574
2	Japan	472	45,729,398	1,041	75,233,695	209	652,976	8,953,126	251	3,923,119	86	1,147,608	2,059	134,986,946
3	China P.R.	203	16,444,797	985	51,978,278	198	587,090	8,068,427	10	140,797	342	5,976,615	1,738	82,608,914
4	Germany	136	7,488,584	188	11,207,987	978	2,616,827	34,673,539	5	88,722	105	1,948,837	1,412	55,407,669
5	United States	322	26,029,195	209	10,759,166	53	129,200	1,782,273	69	1,758,069	37	727,146	690	41,055,849
6	Singapore	246	23,815,284	180	10,145,605	101	194,798	2,883,664	2	35,640	32	596,066	561	37,476,259
7	United Kingdom	189	18,993,812	143	10,216,661	100	300,921	4,199,788	14	228,399	37	550,506	483	34,189,166
8	Norway	319	20,600,027	202	10,343,341	8	18,722	290,894	72	1,486,793	37	427,515	638	33,148,570
9	South Korea	70	8,695,015	224	15,881,106	73	181,261	2,543,570	29	492,011	18	277,137	414	27,888,839
10	Taiwan	46	5,794,204	212	14,520,545	202	538,666	7,302,591	1	15,922	14	162,088	475	27,795,350
11	Bermuda	76	17,374,161	13	1,506,173	0	0	0	0	0	2	21,122	91	18,901,456
12	Denmark	92	6,010,180	24	1,139,730	139	580,516	8,175,829	24	328,630	11	168,024	290	15,822,393
13	India	124	9,274,693	106	4,998,474	3	5,607	86,814	0	0	11	182,658	244	14,542,639
14	Italy	161	7,002,027	77	4,988,595	17	48,361	644,258	52	988,303	17	334,792	324	13,957,975
15	Monaco	56	4,420,463	73	5,062,019	44	172,827	2,302,964	3	65,588	2	30,406	178	11,881,440
16	Saudi Arabia	62	11,056,299	0	0	0	0	0	4	170,400	4	77,962	70	11,304,661
17	Cyprus	63	5,060,966	89	3,422,913	50	91,170	1,219,045	7	109,936	28	457,034	237	10,269,894
18	Russia	112	7,485,125	72	1,627,737	15	18,180	263,050	0	0	21	373,108	220	9,749,020
19	Switzerland	31	1,484,077	26	1,281,236	153	458,480	6,509,817	2	44,276	26	417,664	238	9,737,070
20	Iran	37	6,352,744	48	2,260,368	11	30,748	408,942	0	0	31	636,979	127	9,659,033
21	Canada	53	4,732,396	93	3,183,545	14	64,702	771,500	1	15,175	4	86,122	165	8,788,738
22	Turkey	31	1,662,970	147	5,664,450	23	26,526	334,055	10	133,796	19	292,539	230	8,087,810
23	Malaysia	66	4,339,861	8	269,400	28	49,254	744,761	2	25,531	4	61,135	108	5,440,688
24	U.A.E.	60	2,989,794	38	1,778,868	11	12,519	212,501	0	0	12	200,250	121	5,181,413
25	France	36	1,479,318	12	793,790	53	171,842	2,294,334	7	159,717	3	51,008	111	4,778,167
	Top 25 countries	**3,822**	**336,170,189**	**5,556**	**326,234,622**	**2,640**	**7,377,343**	**100,843,194**	**584**	**10,514,556**	**1,051**	**17,533,972**	**13,653**	**791,296,533**
	Total countries	**4,457**	**368,119,651**	**6,327**	**357,806,857**	**2,837**	**7,748,373**	**106,234,517**	**703**	**12,427,776**	**1,495**	**24,144,412**	**15,819**	**868,733,213**
	Top 25 % of total	**85.8%**	**91.3%**	**87.8%**	**91.2%**	**93.1%**	**95.2%**	**94.9%**	**83.1%**	**84.6%**	**70.3%**	**72.6%**	**86.3%**	**91.1%**

KEY: DWT = deadweight ton; TEU = twenty-foot equivalent unit.

