

FREIGHT FACTS AND FIGURES 2 0 1 1



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Freight Facts and Figures 2011 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.freight.dot.gov.

Chapter 1 summarizes the 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 highway, rail, and port 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 in this report are based on the Economic Census, which is conducted once every five years. The most recently published data are for 2007 (except for the Vehicle Inventory and Use Survey, which was last conducted in 2002).

Several of the tables and maps are based on the Freight Analysis Framework (FAF), version 3, 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, water, and pipeline categories include shipments transported by only one mode. Air includes shipments weighing more than 100 pounds moved by air or by air and truck. The multiple modes and mail category includes all other shipments transported by more than one mode, such as bulk products moved by rail and water and mixed cargo hauled by truck and rail. Multiple modes and mail also includes small shipments sent via postal and courier services. The other and unknown category is primarily unidentified modes but includes miscellaneous categories, such as aircraft delivered to customers and shipments through foreign trade zones. Visit 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 117 million households, 7.4 million business establishments, and 89,500 governmental units are part of an enormous economy that demands the efficient movement of freight. While the U.S. economy has been affected by an economic downturn, it is expected to recover and continue to grow. Long-term economic growth will result in even greater demand for freight transportation.

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 nearly 36 percent between

Table 1-1. Economic and Social Characteristics of the United States: 1980-2009

	1980	1990	2000	2008	2009	Percent change, 1980 to 2009
Resident population (thousands)	226,546	248,791	281,425	304,375	307,007	35.5
Households (thousands)	80,776	93,347	104,705	116,783	117,181	45.1
Median household income (2005 \$)	42,067	44,758	47,608	46,707	45,211	7.5
Civilian labor force (thousands)	106,940	125,840	142,583	154,287	154,142	44.1
Employed ¹ (thousands)	99,303	118,793	136,891	145,362	139,877	40.9
Agriculture, forestry, fishing, and hunting (percent)	NA	1.9	1.8	1.5	1.5	NA
Mining	NA	0.5	0.3	0.6	0.5	NA
Construction	NA	6.9	7.3	7.5	6.9	NA
Manufacturing	NA	16.8	14.4	10.9	10.2	NA
Wholesale and retail trade	NA	14.7	14.6	14.2	14.1	NA
Transportation and utilities	NA	5.1	5.4	5.3	5.2	NA
Information	NA	2.9	3.0	2.4	2.3	NA
Financial activities	NA	7.1	6.8	7.0	6.9	NA
Professional and business services	NA	9.4	10.0	10.7	10.7	NA
Education and health services	NA	17.5	19.1	21.6	22.7	NA
Leisure and hospitality	NA	8.0	8.2	8.8	9.1	NA
Other services	NA	4.3	4.7	4.8	5.0	NA
Public administration	NA	4.7	4.5	4.7	4.9	NA
Business establishments (thousands)	NA	6,176	7,070	7,601	7,433	NA
Governmental units ²	³ 81,831	⁴ 85,006	⁵ 87,576	⁶ 89,527	NA	NA
Gross domestic product (millions of 2005 \$)	(R) 5,834,000	(R) 8,027,100	(R) 11,216,400	(R) 13,161,900	12,703,100	117.7
Foreign trade (millions of 2005 \$)	631,335	1,168,168	2,572,000	(R) 3,793,847	3,346,839	440.2
Goods (percent)	74.0	71.6	78.8	(R) 77.5	75.4	1.9
Services (percent)	26.0	28.4	21.2	(R) 22.5	24.6	-5.3

Key: NA = not available; R = revised.

¹Based 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.

²Data for governmental units come from the Census of Governments, which is collected every five years.

³1982

⁴1992

⁵2002

⁶2007

TABLE 1-1. ECONOMIC AND SOCIAL CHARACTERISTICS OF THE UNITED STATES: 1980-2009

Sources: **Population:** U.S. Department of Commerce, Census Bureau, *Population Profile of the United States*, available at www.census.gov/population/www/pop-profile/profile.html as of August 9, 2011. **Households:** U.S. Department of Commerce, Census Bureau, *Families and Living Arrangements*, table HH-1, available at www.census.gov/population/www/socdemo/hh-fam.html as of August 9, 2011. **Civilian Labor Force:** U.S. Department of Labor, Bureau of Labor Statistics, *Labor Force Statistics from the Current Population Survey*, available at www.bls.gov/data as of August 9, 2011. **Employment:** U.S. Department of Labor, Bureau of Labor Statistics, *Current Employment Statistics*, available at www.bls.gov/ces as of August 9, 2011. **Median household income:** U.S. Department of Commerce, Census Bureau, *Historical Income Tables*, table H-6, available at www.census.gov/hhes/www/income/data/historical/household/index.html as of August 9, 2011. **Business establishments:** U.S. Department of Commerce, Census Bureau, *County Business Patterns*, available at www.census.gov/econ/cbp/ as of August 9, 2011. **Governmental units:** U.S. Department of Commerce, Census Bureau, *Census of Governments*, available at www.census.gov/govs as of August 9, 2011. **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, and 4.2.4, available at www.bea.gov/national/FA2004/index.asp as of August 9, 2011.

1980 and 2009 and climbed to 308.7 million in 2010. The U.S. economy, measured by Gross Domestic Product (GDP), more than doubled in real terms, while household income, another indicator of economic growth, rose by eight percent between 1980 and 2009. Foreign trade grew faster than the overall economy, quintupling in real value over the same period, reflecting unprecedented global interconnectivity.

Table 1-2. Population and Gross Domestic Product (GDP) by Region: 1980-2009

	1980	1990	2000	2008	2009	Percent change, 1980 to 2009
Resident Population (thousands)	226,549	248,789	282,172	304,375	307,007	35.5
Northeast	49,136	50,828	53,668	55,060	55,284	12.5
Midwest	58,868	59,670	64,494	66,596	66,837	13.5
South	75,372	85,454	100,560	112,021	113,318	50.3
West	43,173	52,837	63,451	70,698	71,568	65.8
GDP (millions of 2005 \$)¹	5,696,999	7,883,332	11,223,130	13,100,045	12,773,853	124.2
Northeast	1,248,023	1,808,010	2,344,250	2,675,477	2,601,053	108.4
Midwest	1,423,439	1,766,102	2,490,900	2,688,533	2,601,907	82.8
South	1,812,981	2,503,020	3,763,080	4,509,795	4,442,409	145.0
West	1,212,557	1,806,199	2,622,605	3,226,165	3,126,002	157.8
GDP per capita (millions of 2005 \$)¹	25,147	31,687	39,774	43,039	41,608	65.5
Northeast	25,399	35,571	43,681	48,592	47,049	85.2
Midwest	24,180	29,598	38,622	40,371	38,929	61.0
South	24,054	29,291	37,421	40,258	39,203	63.0
West	28,086	34,184	41,333	45,633	43,679	55.5

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

Notes: Chained dollars are not additive, especially for periods farther away from the base year of 2005. Thus, GDP for all regions is not equal to total GDP. 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. Both population and economic activity have grown faster in the West and South than in the Northeast and Midwest, but the growth in economic activity per capita has been highest in the Northeast.

TABLE 1-2. POPULATION AND GROSS DOMESTIC PRODUCT (GDP) BY REGION: 1980-2009

Sources: Population: 1980-1990: U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States: 2004-2005* (Washington, DC: 2005); 2000-2009: 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 as of August 8, 2011. **Gross Domestic Product:** U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, available at www.bea.gov/regional/as as of August 8, 2011.

II. FREIGHT TO BE MOVED AND TRADING PARTNERS



The American economy stretches across a continent with links to the world, drawing on 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: 2007, 2010, and 2040¹
(millions of tons)

	2007				2010				2040			
	Total	Domestic	Exports ²	Imports ²	Total	Domestic	Exports ²	Imports ²	Total	Domestic	Exports ²	Imports ²
Total	18,879	16,851	655	1,372	18,313	16,394	762	1,156	27,484	23,081	1,824	2,579
Truck	12,778	12,587	95	97	12,490	12,309	95	86	18,503	18,005	272	226
Rail	1,900	1,745	61	93	1,776	1,645	57	74	2,353	2,038	155	159
Water	941	504	55	381	860	464	67	328	1,263	594	113	556
Air, air & truck	13	3	4	6	12	2	4	5	43	7	16	19
Multiple modes & mail	1,424	419	399	606	1,380	400	496	485	2,991	595	1,171	1,225
Pipeline	1,507	1,328	4	175	1,494	1,321	6	167	1,818	1,447	9	362
Other & unknown	316	266	36	14	302	253	37	11	514	395	87	32

¹Many 2007 and 2040 numbers in this table were revised as a result of Freight Analysis Framework (FAF) database improvements in FAF version 3.2.

²Data do not include imports and exports that pass through the United States from a foreign origin to a foreign destination by any mode.

Notes: Numbers may not add to totals due to rounding. The 2010 data are provisional estimates, which are based on selected modal and economic trend data. All truck, rail, water, and pipeline movements that involve more than one mode, including exports and imports that change mode at international gateways, are included in multiple modes & mail to avoid double counting. As a consequence, rail and water totals in this table are less than other published sources.

The U.S. transportation system moved, on average, 52 million tons worth nearly \$46 billion each day in 2007. After successive decreases in 2008 and 2009, estimates from the Freight Analysis Framework (FAF) show that tonnage grew in 2010, increasing 13.6 percent over 2009 and reaching 97 percent of 2007 tonnage. Between 2010 and 2040, tonnage is forecast to increase at 1.4 percent per year.

Version 3 of the FAF and the 2007 Commodity Flow Survey (CFS) include significant improvements and corrections to version 2 of the FAF and the 2002 CFS. Tables in this chapter should not be compared to those in previous editions of *Freight Facts and Figures*. Revised estimates of tonnage and value for 2002 and 1997 will be published in future editions of *Freight Facts and Figures* in order to provide consistent trend statistics.

FAF tables in this edition are based on version 3.2 and include minor corrections to last year's report, which is based on version 3.1.

TABLE 2-1. WEIGHT OF SHIPMENTS BY TRANSPORTATION MODE: 2007, 2010, AND 2040

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.2, 2011.



Table 2-2. Value of Shipments by Transportation Mode: 2007, 2010, and 2040¹
(billions of 2007 dollars)

	2007				2010				2040			
	Total	Domestic	Exports ²	Imports ²	Total	Domestic	Exports ²	Imports ²	Total	Domestic	Exports ²	Imports ²
Total	16,651	13,457	1,196	1,997	16,065	13,032	1,217	1,816	39,441	29,578	4,195	5,668
Truck	10,780	10,225	267	287	10,515	10,000	263	252	21,762	20,234	728	799
Rail	512	374	45	93	427	306	41	79	740	480	118	142
Water	339	158	14	167	343	146	15	182	448	171	32	245
Air, air & truck	1,077	151	422	505	999	123	409	466	4,350	732	1,683	1,936
Multiple modes & mail	2,879	1,639	396	844	2,739	1,562	434	743	10,322	6,538	1,473	2,310
Pipeline	723	658	4	61	719	655	6	58	866	735	9	122
Other & unknown	341	252	48	41	323	240	48	35	953	688	151	114

¹Many 2007 and 2040 numbers in this table were revised as a result of Freight Analysis Framework (FAF) database improvements in FAF version 3.2.

²Data do not include imports and exports that pass through the United States from a foreign origin to a foreign destination by any mode.

Notes: Numbers may not add to totals due to rounding. The 2010 data are provisional estimates, which are based on selected modal and economic trend data. All truck, rail, water, and pipeline movements that involve more than one mode, including exports and imports that change mode at international gateways, are included in multiple modes & mail to avoid double counting. As a consequence, rail and water totals in this table are less than other published sources.

The value of freight moved is expected to increase faster than the weight, rising from \$882 per ton in 2007 to \$1,435 per ton in 2040 when controlling for inflation. Exports at \$1,826 per ton and imports at \$1,455 per ton are significantly higher than domestic shipments at \$799 per ton in 2007. Exports and imports accounted for 11 percent of the tons and 19 percent of the value in 2007 and are forecast to make up an even greater share of freight moving throughout the United States in the future, reaching 16 percent of the tons and 25 percent of the value by 2040.

Table 2-3. Top Commodities: 2007¹

Millions of Tons		Billions of Dollars	
Total, all commodities	18,879	Total, all commodities	16,651
Gravel	2,264	Machinery	1,759
Cereal grains	1,475	Electronics	1,430
Coal	1,445	Motorized vehicles	1,267
Non-metallic mineral products	1,393	Mixed freight	1,061
Waste/scrap	1,325	Pharmaceuticals	880
Natural gas, coke, asphalt ²	1,295	Textiles/leather	696
Gasoline	1,006	Miscellaneous manufactured products	692
Crude petroleum	837	Gasoline	689
Fuel oils	745	Plastics/rubber	578
Natural sands	570	Articles of base metal	573

¹Many 2007 numbers in this table were revised as a result of Freight Analysis Framework (FAF) database improvements in FAF version 3.2.

²This group includes coal and petroleum products not elsewhere classified such as liquefied natural gas, coke, asphalt, and other products of coal and petroleum refining, excluding gasoline, aviation fuel, and fuel oil.

The top 10 commodities by weight are comprised entirely of bulk products and accounted for 65 percent of total tonnage but only 16 percent of the value of goods moved in 2007. The top 10 commodities by value accounted for 58 percent of total value and only 13 percent of all tons. The leading commodities by weight include gravel, cereal grains, and coal. The leading commodities by value are time-sensitive goods, including machinery, electronics, and motorized vehicles.

TABLE 2-2. VALUE OF SHIPMENTS BY TRANSPORTATION MODE: 2007, 2010, AND 2040

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.2, 2011.

TABLE 2-3. TOP COMMODITIES: 2007

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.2, 2011.



Table 2-4. Hazardous Materials Shipments by Transportation Mode: 2007

Transportation mode	Value		Tons		Ton miles		Miles
	\$ Billions	Percent	Millions	Percent	Billions	Percent	Average distance per shipment
All modes, total	1,448	100.0	2,231	100.0	323	100.0	96
Single modes, total	1,371	94.6	2,112	94.6	279	86.3	65
Truck ¹	837	57.8	1,203	53.9	104	32.2	59
For-hire	359	24.8	495	22.2	63	19.6	214
Private ²	478	33.0	708	31.7	41	12.6	32
Rail	69	4.8	130	5.8	92	28.5	578
Water	69	4.8	150	6.7	37	11.5	383
Air	2	0.1	S	S	S	S	1,095
Pipeline ³	393	27.2	629	28.2	S	S	S
Multiple modes, total	71	4.9	111	5.0	43	13.3	834
Parcel, U.S. Postal Service, or Courier	8	0.5	<1	<0.1	<1	<0.1	836
Other multiple modes	28	1.9	57	2.5	17	5.3	233
Unknown and other modes, total	7	0.5	8	0.4	1	0.5	58

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

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

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

³Excludes crude oil shipments.

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

As measured by the CFS, 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 hazardous shipments by weight but nearly 29 percent of ton miles.

Table 2-5. Hazardous Materials Shipments by Hazard Class: 2007

Hazard class	Description	Value		Tons		Ton miles	
		\$ Billions	Percent	Millions	Percent	Billions	Percent
Class 1	Explosives	12	0.8	3	0.1	<1	<0.1
Class 2	Gases	132	9.1	251	11.2	55	17.1
Class 3	Flammable liquids	1,170	80.8	1,753	78.6	182	56.1
Class 4	Flammable solids	4	0.3	20	0.9	6	1.7
Class 5	Oxidizers and organic peroxides	7	0.5	15	0.7	7	2.2
Class 6	Toxic (poison)	21	1.5	11	0.5	6	1.8
Class 7	Radioactive materials	21	1.4	<1	<0.1	<1	<0.1
Class 8	Corrosive materials	51	3.6	114	5.1	44	13.7
Class 9	Miscellaneous dangerous goods	30	2.1	63	2.8	23	7.1
Total		1,448	100.0	2,231	100.0	323	100.0

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

TABLE 2-4. HAZARDOUS MATERIALS SHIPMENTS BY TRANSPORTATION MODE: 2007

Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2007 Commodity Flow Survey, Hazardous Materials* (Washington, DC: February 2010), table 1a, available at www.bts.gov/publications/commodity_flow_survey/ as of August 22, 2011.

TABLE 2-5. HAZARDOUS MATERIALS SHIPMENTS BY HAZARD CLASS: 2007

Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2007 Commodity Flow Survey, Hazardous Materials* (Washington, DC: February 2010), table 1a, available at www.bts.gov/publications/commodity_flow_survey/ as of August 22, 2011.



Flammable liquids, especially gasoline, are the predominant hazardous material transported in the United States. In terms of ton miles, flammable liquids account for about 56 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 17 percent.

International trade has grown considerably and the movement of these goods within the United States 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. This trend is expected to continue with tonnage of international trade forecast to grow at a rate of 2.4 percent per year between 2007 and 2040.

Table 2-6. Domestic Mode of Exports and Imports by Tonnage and Value: 2007 and 2040¹

	Millions of Tons		Billions of 2007 Dollars	
	2007	2040	2007	2040
Total	2,027	4,403	3,193	9,863
Truck²	768	1,940	1,345	3,889
Rail	265	556	197	422
Water	141	246	52	93
Air, air & truck³	10	35	927	3,619
Multiple modes & mail⁴	147	412	278	899
Pipeline	346	658	137	255
Other & unknown	50	119	127	497
No domestic mode⁵	300	436	130	189

¹Many 2007 and 2040 numbers in this table were revised as a result of Freight Analysis Framework (FAF) database improvements in FAF version 3.2.

²Excludes truck moves to and from airports.

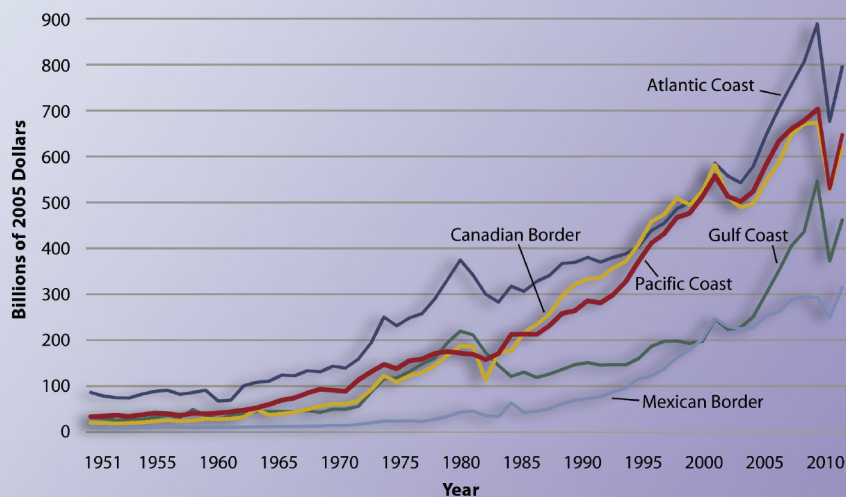
³Includes truck moves to and from airports.

⁴Multiple modes & mail includes U.S. Postal Service, courier shipments, and all intermodal combinations, except air and truck. In this table, oceangoing export and import shipments that move between ports and domestic locations by single modes are classified by the domestic mode rather than multiple modes & mail.

⁵No domestic mode includes waterborne import shipments of crude petroleum off-loaded directly at the domestic destination (refineries) with no domestic mode of transportation.

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

Figure 2-1. Value of U.S. Merchandise Trade by Coasts and Borders: 1951-2010



Notes: The value of 2010 coal exports (\$6.05 billion) from Mobile, AL, Charleston, SC, and Norfolk, VA, are considered proprietary information and are consolidated. In this figure, the total value of coal exports for the above three cities are included under the Atlantic Coast Customs District.

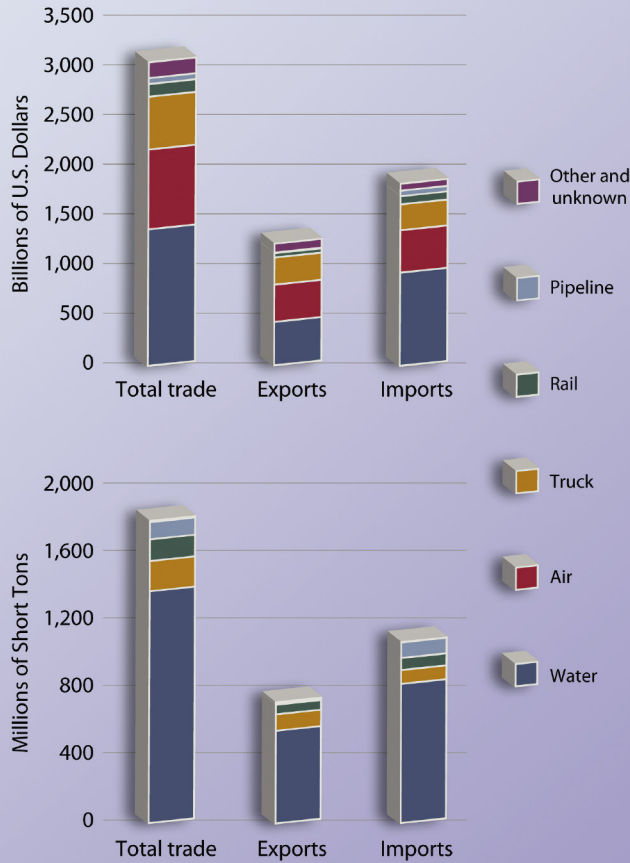
TABLE 2-6. DOMESTIC MODE OF EXPORTS AND IMPORTS BY TONNAGE AND VALUE: 2007 AND 2040

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.2, 2011.

FIGURE 2-1. VALUE OF U.S. MERCHANDISE TRADE BY COASTS AND BORDERS: 1951-2010

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); 1970-2000: U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States* (Washington, DC: annual issues); 2000-2010: U.S. Department of Commerce, Census Bureau, Foreign Trade Division, *FT920 - U.S. Merchandise Trade: Selected Highlights* (Washington, DC: annual issues). **Implicit GDP Deflator:** U.S. Department of Commerce, Bureau of Economic Analysis, Current-Dollar and "Real" Gross Domestic Product, available at www.bea.gov as of August 10, 2011.

Figure 2-2. U.S. International Merchandise Trade by Transportation Mode: 2010



Notes: 1 short ton = 2,000 pounds. The U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration, Bureau of Transportation Statistics estimated 2010 weight data for truck, rail, pipeline and other and unknown modes using value-to-weight ratios derived from imported commodities. Totals for the most recent year differ slightly from the USDOT, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework (FAF) due to variations in coverage and FAF conversion of values to constant dollars. Numbers may not add to totals due to rounding.

Foreign trade has had a major impact on all U.S. borders and coasts. Since 1951, the value of merchandise trade has grown by eighteen-fold in inflation-adjusted terms. However, overall growth has been affected by short-term downturns, such as between 1981 and 1986 and in 2009. In 2010, ports and airports on the Atlantic Coast remain the most significant in terms of value.

Nearly 80 percent of freight tonnage in U.S. foreign trade moves by water, but air and truck transportation are also important when freight value is considered. By value, the

FIGURE 2-2. U.S. INTERNATIONAL MERCHANDISE TRADE BY TRANSPORTATION MODE: 2010

Sources: Total, water and air data: U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Division, FT920 - U.S. Merchandise Trade: Selected Highlights (Washington, DC: February 2011). Truck, rail, and pipeline data: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, North American Transborder Freight Data, available at www.bts.gov/transborder as of August 29, 2011. Other and unknown: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, special tabulation, August 2011.

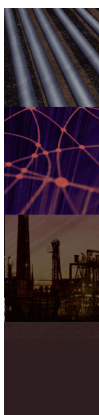




Table 2-7. Top 25 Trading Partners of the United States in Merchandise Trade: 2000-2010
(billions of current U.S. dollars)

Partner	2010				
	Rank	2000	2005	2009	2010
Canada	1	406	499	431	527
China	2	116	285	366	457
Mexico	3	248	290	306	393
Japan	4	212	194	147	181
Germany	5	88	119	115	131
United Kingdom	6	85	90	93	98
South Korea	7	68	71	68	88
France	8	50	56	61	65
Taiwan	9	65	57	47	62
Brazil	10	29	40	46	59
Netherlands	11	32	41	48	54
India	12	14	27	38	49
Singapore	13	37	36	38	46
Venezuela	14	24	40	37	43
Saudi Arabia	15	20	34	33	43
Italy	16	36	43	39	43
Ireland	17	24	38	36	41
Belgium	18	24	32	35	41
Malaysia	19	37	44	34	40
Switzerland	20	20	24	34	40
Nigeria	21	11	26	23	35
Israel	22	21	27	28	32
Russian Federation	23	10	19	24	32
Thailand	24	23	27	26	32
Hong Kong	25	26	25	25	31
Top 25 total¹		1,746.7	2,187.5	2,179.9	2,662.4
U.S. total trade		1,997.3	2,575.3	2,615.7	3,191.4
Top 25 as % of total		87.5	84.9	83.3	83.4

¹Top 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 2010.
Note: Numbers may not add to totals due to rounding.

water share drops to 47 percent, with air and truck accounting for 27 percent and 18 percent respectively. Rail and pipeline account for about 6 percent.

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 2000 and 2010, from about 6 percent of total merchandise trade to 14 percent.

Table 2-8. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 2000-2010
(billions of current U.S. dollars and millions of short tons)

Mode	2000		2005		2009		2010	
	Value	Weight	Value	Weight	Value	Weight	Value	Weight
Truck ¹	429	NA	491	191	455	155	557	187
Rail ¹	94	NA	116	141	96	108	131	134
Air	45	<1	33	<1	39	<1	45	<1
Water	33	194	58	256	59	189	81	210
Pipeline ¹	24	NA	52	86	49	99	63	106
Other ¹	29	NA	39	5	37	6	40	9
Total¹	653	NA	790	679	735	557	918	646

Key: NA = not available.

¹The U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics estimated the weight of exports for truck, rail, pipeline, and other modes using weight-to-value ratios derived from imported commodities.

