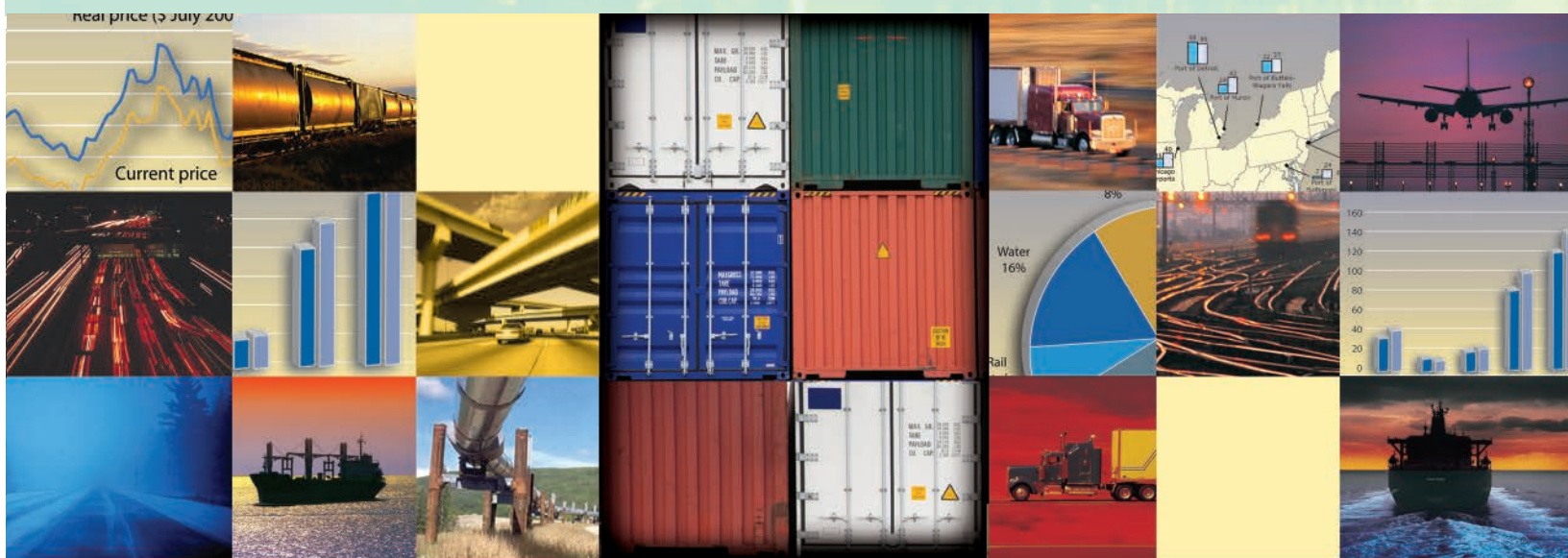


# FREIGHT FACTS AND FIGURES 2 0 0 8



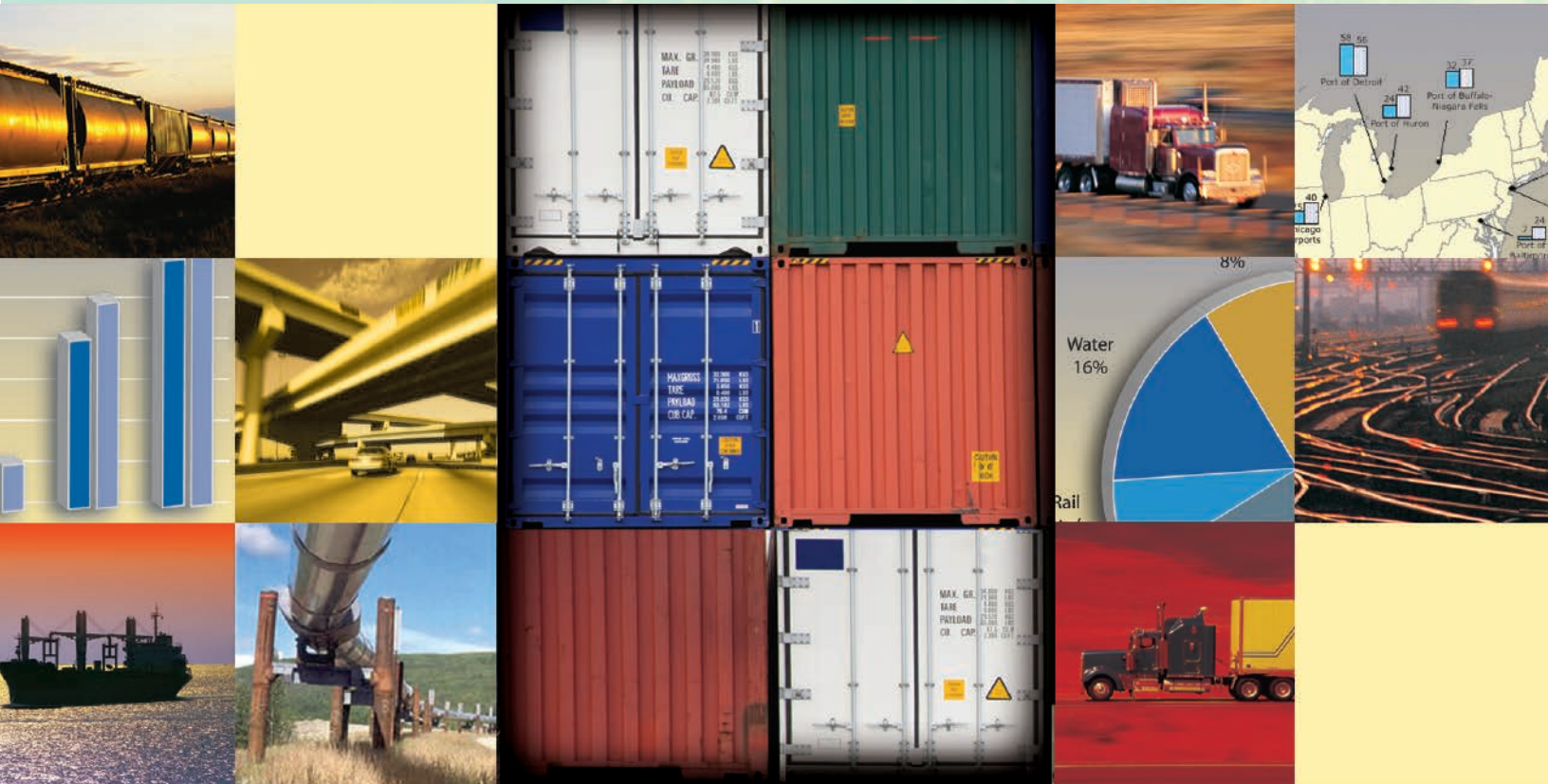
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A N D O P E R A T I O N S



U.S. Department of Transportation  
Federal Highway Administration

## QUALITY ASSURANCE STATEMENT

THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) PROVIDES HIGH-QUALITY INFORMATION TO SERVE GOVERNMENT, INDUSTRY, AND THE PUBLIC IN A MANNER THAT PROMOTES PUBLIC UNDERSTANDING. STANDARDS AND POLICIES ARE USED TO ENSURE AND MAXIMIZE THE QUALITY, OBJECTIVITY, UTILITY, AND INTEGRITY OF ITS INFORMATION. FHWA PERIODICALLY REVIEWS QUALITY ISSUES AND ADJUSTS ITS PROGRAMS AND PROCESSES TO ENSURE CONTINUOUS QUALITY IMPROVEMENT.





**F**reight Facts and Figures 2008 is a snapshot of the volume and value of freight flows in the United States, the physical network over which freight moves, the economic conditions that generate freight movements, the industry that carries freight, and the safety, energy, and environmental implications of freight transportation. This snapshot helps decision makers, planners, and the public understand the magnitude and importance of freight transportation in the economy. An electronic version of this publication is available at [www.ops.fhwa.dot.gov/freight](http://www.ops.fhwa.dot.gov/freight).

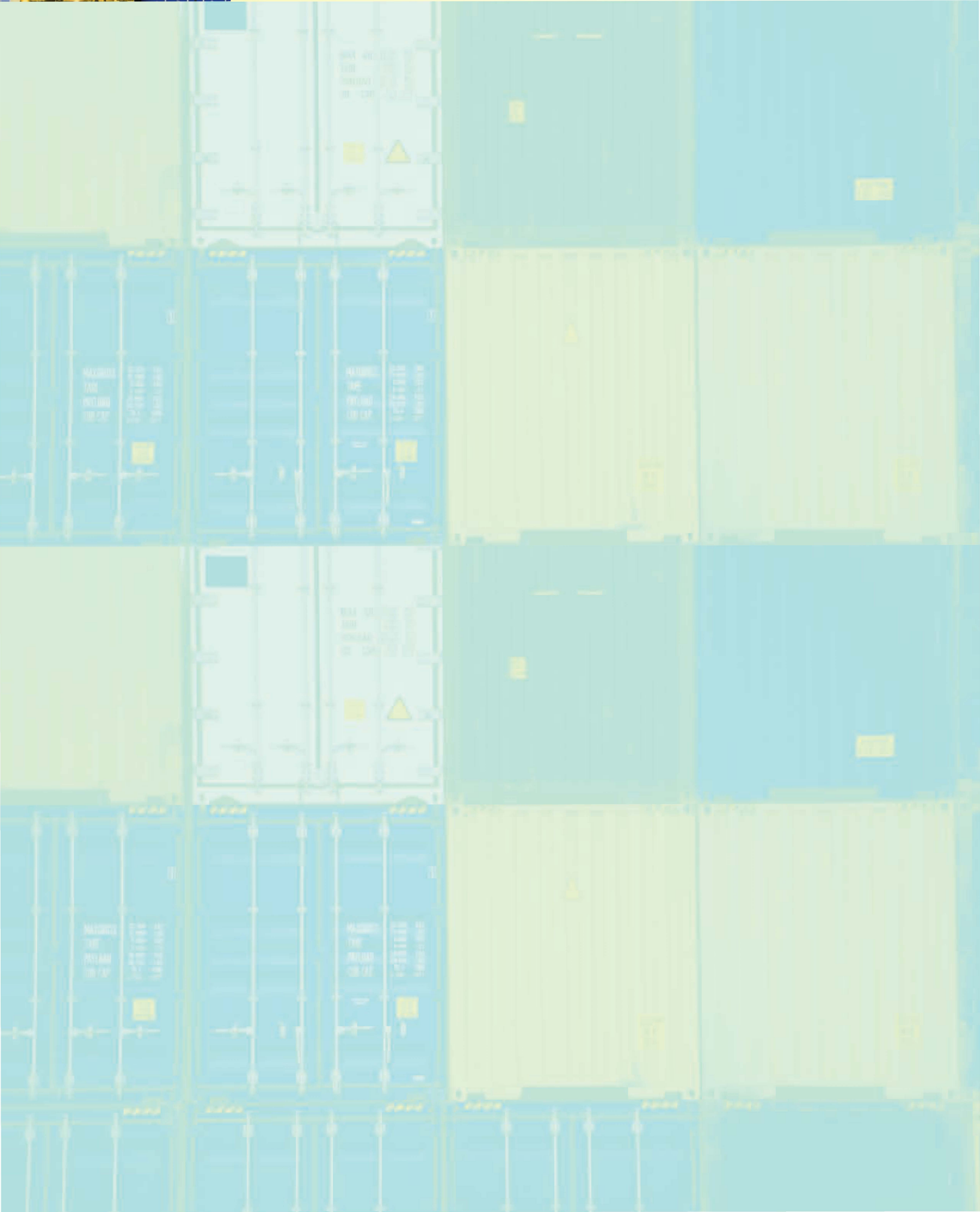
Chapter 1 summarizes basic demographic and economic characteristics of the United States that contribute to the demand for raw materials, intermediate goods, and finished products. Chapter 2 identifies the freight that is moved and the trading partners who move it. Chapter 3 describes the freight transportation system; volumes of freight moving over the system; the amount of truck, train, and other activities required to move the freight; and the performance of the system. Chapter 4 highlights the transportation industry that operates the system. Chapter 5 covers the safety aspects, energy consumption, and environmental implications of freight transportation.

Many of the tables and figures are based on the Economic Census, which is conducted once every five years. The most recently published data from the Economic Census are for 2002.

Several of the tables and maps in this report are based on the Freight Analysis Framework (FAF), version 2.2, which builds on the Economic Census, to estimate all freight flows to, from, and within the United States except shipments between foreign countries that are transported through the United States. Shipments to and from Puerto Rico are counted with Latin America.

FAF covers all modes of transportation. The truck, rail, and water categories include shipments transported by only one mode. Air includes shipments weighing more than 100 pounds moved by air or by air and truck. Intermodal includes all other shipments transported by more than one mode, such as bulk products moved by water and pipeline and mixed cargo hauled by truck and rail. Intermodal also includes shipments weighing less than 100 pounds sent via postal and courier services. Pipeline includes a small quantity of shipments moved by unknown modes. Visit [www.ops.fhwa.dot.gov/freight/freight\\_analysis/faf](http://www.ops.fhwa.dot.gov/freight/freight_analysis/faf) for more information.







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# I. THE NATION SERVED BY FREIGHT

The Nation's 114 million households, 7.6 million business establishments, and 88,000 government units are part of an enormous economy that demands the movement of freight. The U.S. Gross Domestic Product (GDP) is expected to grow, on average, almost 3 percent per year between now and 2035, resulting in even greater demand for freight transportation. This growth will be driven by a population that is expected to increase from 300 million people in 2006 to 380 million in 2035.

Freight transportation has grown over time with the expansion of population and economic activity within the United States and with the increasing interdependence of economies across the globe. The U.S. population grew by 30 percent between 1980 and

**Table 1-1. Economic and Social Characteristics of the United States: 1980-2006**

	1980	1990	2000	2005	2006	Percent change, 1980 to 2006
Resident population (thousands)	(R) 226,546	(R) 248,791	(R) 281,425	(R) 296,507	299,398	32.2
Households (thousands)	80,776	93,347	104,705	(R) 113,343	114,384	41.6
Median household income (\$2000)	35,057	38,257	41,990	(R) 40,864	41,168	17.4
Civilian labor force (thousands)	106,940	125,840	142,583	149,320	151,428	41.6
Employed <sup>1</sup> (thousands)	99,303	118,793	136,891	141,730	144,427	45.4
Agriculture, forestry, fishing, and hunting (percent)	NA	1.9	1.8	1.6	1.5	NA
Mining	NA	0.5	0.3	0.4	0.5	NA
Construction	NA	6.9	7.3	7.9	8.1	NA
Manufacturing	NA	16.8	14.4	11.5	11.3	NA
Wholesale and retail trade	NA	14.7	14.6	15.1	14.8	NA
Transportation and utilities	NA	5.1	5.4	5.2	5.2	NA
Information	NA	2.9	3.0	2.4	2.5	NA
Financial activities	NA	7.1	6.8	7.2	7.3	NA
Professional and business services	NA	9.4	10.0	10.1	10.3	NA
Education and health services	NA	17.5	19.1	20.6	20.7	NA
Leisure and hospitality	NA	8.0	8.2	8.5	8.4	NA
Other services	NA	4.3	4.7	5	4.9	NA
Public administration	NA	4.7	4.5	4.6	4.5	NA
Business establishments (thousands)	NA	6,176	7,070	7,500	7,601	NA
Governments <sup>2</sup>	81,831	85,006	87,576	NA	NA	NA
Gross domestic product (\$2000 millions)	5,161,700	7,112,500	9,817,000	(R) 11,003,400	11,319,400	119.3
Foreign trade (\$2000 millions)	631,335	1,168,168	2,572,000	3,013,471	3,235,200	411.0
Goods (percent)	74.0	71.6	78.8	79.4	79.7	450.5
Services (percent)	26.0	28.4	21.2	20.6	20.3	298.6

**Key:** NA = not available; R = revised.

<sup>1</sup>Based on the 2002 Census Industry Classification system. Data for 1990 do not appear in the source document; they are estimated using the Bureau of Labor Statistics crosswalk from the 1990 Census Industry Classification system to the 2002 Census Industry Classification system.

<sup>2</sup>The value for 1980 is actually 1982, the value for 1990 is actually 1992, and the value for 2000 is actually 2002.

**TABLE 1-1. ECONOMIC AND SOCIAL CHARACTERISTICS OF THE UNITED STATES: 1980-2006**

**Sources:** Unless otherwise stated all data are from: U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States: 2007* (Washington, DC: 2006) and earlier editions, available at [www.census.gov/compendia/statab/](http://www.census.gov/compendia/statab/) as of June 20, 2008. **Median household income:** U.S. Department of Commerce, Census Bureau, Historical Income Tables, table H-6, available at [www.census.gov/hhes/income/histinc/h06ar.html](http://www.census.gov/hhes/income/histinc/h06ar.html) as of June 20, 2008. **Business establishments:** U.S. Department of Commerce, Census Bureau, County Business Patterns, available at [www.census.gov/epcd/cbp/view/cbpview.html](http://www.census.gov/epcd/cbp/view/cbpview.html) as of July 1, 2008. **Gross domestic product and foreign trade:** U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, tables 1.1.5, 1.1.6, 4.2.4, available at [www.bea.doc.gov](http://www.bea.doc.gov) as of June 20, 2008.

2006 while the economy, measured by GDP, more than doubled in real terms. Other indicators of economic growth such as employment and household income have also risen by 45 percent and 17 percent respectively. Foreign trade grew faster than the overall economy, quadrupling in real value between 1980 and 2006, reflecting unprecedented global interconnectivity.

**Table 1-2. Population and Gross Domestic Product (GDP) by Region: 1980-2007**

	1980	1990	2000	2006	2007	Percent change, 1980 to 2007
<b>Resident Population (thousands)</b>	<b>226,549</b>	<b>248,789</b>	<b>(R) 282,194</b>	<b>(R) 298,755</b>	<b>301,621</b>	<b>33</b>
Northeast	49,136	50,828	(R) 53,668	(R) 54,590	54,681	11
Midwest	58,868	59,670	(R) 64,497	(R) 66,128	66,389	13
South	75,372	85,454	(R) 100,568	(R) 108,895	110,455	47
West	43,173	52,837	(R) 63,462	(R) 69,142	70,097	62
<b>GDP (\$ 2000 millions)<sup>1</sup></b>	<b>5,054,549</b>	<b>6,994,329</b>	<b>(R) 9,749,104</b>	<b>(R) 13,119,937</b>	<b>13,743,020</b>	<b>172</b>
Northeast	1,107,283	1,604,121	(R) 2,077,436	(R) 2,697,566	2,844,290	157
Midwest	1,262,917	1,566,939	(R) 2,174,719	(R) 2,701,362	2,809,097	122
South	1,608,531	2,220,755	(R) 3,212,076	(R) 4,567,582	4,791,796	198
West	1,075,817	1,602,514	(R) 2,284,873	(R) 3,153,427	3,297,837	207
<b>GDP per capita (\$ 2000 millions)<sup>1</sup></b>	<b>22,311</b>	<b>28,113</b>	<b>(R) 34,548</b>	<b>(R) 43,915</b>	<b>45,564</b>	<b>104</b>
Northeast	22,535	31,560	(R) 38,709	(R) 49,415	52,016	131
Midwest	21,453	26,260	(R) 33,718	(R) 40,851	42,313	97
South	21,341	25,988	(R) 31,939	(R) 41,945	43,382	103
West	24,919	30,329	(R) 36,004	(R) 45,608	47,047	89

**Key:** R = revised.

<sup>1</sup>As of October 26, 2006, the Bureau of Economic Analysis renamed the gross state product (GSP) series to gross domestic product (GDP) by state.

**Note:** Numbers may not add to totals due to rounding.

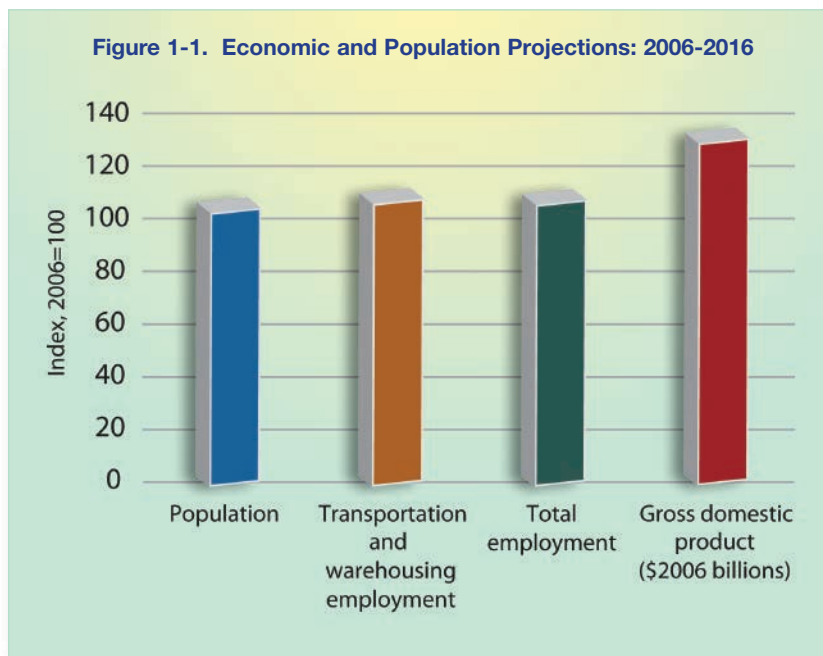
Although freight moves throughout the United States, the demand for freight transportation is driven primarily by the geographic distribution of population and economic activity. While both population and economic activity have grown faster in the West and South than in the Northeast and Midwest, the growth in economic activity per capita has been highest in the Northeast.

**TABLE 1-2. POPULATION AND GROSS DOMESTIC PRODUCT (GDP) BY REGION: 1980-2007**

**Sources: Population: 1980-1990:** U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States: 2004-2005* (Washington, DC: 2005); **2000-2007:** U.S. Department of Commerce, Census Bureau, Population Division, Annual Population Estimates, table 8, available at [www.census.gov/popest/states/NST-ann-est.html](http://www.census.gov/popest/states/NST-ann-est.html) as of June 5, 2008. **Gross State Product: 1980-1990:** U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, available at [www.bea.doc.gov/bea/regional/gsp/](http://www.bea.doc.gov/bea/regional/gsp/) as of June 11, 2004; **2000-2007:** U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, available at [www.bea.gov/bea/regional/gsp/](http://www.bea.gov/bea/regional/gsp/) as of June 5, 2008.



Demand for freight transportation grows with increases in population and economic activity. The U.S. economy, as measured by GDP, is projected to increase by 39 percent and the U.S. population by 8 percent by 2016.



Transportation and warehousing employment is expected to increase by 11 percent over this period, about the same as employment as a whole. These projections are based on long-term trends, and may be lowered given recent disruptions to the economy.

**FIGURE 1-1. ECONOMIC AND POPULATION PROJECTIONS: 2006-2016**

**Sources:** **Population:** Department of Commerce, Census Bureau, *Statistical Abstract of the United States: 2008* (Washington, DC: 2007), available at [www.census.gov/compendia/statab/](http://www.census.gov/compendia/statab/) as of May 8, 2008. **Employment:** U.S. Department of Labor, Bureau of Labor Statistics, *Employment by Major Industry Division*, 1996, 2006, and projected 2016, available at [www.bls.gov](http://www.bls.gov) as of May 8, 2008. **GDP:** Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2007 to 2016*, available at [www.cbo.gov](http://www.cbo.gov) as of May 8, 2008.





## II. FREIGHT TO BE MOVED AND TRADING PARTNERS

The American economy stretches across a continent with links to the world, drawing natural resources and manufactured products from many locations to serve markets at home and abroad. More freight is moving greater distances as part of far flung supply chains among distant trading partners.

**Table 2-1. Weight of Shipments by Transportation Mode: 2002, 2007, and 2035 (millions of tons)**

	2002				2007				2035			
	Total	Domestic	Exports <sup>3</sup>	Imports <sup>3</sup>	Total	Domestic	Exports <sup>3</sup>	Imports <sup>3</sup>	Total	Domestic	Exports <sup>3</sup>	Imports <sup>3</sup>
<b>Total</b>	19,328	17,670	525	1,133	21,225	19,268	619	1,338	(R) 37,211	(R) 33,667	1,112	2,432
<b>Truck</b>	11,539	11,336	106	97	12,896	12,691	107	97	(R) 22,813	(R) 22,230	262	320
<b>Rail</b>	1,879	1,769	32	78	2,030	1,872	65	92	3,525	3,292	57	176
<b>Water</b>	701	595	62	44	689	575	57	57	1,041	874	114	54
<b>Air, air &amp; truck</b>	11	3	3	5	14	4	4	6	61	10	13	38
<b>Intermodal<sup>1</sup></b>	1,292	196	317	780	1,505	191	379	935	2,598	334	660	1,604
<b>Pipeline &amp; unknown<sup>2</sup></b>	3,905	3,772	4	130	4,091	3,934	6	151	7,172	6,926	5	240

**Key:** R = revised.

<sup>1</sup>Intermodal includes U.S. Postal Service and courier shipments and all intermodal combinations, except air and truck. Intermodal also includes oceangoing exports and imports that move between ports and interior domestic locations by modes other than water.

<sup>2</sup>Pipeline and unknown shipments are combined because data on region-to-region flows by pipeline are statistically uncertain.

<sup>3</sup>Data do not include inbound and outbound shipments that pass through the United States from a foreign origin to a foreign destination by any mode.

**Notes:** The 2007 data are provisional estimates, which are based on selected modal and economic trend data. Methods used to develop these estimates have improved over time, and as a consequence, previously released annual provisional estimates are superseded by the 2007 estimates in this table. Numbers may not add to totals due to rounding.

The U.S. transportation system moved, on average, 53 million tons of freight worth \$36 billion each day in 2002. The Freight Analysis Framework (FAF) forecasts that tons transported will almost double by 2035, with international shipments growing somewhat faster than domestic shipments. The provisional estimate of tons moved in 2007 is consistent with annual growth rates in the FAF forecast for all modes except water, which declined slightly, and air and intermodal, which grew at faster rates.

**TABLE 2-1. WEIGHT OF SHIPMENTS BY TRANSPORTATION MODE: 2002, 2007, AND 2035**

**Source: 2002 and 2035:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007. **2007:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, 2007 provisional estimates, 2008.





**Table 2-2. Value of Shipments by Transportation Mode: 2002, 2007, and 2035**  
(billions of 2002 dollars)

	2002				2007				2035			
	Total	Domestic	Exports <sup>3</sup>	Imports <sup>3</sup>	Total	Domestic	Exports <sup>3</sup>	Imports <sup>3</sup>	Total	Domestic	Exports <sup>3</sup>	Imports <sup>3</sup>
<b>Total</b>	13,228	11,083	778	1,367	14,869	12,363	904	1,603	(R) 41,867	(R) 29,590	3,392	8,884
<b>Truck</b>	8,856	8,447	201	208	9,764	9,266	235	264	23,767	(R) 21,654	806	1,306
<b>Rail</b>	382	288	26	68	416	303	36	78	702	483	63	156
<b>Water</b>	103	76	13	13	51	37	8	7	151	103	31	18
<b>Air, air &amp; truck</b>	771	162	269	340	1,022	235	354	434	5,925	721	1,548	3,655
<b>Intermodal<sup>1</sup></b>	1,967	983	268	716	1,935	870	270	795	8,966	4,315	943	3,708
<b>Pipeline and unknown<sup>2</sup></b>	1,149	1,127	1	22	1,680	1,652	1	26	2,357	2,315	1	41

**Key:** R = revised.

<sup>1</sup>Intermodal includes U.S. Postal Service and courier shipments and all intermodal combinations, except air and truck. Intermodal also includes oceangoing exports and imports that move between ports and interior domestic locations by modes other than water.

<sup>2</sup>Pipeline and unknown shipments are combined because data on region-to-region flows by pipeline are statistically uncertain.

<sup>3</sup>Data do not include inbound and outbound shipments that pass through the United States from a foreign origin to a foreign destination by any mode.

**Notes:** The 2007 data are provisional estimates, which are based on selected modal and economic trend data. Methods used to develop these estimates have improved over time, and as a consequence, previously released annual provisional estimates are superseded by the 2007 estimates in this table. Numbers may not add to totals due to rounding.

The value of freight moved on the U.S. transportation system is increasing faster than tons transported, even when calculated in 2002 prices. The FAF 2007 provisional estimate and 2035 forecast expect the value of shipments to increase between 3.1 percent and 3.5 percent per year while tonnage is predicted to grow between 2.0 percent and 2.1 percent per year.

**Table 2-3. Top Commodities: 2002**

	Tons (millions)		Value (\$ billions)	
	Total	(R) 19,328	Total	(R) 13,228
Natural gas & related <sup>1</sup>	2,687		Machinery	1,866
Gravel	2,048		Electronics	948
Cereal grains	1,330		Mixed freight	944
Crude petroleum	1,284		Motorized vehicles	855
Coal	1,261		Natural gas & related <sup>1</sup>	729
Nonmetal mineral products	1,138		Textiles/leather	545
Gasoline	1,090		Pharmaceuticals	519
Waste/scrap	926		Unknown	458
Fuel oils	560		Chemical products	444
Natural sands	557		Miscellaneous manufactured products	411

**Key:** R = revised.

<sup>1</sup>Natural gas, selected coal products, and products of petroleum refining, excluding gasoline, aviation fuel, and fuel oil.

Bulk products comprise nearly two-thirds of the tonnage but only one-fifth of the value of goods moved in 2002. Motor vehicles, machinery, pharmaceuticals, and other manufactured goods

comprise over two-thirds of commodity movements by value but only 15 percent of the tonnage.

**TABLE 2-2. VALUE OF SHIPMENTS BY TRANSPORTATION MODE: 2002, 2007, AND 2035**

**Source:** 2002 and 2035: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, Version 2.2, 2007. 2007: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, 2007 provisional estimates, 2008.