SOURCE: Clarkson Research Studies, Vessel Registers, London: Clarkson Shipbrokers.

- Greek owners account for about 18% of the total world fleet in terms of deadweight tons.
- German owners account for the largest national share of the world containership about 33% (up from about 24% in 2000).
- The United States ranks fifth as in fleet ownership (down from 4th in 2000).

St. Lawrence Seaway



Great Lakes St. Lawrence Seaway System

Since 1959, the Great Lakes St. Lawrence Seaway System (Great Lakes Seaway System or System) has been a vital waterborne transportation link for moving goods between the heartland of North America and international markets. The Seaway System, a binational waterway operated jointly by the United States. and Canada, encompasses the St. Lawrence River and the five Great Lakes, and extends 2,300 miles from the Gulf of the St. Lawrence at the Atlantic Ocean to the Western end of Lake Superior at the twin ports of Duluth, Minnesota, and Superior, Wisconsin.

The U.S. St. Lawrence Seaway Development Corporation (SLSDC), an operating administration of the U.S. Department of Transportation and a wholly owned government corporation, is responsible for the operations and maintenance of the U.S. portion of the St. Lawrence Seaway between Montreal and Lake Erie. This responsibility includes maintaining and operating the two U.S. Seaway locks in Massena, New York, and vessel traffic control areas of the St. Lawrence River and Lake Ontario. In addition, the SLSDC performs trade development functions designed to enhance Seaway System utilization.

The SLSDC coordinates its activities with its Canadian counterpart, the St. Lawrence Seaway Management Corporation (SLSMC), particularly with respect to rules and regulations, overall day-to-day operations, traffic management, navigation aids, safety, environmental programs, operating dates, and trade development programs. The unique binational nature of the Seaway System requires 24-hour, year-round coordination between the two Seaway entities.

This chapter discusses many of the activities and programs of the SLSDC as well as a review of recent studies and analyses. Additional information on the Great Lakes St. Lawrence Seaway System can be found at http://www.greatlakes-seaway.com.

U.S. GREAT LAKES SEAWAY SYSTEM ECONOMIC BENEFITS

- Since opening in 1959, more than 2.4 billion metric tons of cargo has moved on the binational waterway, valued at more than $400 billion.

- A 2001 economic impact study conducted by Martin Associates of Lancaster, PA., found that maritime commerce on the Great Lakes St. Lawrence Seaway System annually sustains 150,000 U.S. jobs, $4.3 billion in personal income, $3.4 billion in business revenues, and $1.3 billion in federal, state, and local taxes.

- A 2007 economic analysis conducted as part of the U.S. and Canadian, multiagency Great Lakes St. Lawrence Seaway Study concluded that the maritime commerce on the binational Seaway System provides approximately $2.7 billion in annual transportation cost savings compared to competing rail and highway routes and that the economic impact of a shutdown of either of the two U.S. locks would range from $1.3 to $2.3 million per day, depending on the length of the delay.

- The Great Lakes Seaway System directly serves an eight-state, two-province region that accounts for 60% of Canada's gross domestic product (GDP), 26% of the U.S. GDP, 55% of North America's manufacturing and services industries, and is home to one-quarter of the continent's population.

2006 ST. LAWRENCE SEAWAY CARGO TONNAGE RESULTS

TABLE 1 2006 St. Lawrence Seaway Commodity and Transit Results
(volume in thousands of metric tons)

			Change	
Commodities	**2006**	**2005**	**Tons/transits**	**Percent**
Grain	11,538	9,773	1,765	18
Government aid	11	0	11	100
Iron ore	11,010	11,010	0	0
Coal	3,714	3,693	21	1
Other bulk	16,327	15,548	779	5
General cargo	4,545	3,259	1,286	39
Containers	19	17	2	12
Cargo total	47,164	43,301	3,863	9
Vessel transit total	4,613	4,361	252	6

SOURCE: 2006 St. Lawrence Seaway Traffic Report, produced by the U.S. St. Lawrence Seaway Development Corp. and Canadian St. Lawrence Seaway Management Corp..

