FREIGHT FACTS AND FIGURES 2012

OFFICE OF FREIGHT MANAGEMENT AND OPERATIONS

U.S. Department of Transportation
Federal Highway Administration

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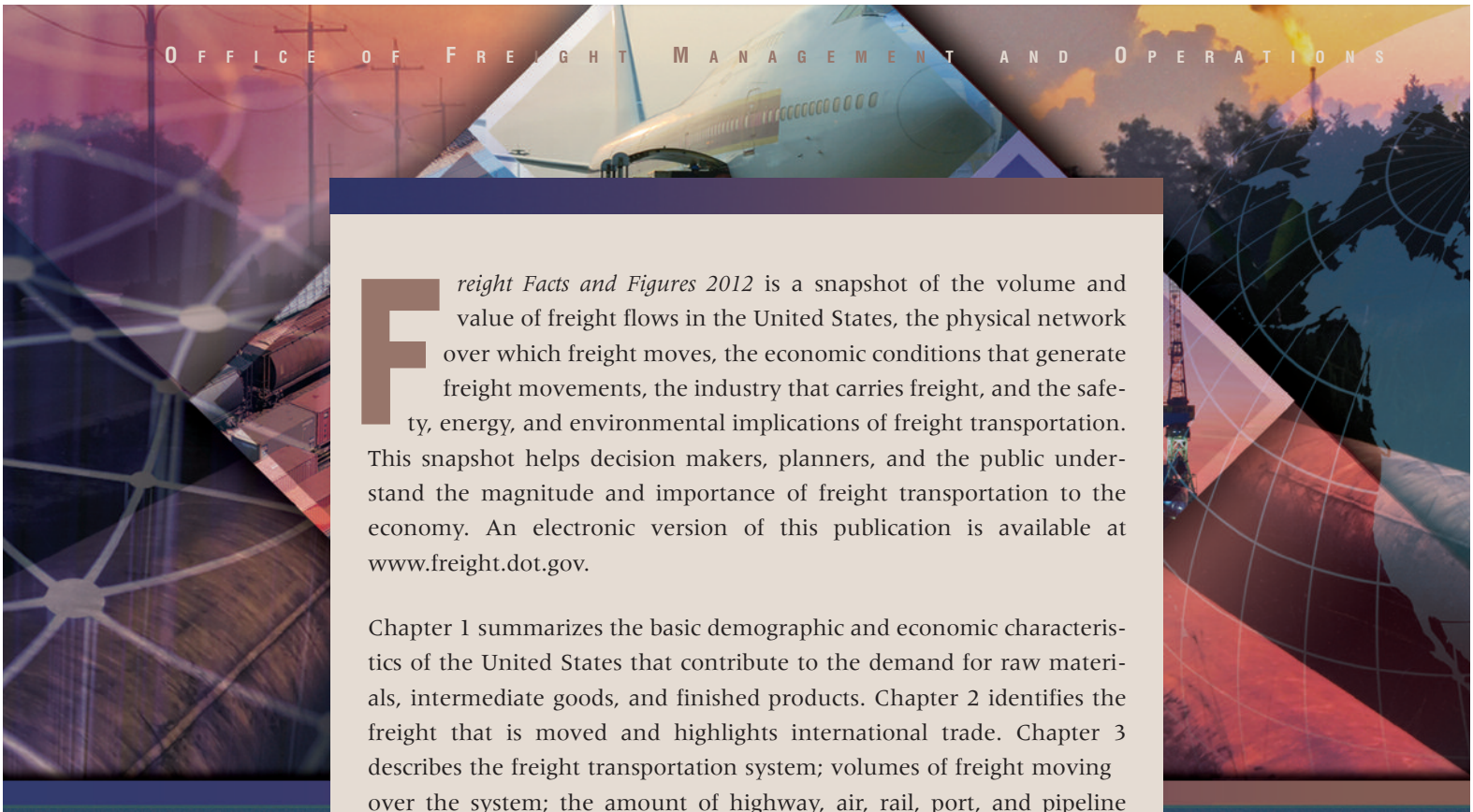