**TABLE 2-3. TOP COMMODITIES: 2002**

**Source:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.

**Table 2-4. Hazardous Materials Shipments by Transportation Mode: 2002**

Transportation mode	Value		Tons		Ton miles		Average distance per shipment (miles)
	\$ Billion	Percent	Millions	Percent	Billions	Percent	
<b>All modes, total</b>	<b>660.2</b>	<b>100.0</b>	<b>2,191.5</b>	<b>100.0</b>	<b>326.7</b>	<b>100.0</b>	<b>136</b>
<b>Single modes, total</b>	<b>644.5</b>	<b>97.6</b>	<b>2,158.5</b>	<b>98.5</b>	<b>311.9</b>	<b>95.5</b>	<b>105</b>
Truck <sup>1</sup>	419.6	63.6	1,159.5	52.9	110.2	33.7	86
For-hire	189.8	28.8	449.5	20.5	65.1	19.9	285
Private <sup>2</sup>	226.7	34.3	702.2	32.0	44.1	13.5	38
Rail	31.3	4.7	109.4	5.0	72.1	22.1	695
Water	46.9	7.1	228.2	10.4	70.6	21.6	S
Air	1.6	0.2	0.1	0.003	0.1	0.03	2,080
Pipeline <sup>3</sup>	145.0	22.0	661.4	30.2	S	S	S
<b>Multiple modes, total</b>	<b>9.6</b>	<b>1.5</b>	<b>18.7</b>	<b>0.9</b>	<b>12.5</b>	<b>3.8</b>	<b>849</b>
Parcel, U.S. Postal Service, or Courier	4.3	0.6	0.2	0.01	0.1	0.04	837
Other	5.4	0.8	18.5	0.8	12.4	3.8	1,371
<b>Unknown and other modes, total</b>	<b>6.1</b>	<b>0.9</b>	<b>14.2</b>	<b>0.6</b>	<b>2.3</b>	<b>0.7</b>	<b>57</b>

**Key:** S = data are not published because of high sampling variability or other reasons.

<sup>1</sup>Truck as a single mode includes shipments that went by private truck only, for-hire truck only, or a combination of both.

<sup>2</sup>Private truck refers to a truck operated by a temporary or permanent employee of an establishment or the buyer/receiver of the shipment.

<sup>3</sup>Excludes most shipments of crude oil.

**Note:** Numbers and percents may not add to totals due to rounding.

Trucks move more than one-half of all hazardous materials shipped from within the United States. However, truck ton miles of hazardous shipments account for a much smaller share, about one-third of all ton miles, because such shipments travel relatively short distances. By contrast, rail accounts for only 5 percent of shipments by weight but 22 percent of ton miles.

**Table 2-5. Hazardous Materials Shipments by Hazard Class: 2002**

Hazard class	Description	Value		Tons		Ton miles	
		\$ Billions	Percent	Millions	Percent	Billions	Percent
Class 1	Explosives	7.9	1.2	5.0	0.2	1.6	0.5
Class 2	Gases	73.9	11.2	213.4	9.7	37.3	11.4
Class 3	Flammable liquids	490.2	74.3	1,789.0	81.6	218.6	66.9
Class 4	Flammable solids	6.6	1.0	11.3	0.5	4.4	1.3
Class 5	Oxidizers and organic peroxides	5.5	0.8	12.7	0.6	4.2	1.3
Class 6	Toxic (poison)	8.3	1.3	8.5	0.4	4.3	1.3
Class 7	Radioactive materials	5.9	0.9	0.1	0.003	0.04	0.01
Class 8	Corrosive materials	38.3	5.8	90.7	4.1	36.3	11.1
Class 9	Miscellaneous dangerous goods	23.6	3.6	61.0	2.8	20.2	6.2
<b>Total</b>		<b>660.2</b>	<b>100.0</b>	<b>2,191.5</b>	<b>100.0</b>	<b>326.7</b>	<b>100.0</b>

**Note:** Numbers and percents may not add to totals due to rounding.

**TABLE 2-4. HAZARDOUS MATERIALS SHIPMENTS BY TRANSPORTATION MODE: 2002**

**Source:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2002 Commodity Flow Survey*, Hazardous Materials (Washington, DC: December 2004), table 1a, available at [www.bts.gov/publications/commodity\\_flow\\_survey/2002/united\\_states/](http://www.bts.gov/publications/commodity_flow_survey/2002/united_states/) as of September 23, 2008.

**TABLE 2-5. HAZARDOUS MATERIALS SHIPMENTS BY HAZARD CLASS: 2002**

**Source:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2002 Commodity Flow Survey*, Hazardous Materials (Washington, DC: December 2004), table 2a, available at [www.bts.gov/publications/commodity\\_flow\\_survey/2002/united\\_states/](http://www.bts.gov/publications/commodity_flow_survey/2002/united_states/) as of September 23, 2008.



Flammable liquids, especially gasoline, are the predominant hazardous material transported in the United States. In terms of ton miles, flammable liquids account for about 67 percent of total ton miles of hazardous materials shipments. The next largest class of hazardous materials in terms of ton miles is gases at about 11 percent.

**Table 2-6. Domestic Mode of Exports and Imports by Tonnage and Value: 2002 and 2035<sup>a</sup>**

	Tons (millions)		Value (\$ billions)	
	2002	2035	2002	2035
<b>Total</b>	1,658	3,544	2,145	12,277
<b>Truck<sup>1</sup></b>	797	2,116	1,198	6,193
<b>Rail</b>	200	397	114	275
<b>Water</b>	106	168	26	49
<b>Air, air &amp; truck<sup>2</sup></b>	9	54	614	5,242
<b>Intermodal<sup>3</sup></b>	22	50	52	281
<b>Pipeline &amp; unknown<sup>4</sup></b>	524	760	141	238

**Key:** R = revised.

<sup>1</sup>Excludes truck moves to and from airports.

<sup>2</sup>Includes truck moves to and from airports.

<sup>3</sup>Intermodal includes U.S. Postal Service and courier shipments and all intermodal combinations, except air and truck. In this table, oceangoing exports and imports that move between ports and domestic locations by single modes are classified by the domestic mode rather than intermodal.

<sup>4</sup>Pipeline and unknown shipments are combined because data on region-to-region flows by pipeline are statistically uncertain.

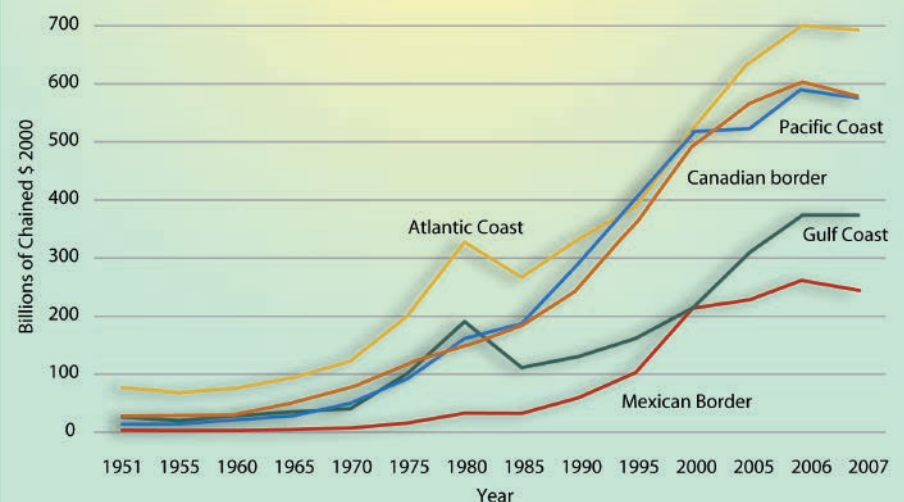
**Note:** Numbers may not add to totals due to rounding.

International trade is growing rapidly and is placing pressure on the domestic transportation network and on all modes. Trucks are the most common mode used to move imports and exports between international gateways and inland locations.

Foreign trade has had a major impact on all U.S. borders and coasts. Since 1951, the value of merchandise trade has grown by sixteen-fold in inflation-adjusted terms. However, overall growth has been affected by short-term downturns, such as in the late 1970s and

between 2005 and 2007. In 2007, ports and airports on the Atlantic Coast remain the most important, but the land borders and other coasts are catching up.

**Figure 2-1. Value of Merchandise Trade by Coasts and Borders: 1951-2007**



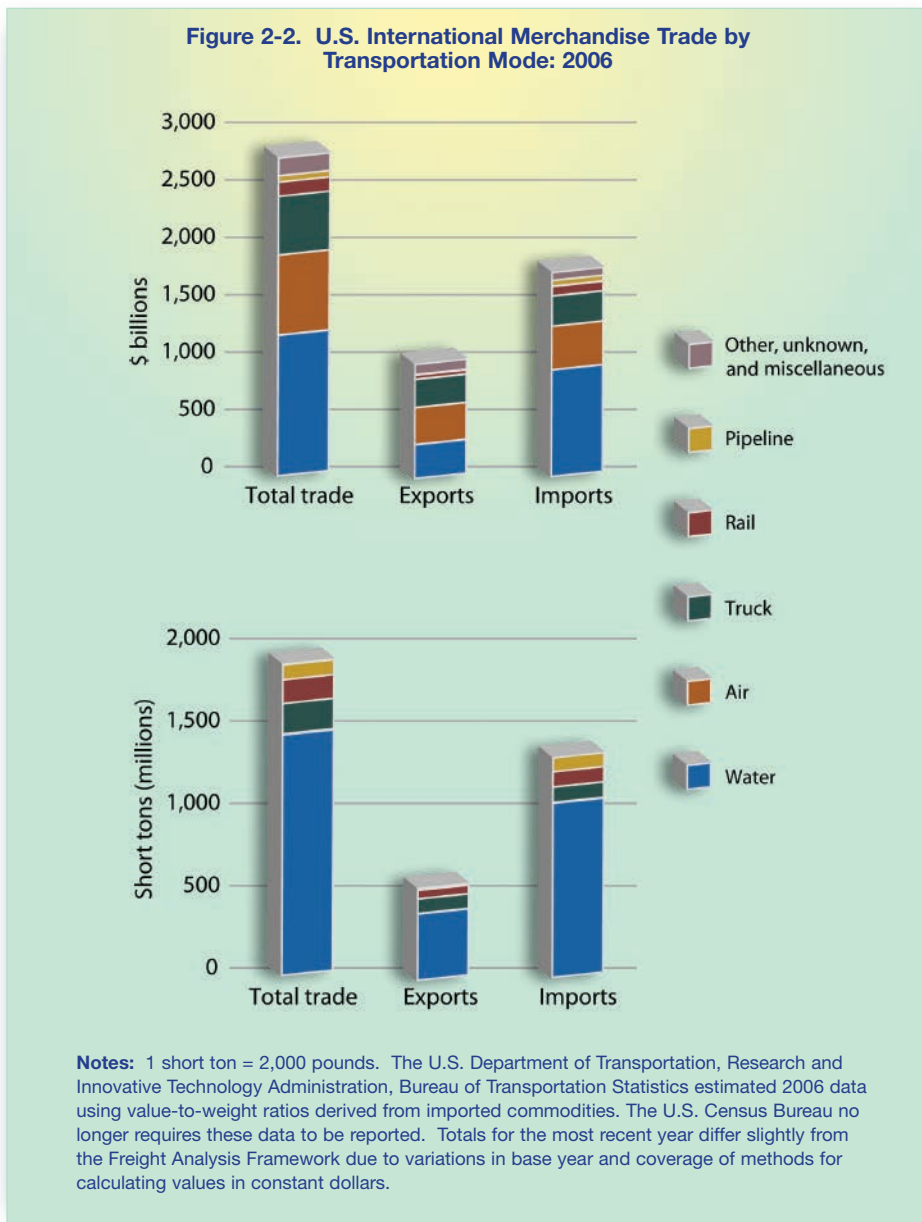
**TABLE 2-6. DOMESTIC MODE OF EXPORTS AND IMPORTS BY TONNAGE AND VALUE: 2002 AND 2035**

**Source:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.

**FIGURE 2-1. VALUE OF MERCHANDISE TRADE BY COASTS AND BORDERS: 1951-2007**

**Sources:** 1951-1970: U.S. Department of Commerce, Census Bureau, *Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition* (Washington, DC: 1975); 1975: U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States: 1977* (Washington, DC: 1977); 1980-1985: U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States: 1987* (Washington, DC: 1986); 1990-2000: U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States: 2006* (Washington, DC: 2005); 2005-2007: U.S. Department of Commerce, Census Bureau, Foreign Trade Division, FT920 - U.S. Merchandise Trade: Selected Highlights (Washington, DC: December 2006) as of July 31, 2008; **Implicit GDP Deflator:** U.S. Department of Commerce, Bureau of Economic Analysis, Current-Dollar and "Real" Gross Domestic Product, available at [www.bea.gov](http://www.bea.gov) as of July 31, 2008.





Nearly 80 percent of freight tons in U.S. foreign trade are transported by ship. Although the vast majority of freight tonnage in U.S. foreign trade moves by water, air and truck transportation are nearly as important when freight value is considered. By value, the water share drops to 44 percent, with air and truck accounting for 25 percent and 18 percent respectively. Rail and pipeline account for the balance.

**FIGURE 2-2. U.S. INTERNATIONAL MERCHANDISE TRADE BY TRANSPORTATION MODE: 2006**  
**Sources:** Compiled by U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration (RITA), Bureau of Transportation Statistics (BTS), October 2007. **Total, water, and air data:** U.S. Department of Commerce, Census Bureau, Foreign Trade Division, FT920 U.S. Merchandise Trade: Selected Highlights, December 2006. **Truck, rail, pipeline data:** USDOT, RITA, BTS, TransBorder Freight Data, 2006. **Other, unknown, and miscellaneous data:** USDOT, RITA, BTS, special tabulation, October 2007.



**Table 2-7. Top 25 Trading Partners of the United States in Merchandise Trade: 1998-2007 (current US\$ billions)**

Partner	2007					
	Rank	1998	2000	2002	2004	2007
Canada	1	329.0	405.6	371.4	445.0	561.5
China	2	85.4	116.3	147.2	231.4	386.7
Mexico	3	173.7	247.6	232.3	266.6	347.3
Japan	4	179.9	211.8	172.9	184.0	208.1
Germany	5	76.5	88.0	89.1	108.6	144.0
United Kingdom	6	73.9	85.0	74.1	82.4	107.2
South Korea	7	40.5	68.2	58.2	72.5	82.3
France	8	41.8	50.0	47.4	53.1	69.0
Taiwan	9	51.3	64.9	50.6	56.3	64.7
Netherlands	10	26.6	31.7	28.2	36.9	51.4
Brazil	11	25.3	29.2	28.2	35.0	50.3
Venezuela	12	15.8	24.2	19.6	29.7	50.1
Italy	13	30.0	36.0	34.4	38.8	49.2
Saudi Arabia	14	16.9	20.4	17.9	26.2	46.0
Singapore	15	34.0	37.0	31.0	34.9	44.7
Malaysia	16	28.0	36.6	34.4	39.1	44.5
India	17	11.8	14.3	15.9	21.7	41.6
Belgium	18	22.3	23.9	23.2	29.3	40.6
Ireland	19	14.0	24.1	29.1	35.6	39.4
Nigeria	20	5.0	11.3	7.0	17.8	35.6
Israel	21	15.6	20.7	19.5	23.7	33.8
Switzerland	22	15.9	20.1	17.2	20.9	31.8
Thailand	23	18.7	23.0	19.7	23.9	31.2
Australia	24	17.3	18.9	19.6	21.8	27.8
Hong Kong <sup>1</sup>	25	23.5	26.1	21.9	25.1	27.2
<b>Top 25 total<sup>2</sup></b>		<b>1,386.3</b>	<b>1,746.7</b>	<b>1,621.2</b>	<b>1,960.5</b>	<b>2,615.8</b>
<b>U.S. total trade</b>		<b>1,594.4</b>	<b>1,997.3</b>	<b>1,856.8</b>	<b>2,287.6</b>	<b>3,116.4</b>
<b>Top 25 as % of total</b>		<b>87</b>	<b>87</b>	<b>87</b>	<b>86</b>	<b>84</b>

<sup>1</sup>Hong Kong has been reported separately since 1989.

<sup>2</sup>Top 25 trading partners change each year. Totals represent the top 25 trading partners for each year, not necessarily the top 25 trading partners listed here for 2007.

**Note:** Numbers may not add to totals due to rounding.

By a wide margin, Canada is this country's top trading partner followed by China and Mexico. China's share of trade with the United States more than doubled between 1998 and 2007, from 5 percent of total merchandise trade to 12 percent.

Trade with Canada and Mexico has grown rapidly over the past decade. Trucks carry more than 60 percent of the value of goods traded with these

**Table 2-8. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 1998-2007**

Mode	1998		2000		2006		2007	
	Value (current US\$ billions)	Weight (millions of short tons)	Value (current US\$ billions)	Weight (millions of short tons)	Value (current US\$ billions)	Weight (millions of short tons)	Value (current US\$ billions)	Weight (millions of short tons)
Truck	350	NA	429	NA	534	NA	555	NA
Rail	68	NA	94	NA	129	NA	138	NA
Air	30	<1	45	1	36	<1	38	1
Water	21	183	33	194	70	251	74	241
Pipeline	11	NA	24	NA	57	NA	59	NA
Other	23	NA	29	NA	40	NA	44	NA
<b>Total</b>	<b>503</b>	<b>NA</b>	<b>653</b>	<b>NA</b>	<b>865</b>	<b>NA</b>	<b>908</b>	<b>NA</b>

**Key:** NA = not available.

**Notes:** Numbers may not add to totals due to rounding. 1 short ton = 2,000 pounds. For value, "Other" is the difference between the total and the sum of the individual modes.

**TABLE 2-7. TOP 25 TRADING PARTNERS OF THE UNITED STATES IN MERCHANDISE: 1998-2007**

**Source:** U.S. Department of Commerce, International Trade Administration, TradeStats Express, available at [www.ita.doc.gov/](http://www.ita.doc.gov/) as of June 3, 2008.

**TABLE 2-8. VALUE AND TONNAGE OF U.S. MERCHANDISE TRADE WITH CANADA AND MEXICO BY TRANSPORTATION MODE: 1998-2007**

**Source:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, TransBorder Freight Data, March 2008.

countries. Rail is the second largest mover of freight for the United States with Canada and Mexico.

**Table 2-9. Value of U.S. Exports to and Imports from Canada and Mexico by Mode of Land Transportation: 1998-2007 (current US\$ millions)**

	1998	2000	2006	2007
<b>Exports to Canada, total</b>	<b>137,745.4</b>	<b>154,847.4</b>	<b>209,283.2</b>	<b>226,058.3</b>
Truck	114,806.1	129,825.3	164,318.1	174,342.7
Rail	12,279.6	12,946.5	22,477.8	25,496.8
Pipeline	93.4	161.6	2,180.0	3,334.5
Other <sup>1</sup>	10,559.5	11,913.4	20,263.4	22,833.8
Mail	6.8	0.6	43.8	50.5
<b>Exports to Mexico, total</b>	<b>70,173.8</b>	<b>97,158.9</b>	<b>116,749.2</b>	<b>118,758.5</b>
Truck	60,432.1	82,389.2	92,991.6	93,047.2
Rail	6,188.8	10,495.8	17,271.2	19,340.0
Pipeline	73.4	301.8	707.0	787.4
Other <sup>1</sup>	3,470.0	3,972.0	5,779.1	5,581.0
Mail	0.1	<0.1	0.3	2.9
<b>Imports from Canada, total</b>	<b>162,105.7</b>	<b>210,270.5</b>	<b>278,889.2</b>	<b>284,773.1</b>
Truck	108,856.7	127,816.3	149,884.0	150,404.1
Rail	37,374.1	49,699.2	63,258.4	65,962.2
Pipeline	11,120.1	23,117.1	53,865.2	55,015.6
Other <sup>1</sup>	4,575.1	9,571.0	11,736.0	12,957.4
Mail	1.7	4.1	0.2	0.4
FTZ <sup>2</sup>	177.9	62.8	145.5	433.5
<b>Imports from Mexico, total</b>	<b>84,102.9</b>	<b>113,436.5</b>	<b>155,205.1</b>	<b>167,713.2</b>
Truck	65,883.7	88,668.7	126,463.6	137,037.0
Rail	12,029.7	21,056.1	25,863.5	27,060.0
Pipeline	2.4	11.5	55.4	168.6
Other <sup>1</sup>	917.8	1,573.9	2,399.2	2,696.4
Mail	0.2	0.6	<0.1	NA
FTZ <sup>2</sup>	2,886.7	2,125.7	423.3	751.1

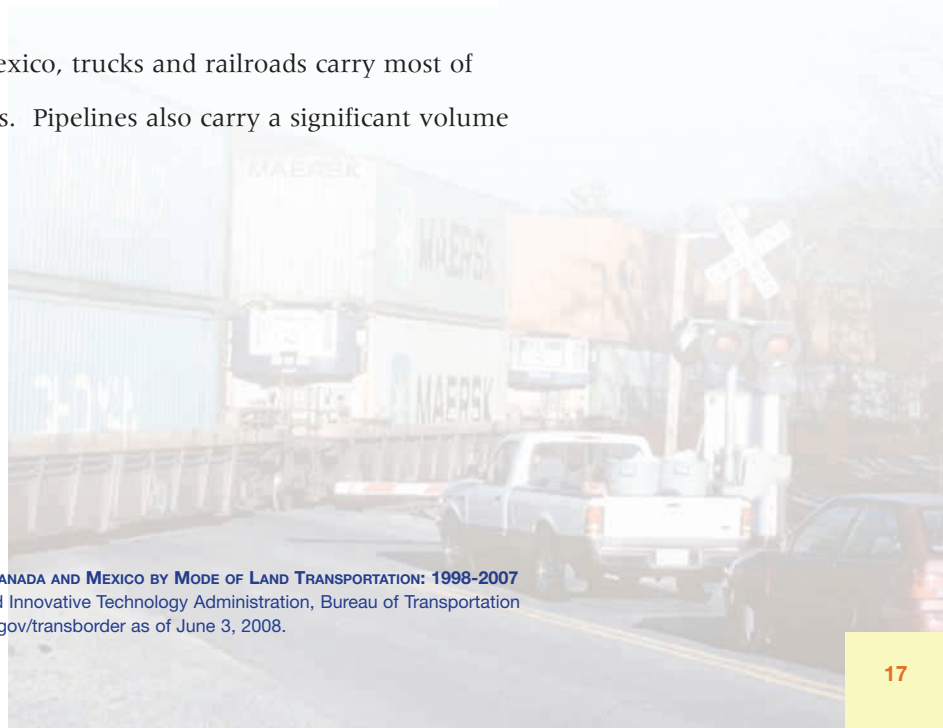
**Key:** NA = not available.

<sup>1</sup>“Other” includes “flyaway aircraft” or aircraft moving under their own power (i.e., aircraft moving from the manufacturer to a customer and not carrying any freight), powerhouse (electricity), vessels moving under their own power, pedestrians carrying freight, and unknown and miscellaneous.

<sup>2</sup>Foreign Trade Zones (FTZs) are treated as a mode of transportation in TransBorder Freight Data because U.S. Customs does not collect the actual mode for specific shipments into or out of an FTZ.

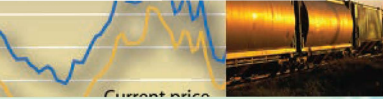
**Note:** Numbers may not add to totals due to rounding.

In addition to total trade with Canada and Mexico, trucks and railroads carry most of the trade in each direction across both borders. Pipelines also carry a significant volume of imports from Canada.

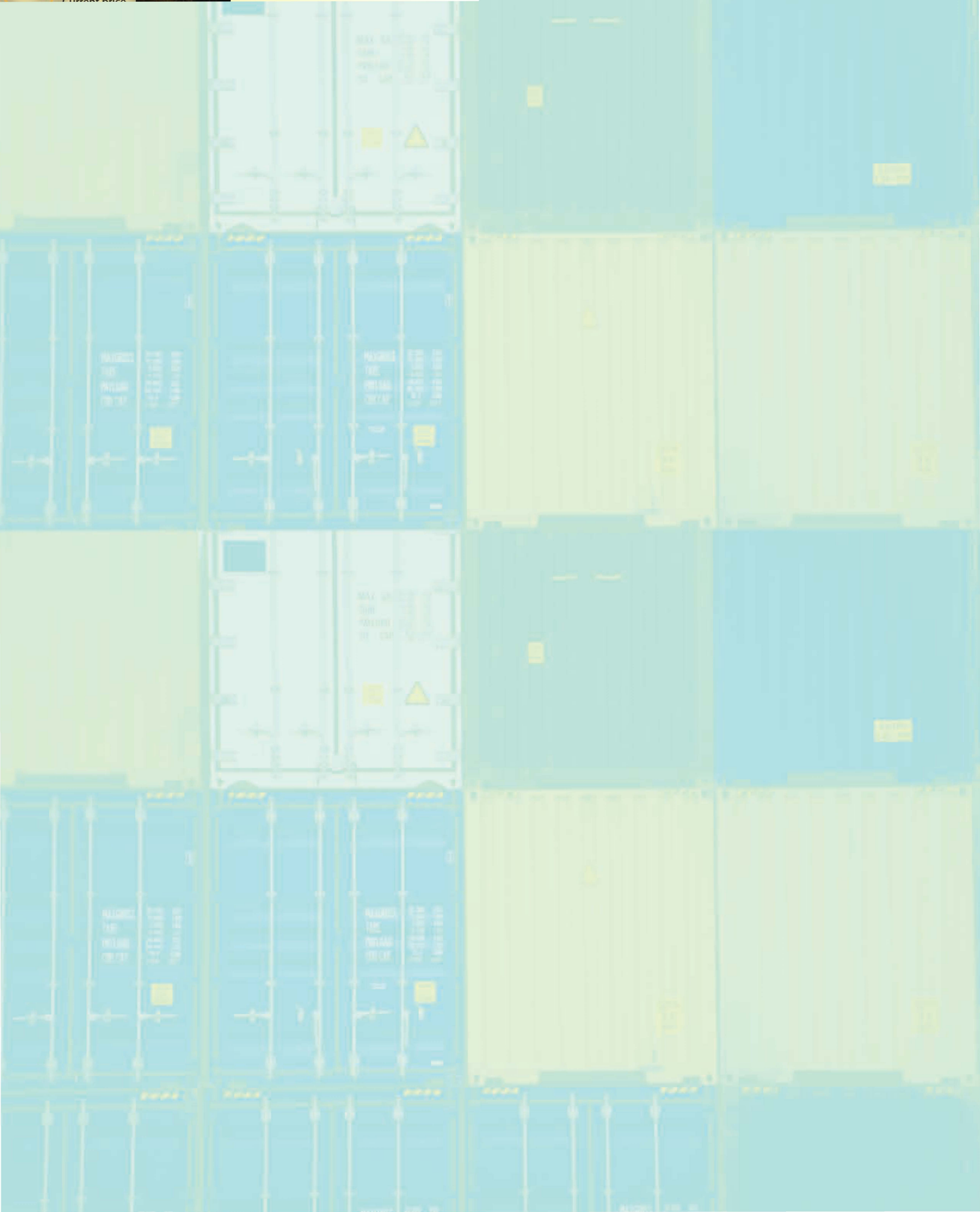


**TABLE 2-9. VALUE OF U.S. EXPORTS TO AND IMPORTS FROM CANADA AND MEXICO BY MODE OF LAND TRANSPORTATION: 1998-2007**

**Source:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, TransBorder Freight Data, available at [www.bts.gov/transborder](http://www.bts.gov/transborder) as of June 3, 2008.



Current price





### III. THE FREIGHT TRANSPORTATION SYSTEM



Freight in America travels over one of the world’s largest and best networks of highways, railroads, waterways, pipelines, and airways. Existing and anticipated increases in the number of freight vehicles, vessels, and other conveyances on both public and private infrastructure are straining system capacity, increasing maintenance requirements, and threatening system performance.

**Table 3-1. Miles of Infrastructure by Transportation Mode: 1980-2006**

	1980	1990	2000	2006	Percent change, 1980-2006
<b>Public roads, route miles</b>	3,859,837	3,866,926	3,951,101	4,033,007	4.5
National Highway System (NHS)	N	N	161,189	163,467	N
Interstates	41,120	45,074	46,673	46,892	14.0
Other NHS	N	N	114,516	116,575	N
Other	N	N	3,789,912	3,869,539	N
<b>Strategic Highway Corridor Network (STRAHNET)</b>	N	N	62,066	61,968	N
Interstate	N	N	46,675	46,893	N
Non-Interstate	N	N	15,389	15,075	N
<b>Railroad</b>	<sup>1</sup> 183,077	175,909	170,512	139,929	-23.6
Class I	NA	133,189	120,597	94,801	N
Regional	NA	18,375	20,978	16,713	N
Local	NA	24,337	28,937	28,415	N
<b>Inland waterways</b>					
Navigable channels	11,000	11,000	11,000	11,000	0.0
Great Lakes-St. Lawrence Seaway	2,342	2,342	2,342	2,342	0.0
<b>Pipelines</b>					
Oil	218,393	208,752	176,996	169,346	-22.5
Gas	1,051,774	1,189,200	1,369,300	1,534,300	45.9

**Key:** N = not applicable; NA = not available.  
<sup>1</sup>Excludes Class III railroads.

Road infrastructure increased slowly over the past 25 years despite a large increase in the volume of traffic. Between 1980 and 2006, route miles of public roads increased by 4.5 percent compared with a 97 percent increase in vehicle miles traveled.

**TABLE 3-1. MILES OF INFRASTRUCTURE BY TRANSPORTATION MODE: 1980-2006**

**Sources:** **Public roads:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table HM-16 and HM-49. **Rail:** Association of American Railroads, *Railroad Facts* (Washington, DC: annual issues). **Navigable channels:** U.S. Army Corps of Engineers, *Corps Facts*, available at [www.hq.usace.army.mil/cepa/pubs](http://www.hq.usace.army.mil/cepa/pubs) as of June 27, 2008. **Great Lakes-St. Lawrence Seaway:** The St. Lawrence Seaway Management Corporation, "The Seaway," available at [www.greatlakes-seaway.com/en/seaway/facts/index.html](http://www.greatlakes-seaway.com/en/seaway/facts/index.html) as of November 28, 2008. **Oil pipelines: 1980-2000:** Eno Transportation Foundation, *Transportation in America, 2002* (Washington, DC: 2002). **2006:** U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety, *Pipeline Statistics*, available at [www.phmsa.dot.gov/pipeline/library/data-stats](http://www.phmsa.dot.gov/pipeline/library/data-stats) as of November 28, 2008. **Gas pipelines:** American Gas Association, *Gas Facts* (Arlington, VA: annual issues).

**Table 3-2. Number of U.S. Vehicles, Vessels, and Other Conveyances: 1980-2006**

	1980	1990	2000	2006
<b>Highway</b>	<b>161,490,159</b>	<b>193,057,376</b>	<b>225,821,241</b>	<b>250,851,833</b>
Truck, single-unit 2-axle 6-tire or more	4,373,784	4,486,981	5,926,030	6,649,337
Truck, combination	1,416,869	1,708,895	2,096,619	2,169,670
Truck, total	5,790,653	6,195,876	8,022,649	8,819,007
Trucks as percent of all highway vehicles	3.6	3.2	3.6	3.5
<b>Rail</b>				
Class I, locomotive	28,094	18,835	20,028	23,732
Class I, freight cars <sup>1</sup>	1,168,114	658,902	560,154	475,415
Nonclass I freight cars <sup>1</sup>	102,161	103,527	132,448	120,688
Car companies and shippers freight cars <sup>1</sup>	440,552	449,832	688,194	750,404
<b>Water</b>	<b>38,788</b>	<b>39,445</b>	<b>41,354</b>	<b>41,109</b>
Nonself-propelled vessels <sup>2</sup>	31,662	31,209	33,152	32,211
Self-propelled vessels <sup>3</sup>	7,126	8,236	8,202	8,898
Oceangoing steam and motor ships <sup>4</sup>	864	636	454	347
U.S. Flag fleet as percent of world fleet <sup>4</sup>	3.5	2.7	1.6	1.1

<sup>1</sup>Beginning with 2001 data, Canadian-owned U.S. railroads are excluded. This accounted for approximately 47,000 cars in 2000.