- Significant increases in the St. Lawrence Seaway's traditional cargoes of grain and steel, during the 2006 navigation season resulted in 47.2 million metric tons of cargo moving through the binational waterway, its highest overall tonnage level since 1999. The increase of 3.9 million metric tons represented a 9% increase compared to the 2005 season.

- Lower prices for imported steel products; drought conditions in Australia's agricultural region; and increased highway, rail, and border crossing congestion in North America were all factors in the Seaway posting its second busiest shipping year in terms of vessel transits in 20 years. Vessel transits in 2006 were 4,612, the second highest amount since 1984.

- Grain exports totaled 11.5 million metric tons (18% increase), serving both traditional markets and those impacted by a lack of sufficient Australian grain exports. General cargoes were also up significantly (4.5 million metric tons, up 39%), led by imports of manufactured iron and steel and steel slabs.

- In addition to increases in the Seaway's "bread-and-butter" commodities of grain and steel, the binational waterway also enjoyed increases in several new and diversified cargoes, including imports of wind turbine components for several U.S. Great Lakes communities and mining-petroleum machinery destined for Canada's tar oil sands megaproject in Alberta.

- The St. Lawrence Seaway also established a new record for the longest shipping season in the waterway's 48th year. With the waterway's opening on March 23 and the passage of the *Kathryn Spirit* on December 30, the Seaway recorded a 283-day season, exceeding by 2 days the previous record set in 2004.

TABLE 2 St. Lawrence Seaway Five-Year Tonnage and Transit Levels
(tonnage in metric tons)

	Montreal-Lake Ontario section		Welland Canal section		Total Seaway[1]	
	Tonnage	Transits	Tonnage	Transits	Tonnage	Transits
2002	30,002,292	3,016	32,108,170	2,612	41,388,250	3,891
2003	28,900,440	2,579	31,870,466	3,027	40,847,809	3,886
2004	30,800,380	2,683	34,284,816	3,185	43,481,570	4,090
2005	31,273,322	2,695	34,149,554	3,443	43,301,146	4,361
2006	35,571,985	2,942	37,419,664	3,673	47,164,160	4,613

[1] The "Total Seaway" column represents tonnage and transits through each section (Montreal-Lake Ontario and Welland Canal), but only counting them once if moved through both sections.

SOURCE: 2006 St. Lawrence Seaway Traffic Report, produced by the U.S. St. Lawrence Seaway Development Corp. and Canadian St. Lawrence Seaway Management Corp..

ST. LAWRENCE SEAWAY VESSEL TRANSIT PROFILE

TABLE 3 St. Lawrence Seaway Vessel Transits by Type

Year	Ocean vessel transits	Laker vessel transits	Non-cargo transits	Total vessel transits
2002	1,145	2,011	735	3,891
2003	937	2,159	790	3,886
2004	1,028	2,211	851	4,090
2005	1,044	2,374	943	4,361
2006	1,365	2,265	983	4,613

SOURCE: St. Lawrence Seaway Traffic Reports, 2002-2006, produced by the U.S. St. Lawrence Seaway Development Corp. and Canadian t. Lawrence Seaway Management Corp..

- Laker vessels that transit the Seaway lock system are primarily Canadian-flagged domestic self-unloader bulk vessels. There are approximately 80 vessels in the Canadian domestic fleet. Because the Canadian lakers are much smaller than U.S.-flagged lakers, they are able to visit ports throughout each of the five Great Lakes, and in some cases, Canadian ports outside the Great Lakes Seaway System. In general, Canadian lakers carry coal, iron ore, and limestone, accounting for nearly two-thirds of the cargo carried. Other cargoes carried include tanker products, grain, salt, miscellaneous bulk, and cement. The primary pattern for Canadian lakers is to transport grain from Thunder Bay and Duluth-Superior to ports along the St. Lawrence River.