Notes: 1 short ton = 2,000 pounds. "Other" includes shipments transported by mail, other and unknown modes, and shipments through Foreign Trade Zones. Totals for the most recent year differ slightly from the Freight Analysis Framework (FAF) due to variations in coverage and FAF conversion of values to constant dollars. Numbers may not add to totals due to rounding.

TABLE 2-7. TOP 25 TRADING PARTNERS OF THE UNITED STATES IN MERCHANDISE TRADE: 2000-2010

Source: U.S. Department of Commerce, International Trade Administration, TradeStats Express, available at www.ita.doc.gov/ as of August 9, 2011.

TABLE 2-8. VALUE AND TONNAGE OF U.S. MERCHANDISE TRADE WITH CANADA AND MEXICO BY TRANSPORTATION MODE: 2000-2010

Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, North American Transborder Freight Data, available at www.bts.gov/transborder as of August 28, 2011; U.S. Department of Commerce, Census Bureau, Foreign Trade Division, *FT920 - U.S. Merchandise Trade: Selected Highlights* (Washington, DC: annual issues).

Table 2-9. Value of U.S. Exports to and Imports from Canada and Mexico by Land Transportation Mode: 2000-2010
(millions of current U.S. dollars)

	2000	2005	2009	2010
Exports to Canada, total	154,847	192,907	184,653	224,809
Truck	129,825	151,222	142,545	173,588
Rail	12,947	19,322	19,973	26,116
Pipeline	162	2,394	2,632	3,151
Other ¹	11,913	19,933	19,456	21,901
Mail	<1	37	48	53
Exports to Mexico, total	97,159	104,277	110,378	138,929
Truck	82,389	83,341	89,417	111,110
Rail	10,496	15,748	15,291	19,632
Pipeline	302	543	788	2,038
Other ¹	3,972	4,623	4,882	6,148
Mail	<1	2	<1	<1
Imports from Canada, total	210,270	265,402	201,089	246,252
Truck	127,816	143,696	105,079	123,238
Rail	49,699	60,606	41,058	56,996
Pipeline	23,117	48,766	45,630	57,562
Other ¹	9,571	12,184	9,098	7,288
Mail	4	<1	<1	<1
FTZ ²	63	149	223	1,167
Imports from Mexico, total	113,437	135,400	140,576	181,339
Truck	88,669	112,268	117,787	148,948
Rail	21,056	20,782	19,303	28,484
Pipeline	12	<1	155	182
Other ¹	1,574	1,990	2,175	1,864
Mail	1	<1	<1	<1
FTZ ²	2,126	360	1,156	1,862

¹ "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.

²Foreign Trade Zones (FTZs) were added as a mode of transport for land import shipments beginning in April 1995. Although FTZs are treated as a mode of transportation in the North American Transborder Freight Data, the actual mode for a specific shipment into or out of an FTZ is unknown because U.S. Customs does not collect this information.

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

Trade with Canada and Mexico has grown rapidly over the past decade. Trucks carry about 62 percent of the value of goods traded with these countries.

In addition to transporting a large share of total trade value with Canada and Mexico, trucks carry most of the trade in each direction across both borders, and rail is the second largest mover of bidirectional freight. Rail and pipelines carry a significant volume of imports from Canada.

TABLE 2-9. VALUE OF U.S. EXPORTS TO AND IMPORTS FROM CANADA AND MEXICO BY LAND TRANSPORTATION MODE: 2000-2010

Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, North American Transborder Freight Data, available at www.bts.gov/transborder as of August 10, 2011.

III. THE FREIGHT TRANSPORTATION SYSTEM

Freight in America travels over an extensive network 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 stressing system capacity, increasing maintenance requirements, and threatening system performance.

Table 3-1. Miles of Infrastructure by Transportation Mode: 1980-2009

	1980	1990	2000	2008	2009
Public roads, route miles	3,859,837	3,866,926	3,951,101	4,059,343	NA
National Highway System (NHS)	N	N	161,189	164,096	NA
Interstates	41,120	45,074	46,673	47,013	NA
Other NHS	N	N	114,516	117,083	NA
Other	N	N	3,789,912	3,895,246	NA
Strategic Highway Corridor Network (STRAHNET)	N	N	62,066	62,253	NA
Interstate	N	N	46,675	47,013	NA
Non-Interstate	N	N	15,389	15,240	NA
Railroad	183,077 ¹	175,909	170,512	139,326	139,118
Class I	NA	133,189	120,597	94,082	93,921
Regional	NA	18,375	20,978	16,690	12,804
Local	NA	24,337	28,937	28,554	32,393
Inland waterways					
Navigable channels	11,000	11,000	11,000	11,000	11,000
Great Lakes-St. Lawrence Seaway	2,342	2,342	2,342	2,342	2,342
Pipelines					
Oil	218,393	208,752	176,996	173,000	171,328
Gas	1,051,774	1,189,200	1,369,300	1,525,000	1,526,400

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

¹Excludes Class III railroads.

Since 1980, road infrastructure increased slowly despite a large increase in the volume of traffic. Over the same period, rail miles declined by 24 percent while gas pipeline mileage increased by more than 30 percent.

TABLE 3-1. MILES OF INFRASTRUCTURE BY TRANSPORTATION MODE: 1980-2009

Sources: Public Roads: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), tables HM-16 and HM-49, available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of October 5, 2011. **Rail:** Association of American Railroads, *Railroad Facts* (Washington, DC: annual issues). **Navigable channels:** U.S. Army Corps of Engineers, *A Citizen's Guide to the USACE*, available at www.corpsreform.org/sitepages/downloads/CitzGuideChptr1.pdf as of October 5, 2011. **Great Lakes-St. Lawrence Seaway:** The St. Lawrence Seaway Management Corporation, "The Seaway," available at www.greatlakes-seaway.com/en/seaway/facts/index.html as of October 5, 2011. **Oil pipelines: 1980-2000:** Eno Transportation Foundation, *Transportation in America, 2002* (Washington, DC: 2002). **2001-2009:** 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 as of October 5, 2011. **Gas pipelines:** American Gas Association, *Gas Facts* (Arlington, VA: annual issues).



Table 3-2. Number of U.S. Vehicles, Vessels, and Other Conveyances: 1980-2009

	1980	1990	2000	2008	2009
Highway¹	-	-	-	255,917,664	254,212,610
Truck, single-unit 2-axle 6-tire or more	-	-	-	8,288,046	8,356,097
Truck, combination	-	-	-	2,585,229	2,617,118
Truck, total	-	-	-	10,873,275	10,973,215
Trucks as percent of all highway vehicles	-	-	-	4.2	4.3
Rail					
Class I, locomotive	28,094	18,835	20,028	24,003	24,045
Class I, freight cars ²	1,168,114	658,902	560,154	450,297	416,180
Nonclass I, freight cars ²	102,161	103,527	132,448	109,487	108,233
Car companies and shippers freight cars ²	440,552	449,832	688,194	833,188	839,020
Water	38,788	39,445	41,354	40,301	40,109
Nonself-propelled vessels ³	31,662	31,209	33,152	31,238	31,008
Self-propelled vessels ⁴	7,126	8,236	8,202	9,063	9,101

¹Based on a new methodology, FHWA revised its annual vehicle miles travelled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at www.fhwa.dot.gov/policyinformation/statistics.cfm. Data in this table should not be compared to those in previous editions of *Freight Facts and Figures*.

²Beginning with 2001 data, Canadian-owned U.S. railroads are excluded. Canadian-owned U.S. railroads accounted for over 46,000 freight cars in 2000.

³Nonself-propelled vessels include dry-cargo barges, tank barges, and railroad-car floats.

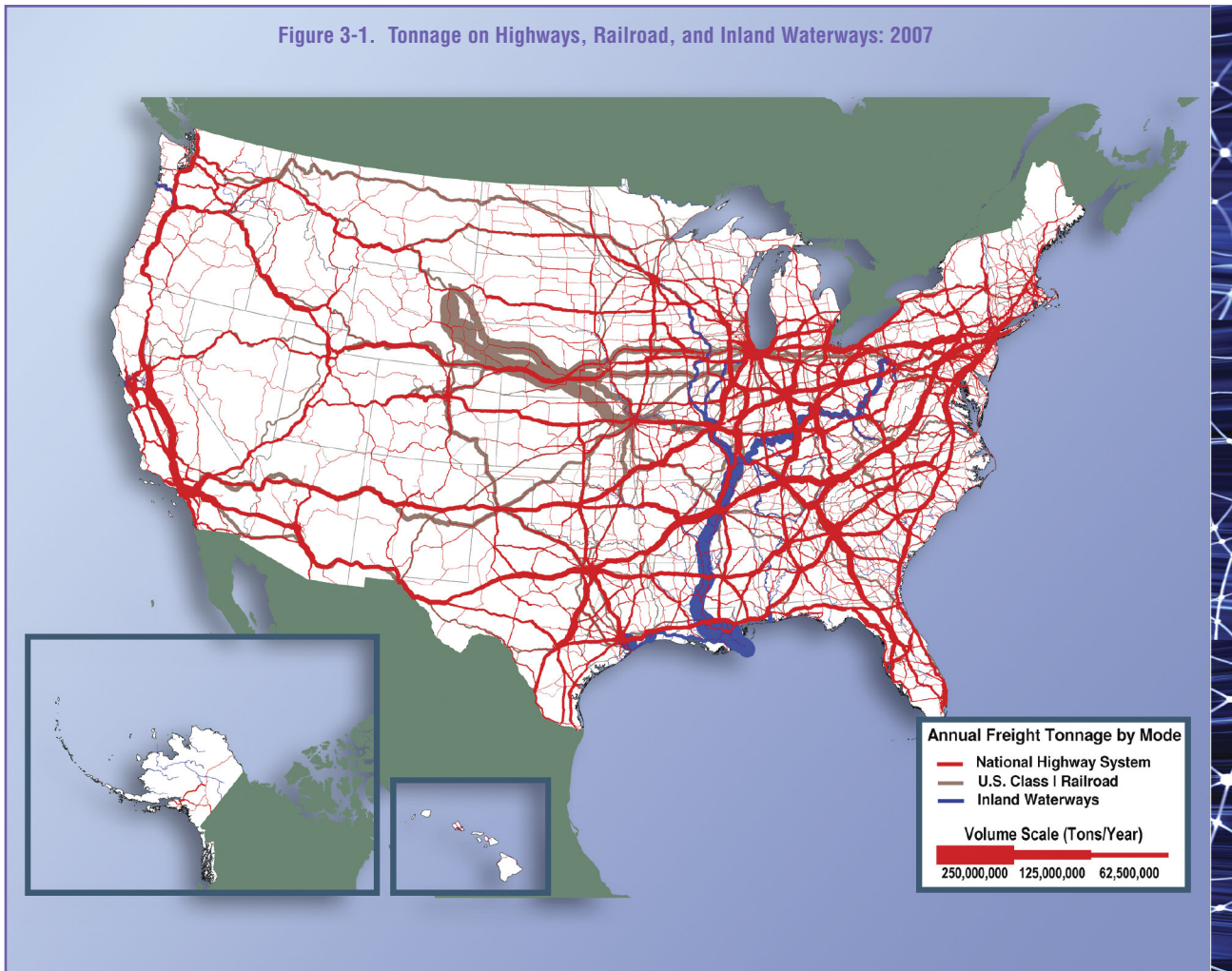
⁴Self-propelled vessels include dry cargo, passenger, off-shore support, tankers, and towboats.

A vast number of vehicles and vessels move goods over the transportation network. The number of commercial trucks has been relatively stable in recent years, while the number of rail freight cars declined by about 10 percent with improved utilization and the deployment of larger cars.

TABLE 3-2. NUMBER OF U.S. VEHICLES, VESSELS, AND OTHER CONVEYANCES: 1980-2009

Sources: **Highway:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1, available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of October 5, 2011. **Rail: Locomotive:** Association of American Railroads, *Railroad Facts* (Washington, DC: annual issues). **Freight cars:** Association of American Railroads, *Railroad Equipment Report* (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, Maritime Administration, *Merchant Fleets of the World*, available at www.marad.dot.gov/library_landing_page/data_and_statistics/Data_and_Statistics.htm as of September 20, 2011.

Figure 3-1. Tonnage on Highways, Railroad, and Inland Waterways: 2007

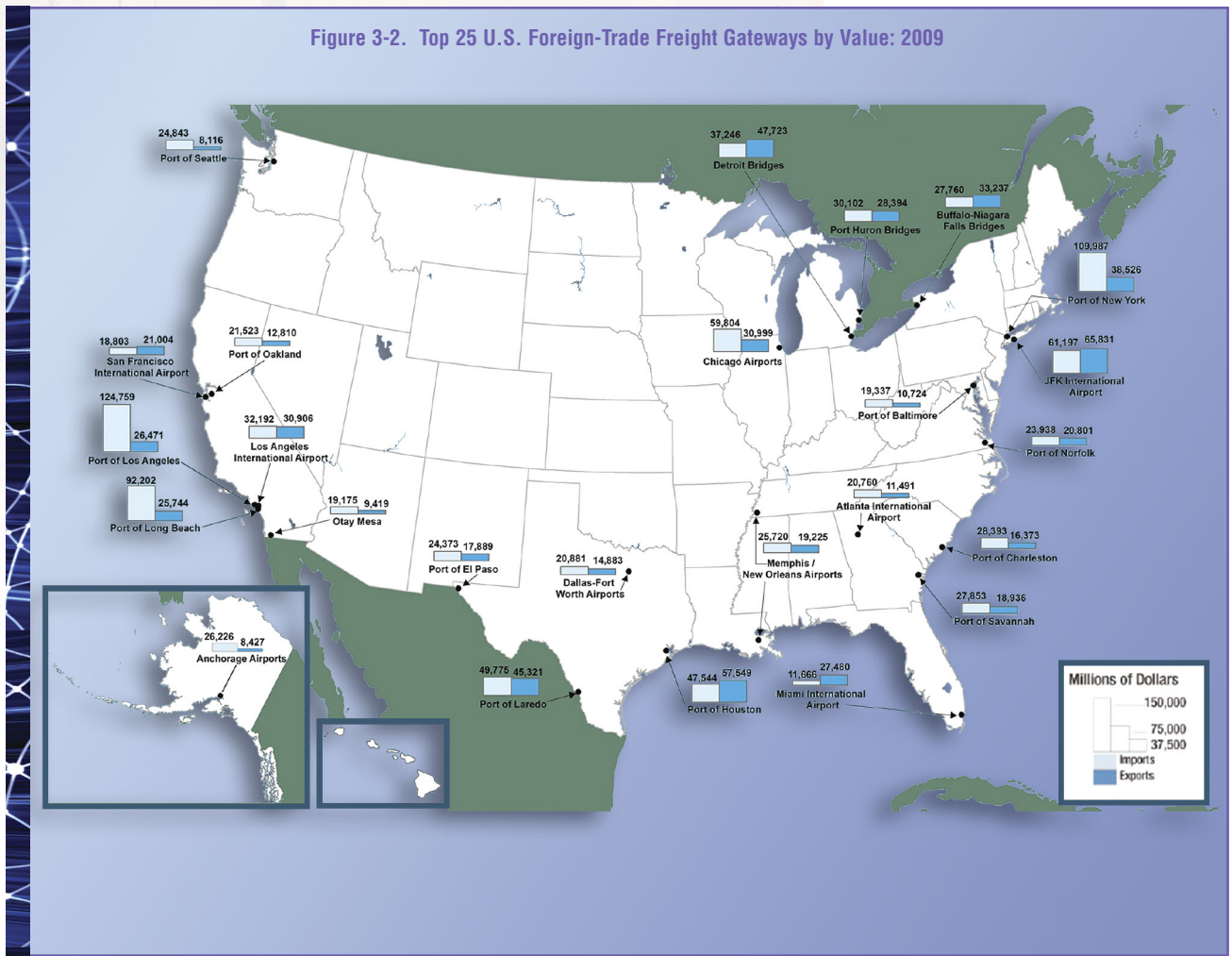


Trucks carry most of the tonnage and value of freight in the United States, but railroads and waterways carry significant volumes over long distances. The largest volume of freight transported by rail is coal moving between the Powder River Basin in Wyoming and the Midwest, while the principal inland waterways movement by volume is along the Lower Mississippi River.

FIGURE 3-1. TONNAGE ON HIGHWAYS, RAILROAD, AND INLAND WATERWAYS: 2007

Sources: **Highways:** U.S. Department of Transportation, Federal Highway Administration, Freight Analysis Framework, version 3.1, 2010. **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 were done by Oak Ridge National Laboratory.

Figure 3-2. Top 25 U.S. Foreign-Trade Freight Gateways by Value: 2009

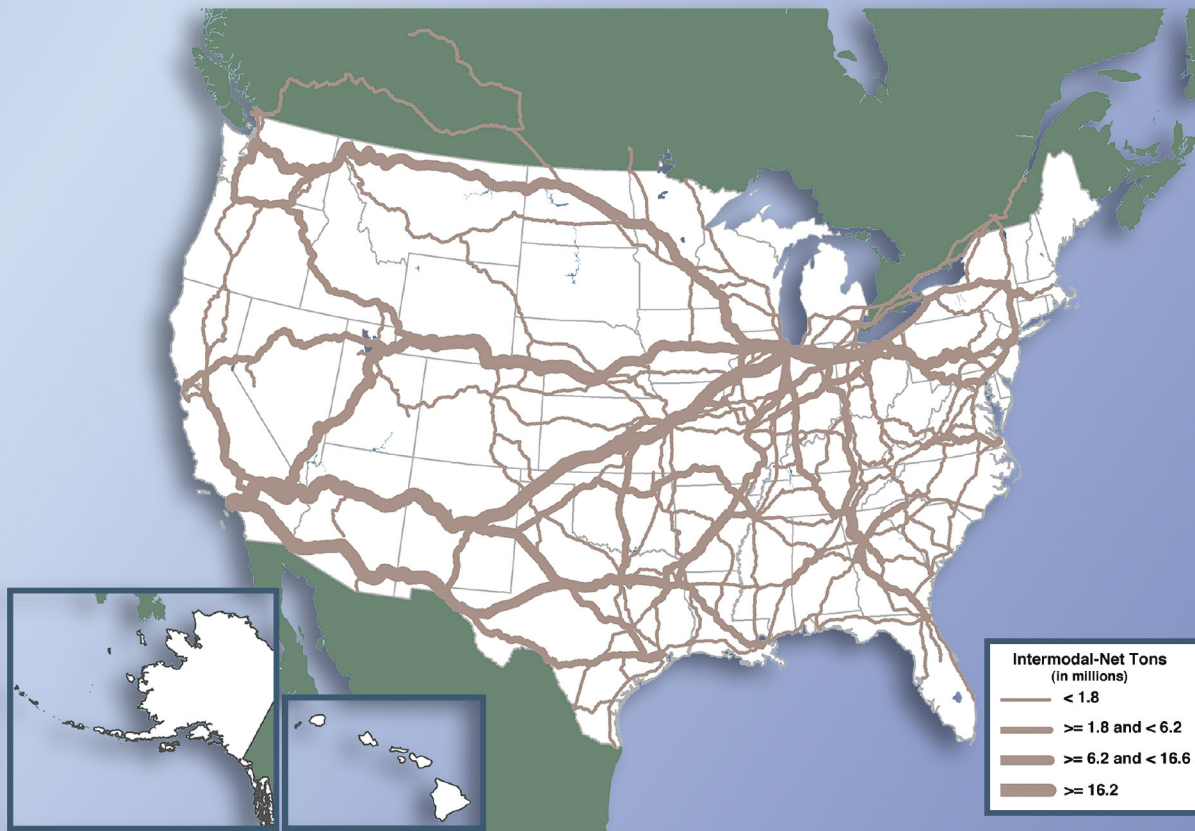


Transportation facilities that move international trade into and out of the United States demonstrate the importance of all modes and intermodal combinations to global connectivity. The top 25 foreign-trade gateways measured by value of shipments are comprised of 10 water ports, 6 land-border crossings, and 9 air gateways.

FIGURE 3-2. TOP 25 U.S. FOREIGN-TRADE FREIGHT GATEWAYS BY VALUE: 2009

Source: Air: U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Division, special tabulation, July 22, 2011; Water: U.S. Army Corps of Engineers, Navigation Data Center, special tabulation, July 22, 2011; Land: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, North American Transborder Freight Data, July 22, 2011.

Figure 3-3. Tonnage of Trailer-on-Flatcar and Container-on-Flatcar Rail Intermodal Moves: 2009



Notes: All data: Trade levels reflect the mode of transportation as a shipment enters or exits at a border port. Flows through individual ports are based on reported data collected from U.S. trade documents. Trade does not include low-value shipments. (In general, these are imports valued at less than \$1,250 and exports that are valued at less than \$2,500). **Air:** Data for all air gateways include a low level (generally less than 2%-3% of the total value) of small user-fee airports located in the same region. Air gateways not identified by airport name (e.g., Chicago, IL, and others) include major airport(s) in that geographic area in addition to small regional airports. In addition, due to U.S. Census Bureau confidentiality regulations, data for courier operations are included in the airport totals for JFK International Airport, New Orleans, Los Angeles, Chicago, Miami, and Anchorage.

Modes of transportation frequently work together to move high-value, time-sensitive cargo. The classic forms of rail intermodal transportation are trailer-on-flatcar and container-on-flatcar, and these are spread throughout the United States. The largest concentrations are on routes between Pacific Coast ports and Chicago, southern California and Texas, and Chicago and New York.

FIGURE 3-3. TONNAGE OF TRAILER-ON-FLATCAR AND CONTAINER-ON-FLATCAR RAIL INTERMODAL MOVES: 2009

Source: U.S. Department of Transportation, Federal Railroad Administration, special tabulation, October 2011.



Containerized cargo has grown rapidly over the past decade and is concentrated at a few large water ports. The Ports of Los Angeles and Long Beach together handle about 38 percent of all container traffic at water ports in the United States. While container trade at these two ports increased by 54 percent between 2000 and 2010, this growth rate was slightly lower than that reported for container cargo overall.

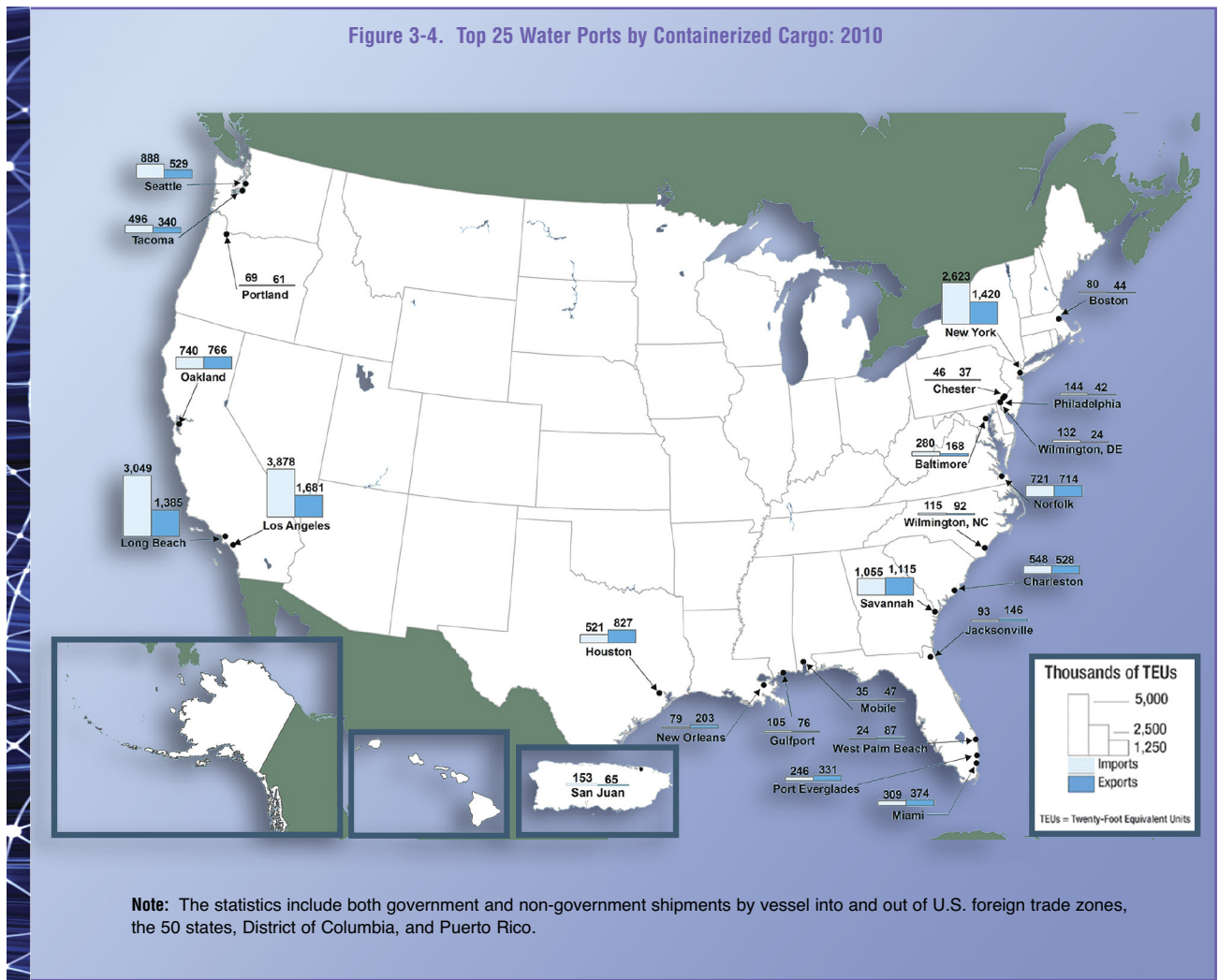


FIGURE 3-4. TOP 25 WATER PORTS BY CONTAINERIZED CARGO: 2010
Source: U.S. Department of Transportation, Maritime Administration, *U.S. Waterborne Container Trade by U.S. Custom Ports*, based on data provided by Port Import/Export Reporting Service, available at www.marad.dot.gov/library_landing_page/data_and_statistics/Data_and_Statistics.htm as of August 29, 2011.