<sup>2</sup>Nonself-propelled vessels include dry-cargo barges, tank barges, and railroad-car floats.

<sup>3</sup>Self-propelled vessels include dry cargo, passenger, off-shore support, tankers, and towboats.

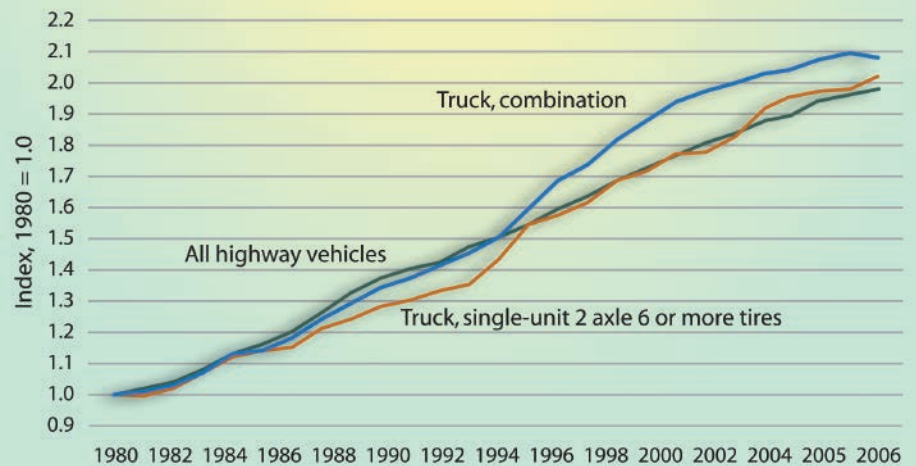
<sup>4</sup>1,000 gross tons and over.

A vast number of vehicles and vessels move goods over the transportation network. The number of commercial trucks climbed 52 percent between 1980 and 2006. In comparison, the number of

rail freight cars has declined since 1980 with improved utilization and the deployment of larger cars. The number of U.S.-flag water vessels decreased by 59 percent over the same period while the world fleet expanded by 29 percent.

The growing demand for goods and services contributes to the increase in travel by trucks at a slightly faster rate than for all vehicles.

**Figure 3-1. Highway Vehicle Miles Traveled by Trucks and All Vehicles: 1980-2006**



**TABLE 3-2. NUMBER OF U.S. VEHICLES, VESSELS, AND OTHER CONVEYANCES: 1980-2006**

**Sources:** **Highway:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues). **Rail:** Association of American Railroads, *Railroad Facts* (Washington, DC: annual issues). **Water: Nonself-propelled vessels and self-propelled vessels:** U.S. Army, Corps of Engineers, *Waterborne Transportation Lines of the United States, Volume 1, National Summaries* (New Orleans, LA: annual issues). **Oceangoing steam motor ships and U.S. Flag fleet:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics* (Washington, DC: annual issues).

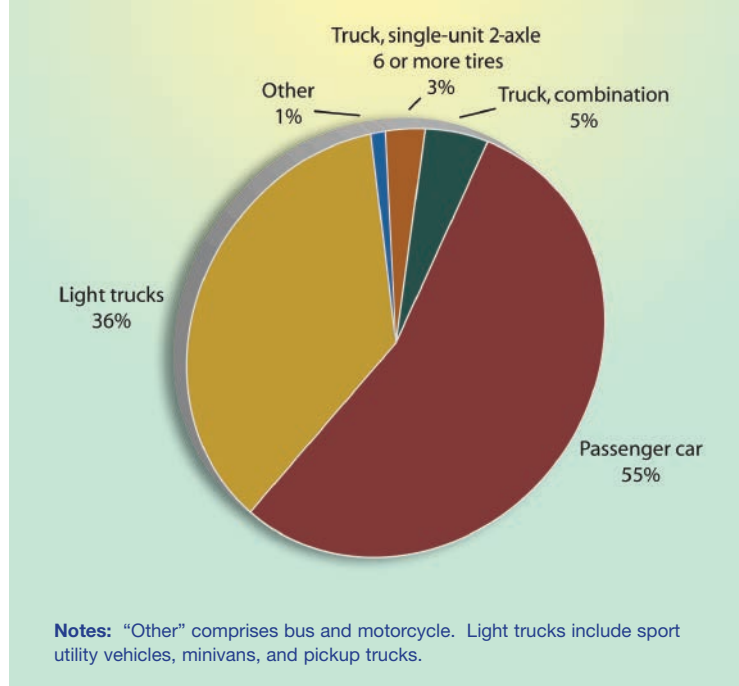
**FIGURE 3-1. HIGHWAY VEHICLE MILES TRAVELED BY TRUCKS AND ALL VEHICLES: 1980-2006**

**Source:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1, available at [www.fhwa.dot.gov/policy/ohpi/hss/index.htm](http://www.fhwa.dot.gov/policy/ohpi/hss/index.htm) as of April 21, 2008.

Despite doubling over the past two decades, truck traffic remains a relatively small share of highway traffic as a whole. In 2006, commercial trucks accounted for about 8 percent of highway vehicle miles traveled. Approximately two-thirds of commercial truck travel is by truck tractors hauling semitrailers and by other combinations, while the remaining one-third is by single-unit trucks with 6 or more tires.

The nation's truck fleet has grown significantly in number and distance driven. Of trucks weighing more

**Figure 3-2. Highway Vehicle Miles Traveled by Vehicle Type: 2006**



**Table 3-3. Trucks and Truck Miles by Average Weight: 1987-2002<sup>1</sup>**

Average weight (pounds)	1987		1992		1997		2002		Percent change, 1987-2002	
	Number (thousands)	VMT (millions)	Number (thousands)	VMT (millions)	Number (thousands)	VMT (millions)	Number (thousands)	VMT (millions)	Number	VMT
<b>Total</b>	<b>3,624</b>	<b>89,972</b>	<b>4,008</b>	<b>104,987</b>	<b>4,701</b>	<b>147,876</b>	<b>5,415</b>	<b>145,624</b>	<b>49</b>	<b>62</b>
<b>Light-heavy</b>	<b>1,030</b>	<b>10,768</b>	<b>1,259</b>	<b>14,012</b>	<b>1,436</b>	<b>19,815</b>	<b>1,914</b>	<b>26,256</b>	<b>86</b>	<b>144</b>
10,001 to 14,000	525	5,440	694	8,000	819	11,502	1,142	15,186	118	179
14,001 to 16,000	242	2,738	282	2,977	316	3,951	396	5,908	64	116
16,001 to 19,500	263	2,590	282	3,035	301	4,362	376	5,161	43	99
<b>Medium-heavy</b>	<b>766</b>	<b>7,581</b>	<b>732</b>	<b>8,143</b>	<b>729</b>	<b>10,129</b>	<b>910</b>	<b>11,766</b>	<b>19</b>	<b>55</b>
19,501 to 26,000	766	7,581	732	8,143	729	10,129	910	11,766	19	55
<b>Heavy-heavy</b>	<b>1,829</b>	<b>71,623</b>	<b>2,017</b>	<b>82,832</b>	<b>2,536</b>	<b>117,931</b>	<b>2,591</b>	<b>107,602</b>	<b>42</b>	<b>50</b>
26,001 to 33,000	377	5,411	387	5,694	428	7,093	437	5,845	16	8
33,001 to 40,000	209	4,113	233	5,285	257	6,594	229	3,770	10	-8
40,001 to 50,000	292	7,625	339	9,622	400	13,078	318	6,698	9	-12
50,001 to 60,000	188	7,157	227	8,699	311	12,653	327	8,950	74	25
60,001 to 80,000	723	45,439	781	51,044	1,070	74,724	1,179	77,489	63	71
80,001 to 100,000	28	1,254	33	1,529	46	2,427	69	2,950	144	135
100,001 to 130,000	8	440	12	734	18	1,051	26	1,571	238	257
130,001 or more	4	185	5	227	6	312	6	329	43	78

**Key:** VMT = vehicle miles traveled.

<sup>1</sup>Excludes trucks with an average weight of 10,000 pounds or less.

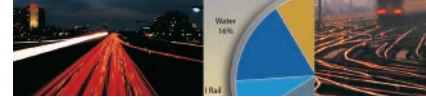
**Notes:** Weight includes the empty weight of the vehicle plus the average weight of the load carried. Numbers may not add to totals due to rounding.

**FIGURE 3-2. HIGHWAY VEHICLE MILES TRAVELED BY VEHICLE TYPE: 2006**

**Source:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1, available at [www.fhwa.dot.gov/policy/ohpi/hss/index.htm](http://www.fhwa.dot.gov/policy/ohpi/hss/index.htm) of April 21, 2008.

**TABLE 3-3. TRUCKS AND TRUCK MILES BY AVERAGE WEIGHT 1987-2002<sup>1</sup>**

**Sources:** U.S. Department of Commerce, Census Bureau, *2002 Vehicle Inventory and Use Survey: United States* (Washington, DC: 2004), available at [www.census.gov/svsd/www/vius/products.html](http://www.census.gov/svsd/www/vius/products.html) as of April 24, 2008; U.S. Department of Commerce, Census Bureau, *1992 Truck Inventory and Use Survey: United States* (Washington, DC: 1995), available at [www.census.gov/svsd/www/vius/products.html](http://www.census.gov/svsd/www/vius/products.html) as of April 24, 2008.



than 10,000 pounds registered to businesses, individuals, and organizations other than government, most growth has occurred at either end of the weight spectrum. Distance traveled has more than doubled in 15 years for trucks weighing between 10,000 pounds and 26,000 pounds and for trucks weighing over 80,000 pounds. Trucks between 60,000 pounds and 80,000 pounds form the largest category in both number of trucks and vehicle miles traveled because in most cases 80,000 pounds is the maximum weight allowed on the highway system without special permits.

Federal and state governments are concerned about truck weight because of the damage that heavy trucks can do to roads and bridges. To monitor truck weight, approximately 200 million weighs

**Table 3-4. Commercial Vehicle Weight Enforcement Activities: 2005-2007**

	2005	2006	2007
<b>All weighs</b>	<b>230,464,926</b>	<b>229,435,113</b>	<b>217,444,117</b>
<b>Weigh-in-motion</b>	<b>136,380,657</b>	<b>142,587,134</b>	<b>132,257,618</b>
<b>Static weighs, total<sup>1</sup></b>	<b>94,084,269</b>	<b>86,847,979</b>	<b>85,186,499</b>
Semiportable scales	493,574	422,860	425,731
Fixed scales	93,038,479	85,897,099	84,213,507
Portable scales	552,216	528,020	547,261
<b>Violations, total<sup>2</sup></b>	<b>567,949</b>	<b>622,806</b>	<b>530,350</b>
Axle weight violations	275,442	271,121	233,563
Gross weight violations	118,328	149,678	126,761
Bridge weight violations	174,179	202,007	170,026
<b>Permits, total<sup>3</sup></b>	<b>3,625,898</b>	<b>4,598,227</b>	<b>4,827,668</b>
Non-divisible trip permits	2,711,500	3,399,435	3,743,323
Non-divisible annual permits	233,160	250,505	332,148
Divisible trip permits	288,145	426,381	398,003
Divisible annual permits	393,093	521,906	354,194

<sup>1</sup>Static weighs include the total number of vehicles weighed from semiportable, portable, and fixed scales.

<sup>2</sup>Violations include those from axle, gross, and bridge formula weight limits.

<sup>3</sup>Permits issued are for divisible and non-divisible loads on a trip or on an annual basis, as well as the overwidth movement of a divisible load.

**Note:** Data are not complete for Indiana (2005), Pennsylvania (2005 and 2006), and South Dakota (2006 and 2007).

are made each year, about 60 percent are weight-in motion and nearly 40 percent are static. Weigh-in-motion technology is used as a screening tool to determine which vehicles need closer scrutiny. Violations are taken from static weighs only. Less than 1 percent of static weighs result in violations.

**TABLE 3-4. COMMERCIAL VEHICLE WEIGHT ENFORCEMENT ACTIVITIES: 2005-2007**

**Source:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Annual State Certifications of Size and Weight Enforcement on Federal-aid Highways, as prescribed under CFR Part 657, personal communication, August 20, 2008.





In addition to weight restrictions, Federal and state governments place limits on the length and other characteristics of commercial trucks using the road system. Twenty-nine states have semitrailer length limitations on the National Network for conventional combination trucks other than the 48-foot limit set by Federal law for a semi-trailer operating in a truck tractor-semi-trailer combination.

**Table 3-5. Semitrailer Length Limitations on the National Network by State: 2008**

State	Length limitation (feet and inches)
States not listed	48-0
Alabama	53-6
Arizona	57-6
Arkansas	53-6
California <sup>1</sup>	48-0
Colorado	57-4
Delaware	53-0
Illinois	53-0
Indiana <sup>2</sup>	48-6
Iowa	53-0
Kansas	57-6
Kentucky	53-0
Louisiana	59-6
Mississippi	53-0
Missouri	53-0
Montana	53-0
Nebraska	53-0
Nevada	53-0
New Mexico	57-6
North Dakota	53-0
Ohio	53-0
Oklahoma	59-6
Oregon	53-0
Pennsylvania	53-0
Rhode Island	48-6
South Dakota	53-0
Tennessee	50-0
Texas	59-0
Wisconsin <sup>3</sup>	48-0
Wyoming	57-4

<sup>1</sup>Semitrailers up to 53 feet may also operate without a permit by conforming to a kingpin-to-rearmost axle distance of 38 feet.

<sup>2</sup>Semitrailers up to 53 feet in length may operate without a permit by conforming to a kingpin-to-rearmost axle distance of 40 feet and 6 inches. Semitrailers that are consistent with 23 CFR 23 658.13(h) may operate without a permit provided the distance from the kingpin to the center of the rear axle is 46 feet or less.

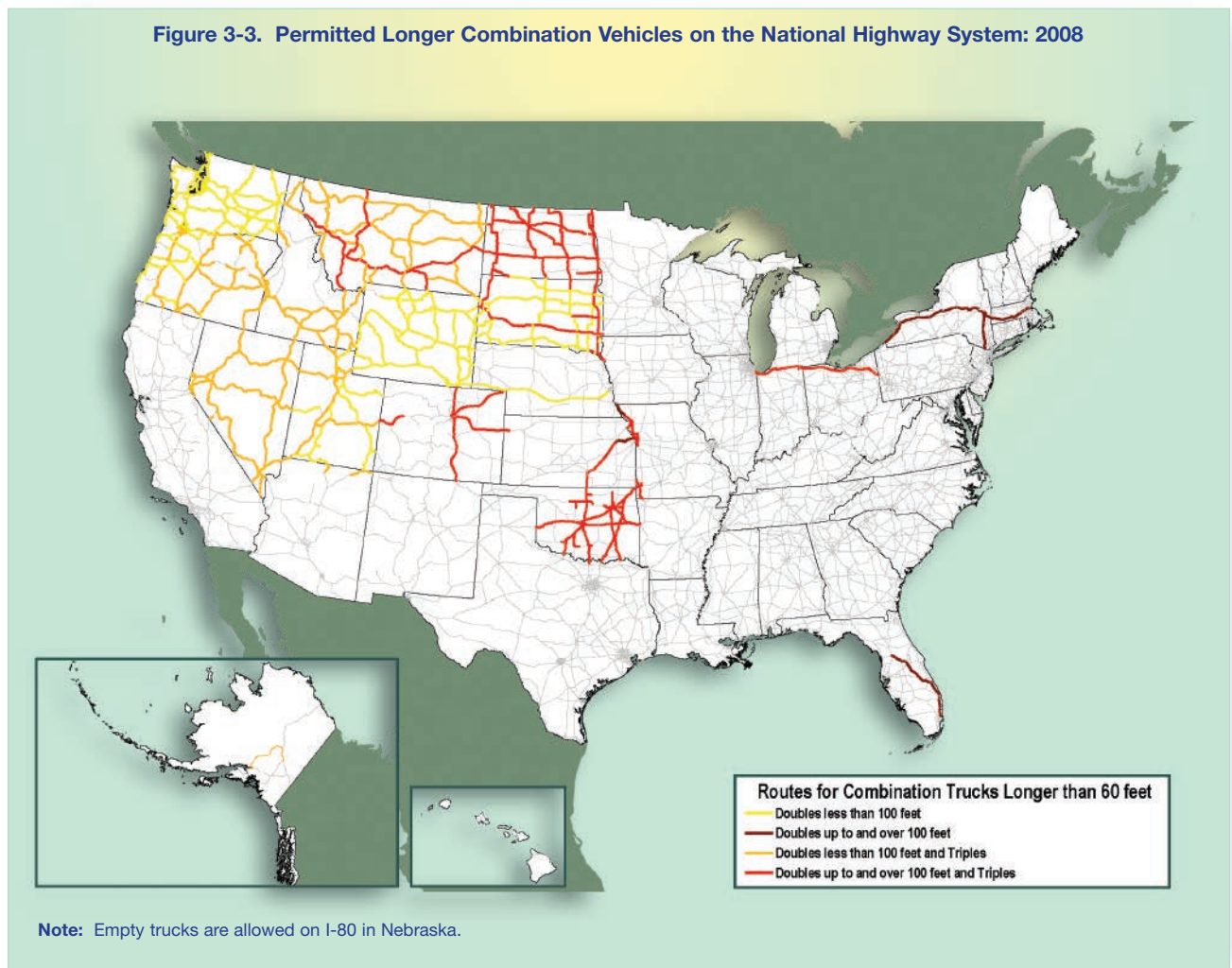
<sup>3</sup>Semitrailers up to 53 feet in length may operate without a permit by conforming to a kingpin-to-rearmost axle distance of 41 feet, measured to the center of the rear tandem assembly. Semitrailers that are consistent with 23 CFR 658.13(h) may operate without a permit provided the distance from the kingpin to the center of the rear axle is 46 feet or less.

**Note:** The National Network, established by the Surface Transportation Assistance Act of 1982 (PL 97-424) and designated in U.S. Code of Federal Regulations (23 CFR 658), are the routes over which states must allow conventional combination trucks to operate.

**TABLE 3-5. SEMITRAILER LENGTH LIMITATIONS ON THE NATIONAL NETWORK BY STATE: 2008**

**Source:** National Archives and Records Administration, Office of Federal Register, *Code of Federal Regulations, Title 23: Highways, Part 658, Appendix B.*

**Figure 3-3. Permitted Longer Combination Vehicles on the National Highway System: 2008**



Longer Combination Vehicles (LCVs) are tractors pulling a semitrailer longer than 28 feet and a trailer longer than 28 feet, a semitrailer longer than 28 feet and a trailer no more than 28 feet long, or a 28-foot semitrailer and two 28-foot trailers. Although all states allow conventional combinations consisting of a 28-foot semitrailer and a 28-foot trailer, only fourteen states and six state turnpike authorities allow LCVs on at least some parts of their road networks. Allowable routes for LCVs have been frozen since 1991.

**FIGURE 3-3. PERMITTED LONGER COMBINATION VEHICLES ON THE NATIONAL HIGHWAY SYSTEM: 2008**

**Source:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, special compilation by the Freight Operations and Technology Team, 2008.

Three-fourths of the miles traveled by trucks larger than panels, pickups, minivans, other light vans, and government-owned vehicles are for the movement of products from electronics to sand and gravel. Most of the remaining mileage is for empty backhauls and empty shipping containers.

**Table 3-6. Truck Miles by Products Carried: 2002<sup>1</sup>**

Products carried	Millions of miles
<b>Total<sup>2</sup></b>	<b>145,173</b>
Animals and fish, live	735
Animal feed and products of animal origin	2,088
Grains, cereal	1,368
All other agricultural products	2,661
Basic chemicals	876
Fertilizers and fertilizer materials	1,666
Pharmaceutical products	305
All other chemical products and preparations	1,351
Alcoholic beverages	1,124
Bakery and milled grain products	3,553
Meat, seafood, and their preparations	3,056
Tobacco products	445
All other products foodstuff	7,428
Logs and other wood in the rough	1,149
Paper or paperboard articles	3,140
Printed products	765
Pulp, newsprint, paper, paperboard	1,936
Wood products	3,561
Articles of base metal	3,294
Base metal in primary or semifinished forms	2,881
Nonmetallic mineral products	3,049
Tools, nonpowered	7,759
Tools, powered	6,478
Electronic and other electrical equipment	3,024
Furniture, mattresses, lamps, etc.	2,043
Machinery	3,225
Miscellaneous manufactured products	4,008
Precision instruments and apparatus	734
Textile, leather, and related articles	1,538
Vehicles, including parts	3,844
All other transportation equipment	636
Coal	301
Crude petroleum	132
Gravel or crushed stone	2,790
Metallic ores and concentrates	45
Monumental or building stone	462
Natural sands	1,089
All other nonmetallic minerals	499
Fuel oils	1,232
Gasoline and aviation turbine fuel	849
Plastic and rubber	2,393
All other coal and refined petroleum products	1,172
Hazardous waste (EPA manifest)	190
All other waste and scrape (non-EPA manifest)	2,647
Recyclable products	922
Mail and courier parcels	4,760
Empty shipping containers	794
Passengers	274
Mixed freight	14,659
Products, equipment, or materials not elsewhere classified	265
Products not specified	6,358
Not applicable <sup>3</sup>	150
No product carried	28,977

<sup>1</sup>Excludes pickups, panels, minivans, sport utilities, and station wagons.

<sup>2</sup>Detail lines may not add to total because multiple products/hazardous materials may be carried at the same time.

<sup>3</sup>Vehicles not in use. When the respondent had partial-year ownership of the vehicle, annual miles were adjusted to reflect miles traveled when not owned by the respondent.

**TABLE 3-6. TRUCK MILES BY PRODUCTS CARRIED: 2002**

Source: U.S. Department of Commerce, Census Bureau, 2002 Vehicle Inventory and Use Survey: United States, EC02TV-US (Washington, DC: 2004), available at [www.census.gov/prod/ec02/ec02tv-us.pdf](http://www.census.gov/prod/ec02/ec02tv-us.pdf) as of April 24, 2008.



**Table 3-7. Trucks, Truck Miles, and Average Distance by Range of Operations and Jurisdictions: 2002**

	<b>Number of Trucks (thousands)</b>	<b>Truck Miles (millions)</b>	<b>Miles per Truck (thousands)</b>
<b>Total</b>	<b>5,520.5</b>	<b>145,172.5</b>	<b>26.3</b>
Off the road	182.9	2,262.8	12.4
50 miles or less	2,942.4	42,531.1	14.5
51 to 100 miles	684.7	19,161.6	28.0
101 to 200 miles	243.5	11,779.9	48.4
201 to 500 miles	231.6	17,519.7	75.7
501 miles or more	293.0	26,706.4	91.2
Not reported	716.3	25,061.1	35.0
Not applicable	226.1	149.9	0.7
Operated in Canada	1.7	72.0	42.7
Operated in Mexico	1.6	29.3	18.5
Operated within the home base state	4,196.4	84,973.9	20.2
Operated in states other than the home base state	495.6	40,901.2	82.5
Not reported	599.1	19,046.1	31.8
Not applicable	226.1	149.9	0.7

**Note:** Includes trucks registered to companies and individuals in the United States except pickups, minivans, other light cars, and sport utility vehicles.

Most trucks larger than pickups, minivans, other light vans, and sport utility vehicles typically operate close to home. About one-half of all trucks typically travel to destinations within 50 miles of their base, and almost three-fourths stayed within their base state. Less than 10 percent of trucks larger than pickups, minivans, other light vans, and sport utility vehicles typically travel to places more than 200 miles away, but these vehicles count for 30 percent of the mileage traveled by larger trucks.

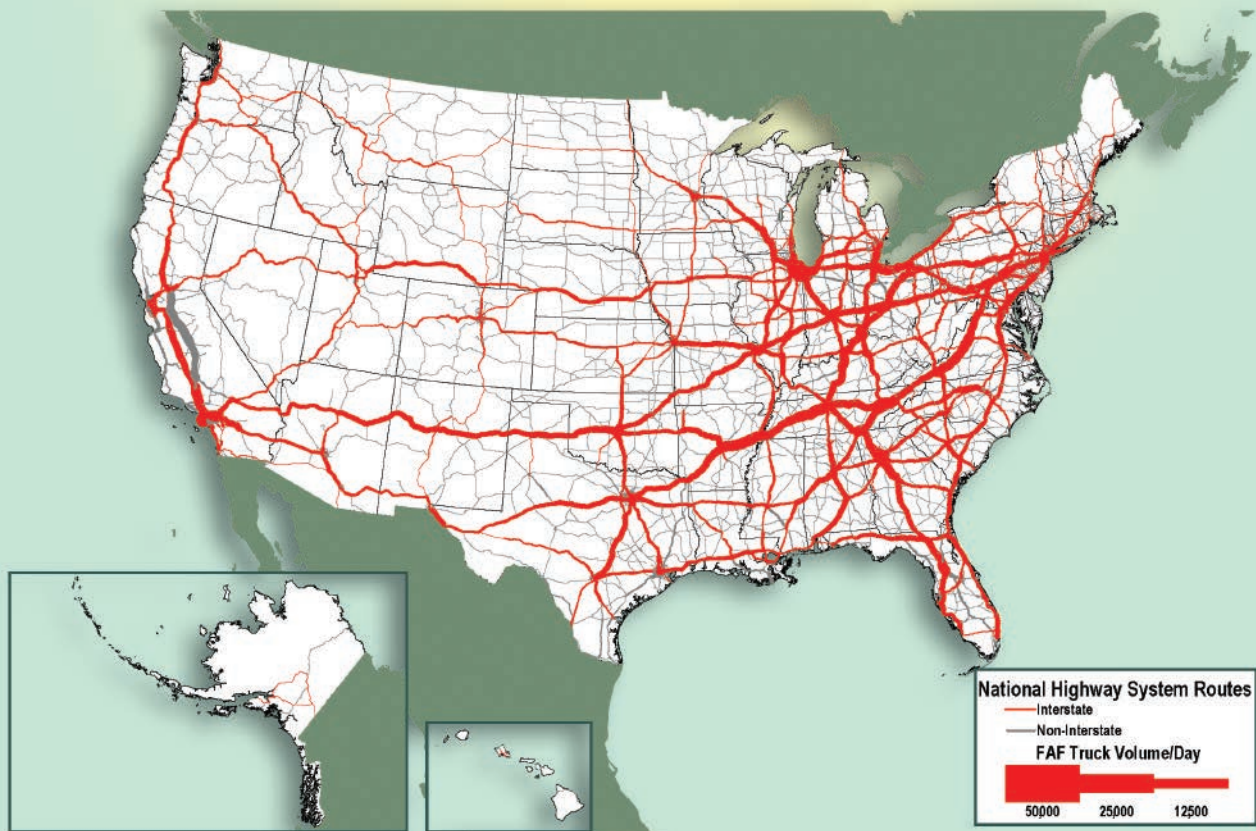
**TABLE 3-7. TRUCKS, TRUCK MILES, AND AVERAGE DISTANCE BY RANGE OF OPERATIONS AND JURISDICTIONS: 2002**

**Source:** U.S. Department of Commerce, Census Bureau, *2002 Vehicle Inventory and Use Survey: United States*, EC02TV-US, Table 3a (Washington, DC: 2004), available at [www.census.gov/prod/ec02/ec02tv-us.pdf](http://www.census.gov/prod/ec02/ec02tv-us.pdf) as of April 24, 2008.



Long-haul truck traffic carrying commodities between places at least 50 miles apart is concentrated on major routes connecting population centers, ports, border crossings, and other major hubs of activity. Except for Route 99 in California, most of the heaviest traveled routes are on the Interstate System.

**Figure 3-4. Average Daily Long-Haul Truck Traffic on the National Highway System: 2002**

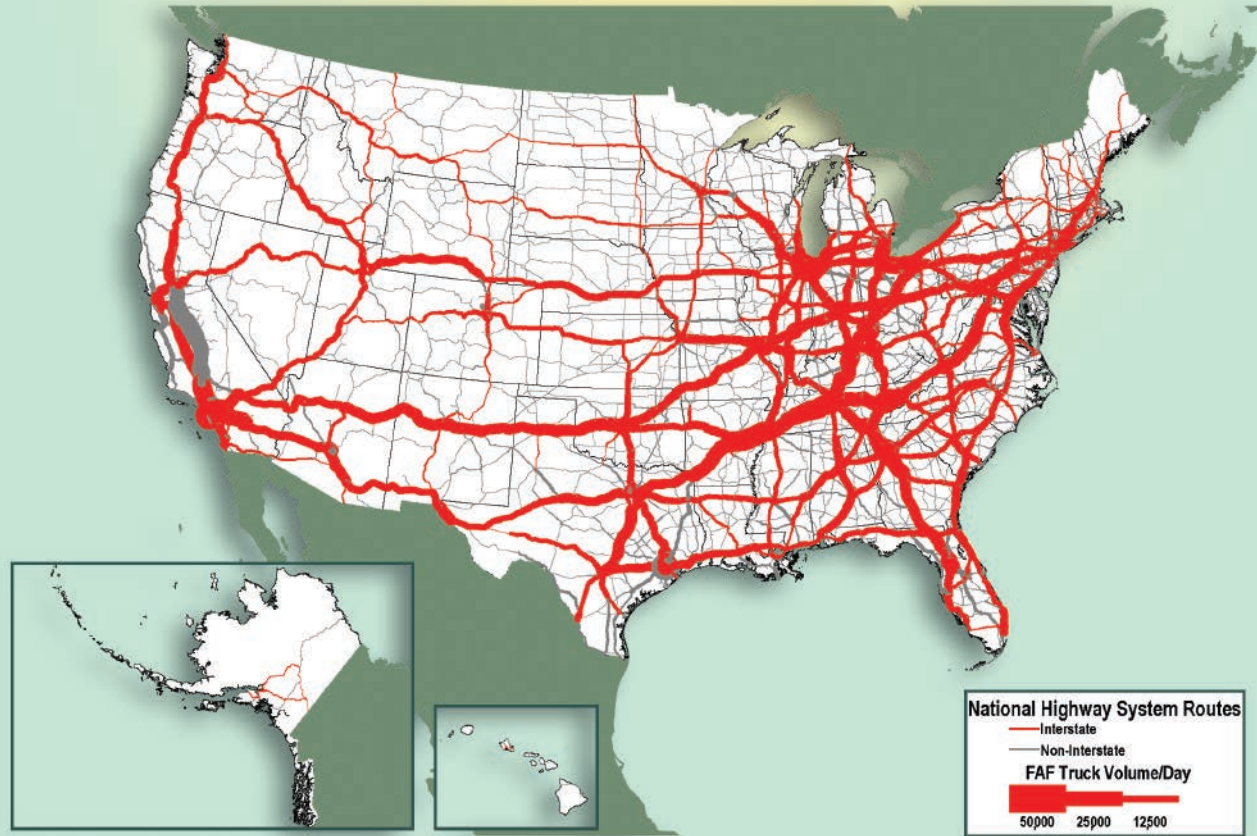


**Note:** Long-haul freight trucks serve locations at least 50 miles apart, excluding trucks that are used in intermodal movements.