- The transoceanic vessel fleet that uses the Seaway System comprises approximately 220 vessels flagged in more than 30 countries. The vast majority of vessels are bulk carriers, though there are also a small number of general cargo carriers, heavy lift ships, and tankers in service. With the exception of barges, ocean vessels are by far the smallest vessels operating on the Lakes, with most vessels approximately 180 meters in length. This smaller size enables them to enter the lakes from overseas, transit the St. Lawrence Seaway, Welland Canal, and all five Great Lakes. Ocean vessels generally follow a "steel in–grain out" trade pattern, whereby iron and steel, and other high value cargoes generally arrive from Europe, and are discharged in a series of lower Great Lakes ports.

- Noncargo vessels include passenger, military, and other noncommercial ships.

SEAWAY SYSTEM RELIABILITY AND PERFORMANCE

- Since opening in 1959, the St. Lawrence Seaway has enjoyed a high reliability rate in serving its commercial customers. The SLSDC maintains an annual reliability performance target of 99% for the U.S. sector of the Seaway, including the two U.S. locks in Massena, NY. During the 2006 navigation season, the SLSDC met its target with a reliability rate of 99.1%.

TABLE 4 U.S. Seaway System Downtime/Availability in Hours

Cause of delay	2002	2003	2004	2005	2006	5-year average
Weather, poor visibility	36.8	39.3	32.5	15.2	16.3	28
Weather, high wind/ice	4.3	18.3	11.3	1.7	2.8	7.7
Water levels/flows	0.0	0.0	0.0	0.0	0.0	0.0
Vessel incident	16.9	15.9	15	12.1	34.5	18.9
Civil interference	2.0	0.0	1.0	0.0	0.0	0.6
Pilotage	0.0	0.0	0.0	3.3	0.0	0.7
Lock equipment malfunction	3.1	0	6.2	2.7	2.5	2.9
Other	0.0	0.0	0.0	0.0	6.3	1.3
Total delay (hours)	**63.1**	**73.5**	**66**	**35**	**62.4**	**60**
Equivalent days	2.6	3.1	2.8	1.5	2.6	2.5
Duration of season (days)	276	273	281	280	283	279
Percent of U.S. System availability	**99.1%**	**98.9%**	**99.0%**	**99.5%**	**99.1%**	**99.1%**

SOURCE: St. Lawrence Seaway Development Corp. Lock Operations Records

- Of those delay elements that affect system availability, the SLSDC is most responsible for lock equipment malfunction. In 2006, lock equipment-related delays totaled 2.5 hours, representing four one-hundredths of 1% of the entire navigation season.

TABLE 5 U.S. Lockage Equipment Malfunction by Type in Hours

Type of Malfunction	2002	2003	2004	2005	2006	5-year average
Electrical						
Fender Boom	2.8	0	0	0	0.7	0.7
Gates	0.0	0.0	0.0	1.4	0.7	0.4
Valves	0.3	0.0	0.0	0.0	0.0	0.1
Lock Equipment	0.0	0.0	0.0	0.0	0.4	0.1
Subtotal	**3.1**	**0.0**	**0.0**	**1.4**	**1.8**	**1.3**
Mechanical						
Fender Boom	0.0	0.0	0.0	1.3	0.0	0.2
Gates	0.0	0.0	0.0	0.0	0.0	0.0
Valves	0.0	0.0	0.0	0.0	0.0	0.0
Lock Equipment	0.0	0.0	6.2	0.0	0.7	1.4
Subtotal	**0.0**	**0.0**	**6.2**	**1.3**	**0.7**	**1.6**
Grand Total	**3.1**	**0.0**	**6.2**	**2.7**	**2.5**	**2.9**

SOURCE: St. Lawrence Seaway Development Corp. Lock Operations Records

U.S. Coast Guard

U.S. Coast Guard

U.S. COAST GUARD ROLES AND MISSIONS

Maritime Security

Maritime law enforcement and border control are the oldest of the U.S. Coast Guard's (USCG) numerous responsibilities, dating back to its founding as the Revenue Cutter Service in 1790. Congress established the Revenue Cutter Service specifically to patrol the nation's coasts and seaports to frustrate smuggling and enforce the customs laws of the fledgling Republic.