Freight Facts and Figures 2012 is a snapshot of the volume and value of freight flows in the United States, the physical network over which freight moves, the economic conditions that generate freight movements, the industry that carries freight, and the safety, energy, and environmental implications of freight transportation. This snapshot helps decision makers, planners, and the public understand the magnitude and importance of freight transportation to 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 highlights international trade. Chapter 3 describes the freight transportation system; volumes of freight moving over the system; the amount of highway, air, rail, port, and pipeline activities required to move the freight; and the performance of the system. Chapter 4 focuses on the economic characteristics of the transportation industry that operates the system. Chapter 5 covers the safety aspects, energy consumption, and environmental implications of freight transportation.

Several 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).

Many of the tables and figures 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. Please visit www.ops.fhwa.dot.gov/freight/freight_analysis/faf for FAF data and documentation.

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I. THE NATION SERVED BY FREIGHT

The Nation's 117.5 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 24 percent between 1990 and 2010, climbing to 309.3 million in 2010. The U.S. economy, measured by Gross

Table 1-1. Economic and Social Characteristics of the United States: 1990, 2000, and 2008-2010

	1990	2000	2008	2009	2010	Percent change, 1990 to 2010
Resident population (thousands)	248,791	282,172	304,375	307,007	309,330	24.3
Households (thousands)	93,347	104,705	116,783	117,181	117,538	25.9
Median household income (2005 $)	(R)44,790	(R)47,624	(R)45,665	(R)45,325	44,303	-1.1
Civilian labor force (thousands)	125,840	142,583	(R)154,626	(R)153,091	153,613	22.1
Employed[1] (thousands)	118,793	136,891	145,362	139,877	139,064	17.1
Agriculture, forestry, fishing, and hunting (percent)	1.9	1.8	1.5	1.5	1.6	-16.8
Mining	0.5	0.3	0.6	0.5	0.5	-3.0
Construction	6.9	7.3	7.5	6.9	6.5	-4.9
Manufacturing	16.8	14.4	10.9	10.2	10.1	-39.7
Wholesale and retail trade	14.7	14.6	14.2	14.1	14.2	-3.5
Transportation and utilities	5.1	5.4	5.3	5.2	5.1	-0.3
Information	2.9	3.0	2.4	2.3	2.3	-22.3
Financial activities	7.1	6.8	7.0	6.9	6.7	-5.1
Professional and business services	9.4	10.0	10.7	10.7	11.0	16.4
Education and health services	17.5	19.1	21.6	22.7	23.1	31.6
Leisure and hospitality	8.0	8.2	8.8	9.1	9.0	12.0
Other services	4.3	4.7	4.8	5.0	4.9	13.1
Public administration	4.7	4.5	4.7	4.9	5.0	5.9
Business establishments (thousands)	6,176	7,070	7,601	7,433	7,397	19.8
Governmental units[2]	85,006[3]	87,576[4]	89,527[5]	NA	NA	NA
Gross domestic product (millions of 2005 $)	(R)8,027,100	(R)11,216,400	(R)13,161,900	(R)12,757,900	13,063,000	62.7
Foreign trade (millions of 2005 $)	(R)1,973,122	(R)3,251,266	(R)4,461,196	(R)3,621,545	4,200,500	112.9
Goods (percent)	NA	(R)78.2	(R)77.5	(R) 75.3	77.1	NA
Services (percent)	NA	(R)21.8	(R)22.5	(R) 24.7	22.9	NA

Key: NA = not available; R = revised.
[1]Based on the 2002 Census Industry Classification system. Data for 1990 do not appear in the source document; they are estimated using the Bureau of Labor Statistics crosswalk from the 1990 Census Industry Classification system to the 2002 Census Industry Classification system.
[2]Data for governmental units come from the Census of Governments, which is collected every five years.
[3]1992
[4]2002
[5]2007

Table 1-1. Economic and Social Characteristics of the United States: 1990, 2000, and 2008-2010
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 16, 2012. **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 16, 2012. **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 16, 2012. **Employment:** U.S. Department of Labor, Bureau of Labor Statistics, *Current Employment Statistics*, available at www.bls.gov/ces as of August 16, 2012. **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 16, 2012. **Business establishments:** U.S. Department of Commerce, Census Bureau, County Business Patterns, available at www.census.gov/econ/cbp/ as of August 16, 2012. **Governmental units:** U.S Department of Commerce, Census Bureau, *Census of Governments*, available at www.census.gov/govs as of August 16, 2012. **Gross domestic product and foreign trade:** U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Table, tables 1.1.5, available at www.bea.gov/national/FA2004/index.asp as of August 16, 2012.