**FIGURE 3-4. AVERAGE DAILY LONG-HAUL TRUCK TRAFFIC ON THE NATIONAL HIGHWAY SYSTEM: 2002**

**Source:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.

Figure 3-5. Average Daily Long-Haul Truck Traffic on the National Highway System: 2035



**Note:** Long-haul freight trucks serve locations at least 50 miles apart, excluding trucks that are used in intermodal movements.

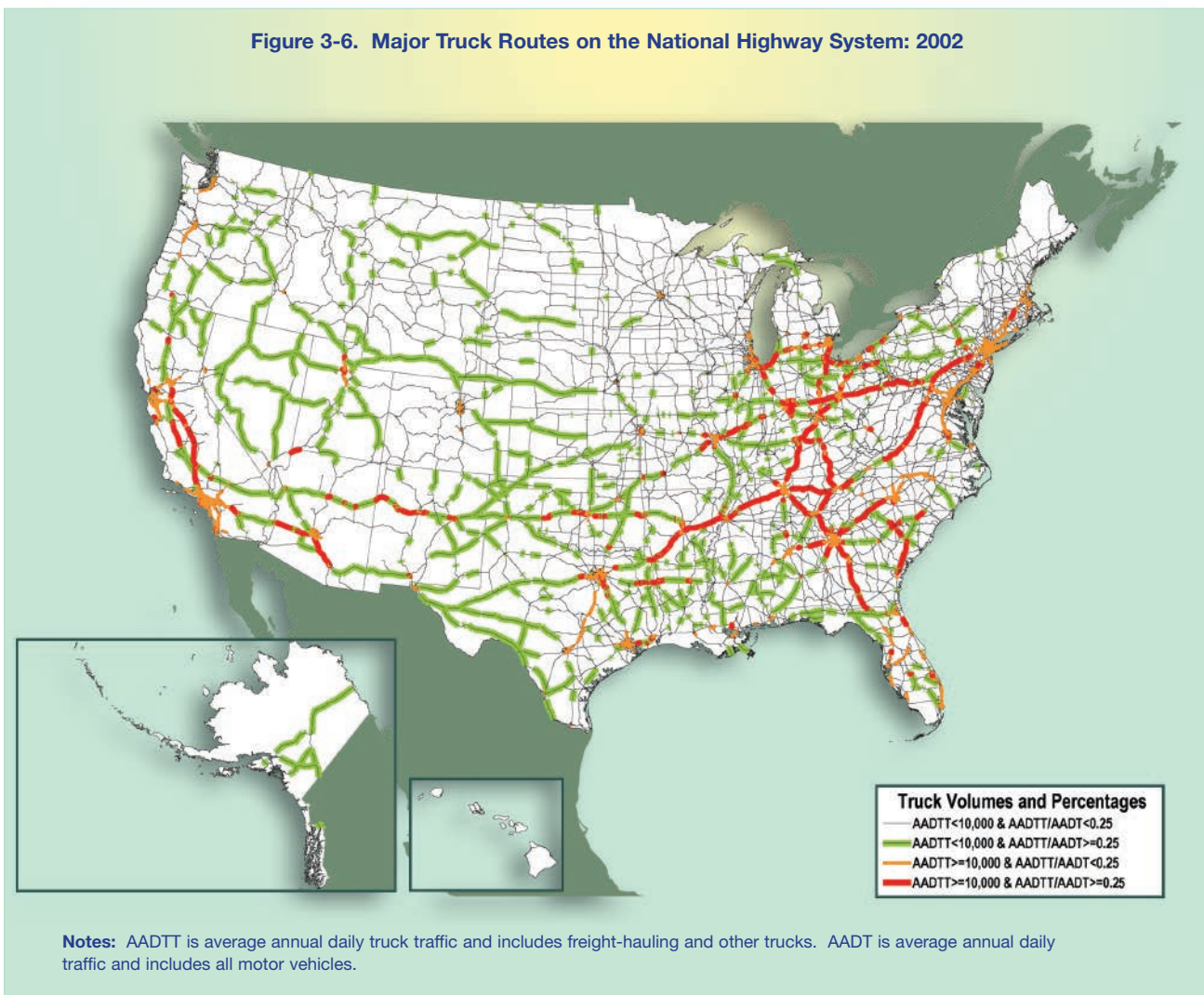
By 2035, long-haul truck traffic between places at least 50 miles apart is expected to increase dramatically on Interstate highways and other arterials throughout the nation. These trucks are expected to travel 600 million miles per day.

FIGURE 3-5. AVERAGE DAILY LONG-HAUL TRUCK TRAFFIC ON THE NATIONAL HIGHWAY SYSTEM: 2035

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.



Figure 3-6. Major Truck Routes on the National Highway System: 2002

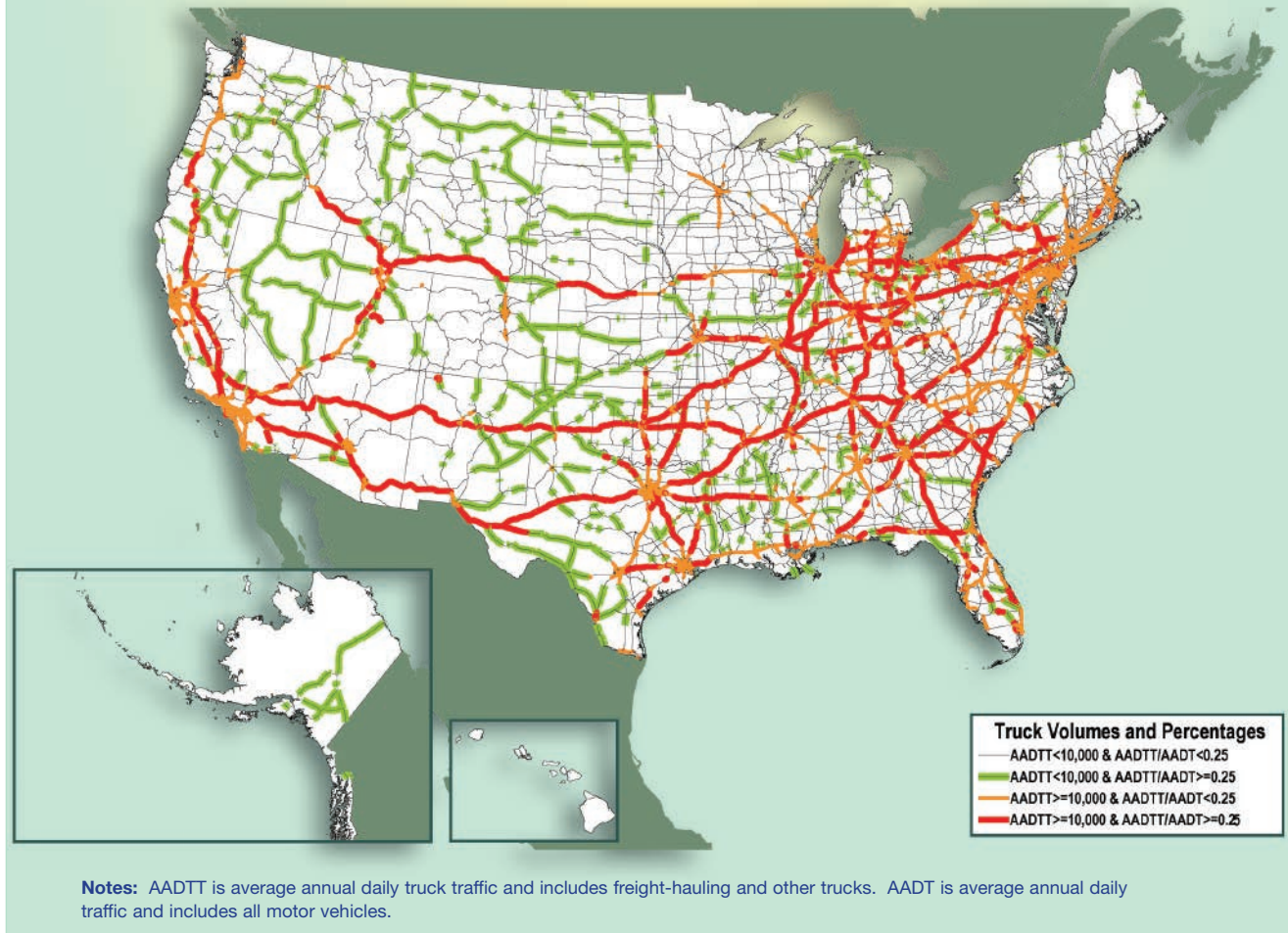


Selected routes carry a significant concentration of trucks, either as an absolute number or as a percentage of the traffic stream. More than 4,000 miles of the National Highway System (NHS) carry more than 10,000 trucks per day on sections where at least every fourth vehicle is a truck.

FIGURE 3-6. MAJOR TRUCK ROUTES ON THE NATIONAL HIGHWAY SYSTEM: 2002

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.

Figure 3-7. Major Truck Routes on the National Highway System: 2035



The number of NHS miles carrying large volumes and high percentages of trucks is forecast to increase dramatically by 2035. Segments with more than 10,000 trucks per day and where at least every fourth vehicle is a truck are forecast to exceed 14,000 miles, an increase of almost 230 percent from 2002.

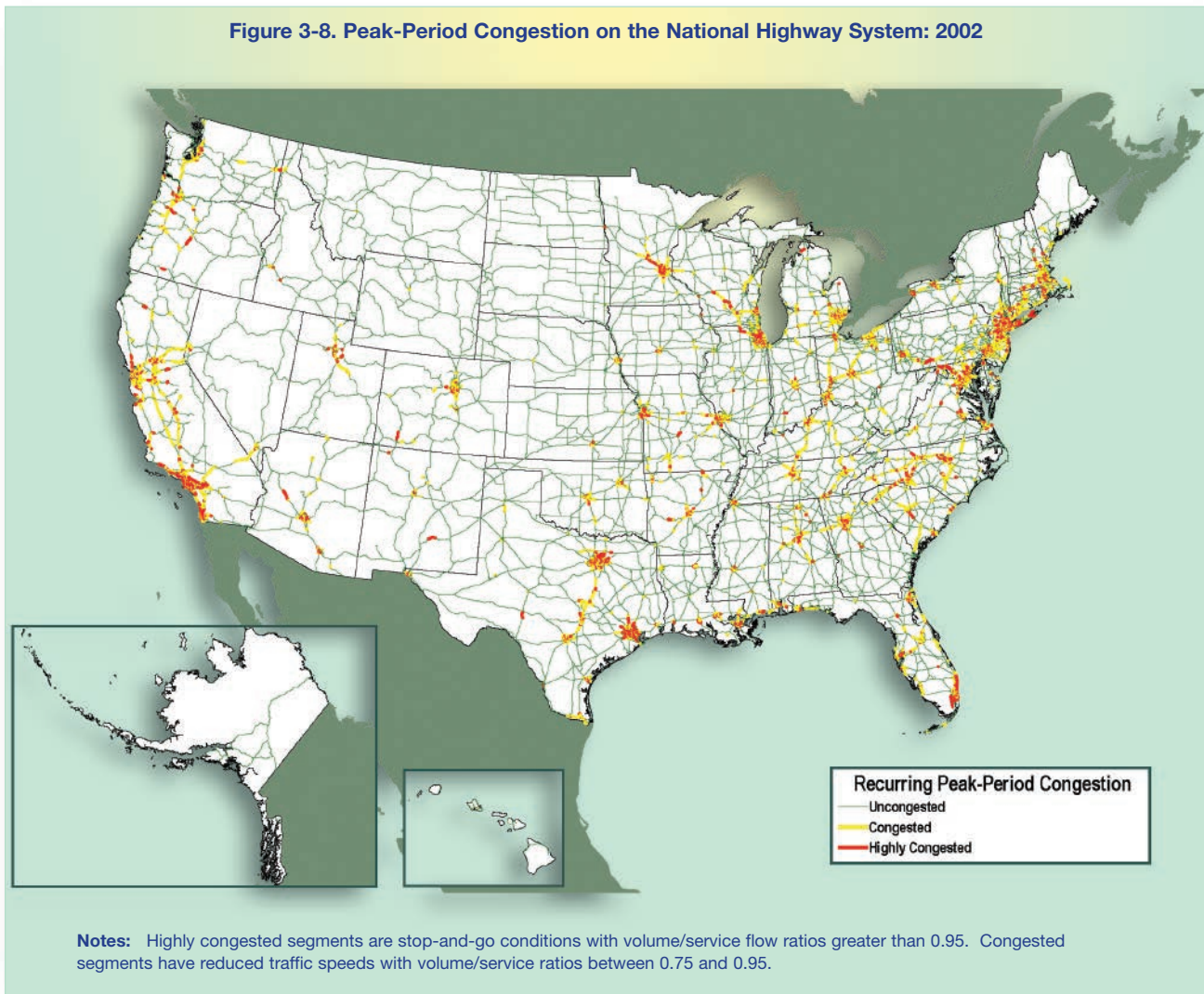
FIGURE 3-7. MAJOR TRUCK ROUTES ON THE NATIONAL HIGHWAY SYSTEM: 2035

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.



Recurring congestion caused by volumes of passenger vehicles and trucks that exceed capacity on roadways during peak periods is concentrated primarily in major metropolitan areas. In 2002, peak-period congestion resulted in traffic slowing below posted speed limits on more than 10,600 miles of the NHS and created stop-and-go conditions on an additional 6,700 miles.

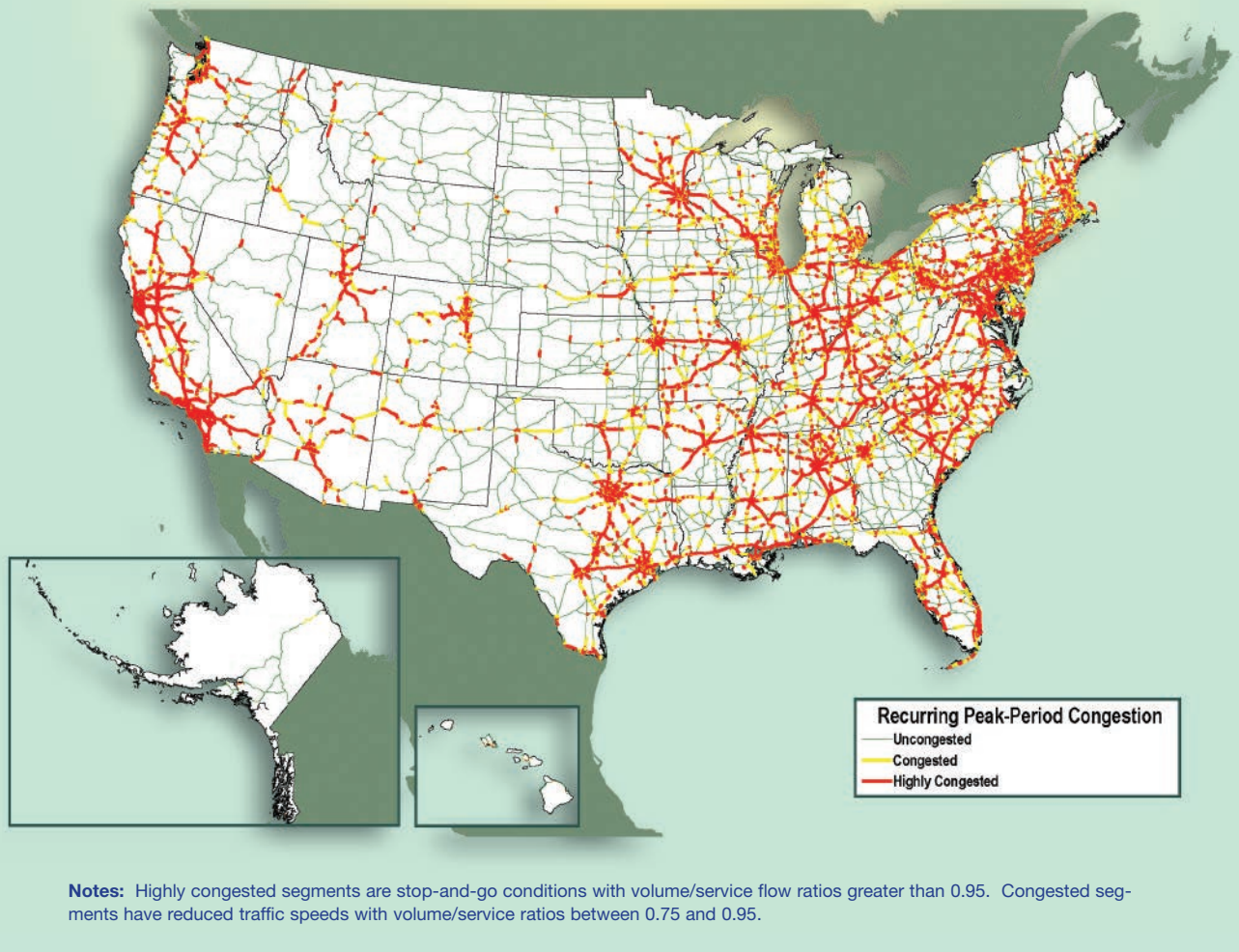
**Figure 3-8. Peak-Period Congestion on the National Highway System: 2002**



**FIGURE 3-8. PEAK-PERIOD CONGESTION ON THE NATIONAL HIGHWAY SYSTEM: 2002**

**Source:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.

Figure 3-9. Peak-Period Congestion on the National Highway System: 2035



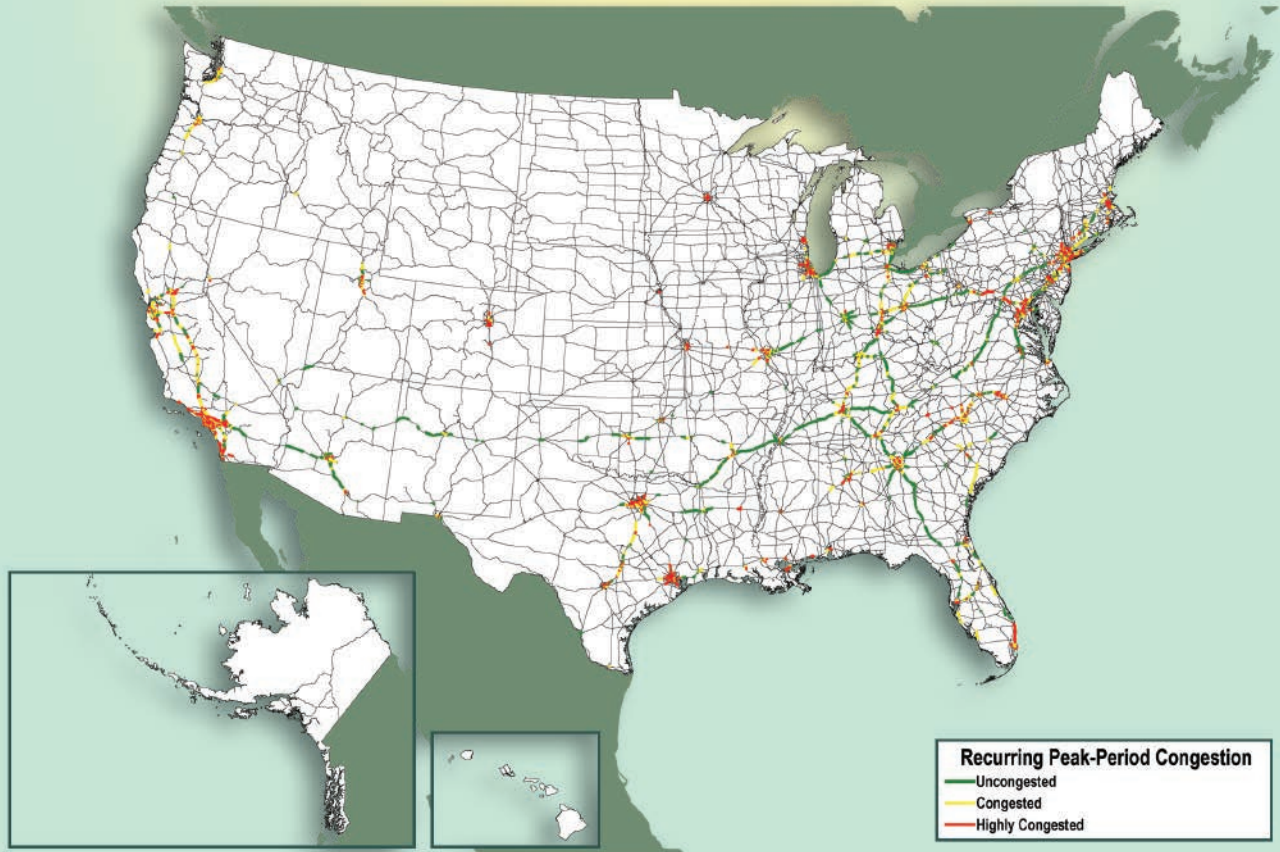
Assuming no changes in network capacity, increases in truck and passenger vehicle traffic are forecast to expand recurring, peak- period congestion to 40 percent of the NHS in 2035 compared with 11 percent in 2002. This will slow traffic on nearly 20,000 miles of the NHS and create stop-and-go conditions on an additional 45,000 miles.

FIGURE 3-9. PEAK-PERIOD CONGESTION ON THE NATIONAL HIGHWAY SYSTEM: 2035

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.

Congested highways carrying a large number of trucks substantially impede interstate commerce, and trucks on those segments contribute significantly to congestion. Recurring congestion slows or stops traffic on over 6,300 miles of the NHS that carry more than 10,000 trucks per day.

**Figure 3-10. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2002**



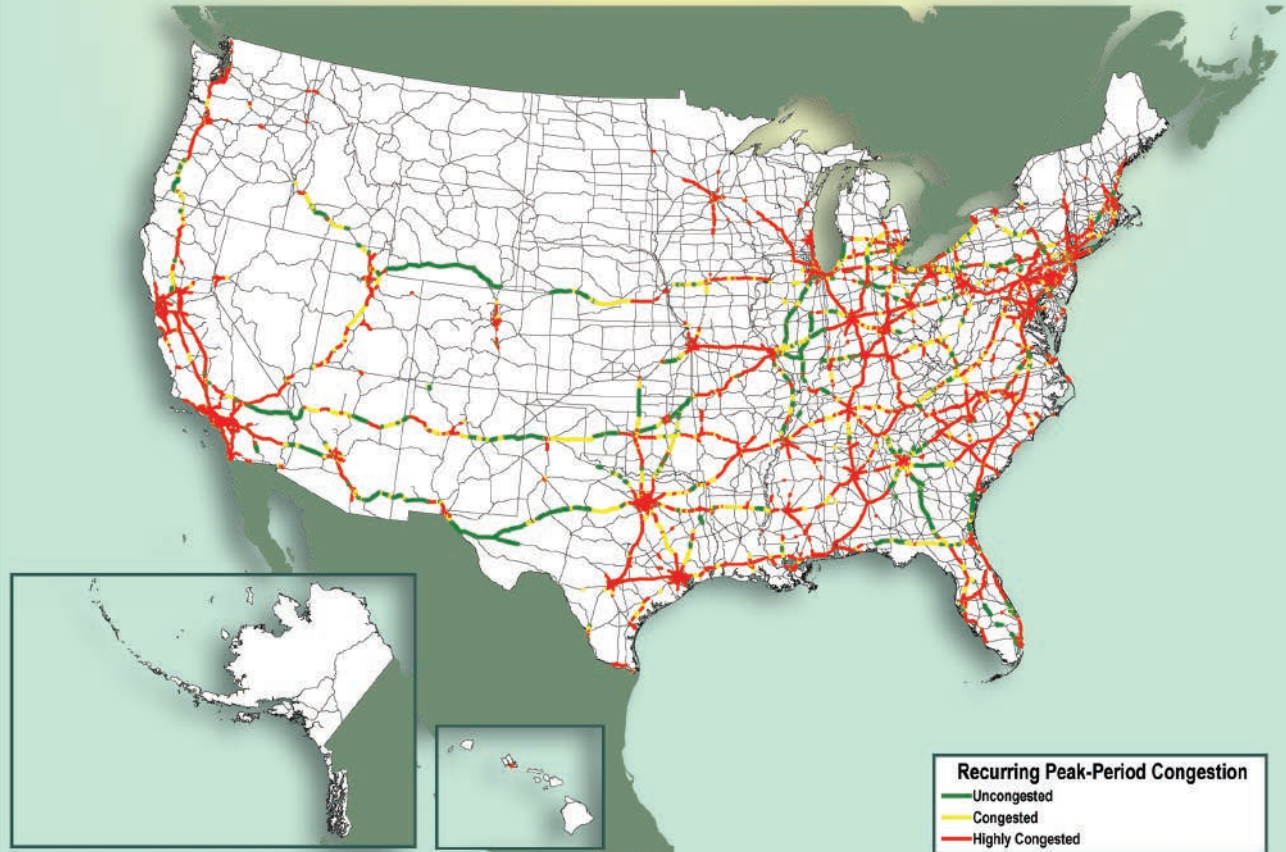
**Notes:** High-volume truck portions of the National Highway System carry more than 10,000 trucks per day, including freight-hauling long-distance trucks, freight-hauling local trucks, and other trucks with six or more tires. Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95.

**FIGURE 3-10. PEAK-PERIOD CONGESTION ON HIGH-VOLUME TRUCK PORTIONS OF THE NATIONAL HIGHWAY SYSTEM: 2002**

**Source:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.



Figure 3-11. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2035



**Notes:** High-volume truck portions of the National Highway System carry more than 10,000 trucks per day, including freight-hauling long-distance trucks, freight-hauling local trucks, and other trucks with six or more tires. Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95.

Assuming no change in network capacity, the number of NHS miles with recurring congestion and a large number of trucks is forecast to increase four fold between 2002 and 2035. On highways carrying more than 10,000 trucks per day, recurring congestion will slow traffic on more than 4,800 miles and create stop-and-go conditions on an additional 23,300 miles.

FIGURE 3-10. PEAK-PERIOD CONGESTION ON HIGH-VOLUME TRUCK PORTIONS OF THE NATIONAL HIGHWAY SYSTEM: 2002  
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.



Delay, reliability, and similar performance measures are typically based on the difference between speed limits and actual speeds. Speed limits for trucks vary from state to state and often differ from limits set for passenger vehicles.

**Table 3-8. Maximum Posted Speed Limits on Rural Interstates: 2008 (miles per hour)**

State	Truck	Car
Alabama	70	70
Alaska	65	65
Arizona	75	75
Arkansas	65	70
California	55	70
Colorado	75	75
Connecticut	65	65
Delaware	65	65
District of Columbia <sup>1</sup>	55	55
Florida	70	70
Georgia	70	70
Hawaii	60	60
Idaho	65	75
Illinois	55	65
Indiana	65	70
Iowa	70	70
Kansas	70	70
Kentucky	<sup>2</sup> 65	<sup>2</sup> 65
Louisiana	70	70
Maine	65	65
Maryland	65	65
Massachusetts	65	65
Michigan	60	70
Minnesota	70	70
Mississippi	70	70
Missouri	70	70
Montana	65	75
Nebraska	75	75
Nevada	75	75
New Hampshire	65	65
New Jersey	65	65
New Mexico	75	75
New York	65	65
North Carolina	70	70
North Dakota	75	75
Ohio	<sup>3</sup> 55	65
Oklahoma	75	75
Oregon	55	65
Pennsylvania	65	65
Rhode Island	65	65
South Carolina	70	70
South Dakota	75	75
Tennessee	70	70
Texas	<sup>4</sup> 65	<sup>4</sup> 75
Utah	<sup>5</sup> 75	<sup>5</sup> 75
Vermont	65	65
Virginia	<sup>6</sup> 65	<sup>6</sup> 65
Washington	60	70
West Virginia	70	70
Wisconsin	65	65
Wyoming	75	75

<sup>1</sup>Urban Interstate.

<sup>2</sup>Effective July 10, 2007, the posted speed limit is 70 miles per hour (mph) in designated areas on I-75 and I-71.

<sup>3</sup>The maximum speed for trucks on the Ohio Turnpike is 65 mph.

<sup>4</sup>In sections of I-10 and I-20 in rural West Texas, the speed limit for passenger cars and light trucks is 80 mph. For large trucks, the speed limit is 70 mph in the daytime and 65 mph at night.

<sup>5</sup>Effective May 5, 2008, the portion of I-15 between milepost 222 and milepost 64 may be posted with a speed limit of more than 75 mph if warranted by a safety study and a consideration of roadway geometry and population density.