Two centuries have passed, and that early challenge has evolved into a full open ocean responsibility for the maritime sovereignty of our nation. The USCG maritime law enforcement role and the task of interdicting ships at sea provide the foundation on which the much broader and complex present-day mission set has been built.

As the nation's primary maritime law enforcement service, the USCG enforces or assists in enforcing federal laws, treaties, and other international agreements on the high seas and waters under U.S. jurisdiction. The USCG possesses the authority to board any vessel subject to U.S. jurisdiction to make inspections, searches, inquiries, and arrests. This law enforcement authority is primarily used to suppress violations of our drug, immigration, fisheries, and environmental laws.

As the designated lead agency for maritime drug interdiction under the National Drug Control Strategy and the co-lead agency with the U.S. Customs Service for air interdiction operations, the USCG defends America's seaward frontier against illegal drug trafficking. For more than two decades USCG cutters and aircraft deployed off South America and in the transit zone have intercepted tons of cocaine, marijuana, and other illegal drugs that otherwise would have found their way to America's streets.

USCG alien migrant interdiction operations (AMIO) are also law enforcement missions with a significant humanitarian dimension. Migrants typically take great risks and endure significant hardships in their attempts to flee their countries and enter the United States. In many cases, migrant vessels interdicted at sea are overloaded and unseaworthy, lack basic safety equipment, and are operated by inexperienced mariners. The majority of alien migrant interdiction cases handled actually begin as search and rescue cases. Between 1980 and 2000, the USCG interdicted 290,000 migrants, mostly from Cuba, Dominican Republic, People's Republic of China, and Haiti.

Maritime Safety

One of the most basic responsibilities of the U.S. Government is to protect the lives and safety of Americans. In the maritime realm, that lead responsibility falls to the USCG. In partnership with other federal agencies, state and local governments, marine industries, and individual mariners, the USCG preserves safety at sea through a focused program of prevention, response, and investigation. Prevention activities include developing commercial and recreational vessel standards, enforcing compliance with these standards, licensing commercial mariners, operating the International Ice Patrol to protect ships transiting the North Atlantic shipping lanes, and educating the public.

The USCG develops operating and construction criteria for many types of vessels, from commercial ships to recreational boats. The USCG represents the United States in the

International Maritime Organization (IMO), which promulgates measures to improve shipping safety, pollution prevention, mariner training, and certification standards.

Also, the USCG is the agency primarily responsible for developing domestic shipping and navigation regulations. The USCG inspects U.S. flag vessels, mobile offshore drilling units, and marine facilities; examines foreign-flag vessels based on the potential safety and pollution risk they pose; reviews and approves plans for vessel construction, repair, and alteration; and documents and measures U.S.-flag vessels.

The Port State Control program, which is aimed at eliminating substandard vessels from U.S. ports and waterways, is a key element in the USCG's safety enforcement program because 95% of passenger ships and 75% of cargo ships operating in U.S. waters are foreign-flagged.

As National Recreational Boating Safety Coordinator, the USCG works to minimize loss of life, personal injury, property damage, and environmental harm associated with recreational boating. Their boating safety program involves public education programs, regulation of boat design and construction, approval of boating safety equipment, and courtesy marine examinations of boats for compliance with federal and state safety requirements. The all-volunteer USCG Auxiliary plays a central role in this program.