Table 3-3. Top 25 Airports by Landed Weight of All-Cargo Operations: 2000-2009¹

Airport	2009 Rank	Landed weight (thousands of short tons)				
		2000	2006	2007	2008	2009
Memphis, TN (Memphis International)	1	6,318	9,425	9,772	9,750	9,464
Anchorage, AK (Ted Stevens Anchorage International) ²	2	8,084	10,588	10,562	8,976	7,762
Louisville, KY (Louisville International-Standiford Field)	3	3,987	5,015	5,216	5,223	5,139
Miami, FL (Miami International)	4	2,929	3,591	3,715	3,494	3,176
Indianapolis, IN (Indianapolis International)	5	2,892	2,627	2,652	2,564	2,288
Los Angeles, CA (Los Angeles International)	6	2,884	3,627	3,431	2,876	1,884
Chicago, IL (O'Hare International)	7	2,793	2,208	2,201	2,103	1,750
New York, NY (John F. Kennedy International)	8	2,062	2,615	2,557	2,222	1,591
Newark, NJ (Newark Liberty International)	9	1,811	1,867	1,873	1,727	1,464
Fort Worth, TX (Dallas/Fort Worth International)	10	1,961	1,722	1,753	1,614	1,436
Oakland, CA (Metropolitan Oakland International)	11	1,691	1,798	1,811	1,742	1,341
Atlanta, GA (William B. Hartsfield International)	12	1,220	1,180	1,261	1,167	1,278
Ontario, CA (Ontario International)	13	1,454	1,401	1,394	1,350	1,168
Philadelphia, PA (Philadelphia International)	14	1,090	1,366	1,375	1,264	1,132
Honolulu, HI (Honolulu International)	15	692	979	1,134	1,032	1,021
Seattle, WA (Seattle-Tacoma International)	16	1,267	709	691	747	803
Houston, TX (George Bush Intercontinental)	17	480	696	769	754	784
San Francisco, CA (San Francisco International)	18	1,060	829	1,039	775	747
Denver, CO (Denver International)	19	654	711	642	625	624
Phoenix, AZ (Sky Harbor International)	20	920	726	711	675	610
Chicago/Rockford, IL (Chicago/Rockford International)	21	882	696	737	710	564
Cincinnati, OH (Cincinnati/Northern Kentucky International) ³	22	900	100	97	104	564
Portland, OR (Portland International)	23	622	730	713	656	545
San Juan, PR (Luis Munoz Marin International)	24	751	606	522	431	543
Minneapolis, MN (Minneapolis-St Paul International/Wold-Chamberlain)	25	703	620	612	562	474
Top 25 airports⁴		52,381	56,973	57,715	53,621	48,153
United States, all airports⁵		74,743	76,362	76,583	71,281	63,191
Top 25 as % of U.S. total		70.1	74.6	75.4	75.2	76.2

¹Dedicated to the exclusive transportation of cargo, all-cargo operations do not include aircraft carrying passengers that also may be carrying cargo. Aircraft landed weight is the certificated maximum gross landed weight of the aircraft as specified by the aircraft manufacturers.

²Anchorage includes a large share of all-cargo operations in-transit.

³The significant 2006 decrease in landed weight at Cincinnati/Northern Kentucky International Airport was due to a major reduction in DHL Airways' cargo operations, which have since rebounded.

⁴Airport rankings change each year. Totals represent the top 25 airports for each year, not necessarily the top 25 airports listed here for 2009.

⁵Limited 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.

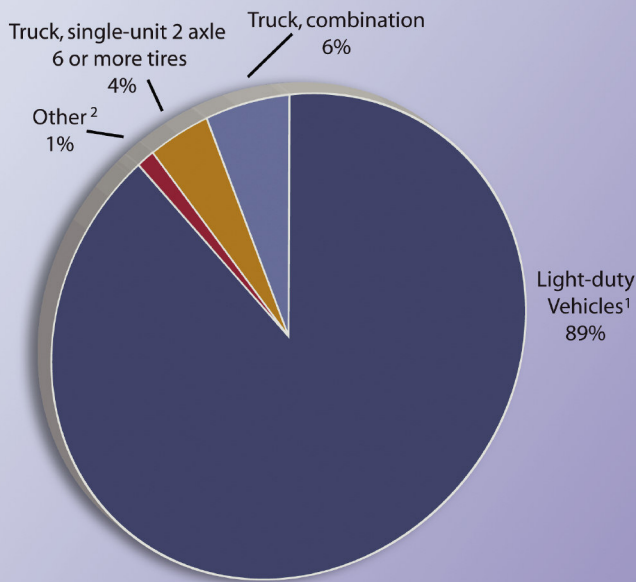
The three most important U.S. airports that handle all-cargo aircraft are Memphis, Anchorage, and Louisville. Memphis and Louisville are major hubs for FedEx and the United Parcel Service. Anchorage is a major international gateway for trade with Asia.

TABLE 3-3. TOP 25 AIRPORTS BY LANDED WEIGHT OF ALL-CARGO OPERATIONS: 2000-2009

Sources: U.S. Department of Transportation, Federal Aviation Administration, Air Carrier Activity Information System (ACAIS) database, All-Cargo Data, available at www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/as of August 19, 2011.

Despite doubling over the past two decades, truck traffic remains a relatively small share of highway traffic as a whole. In 2009, commercial trucks accounted for about 10 percent of highway vehicle miles traveled. Truck tractors hauling semitrailers and other truck combinations accounted for approximately 58 percent of commercial truck travel, while single-unit trucks with six or more tires accounted for the remainder.

Figure 3-6. Share of Highway Vehicle Miles Traveled by Vehicle Type: 2009



¹Includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase equal to or less than 121 inches and large passenger cars, vans, pickup trucks, and sport utility vehicles with a wheelbase larger than 121 inches.

²Includes buses and motorcycles.

Notes: Based on a new methodology, FHWA revised its annual vehicle miles travelled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at www.fhwa.dot.gov/policyinformation/statistics.cfm. Data in this figure should not be compared to those in previous editions of *Freight Facts and Figures*.

FIGURE 3-6. SHARE OF HIGHWAY VEHICLE MILES TRAVELED BY VEHICLE TYPE: 2009

Source: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1, available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of October 5, 2011.

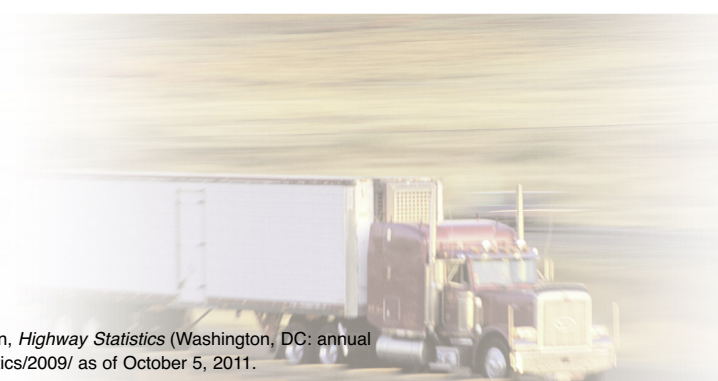


Table 3-4. Trucks and Truck Miles by Average Weight: 1987-2002¹

Average weight (pounds)	1987		1992		1997		2002		Percent Change, 1987 to 2002	
	Number (thousands)	VMT (millions)	Number (thousands)	VMT (millions)	Number (thousands)	VMT (millions)	Number (thousands)	VMT (millions)	Number	VMT
Total	3,624	89,972	4,008	104,987	4,701	147,876	5,415	145,624	49.4	61.9
Light-heavy	1,030	10,768	1,259	14,012	1,436	19,815	1,914	26,256	85.9	143.8
10,001 to 14,000	525	5,440	694	8,000	819	11,502	1,142	15,186	117.6	179.2
14,001 to 16,000	242	2,738	282	2,977	316	3,951	396	5,908	63.6	115.8
16,001 to 19,500	263	2,590	282	3,035	301	4,362	376	5,161	43.2	99.3
Medium-heavy	766	7,581	732	8,143	729	10,129	910	11,766	18.8	55.2
19,501 to 26,000	766	7,581	732	8,143	729	10,129	910	11,766	18.8	55.2
Heavy-heavy	1,829	71,623	2,017	82,832	2,536	117,931	2,591	107,602	41.7	50.2
26,001 to 33,000	377	5,411	387	5,694	428	7,093	437	5,845	15.9	8.0
33,001 to 40,000	209	4,113	233	5,285	257	6,594	229	3,770	9.7	-8.4
40,001 to 50,000	292	7,625	339	9,622	400	13,078	318	6,698	9.0	-12.2
50,001 to 60,000	188	7,157	227	8,699	311	12,653	327	8,950	73.8	25.1
60,001 to 80,000	723	45,439	781	51,044	1,070	74,724	1,179	77,489	63.1	70.5
80,001 to 100,000	28	1,254	33	1,529	46	2,427	69	2,950	144.3	135.2
100,001 to 130,000	8	440	12	734	18	1,051	26	1,571	238.5	257.2
130,001 or more	4	185	5	227	6	312	6	329	43.2	77.9

Key: VMT = vehicle miles traveled.

¹Excludes 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.

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



TABLE 3-4. TRUCKS AND TRUCK MILES BY AVERAGE WEIGHT: 1987-2002

Sources: 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 as of August 22, 2011; U.S. Department of Commerce, Census Bureau, 1992 Truck Inventory and Use Survey: United States, TC92-T-52 (Washington, DC: 1995), available at www.census.gov/prod/ec97/97tv-us.pdf as of August 22, 2011.



Table 3-5. Commercial Vehicle Weight Enforcement Activities: 2006-2010 (thousands)

	2006	2007	2008	2009	2010
All weighs	229,451	217,444	200,419	182,257	198,565
Weigh-in-motion	142,599	132,258	119,826	116,176	118,026
Static weighs ¹	86,852	85,186	80,593	66,081	80,539
Semiportable scales	423	426	358	373	285
Fixed scales	85,900	84,214	79,645	65,182	79,704
Portable scales	529	547	591	525	550
Violations ²	621	530	555	490	479
Axle weight violations	270	234	249	221	217
Gross weight violations	150	127	120	116	114
Bridge weight violations	202	170	186	153	148
Permits ³	4,598	4,828	5,216	4,529	4,839
Non-divisible trip permits	3,399	3,743	3,693	3,286	3,510
Non-divisible annual permits	251	332	322	299	303
Divisible trip permits	426	398	490	370	342
Divisible annual permits	522	354	710	574	683

¹Static weighs include the total number of vehicles weighed from semiportable, portable, and fixed scales.
²Violations include those from axle, gross, and bridge formula weight limits.
³Permits issued are for divisible and non-divisible loads on a trip or on an annual basis, as well as the over-width movement of a divisible load.
Note: Incomplete data from Washington, D.C. (2008), Hawaii (2008, 2009, and 2010), Massachusetts (2010), Michigan (2008), Pennsylvania (2006), and South Dakota (2006 and 2007).

Table 3-6. Annual Vehicle Distance Traveled by Highway Category and Vehicle Type: 2009

	Combination Trucks	Single-Unit Trucks ¹	Other ²	Light-duty Vehicles ³	Total, All Motor Vehicles
Interstate vehicle miles (millions)	79,118	26,640	7,574	603,503	716,836
Interstate percent	47.1	22.2	21.5	22.9	24.3
Non-Interstate vehicle miles (millions)	88,724	93,523	27,584	2,026,835	2,236,665
Non-Interstate percent	52.9	77.8	78.5	77.1	75.7
Total vehicle miles, all roadways	167,842	120,163	35,158	2,630,338	2,953,501

¹Trucks on a single frame with at least two axles and six tires.
²Includes buses and motorcycles.
³Includes passenger cars, light trucks, vans and sport utility vehicles with a wheelbase equal to or less than 121 inches and large passenger cars, vans, light trucks, and sport utility vehicles with a wheelbase larger than 121 inches.
Notes: Based on a new methodology, FHWA revised its annual vehicle miles travelled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at www.fhwa.dot.gov/policyinformation/statistics.cfm. Data in this table should not be compared to those in previous editions of *Freight Facts and Figures*. Numbers may not add to totals due to rounding.

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 198 million weighs were made in 2010, about 59 percent were weigh-in motion and 41 percent were static. Considerably less than 1 percent of weighs discover violations.

TABLE 3-5. COMMERCIAL VEHICLE WEIGHT ENFORCEMENT ACTIVITIES: 2006-2010

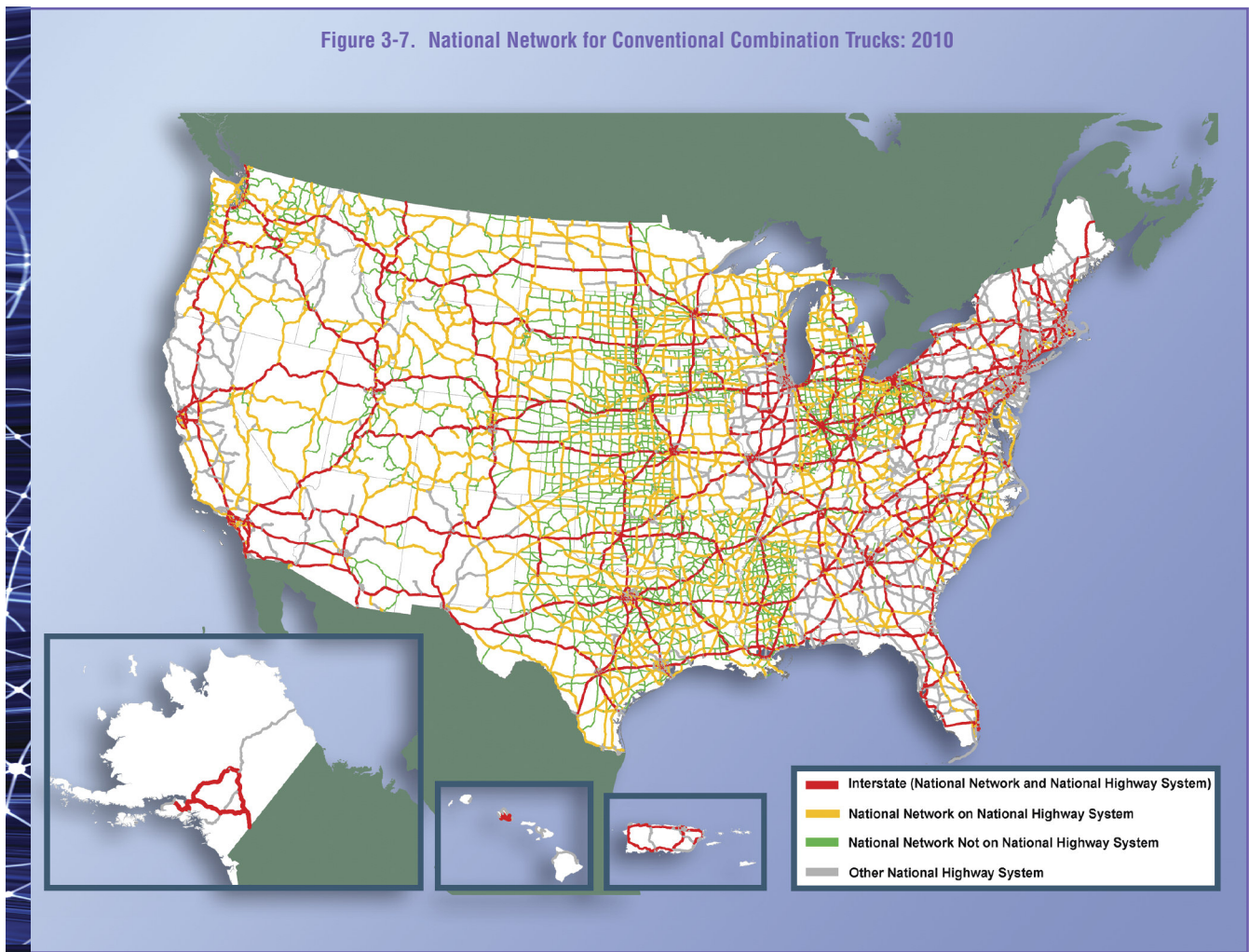
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Annual State Certifications of Size and Weight Enforcement on Federal-aid Highways, as prescribed under CFR Part 657, August 31, 2011.

TABLE 3-6. ANNUAL VEHICLE DISTANCE TRAVELED BY HIGHWAY CATEGORY AND VEHICLE TYPE: 2009

Source: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics*, Table VM-1, available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of October 5, 2011.



Figure 3-7. National Network for Conventional Combination Trucks: 2010



Freight moving in combination trucks depends heavily on the Interstate System. Although only one-fourth of the distance traveled by all traffic is on the Interstate System, nearly one-half of combination-truck vehicle miles of travel is on the Interstate System.

The National Network was established by Congress in 1982 to facilitate interstate commerce and encourage regional and national economic growth by requiring states to allow conventional combination trucks on the Interstate System and portions of the Federal-aid Primary System of highways. The National Network, which is approximately 200,000 miles in length, has not changed significantly in three decades.

FIGURE 3-7. NATIONAL NETWORK FOR CONVENTION TRUCKS: 2010

Source: U.S. Code of Federal Regulations, title 23, part 658, appendix A, as of August 10, 2011.

Longer combination vehicles (LCVs) include truck tractors pulling a long semi-trailer and a short trailer (often called a Rocky Mountain Double), a long semi-trailer and a long trailer (often called a Turnpike Double) or a short semi-trailer and two trailers (called a Triple). Although all states allow conventional combinations consisting of a 28-foot semi-trailer and a 28-foot trailer, fewer than half of U.S. states allow LCVs on at least some parts of their road networks. Allowable routes for LCVs have been frozen since 1991.

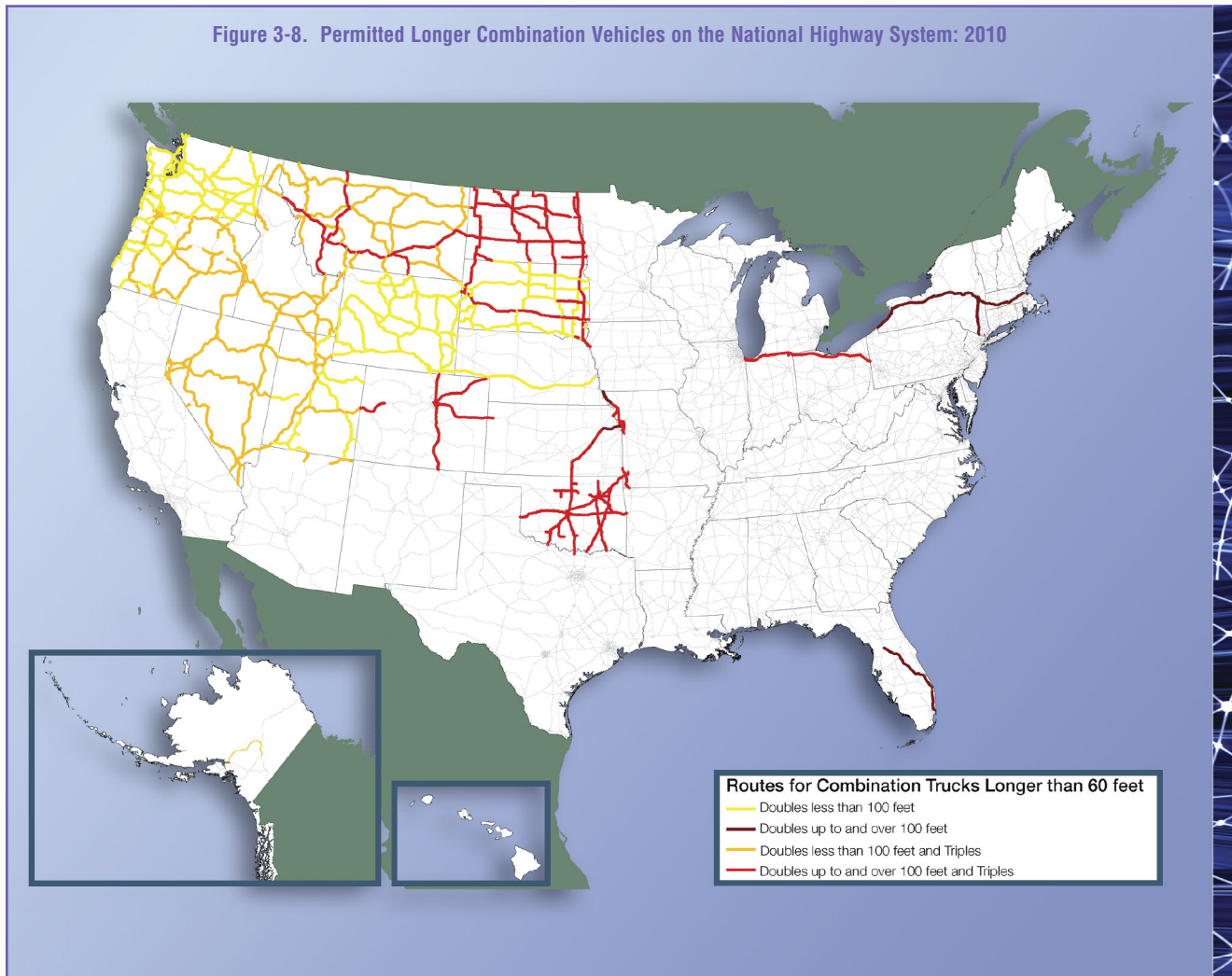


FIGURE 3-8. PERMITTED LONGER COMBINATION VEHICLES ON THE NATIONAL HIGHWAY SYSTEM: 2010

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Operations and Technology Team, special tabulation, 2011.

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

	Number of Trucks (thousands)	Truck Miles (millions)	Miles per Truck (thousands)
Total	5,521	145,173	26
Off the road	183	2,263	12
50 miles or less	2,942	42,531	15
51 to 100 miles	685	19,162	28
101 to 200 miles	244	11,780	48
201 to 500 miles	232	17,520	76
501 miles or more	293	26,706	91
Not reported	716	25,061	35
Not applicable	226	150	1
Operated in Canada	2	72	43
Operated in Mexico	2	29	19
Operated within the home base state	4,196	84,974	20
Operated in states other than the home base state	496	40,901	83
Not reported	599	19,046	32
Not applicable	226	150	1

Notes: Includes trucks registered to companies and individuals in the United States except pickups, minivans, other light vans, and sport utility vehicles. Numbers may not add to totals due to rounding.

Most trucks larger than pickups, minivans, other light vans, and sport utility vehicles typically operate close to home. About one-half of all trucks usually travel to destinations within 50 miles of their base, and 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 trucks account for 30 percent of the mileage.

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

TABLE 3-7. TRUCKS, TRUCK MILES, AND AVERAGE DISTANCE BY RANGE OF OPERATIONS AND JURISDICTION: 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 as of August 22, 2011.

Table 3-8. Truck Miles by Products Carried: 2002

Products carried	Millions of miles
Total¹	145,173
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 packaged foodstuffs	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 ²	150
No product carried	28,977

¹Detail lines may not add to total because multiple products/hazardous materials may be carried at the same time.

²Vehicles not in use. When the survey respondent had partial-year ownership of the vehicle, annual miles were adjusted to reflect miles traveled when not owned by the respondent.

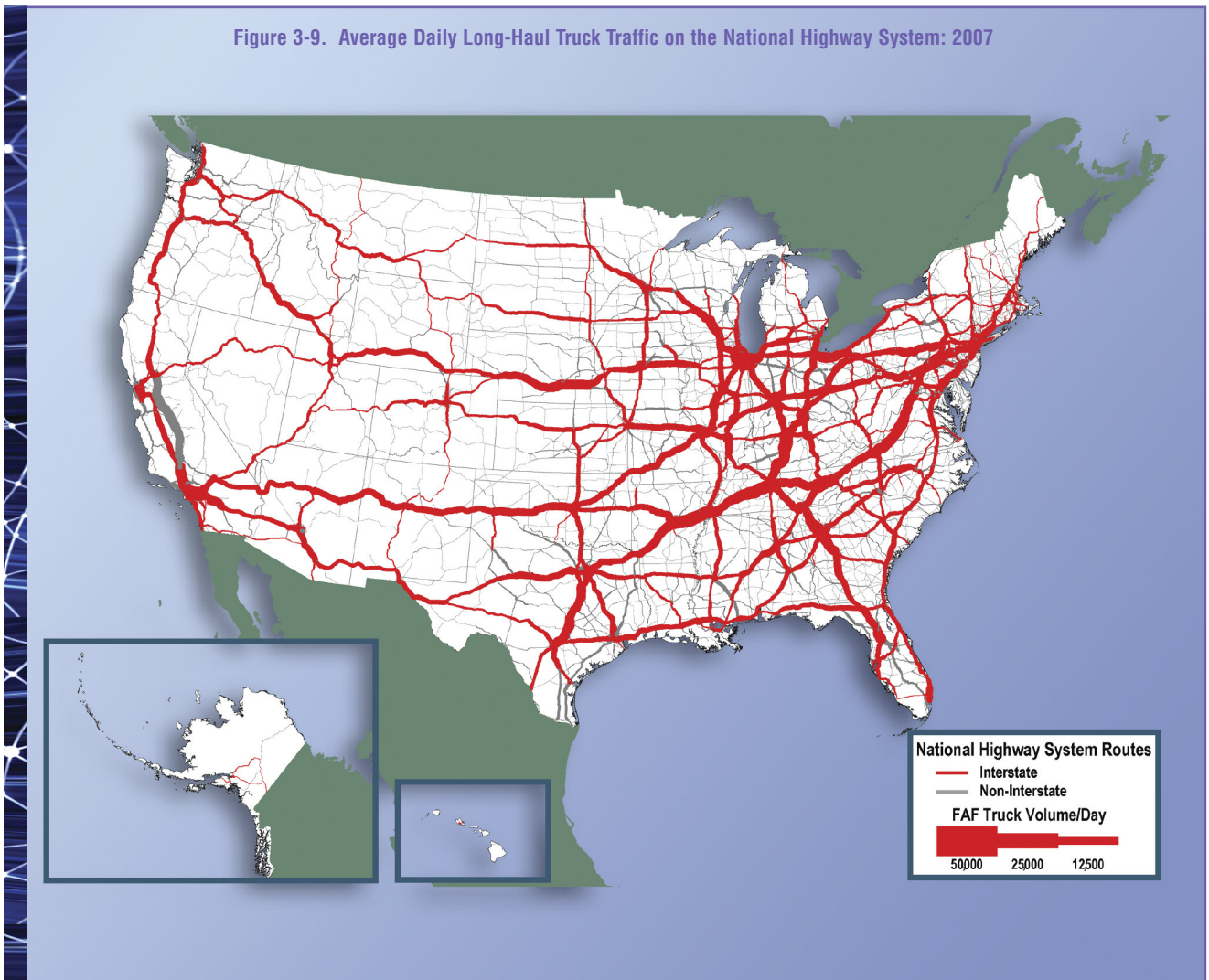
Notes: Includes trucks registered to companies and individuals in the United States except pickups, minivans, other light vans, and sport utility vehicles. Numbers may not add to totals due to rounding.