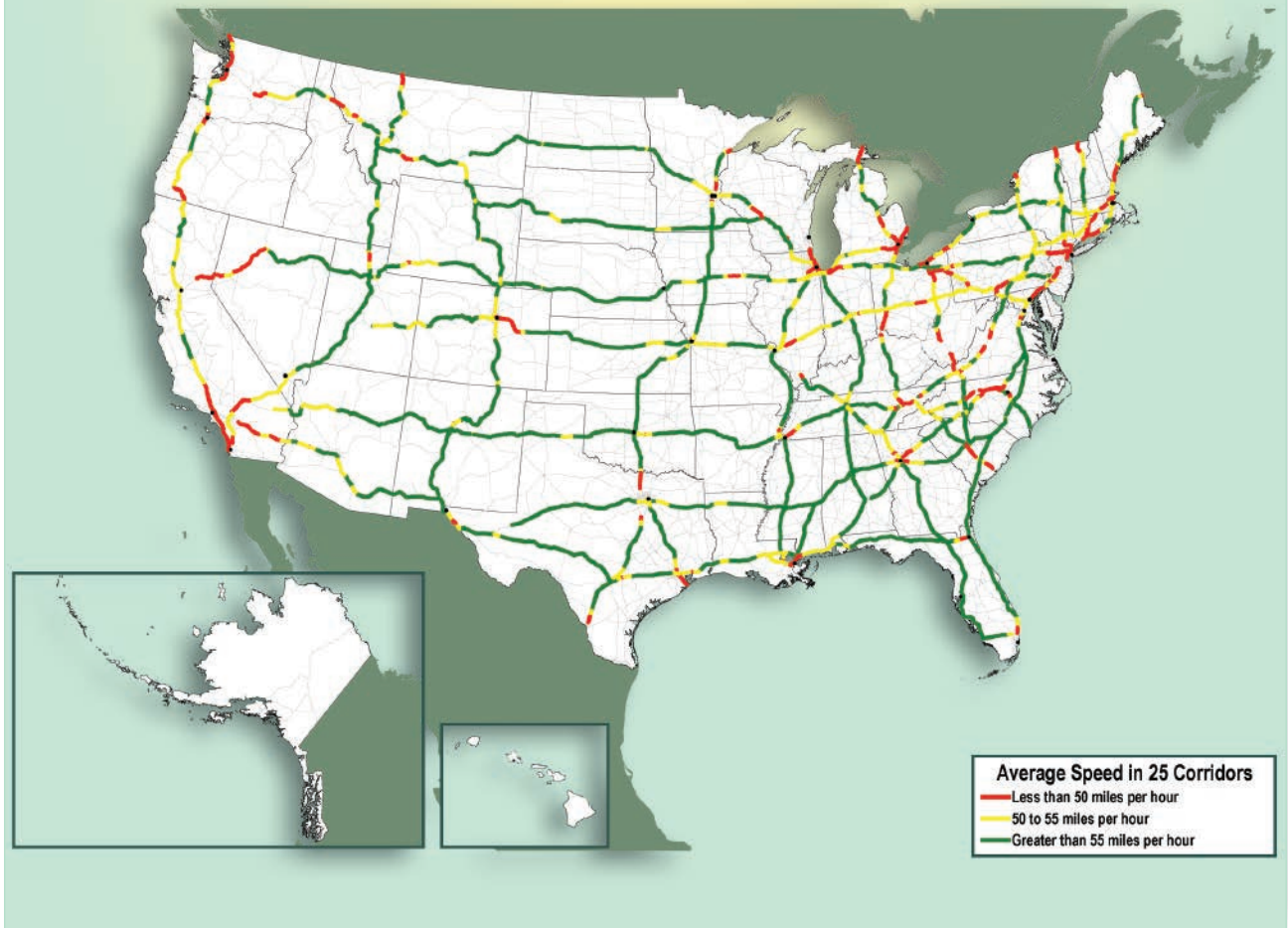
<sup>6</sup>Effective July 1, 2006, the posted speed limit on I-85 may be as high as 70 mph.

**TABLE 3-8. MAXIMUM POSTED SPEED LIMITS ON RURAL INTERSTATES: 2008**

**Source:** Insurance Institute for Highway Safety, Maximum Posted Speed Limits for Passenger Vehicles as of May 2007, available at [www.iihs.org/laws/state\\_laws/speed\\_limit\\_laws.html](http://www.iihs.org/laws/state_laws/speed_limit_laws.html) as of June 3, 2008.



Figure 3-12. Average Truck Speeds on Selected Interstate Highways: 2007



In addition to calculating peak-period congestion from traffic volumes, as shown in Figures 3-8 through 3-11, the Federal Highway Administration (FHWA) directly measures operating speeds and reliability on major truck routes by tracking more than 500,000 commercial vehicles. Average truck speeds drop below 55 miles per hour near major urban areas, border crossings and gateways, and in mountainous terrain.

FIGURE 3-12. AVERAGE TRUCK SPEEDS ON SELECTED INTERSTATE HIGHWAYS: 2007

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Performance Measurement Program, 2008.

Truck speed and travel time reliability statistics from the cooperative research initiative between private industry and FHWA can be summarized by location, date, and time of day. As expected, average speeds in the peak period between 6 a.m. and 9 a.m. and between 4 p.m. and 7 p.m. are less than those recorded in the non-peak period between 10 a.m. and 2 p.m. on all routes.

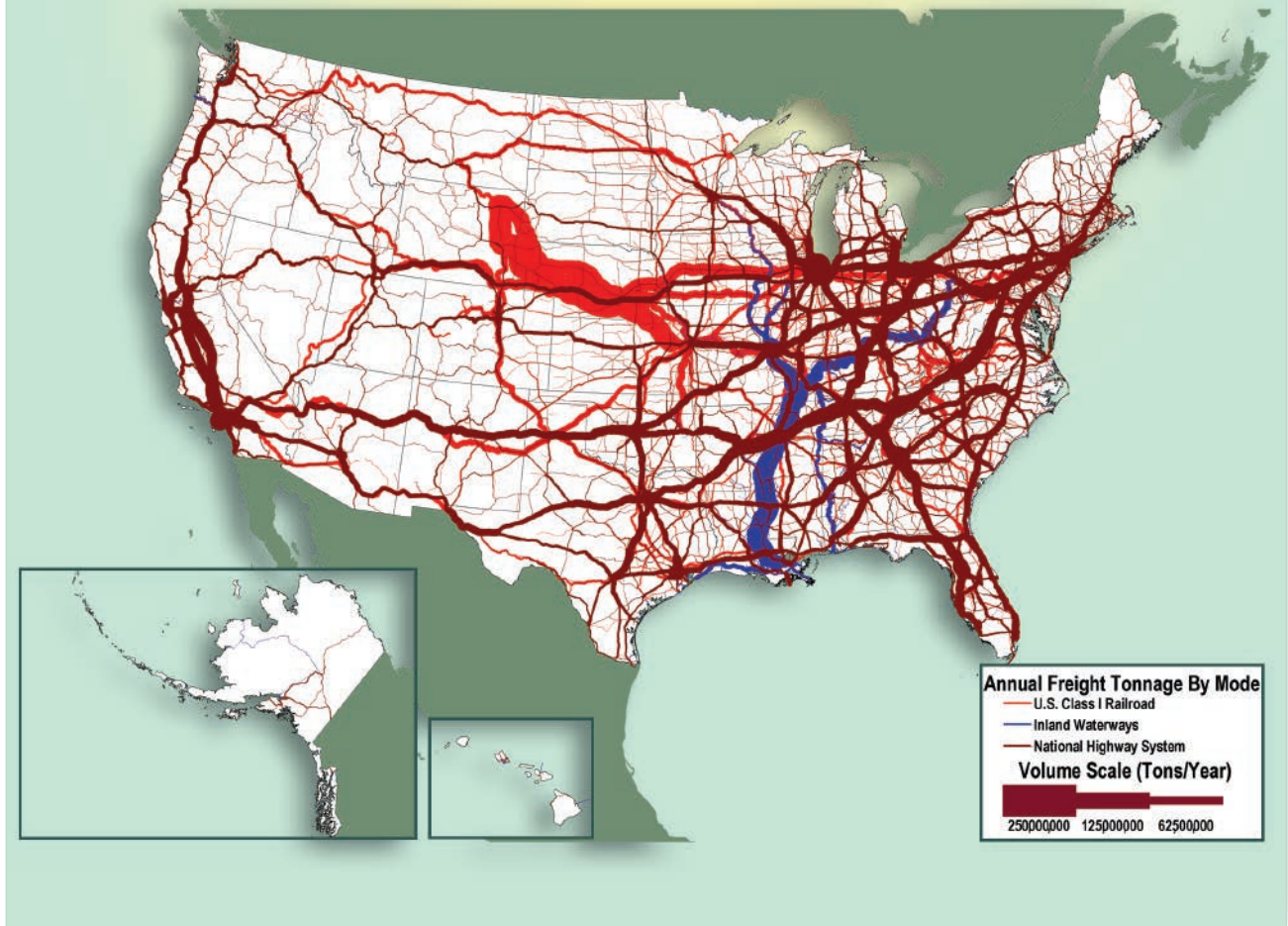
**Table 3-9. Average Truck Speeds on Selected Interstate Highways: January-March 2008**

<b>Interstate Route</b>	<b>Average Operating Speed</b>	<b>Peak Period Average Speed</b>	<b>Non-Peak Period Average Speed</b>
<b>5</b>	51.72	50.63	52.38
<b>10</b>	55.60	54.95	56.20
<b>15</b>	55.45	54.91	55.85
<b>20</b>	57.45	57.12	57.91
<b>24</b>	55.37	54.86	56.13
<b>25</b>	58.55	58.01	59.42
<b>26</b>	53.33	52.94	54.32
<b>35</b>	56.31	55.74	56.98
<b>40</b>	56.29	55.98	56.82
<b>45</b>	55.05	55.36	57.21
<b>55</b>	56.78	56.54	57.53
<b>65</b>	57.42	56.88	58.19
<b>70</b>	53.57	53.21	54.36
<b>75</b>	55.53	54.95	56.28
<b>76</b>	50.23	50.04	53.40
<b>77</b>	52.59	52.38	53.40
<b>80</b>	54.94	54.53	55.79
<b>81</b>	53.91	53.73	54.59
<b>84</b>	51.75	50.73	52.74
<b>85</b>	55.25	53.32	54.42
<b>87</b>	53.87	53.72	54.93
<b>90</b>	54.11	53.79	55.07
<b>91</b>	52.48	52.66	54.83
<b>94</b>	53.17	52.67	53.89
<b>95</b>	54.88	54.00	55.60

**TABLE 3-9. AVERAGE TRUCK SPEEDS ON SELECTED INTERSTATE HIGHWAYS: JANUARY-MARCH 2008**

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Performance Measurement Program, 2008.

Figure 3-13. Tonnage on Highways, Railroads, and Inland Waterways: 2002



Although trucks carry most of the tonnage and value of freight, railroads and waterways carry significant volumes over long distances. The biggest rail volume is coal between the Powder River Basin and the Midwest, and the largest inland waterways volume is along the Lower Mississippi River.

FIGURE 3-13. TONNAGE ON HIGHWAYS, RAILROAD, AND INLAND WATERWAYS: 2002

**Source: Highways:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007. **Rail:** Based on Surface Transportation Board, Annual Carload Waybill Sample and rail freight flow assignments done by Oak Ridge National Laboratory. **Inland Waterways:** U.S. Army Corps of Engineers (USACE), Annual Vessel Operating Activity and Lock Performance Monitoring System data, as processed for USACE by the Tennessee Valley Authority; and USACE, Institute for Water Resources, Waterborne Foreign Trade Data. Water flow assignments done by Oak Ridge National Laboratory.



The classic forms of rail intermodal transportation, trailer-on-flatcar and container-on-flatcar, are spread throughout the United States. The largest concentrations are on routes between the Pacific Coast ports and Chicago and between Chicago and New York.

**Figure 3-14: Tonnage of Trailer-on-Flatcar and Container-on-Flatcar Rail Intermodal Moves: 2006**

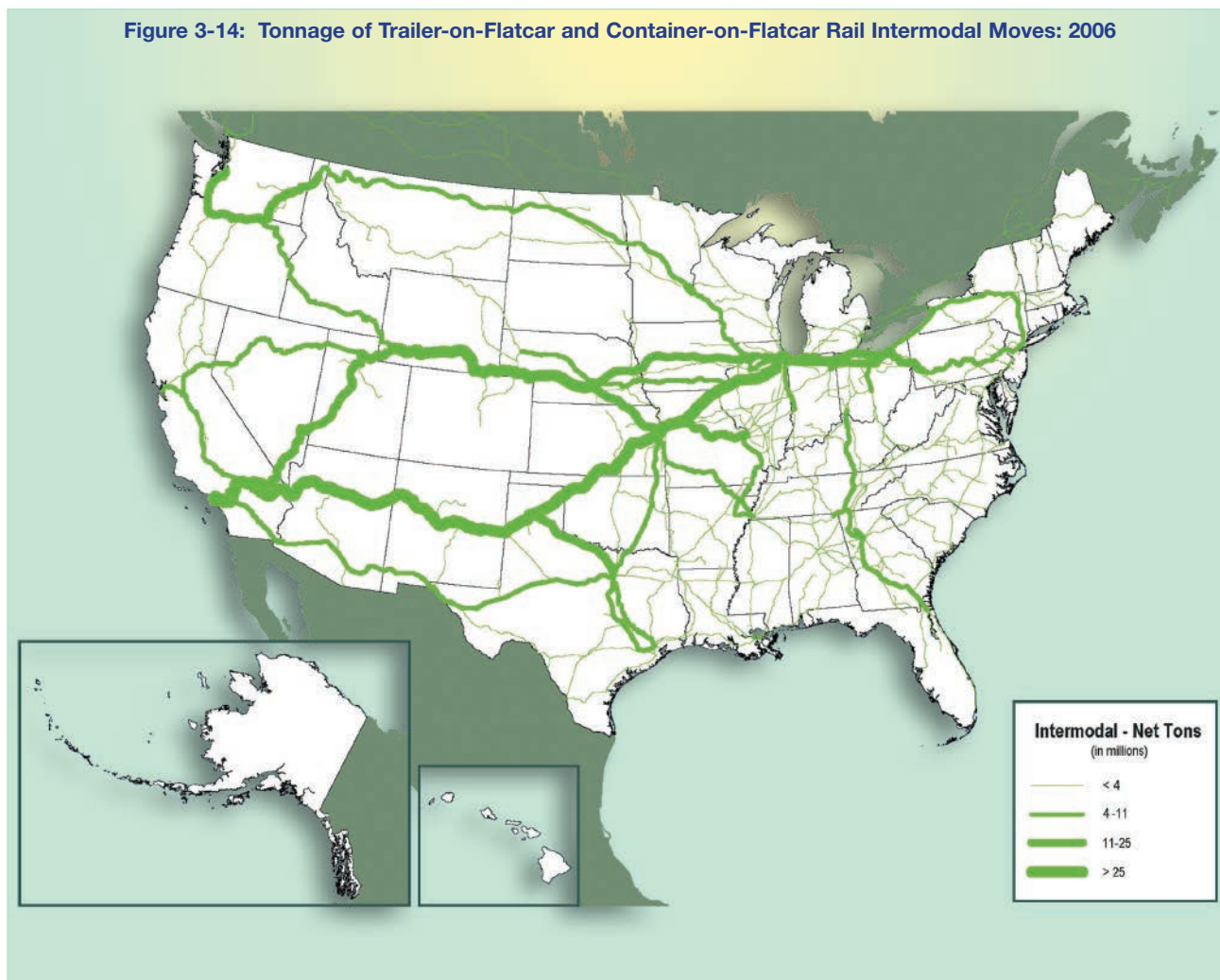
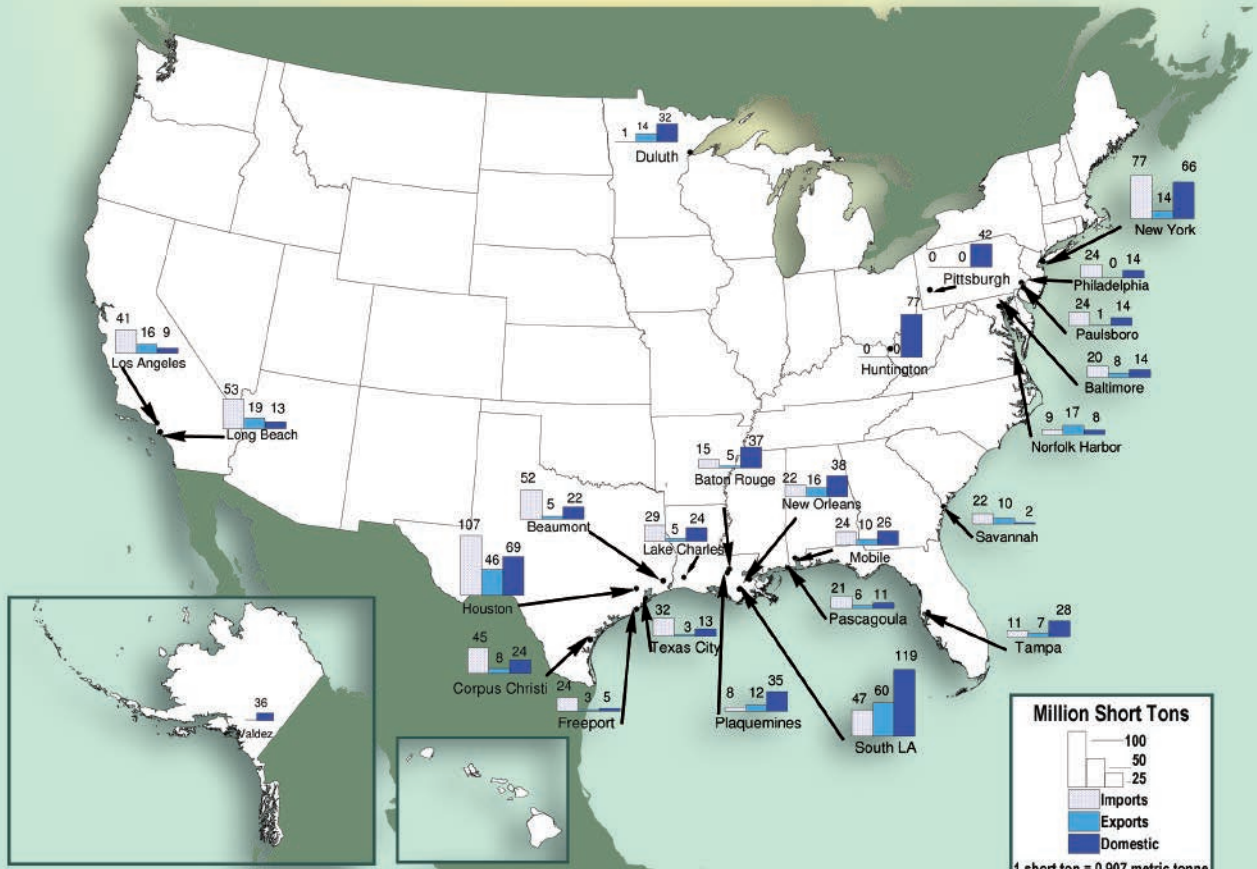
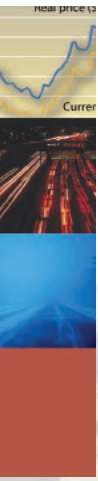


Figure 3-15. Top 25 Water Ports by Tonnage: 2006



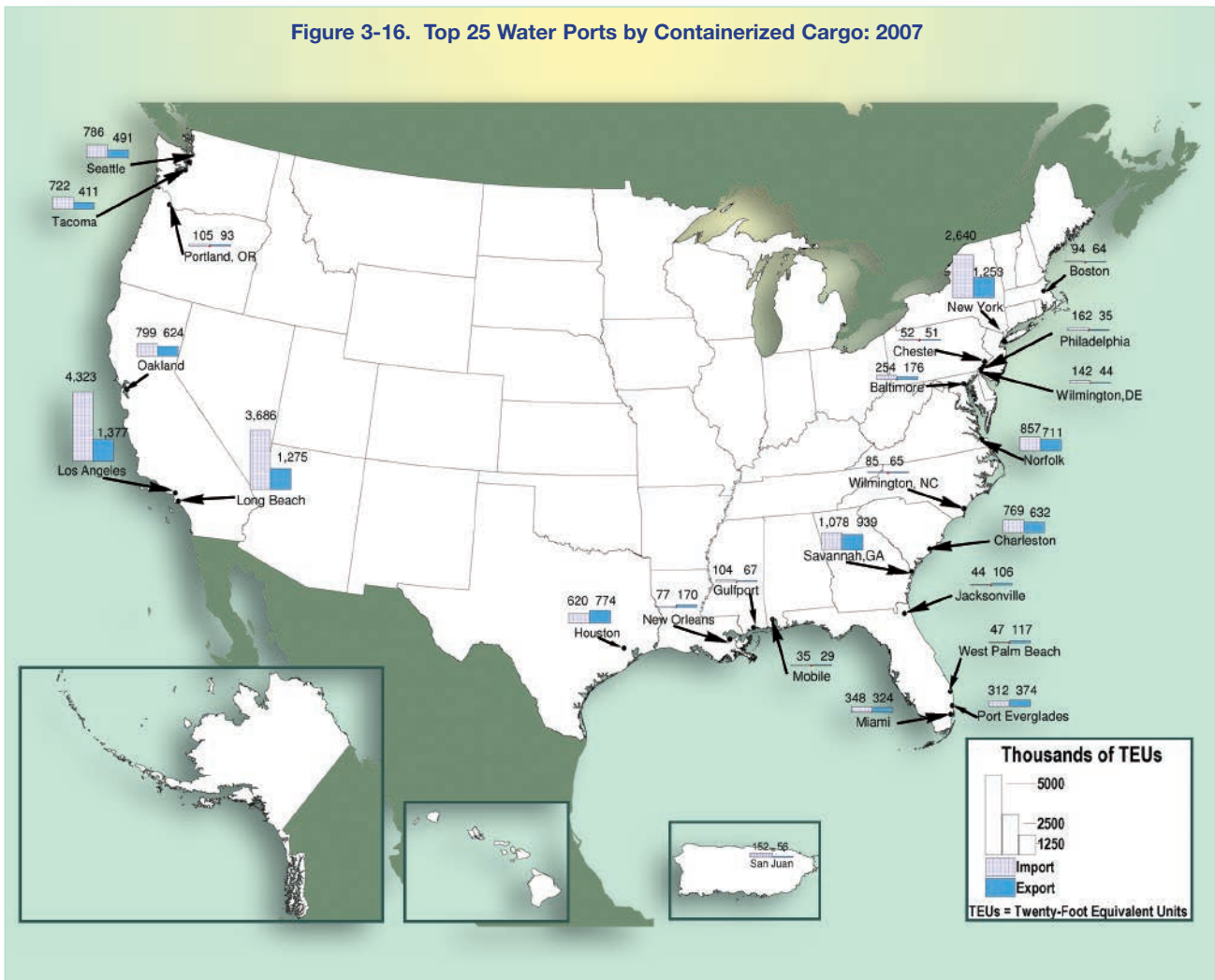
The top 25 water ports handle about two-thirds of the weight of all foreign and domestic goods moved by water. These goods are primarily bulk commodities such as coal, crude petroleum, and grain.



**FIGURE 3-15. TOP 25 WATER PORTS BY TONNAGE: 2006**  
 Source: U.S. Army Corps of Engineers, 2006 *Waterborne Commerce of the United States, Part 5, National Summaries* (New Orleans, LA: 2007), table 5-2.



Figure 3-16. Top 25 Water Ports by Containerized Cargo: 2007



Containerized cargo has grown rapidly over the past few years and is concentrated at a few large water ports. The Ports of Los Angeles and Long Beach together handle about 37 percent of all container traffic at water ports in the United States. Container trade at these two ports doubled between 1997 and 2007, slightly higher than the growth rate reported for container cargo overall.

FIGURE 3-16. TOP 25 WATER PORTS BY CONTAINERIZED CARGO: 2007

Source: U.S. Department of Transportation, Maritime Administration, U.S. Waterborne Container Trade by U.S.

Custom Ports, 1997-2007, based on data provided by Port Import/Export Reporting Service, available at

[www.marad.dot.gov/MARAD\\_statistics/index.html](http://www.marad.dot.gov/MARAD_statistics/index.html) as of June 20, 2008.

**Table 3-10. Top 25 Airports by Landed Weight of All-Cargo Operations: 2000-2006<sup>1</sup>**

Airport	2006 Rank	Landed weight (thousands of short tons)				
		2000	2003	2004	2005	2006
Anchorage, AK (Ted Stevens Anchorage International) <sup>2</sup>	1	8,084	9,007	9,844	10,364	10,588
Memphis, TN (Memphis International)	2	6,318	8,760	8,885	9,343	9,425
Louisville, KY (Louisville International-Standiford Field)	3	3,987	4,172	4,388	4,591	5,015
Los Angeles, CA (Los Angeles International)	4	2,892	3,120	3,062	2,927	3,627
Miami, FL (Miami International)	5	2,929	3,239	3,423	3,550	3,591
Indianapolis, IN (Indianapolis International)	6	2,884	2,277	2,314	2,545	2,627
New York, NY (John F. Kennedy International)	7	2,793	2,937	2,898	2,811	2,615
Chicago, IL (O'Hare International)	8	2,062	2,351	2,359	2,412	2,208
Newark, NJ (Newark Liberty International)	9	1,961	1,835	1,765	1,870	1,867
Oakland, CA (Metropolitan Oakland International)	10	1,811	1,695	1,703	1,797	1,798
Fort Worth, TX (Dallas/Fort Worth International)	11	1,691	1,481	1,431	1,655	1,722
Ontario, CA (Ontario International)	12	1,220	1,338	1,326	1,344	1,401
Philadelphia, PA (Philadelphia International)	13	1,454	1,365	1,371	1,401	1,363
Atlanta, GA (William B. Hartsfield International)	14	1,090	1,194	1,162	1,014	1,180
Honolulu, HI (Honolulu International)	15	692	1,017	970	828	979
San Francisco, CA (San Francisco International)	16	1,267	1,200	740	797	829
Portland, OR (Portland International)	17	882	749	718	747	730
Phoenix, AZ (Sky Harbor International)	18	920	779	801	778	726
Denver, CO (Denver International)	19	900	747	763	763	711
Seattle, WA (Seattle-Tacoma International)	20	1,060	796	531	709	709
Houston, TX (George Bush Intercontinental)	21	480	666	697	710	696
Chicago/Rockford, IL (Chicago/Rockford International)	22	654	625	677	696	696
Fort Worth, TX (Fort Worth Alliance)	23	508	348	374	501	644
Minneapolis, MN (Minneapolis-St Paul International/Wold-Chamberlain)	24	622	687	678	702	620
San Juan, PR (Luis Munoz Marin International)	25	485	652	452	625	606
<b>Top 25 airports<sup>3</sup></b>		<b>(R) 52,381</b>	<b>(R) 53,947</b>	<b>(R) 54,526</b>	<b>55,955</b>	<b>56,973</b>
<b>United States, all airports<sup>4</sup></b>		<b>(R) 74,753</b>	<b>73,072</b>	<b>74,297</b>	<b>76,091</b>	<b>76,207</b>
<b>Top 25 as % of U.S. total</b>		<b>(R) 70.1</b>	<b>73.8</b>	<b>(R) 73.4</b>	<b>73.5</b>	<b>74.8</b>

**Key:** R = revised.

<sup>1</sup>All-cargo operations are operations dedicated to the exclusive transportation of cargo. This does not include aircraft carrying passengers that may also be carrying cargo. Aircraft landed weight is the certificated maximum gross landed weight of the aircraft as specified by the aircraft manufacturers.

<sup>2</sup>Anchorage includes a large proportion of all-cargo operations in-transit.

<sup>3</sup>Airport rankings change each year. Totals represent the top 25 airports for each year, not necessarily the top 25 airports listed here for 2006.

<sup>4</sup>Limited to airports with an aggregate landed weight in excess of 100 million pounds (50,000 short tons) annually.

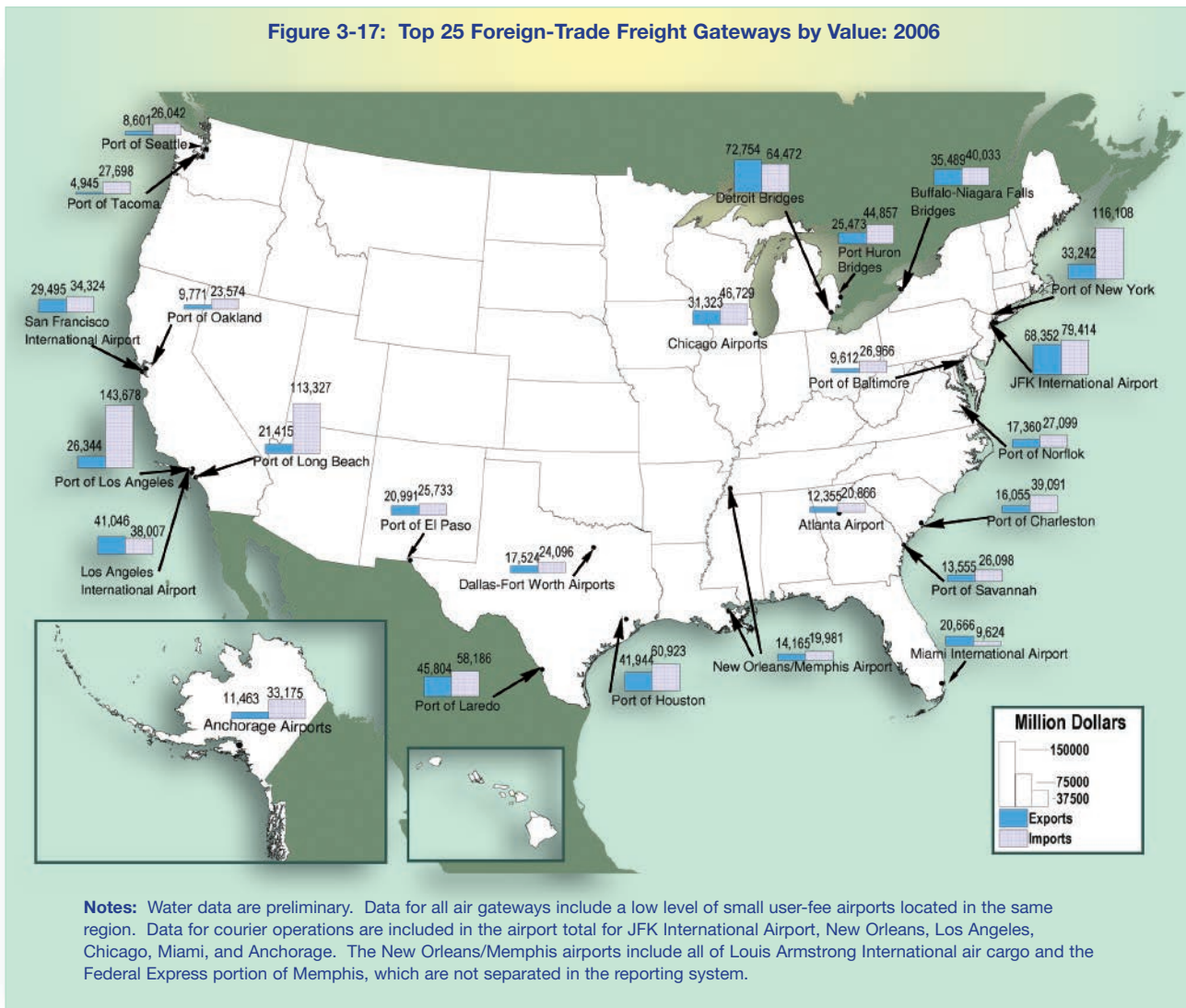
**Note:** 1 short ton = 2,000 pounds.

The Federal Aviation Administration (FAA) reports that Anchorage International and Memphis International are two of the most important U.S. airports that handle all-cargo aircraft. All-cargo aircraft do not include aircraft carrying passengers as well as cargo.