USCG prevention activities in pursuit of maritime safety are often inseparable from those it performs to protect the marine environment or police the U.S. marine transportation system. Actions in one area often reinforce those required for other roles and missions. As a result, the USCG's accident-prevention efforts save many lives and contribute to the economic and environmental health of the nation. As the lead agency for maritime search and rescue (SAR) in U.S. waters, it coordinates the SAR efforts of sea and airborne USCG units, as well as those of federal, state, and local responders. It also leverages the world's merchant fleet to rescue mariners in distress around the globe through the Automated Mutual-assistance Vessel Rescue (AMVER) system.

Finally, in addition to responding to a wide variety of time-critical maritime emergencies and accidents, the USCG investigates their causes and determines whether laws have been violated or whether changes should be made to improve safety through our prevention programs.

Protection of Natural Resources

America's marine waters and their ecosystems are vital to the health, well being, and economy of the nation. The USCG's protection of natural resources role dates back to the 1820s, when Congress tasked the Revenue Cutter Service to protect federal stocks of Florida live oak. As the exploitation of the nation's valuable marine resources—whales, fur-bearing animals, and fish—increased, the USCG was given the duty to protect these resources as well. The USCG's role has expanded over the last few decades to include enforcing laws intended to protect the environment as a public good. As a result, it now actively protects sensitive marine habitats, marine mammals, and endangered marine species, and enforces laws protecting U.S. waters from the discharge of oil and other hazardous substances.

The Coast Guard conducts a wide range of activities— education and prevention, enforcement, response and containment, and recovery— in support of its primary environmental protection mission areas: maritime pollution enforcement, offshore lightering zone enforcement, domestic

fisheries enforcement, and foreign vessel inspection. They also provide mission-critical command and control support and usually are the first responding force to environmental disasters on the seas.

Under the National Contingency Plan, Coast Guard Captains of the Port are the predesignated Federal On-Scene Coordinators (FOSC) for oil and hazardous substance incidents in all coastal and some inland areas. The FOSC is, in reality, the President's designated on-scene representative. As such, the FOSC is responsible for forging a well coordinated and effective response operation involving a diverse set of government and commercial entities in many emotionally charged and potentially dangerous emergency situations.

Maritime Mobility

The U.S. marine transportation system facilitates America's global reach into foreign markets and the nation's engagement in world affairs, including protection of U.S. national interests through a national and international regulatory framework governing trade and commerce. This system includes the waterways and ports through which more than 2 billion tons of America's foreign and domestic freight and 3.3 billion barrels of oil move each year, plus the intermodal links that support our economic and military security. It also includes international and domestic passenger services, commercial and recreational fisheries, and recreational boating.

A major USCG mission is to provide a safe, efficient, and navigable waterway system to support domestic commerce, international trade, and the military sealift requirements for national defense. In support of this mission, the services it provides include long- and short-range aids to navigation; charting, tide/current/pilotage information through Notices to Mariners; vessel traffic services; domestic and international icebreaking and patrol services; technical assistance and advice; vessel safety standards and inspection; and bridge administration standards and inspection.

National Defense

The USCG has served alongside the U.S. Navy in critical national defense missions, beginning with the quasi-war with France in 1798, through the Civil War, World Wars I and II, to the Vietnam War and the Persian Gulf War. The close relationship between USCG services and its other agencies has evolved through more than two centuries of cooperation, culminating in a 1995 agreement between the Secretaries of Defense and Transportation. This agreement assigns to the USCG five specific national defense missions in support of the Unified Commanders-in-Chief (CINCs) in addition to its general defense operations and polar icebreaking duties. These missions—maritime interception operations; military environmental response operations; port operations, security, and defense; peacetime military engagement; and coastal sea control operations—require the USCG to execute military functions and tasks in support of joint and combined forces in peacetime, crisis, and war. In recent years, the CINCs have requested USCG cutters to conduct military interception operations, peacetime military engagement, and other supporting warfare tasks in all key areas of operations.