TABLE 3-8. 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 as of August 22, 2011.

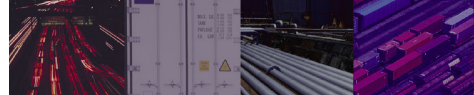
Figure 3-9. Average Daily Long-Haul Truck Traffic on the National Highway System: 2007



Long-haul freight truck traffic in the United States is concentrated on major routes connecting population centers, ports, border crossings, and other major hubs of activity. Except for Route 99 in California and a few toll roads and border connections, most of the heaviest traveled routes are on the Interstate System.

FIGURE 3-9. AVERAGE DAILY LONG-HAUL TRUCK TRAFFIC ON THE NATIONAL HIGHWAY SYSTEM: 2007

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.



By 2040, long-haul freight truck traffic in the United States is expected to increase dramatically on Interstate highways and other arterials throughout the Nation. Forecast data indicate that truck travel may reach 662 million miles per day.

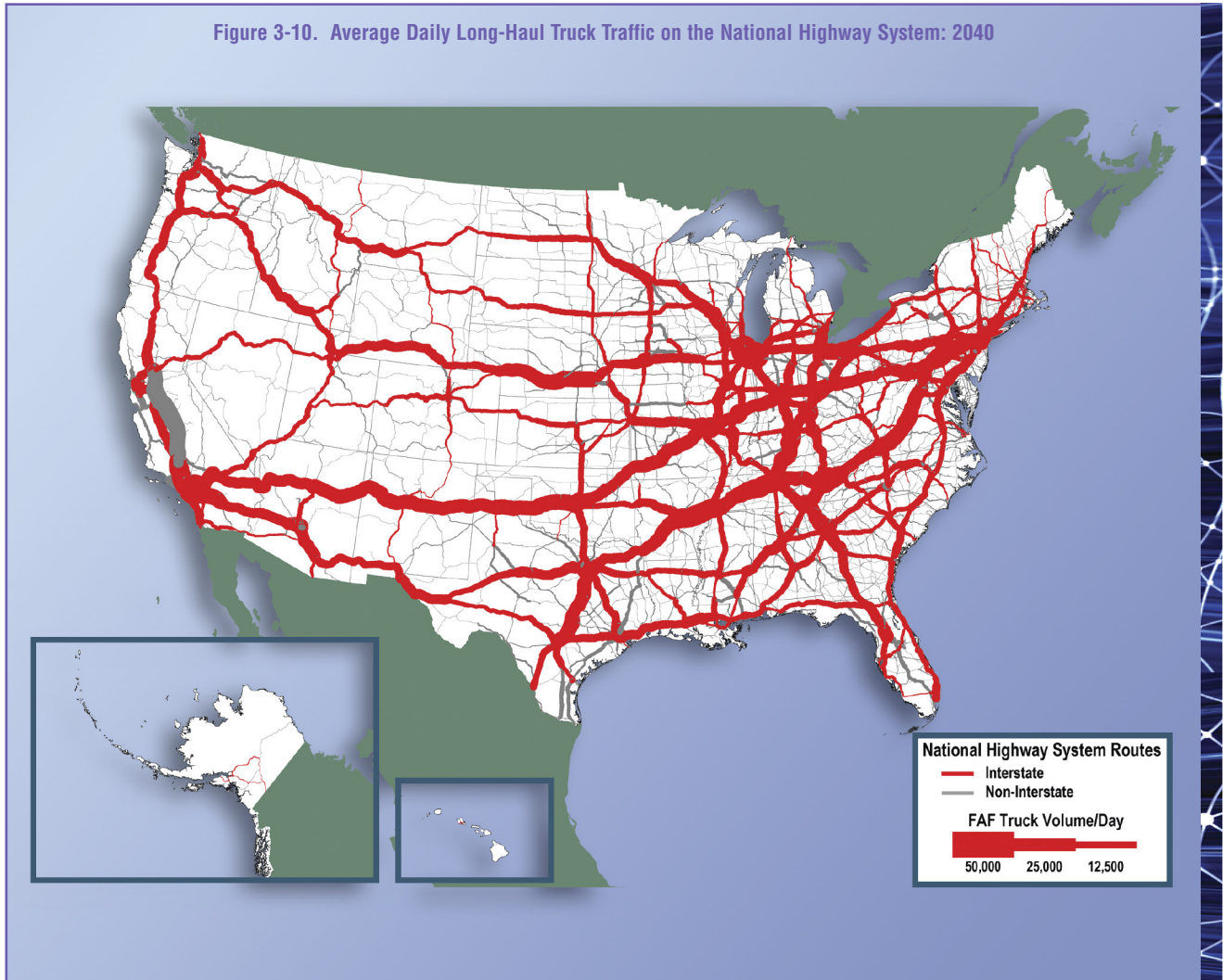
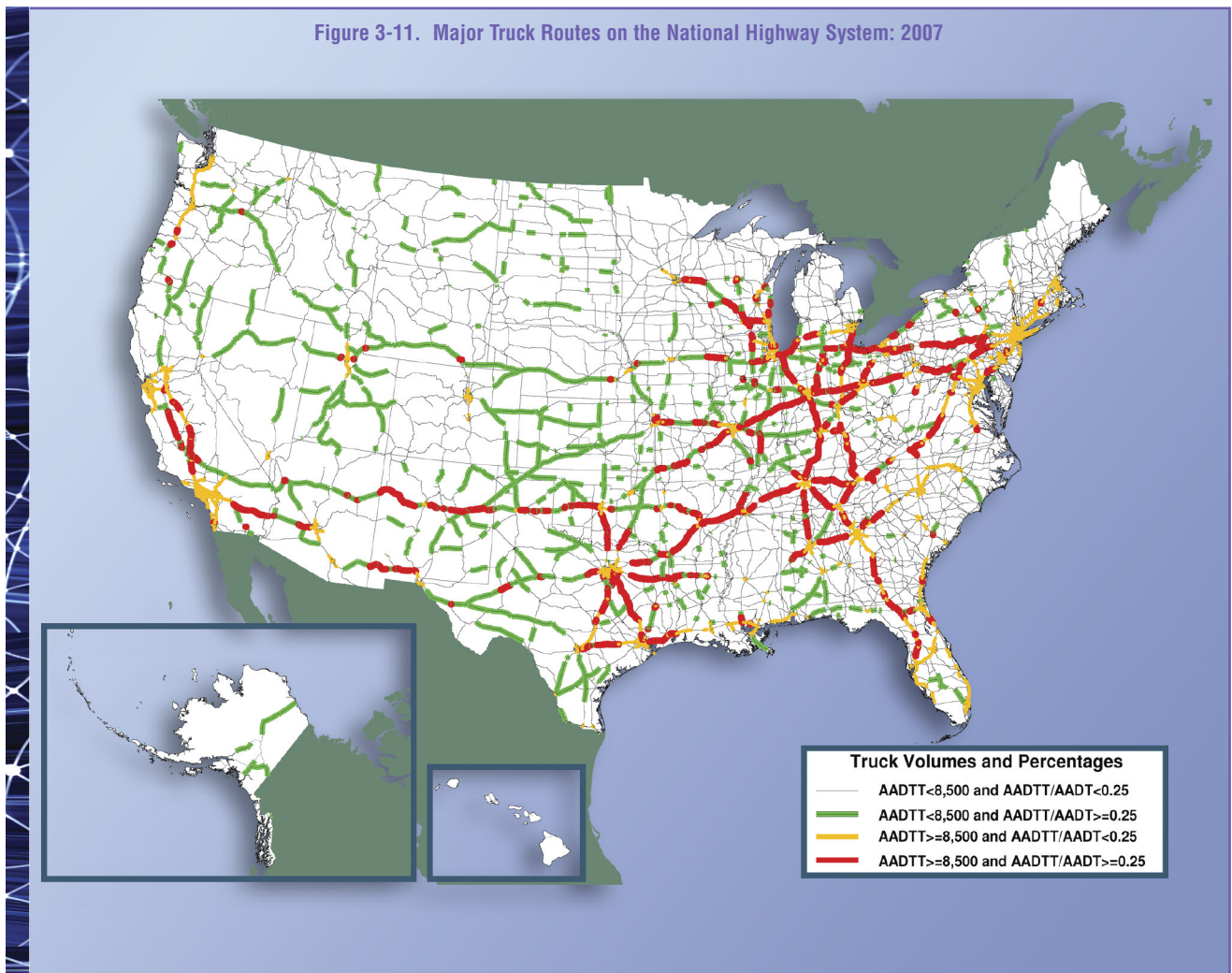


FIGURE 3-10. AVERAGE DAILY LONG-HAUL TRUCK TRAFFIC ON THE NATIONAL HIGHWAY SYSTEM: 2040

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.

Figure 3-11. Major Truck Routes on the National Highway System: 2007



Selected routes carry a significant concentration of trucks, either as an absolute number or as a percentage of the traffic stream. Nearly 6,000 miles of the NHS carry more than 8,500 trucks per day on sections where at least every fourth vehicle is a truck. With each truck carrying an average of 16 tons of cargo, 8,500 trucks per day move approximately 50 million tons per year.

FIGURE 3-11. MAJOR TRUCK ROUTES ON THE NATIONAL HIGHWAY SYSTEM: 2007

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.

The number of NHS miles carrying large volumes and high percentages of trucks is forecast to increase dramatically by 2040. Segments with more than 8,500 trucks per day and where at least every fourth vehicle is a truck are forecast to approach 21,000 miles, an increase of almost 250 percent from 2007.

Figure 3-12. Major Truck Routes on the National Highway System: 2040

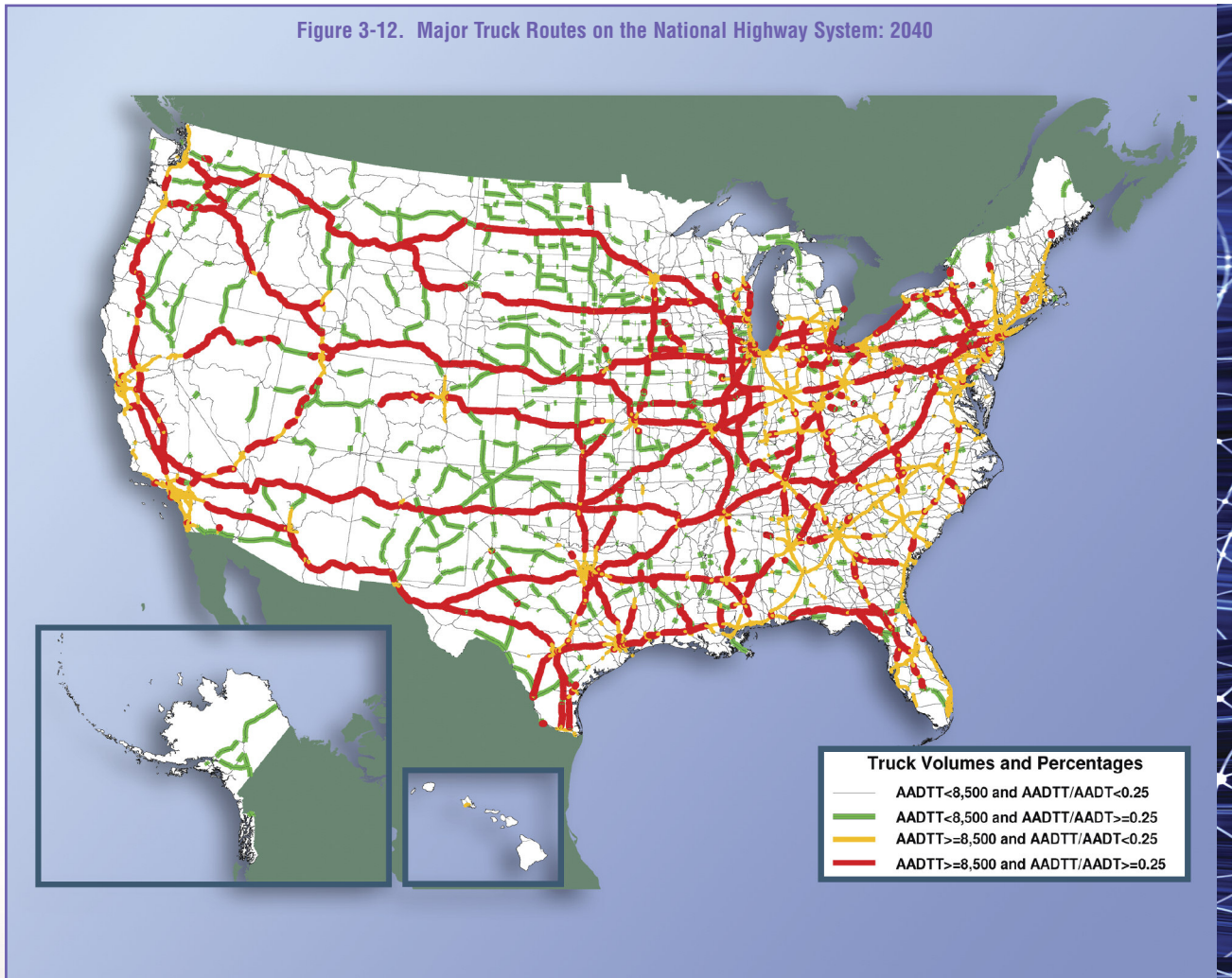
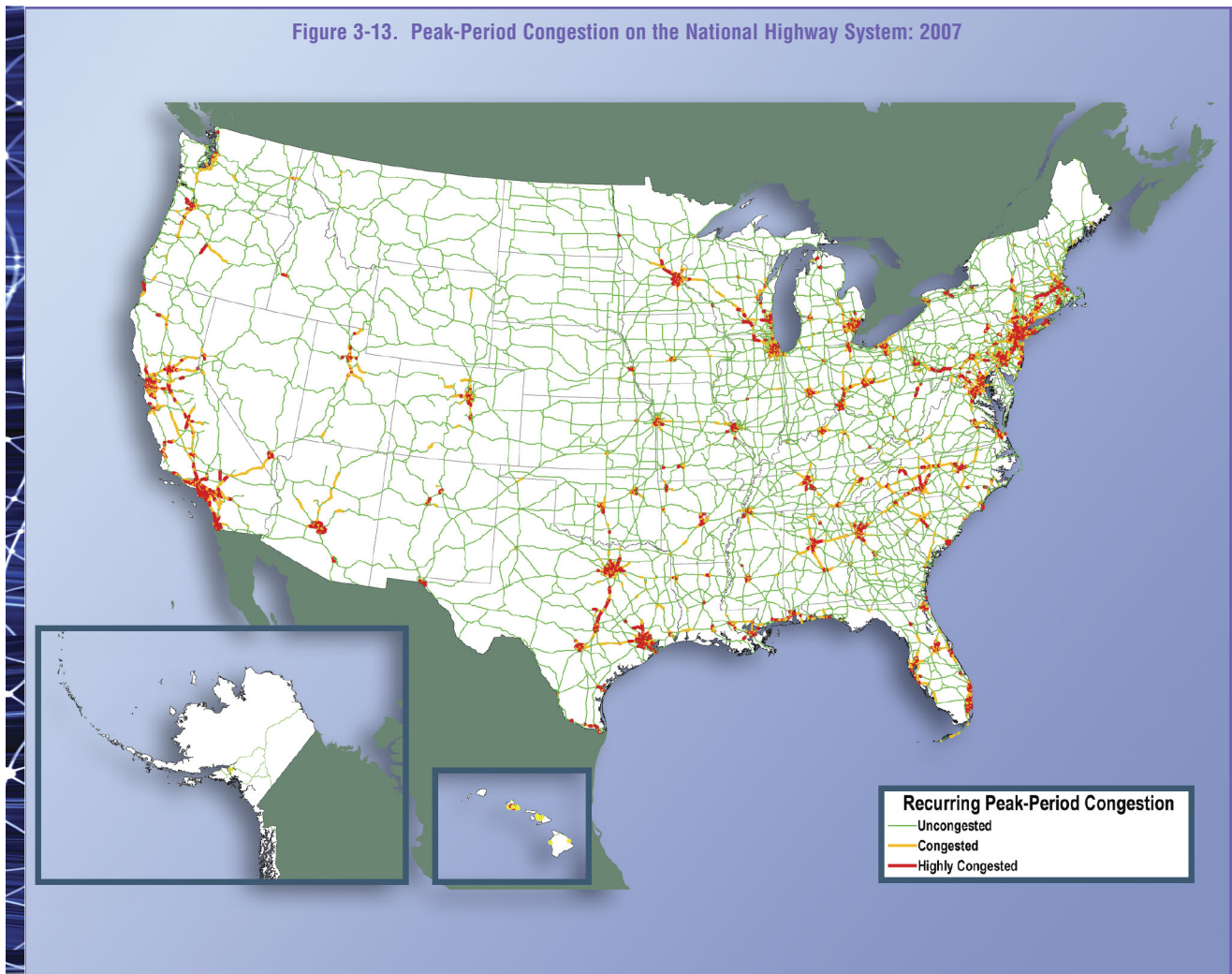


FIGURE 3-12. MAJOR TRUCK ROUTES ON THE NATIONAL HIGHWAY SYSTEM: 2040

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.



Figure 3-13. Peak-Period Congestion on the National Highway System: 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 2007, peak-period congestion resulted in traffic slowing below posted speed limits on 11,700 miles of the NHS and created stop-and-go conditions on an additional 6,700 miles.

FIGURE 3-13. PEAK-PERIOD CONGESTION ON THE NATIONAL HIGHWAY SYSTEM: 2007

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Performance Monitoring System, and Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.

Assuming no changes in network capacity, increases in truck and passenger vehicle traffic are forecast to expand areas of recurring peak-period congestion to 36 percent of the NHS in 2040 compared with 11 percent in 2007. This will slow traffic on 20,300 miles of the NHS and create stop-and-go conditions on an additional 39,000 miles.

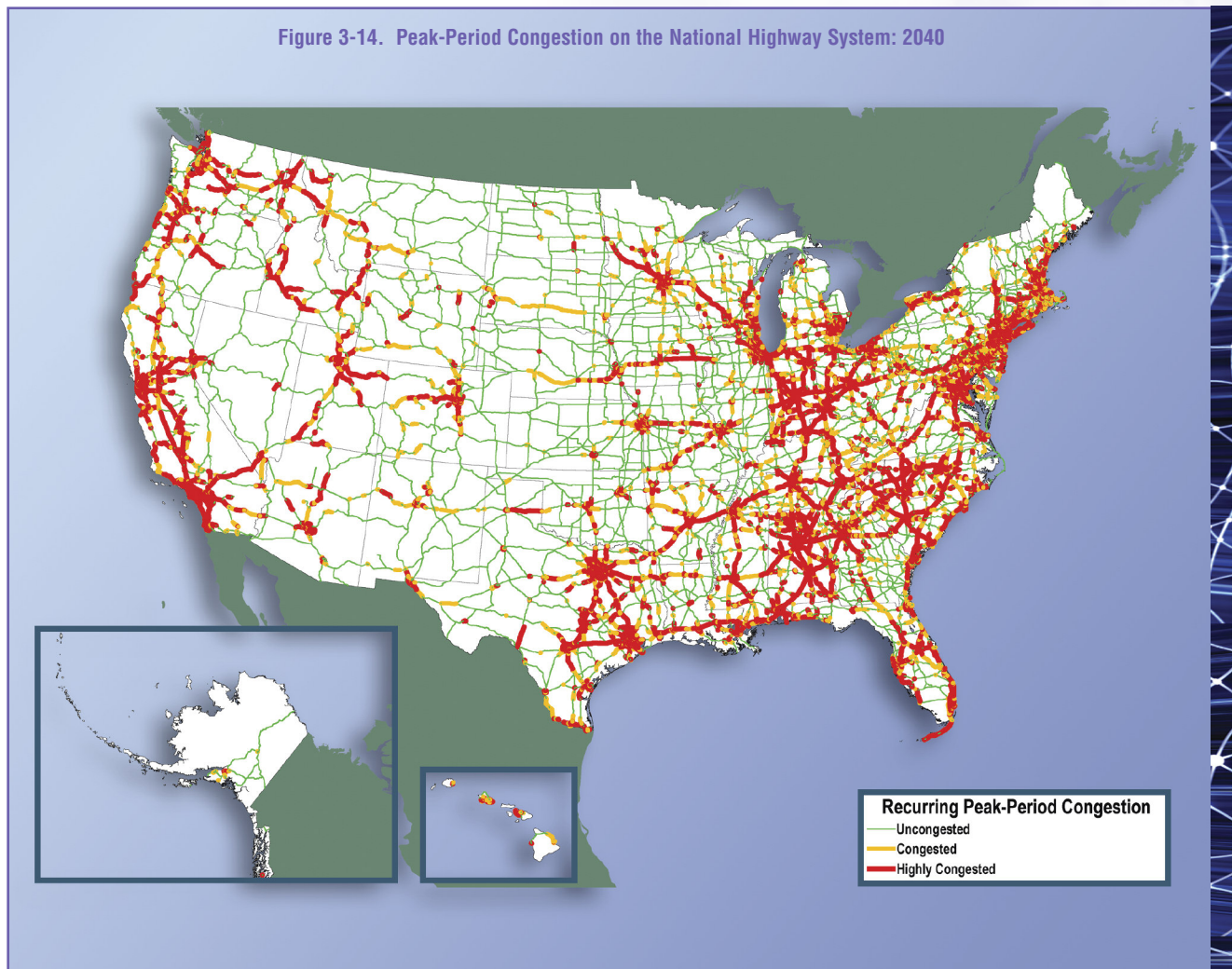
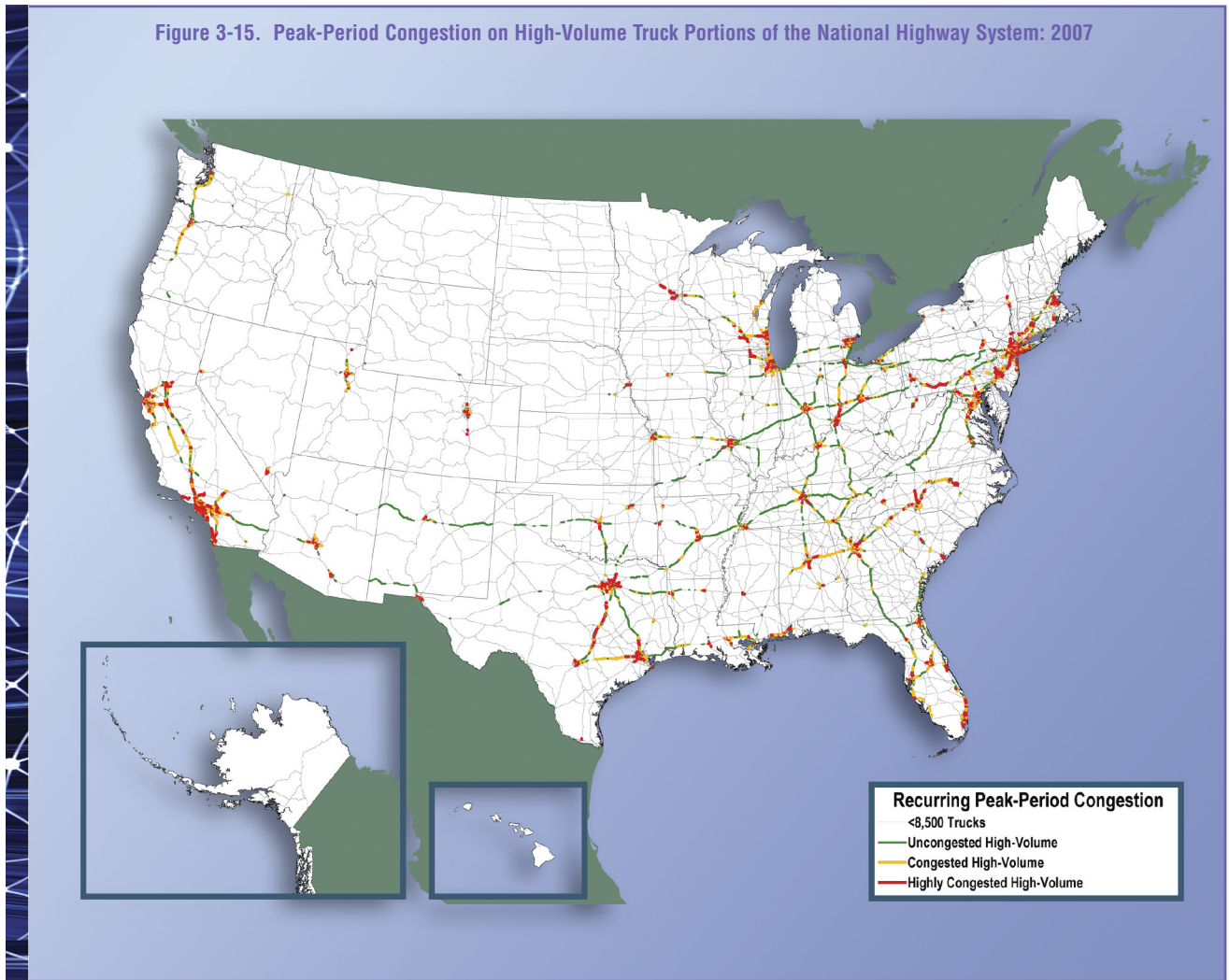


FIGURE 3-14. PEAK-PERIOD CONGESTION ON THE NATIONAL HIGHWAY SYSTEM: 2040

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Performance Monitoring System, and Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.