**TABLE 3-10. TOP 25 AIRPORTS BY LANDED WEIGHT OF ALL-CARGO OPERATIONS: 2000-2006**

**Source:** U.S. Department of Transportation, Federal Aviation Administration, Air Carrier Activity Information System (ACAIS) database, All-Cargo Data, available at [www.faa.gov/airports\\_airtraffic/airports/planning\\_capacity/passenger\\_allcargo\\_stats/passenger/index](http://www.faa.gov/airports_airtraffic/airports/planning_capacity/passenger_allcargo_stats/passenger/index) as of May 29, 2008.

Figure 3-17: Top 25 Foreign-Trade Freight Gateways by Value: 2006



Transportation facilities that move international trade into and out of the United States demonstrate the importance of all modes and intermodal combinations to global connectivity. The top 25 foreign-trade gateways measured by value of shipments are comprised of 9 airports, 11 water ports, and 5 land-border crossings.



FIGURE 3-17: TOP 25 FOREIGN-TRADE FREIGHT GATEWAYS BY VALUE: 2006

Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics 2007* (Washington, DC: 2007), available at [www.bts.gov](http://www.bts.gov) as of June 3, 2008.



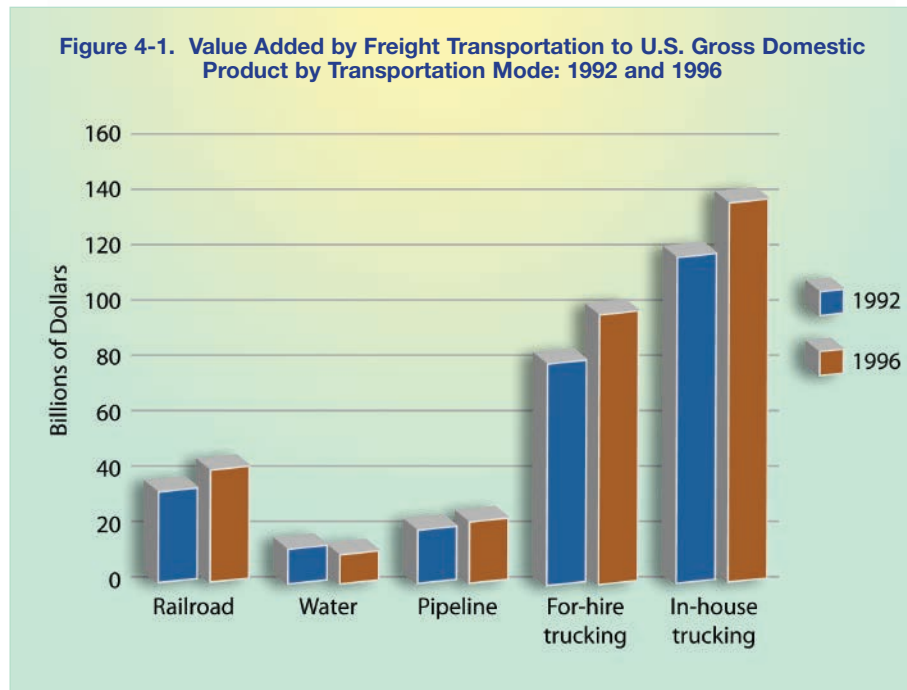
## IV. THE FREIGHT TRANSPORTATION INDUSTRY

The private sector owns a significant share of assets in the transportation industry: \$984.7 billion in equipment plus \$557.5 billion in private structures, compared to \$485.7 billion in transportation equipment plus \$2.36 trillion in highways owned by public agencies.<sup>1</sup> Freight railroad facilities and services are almost entirely private, while trucks in the private sector operate over public highways. Air-cargo services in the private sector operate in public airways and mostly public airports, and ships in the private sector operate in public waterways and both public and private port facilities. Pipelines are mostly in the private sector, although significantly controlled by public regulation. In the public sector, virtually all truck routes are owned by state or local governments, airports and harbors are

typically owned by public authorities (although terminals are usually owned or managed by private operators), air and water navigation is mostly federal, and safety is regulated by all levels of government.

Freight transportation is a big part of the economy. The value

generated by transportation services in moving goods and people on the transportation system is about 5 percent of GDP. Of this 5 percent, three-fifths is generated by for-hire transportation services, and the rest is generated by in-house transportation (transportation provided by businesses for their own use). Most in-house transportation is in-house trucking, which contributed 40 percent more value to GDP than for-hire trucking in 1996 (the latest year for which data are available).



<sup>1</sup>Fixed assets are for 2006 and include both passenger and freight transportation. See the Bureau of Economic Analysis at [www.bea.gov/bea/dn/FA2004/](http://www.bea.gov/bea/dn/FA2004/).





The freight industry has many components, encompassing companies large and small. All told there were about 200,000 transportation and warehousing establishments in 2002, with more than one-half of those primarily engaged in trucking. Revenue generated by trucking accounts for about 40 percent of transportation and warehousing sector revenue while warehousing accounts for a small percentage of the total.

**Table 4-1. Economic Characteristics of Transportation and Warehousing Establishments in Freight-Dominated Modes: 1997 and 2002**

	Establishments		Revenue (Current \$ thousands)		Payroll (Current \$ thousands)		Paid Employees	
	1997	2002	1997	2002	1997	2002	1997	2002
<b>Transportation and warehousing<sup>1</sup></b>	<b>178,025</b>	<b>199,618</b>	<b>318,245,044</b>	<b>382,152,040</b>	<b>82,346,182</b>	<b>115,988,733</b>	<b>2,920,777</b>	<b>3,650,859</b>
Rail transportation	NA	NA	NA	NA	NA	NA	NA	NA
Water transportation	1,921	1,890	24,019,168	23,331,333	2,834,114	3,194,391	72,857	66,153
Truck transportation <sup>1</sup>	103,798	112,642	141,225,398	164,218,769	38,471,272	47,750,111	1,293,790	1,435,210
Pipeline transportation	2,311	2,188	26,836,992	22,031,419	2,660,576	2,476,638	49,280	36,790
Support activities for transportation	30,675	33,942	39,758,245	57,414,131	12,592,441	16,202,043	411,640	465,616
Couriers and messengers	10,887	12,655	39,812,433	58,164,869	14,071,630	17,175,401	530,839	561,514
Warehousing and storage <sup>1</sup>	6,497	12,671	10,657,925	16,547,657	2,926,119	17,183,289	109,760	565,533

**Key:** NA = not available.  
<sup>1</sup>Enterprise support establishments are included in 2002 but not 1997, thus the two years are not comparable.  
**Notes:** Total includes air transportation, transit and ground passenger transportation, and scenic and sightseeing transportation. Data are for establishments in which transportation is the primary business. Data exclude transportation provided privately, such as trucking organized "in-house" by a grocery company. Data are not collected for rail transportation nor for governmental organizations even when their primary activity would be classified in industries covered by the census. For example, data are not collected for publicly operated buses and subway systems.

**Table 4-2. Economic Characteristics of Freight Railroads: 2000 and 2006**

	Class I		Non-Class I		Total	
	2000	2006	2000	2006	2000	2006
Number of railroads	8	7	552	552	560	559
Freight revenue (billions \$)	33.1	50.3	3.2	3.7	36.3	54.0
Operating revenue (billions \$)	34.1	52.2	NA	NA	NA	NA
Employees	168,360	167,581	23,448	19,376	191,808	186,957

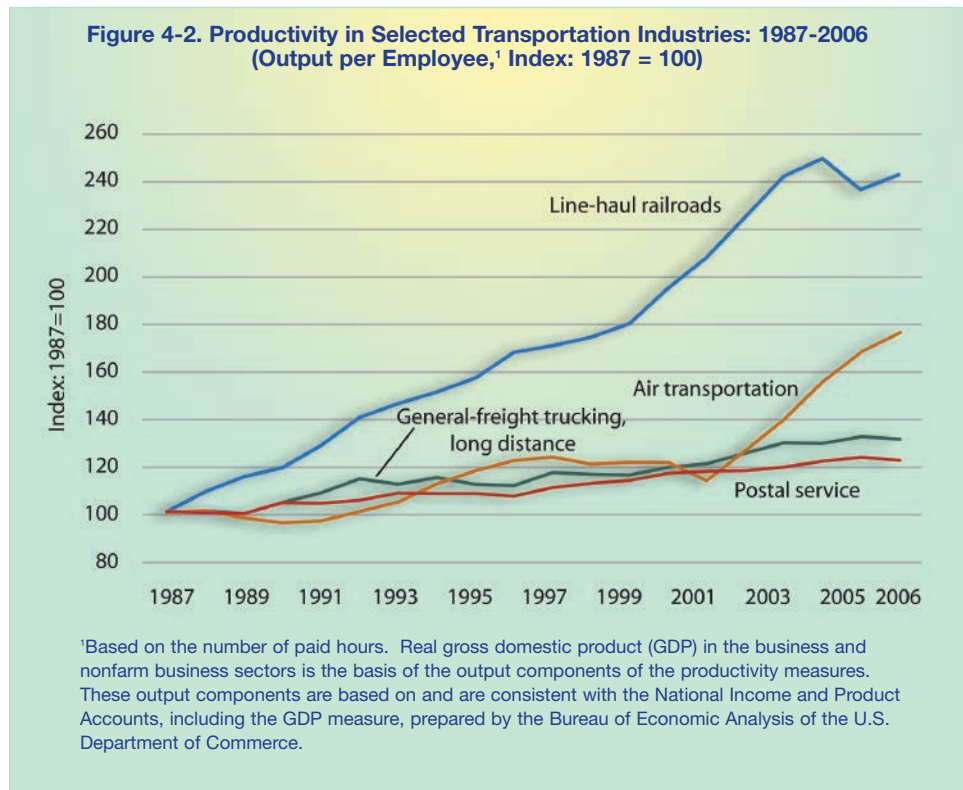
**Key:** NA = not available.

Revenue grew while employment declined in both the national (Class I) railroads and the regional and local railroads during the first half of the decade.

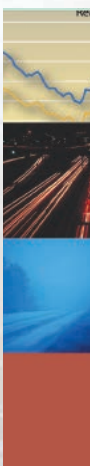
**TABLE 4-1. ECONOMIC CHARACTERISTICS OF TRANSPORTATION AND WAREHOUSING ESTABLISHMENTS IN FREIGHT-DOMINATED MODES: 1997 AND 2002**  
**Sources:** U.S. Department of Commerce, Census Bureau, *2002 Economic Census, Transportation and Warehousing, United States*, available at [www.census.gov/econ/census02/data/us/US000\\_48.htm](http://www.census.gov/econ/census02/data/us/US000_48.htm) as of April 24, 2008; U.S. Department of Commerce, Census Bureau, *1997 Economic Census, Transportation and Warehousing, United States*, available at [www.census.gov/epcd/ec97/us/US000\\_48.htm](http://www.census.gov/epcd/ec97/us/US000_48.htm) as of April 24, 2008.

**TABLE 4-2. ECONOMIC CHARACTERISTICS OF FREIGHT RAILROADS: 2000 AND 2006**  
**Source:** Association of American Railroads, *Railroad Facts* (Washington, DC: annual issues), p. 3.

Productivity has improved in all modes, particularly railroads. Between 1987 and 2006, output-per-hour worked more than doubled in line-haul railroading but grew only 37 percent in long-distance, general-freight trucking. Line-haul railroads do not include switching and terminal operations or short-distance (or local) railroads. Long-distance, general-freight trucking establishments exclude local trucking and truck operators that require specialized equipment, such as flatbeds, tankers, or refrigerated trailers.



**FIGURE 4-2. PRODUCTIVITY IN SELECTED TRANSPORTATION INDUSTRIES: 1987-2006**  
**Source:** U.S. Department of Labor, Bureau of Labor Statistics, Industry Productivity, available at [www.bls.gov/lpc/](http://www.bls.gov/lpc/) as of May 22, 2008.



Employment in many transportation industries has remained steady or has grown over the past two decades with the notable exception of railroads. While the long-term trend may have reversed in recent months, rail employment declined by 55 percent between 1980 and 2007. Consequently, in 2007 rail transportation employed only 5 percent of those working in the transportation and warehousing industry compared with 18 percent in 1980. By comparison, employment in trucking in 2007 accounted for about one-third of employment in transportation and warehousing.

**Table 4-3. Employment in For-Hire Transportation Establishments Primarily Serving Freight: 1980-2007<sup>1</sup> (thousands)**

	1980	1990	2000	2006	2007
<b>Total U.S. labor force<sup>2</sup></b>	<b>90,528</b>	<b>109,487</b>	<b>131,785</b>	<b>(R) 136,086</b>	<b>137,623</b>
<b>Transportation and warehousing</b>	<b>2,961</b>	<b>3,476</b>	<b>4,410</b>	<b>(R) 4,470</b>	<b>4,536</b>
Rail transportation	518	272	232	(R) 228	234
Water transportation	NA	57	56	(R) 63	64
Truck transportation	NA	1,122	1,406	(R) 1,436	1,441
Pipeline transportation	NA	60	46	39	40
Support activities for transportation <sup>3</sup>	NA	364	537	571	583
Couriers and messengers	NA	375	605	(R) 582	583
Warehousing and storage	NA	407	514	(R) 638	659

**Key:** NA = not available; R = revised.

<sup>1</sup>Annual averages.

<sup>2</sup>Excludes farm employment.

<sup>3</sup>Industries in the support activities for transportation subsector provide services which support transportation. These services may be provided to transportation carrier establishments or to the general public. This subsector includes a wide array of establishments, including air traffic control services, marine cargo handling, and motor vehicle towing.

**Notes:** These data include workers employed in transportation industries but not necessarily in a transportation occupation, such as a lawyer working for a trucking company. Moreover, these data exclude workers in transportation occupations employed by non-transportation industries, such as a truck driver employed by a retail company.

**TABLE 4-3. EMPLOYMENT IN FOR-HIRE TRANSPORTATION ESTABLISHMENTS PRIMARILY SERVING FREIGHT: 1980-2007**

**Source:** U.S. Department of Labor, Bureau of Labor Statistics, Current Employment Statistics survey, available at [www.bls.gov](http://www.bls.gov) as of May 23, 2008.

**Table 4-4. Employment in Selected Freight Transportation and Freight Transportation-Related Occupations: 2000-2007**

Occupation (SOC code)	2000	2005	2006	2007
<b>Vehicle operators, pipeline operators, and primary support</b>				
Driver/sales worker (53-3031)	373,660	400,530	396,680	382,360
Truck drivers, heavy and tractor-trailer (53-3032)	1,577,070	1,624,740	1,673,950	1,693,590
Truck drivers, light or delivery services (53-3033)	1,033,220	938,280	941,590	922,900
Locomotive engineers (53-4011)	29,390	37,390	36,870	41,760
Rail yard engineers, dinkey operators, and hostlers (53-4013)	4,020	6,970	5,820	4,950
Railroad brake, signal, and switch operators (53-4021)	16,830	20,700	22,810	23,120
Railroad conductors and yardmasters (53-4031)	40,380	38,330	37,110	37,540
Sailors and marine oilers (53-5011)	30,090	31,090	31,690	32,520
Captains, mates, and pilots of water vessels (53-5021)	21,080	28,570	29,170	30,540
Ship engineers (53-5031)	7,370	13,240	14,190	13,710
Bridge and lock tenders (53-6011)	4,790	3,620	3,700	4,750
Gas compressor and gas pumping station operators (53-7071)	6,510	3,950	3,900	4,230
Pump operators, except wellhead pumpers (53-7072)	13,730	9,970	10,030	10,400
<b>Transportation equipment manufacturing and maintenance occupations</b>				
Bus and truck mechanics and diesel engine specialists (49-3031)	258,800	248,280	254,850	250,370
Rail car repairers (49-3043)	10,620	24,270	23,810	23,190
<b>Transportation infrastructure construction and maintenance occupations</b>				
Rail-track laying and maintenance equipment operators (47-4061)	9,940	13,510	13,680	14,050
Signal and track switch repairers (49-9097)	5,540	6,100	5,980	6,090
Dredge operators (53-7031)	3,100	1,720	1,780	1,910
<b>Secondary support service occupations</b>				
Dispatchers, except police, fire, and ambulance (43-5032)	167,180	172,550	185,410	190,190
Postal service mail carriers (43-5052)	354,980	347,180	346,990	348,070
Shipping, receiving, and traffic clerks (43-5071)	864,530	759,910	763,350	755,790
Transportation inspectors (53-6051)	26,520	25,570	23,790	24,130
Tank car, truck, and ship loaders (53-7121)	17,480	15,950	15,360	14,870

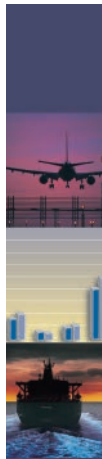
**Key:** SOC = Standard Occupational Classification.

Freight transportation jobs are not limited to for-hire carriers. Truck driving is by far the largest freight transportation occupation in the United States, and many drivers work for retailers and other establishments with shipper-owned trucks. There were more than 3 million truck drivers in 2007; about 56 percent of these professionals drive tractor-trailer trucks, 31 percent drive lighter delivery service trucks, and about 13 percent are driver/sales workers. Many industry analysts believe the number of truck drivers is below demand and driver shortages will worsen in the future.

**TABLE 4-4. EMPLOYMENT IN SELECTED FREIGHT TRANSPORTATION AND FREIGHT TRANSPORTATION-RELATED OCCUPATIONS: 2000-2007**

**Source:** U.S. Department of Labor, Bureau of Labor Statistics, *National Occupational Employment and Wages, 2007*

(Washington, DC: May 2007), available at [www.bls.gov/oes](http://www.bls.gov/oes) as of May 22, 2008.





**Table 4-5: Producer Price Indices for Selected Transportation Services: 1990-2006**  
(North American Industry Classification System [NAICS] basis)

	1990	2000	2002	2003	2004	2005	2006
<b>Air Transportation (NAICS 481)<sup>1</sup></b>	<b>NA</b>	<b>147.7</b>	<b>157.8</b>	<b>162.1</b>	<b>162.3</b>	<b>171.0</b>	<b>180.4</b>
Scheduled Air Transportation (NAICS 4811) <sup>2</sup>	110.2	180.1	193.3	198.5	198.6	209.3	220.5
Scheduled Freight Air Transportation (NAICS 481112)	NA	NA	NA	100.0	100.2	104.9	108.4
Nonscheduled Air Transportation (NAICS 4812) <sup>3</sup>	NA	107.3	114.7	117.8	119.9	126.7	136.8
<b>Rail Transportation (NAICS 482)<sup>3</sup></b>	<b>NA</b>	<b>102.6</b>	<b>106.6</b>	<b>108.8</b>	<b>113.4</b>	<b>125.2</b>	<b>135.9</b>
Line-Haul Railroads (NAICS 482111) <sup>4</sup>	107.5	114.5	118.9	121.4	126.5	139.6	151.2
<b>Water Transportation (NAICS 483)</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>100.0</b>	<b>101.3</b>	<b>106.4</b>	<b>111.1</b>
Deep Sea Freight Transportation (NAICS 483111) <sup>5</sup>	113.1	155.8	185.8	219.9	225.9	231.9	233.3
Coastal and Great Lakes Freight Transportation (NAICS 483113)	NA	NA	NA	100.0	101.7	109.9	119.9
Inland Water Freight Transportation (NAICS 483211)	100.0	117.9	120.6	124.7	131.0	151.4	182.9
<b>Truck Transportation (NAICS 484)</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>100.0</b>	<b>103.1</b>	<b>109.0</b>	<b>113.2</b>
General Freight Trucking (NAICS 4841)	NA	NA	NA	100.0	103.5	110.0	114.1
General Freight Trucking, Local (NAICS 48411)	NA	NA	NA	100.0	105.2	111.5	115.3
General Freight Trucking, Long Distance (NAICS 48412)	NA	NA	NA	100.0	103.2	109.7	113.8
Specialized Freight Trucking (NAICS 4842)	NA	NA	NA	100.0	102.3	107.0	111.4
Used Household and Office Goods Moving (NAICS 48421)	NA	NA	NA	100.0	102.6	106.0	107.8
Specialized Freight (except Used Goods) Trucking, Local (NAICS 48422)	NA	NA	NA	100.0	102.7	107.1	112.3
Specialized Freight (except Used Goods) Trucking, Long Distance (NAICS 48423)	NA	NA	NA	100.0	101.7	107.5	112.8
<b>Pipeline Transportation (NAICS 486)</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
Pipeline Transportation of Crude Oil (NAICS 4861)	NA	NA	NA	100.0	103.9	113.3	112.0
Other Pipeline Transportation (NAICS 4869) <sup>6</sup>	NA	NA	NA	100.0	101.4	105.2	108.2
<b>Support Activities for Transportation (NAICS 488)</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>100.0</b>	<b>101.1</b>	<b>104.1</b>	<b>106.5</b>
Support Activities for Water Transportation (NAICS 4883) <sup>7</sup>	NA	NA	NA	100.0	101.0	103.5	107.7
Navigational Services to Shipping (NAICS 48833)	NA	NA	NA	100.0	101.5	105.7	113.9
Freight Transportation Arrangement (NAICS 4885) <sup>3</sup>	NA	98.3	97.5	97.9	98.9	99.1	98.8
<b>Postal Service (NAICS 491)</b>	<b>100.0</b>	<b>135.2</b>	<b>150.2</b>	<b>155.0</b>	<b>155.0</b>	<b>155.0</b>	<b>164.7</b>
<b>Couriers and Messengers (NAICS 492)</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>100.0</b>	<b>106.1</b>	<b>113.8</b>	<b>121.5</b>

**Key:** NA = not available.

**Notes:** Index values start at 100.0 in 1990 unless another year is specified. This table shows annual data, which are calculated by the Bureau of Labor Statistics by averaging monthly indices. Data are reported monthly from January to December. The monthly indices, however, are available for fewer than 12 months for some years. In both cases, a simple average of the available monthly indices is reported for each year. Data are not seasonally adjusted.

<sup>1</sup>Base year = 1992.

<sup>2</sup>Base year = 1989.

<sup>3</sup>Base year = 1996.

<sup>4</sup>Base year = 1984.

<sup>5</sup>Base year = 1988.

<sup>6</sup>Other pipeline transportation includes pipeline transportation of refined petroleum products (NAICS 48691).

<sup>7</sup>Support activities for water transportation includes port and harbor operations (NAICS 48831), marine cargo handling (NAICS 48832), and navigational services to shipping (NAICS 48833).

The prices charged for transportation purchased from carriers and support activities have gone up in most industries. Rail and air prices increased about 10 percent from 2005 to 2006, while trucking increased about 4 percent.

**TABLE 4-5: PRODUCER PRICE INDICES FOR SELECTED TRANSPORTATION SERVICES: 1990-2006**

**Source:** U.S. Department of Labor, Bureau of Labor Statistics, Producer Price Index Industry Data, available at [www.bls.gov/data/sa.htm](http://www.bls.gov/data/sa.htm) as of June 10, 2008.

## V. SAFETY, ENERGY, AND ENVIRONMENTAL IMPLICATIONS OF FREIGHT TRANSPORTATION

Growing demand for freight transportation heightens concerns about its safety, energy consumption, and environmental impacts. While safety in all freight modes continues to be monitored actively, the availability of energy consumption data has declined with the demise of the Vehicle Inventory and Use Survey, and the environmental implications of freight transportation only recently have been considered separately from passenger travel.

**Table 5-1. Fatalities by Freight Transportation Mode: 1980-2007**

	1980	1990	2000	2006	2007
<b>Total transportation fatalities (passenger and freight)</b>	NA	<b>47,350</b>	<b>44,384</b>	(P) <b>44,912</b>	NA
<b>Highway (passenger and freight)</b>	<b>51,091</b>	<b>44,599</b>	<b>41,945</b>	(R) <b>42,708</b>	<b>41,059</b>
Large truck occupants <sup>1</sup>	1,262	705	754	805	802
Others killed in crashes involving large trucks	4,709	4,567	4,528	4,222	4,006
Large truck occupants <sup>1</sup> (percent)	2.5	1.6	1.8	(R) 1.9	2.0
Others killed in crashes involving large trucks (percent)	9.2	10.2	10.8	(R) 9.9	9.8
<b>Railroad (passenger and freight)</b>	<b>1,417</b>	<b>1,297</b>	<b>937</b>	(R) <b>910</b>	<b>851</b>
Highway-rail crossing <sup>2</sup>	833	698	425	(R) 369	338
Railroad <sup>2,3</sup>	584	599	512	(R) 541	513
<b>Waterborne (passenger and freight)</b>	<b>487</b>	<b>186</b>	<b>111</b>	(R) <b>107</b>	<b>98</b>
Vessel-related <sup>4</sup>	206	85	42	(R) 55	51
Freight ship	8	0	0	1	3
Tank ship	4	5	0	0	1
Tug/towboat	14	13	1	(R) 7	4
Offshore supply	NA	2	0	0	1
Fishing vessel	60	47	26	(R) 23	19
Mobile offshore drilling units	NA	0	0	(R) 2	1
Platform	NA	1	0	0	0
Freight barge	NA	0	0	(R) 1	3
Tank barge	NA	0	0	0	0
Miscellaneous <sup>5</sup>	56	11	15	(R) 21	21
Not vessel-related <sup>4</sup>	281	101	69	(R) 52	47
<b>Pipeline</b>	<b>19</b>	<b>9</b>	<b>38</b>	<b>19</b>	<b>18</b>
Hazardous liquid pipeline	4	3	1	0	4
Gas pipeline	15	6	37	19	14

**Key:** NA = not available; P = preliminary; R = revised.

<sup>1</sup>Large trucks are defined as trucks over the 10,000 pound gross vehicle weight rating, including single-unit trucks and truck tractors.

<sup>2</sup>Includes Amtrak.

<sup>3</sup>Includes train accidents and other incidents. Most fatalities involve trespassers who are included under other incidents (472 in 2007).

<sup>4</sup>Vessel-related casualties include those involving damage to vessels such as collisions or groundings. Fatalities not related to vessel casualties include deaths from falling overboard or from accidents involving onboard equipment.

<sup>5</sup>Includes industrial vessel, passenger (inspected), passenger (uninspected), recreational, research vessel, unclassified, and unknown data.

**Note:** Caution must be exercised in comparing fatalities across modes because significantly different definitions are used.

While the amount of freight transportation activity has increased in recent decades, the number of fatalities has declined or remained stable in each mode. Most fatalities involve people who are not in the freight business, such as trespassers on freight railroads.

**TABLE 5-1. FATALITIES BY FREIGHT TRANSPORTATION MODE: 1980-2007**

**Sources: Total and Pipeline:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics 2008*, available at [www.bts.gov/](http://www.bts.gov/) as of August 14, 2008. **Highway:** National Center for Transportation Analysis, National Highway Transit Safety Administration, *Traffic Safety Facts, Large Trucks* (annual issues). **2006:** National Center for Transportation Analysis, National Highway Transit Safety Administration, *Traffic Safety Facts* (August 2008). **Highway-Rail Grade Crossings:** U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, available at [safetydata.fra.dot.gov/officeofsafety/default.asp](http://safetydata.fra.dot.gov/officeofsafety/default.asp) as of August 14, 2008. **Waterborne:** U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, August 14, 2008.

Highways and railroads account for almost all of the people injured by freight transportation, and the number of those injuries has dropped substantially over the last 25 years.

**Table 5-2. Injured Persons by Freight Transportation Mode: 1980-2007**

	1980	1990	2000	2006	2007
<b>Total injured persons (passenger and freight)</b>	NA	NA	3,259,673	2,604,648	NA
<b>Highway (passenger and freight)</b>	NA	3,230,666	3,188,750	2,575,000	2,491,000
Large truck occupants <sup>1</sup>	NA	41,822	30,832	23,000	23,000
Others injured in crashes involving large trucks	NA	108,000	109,000	83,000	NA
Large truck occupants <sup>1</sup> (percent)	NA	1.3	1.0	0.9	0.9
Others injured in crashes involving large trucks (percent)	NA	3.3	3.4	3.2	NA
<b>Railroad (passenger and freight)</b>	<b>62,246</b>	<b>25,143</b>	<b>11,643</b>	<b>(R) 8,630</b>	<b>8,960</b>
Highway-rail grade crossing <sup>2</sup>	3,550	2,407	1,219	(R) 1,067	1,039
Railroad <sup>2,3</sup>	58,696	22,736	10,424	(R) 7,563	7,921
<b>Waterborne (passenger and freight)</b>	<b>NA</b>	<b>NA</b>	<b>665</b>	<b>(R) 1,054</b>	<b>710</b>
Vessel-related <sup>4</sup>	180	175	151	(R) 368	169
Freight ship	8	10	5	(R) 21	8
Tank ship	9	13	3	2	3
Tug/towboat	27	19	18	(R) 33	20
Offshore supply	NA	9	6	(R) 7	6
Fishing vessel	28	31	21	(R) 35	28
Mobile offshore drilling units	NA	13	0	(R) 3	5
Platform	NA	9	0	0	1
Freight barge	NA	3	2	(R) 1	7
Tank barge	NA	3	0	0	0
Miscellaneous <sup>5</sup>	98	12	96	(R) 266	91
Not related to vessel casualties <sup>4</sup>	NA	NA	514	(R) 686	541
<b>Pipeline</b>	<b>192</b>	<b>76</b>	<b>81</b>	<b>35</b>	<b>62</b>
Hazardous liquid pipeline	15	7	4	2	9
Gas pipeline	177	69	77	(R) 33	53

**Key:** NA = not available; R = revised.

<sup>1</sup>Large trucks are defined as trucks over the 10,000 pound gross vehicle weight rating, including single-unit trucks and truck tractors.

<sup>2</sup>Includes Amtrak.

<sup>3</sup>Includes train accidents and other incidents. Most injuries involve workers on duty (5,282 in 2007).

<sup>4</sup>Vessel-related injuries include those involving damage to vessels, such as collisions or groundings. Injuries not related to vessel casualties include those from falls overboard or from accidents involving onboard equipment.

<sup>5</sup>Includes industrial vessel, passenger (inspected), passenger (uninspected), recreational, research vessel, unclassified, and unknown data.

**Note:** Numbers may not add to totals because some injuries are counted in more than one mode.

**TABLE 5-2. INJURED PERSONS BY FREIGHT TRANSPORTATION MODE: 1980-2007**

**Sources:** **Total and Pipeline:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics 2008*, available at [www.bts.gov/](http://www.bts.gov/) as of August 14, 2008. **Highway:** National Center for Transportation Analysis, National Highway Transit Safety Administration, *Traffic Safety Facts, Large Trucks* (Washington, DC: annual issues). **2006-2007:** National Center for Transportation Analysis, National Highway Transit Safety Administration, *Traffic Safety Facts* (August 2008). **Highway-Rail Grade Crossings:** U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, available at [safetydata.fra.dot.gov/officeofsafety/default.asp](http://safetydata.fra.dot.gov/officeofsafety/default.asp) as of August 14, 2008. **Waterborne:** U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, August 14, 2008.