Figure 3-15. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2007



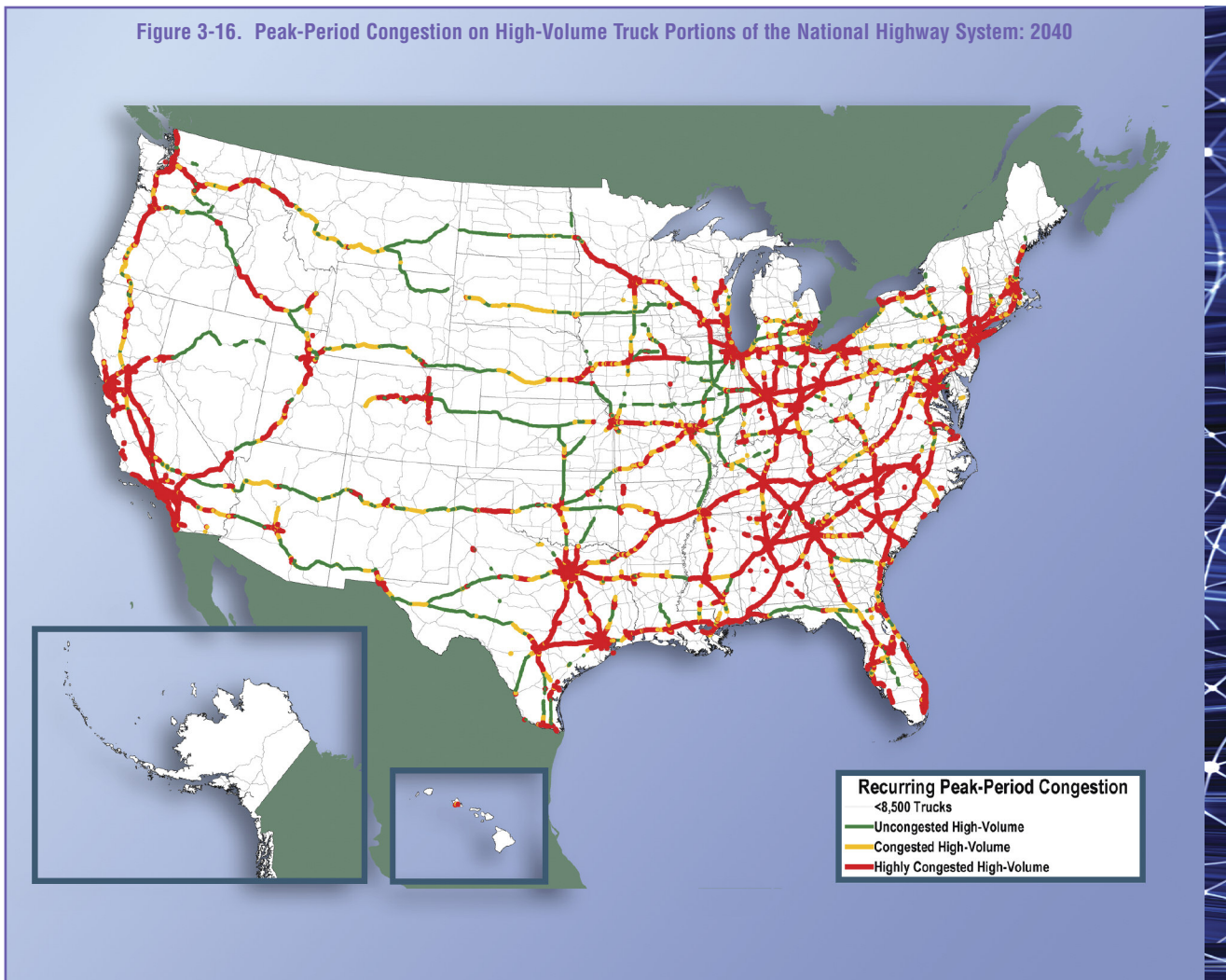
Congested highways carrying a large number of trucks substantially impede interstate commerce, and trucks on those segments contribute significantly to congestion.

Recurring congestion slows traffic on 4,700 miles and creates stop-and-go conditions on 3,700 miles of the NHS that carry more than 8,500 trucks per day.

FIGURE 3-15. PEAK-PERIOD CONGESTION ON HIGH-VOLUME TRUCK PORTIONS OF THE NATIONAL HIGHWAY SYSTEM: 2007

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Performance Monitoring System, and Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.

Figure 3-16. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2040

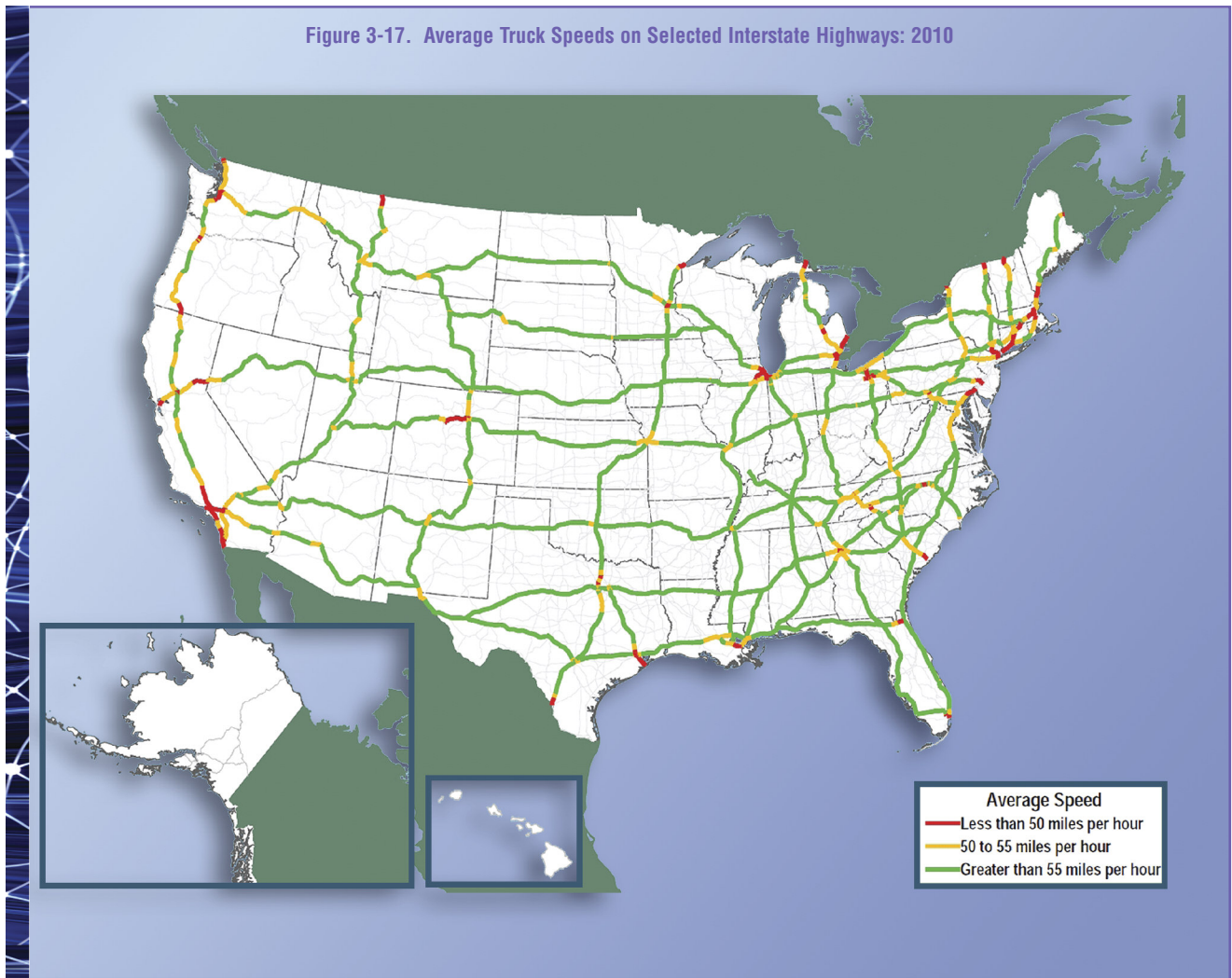


Assuming no change in network capacity, the number of NHS miles with recurring congestion and a large number of trucks is forecast to increase nearly four-fold between 2007 and 2040. On highways carrying more than 8,500 trucks per day, recurring congestion will slow traffic on close to 7,200 miles and create stop-and-go conditions on an additional 23,500 miles.

FIGURE 3-16. PEAK-PERIOD CONGESTION ON HIGH-VOLUME TRUCK PORTIONS OF THE NATIONAL HIGHWAY SYSTEM: 2040

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Performance Monitoring System, and Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.

Figure 3-17. Average Truck Speeds on Selected Interstate Highways: 2010



In addition to calculating peak-period congestion from traffic volumes, as shown in other figures, the Federal Highway Administration (FHWA), in cooperation with private industry, measures the speed and travel time reliability of more than 500,000 trucks at 250 freight-significant highway infrastructure locations on an annual basis. Average truck speeds drop below 55 miles per hour near major urban areas, border crossings and gateways, and in mountainous terrain.

FIGURE 3-17. AVERAGE TRUCK SPEEDS ON SELECTED INTERSTATE HIGHWAYS: 2010

Source: U.S. Department of Transportation, Federal Highway Administration Office of Freight Management and Operations, Freight Performance Measurement Program, 2011.

Table 3-9. Top 20 Freight-Significant Locations by Freight Congestion Index Rating: 2010

Location	Congestion Ranking	Average Speed (mph)	Peak Period Average Speed (mph)	Non-Peak Period Average Speed (mph)	Non-Peak/ Peak Ratio
Chicago, IL: I-290 at I-90/I-94	1	29.41	22.34	31.89	1.43
Fort Lee, NJ: I-95 at SR 4	2	28.98	22.67	31.84	1.40
Houston, TX: I-45 at US 59	3	38.55	30.19	42.49	1.41
Houston, TX: I-10 at I-45	4	41.28	32.18	45.51	1.41
Houston, TX: I-10 at US 59	5	41.01	31.02	46.41	1.50
Gary, IN: I-65 at I-80	6	47.35	45.06	48.26	1.07
Austin, TX: I-35	7	34.55	20.35	43.42	2.13
Chicago, IL: I-90 at I-94 (North)	8	35.39	22.64	40.99	1.81
Atlanta, GA: I-285 at I-85 (North)	9	45.69	34.87	50.94	1.46
Los Angeles, CA: SR 60 at SR 57	10	46.43	39.01	49.30	1.26
Minneapolis - St. Paul, MN: I-35W at I-494	11	44.80	35.01	49.74	1.42
Houston, TX: I-610 at US 290	12	44.55	35.80	48.77	1.36
Dallas, TX: I-45 at I-30	13	41.40	32.78	45.08	1.38
Houston, TX: I-45 at I-610 (North)	14	45.82	38.60	49.03	1.27
Cincinnati, OH: I-71 at I-75	15	46.76	37.34	50.79	1.36
Denver, CO: I-70 at I-25	16	43.88	37.09	46.91	1.26
Buffalo-Niagara Falls, NY: I-90 at I-290	17	41.93	39.25	43.24	1.10
Hartford, CT: I-84 at I-91	18	46.73	37.04	50.69	1.37
Louisville, KY: I-65 at I-64/I-71	19	45.04	35.77	49.64	1.39
Atlanta, GA: I-75 at I-285 (North)	20	48.75	38.99	53.30	1.37

Key: mph = miles per hour.

Notes: FHWA monitors 250 freight-significant highway infrastructure locations on an annual basis. These locations were identified over several years through reviews of past research, available highway speed and volume datasets, and surveys of private- and public-sector stakeholders. FHWA developed a freight congestion index to rank congestion's impact on freight. The index factors in the number of trucks using a particular highway facility and the impact that congestion has on average commercial vehicle speed in each of the 250 study areas. These data represent truck travel during weekdays at all hours of the day in 2010. Average speeds below a free flow of 55 miles per hour indicate congestion.

Truck speed and travel time reliability data can be used to identify and quantify major freight truck chokepoints and bottlenecks along highways that are critical to the Nation's freight transportation system. FHWA developed a freight congestion index that ranks congestion's impact on freight movement. The index factors in both the number of trucks using a particular highway facility and the impact that congestion has on the average speed of those vehicles

On weekdays, average speeds during peak periods (between 6:00 a.m. and 9:00 a.m. and between 4:00 p.m. and 7:00 p.m.) are typically less than those recorded during non-peak periods. Freight traveling across urban Interstate interchanges is affected to the greatest degree by peak-period congestion. At several locations, congestion affects freight mobility during all hours of the day.

Table 3-9. Top 20 Freight-Significant Locations by Freight Congestion Index Rating: 2010

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Performance Measurement Program, special tabulation, 2011.



Table 3-10. Largest Improvements in Average Speed for Congested Freight-Significant Highway Locations: 2010

Location	Average Speed (mph)		Percent change, 2009 to 2010	Peak Period Average Speed (mph)		Percent change, 2009 to 2010	Non-Peak Period Average Speed (mph)		Percent change, 2009 to 2010
	2009	2010		2009	2010		2009	2010	
Las Vegas, NV: I-15 at I-515	38.24	50.64	12.39	34.49	47.46	12.96	40.14	52.43	12.30
Oakland, CA: I-880 at I-238	44.85	48.92	4.07	39.75	41.74	1.98	47.24	52.14	4.90
New Haven, CT: I-95 at I-91	41.70	44.74	3.05	34.94	38.51	3.57	44.25	46.65	2.39
Albuquerque, NM: I-25 at I-40	50.10	53.09	2.99	45.98	49.52	3.54	51.77	54.58	2.81
Tampa, FL: I-4 at I-275	45.17	47.16	1.98	36.44	38.05	1.61	49.99	52.03	2.04

Key: mph = miles per hour.

Several monitored locations have seen significant improvements in performance from 2009 to 2010 when looking at averages over 24 hours.

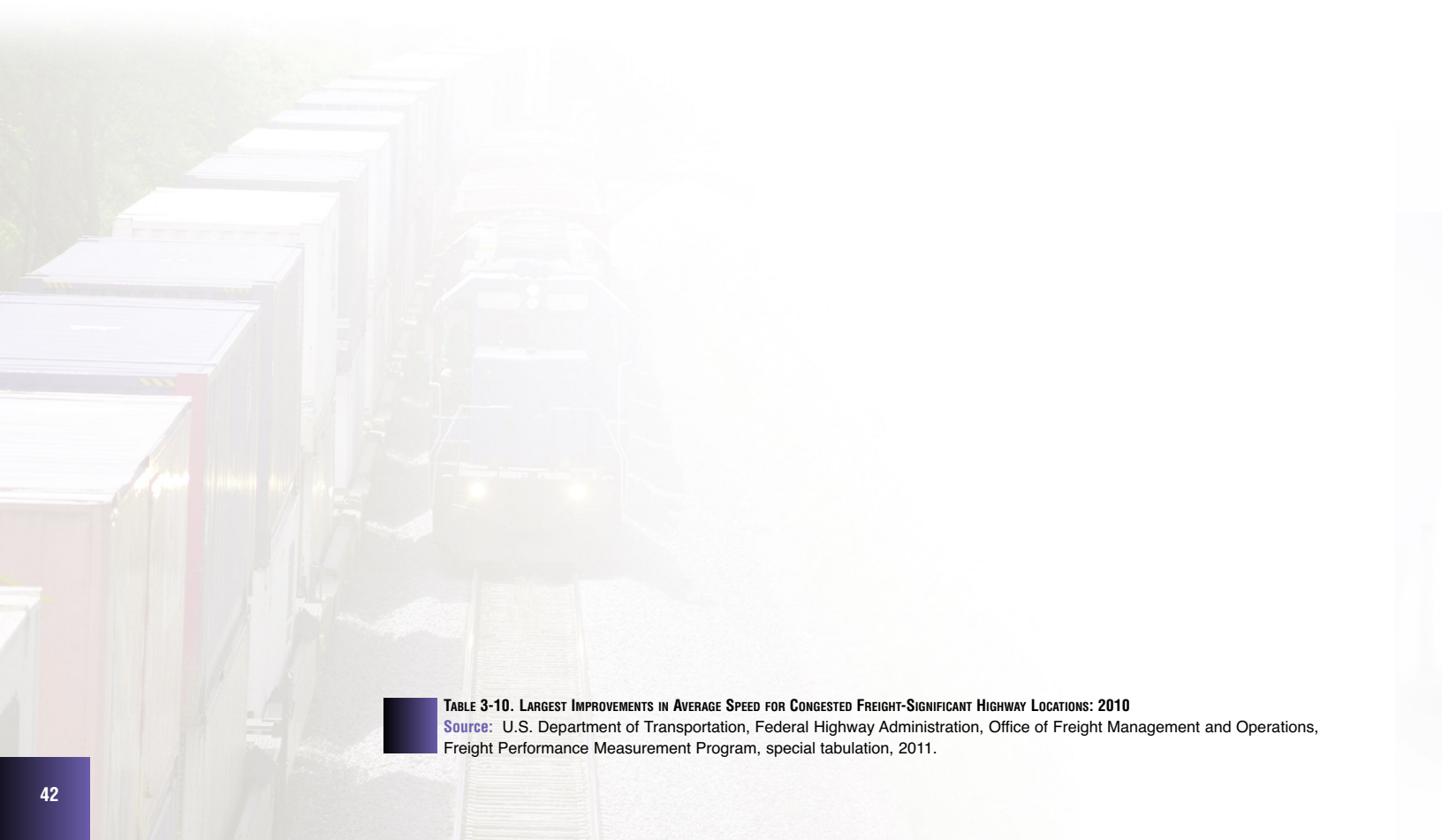


TABLE 3-10. LARGEST IMPROVEMENTS IN AVERAGE SPEED FOR CONGESTED FREIGHT-SIGNIFICANT HIGHWAY LOCATIONS: 2010

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Performance Measurement Program, special tabulation, 2011.

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 differ from limits set for passenger vehicles in nine states.

Table 3-11. Maximum Posted Speed Limits on Rural Interstates: 2011 (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 ¹	55	55
Florida	70	70
Georgia	70	70
Hawaii	60	60
Idaho	65	75
Illinois	65	65
Indiana	65	70
Iowa	70	70
Kansas	70	70
Kentucky	² 65	² 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	65	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	³ 70	³ 75
Utah	⁴ 75	⁴ 75
Vermont	65	65
Virginia	⁵ 70	⁵ 70
Washington	60	70
West Virginia	70	70
Wisconsin	65	65
Wyoming	75	75

¹Urban Interstate.

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

³In 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. For cars, it is also 65 mph at night.

⁴Portions of I-15 have a posted limit of 80 mph.

⁵Effective July 1, 2010, the posted speed limit may be as high as 70 mph where indicated by lawfully placed signs, erected subsequent to a traffic engineering study.

TABLE 3-11. MAXIMUM POSTED SPEED LIMITS ON RURAL INTERSTATES: 2011

Source: Insurance Institute for Highway Safety, Maximum Posted Speed Limits for Passenger Vehicles, available at www.iihs.org/laws/speedlimits.aspx as of August 19, 2011.



IV. THE FREIGHT TRANSPORTATION INDUSTRY

The freight transportation industry is an important part of the U.S. economy. It employs millions of people, supports economic activity, and invests in transportation infrastructure and equipment that benefits both passenger travel and freight movement.

Fixed transportation assets reflect the significant role of both public and private sectors in moving freight. Freight railroad facilities and services are almost entirely private, while private-sector

trucks 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 serve public waterways and both public and private port facilities. Pipelines are mostly privately owned, 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 controlled by the Federal government, and safety is regulated by all levels of government.

Total private and public fixed assets grew from just over \$26.9 trillion in 2000 to more than \$44.7 trillion in 2010 (current U.S. dollars). Transportation equipment and structures (private and public) accounted for 11 percent of the total in 2010. The components of transportation fixed assets and their 2010 values are private transportation equipment (\$1.0 trillion), private transportation structures (\$656 billion), and government transportation structures (\$3.5 trillion).¹

Table 4-1. Transportation Fixed Assets: 2000-2010
(billions of current dollars)

	2000	2005	2009	2010	Percent change, 2000 to 2010
Private Sector					
Transportation Equipment ¹	828	980	1,012	1,001	20.9
Transportation Structures ²	450	557	637	656	45.9
Public Sector					
Highways	1,435	2,056	2,836	2,939	104.8
Transportation Structures ²	261	413	564	592	126.9
Federal	6	10	14	14	117.2
State and Local	254	403	551	578	127.1

¹Includes trucks, truck trailers, buses, automobiles, aircraft, ships, boats, and railroad equipment.

²Includes physical structures for all modes of transportation.

¹Fixed assets are for 2010 and include both passenger and freight transportation. See the Bureau of Economic Analysis at www.bea.gov/national/FA2004/index.asp, tables 2.1, 3.1s, and 7.1b.

TABLE 4-1. TRANSPORTATION FIXED ASSETS: 2000-2010

Source: U.S. Department of Commerce, Bureau of Economic Analysis, National Economic Accounts, Fixed Assets Tables, tables 2.1, 3.1s, and 7.1b, available at www.bea.gov/iTable/index_FA.cfm as of September 23, 2011.

The freight industry has many components, encompassing companies large and small. All told there were nearly 220,000 transportation and warehousing establishments in 2007, with more than one-half of those primarily engaged in trucking. Revenue generated by trucking accounted for about 34 percent of transportation and warehousing sector revenue while warehousing accounted for a small percentage of the total.

Table 4-2. Economic Characteristics of Transportation and Warehousing Establishments in Freight-Dominated Modes: 2002 and 2007

NAICS	Establishments		Revenue (millions of current \$)		Payroll (millions of current \$)		Paid Employees	
	2002	2007	2002	2007	2002	2007	2002	2007
Transportation and warehousing	199,618	219,706	382,152	639,916	115,989	173,183	3,650,859	4,454,383
Rail transportation	NA	NA	NA	NA	NA	NA	NA	NA
Water transportation	1,890	1,721	23,331	34,447	3,194	4,544	66,153	75,997
Truck transportation	112,642	120,390	164,219	217,833	47,750	58,266	1,435,210	1,507,923
Pipeline transportation	2,188	2,529	22,031	25,718	2,477	3,219	36,790	36,964
Support activities for transportation	33,942	42,130	57,414	86,596	16,202	24,579	465,616	608,385
Couriers and messengers	12,655	13,004	58,165	77,877	17,175	20,431	561,514	557,195
Warehousing and storage	12,671	13,938	16,548	21,921	17,183	25,526	565,533	720,451

Key: NA = not available; NAICS = North American Industry Classification System.

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 or 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 4-3. Economic Characteristics of Freight Railroads: 2000 and 2009

	Class I		Non-Class I		Total	
	2000	2009	2000	2009	2000	2009
Number of railroads	8	7	552	556	560	563
Freight revenue (billions of current dollars)	33.1	46.1	3.2	3.3	36.3	49.4
Operating revenue (billions of current dollars)	34.1	47.8	NA	NA	NA	NA
Employees	168,360	151,906	23,448	17,985	191,808	169,891

Key: NA = not available.

Railroads include Class I (national), Class II (regional), and Class III (local) carriers. Revenue grew while employment declined in both the national railroads and the regional and local railroads between 2000 and 2009.

TABLE 4-2. ECONOMIC CHARACTERISTICS OF TRANSPORTATION AND WAREHOUSING ESTABLISHMENTS IN FREIGHT-DOMINATED MODES: 2002 AND 2007

Sources: 2002: U.S. Department of Commerce, Census Bureau, *2002 Economic Census, Transportation and Warehousing, United States* (Washington, DC: 2004), available at www.census.gov/econ/census02/data/us/US000_48.HTM as of August 22, 2011; 2007: U.S. Department of Commerce, Census Bureau, *2007 Economic Census, Transportation and Warehousing, United States* (Washington, DC: 2010), available at www.census.gov/econ/census07 as of August 22, 2011.

TABLE 4-3. ECONOMIC CHARACTERISTICS OF FREIGHT RAILROADS: 2000 AND 2009

Source: Association of American Railroads, *Railroad Facts* (Washington, DC: annual issues), p. 3.

Productivity has been relatively stable after years of improvement. Between 1987 and 2009, output-per-hour worked more than doubled in line-haul railroading but grew only 23 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.