**Table 5-3. Accidents by Freight Transportation Mode: 1980-2007**

	1980	1990	2000	2006	2007
<b>Highway (passenger and freight)</b>	NA	6,471,000	6,394,000	5,973,000	NA
Large truck <sup>1</sup>	NA	371,801	437,861	367,920	NA
Large truck <sup>1</sup> (percent of total)	NA	5.7	6.8	6.2	NA
<b>Rail (passenger and freight)</b>					
Highway-rail grade crossing <sup>2,3</sup>	10,612	5,715	3,502	(R) 2,937	2,749
Railroad <sup>2,4</sup>	8,205	2,879	2,983	(R) 2,962	2,610
<b>Waterborne (passenger and freight)</b>					
Vessel-related	4,624	3,613	13,546	(R) 5,419	5,671
<b>Pipeline</b>					
Hazardous liquid pipeline	246	180	146	(R) 103	106
Gas pipeline	1,524	198	234	(R) 265	281

**Key:** NA = not available; R = revised.

<sup>1</sup>Large trucks are defined as trucks over the 10,000 pound gross truck weight rating, including single-unit trucks and truck tractors.

<sup>2</sup>Includes Amtrak.

<sup>3</sup>Includes both accidents and incidents. Most highway-rail grade crossing accidents are also counted under highway.

<sup>4</sup>Train accidents only.

The number of crashes and other accidents in freight transportation has declined in all modes, except water, over the last quarter century in spite of the increase in freight activity.

Because most hazardous materials are transported by truck, most incidents related to the movement of hazardous materials occur on highways or in truck terminals. A very small share of hazardous materials transportation incidents are the result of a vehicular crash or derailment

**Table 5-4. Hazardous Materials Transportation Incidents: 1980-2007**

	1980	1990	2000	2006	2007
<b>Total</b>	<b>15,719</b>	<b>8,879</b>	<b>17,557</b>	<b>(R) 20,333</b>	<b>19,185</b>
Accident-related	486	297	394	(R) 355	350
<b>Air</b>	<b>223</b>	<b>297</b>	<b>1,419</b>	<b>(R) 2,411</b>	<b>1,550</b>
Accident-related	0	0	3	7	7
<b>Highway</b>	<b>14,161</b>	<b>7,296</b>	<b>15,063</b>	<b>(R) 17,150</b>	<b>16,832</b>
Accident-related	347	249	329	(R) 304	291
<b>Rail</b>	<b>1,271</b>	<b>1,279</b>	<b>1,058</b>	<b>(R) 704</b>	<b>742</b>
Accident-related	134	48	62	(R) 44	52
<b>Water<sup>1</sup></b>	<b>34</b>	<b>7</b>	<b>17</b>	<b>68</b>	<b>61</b>
Accident-related	2	0	0	0	0
<b>Other<sup>2</sup></b>	<b>30</b>	<b>0</b>	<b>0</b>	<b>NA</b>	<b>NA</b>
Accident-related	3	0	0	NA	NA

**Key:** R = revised; NA = not available.

<sup>1</sup>Water category only includes packaged (nonbulk) marine. Non-packaged (bulk) marine hazardous materials incidents are reported to the U.S. Coast Guard and are not included.

<sup>2</sup>Other category includes freight forwarders and modes not otherwise specified.

**Notes:** Hazardous materials transportation incidents required to be reported are defined in the Code of Federal Regulations (CFR), 49 CFR 171.15, 171.16 (Form F 5800.1). Hazardous materials deaths and injuries are caused by the hazardous material in commerce. Accident related means vehicular accident or derailment. Each modal total also includes fatalities caused by human error, package failure, and causes not elsewhere classified. As of 2005, the "other" data is no longer included in the hazardous materials information system report.

**TABLE 5-3. ACCIDENTS BY FREIGHT TRANSPORTATION MODE: 1980-2007**

**Sources:** **Highway:** National Center for Transportation Analysis, National Highway Transit Safety Administration, *Traffic Safety Facts, Large Trucks* (Washington, DC: annual issues). **2006:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics 2008*, available at [www.bts.gov/](http://www.bts.gov/) as of August 15, 2008. **Highway-Rail Grade Crossings:** U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, available at [safetydata.fra.dot.gov/officeofsafety/default.asp](http://safetydata.fra.dot.gov/officeofsafety/default.asp) as of August 15, 2008. **Waterborne:** U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, August 15, 2008. **Pipeline:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics 2008*, available at [www.bts.gov/](http://www.bts.gov/) as of August 15, 2008.

**TABLE 5-4. HAZARDOUS MATERIALS TRANSPORTATION INCIDENTS: 1980-2007**

**Source:** U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Hazardous Materials Safety, Hazardous Materials Information System Database, available at [hazmat.dot.gov/pubs](http://hazmat.dot.gov/pubs) as of May 22, 2008.





(referred to as “accident-related”). In 2007, less than 2 percent of incidents were accident-related. Most incidents occur because of human error or package failure, particularly during loading and unloading. While less than 2 percent of incidents were accident-related in 2007, they accounted for nearly 70 percent of all property damage.

**Table 5-5. Commercial Motor Carrier Compliance Review Activity by Safety Rating: 2000-2007**

Safety rating	2000		2006		2007	
	Number	Percent	Number	Percent	Number	Percent
Satisfactory	5,309	51.1	(R) 6,867	(R) 66.0	6,221	65.0
Conditional	3,354	32.3	(R) 2,593	(R) 25.3	2,143	22.4
Unsatisfactory	1,481	14.3	(R) 656	(R) 6.3	422	4.4
Not rated	245	2.4	(R) 244	(R) 2.4	790	8.3
<b>Total</b>	<b>10,389</b>	<b>100.0</b>	<b>(R) 10,360</b>	<b>100.0</b>	<b>9,576</b>	<b>100.0</b>

**Key:** R = revised.

**Notes:** A compliance review is an on-site examination of a motor carrier’s records and operations to determine whether the carrier meets the Federal Motor Carrier Safety Administration’s safety fitness standard. This entails having adequate safety management controls in place to ensure acceptable compliance with applicable safety requirements to reduce the risk associated with: alcohol and controlled substance testing violations; commercial driver’s license standard violations; inadequate levels of financial responsibility; the use of unqualified drivers; improper use and driving of motor vehicles; unsafe vehicles operating on the highways; failure to maintain crash registers and copies of crash reports; the use of fatigued drivers; inadequate inspection, repair, and maintenance of vehicles; transportation of hazardous materials; driving and parking rule violations; violation of hazardous materials regulations; and motor vehicle crashes and hazardous materials incidents. Percents may not add to totals due to rounding.

The safety fitness of motor carriers has improved markedly over the past few years. In 2007, the share of motor carriers rated satisfactory was 65 percent, up from 51 percent in 2000.

Less than one-fourth of all roadside inspections of commercial vehicles result in the vehicle being taken out-of-service (OOS) for a serious violation. A much lower percentage of driver and hazardous materials inspections results in OOS orders. In 2007 only 7 percent of driver inspections and about 5 percent of hazardous materials inspections resulted in an OOS order.

The number of gallons of fuel burned by commercial trucks increased significantly over the past 26 years. Between 1980 and 2006, the fuel consumed in highway freight transportation increased from 20 billion to 38 billion gallons annually. This is due to a substantial increase in the number of trucks on the road, an increase in the average num-

**TABLE 5-5. COMMERCIAL MOTOR CARRIER COMPLIANCE REVIEW ACTIVITY BY SAFETY RATING: 2000-2007**  
**Source:** U.S. Department of Transportation, Federal Motor Carrier Administration, Motor Carrier Management Information System (MCMIS), Compliance Review Activity by Safety Rating for Calendar Years, available at [www.fmcsa.dot.gov/](http://www.fmcsa.dot.gov/) as of May 22, 2008.

**Table 5-6. Roadside Safety Inspection Activity Summary by Inspection Type: 2000-2007**

	2000		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<b>All inspections</b>								
Number of inspections	2,453,776	100.0	(R) 3,028,443	100.0	(R) 3,334,477	100.0	3,279,486	100.0
With no violations	639,593	26.1	(R) 823,256	27.2	(R) 940,086	28.2	986,877	30.1
With violations	1,814,183	73.9	(R) 2,205,187	72.8	(R) 2,394,391	71.8	2,292,609	69.9
<b>Driver inspections</b>								
Number of inspections	2,396,688	100.0	(R) 2,966,688	100.0	(R) 3,192,216	100.0	3,136,496	100.0
With no violations	1,459,538	60.9	(R) 1,884,408	63.5	(R) 2,015,123	63.1	1,982,276	63.2
With violations	937,150	39.1	(R) 1,082,280	36.5	(R) 1,177,093	36.9	1,154,220	36.8
With OOS violations	191,031	8.0	(R) 195,842	6.6	(R) 225,653	7.1	215,226	6.9
<b>Vehicle inspections</b>								
Number of inspections	1,908,300	100.0	(R) 2,203,881	100.0	(R) 2,414,442	100.0	2,297,189	100.0
With no violations	584,389	30.6	(R) 690,209	31.3	(R) 789,259	32.7	775,849	33.8
With violations	1,323,911	69.4	(R) 1,513,672	68.7	(R) 1,625,183	67.3	1,521,340	66.2
With OOS violations	452,850	23.7	(R) 514,710	23.4	(R) 552,409	22.9	514,453	22.4
<b>Hazardous materials inspections</b>								
Number of inspections	133,486	100.0	(R) 180,911	100.0	(R) 191,614	100.0	189,657	100.0
With no violations	101,098	75.7	(R) 147,569	81.6	(R) 156,399	81.6	155,598	82.0
With violations	32,388	24.3	(R) 33,342	18.4	(R) 35,215	18.4	34,059	18.0
With OOS violations	9,964	7.5	(R) 9,889	5.5	(R) 10,142	5.3	9,872	5.2

**Key:** OOS = out of service; R = revised.

**Notes:** A roadside inspection is an examination of individual commercial motor vehicles and drivers to determine if they are in compliance with the Federal Motor Carrier Safety Regulations and/or Hazardous Materials Regulations. Serious violations result in the issuance of driver or vehicle OOS orders. These violations must be corrected before the driver or vehicle can return to service. Moving violations also may be recorded in conjunction with a roadside inspection.

**Table 5-7. Fuel Consumption by Transportation Mode: 1980-2006**

	1980	1990	2000	2005	2006
<b>Highway</b>					
Gasoline, diesel and other fuels (million gallons)	114,960	130,755	162,555	(R) 174,787	174,930
Truck, total	19,960	24,490	35,229	(R) 37,190	37,918
Single-unit 2-axle 6-tire or more truck	6,923	8,357	9,563	(R) 9,501	9,843
Combination truck	13,037	16,133	25,666	(R) 27,689	28,075
Truck (percent of total)	17.4	18.7	21.7	(R) 21.3	21.7
<b>Rail, Class I (in freight service)</b>					
Distillate / diesel fuel (million gallons)	3,904	3,115	3,700	4,098	4,192
<b>Water</b>					
Residual fuel oil (million gallons)	8,952	6,326	6,410	5,179	5,754
Distillate / diesel fuel oil (million gallons)	1,478	2,065	2,261	2,006	1,903
Gasoline (million gallons)	1,052	1,300	1,124	1,261	1,237
<b>Pipeline</b>					
Natural gas (million cubic feet)	634,622	659,816	642,210	(R) 584,026	584,497

**Key:** R = revised.

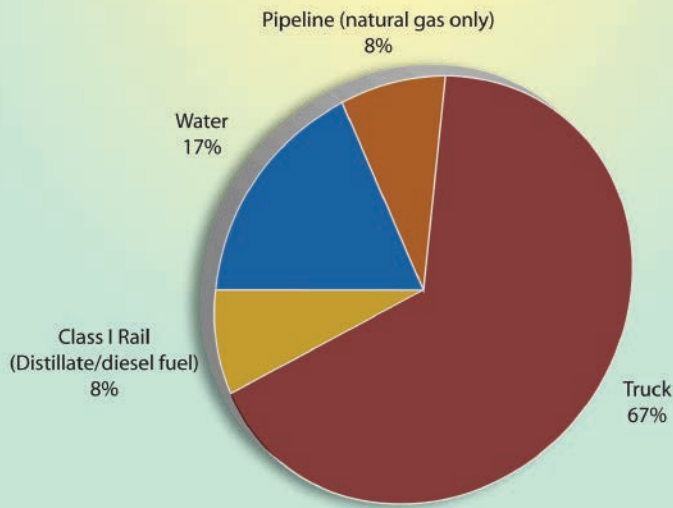
**TABLE 5-6. ROADSIDE SAFETY INSPECTION ACTIVITY SUMMARY BY INSPECTION TYPE: 2000-2007**

**Source:** U.S. Department of Transportation, Federal Motor Carrier Administration, Motor Carrier Management Information System (MCMIS), Roadside Inspection Activity Summary for Calendar Years, available at [www.fmcsa.dot.gov](http://www.fmcsa.dot.gov) as of May 22, 2008.

**TABLE 5-7. FUEL CONSUMPTION BY TRANSPORTATION MODE: 1980-2006**

**Sources:** **Highway:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2006* (Washington, DC: 2006), table VM-1 and similar tables in earlier editions. **Rail:** Association of American Railroads, *Railroad Facts* (Washington, DC: annual issues), p. 40. **Water:** U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales 2006* (Washington, DC: 2007), tables 2, 4, and similar tables in earlier editions. **Pipeline:** U.S. Department of Energy, *Natural Gas Annual 2006*, DOE/EIA-0131(04) (Washington, DC: January 2008), table 15 and similar tables in earlier editions.

**Figure 5-1. Energy Consumption by Freight Transportation Mode: 2006**



**Note:** Data do not include energy consumed by oil pipelines (crude petroleum and petroleum products) nor coal slurry/water slurry pipelines.

ber of miles traveled per truck, and a doubling of truck miles traveled. Over the same period, fuel use in Class I freight railroads increased slightly from 3.9 billion gallons to 4.2 billion gallons.

In 2006, trucking accounted for two-thirds of freight transportation energy consumption. Water was a distant second with roughly one-sixth of freight energy consumption.

Since 1980, miles per gallon by single-unit trucks (based on total travel and fuel consumption) increased by more than 40 percent. Total fuel consumed increased 42 percent whereas miles traveled nearly doubled, indicating that miles per gallon increased from 5.8 to 8.2 between 1980 and 2006.

**Table 5-8. Single-Unit Truck Fuel Consumption and Travel: 1980-2006**

	1980	1990	2000	2005	2006
Number registered (thousands)	4,374	4,487	5,926	6,395	6,649
Vehicle miles (millions)	39,813	51,901	70,500	(R) 78,496	80,331
Fuel consumed (million gallons)	6,923	8,357	9,563	(R) 9,501	9,843
Average miles traveled per vehicle	9,103	11,567	11,897	(R) 12,274	12,081
Average miles traveled per gallon	5.8	6.2	7.4	(R) 8.3	8.2
Average fuel consumed per vehicle (gallons)	1,583	1,862	1,614	(R) 1,486	1,480

**Key:** R = revised.

**FIGURE 5-1. ENERGY CONSUMPTION BY FREIGHT TRANSPORTATION MODE: 2006**

**Sources:** **Truck:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1. **Rail:** Association of American Railroads, *Railroad Facts* (Washington, DC: 2007), p. 40. **Water:** U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: annual issues), tables 2 and 4; U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table MF-24. **Pipeline:** U.S. Department of Energy, *Natural Gas Annual 2006*, DOE/EIA-0131(04) (Washington, DC: January 2008), table 15.

**TABLE 5-8. SINGLE-UNIT TRUCK FUEL CONSUMPTION AND TRAVEL: 1980-2006**

**Source:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1 and similar tables in earlier editions.

In contrast to single-unit trucks, miles per gallon by combination trucks (based on total travel and fuel consumption) decreased by about 4 percent over the past 26 years.

Vehicle miles traveled more than doubled over the same period. Consequently, the gallons of fuel consumed more than doubled between 1980 and 2006.

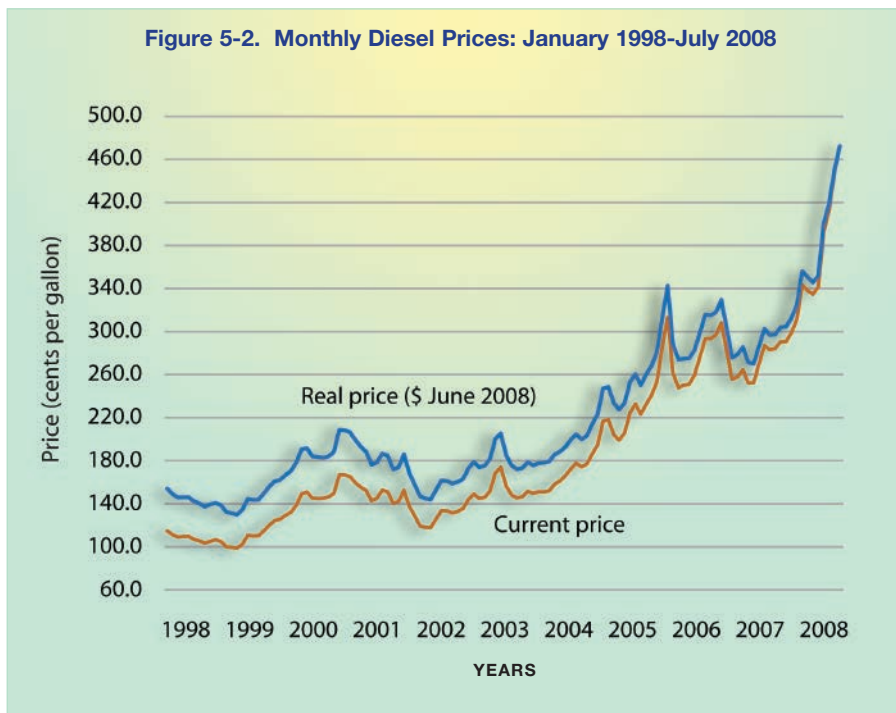
**Table 5-9. Combination Truck Fuel Consumption and Travel: 1980-2006**

	1980	1990	2000	2005	2006
Number registered (thousands)	1,417	1,709	2,097	2,087	2,170
Vehicle miles traveled (millions)	68,678	94,341	135,020	(R) 144,028	142,706
Fuel consumed (million gallons)	13,037	16,133	25,666	(R) 27,689	28,075
Average miles traveled per vehicle	48,472	55,206	64,399	(R) 69,020	70,986
Average miles traveled per gallon	5.3	5.8	5.3	(R) 5.2	5.1
Average fuel consumed per vehicle (gallons)	9,201	9,441	12,241	(R) 13,269	13,965

Key: R =revised.

Diesel prices were about 239 percent higher in July 2008 than 10 years earlier (in inflation-adjusted terms).

**Figure 5-2. Monthly Diesel Prices: January 1998-July 2008**



**TABLE 5-9. COMBINATION TRUCK FUEL CONSUMPTION AND TRAVEL: 1980-2006**

Source: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1 and similar tables in earlier editions.

**FIGURE 5-2. MONTHLY DIESEL PRICES: 1998-2008**

Sources: Diesel price: U.S. Department of Energy, Energy Information Agency, U.S. Petroleum Prices, available at [www.eia.doe.gov](http://www.eia.doe.gov) as of August 8, 2008. Consumer price index: U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index – All Urban Consumers, Monthly, available at [www.bls.gov](http://www.bls.gov) as of August 8, 2008.



Energy intensity is the amount of energy used in producing a given level of output or activity, in this case vehicle miles and ton miles. Compared with 1980, the energy intensity of both trucking and freight rail has improved. However, over the same period, domestic freight water transportation, measured by Btu per ton mile, has become less energy efficient.

**Table 5-10. Energy Intensities of Domestic Freight Transportation Modes: 1980-2006**

	1980	1990	2000	2005	2006
Highway (Btu per vehicle mile)	24,757	22,795	23,448	(R) 22,866	23,260
Railroad (Class I) (Btu per freight car mile)	18,742	16,619	14,917	15,152	14,990
Railroad (Class I) (Btu per ton mile)	597	420	352	337	330
Domestic water (Btu per ton mile)	358	387	473	514	NA

**Key:** Btu = British thermal unit; R = revised; NA = not available.

**TABLE 5-10. ENERGY INTENSITIES OF DOMESTIC FREIGHT TRANSPORTATION MODES: 1980-2006**

**Source:** Oak Ridge National Laboratory, *Transportation Energy Data Book* (Oak Ridge, TN: annual issues), table 2.16, available at [cta.ornl.gov/data/index.shtml](http://cta.ornl.gov/data/index.shtml) as of November 23, 2008.

Air quality is affected by emissions from freight vehicles. Compared with gasoline-fueled cars and trucks, diesel-fueled heavy trucks emit small amounts of carbon monoxide (CO) but large amounts of nitrogen oxides (NO<sub>x</sub>).

Freight transportation is a major source of NO<sub>x</sub> emissions, accounting for 27 percent of all NO<sub>x</sub> emissions in the United States and one-half of emissions from mobile sources. Freight transportation also accounts for about one-third of emissions of particulate matter 10 microns in diameter (PM-10) from mobile sources. Most PM-10, however, comes from agricultural fields, wildfires, and fugitive dust. Consequently, freight transportation is a minor factor when considering total PM-10 emissions.

**Table 5-11. Estimated National Average Vehicle Emissions Rates of Heavy-Duty and Light-Duty Vehicles: 1990-2007 (grams per mile)**

	1990	2000	2006	2007
<b>Gasoline (assuming zero RFG)</b>				
<b>Cars</b>				
Exhaust HC	2.79	0.97	0.46	0.42
Nonexhaust HC	1.21	0.92	0.68	0.62
<b>Total HC</b>	<b>3.99</b>	<b>1.89</b>	<b>1.13</b>	<b>1.04</b>
Exhaust CO	42.89	18.53	10.87	10.28
Exhaust NO <sub>x</sub>	2.70	1.29	0.79	0.73
<b>Light trucks</b>				
Exhaust HC	3.68	1.45	0.69	0.64
Nonexhaust HC	1.36	0.97	0.71	0.66
<b>Total HC</b>	<b>5.04</b>	<b>2.42</b>	<b>1.40</b>	<b>1.31</b>
Exhaust CO	56.23	26.81	14.33	13.52
Exhaust NO <sub>x</sub>	2.62	1.54	1.09	1.02
<b>Heavy trucks</b>				
Exhaust HC	3.66	1.22	0.53	0.48
Nonexhaust HC	2.74	1.62	1.14	1.07
<b>Total HC</b>	<b>6.40</b>	<b>2.84</b>	<b>1.67</b>	<b>1.54</b>
Exhaust CO	85.61	31.08	14.51	13.55
Exhaust NO <sub>x</sub>	7.19	5.26	3.73	3.33
<b>Diesel</b>				
<b>Cars</b>				
Exhaust HC	0.68	0.80	0.48	0.36
Exhaust CO	1.49	1.78	1.41	1.21
Exhaust NO <sub>x</sub>	1.83	1.81	1.11	0.85
<b>Light trucks</b>				
Exhaust HC	1.59	1.02	0.79	0.63
Exhaust CO	2.67	1.77	1.34	1.06
Exhaust NO <sub>x</sub>	2.71	1.76	1.30	1.09
<b>Heavy trucks</b>				
Exhaust HC	2.21	0.79	0.51	0.48
Exhaust CO	10.06	4.10	2.90	2.66
Exhaust NO <sub>x</sub>	23.34	18.05	10.55	9.60

**Key:** CO = carbon monoxide; HC = hydrocarbon; NO<sub>x</sub> = nitrogen oxides; RFG = reformulated gasoline.

**Table 5-12. Nitrogen Oxides (NO<sub>x</sub>) and Particulate Matter (PM-10) Emissions by Freight Transportation Mode: 2002**

Mode	NO <sub>x</sub> Emissions				PM-10 Emissions			
	Tons	Percent	As percent of:		Tons	Percent	As percent of:	
			All mobile sources	All sources			All mobile sources	All sources
Heavy-duty vehicles	3,782,000	66.8	33.0	17.9	120,000	64.7	23.3	0.5
Freight railroads	857,200	15.1	7.5	4.1	21,300	11.5	4.1	0.1
Marine vessels	1,011,000	17.9	8.8	4.8	44,000	23.7	8.5	0.2
Air freight	8,200	0.1	0.1	0.0	300	0.2	0.1	0.0
Total	5,658,400	100.0	49.4	26.8	185,600	100.0	36.0	0.8

**TABLE 5-11. ESTIMATED NATIONAL AVERAGE VEHICLE EMISSIONS RATES OF HEAVY-DUTY AND LIGHT-DUTY VEHICLES: 1990-2007**

**Source:** U.S. Environmental Protection Agency, National Vehicle and Fuel Emissions Laboratory, personal communication, August 13, 2008.

**TABLE 5-12. NITROGEN OXIDES (NO<sub>x</sub>) AND PARTICULATE MATTER (PM-10) EMISSIONS BY FREIGHT TRANSPORTATION MODE: 2002**

**Source:** U.S. Department of Transportation, Federal Highway Administration, *Assessing the Effects of Freight Movement on Air Quality at the National and Regional Level, Final Report*, April 2005, available at [www.fhwa.dot.gov/environment/freightaq/](http://www.fhwa.dot.gov/environment/freightaq/) as of April 24, 2008.

**Table 5-13. Current and Projected Nitrogen Oxides (NO<sub>x</sub>) Emissions by Freight Transportation Mode: 2002, 2010, and 2020**

	Tons			Percent change, 2002-2010	Percent change, 2002-2020
	2002	2010	2020		
Heavy-duty trucks	3,782,000	2,186,900	662,600	-42	-82
Freight rail	857,200	563,200	486,400	-34	-43
Commercial marine	1,011,000	987,200	938,600	-2	-7
Air freight	8,200	10,000	12,400	22	51
Freight total	5,658,400	3,747,299	2,099,999	-34	-63

Trucks are by far the largest contributor to freight emissions nationally, producing two-thirds of NO<sub>x</sub> from the freight sector. However, freight emissions of NO<sub>x</sub> are forecast to decline by almost two-thirds over the next two decades. Beginning in June 2006, the U.S. Environmental Protection Agency required the use of ultra low sulfur diesel (ULSD) fuel in heavy-duty trucks and other diesel-powered highway vehicles. ULSD will reduce emissions of NO<sub>x</sub> and enable the use of advanced pollution control technologies to meet emissions standards.

As in the case of NO<sub>x</sub>, trucks also are by far the largest contributor to PM-10 emissions from the freight sector. However, freight emissions of PM-10 are forecast to decline by one-half over the next two decades. The required use of ULSD fuel in heavy-duty trucks and other diesel-powered highway vehicles will reduce PM emissions and enable the use of advanced pollution control technologies to meet emissions standards.

**Table 5-14. Current and Projected Particulate Matter (PM-10) Emissions by Freight Transportation Mode: 2002, 2010, and 2020**

	Tons			Percent change, 2002-2010	Percent change, 2002-2020
	2002	2010	2020		
Heavy-duty trucks	120,000	65,380	34,760	-46	-71
Freight rail	21,300	15,730	12,990	-26	-39
Commercial marine	44,000	42,930	44,080	-2	0
Air freight	300	290	270	-3	-10
Freight total	185,600	124,329	92,099	-33	-50

**TABLE 5-13. CURRENT AND PROJECTED NITROGEN OXIDES (NO<sub>x</sub>) EMISSIONS BY FREIGHT TRANSPORTATION MODE: 2002, 2010, AND 2020**

**Source:** U.S. Department of Transportation, Federal Highway Administration, *Assessing the Effects of Freight Movement on Air Quality at the National and Regional Level, Final Report*, April 2005, available at [www.fhwa.dot.gov/environment/freightaq/](http://www.fhwa.dot.gov/environment/freightaq/) as of April 24, 2008.

**TABLE 5-14. CURRENT AND PROJECTED PARTICULATE MATTER (PM-10) EMISSIONS BY FREIGHT TRANSPORTATION MODE: 2002, 2010, AND 2020**

**Source:** U.S. Department of Transportation, Federal Highway Administration, *Assessing the Effects of Freight Movement on Air Quality at the National and Regional Level, Final Report*, April 2005, available at [www.fhwa.dot.gov/environment/freightaq/](http://www.fhwa.dot.gov/environment/freightaq/) as of April 24, 2008.

# APPENDIX A. SELECTED METRIC DATA

**Table 2-1M. Weight of Shipments by Transportation Mode: 2002, 2007, and 2035**  
(millions of metric tonnes)

	2002				2007				2035			
	Total	Domestic	Exports <sup>3</sup>	Imports <sup>3</sup>	Total	Domestic	Exports <sup>3</sup>	Imports <sup>3</sup>	Total	Domestic	Exports <sup>3</sup>	Imports <sup>3</sup>
<b>Total</b>	17,588	16,079	477	1,031	19,315	17,534	563	1,218	(R) 33,862	(R) 30,637	1,012	2,213
<b>Truck</b>	10,501	10,316	97	88	11,735	11,549	98	88	(R) 20,760	20,230	239	291
<b>Rail</b>	1,710	1,610	29	71	1,847	1,703	59	84	3,208	2,996	52	160
<b>Water</b>	638	541	57	40	627	523	52	52	948	795	104	49
<b>Air, air &amp; truck</b>	10	3	3	5	13	4	4	5	56	9	12	35
<b>Intermodal<sup>1</sup></b>	1,176	178	288	709	1,370	174	345	851	2,364	304	601	1,460
<b>Pipeline &amp; unknown<sup>2</sup></b>	3,554	3,432	4	118	3,723	3,580	6	138	6,526	6,303	5	219

**Key:** R = revised.

<sup>1</sup>Intermodal includes U.S. Postal Service and courier shipments and all intermodal combinations, except air and truck. Intermodal also includes oceangoing exports and imports that move between ports and interior domestic locations by modes other than water.

<sup>2</sup>Pipeline and unknown shipments are combined because data on region-to-region flows by pipeline are statistically uncertain.

<sup>3</sup>Data do not include inbound and outbound shipments that pass through the United States from a foreign origin to a foreign destination by any mode.

**Notes:** 1 metric tonne = 1.1 short tons. The 2007 data are provisional estimates, which are based on selected modal and economic trend data. Methods used to develop these estimates have improved over time, and as a consequence, previously released annual provisional estimates are superseded by the 2007 estimates in this table. Numbers may not add to totals due to rounding.

**Table 2-3M. Top Commodities: 2002**

	Metric Tonnes (millions)	Value (\$ billions)
<b>Total</b>	<b>(R) 17,588</b>	<b>(R) 13,228</b>
Natural gas & related <sup>1</sup>	(R) 2,445	Machinery 1,866
Gravel	(R) 1,863	Electronics 948
Cereal grains	(R) 1,211	Mixed freight 944
Crude petroleum	(R) 1,169	Motorized vehicles 855
Coal	(R) 1,148	Natural gas & related <sup>1</sup> 729
Nonmetal mineral products	(R) 1,035	Textiles/leather 545
Gasoline	(R) 992	Pharmaceuticals 519
Waste/scrap	(R) 842	Unknown 458
Fuel oils	(R) 509	Chemical products 444
Natural sands	(R) 507	Miscellaneous manufactured products 411

**Key:** R = revised.

<sup>1</sup>Natural gas, selected coal products, and products of petroleum refining, excluding gasoline, aviation fuel, and fuel oil.

**Note:** 1 metric tonne = 1.1 short tons.

**TABLE 2-1M. WEIGHT OF SHIPMENTS BY TRANSPORTATION MODE: 2002, 2007, AND 2035**

**Source:** 2002 and 2035: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, Version 2.2, 2007. 2007: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, 2007 provisional estimates, 2008.

**TABLE 2-3M. TOP COMMODITIES: 2002**

**Source:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.



**Table 2-4M. Hazardous Materials Shipments by Transportation Mode: 2002**

Transportation mode	Value		Metric tonnes		Tonne kilometers		Average distance per shipment (kilometers)
	US\$ Billions	Percent	Millions	Percent	Billions	Percent	
<b>TOTAL all modes</b>	<b>660.2</b>	<b>100.0</b>	<b>1,988.1</b>	<b>100.0</b>	<b>477.0</b>	<b>100.0</b>	<b>219</b>
<b>Single modes, total</b>	<b>644.5</b>	<b>97.6</b>	<b>1,958.2</b>	<b>98.5</b>	<b>455.4</b>	<b>95.5</b>	<b>169</b>
Truck <sup>1</sup>	419.6	63.6	1,051.9	52.9	160.8	33.7	138
For-hire	189.8	28.8	407.8	20.5	95.1	19.9	459
Private <sup>2</sup>	226.7	34.3	637.0	32.0	64.4	13.5	61
Rail	31.3	4.7	99.2	5.0	105.2	22.1	1,118
Water	46.9	7.1	207.0	10.4	103.1	21.6	S
Air	1.6	0.2	0.1	Z	0.1	Z	3,347
Pipeline <sup>3</sup>	145.0	22.0	600.0	30.2	S	S	S
<b>Multiple modes, total</b>	<b>9.6</b>	<b>1.5</b>	<b>17.0</b>	<b>0.9</b>	<b>18.2</b>	<b>3.8</b>	<b>1,366</b>
Parcel, U.S. Postal Service, or courier	4.3	0.6	0.2	Z	0.2	Z	1,347
Other	5.4	0.8	16.8	0.8	18.1	3.8	2,206
<b>Unknown and other modes, total</b>	<b>6.1</b>	<b>0.9</b>	<b>12.9</b>	<b>0.6</b>	<b>3.4</b>	<b>0.7</b>	<b>92</b>

**Key:** S = data are not published because of high sampling variability or other reasons; Z = zero or less than 1 unit of measure.

<sup>1</sup>Truck as a single mode includes shipments that went by private truck only, for-hire truck only, or a combination of both.

<sup>2</sup>Private truck refers to a truck operated by a temporary or permanent employee of an establishment or the buyer/receiver of the shipment.

<sup>3</sup>Excludes most shipments of crude oil.

**Notes:** 1 metric tonne = 1.1 short tons; 1 tonne kilometer = 0.7 ton miles. Numbers and percents may not add to totals due to rounding.

**Table 2-5M. Hazardous Materials Shipments by Hazard Class: 2002**

Hazard Class	Description	Value		Metric tonnes		Tonne kilometers	
		\$ Billions	Percent	Millions	Percent	Billions	Percent
Class 1	Explosives	7.9	1.2	4.5	0.2	2.3	0.5
Class 2	Gases	73.9	11.2	193.6	9.7	54.4	11.4
Class 3	Flammable liquids	490.2	74.3	1,622.9	81.6	319.1	66.9
Class 4	Flammable solids	6.6	1.0	10.3	0.5	6.4	1.3
Class 5	Oxidizers and organic peroxides	5.5	0.8	11.5	0.6	6.2	1.3
Class 6	Toxics	8.3	1.3	7.7	0.4	6.2	1.3
Class 7	Radioactive materials	5.9	0.9	0.1	0.003	0.1	0.01
Class 8	Corrosive materials	38.3	5.8	82.3	4.1	52.9	11.1
Class 9	Miscellaneous dangerous goods	23.6	3.6	55.4	2.8	29.4	6.2
<b>Total</b>		<b>660.2</b>	<b>100.0</b>	<b>1,988.1</b>	<b>100.0</b>	<b>477.0</b>	<b>100.0</b>

**Notes:** 1 metric tonne = 1.1 short tons; 1 tonne kilometer = 0.7 ton miles. Numbers and percents may not add to totals due to rounding.

**TABLE 2-4M. HAZARDOUS MATERIALS SHIPMENTS BY TRANSPORTATION MODE: 2002**

**Source:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2002 Commodity Flow Survey, Hazardous Materials* (Washington, DC: December 2004), table 1a, available at [www.bts.gov/publications/commodity\\_flow\\_survey/2002/united\\_states/](http://www.bts.gov/publications/commodity_flow_survey/2002/united_states/) as of September 23, 2008.

**TABLE 2-5M. HAZARDOUS MATERIALS SHIPMENTS BY HAZARD CLASS: 2002**

**Source:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2002 Commodity Flow Survey, Hazardous Materials* (Washington, DC: December 2004), table 2a, available at [www.bts.gov/publications/commodity\\_flow\\_survey/2002/united\\_states/](http://www.bts.gov/publications/commodity_flow_survey/2002/united_states/) as of September 23, 2008.

**Table 2-6M. Domestic Mode of Exports and Imports by Tonnage and Value: 2002 and 2035<sup>a</sup>**

	Metric Tonnes (millions)		Value (\$ billions)	
	2002	2035	2002	2035
<b>Total</b>	1,509	3,225	2,145	12,277
<b>Truck<sup>1</sup></b>	725	1,926	1,198	6,193
<b>Rail</b>	182	361	114	275
<b>Water</b>	97	153	26	49
<b>Air, air &amp; truck<sup>2</sup></b>	8	49	614	5,242
<b>Intermodal<sup>3</sup></b>	20	46	52	281
<b>Pipeline &amp; unknown<sup>4</sup></b>	477	692	141	238

**Key:** R = revised.

<sup>1</sup>Excludes truck moves to and from airports.

<sup>2</sup>Includes truck moves to and from airports.

<sup>3</sup>Intermodal includes U.S. Postal Service and courier shipments and all intermodal combinations, except air and truck.

<sup>4</sup>Pipeline and unknown shipments are combined because data on region-to-region flows by pipeline are statistically uncertain.

**Notes:** 1 metric tonne = 1.1 short tons. In this table, oceangoing exports and imports that move between ports and domestic locations by single modes are classified by the domestic mode rather than as intermodal.

**Table 2-8M. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 1998-2007**

Mode	1998		2000		2006		2007	
	Value (current US\$ billions)	Weight (millions of metric tonnes)	Value (current US\$ billions)	Weight (millions of metric tonnes)	Value (current US\$ billions)	Weight (millions of metric tonnes)	Value (current US\$ billions)	Weight (millions of metric tonnes)
Truck	350	NA	429	NA	534	NA	555	NA
Rail	68	NA	94	NA	129	NA	138	NA
Air	30	<1	45	<1	36	<1	38	<1
Water	21	166	33	176	70	(R) 228	74	219
Pipeline	11	NA	24	NA	57	NA	59	NA
Other	23	NA	29	NA	40	NA	44	NA
<b>Total</b>	<b>503</b>	<b>NA</b>	<b>653</b>	<b>NA</b>	<b>865</b>	<b>NA</b>	<b>908</b>	<b>NA</b>

**Key:** NA = not available; R = revised.

**Notes:** 1 metric tonne = 1.1 short tons. Numbers may not add to totals due to rounding. For value, "Other" is the difference between the total and the sum of the individual modes.

**TABLE 2-6M. DOMESTIC MODE OF EXPORTS AND IMPORTS BY TONNAGE AND VALUE: 2002 AND 2035**

**Source:** U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, Version 2.2, 2007.

**TABLE 2-8M. VALUE AND TONNAGE OF U.S. MERCHANDISE TRADE WITH CANADA AND MEXICO BY TRANSPORTATION MODE: 1998-2007**

**Source:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, TransBorder Freight Data, March 2008.

**Table 3-1M. Kilometers of Infrastructure by Transportation Mode: 1980-2006**

	1980	1990	2000	2006	Percent change, 1980-2006
<b>Public roads, route kilometers</b>	6,211,806	6,223,214	6,358,681	6,493,141	4.5
National Highway System (NHS)	N	N	259,409	263,182	N
Interstates	66,176	72,540	75,113	75,496	14.1
Other NHS	N	N	184,296	187,686	N
Other	N	N	6,099,272	6,229,958	N
<b>Strategic Highway Corridor Network (STRAHNET)</b>	N	N	99,886	99,768	N
Interstate	N	N	75,116	75,498	N
Non-Interstate	N	N	24,766	24,271	N
<b>Railroad</b>	294,634 <sup>1</sup>	283,098	274,412	225,286	-23.1
Class I	NA	214,347	194,082	152,630	N
Regional	NA	29,572	33,761	26,908	N
Local	NA	39,167	46,570	45,748	N
<b>Inland waterways</b>					
Navigable channels	17,703	17,703	17,703	17,710	0.0
Great Lakes-St. Lawrence Seaway	3,769	3,769	3,769	3,771	0.0
<b>Pipelines</b>					
Oil	351,469	335,954	284,847	272,647	-22.5
Gas	1,692,666	1,913,832	2,203,675	2,470,223	45.9

**Key:** N = not applicable; NA = not available.

<sup>1</sup>Excludes Class III railroads.

**Note:** 1 kilometer = 0.6 miles.

**TABLE 3-1M. KILOMETERS OF INFRASTRUCTURE BY TRANSPORTATION MODE: 1980-2006**

**Sources:** **Public roads:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table HM-16 and HM-49. **Rail:** Association of American Railroads, *Railroad Facts* (Washington, DC: annual issues). **Navigable channels:** U.S. Army Corps of Engineers, *Corps Facts*, available at [www.hq.usace.army.mil/cepa/pubs](http://www.hq.usace.army.mil/cepa/pubs) as of June 27, 2008. **Great Lakes-St. Lawrence Seaway:** The St. Lawrence Seaway Management Corporation, "The Seaway," available at [www.greatlakes-seaway.com/en/seaway/facts/index.html](http://www.greatlakes-seaway.com/en/seaway/facts/index.html) as of November 28, 2008. **Oil pipelines: 1980-2000:** Eno Transportation Foundation, *Transportation in America*, 2002 (Washington, DC: 2002). **2006:** U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety, Pipeline Statistics, available at [www.phmsa.dot.gov/pipeline/library/data-stats](http://www.phmsa.dot.gov/pipeline/library/data-stats) as of November 28, 2008. **Gas pipelines:** American Gas Association, *Gas Facts* (Arlington, VA: annual issues).



**Table 3-3M. Trucks and Truck Kilometers by Average Weight: 1987-2002<sup>1</sup>**

Average weight (kilograms)	1987		1992		1997		2002		Percent change, 1987-2002	
	Number (thousands)	VKT (millions)	Number (thousands)	VKT (millions)	Number (thousands)	VKT (millions)	Number (thousands)	VKT (millions)	Number	VKT
<b>Total</b>	<b>3,624</b>	<b>144,796</b>	<b>4,008</b>	<b>168,960</b>	<b>4,701</b>	<b>237,983</b>	<b>5,415</b>	<b>234,359</b>	<b>49</b>	<b>62</b>
<b>Light-heavy</b>	<b>1,030</b>	<b>17,329</b>	<b>1,259</b>	<b>22,551</b>	<b>1,436</b>	<b>31,890</b>	<b>1,914</b>	<b>42,254</b>	<b>86</b>	<b>144</b>
4,536 to 6,350	525	8,754	694	12,875	819	18,510	1,142	24,440	118	179
6,351 to 7,257	242	4,407	282	4,791	316	6,359	396	9,508	64	116
7,258 to 8,845	263	4,168	282	4,885	301	7,021	376	8,306	43	99
<b>Medium-heavy</b>	<b>766</b>	<b>12,200</b>	<b>732</b>	<b>13,104</b>	<b>729</b>	<b>16,302</b>	<b>910</b>	<b>18,935</b>	<b>19</b>	<b>55</b>
8,846 to 11,793	766	12,200	732	13,104	729	16,302	910	18,935	19	55
<b>Heavy-heavy</b>	<b>1,829</b>	<b>115,266</b>	<b>2,017</b>	<b>133,305</b>	<b>2,536</b>	<b>189,791</b>	<b>2,591</b>	<b>173,169</b>	<b>42</b>	<b>50</b>
11,794 to 14,969	377	8,708	387	9,163	428	11,414	437	9,407	16	8
14,969 to 18,144	209	6,619	233	8,505	257	10,612	229	6,067	10	-8
18,144 to 22,680	292	12,271	339	15,485	400	21,047	318	10,779	9	-12
22,680 to 27,216	188	11,518	227	13,999	311	20,362	327	14,404	74	25
27,216 to 36,287	723	73,127	781	82,147	1,070	120,256	1,179	124,707	63	71
36,288 to 45,359	28	2,018	33	2,460	46	3,906	69	4,747	144	135
45,360 to 58,967	8	708	12	1,181	18	1,691	26	2,528	238	257
58,967 or more	4	298	5	365	6	502	6	530	43	78

**Key:** VKT = vehicle kilometers traveled.

<sup>1</sup>Excludes trucks with an average weight of 10,000 pounds or less.

**Notes:** 1 kilometer = 0.6 miles; 1 kilogram = 2.2 pounds. Weight includes the empty weight of the vehicle plus the average weight of the load carried.

**TABLE 3-3M. TRUCKS AND TRUCK KILOMETERS BY AVERAGE WEIGHT: 1987-2002<sup>1</sup>**

**Sources:** U.S. Department of Commerce, Census Bureau, 2002 *Vehicle Inventory and Use Survey: United States* (Washington, DC: 2004), available at [www.census.gov/svsd/www/vius/products.html](http://www.census.gov/svsd/www/vius/products.html) as of April 24, 2008; U.S.

Department of Commerce, Census Bureau, 1992 *Truck Inventory and Use Survey: United States* (Washington, DC: 1995), available at [www.census.gov/svsd/www/vius/products.html](http://www.census.gov/svsd/www/vius/products.html) as of April 24, 2008.





**Table 3-6M. Truck Kilometers by Products Carried: 2002<sup>1</sup>**

Products carried	Millions of kilometers
<b>Total<sup>2</sup></b>	<b>233,728</b>
Animals and fish, live	1,182
Animal feed and products of animal origin	3,360
Grains, cereal	2,202
All other agricultural products	4,283
Basic chemicals	1,410
Fertilizers and fertilizer materials	2,681
Pharmaceutical products	491
All other chemical products and preparations	2,174
Alcoholic beverages	1,808
Bakery and milled grain products	5,717
Meat, seafood, and their preparations	4,918
Tobacco products	717
All other products foodstuff	11,954
Logs and other wood in the rough	1,849
Paper or paperboard articles	5,053
Printed products	1,231
Pulp, newsprint, paper, paperboard	3,115
Wood products	5,731
Articles of base metal	5,301
Base metal in primary or semifinished forms	4,637
Nonmetallic mineral products	4,906
Tools, nonpowered	12,487
Tools, powered	10,425
Electronic and other electrical equipment	4,866
Furniture, mattresses, lamps, etc.	3,288
Machinery	5,190
Miscellaneous manufactured products	6,449
Precision instruments and apparatus	1,181
Textile, leather, and related articles	2,475
Vehicles, including parts	6,186
All other transportation equipment	1,024
Coal	484
Crude petroleum	212
Gravel or crushed stone	4,490
Metallic ores and concentrates	73
Monumental or building stone	744
Natural sands	1,753
All other nonmetallic minerals	802
Fuel oils	1,983
Gasoline and aviation turbine fuel	1,366
Plastic and rubber	3,851
All other coal and refined petroleum products	1,886
Hazardous waste (EPA manifest)	306
All other waste and scrape (non-EPA manifest)	4,261
Recyclable products	1,484
Mail and courier parcels	7,660
Empty shipping containers	1,278
Passengers	440
Mixed freight	23,591
Products, equipment, or materials not elsewhere classified	426
Products not specified	10,232
Not applicable <sup>3</sup>	241
No product carried	46,653

<sup>1</sup>Excludes pickups, panels, minivans, sport utilities, and station wagons.

<sup>2</sup>Detail lines may not add to total because multiple products/hazardous materials may be carried at the same time.

<sup>3</sup>Vehicles not in use. When the respondent had partial-year ownership of the vehicle, annual miles were adjusted to reflect miles traveled when not owned by the respondent.

**Note:** 1 kilometer = 0.6 miles.

**TABLE 3-6M. TRUCK KILOMETERS BY PRODUCTS CARRIED: 2002**

**Source:** U.S. Department of Commerce, Census Bureau, *2002 Vehicle Inventory and Use Survey: United States, EC02TV-US* (Washington, DC: 2004), available at [www.census.gov/prod/ec02/ec02tv-us.pdf](http://www.census.gov/prod/ec02/ec02tv-us.pdf) as of April 24, 2008.

**Table 3-7M. Trucks, Truck Kilometers, and Average Distance by Range of Operations and Jurisdictions: 2002**

	Number of Trucks (thousands)	Truck Kilometers (millions)	Kilometers per Truck (thousands)
<b>Total</b>	<b>5,520.5</b>	<b>233,632.5</b>	<b>42.3</b>
Off the road	182.9	3,641.6	20.0
50 miles or less	2,942.4	68,447.2	23.3
51 to 100 miles	684.7	30,837.6	45.1
101 to 200 miles	243.5	18,957.9	77.9
201 to 500 miles	231.6	28,195.2	121.8
501 miles or more	293.0	42,979.8	146.8
Not reported	716.3	40,331.9	56.3
Not applicable	226.1	241.2	1.1
Operated in Canada	1.7	115.9	68.7
Operated in Mexico	1.6	47.2	29.8
Operated within the home base state	4,196.4	136,752.2	32.5
Operated in states other than the home base state	495.6	65,824.1	132.8
Not reported	599.1	30,651.7	51.2
Not applicable	226.1	241.2	1.1

**Notes:** 1 kilometer = 0.6 miles. Includes trucks registered to companies and individuals in the United States except pickups, minivans, other light cars, and sport utility vehicles.

**TABLE 3-7M. TRUCKS, TRUCK KILOMETERS, AND AVERAGE DISTANCE BY RANGE OF OPERATIONS AND JURISDICTIONS: 2002**

**Source:** U.S. Department of Commerce, Census Bureau, *2002 Vehicle Inventory and Use Survey: United States, EC02TV-US*, Table 3a (Washington, DC: 2004), available at [www.census.gov/prod/ec02/ec02tv-us.pdf](http://www.census.gov/prod/ec02/ec02tv-us.pdf) as of

April 24, 2008.



**Table 3-10M. Top 25 Airports by Landed Weight of All-Cargo Operations: 2000-2006<sup>1</sup>**

Airport	2006 Rank	Landed weight (thousands of metric tonnes)				
		2000	2003	2004	2005	2006
Anchorage, AK (Ted Stevens Anchorage International) <sup>2</sup>	1	7,333	8,171	8,930	9,402	9,605
Memphis, TN (Memphis International)	2	5,732	7,946	8,060	8,476	8,550
Louisville, KY (Louisville International-Standiford Field)	3	3,617	3,785	3,981	4,165	4,549
Los Angeles, CA (Los Angeles International)	4	2,624	2,830	2,778	2,655	3,290
Miami, FL (Miami International)	5	2,657	2,938	3,105	3,221	3,258
Indianapolis, IN (Indianapolis International)	6	2,616	2,065	2,099	2,308	2,383
New York, NY (John F. Kennedy International)	7	2,534	2,664	2,629	2,550	2,372
Chicago, IL (O'Hare International)	8	1,870	2,133	2,140	2,188	2,003
Newark, NJ (Newark Liberty International)	9	1,778	1,664	1,601	1,697	1,694
Oakland, CA (Metropolitan Oakland International)	10	1,643	1,537	1,545	1,631	1,631
Fort Worth, TX (Dallas/Fort Worth International)	11	1,534	1,344	1,298	1,501	1,562
Ontario, CA (Ontario International)	12	1,107	1,213	1,203	1,219	1,271
Philadelphia, PA (Philadelphia International)	13	1,319	1,238	1,244	1,271	1,236
Atlanta, GA (William B. Hartsfield International)	14	989	1,083	1,054	919	1,070
Honolulu, HI (Honolulu International)	15	628	923	880	751	888
San Francisco, CA (San Francisco International)	16	1,149	1,089	671	723	752
Portland, OR (Portland International)	17	800	679	651	677	662
Phoenix, AZ (Sky Harbor International)	18	835	707	727	706	659
Denver, CO (Denver International)	19	817	678	692	692	645
Seattle, WA (Seattle-Tacoma International)	20	961	722	482	643	643
Houston, TX (George Bush Intercontinental)	21	435	604	632	644	631
Chicago/Rockford, IL (Chicago/Rockford International)	22	593	567	614	632	631
Fort Worth, TX (Fort Worth Alliance)	23	461	316	339	454	584
Minneapolis, MN (Minneapolis-St Paul International/Wold-Chamberlain)	24	564	623	615	637	562
San Juan, PR (Luis Munoz Marin International)	25	440	591	410	567	550
<b>Top 25 airports<sup>3</sup></b>		<b>(R) 47,517</b>	<b>(R) 48,938</b>	<b>(R) 49,463</b>	<b>(R) 50,760</b>	<b>51,683</b>
<b>United States, all airports<sup>4</sup></b>		<b>(R) 67,812</b>	<b>(R) 66,287</b>	<b>(R) 67,399</b>	<b>(R) 69,026</b>	<b>69,131</b>
<b>Top 25 as % of U.S. total</b>		<b>(R) 70.1</b>	<b>(R) 73.8</b>	<b>73.4</b>	<b>73.5</b>	<b>74.8</b>

**Key:** R = revised.

<sup>1</sup>All-cargo operations are operations dedicated to the exclusive transportation of cargo. This does not include aircraft carrying passengers that may also be carrying cargo. Aircraft landed weight is the certificated maximum gross landed weight of the aircraft as specified by the aircraft manufacturers.

<sup>2</sup>Anchorage includes a large proportion of all-cargo operations in-transit.

<sup>3</sup>Airport rankings change each year. Totals represent the top 25 airports for each year, not necessarily the top 25 airports listed here for 2006.

<sup>4</sup>Limited to airports with an aggregate landed weight in excess of 45.36 million kilograms (45,359 metric tonnes) annually.

**Note:** 1 metric tonne = 1.1 short tons.

**TABLE 3-10M. TOP 25 AIRPORTS BY LANDED WEIGHT OF ALL-CARGO OPERATIONS: 2000-2006**

**Source:** U.S. Department of Transportation, Federal Aviation Administration, Air Carrier Activity Information System (ACAIS) database, All-Cargo Data, available at [www.faa.gov/airports\\_airtraffic/airports/planning\\_capacity/passenger\\_allcargo\\_stats/passenger/index](http://www.faa.gov/airports_airtraffic/airports/planning_capacity/passenger_allcargo_stats/passenger/index) as of May 29, 2008.

**Table 5-7M. Fuel Consumption by Transportation Mode: 1980-2006**

	1980	1990	2000	2005	2006
<b>Highway</b>					
Gasoline, diesel and other fuels (million liters)	436,848.0	496,869.0	617,709.0	(R) 664,190.6	664,734.0
Truck, total	75,848.0	93,062.0	133,870.2	(R) 141,322.0	144,088.4
Single-unit 2-axle 6-tire or more truck	26,307.4	31,756.6	36,339.4	(R) 36,103.8	37,403.4
Combination truck	49,540.6	61,305.4	97,530.8	(R) 105,218.2	106,685.0
Truck (percent of total)	17.4	18.7	21.7	(R) 21.3	21.7
<b>Rail, Class I (in freight service)</b>					
Distillate / diesel fuel (million liters)	14,835.2	11,837.0	14,060.0	15,572.4	15,929.6
<b>Water</b>					
Residual fuel oil (million liters)	34,017.6	24,038.8	24,358.0	19,680.2	21,865.2
Distillate / diesel fuel oil (million liters)	5,616.4	7,847.0	8,591.8	7,622.8	7,231.4
Gasoline (million liters)	3,997.6	4,940.0	4,271.2	4,791.8	4,700.6
<b>Pipeline</b>					
Natural gas (million cubic meters)	19,038.7	19,794.5	19,266.3	(R) 17,520.8	17,534.9

**Key:** R = revised.

**Notes:** 1 liter = 0.3 gallons; 1 cubic meter = 33.3 cubic feet. Table 5-7M was updated in January 2009 and differs from the print version published November 2008.

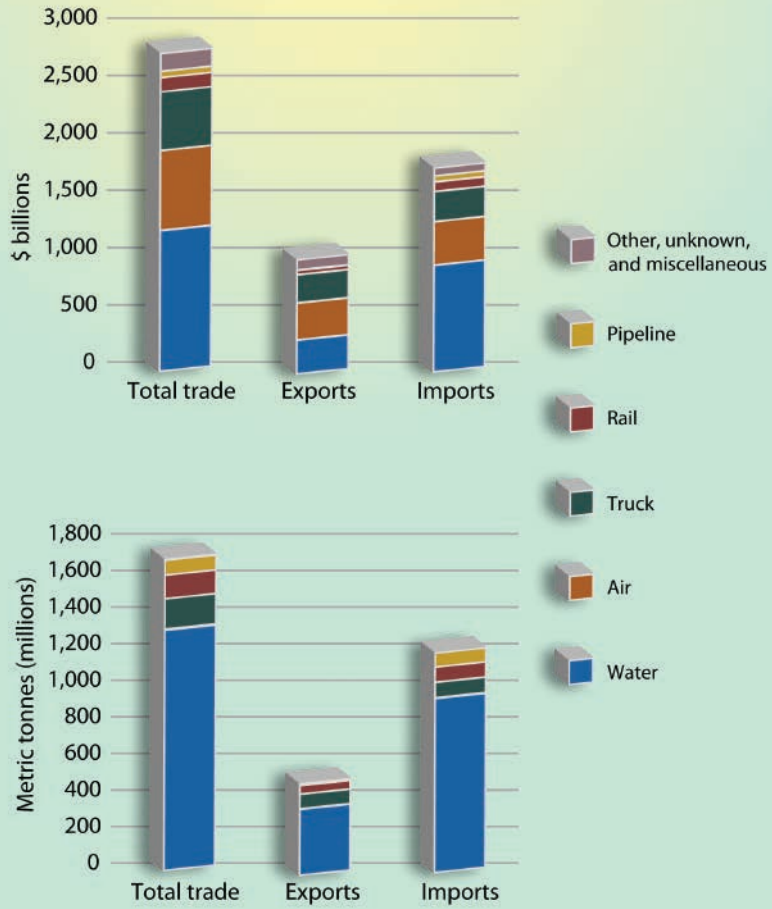
**TABLE 5-7M. FUEL CONSUMPTION BY TRANSPORTATION MODE: 1980-2006**

**Sources:** **Highway:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2006* (Washington, DC: 2006), table VM-1 and similar tables in earlier editions. **Rail:** Association of American Railroads, *Railroad Facts* (Washington, DC: annual issues), p. 40. **Water:** U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales 2006* (Washington, DC: 2007), tables 2, 4, and similar tables in earlier editions. **Pipeline:** U.S. Department of Energy, *Natural Gas Annual 2006*, DOE/EIA-0131(04) (Washington, DC: January 2008), table 15 and similar tables in earlier editions.





**Figure 2-2M. U.S. International Merchandise Trade by Mode of Transportation: 2006**



**Notes:** 1 metric tonne = 1.1 short tons. The U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics estimated 2006 data using value-to-weight ratios derived from imported commodities. The U.S. Census Bureau no longer requires these data to be reported. Totals for the most recent year differ slightly from the Freight Analysis Framework due to variations in base year and coverage of methods for calculating values in constant dollars.



**FIGURE 2-2M. U.S. INTERNATIONAL MERCHANDISE TRADE BY MODE OF TRANSPORTATION: 2006**

**Sources:** Compiled by U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration (RITA), Bureau of Transportation Statistics (BTS), October 2007. **Total, water, and air data:** U.S. Department of Commerce, Census Bureau, Foreign Trade Division, FT920 U.S. Merchandise Trade: Selected Highlights, December 2006. **Truck, rail, pipeline data:** USDOT, RITA, BTS, TransBorder Freight Data, 2006. **Other, unknown, and miscellaneous data:** USDOT, RITA, BTS, special tabulation, October 2007.



**Table 5-8M. Single-Unit Truck Fuel Consumption and Travel: 1980-2006**

	1980	1990	2000	2005	2006
Number registered (thousands)	4,374	4,487	5,926	6,395	6,649
Vehicle kilometers (millions)	64,073	83,527	113,459	(R) 126,327	129,280
Fuel consumed (million liters)	26,206	31,635	36,200	(R) 35,966	37,261
Average kilometers traveled per vehicle	14,649	18,615	19,146	(R) 19,753	19,443
Average kilometers traveled per liter	2.4	2.6	3.1	(R) 3.5	3.5
Average fuel consumed per vehicle (liter)	5,992	7,050	6,109	(R) 5,624	5,604

**Key:** R = revised.

**Notes:** 1 kilometer = 0.6 miles; 1 liter = 0.3 gallons.

**Table 5-9M. Combination Truck Fuel Consumption and Travel: 1980-2006**

	1980	1990	2000	2005	2006
Number registered (thousands)	1,417	1,709	2,097	2,087	2,170
Vehicle kilometers traveled (millions)	110,527	151,827	217,294	(R) 231,791	229,663
Fuel consumed (million liters)	49,350	61,070	97,155	(R) 104,813	106,274
Average kilometers traveled per vehicle	78,008	88,845	103,640	(R) 111,077	105,852
Average kilometers traveled per liter	2.2	2.5	2.2	(R) 2.2	2.2
Average fuel consumed per vehicle (liters)	34,831	35,737	46,339	(R) 50,228	48,982

**Key:** R = revised.

**Notes:** 1 kilometer = 0.6 miles; 1 liter = 0.3 gallons.

**TABLE 5-8M. SINGLE-UNIT TRUCK FUEL CONSUMPTION AND TRAVEL: 1980-2006**

**Source:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1 and similar tables in earlier editions.

**TABLE 5-9M. COMBINATION TRUCK FUEL CONSUMPTION AND TRAVEL: 1980-2006**

**Source:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1 and similar tables in earlier editions.



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