Employment in many transportation industries has remained steady or has grown over the past two decades with the

notable exception of railroads and pipelines, which have declined by 21 percent and 30

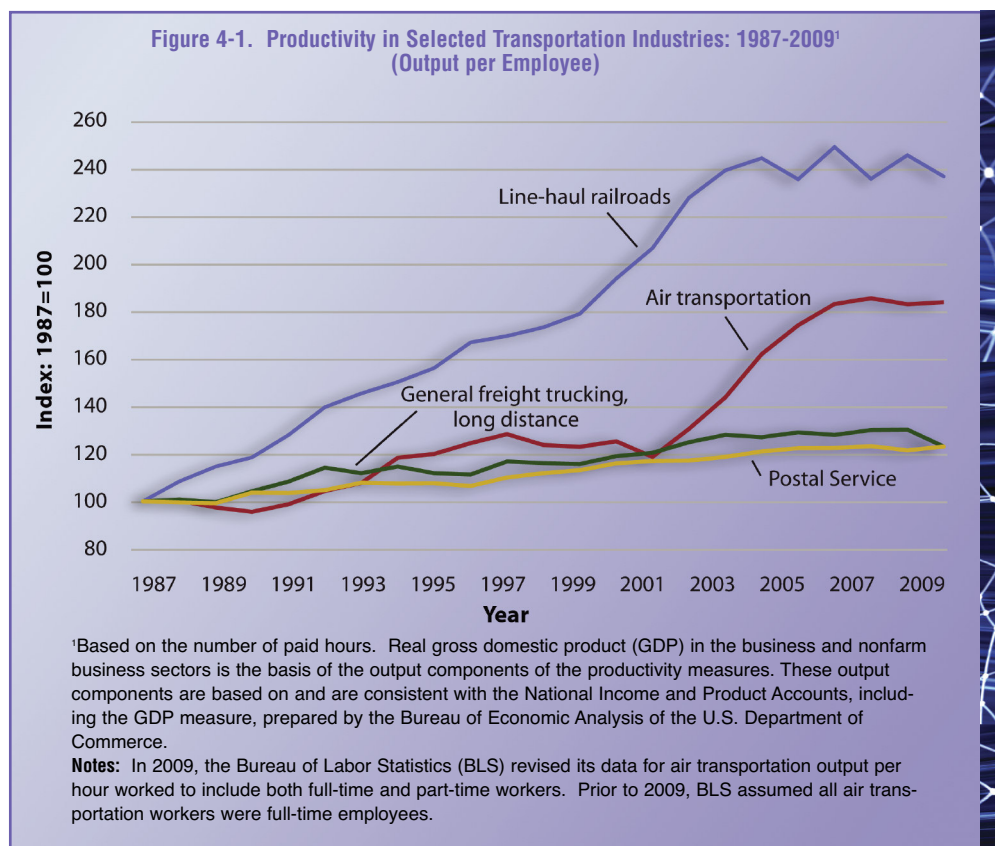


Table 4-4. Employment in For-Hire Transportation Establishments Primarily Serving Freight: 1980-2010¹

	1980	1990	2000	2009	2010
Total U.S. labor force²	90,528	109,487	131,785	(R) 130,807	129,818
Transportation and warehousing	2,961	3,476	4,410	(R) 4,236	4,184
Rail transportation	518	272	232	(R) 218	215
Water transportation	NA	57	56	(R) 63	63
Truck transportation	NA	1,122	1,406	(R) 1,268	1,244
Pipeline transportation	NA	60	46	(R) 43	42
Support activities for transportation ³	NA	364	537	549	540
Couriers and messengers	NA	375	605	(R) 546	527
Warehousing and storage	NA	407	514	(R) 637	628

Key: NA = not available; R = revised.
¹Annual averages.
²Excludes farm employment.
³Industries in the support activities for transportation subsector provide services 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.

FIGURE 4-1. PRODUCTIVITY IN SELECTED TRANSPORTATION INDUSTRIES: 1987-2009

Source: U.S. Department of Labor, Bureau of Labor Statistics, Industry Productivity, available at www.bls.gov/lpc/ as of August 20, 2011.

TABLE 4-4. EMPLOYMENT IN FOR-HIRE TRANSPORTATION ESTABLISHMENTS PRIMARILY SERVING FREIGHT: 1980-2010

Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Employment Statistics survey, available at www.bls.gov/ces/ as of August 19, 2011.



percent, respectively, between 1990 and 2010. Consequently, in 2010 rail transportation employed only 5 percent of those working in the transportation and warehousing industry compared with about 18 percent in 1980. By comparison, trucking in 2010 accounted for 30 percent of total transportation and warehousing sector employment.

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 nearly 2.62 million truck drivers in 2010; about 56 percent of these professionals drive heavy/tractor trailer trucks, 30 percent drive light/delivery service trucks, and about 14 percent are driver/sales workers. Several industry analysts believe the number of truck drivers is below demand and driver shortages will worsen in the future.

Table 4-5. Employment in Selected Freight Transportation and Freight Transportation-Related Occupations: 2000-2010

Occupation (SOC code)	2000	2008	2009	2010
Vehicle operators, pipeline operators, and primary support				
Driver/sales worker (53-3031)	373,660	372,720	363,050	371,670
Truck drivers, heavy and tractor-trailer (53-3032)	1,577,070	1,672,580	1,550,930	1,466,740
Truck drivers, light or delivery services (53-3033)	1,033,220	908,960	834,780	780,260
Locomotive engineers (53-4011)	29,390	42,760	43,560	40,750
Rail yard engineers, dinkey operators, and hostlers (53-4013)	4,020	5,480	5,360	5,600
Railroad brake, signal, and switch operators (53-4021)	16,830	24,610	24,270	22,760
Railroad conductors and yardmasters (53-4031)	40,380	39,580	41,540	42,700
Sailors and marine oilers (53-5011)	30,090	32,420	31,950	31,690
Captains, mates, and pilots of water vessels (53-5021)	21,080	30,600	30,450	29,280
Ship engineers (53-5031)	7,370	11,190	10,850	9,470
Bridge and lock tenders (53-6011)	4,790	4,490	4,290	3,250
Gas compressor and gas pumping station operators (53-7071)	6,510	4,050	4,160	4,040
Pump operators, except wellhead pumpers (53-7072)	13,730	9,280	10,310	9,440
Transportation equipment manufacturing and maintenance occupations				
Bus and truck mechanics and diesel engine specialists (49-3031)	258,800	248,620	232,810	222,770
Rail car repairers (49-3043)	10,620	20,780	20,910	19,280
Transportation Infrastructure construction and maintenance occupations				
Rail-track laying and maintenance equipment operators (47-4061)	9,940	15,020	14,880	15,520
Signal and track switch repairers (49-9097)	5,540	6,570	6,450	7,400
Dredge operators (53-7031)	3,100	1,910	1,990	1,720
Secondary support service occupations				
Dispatchers, except police, fire, and ambulance (43-5032)	167,180	193,210	185,100	180,540
Postal service mail carriers (43-5052)	354,980	354,570	339,030	324,990
Shipping, receiving, and traffic clerks (43-5071)	864,530	760,950	715,130	687,850
Transportation inspectors (53-6051)	26,520	24,940	24,250	24,280
Tank car, truck, and ship loaders (53-7121)	17,480	12,330	11,560	10,390

Key: SOC = Standard Occupational Classification.

TABLE 4-5. EMPLOYMENT IN SELECTED FREIGHT TRANSPORTATION AND FREIGHT TRANSPORTATION-RELATED OCCUPATIONS: 2000-2010

Source: U.S. Department of Labor, Bureau of Labor Statistics, *National Occupational Employment and Wages, 2010*, available at www.bls.gov/oes as of August 19, 2011.

Table 4-6: Producer Price Indices for Selected Transportation Services: 1990-2009

	1990	2000	2003	2005	2006	2007	2008	2009
Air Transportation (NAICS 481)¹	NA	147.7	162.1	171.0	180.4	183.7	203.8	188.5
Scheduled Air Transportation (NAICS 4811) ²	110.2	180.1	198.5	209.3	220.5	224.5	248.9	229.1
Scheduled Freight Air Transportation (NAICS 481112)	NA	NA	100.0	104.9	108.4	109.0	127.8	119.1
Nonscheduled Air Transportation (NAICS 4812) ³	NA	107.3	117.8	126.7	136.8	148.5	165.8	160.4
Rail Transportation (NAICS 482)³	NA	102.6	108.8	125.2	135.9	140.9	157.3	148.5
Line-Haul Railroads (NAICS 482111) ⁴	107.5	114.5	121.4	139.6	151.2	157.2	175.5	165.6
Water Transportation (NAICS 483)	NA	NA	100.0	106.4	111.1	113.5	127.0	116.1
Deep Sea Freight Transportation (NAICS 483111) ⁵	113.1	155.8	219.9	231.9	233.3	230.0	258.3	218.8
Coastal and Great Lakes Freight Transportation (NAICS 483113)	NA	NA	100.0	109.9	119.9	130.2	141.8	137.4
Inland Water Freight Transportation (NAICS 483211)	100.0	117.9	124.7	151.4	182.9	186.1	218.3	211.4
Truck Transportation (NAICS 484)	NA	NA	100.0	109.0	113.2	115.4	123.0	117.3
General Freight Trucking (NAICS 4841)	NA	NA	100.0	110.0	114.1	116.5	123.6	117.5
General Freight Trucking, Local (NAICS 48411)	NA	NA	100.0	111.5	115.3	119.6	130.2	126.0
General Freight Trucking, Long Distance (NAICS 48412)	NA	NA	100.0	109.7	113.8	115.9	122.2	115.5
Specialized Freight Trucking (NAICS 4842)	NA	NA	100.0	107.0	111.4	113.1	122.1	117.4
Used Household and Office Goods Moving (NAICS 48421)	NA	NA	100.0	106.0	107.8	108.8	112.2	112.8
Specialized Freight (except Used Goods) Trucking, Local (NAICS 48422)	NA	NA	100.0	107.1	112.3	114.2	126.7	123.9
Specialized Freight (except Used Goods) Trucking, Long Distance (NAICS 48423)	NA	NA	100.0	107.5	112.8	114.8	123.6	113.2
Pipeline Transportation (NAICS 486)	NA	NA	NA	NA	NA	NA	NA	NA
Pipeline Transportation of Crude Oil (NAICS 4861)	NA	NA	100.0	113.3	112.0	125.4	137.1	141.0
Other Pipeline Transportation (NAICS 4869) ⁶	NA	NA	100.0	105.2	108.2	115.0	121.6	128.7
Support Activities for Transportation (NAICS 488)	NA	NA	100.0	104.1	106.5	108.5	111.7	108.6
Support Activities for Water Transportation (NAICS 4883) ⁷	NA	NA	100.0	103.5	107.7	112.7	117.3	116.8
Navigational Services to Shipping (NAICS 48833)	NA	NA	100.0	105.7	113.9	120.6	133.8	122.9
Freight Transportation Arrangement (NAICS 4885) ³	NA	98.3	97.9	99.1	98.8	100.2	102.5	94.8
Postal Service (NAICS 491)	100.0	135.2	155.0	155.0	164.7	171.9	178.9	185.0
Couriers and Messengers (NAICS 492)	NA	NA	100.0	113.8	121.5	131.5	142.0	141.5

Key: NA = not available; NAICS = North American Industry Classification System.

¹Base year = 1992.

²Base year = 1989.

³Base year = 1996.

⁴Base year = 1984.

⁵Base year = 1988.

⁶Other pipeline transportation includes pipeline transportation of refined petroleum products (NAICS 48691).

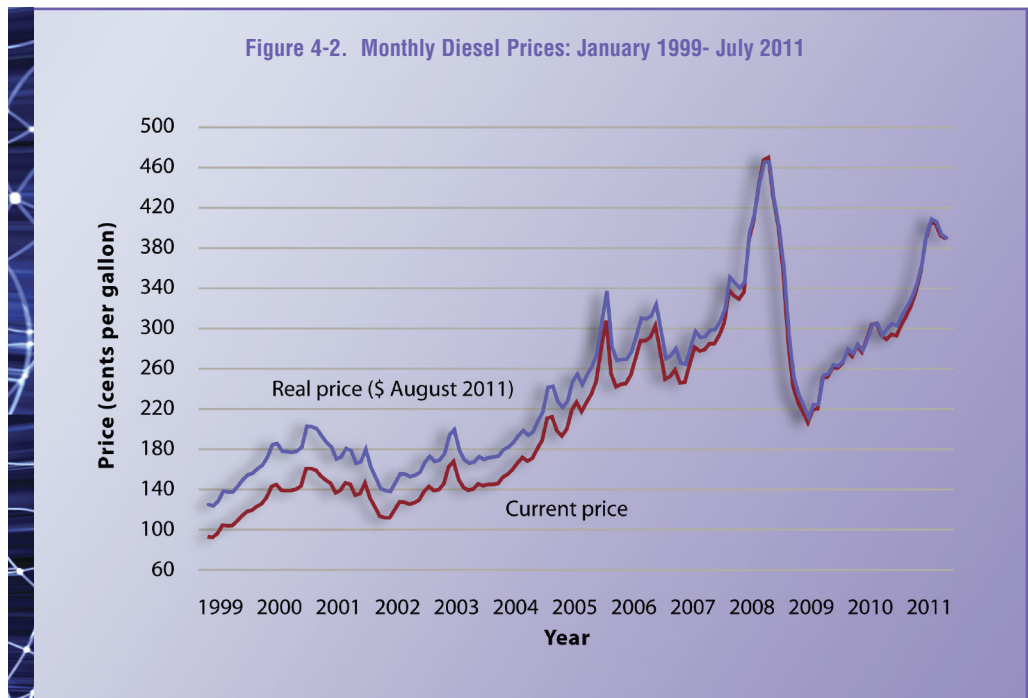
⁷Support activities for water transportation include port and harbor operations (NAICS 48831), marine cargo handling (NAICS 48832), and navigational services to shipping (NAICS 48833).

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.

From 2008 to 2009, the prices charged for transportation purchased from carriers and support activities have gone down in most industries. Rail prices decreased by about 6 percent, while air and trucking fell by 8 percent and 5 percent respectively.

TABLE 4-6: PRODUCER PRICE INDICES FOR SELECTED TRANSPORTATION SERVICES: 1990-2009

Source: U.S. Department of Labor, Bureau of Labor Statistics, Producer Price Index Industry Data, available at www.bls.gov/data/sa.htm as of August 19, 2011.



Diesel prices were about 132 percent higher in July 2011 than 10 years earlier (in inflation-adjusted terms).



FIGURE 4-2. MONTHLY DIESEL PRICES: JANUARY 1999- JULY 2011
Source: Diesel price: U.S. Department of Energy, Energy Information Agency, U.S. Petroleum Prices, available at www.eia.doe.gov as of August 19, 2011. Consumer Price Index: U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index – All Urban Consumers, Monthly, available at www.bls.gov as of August 19, 2011.

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 environmental implications of freight transportation only recently have been considered separately from passenger travel. At the same time, the availability of energy consumption data has declined with the discontinuation of the Vehicle Inventory and Use Survey.

Table 5-1. Fatalities by Freight Transportation Mode: 1980-2010

	1980	1990	2000	2009	2010
Total transportation fatalities (passenger and freight)	NA	47,350	44,384	(P) 35,929	U
Highway (passenger and freight)	51,091	44,599	41,945	33,808	U
Large truck occupants ¹	1,262	705	754	503	U
Others killed in crashes involving large trucks	4,709	4,567	4,528	(R) 2,551	U
Large truck occupants ¹ (percent)	2.5	1.6	1.8	1.5	U
Others killed in crashes involving large trucks (percent)	9.2	10.2	10.8	7.5	U
Railroad (passenger and freight)	1,417	1,297	937	(R) 695	737
Highway-rail crossing ²	833	698	425	(R) 247	261
Railroad ^{2,3}	584	599	512	(R) 448	476
Waterborne (passenger and freight)	487	186	111	185	160
Vessel-related ⁴	206	85	42	54	28
Freight ship	8	0	0	1	1
Tank ship	4	5	0	1	0
Tug/towboat	14	13	1	3	0
Offshore supply	NA	2	0	0	0
Fishing vessel	60	47	26	25	14
Mobile offshore drilling units	NA	0	0	1	0
Platform	NA	1	0	0	0
Freight barge	NA	0	0	0	0
Tank barge	NA	0	0	0	0
Miscellaneous ⁵	56	11	15	23	13
Not vessel-related ⁴	281	101	69	131	132
Pipeline	19	9	38	(R) 13	22
Hazardous liquid pipeline	4	3	1	4	1
Gas pipeline	15	6	37	(R) 9	21

Key: NA = not available; R = revised; P = preliminary; U = unavailable at date of publication.

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

²Includes Amtrak.

³Includes train accidents and other incidents. Most fatalities involve trespassers who are included under other incidents (442 in 2010).

⁴Vessel-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.

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

Notes: Caution must be exercised in comparing fatalities across modes because significantly different definitions are used. Numbers may not add to totals because some fatalities are counted in more than one mode.

TABLE 5-1. FATALITIES BY FREIGHT TRANSPORTATION MODE: 1980-2010

Sources: **Total:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics*, available at www.bts.gov as of August 29, 2011. **Highway:** 1980, 1990, and 2000: U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts, Large Trucks* (annual issues). 2008- 2009: U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts - Highlights* (August 2010). **Railroad:** U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, available at <http://safetydata.fra.dot.gov/officeofsafety/default.asp> as of August 29, 2011. **Waterborne:** U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, September 6, 2011. **Pipeline:** U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Pipeline Safety Program, Pipeline Library, available at <http://primis.phmsa.dot.gov/comm/PipelineLibrary.htm> as of August 28, 2011.

While the amount of freight transportation activity has increased in recent decades, the number of fatalities has declined or remained stable in each mode, with the exception of waterborne casualties that are not vessel related. Trucks accounted for approximately 9 percent of all highway fatalities in 2009. The vast majority of fatalities involve passenger travel on highways.

The highway mode accounted for almost all of the injuries in freight transportation, but the number of injuries has dropped substantially since 2000.

Table 5-2. Injured Persons by Freight Transportation Mode: 1980-2010

	1980	1990	2000	2009	2010
Total injured persons (passenger and freight)	NA	NA	3,259,673	NA	U
Highway (passenger and freight)	NA	3,230,666	3,188,750	2,217,000	U
Large truck occupants ¹	NA	41,822	30,832	17,000	U
Others injured in crashes involving large trucks	NA	108,000	109,000	56,000	U
Large truck occupants ¹ (percent)	NA	1.3	1.0	0.8	U
Others injured in crashes involving large trucks (percent)	NA	3.3	3.4	2.5	U
Railroad (passenger and freight)	62,246	25,143	11,643	(R) 7,968	8,221
Highway-rail grade crossing ²	3,550	2,407	1,219	(R) 741	845
Railroad ^{2,3}	58,696	22,736	10,424	(R) 7,227	7,376
Waterborne (passenger and freight)	NA	NA	665	722	509
Vessel-related ⁴	180	175	151	186	135
Freight ship	8	10	5	8	17
Tank ship	9	13	3	4	0
Tug/towboat	27	19	18	39	0
Offshore supply	NA	9	6	0	3
Fishing vessel	28	31	21	35	15
Mobile offshore drilling units	NA	13	0	1	10
Platform	NA	9	0	0	0
Freight barge	NA	3	2	0	0
Tank barge	NA	3	0	1	0
Miscellaneous ⁵	98	12	96	98	90
Not related to vessel casualties ⁴	NA	NA	514	536	374
Pipeline	192	76	81	(R) 65	107
Hazardous liquid pipeline	15	7	4	4	4
Gas pipeline	177	69	77	(R) 61	103

Key: NA = not available; R = revised; U = unavailable at date of publication.

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

²Includes Amtrak.

³Includes train accidents and other incidents. Most injuries involve workers on duty and are included under other incidents (4,183 in 2010).

⁴Vessel-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.

⁵Includes industrial vessel, oil recovery, 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: 1980-2010

Sources: **Total:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, National Transportation Statistics, available at www.bts.gov as of August 29, 2011. **Highway:** 1980, 1990, and 2000: U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts, Large Trucks* (annual issues). 2008- 2009: U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts - Highlights* (August 2010). **Railroad:** U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, available at <http://safetydata.fra.dot.gov/officeofsafety/default.asp> as of August 29, 2011. **Waterborne:** U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, September 6, 2011. **Pipeline:** U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Pipeline Safety Program, Pipeline Library, available at <http://primis.phmsa.dot.gov/comm/PipelineLibrary.htm> as of August 28, 2011.

Table 5-3. Accidents by Freight Transportation Mode: 1980-2010

	1980	1990	2000	2009	2010
Highway (passenger and freight)	NA	6,471,000	6,394,000	5,505,000	U
Large truck ¹	NA	371,801	437,861	296,000	U
Large truck ¹ (percent of total)	NA	5.7	6.8	5.4	U
Rail (passenger and freight)					
Highway-rail grade crossing ^{2,3}	10,612	5,715	3,502	(R) 1,926	2,013
Railroad ^{2,4}	8,205	2,879	2,983	(R) 1,902	1,884
Waterborne (passenger and freight)					
Vessel-related	4,624	3,613	5,403	5,475	5,434
Pipeline					
Hazardous liquid pipeline	246	180	135	(R) 106	120
Gas pipeline	1,524	198	290	(R) 271	256

Key: NA = not available; R = revised; U = unavailable at date of publication.

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

²Includes Amtrak.

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

⁴Train accidents only.

The number of crashes and other freight transportation accidents has declined in all modes except water over that last 20 years, despite an increase in freight transportation 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

Table 5-4. Hazardous Materials Transportation Incidents: 1980-2010

	1980	1990	2000	2009	2010
Total	15,719	8,879	17,557	(R) 14,819	14,783
Accident-related	486	297	394	(R) 290	353
Air	223	297	1,419	(R) 1,356	1,293
Accident-related	0	0	3	2	2
Highway	14,161	7,296	15,063	(R) 12,730	12,635
Accident-related	347	249	329	(R) 251	313
Rail	1,271	1,279	1,058	(R) 643	750
Accident-related	134	48	62	37	37
Water¹	34	7	17	(R) 90	105
Accident-related	2	0	0	0	1
Other²	30	0	0	NA	NA
Accident-related	3	0	0	NA	NA

Key: NA = not available; R = revised.

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

²Other 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: 1980-2010

Sources: Highway: 1980, 1990, and 2000: U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts, Large Trucks* (annual issues). 2009: U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts - Highlights* (August 2010). Railroad: U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, available at <http://safetydata.fra.dot.gov/officeofsafety/default.asp> as of August 20, 2011. Waterborne: U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, September 6, 2011. Pipeline: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Pipeline Safety Program, Pipeline Library, available at <http://primis.phmsa.dot.gov/comm/PipelineLibrary.htm> as of August 28, 2011.

TABLE 5-4. HAZARDOUS MATERIALS TRANSPORTATION INCIDENTS: 1980-2010

Source: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Hazardous Materials Safety, Hazardous Materials Information System Database, available at www.phmsa.dot.gov/hazmat/library/data-stats as of August 21, 2011.



vehicular crash or derailment (referred to as “accident related”). Approximately two percent of incidents were accident related in 2010, but they accounted for 85 percent of all property damage. Most incidents occur because of human error or package failure, particularly during loading and unloading.

Table 5-5. Commercial Motor Carrier Compliance Review Activity by Safety Rating: 2000-2010

Safety rating	2000		2009		2010	
	Number	Percent	Number	Percent	Number	Percent
Satisfactory	5,309	51.1	(R) 6,916	(R) 68.5	6,046	67.6
Conditional	3,354	32.3	(R) 2,731	(R) 27.1	2,506	28.0
Unsatisfactory	1,481	14.3	(R) 293	(R) 2.9	198	2.2
Not rated	245	2.4	152	1.5	190	2.1
Total	10,389	100.0	(R) 10,092	100.0	8,940	100.0

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. Numbers and percents may not add to totals due to rounding.

The safety fitness of motor carriers has improved markedly over the past few years. In 2010, the share of motor carriers rated satisfactory was nearly 68 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 2009, about five percent of driver inspections and four percent of hazardous materials inspections result in an OOS order.

Fuel consumption is a major concern for environmental and other reasons. The number of gallons of fuel burned by commercial trucks decreased by nearly five percent from 2007 to 2009. This is due, in part, to increases in fuel costs, a slight decrease in the number of trucks on the road, and improved energy efficiency. Fuel use in Class I freight railroads declined from 4.1 billion gallons in 2007 to 3.2 billion gallons in 2009.

TABLE 5-5. COMMERCIAL MOTOR CARRIER COMPLIANCE REVIEW ACTIVITY BY SAFETY RATING: 2000-2010

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 as of August 28, 2011.

Table 5-6. Roadside Safety Inspection Activity Summary By Inspection Type: 2000-2010

	2000		2008		2009		2010	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All inspections								
Number of inspections	2,453,776	100.0	3,317,187	100.0	3,530,382	100.0	3,569,373	100.0
With no violations	639,593	26.1	1,041,262	31.4	1,176,351	33.3	1,225,324	34.3
With violations	1,814,183	73.9	2,275,925	68.6	2,354,031	66.7	2,344,049	65.7
Driver inspections								
Number of inspections	2,396,688	100.0	3,176,813	100.0	3,429,882	100.0	3,470,871	100.0
With no violations	1,459,538	60.9	2,012,241	63.3	2,100,760	61.2	2,316,960	66.8
With violations	937,150	39.1	1,164,572	36.7	1,329,122	38.8	1,153,911	33.2
With OOS violations	191,031	8.0	204,542	6.4	196,625	5.7	183,350	5.3
Vehicle inspections								
Number of inspections	1,908,300	100.0	2,278,230	100.0	2,349,072	100.0	2,413,094	100.0
With no violations	584,389	30.6	746,362	33.6	779,891	33.2	834,551	34.6
With violations	1,323,911	69.4	1,513,868	66.5	1,569,181	66.8	1,578,543	65.4
With OOS violations	452,850	23.7	509,800	22.4	506,878	21.6	480,416	19.9
Hazardous materials inspections								
Number of inspections	133,486	100.0	192,516	100.0	222,587	100.0	211,154	100.0
With no violations	101,098	75.7	159,799	83.0	153,219	68.8	180,522	85.5
With violations	32,388	24.3	32,717	17.0	69,368	31.2	30,632	14.5
With OOS violations	9,964	7.5	9,648	5.0	10,323	4.6	9,210	4.4

Key: OOS = out of service.

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: 2007-2009

	2007	2008	2009
Highway¹			
Gasoline, diesel and other fuels (million gallons)	176,203	170,765	168,140
Truck, total	47,219	47,704	44,472
Single-unit 2-axle 6-tire or more truck	16,314	17,144	16,342
Combination truck	30,904	30,561	28,130
Truck (percent of total)	26.8	27.9	26.4
Rail, Class I (in freight service)			
Distillate / diesel fuel (million gallons)	4,062	3,886	3,192
Water			
Residual fuel oil (million gallons)	6,327	5,066	4,543
Distillate / diesel fuel oil (million gallons)	1,924	1,187	1,266
Gasoline (million gallons)	1,222	1,136	1,130
Pipeline			
Natural gas (million cubic feet)	621,364	(R) 647,956	598,216

Key: R = revised.

¹Based on a new methodology, FHWA revised its annual vehicle miles travelled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at www.fhwa.dot.gov/policyinformation/statistics.cfm. Data in this table should not be compared to those in previous editions of Freight Facts and Figures.

TABLE 5-6. ROADSIDE SAFETY INSPECTION ACTIVITY SUMMARY BY INSPECTION TYPE: 2000-2010

Source: U.S. Department of Transportation, Federal Motor Carrier Administration, Motor Carrier Management Information System (MCMIS), Roadside Inspection Activity Summary for Calendar Years, special tabulation, October 3, 2011.

TABLE 5-7. FUEL CONSUMPTION BY TRANSPORTATION MODE: 2007-2009

Sources: **Highway:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1, available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of October 5, 2011. **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 2009* (Washington, DC: 2010), tables 2, 4, and similar tables in earlier editions. **Pipeline:** U.S. Department of Energy, *Natural Gas Annual 2009* (Washington, DC: December 2010), table 15 and similar tables in earlier editions.

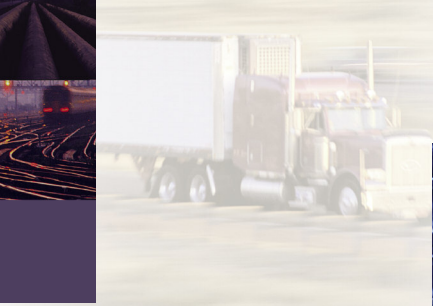


Table 5-8. Energy Consumption by Selected Freight Transportation Mode: 2007-2009 (trillions of BTUs)

	2007	2008	2009
Truck	6,326	6,382	5,944
Class I Rail	563	539	443
Water	1,367	1,065	997
Pipeline (natural gas only)	642	668	617

Notes: Based on a new methodology, FHWA revised its annual vehicle miles travelled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at www.fhwa.dot.gov/policyinformation/statistics.cfm. Data in this figure should not be compared to those in previous editions of *Freight Facts and Figures*. Data do not include energy consumed by oil pipelines (crude petroleum and petroleum products) or coal slurry/water slurry pipelines.

In 2009, trucking accounted for nearly three-fourths of freight transportation energy consumption followed by water, a distant second.

Miles per gallon by single-unit trucks (based on total travel and fuel consumption) have been stable in recent years. In 2009, single-unit trucks consumed 802 million fewer gallons than the previous year.

Table 5-9. Single-Unit Truck Fuel Consumption and Travel: 2007-2009

	2007	2008	2009
Number registered (thousands)	8,117	8,288	8,356
Vehicle miles (millions)	119,979	126,855	120,163
Fuel consumed (million gallons)	16,314	17,144	16,342
Average miles traveled per vehicle	14,782	15,306	14,380
Average miles traveled per gallon	7.4	7.4	7.4
Average fuel consumed per vehicle (gallons)	2,010	2,068	1,956

Notes: Based on a new methodology, FHWA revised its annual vehicle miles travelled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at www.fhwa.dot.gov/policyinformation/statistics.cfm. Data in this table should not be compared to those in previous editions of *Freight Facts and Figures*.

TABLE 5-8. SHARE OF ENERGY CONSUMPTION BY FREIGHT TRANSPORTATION MODE: 2009

Sources: Highway: 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: annual issues), p. 40. Water: U.S. Department of Energy, Energy Information Administration, Fuel Oil and Kerosene Sales 2009 (Washington, DC: 2010), tables 2, 4, and similar tables in earlier editions; U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: annual issues), table MF-24, available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of September 20, 2011. Pipeline: U.S. Department of Energy, Natural Gas Annual 2009, (Washington, DC: December 2010), table 15 and similar tables in earlier editions.

TABLE 5-9. SINGLE-UNIT TRUCK FUEL CONSUMPTION AND TRAVEL: 2007-2009

Source: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1. available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of October 5, 2011.

Miles per gallon by combination trucks (based on total travel and fuel consumption) remained the same between 2007 and 2009. During the same period, vehicle miles traveled by combination trucks declined by 16.4 billion (nearly 9 percent).

Table 5-10. Combination Truck Fuel Consumption and Travel: 2007-2009

	2007	2008	2009
Number registered (thousands)	2,635	2,585	2,617
Vehicle miles traveled (millions)	184,199	183,826	167,842
Fuel consumed (million gallons)	30,904	30,561	28,130
Average miles traveled per vehicle	69,896	71,106	64,132
Average miles traveled per gallon	6.0	6.0	6.0
Average fuel consumed per vehicle (gallons)	11,727	11,821	10,748

Notes: Based on a new methodology, FHWA revised its annual vehicle miles travelled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at www.fhwa.dot.gov/policyinformation/statistics.cfm. Data in this table should not be compared to those in previous editions of *Freight Facts and Figures*.

Table 5-11. Energy Intensities of Selected Domestic Freight Transportation Modes: 2007-2009

	2007	2008	2009
Highway ¹ (Btu per vehicle mile)	(R) 21,238	(R) 21,008	21,127
Railroad (Class I) (Btu per freight car mile)	14,846	14,573	13,907
Railroad (Class I) (Btu per ton mile)	320	305	291

Key: Btu = British thermal unit; R = revised.

¹Based on a new methodology, FHWA revised its annual vehicle miles travelled, number of vehicles, and fuel economy data beginning with 2007. Energy intensity data is based on FHWA fuel use methodology. Information on the new methodology is available at www.fhwa.dot.gov/policyinformation/statistics.cfm. Data in this table should not be compared to those in previous editions of *Freight Facts and Figures*.

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. In recent years, the energy intensity of trucking has remained stable, while rail has improved slightly.

TABLE 5-10. COMBINATION TRUCK FUEL CONSUMPTION AND TRAVEL: 2007-2009

Source: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1. available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of October 5, 2011.

TABLE 5-11. ENERGY INTENSITIES OF DOMESTIC FREIGHT TRANSPORTATION MODES: 2007-2009

Source: Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 30* (Oak Ridge, TN: annual issues), table 2.15, available at <http://cta.ornl.gov/data/index.shtml> as of August 19, 2011.





Table 5-12. Estimated National Average Vehicle Emissions Rates of Heavy-Duty and Light-Duty Vehicles: 2000- 2010 (grams per mile)

	2000	2005	2009	2010
Gasoline				
Cars				
Exhaust HC	0.88	0.49	0.33	0.29
Nonexhaust HC	0.61	0.38	0.25	0.22
Total HC	1.49	0.87	0.57	0.51
Exhaust CO	15.21	8.44	5.63	5.17
Exhaust NO _x	1.98	1.24	0.85	0.77
Light trucks				
Exhaust HC	1.31	0.98	0.79	0.74
Nonexhaust HC	0.63	0.44	0.35	0.33
Total HC	1.94	1.43	1.14	1.08
Exhaust CO	23.44	16.08	12.48	11.77
Exhaust NO _x	2.85	2.04	1.66	1.59
Heavy trucks				
Exhaust HC	2.75	1.87	1.38	1.30
Nonexhaust HC	1.22	0.94	0.81	0.76
Total HC	3.96	2.81	2.19	2.06
Exhaust CO	62.89	47.27	37.26	35.27
Exhaust NO _x	5.84	4.50	3.67	3.56
Diesel				
Cars				
Exhaust HC	0.26	0.16	0.08	0.08
Exhaust CO	1.14	0.57	0.45	0.54
Exhaust NO _x	1.36	1.96	1.38	1.23
Light trucks				
Exhaust HC	0.65	0.66	0.63	0.60
Exhaust CO	3.51	3.74	3.53	3.40
Exhaust NO _x	6.04	5.83	4.96	4.62
Heavy trucks				
Exhaust HC	1.06	1.10	0.94	0.92
Exhaust CO	4.59	4.64	3.72	3.57
Exhaust NO _x	23.20	16.84	12.15	10.97

Key: CO = carbon monoxide; HC = hydrocarbon; NO_x = nitrogen oxides.

Notes: This table is based on MOVES, the latest U.S. Environmental Protection Agency's (EPA) highway vehicle emissions factor model. Tables in previous editions of *Freight Facts and Figures* were based on the MOBILE6 model. Thus, the data in this table should not be compared to those in previous editions. Data are for July of each year.

Air quality is affected by freight vehicle emissions. 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_x). However, since 2000 heavy-duty truck emissions of NO_x have declined by 50 percent.

TABLE 5-12. ESTIMATED NATIONAL AVERAGE VEHICLE EMISSIONS RATES OF HEAVY-DUTY AND LIGHT-DUTY VEHICLES: 2000- 2010

Source: U.S. Environmental Protection Agency, National Vehicle and Fuel Emissions Laboratory, personal communication, September 19, 2011.

Most PM-10 emissions come from agricultural fields, wildfires, and fugitive dust. Consequently, freight transportation is a minor factor when considering total PM-10 emissions.

Table 5-13. Freight Nitrogen Oxides (NO_x) and Particulate Matter (PM-10) Emissions by Freight Transportation Mode: 2002

Mode	NO _x Emissions				PM-10 Emissions			
	Tons (thousands)	Percent	As a percent of:		Tons (thousands)	Percent	As a percent of:	
			All mobile sources	All sources			All mobile sources	All sources
Heavy-duty vehicles	3,782.0	66.8	33.0	17.9	120.0	64.7	23.3	0.5
Freight railroads	857.2	15.1	7.5	4.1	21.3	11.5	4.1	0.1
Marine vessels	1,011.0	17.9	8.8	4.8	44.0	23.7	8.5	0.2
Air freight	8.2	0.1	0.1	0.0	0.3	0.2	0.1	0.0
Total	5,658.4	100.0	49.4	26.8	185.6	100.0	36.0	0.8

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

Trucks are by far the largest contributor to freight emissions nationally, producing two-thirds of NO_x from the freight sector. However, as noted earlier, freight emissions of NO_x have declined significantly since 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 beginning in 2006.

Table 5-14. Current and Projected Nitrogen Oxides (NO_x) Emissions by Freight Transportation Mode: 2002 and 2020

	Tons (thousands)		Percent change, 2002 to 2020
	2002	2020	
Heavy-duty trucks	3,782.0	662.6	-82.5
Freight rail	857.2	486.4	43.3
Commercial marine	1,011.0	938.6	-7.2
Air freight	8.2	12.4	51.2
Total freight	5,658.4	2,100.0	-62.9

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

TABLE 5-13. FREIGHT NITROGEN OXIDES (NO_x) 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* (Washington, DC: 2005), available at www.fhwa.dot.gov/environment/freightaq/ as of August 22, 2011.

TABLE 5-14. CURRENT AND PROJECTED NITROGEN OXIDES (NO_x) EMISSIONS BY FREIGHT TRANSPORTATION MODE: 2002 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* (Washington, DC: 2005), available at www.fhwa.dot.gov/environment/freightaq/ as of August 22, 2011.

Table 5-15. Current and Projected Particulate Matter (PM-10) Emissions by Freight Transportation Mode: 2002 and 2020

	Tons (thousands)		Percent change, 2002 to 2020
	2002	2020	
Heavy-duty trucks	120.0	34.8	-71.0
Freight rail	21.3	13.0	-39.0
Commercial marine	44.0	44.1	0.2
Air freight	0.3	0.3	-10.0
Total freight	185.6	92.1	-50.4

Trucks produced two-thirds of PM-10 emissions from the freight sector. Freight-related PM-10 emissions are forecast to decline by 50 percent from 2002 to 2020, primarily from a reduction in heavy-duty truck emis-

sions. The required use of ULSD fuel in heavy-duty trucks and other diesel-powered highway vehicles has helped to reduce PM emissions and enabled the use of advanced pollution control technologies to meet emissions standards.

In addition to CO, NO_x, and particulate matter emissions, the transportation sector releases large quantities of greenhouse gases (GHGs), such as carbon dioxide (CO₂), methane, nitrous oxide, and hydrofluorocarbons. Transportation is responsible for about 27 percent of all greenhouse gases emitted in the United States and nearly 7 percent of all greenhouse gases emitted globally.¹ When emissions from electricity generation are allocated among end-use sectors (on the basis of each sector's share of electricity consumption), the industrial sector produces the largest amount of GHG emissions, followed closely by transportation.

¹Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report* (Geneva, Switzerland: 2008).

TABLE 5-15. CURRENT AND PROJECTED PARTICULATE MATTER (PM-10) EMISSIONS BY FREIGHT TRANSPORTATION MODE: 2002 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* (Washington, DC: 2005), available at www.fhwa.dot.gov/environment/freightaq/ as of August, 22, 2011.

From 1990 to 2009, transportation GHG emissions rose by 17 percent. However, transportation sector emissions decreased by 4 percent from 2008 to 2009, likely the result of the economic downturn and higher fuel prices, which led to a decrease in vehicle travel and fuel consumption.

Table 5-16. U.S. Greenhouse Gas Emissions by Economic End-Use Sector: 1990-2009 (electricity-related emissions distributed among sectors)¹
(millions of metric tonnes of CO₂ equivalent)

Sector	1990	1995	2000	(R)2005	(R)2008	2009
Industry ²	(R)2,238.3	2,228.0	(R)2,314.4	2,162.5	2,146.5	1,910.9
Transportation ³	1,548.2	1,698.3	1,935.8	2,022.2	1,895.5	1,816.9
Commercial	(R)947.7	1,000.2	(R)1,135.8	1,205.1	1,224.5	1,184.9
Residential	(R)953.8	1,024.5	(R)1,162.2	1,242.9	1,215.1	1,158.9
Agriculture	(R)460.0	497.1	(R)518.4	522.7	531.1	516.0
U.S. Territories ⁴	33.7	40.7	(R)46.0	58.2	48.4	45.5
Total	(R)6,181.8	6,488.8	(R)7,112.7	7,213.5	7,061.1	6,633.2

Key: CO₂ = carbon dioxide; R = revised.

¹Emissions from electricity generation are allocated to each economic end-use sector on the basis of each sector's share of aggregate electricity consumption. This method assumes each sector consumes electricity that is generated from the national average mix of fuels according to their carbon intensity.

²Industry includes manufacturing, construction, and mining. Six manufacturing industries—petroleum refineries, chemicals, primary metals, paper, food, and nonmetallic mineral products—represent the vast majority of energy use and thus GHG emissions in the industrial sector.

³Includes emissions from military aircraft (14.3 million metric tonnes in 2009) and "other" transportation, primarily lubricants (8.5 million metric tonnes in 2009). Emissions from international bunker fuels are not included.

⁴Electricity-related emissions were not distributed to U.S. Territories.

Notes: Greenhouse gas (GHG) emissions include CO₂, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. CO₂ equivalent is computed by multiplying the weight of the gas being measured by its estimated Global Warming Potential (GWP). The Intergovernmental Panel on Climate Change developed the GWP concept to compare the ability of one GHG to trap heat in the atmosphere to another gas. Carbon comprises 12/44 of CO₂ by weight. Numbers may not add to totals due to rounding.

TABLE 5-16. U.S. GREENHOUSE GAS EMISSIONS BY ECONOMIC END-USE SECTOR: 1990-2009

Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009*,

EPA 430-R-11-005 (Washington, DC: April 15, 2011), table ES-8, available at

<http://epa.gov/climatechange/emissions/usinventoryreport.html> as of August 10, 2011.

CO₂ accounts for nearly all of the transportation sector's GHG emissions, primarily from the combustion of fossil fuels. Almost all of the energy consumed by the sector is petroleum-based and includes motor gasoline, diesel fuel, jet fuel, and residual oil. Gasoline-fueled passenger cars and light-duty trucks are responsible for about 65 percent of transportation sector CO₂ emissions while the combustion of diesel fuel in heavy-duty trucks and jet fuel in aircraft produced much of the rest.

Table 5-17. U.S. Transportation Sector CO₂ Emissions from Fossil Fuel Combustion by Fuel Type: 1990-2009
(millions of metric tonnes of CO₂ equivalent)

Fuel	1990	1995	2000	2005	2008	2009
Petroleum	(R)1,449.9	(R)1,569.8	1,773.9	(R)1863.5	(R)1,753.1	1,683.4
Motor gasoline	(R)983.7	(R)1,041.8	(R)1,135.0	(R)1187.8	(R)1,130.3	1,125.7
Distillate fuel oil	262.9	324.2	402.5	458.1	(R)443.5	402.5
Jet fuel	176.2	170.9	199.8	(R)194.2	(R)155.1	138.8
Residual fuel ¹	22.6	29.1	33.3	19.3	(R)19.9	12.0
Aviation gasoline	3.1	2.7	2.5	2.4	2.0	1.8
Liquefied petroleum gas	(R)1.4	(R)1.1	0.7	(R)1.7	(R)2.4	2.5
Natural Gas	36.0	38.4	35.6	33.1	(R)36.8	36.3
Transportation Total²	(R)1,485.9	(R)1,608.2	1,809.5	(R)1,896.6	(R)1789.9	1,719.7
U.S. Total²	(R)4,738.4	(R)5,031.5	(R)5,594.8	(R)5,753.2	(R)5565.9	5,209.0
Transportation Sector as % of Total	31.4	32.0	(R)32.3	(R)33.0	32.0	33.0

Key: CO₂ = carbon dioxide; R = revised.

¹Fluctuations in emissions estimates reflect data collection problems.

²Electricity-related emissions are not included in the transportation sector and U.S. totals.

Note: CO₂ equivalent is computed by multiplying the weight of the gas being measured by its estimated Global Warming Potential (GWP). The Intergovernmental Panel on Climate Change developed the GWP concept to compare the ability of one GHG to trap heat in the atmosphere to another gas. Carbon comprises 12/44 of CO₂ by weight. Numbers may not add to totals due to rounding. Electricity-related emissions are not included in this table.

TABLE 5-17. U.S. TRANSPORTATION SECTOR CO₂ EMISSIONS FROM FOSSIL FUEL COMBUSTION BY FUEL TYPE: 1990-2009

Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009*, EPA 430-R-11-005 (Washington, DC: April 15, 2011), Annex 2, tables A-11, A-12, A-15, A-20, A-25, and A-30, available at <http://epa.gov/climatechange/emissions/usinventoryreport.html> as of August 10, 2011.



Table 5-18. U.S. Greenhouse Gas Emissions from Domestic Freight Transportation: 1990-2009
(millions of metric tonnes of CO₂ equivalent)

Mode	1990	1995	2000	2005	2008	2009	Percent change, 1990 to 2009
Trucking	231.1	(R)277.8	(R)354.5	(R)408.4	(R)403.1	365.6	58.2
Freight Rail	34.5	39.1	42.8	46.7	(R)44.5	37.2	7.8
Ships and Other Boats ¹	30.6	42.2	48.3	27.9	(R)22.6	13.5	-55.9
Pipelines ²	36.1	(R)38.2	35.2	(R)32.2	(R)35.7	35.2	-2.5
Commercial Aircraft	23.7	24.8	29.6	26.0	18.0	16.4	-30.8
Freight Total	356.0	422.1	510.5	(R)541.1	(R)523.7	467.9	31.4
Passenger Total	(R)1,145.7	(R)1,241.0	1,391.8	(R)1,452.5	(R)1,345.8	1,326.1	15.7
Transportation Total³	1,548.2	1,698.3	1,935.8	(R)2,022.2	(R)1,895.5	1,816.9	17.4
Freight as % of Transportation Total	23.0	24.9	26.4	26.8	27.6	25.8	12.2

Key: CO₂ = carbon dioxide; R = revised.

¹Fluctuations in emissions estimates reflect data collection problems.

²Includes only CO₂ emissions from natural gas used to power pipelines.

³Includes greenhouse gas emissions from military aircraft (14.3 million metric tonnes); "other" transportation, primarily lubricants (8.5 million metric tonnes); and electricity-related emissions. Emissions from international bunker fuels are not included.

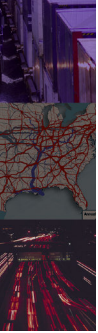
Notes: U.S. Environmental Protection Agency (EPA) used U.S. Department of Energy fuel consumption data to allocate freight and passenger rail emissions. EPA used U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics data on freight shipped by commercial aircraft and the total number of passengers enplaned to split commercial aircraft emissions. Each passenger was estimated to weigh an average of 150 pounds and luggage was estimated to weigh 50 pounds. Previous inventories included commercial aircraft emissions under passenger travel. CO₂ equivalent is computed by multiplying the weight of the gas being measured by its estimated Global Warming Potential (GWP). The Intergovernmental Panel on Climate Change developed the GWP concept to compare the ability of one GHG to trap heat in the atmosphere to another gas. Carbon comprises 12/44 of CO₂ by weight. Numbers may not add to totals due to rounding.

Since 1990, the rate of growth of GHG emissions from freight sources has been twice as fast as that for passenger travel (31.4 percent vs. 15.7 percent). Trucking accounted for the lion's share of freight emissions followed by freight rail, a distant second.

TABLE 5-18. U.S. GREENHOUSE GAS EMISSIONS FROM DOMESTIC FREIGHT TRANSPORTATION: 1990-2009

Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009*, EPA 430-R-11-005 (Washington, DC: April 15, 2011), table ES-8 and Annex 3, tables A-111 and A-112, available at

www.epa.gov/climatechange/emissions/usinventoryreport.html as of August 10, 2011.



Between 1990 and 2009, medium- and heavy-duty truck emissions rose by more than 58 percent, the largest percentage increase of any major transportation mode. An increase in truck freight movement is largely responsible for the rise in emissions.

Table 5-19. Medium- and Heavy-Duty Truck Greenhouse Gas Emissions: 1990-2009
(millions of metric tonnes of CO₂ equivalent)

	1990	1995	2000	2005	2008	2009
Carbon dioxide (CO ₂)	230.1	274.8	345.8	396.0	(R)390.4	353.1
Methane	0.2	0.2	0.1	0.1	0.1	0.1
Nitrous Oxide	0.8	1.0	1.2	1.1	1.0	0.8
Hydrofluorocarbons	<0.05	1.7	7.4	11.1	11.6	11.6
Total Truck (R)	231.1	277.7	(R)354.6	(R)408.4	(R)403.1	365.5
Total U.S. Transportation¹	(R)1,548.3	1,698.3	1,935.8	(R)2,022.2	(R)1,895.5	1,816.90
Total U.S.¹	(R)6,181.8	6,488.8	(R)7,112.7	(R)7,213.5	(R)7,061.1	6,633.20
Truck share of transportation total (percent)	14.9	16.5	18.3	20.2	(R)21.3	20.1
Truck share of U.S. total (percent)	(R)3.7	4.3	5.0	5.7	(R)5.7	5.6

Key: CO₂ = carbon dioxide; R = revised.

¹Transportation and U.S. totals include greenhouse gas emissions from military aircraft (14.3 million metric tonnes in 2009); "other" transportation, primarily lubricants (8.5 million metric tonnes in 2009); and electricity-related emissions. Emissions from international bunker fuels are not included.

Notes: CO₂ equivalent is computed by multiplying the weight of the gas being measured by its estimated Global Warming Potential (GWP). The Intergovernmental Panel on Climate Change developed the GWP concept to compare the ability of one GHG to trap heat in the atmosphere to another gas. Carbon comprises 12/44 of CO₂ by weight. Medium- and heavy-duty trucks weigh 8,501 pounds and above. Numbers may not add to totals due to rounding.



TABLE 5-19. MEDIUM- AND HEAVY-DUTY TRUCK GREENHOUSE GAS EMISSIONS: 1990-2009

Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009*, EPA 430-R-11-005 (Washington, DC: April 15, 2011), tables 2-15 and ES-8, available at <http://epa.gov/climatechange/emissions/usinventoryreport.html> as of August 10, 2011.

APPENDIX. SELECTED METRIC DATA

Table 2-1M. Weight of Shipments by Transportation Mode: 2007, 2010, and 2040¹
(millions of metric tonnes)

	2007				2010				2040			
	Total	Domestic	Exports ²	Imports ²	Total	Domestic	Exports ²	Imports ²	Total	Domestic	Exports ²	Imports ²
Total	17,127	15,288	594	1,245	16,613	14,873	692	1,049	24,933	20,939	1,655	2,340
Truck	11,592	11,418	86	88	11,331	11,167	86	78	16,786	16,334	247	205
Rail	1,723	1,583	56	84	1,611	1,492	51	67	2,134	1,849	141	145
Water	853	457	50	346	780	421	61	298	1,146	539	103	504
Air, air & truck	12	2	4	5	11	2	4	5	39	7	14	18
Multiple modes & mail	1,292	380	362	550	1,252	363	450	440	2,713	539	1,062	1,111
Pipeline	1,367	1,204	4	159	1,355	1,198	6	152	1,649	1,312	8	328
Other & unknown	287	241	33	13	274	230	34	10	466	359	79	29

¹Many 2007 and 2040 numbers in this table were revised as a result of Freight Analysis Framework (FAF) database improvements in FAF version 3.2.

²Data do not include imports and exports that pass through the United States from a foreign origin to a foreign destination by any mode.

Notes: 1 metric tonne = 1.1023 short tons. Numbers may not add to totals due to rounding. The 2010 data are provisional estimates, which are based on selected modal and economic trend data. All truck, rail, water, and pipeline movements that involve more than one mode, including exports and imports that change mode at international gateways, are included in multiple modes & mail to avoid double counting. As a consequence, rail and water totals in this table are less than other published sources.

Table 2-3M. Top Commodities: 2007¹

Millions of Metric Tonnes		Billions of Dollars	
Total, all commodities	17,128	Total, all commodities	16,651
Gravel	2,054	Machinery	1,759
Cereal grains	1,338	Electronics	1,430
Coal	1,311	Motorized vehicles	1,267
Non-metallic mineral products	1,263	Mixed freight	1,061
Waste/scrap	1,202	Pharmaceuticals	880
Natural gas, coke, asphalt ²	1,175	Textiles/leather	696
Gasoline	912	Miscellaneous manufactured products	692
Crude petroleum	759	Gasoline	689
Fuel oils	676	Plastics/rubber	578
Natural sands	517	Articles of base metal	573

¹Many 2007 numbers in this table were revised as a result of Freight Analysis Framework (FAF) improvements in FAF version 3.2.

²This group includes coal and petroleum products not elsewhere classified such as liquefied natural gas, coke, asphalt, and other products of coal and petroleum refining, excluding gasoline, aviation fuel, and fuel oil.

Note: 1 metric tonne = 1.1023 short tons.

TABLE 2-1M. WEIGHT OF SHIPMENTS BY TRANSPORTATION MODE: 2007, 2010, AND 2040

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.2, 2011.

TABLE 2-3M. TOP COMMODITIES: 2007

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.2, 2011.

Table 2-4M. Hazardous Materials Shipments by Transportation Mode: 2007

Transportation mode	Value		Metric Tonnes		Tonne kilometers		Kilometers
	\$ Billions	Percent	Millions	Percent	Billions	Percent	Average distance per shipment
All modes, total	1,448	100.0	2,024	100.0	472	100.0	154
Single modes, total	1,371	94.6	1,916	94.6	408	86.3	105
Truck ¹	837	57.8	1091	53.9	152	32.2	95
For-hire	359	24.8	449	22.2	92	19.6	344
Private ²	478	33.0	642	31.7	59	12.6	51
Rail	69	4.8	118	5.8	135	28.5	930
Water	69	4.8	136	6.7	54	11.5	616
Air	2	0.1	S	S	S	S	1,762
Pipeline ³	393	27.2	571	28.2	S	S	S
Multiple modes, total	71	4.9	101	5.0	63	13.3	1,342
Parcel, U.S. Postal Service, or Courier	8	0.5	<1	<0.1	<1	<0.1	1,345
Other multiple modes	28	1.9	51	2.5	25	5.3	375
Unknown and other modes, total	7	0.5	8	0.4	2	0.5	93

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

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

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

³Excludes crude oil shipments.

Notes: 1 metric tonne = 1.1023 short tons; 1 tonne kilometer = 0.6849 ton miles. Numbers and percents may not add to totals due to rounding.

Table 2-5M. Hazardous Materials Shipments by Hazard Class: 2007

Hazard class	Description	Value		Metric tonnes		Tonne kilometers	
		\$ Billions	Percent	Millions	Percent	Billions	Percent
Class 1	Explosives	12	0.8	3	0.1	<1	<0.1
Class 2	Gases	132	9.1	206	11.2	118	17.1
Class 3	Flammable liquids	1,170	80.8	1,443	78.6	387	56.3
Class 4	Flammable solids	4	0.3	17	0.9	12	1.7
Class 5	Oxidizers and organic peroxides	7	0.5	12	0.7	15	2.2
Class 6	Toxic (poison)	21	1.5	9	0.5	12	1.8
Class 7	Radioactive materials	21	1.4	<1	<0.1	<1	<0.1
Class 8	Corrosive materials	51	3.6	94	5.1	95	13.8
Class 9	Miscellaneous dangerous goods	30	2.1	52	2.8	49	7.1
Total		1,448	100.0	1,836	100.0	688	100.0

Notes: 1 metric tonne = 1.1023 short tons; 1 tonne kilometer = 0.6849 ton miles. Numbers and percents may not add to totals due to rounding.

TABLE 2-4M. HAZARDOUS MATERIALS SHIPMENTS BY TRANSPORTATION MODE: 2007

Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2007 Commodity Flow Survey, Hazardous Materials* (Washington, DC: February 2010), table 1a, available at www.bts.gov/publications/commodity_flow_survey/ as of August 22, 2011.

TABLE 2-5M. HAZARDOUS MATERIALS SHIPMENTS BY HAZARD CLASS: 2007

Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2007 Commodity Flow Survey, Hazardous Materials* (Washington, DC: February 2010), table 1a, available at www.bts.gov/publications/commodity_flow_survey/ as of August 22, 2011.

Table 2-6M. Domestic Mode of Exports and Imports by Tonnage and Value: 2007 and 2040¹

	Millions of Metric Tonnes		Billions of 2007 Dollars	
	2007	2040	2007	2040
Total	1,839	3,995	3,193	9,863
Truck²	697	1,760	1,345	3,889
Rail	240	505	197	422
Water	128	223	52	93
Air, air & truck³	9	32	927	3,619
Multiple modes & mail⁴	133	374	278	899
Pipeline	314	597	137	255
Other & unknown	46	108	127	497
No domestic mode⁵	272	395	130	189

¹Many 2007 and 2040 numbers in this table were revised as a result of Freight Analysis Framework (FAF) improvements in FAF version 3.2.

²Excludes truck moves to and from airports.

³Includes truck moves to and from airports.

⁴Multiple modes & mail includes U.S. Postal Service, courier shipments, and all intermodal combinations, except air and truck. In this table, oceangoing export and import shipments that move between ports and domestic locations by single modes are classified by the domestic mode rather than multiple modes & mail.

⁵No domestic mode includes waterborne import shipments of crude petroleum off-loaded directly at the domestic destination (refineries) with no domestic mode of transportation.

Notes: 1 metric tonne = 1.1023 short tons. Numbers may not add to totals due to rounding.

Table 2-8M. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 2000-2010 (billions of current U.S. dollars and millions of metric tonnes)

Mode	2000		2005		2009		2010	
	Value	Weight	Value	Weight	Value	Weight	Value	Weight
Truck ¹	429	NA	491	173	455	141	557	170
Rail ¹	94	NA	116	128	96	98	131	122
Air	45	<1	33	<1	39	<1	45	<1
Water	33	176	58	232	59	172	81	190
Pipeline ¹	24	NA	52	78	49	89	63	96
Other ¹	29	NA	39	5	37	5	40	8
Total¹	653	NA	790	616	735	506	918	586

Key: NA = not available.

¹The U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics estimated the weight of exports for truck, rail, pipeline, and other modes using weight-to-value ratios derived from imported commodities.

Notes: 1 metric tonne = 1.1023 short tons. "Other" includes shipments transported by mail, other and unknown modes, and shipments through Foreign Trade Zones. Totals for the most recent year differ slightly from the Freight Analysis Framework due to variations in coverage and FAF conversion of values to constant dollars. Numbers may not add to totals due to rounding.

TABLE 2-6M. DOMESTIC MODE OF EXPORTS AND IMPORTS BY TONNAGE AND VALUE: 2007 AND 2040

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.2, 2011.

TABLE 2-8M. VALUE AND TONNAGE OF U.S. MERCHANDISE TRADE WITH CANADA AND MEXICO BY TRANSPORTATION MODE: 2000-2010

Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, North American Transborder Freight Data, available at www.bts.gov/transborder as of August 28, 2011; U.S. Department of Commerce, Census Bureau, Foreign Trade Division, FT920 - *U.S. Merchandise Trade: Selected Highlights* (Washington, DC: annual issues).

Table 3-1M. Kilometers of Infrastructure by Transportation Mode: 1980-2009

	1980	1990	2000	2008	2009
Public roads, route kilometers	6,211,518	6,222,926	6,358,386	6,532,576	NA
National Highway System (NHS)	N	N	417,439	264,075	NA
Interstates	66,173	72,536	75,109	75,657	NA
Other NHS	N	N	184,287	188,418	NA
Other	N	N	6,098,989	6,268,500	NA
Strategic Highway Corridor Network (STRAHNET)	N	N	99,881	100,182	NA
Interstate	N	N	75,113	75,657	NA
Non-Interstate	N	N	24,765	24,525	NA
Railroad	2,946,204	283,085	274,400	224,213	223,878
Class I	NA	214,337	194,073	151,403	151,144
Regional	NA	29,570	33,759	26,859	20,605
Local	NA	39,165	46,567	45,951	52,129
Inland waterways					
Navigable channels	17,702	17,702	17,702	17,702	17,702
Great Lakes-St. Lawrence Seaway	3,769	3,769	3,769	3,769	3,769
Pipelines					
Oil	351,453	335,938	284,834	278,404	275,713
Gas	1,692,588	1,913,743	2,203,573	2,454,136	2,456,389

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

¹Excludes Class III railroads.

Note: 1 kilometer = 0.6214 miles.

TABLE 3-1M. KILOMETERS OF INFRASTRUCTURE BY TRANSPORTATION MODE: 1980-2009

Sources: **Public roads:** U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), tables HM-16 and HM-49, available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of October 5, 2011. **Rail:** Association of American Railroads, *Railroad Facts* (Washington, DC: annual issues). **Navigable channels:** U.S. Army Corps of Engineers, *A Citizen's Guide to the USACE*, available at www.corpsreform.org/sitepages/downloads/CitzGuideChptr1.pdf as of October 5, 2011. **Great Lakes-St. Lawrence Seaway:** The St. Lawrence Seaway Development Corporation, "The Seaway," available at www.greatlakes-seaway.com/en/seaway/facts/index.html as of October 5, 2011. **Oil pipelines: 1980-2000:** Eno Transportation Foundation, *Transportation in America, 2002* (Washington, DC: 2002). **2001-2009:** 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 as of October 5, 2011. **Gas pipelines:** American Gas Association, *Gas Facts* (Arlington, VA: annual issues).

Table 3-3M. Top 25 Airports by Landed Weight of All-Cargo Operations: 2000-2009¹

Airport	2009 Rank	Landed weight (thousands of metric tonnes)				
		2000	2006	2007	2008	2009
Memphis, TN (Memphis International)	1	5,732	8,550	8,865	8,845	8,586
Anchorage, AK (Ted Stevens Anchorage International) ²	2	7,333	9,605	9,582	8,143	7,042
Louisville, KY (Louisville International-Standiford Field)	3	3,617	4,550	4,732	4,738	4,662
Miami, FL (Miami International)	4	2,657	3,258	3,370	3,170	2,882
Indianapolis, IN (Indianapolis International)	5	2,624	2,383	2,406	2,326	2,075
Los Angeles, CA (Los Angeles International)	6	2,616	3,290	3,112	2,609	1,710
Chicago, IL (O'Hare International)	7	2,534	2,003	1,996	1,908	1,587
New York, NY (John F. Kennedy International)	8	1,870	2,372	2,320	2,016	1,443
Newark, NJ (Newark Liberty International)	9	1,643	1,694	1,700	1,566	1,328
Fort Worth, TX (Dallas/Fort Worth International)	10	1,779	1,562	1,591	1,464	1,303
Oakland, CA (Metropolitan Oakland International)	11	1,534	1,631	1,643	1,580	1,216
Atlanta, GA (William B. Hartsfield International)	12	1,107	1,070	1,144	1,059	1,159
Ontario, CA (Ontario International)	13	1,319	1,271	1,265	1,225	1,060
Philadelphia, PA (Philadelphia International)	14	989	1,239	1,248	1,146	1,027
Honolulu, HI (Honolulu International)	15	628	888	1,028	936	926
Seattle, WA (Seattle-Tacoma International)	16	1,149	643	627	677	729
Houston, TX (George Bush Intercontinental)	17	435	631	698	684	711
San Francisco, CA (San Francisco International)	18	961	752	943	703	678
Denver, CO (Denver International)	19	593	645	583	567	566
Phoenix, AZ (Sky Harbor International)	20	835	659	645	612	554
Chicago/Rockford, IL (Chicago/Rockford International)	21	800	631	669	644	512
Cincinnati, OH (Cincinnati/Northern Kentucky International) ³	22	817	91	88	94	512
Portland, OR (Portland International)	23	564	662	647	595	494
San Juan, PR (Luis Munoz Marin International)	24	681	549	474	391	493
Minneapolis, MN (Minneapolis-St Paul International/Wold-Chamberlain)	25	638	562	555	510	430
Top 25 airports⁴		47,520	51,686	52,359	48,645	43,684
United States, all airports⁵		67,807	69,275	69,476	64,666	57,327
Top 25 as % of U.S. total		70.1	74.6	75.4	75.2	76.2

¹Dedicated to the exclusive transportation of cargo, all-cargo operations do not include aircraft carrying passengers that also may be carrying cargo. Aircraft landed weight is the certificated maximum gross landed weight of the aircraft as specified by the aircraft manufacturers.

²Anchorage includes a large share of all-cargo operations in-transit.

³The significant 2006 decrease in landed weight at Cincinnati/ Northern Kentucky International Airport was due to a major reduction in DHL Airways' cargo operations, which have since rebounded.

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

Note: 1 metric tonne = 1.1023 short tons.

TABLE 3-3M. TOP 25 AIRPORTS BY LANDED WEIGHT OF ALL-CARGO OPERATIONS: 2000-2009

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/planning_capacity/passenger_allcargo_stats/passenger/as of August 19, 2011.



Table 3-4M. Trucks and Truck Kilometers by Average Weight: 1987-2002¹

Average weight (kilograms)	1987		1992		1997		2002		Percent Change, 1987 to 2002	
	Number (thousands)	VKT (millions)	Number (thousands)	VKT (millions)	Number (thousands)	VKT (millions)	Number (thousands)	VKT (millions)	Number	VKT
Total	3,624	144,789	4,008	168,952	4,701	237,972	5,415	234,348	49.4	61.9
Light-heavy	1,030	17,328	1,259	22,550	1,436	31,888	1,914	42,252	85.9	143.8
4,536 to 6,350	525	8,754	694	12,874	819	18,509	1,142	24,439	117.6	179.2
6,351 to 7,257	242	4,407	282	4,791	316	6,359	396	9,508	63.6	115.8
7,258 to 8,845	263	4,168	282	4,884	301	7,020	376	8,306	43.2	99.3
Medium-heavy	766	12,200	732	13,103	729	16,301	910	18,934	18.8	55.2
8,846 to 11,793	766	12,200	732	13,103	729	16,301	910	18,934	18.8	55.2
Heavy-heavy	1,829	115,261	2,017	133,299	2,536	189,782	2,591	173,161	41.7	50.2
11,794 to 14,969	377	8,707	387	9,163	428	11,414	437	9,407	15.9	8.0
14,969 to 18,144	209	6,619	233	8,505	257	10,612	229	6,066	9.7	-8.4
18,144 to 22,680	292	12,271	339	15,484	400	21,046	318	10,778	9.0	-12.2
22,680 to 27,216	188	11,517	227	13,998	311	20,361	327	14,404	73.8	25.1
27,216 to 36,287	723	73,123	781	82,143	1,070	120,250	1,179	124,701	63.1	70.5
36,288 to 45,359	28	2,018	33	2,460	46	3,906	69	4,747	144.3	15.2
45,360 to 58,967	8	708	12	1,181	18	1,691	26	2,528	238.5	257.2
58,967 or more	4	298	5	365	6	502	6	530	43.2	77.9

Key: VKT = vehicle kilometers traveled.

¹Excludes trucks with an average weight of 4,536 kilograms (10,000 pounds) or less.

Note: 1 kilometer = 0.6214 miles; 1 kilogram = 2.2046 pounds. 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.

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

	Number of Trucks (thousands)	Truck Kilometers (millions)	Kilometers per Truck (thousands)
Total	5,521	233,622	42
Off the road	183	3,641	20
50 miles or less	2,942	68,444	23
51 to 100 miles	685	30,836	45
101 to 200 miles	244	18,957	78
201 to 500 miles	232	28,194	122
501 miles or more	293	42,978	147
Not reported	716	40,330	56
Not applicable	226	241	1
Operated in Canada	2	116	69
Operated in Mexico	2	47	30
Operated within the home base state	4,196	136,746	33
Operated in states other than the home base state	496	65,821	133
Not reported	599	30,650	51
Not applicable	226	241	1

Notes: 1 kilometer = 0.6214 miles. Includes trucks registered to companies and individuals in the United States except pickups, minivans, other light vans, and sport utility vehicles. Numbers may not add to totals due to rounding.

TABLE 3-4M. TRUCKS AND TRUCK KILOMETERS BY AVERAGE WEIGHT: 1987-2002

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 as of August 22, 2011; U.S. Department of Commerce, Census Bureau, 1992 Truck Inventory and Use Survey: United States, TC92-T-52 (Washington, DC: 1995), available at www.census.gov/prod/ec97/97tv-us.pdf as of August 22, 2011.

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 as of August 22, 2011.

Table 3-8M. Truck Kilometers by Products Carried: 2002¹

Products carried	Millions of kilometers
Total²	233,622
Animals and fish, live	1,182
Animal feed and products of animal origin	3,360
Grains, cereal	2,201
All other agricultural products	4,282
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 prepared foodstuffs	11,953
Logs and other wood in the rough	1,849
Paper or paperboard articles	5,052
Printed products	1,231
Pulp, newsprint, paper, paperboard	3,115
Wood products	5,730
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	10,424
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	1,365
Plastic and rubber	3,850
All other coal and refined petroleum products	1,886
Hazardous waste (EPA manifest)	306
All other waste and scrape (non-EPA manifest)	4,260
Recyclable products	1,484
Mail and courier parcels	7,660
Empty shipping containers	1,278
Passengers	440
Mixed freight	23,590
Products, equipment, or materials not elsewhere classified	426
Products not specified	10,232
Not applicable ³	241
No product carried	46,632

¹Excludes pickups, minivans, other light vans, and sport utility vehicles.

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

³Vehicles 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 = 0.6214 miles.

TABLE 3-8M. 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 <http://www.census.gov/prod/ec02/ec02tv-us.pdf> as of August 22, 2011.



Table 5-7M. Fuel Consumption by Transportation Mode: 2007-2009

	2007	2008	2009
Highway¹			
Gasoline, diesel and other fuels (million liters)	666,929	646,349	636,412
Truck, total	178,724	180,562	168,328
Single-unit 2-axle 6-tire or more truck	61,750	64,888	61,855
Combination truck	116,973	115,673	106,473
Truck (percent of total)	101.4	27.9	26.4
Rail, Class I (in freight service)			
Distillate / diesel fuel (million liters)	15,375	14,709	12,082
Water			
Residual fuel oil (million liters)	23,948	19,174	17,197
Distillate / diesel fuel oil (million liters)	7,282	4,495	4,793
Gasoline (million liters)	4,625	4,301	4,278
Pipeline			
Natural gas (million cubic meters)	17,595	18,348	16,940

¹Based on a new methodology, FHWA revised its annual vehicle miles travelled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at www.fhwa.dot.gov/policyinformation/statistics.cfm. Data in this table should not be compared to those in previous editions of *Freight Facts and Figures*.

Notes: 1 liter = 0.2642 gallons; 1 cubic meter = 35.3147 cubic feet.

Table 5-9M. Single-Unit Truck Fuel Consumption and Travel: 2007-2009

	2007	2008	2009
Number registered (thousands)	8,117	8,288	8,356
Vehicle kilometers (millions)	193,079	204,144	193,375
Fuel consumed (million liters)	61,750	64,888	61,855
Average kilometers traveled per vehicle	23,788	24,631	23,141
Average kilometers traveled per liter	3.1	3.1	3.1
Average fuel consumed per vehicle (liter)	7,608	7,827	7,403

Notes: 1 kilometer = 0.6214 miles; 1 liter = 0.2642 gallons. Based on a new methodology, FHWA revised its annual vehicle miles travelled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at www.fhwa.dot.gov/policyinformation/statistics.cfm. Data in this table should not be compared to those in previous editions of *Freight Facts and Figures*.

TABLE 5-7M. FUEL CONSUMPTION BY TRANSPORTATION MODE: 2007-2009

Sources: Highway: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1, available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of October 5, 2011. 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 2009* (Washington, DC: 2010), tables 2, 4, and similar tables in earlier editions. Pipeline: U.S. Department of Energy, *Natural Gas Annual 2009* (Washington, DC: December 2010), table 15 and similar tables in earlier editions.

TABLE 5-9M. SINGLE-UNIT TRUCK FUEL CONSUMPTION AND TRAVEL: 2007-2009

Source: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1, available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of October 5, 2011.

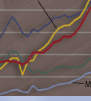


Table 5-10M. Combination Truck Fuel Consumption and Travel: 2007-2009

	2007	2008	2009
Number registered (thousands)	2,635	2,585	2,617
Vehicle kilometers traveled (millions)	296,426	295,826	270,103
Fuel consumed (million liters)	116,973	115,673	106,473
Average kilometers traveled per vehicle	112,481	114,429	103,206
Average kilometers traveled per liter	2.5	2.6	2.5
Average fuel consumed per vehicle (liters)	44,387	44,743	40,681

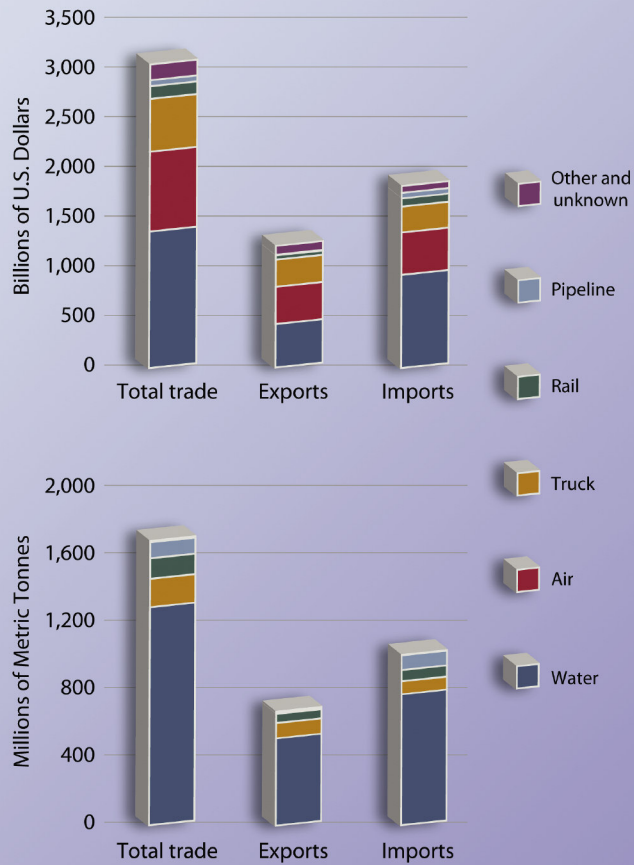
Notes: 1 kilometer = 0.6214 miles; 1 liter = 0.2642 gallons. Based on a new methodology, FHWA revised its annual vehicle miles travelled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at www.fhwa.dot.gov/policyinformation/statistics.cfm. Data in this table should not be compared to those in previous editions of *Freight Facts and Figures*.



TABLE 5-10M. COMBINATION TRUCK FUEL CONSUMPTION AND TRAVEL: 2007-2009

Source: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1, available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of October 5, 2011.

2-2M. U.S. International Merchandise Trade by Transportation Mode: 2010

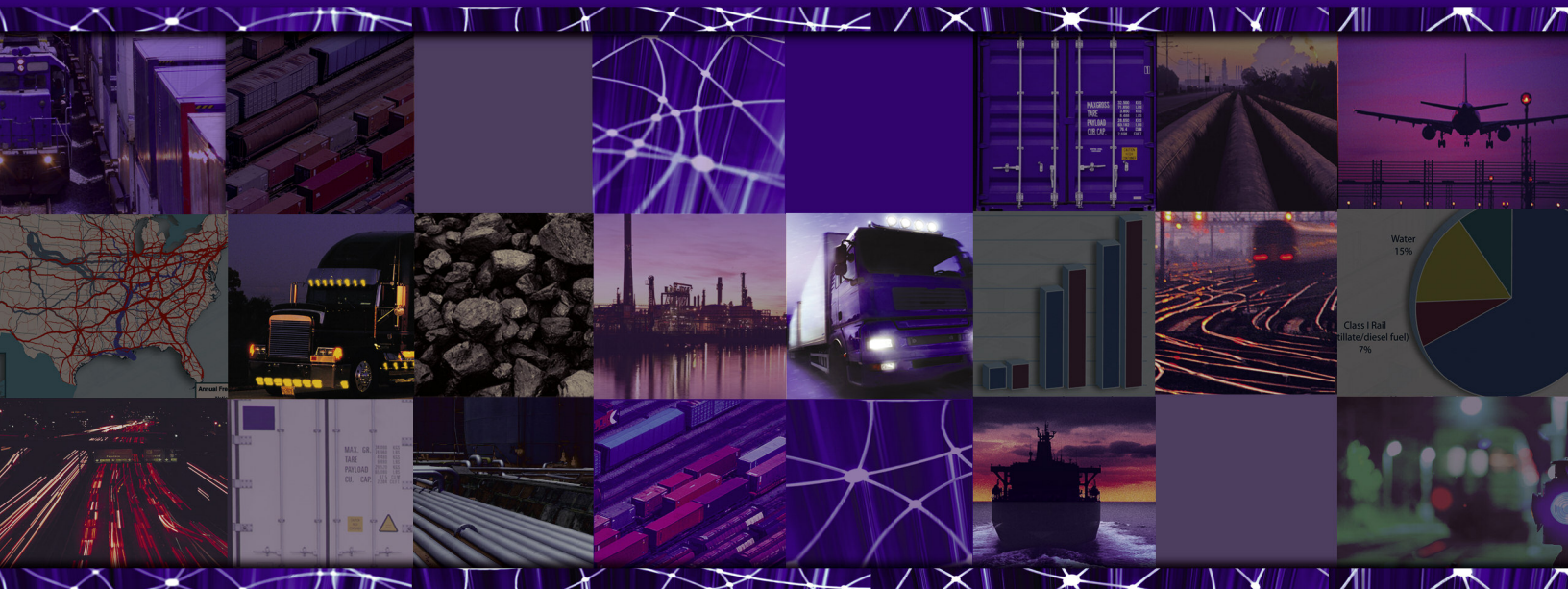


Notes: 1 metric tonne = 1.1023 short tons. The U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration, Bureau of Transportation Statistics estimated 2009 weight data for truck, rail, pipeline, and other and unknown modes using value-to-weight ratios derived from imported commodities. Totals for the most recent year differ slightly from the USDOT, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework (FAF) due to variations in coverage and FAF conversion of values to constant dollars. Numbers may not add to totals due to rounding.

FIGURE 2-2M. U.S. INTERNATIONAL MERCHANDISE TRADE BY TRANSPORTATION MODE: 2009
Sources: Total, water and air data: U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Division, FT920 - U.S. Merchandise Trade: Selected Highlights (Washington, DC: January 2010). Truck, rail, and pipeline data: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, North American Transborder Freight Data, available at www.bts.gov/transborder as of August 15, 2010. Other, unknown and miscellaneous data: special tabulation, August 2011.

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