Domestic Product (GDP), increased by 60 percent in real terms, while household income, another indicator of economic growth, rose by two percent between 1990 and 2010. Foreign trade grew faster than the overall economy, doubling in real value over the same period, reflecting unprecedented global interconnectivity.

Table 1-2. Population and Gross Domestic Product (GDP) by Region: 1990, 2000, and 2008-2010

	1990	2000	(R)2008	(R)2009	2010	Percent change, 1990 to 2010
Resident Population (thousands)	**248,789**	**282,172**	**304,094**	**306,772**	**309,350**	**24.3**
Northeast	50,828	53,668	54,876	55,133	55,361	8.9
Midwest	59,670	64,494	66,524	66,748	66,976	12.2
South	85,454	100,560	112,185	113,549	114,866	34.4
West	52,837	63,451	70,509	71,341	72,147	36.5
GDP (millions of chained 2005 $)[1]	**7,883,332**	**11,223,130**	**13,016,791**	**12,527,057**	**12,918,931**	**63.9**
Northeast	1,808,010	2,344,250	2,634,008	2,547,214	2,634,240	45.7
Midwest	1,766,102	2,490,900	2,659,876	2,526,373	2,618,970	48.3
South	2,503,020	3,763,080	4,507,247	4,372,208	4,521,841	80.7
West	1,806,199	2,622,605	3,215,155	3,079,323	3,142,706	74.0
GDP per capita (chained 2005 $)[1]	**31,687**	**39,774**	**42,805**	**40,835**	**41,762**	**31.8**
Northeast	35,571	43,681	47,999	46,201	47,583	33.8
Midwest	29,598	38,622	39,984	37,849	39,103	32.1
South	29,291	37,421	40,177	38,505	39,366	34.4
West	34,184	41,333	45,599	43,163	43,560	27.4

Key: R = revised.
[1]As 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 Northeast has the highest growth in economic activity per capita.

Table 1-2. Population and Gross Domestic Product (GDP) by Region: 1990, 2000, and 2008-2010
Sources: Population: 1990: U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States: 2004-2005* (Washington, DC: 2005); **2000-2010:** U.S. Department of Commerce, Census Bureau, Population Division, Annual Population Estimates, table 8, available at www.census.gov/popest/data/index.html as of June 25, 2012. **Gross Domestic Product:** U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, available at www.bea.gov/regional/ as of June 25, 2012.

II. FREIGHT MOVED AND INTERNATIONAL TRADE

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, 2011, and 2040 (millions of tons)[1]

	2007				2011				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**	**17,622**	**15,336**	**895**	**1,390**	**28,520**	**23,095**	**2,632**	**2,794**
Truck	12,778	12,587	95	97	11,301	11,065	107	130	18,786	18,083	368	335
Rail	1,900	1,745	61	93	1,895	1,695	108	92	2,770	2,182	388	201
Water	950	504	65	381	825	501	75	248	1,070	559	164	347
Air, air & truck	13	3	4	6	17	3	5	10	53	6	20	27
Multiple modes & mail	1,415	419	389	606	1,618	409	547	662	3,575	645	1,546	1,383
Pipeline	1,507	1,328	4	175	1,652	1,412	6	235	1,740	1,257	17	467
Other & unknown	316	266	36	14	313	251	48	14	526	362	130	34

[1]Many 2007 and 2040 numbers in this table were revised as a result of Freight Analysis Framework (FAF) database improvements in FAF version 3.4.
[2]Data 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 2011 data are provisional estimates that 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 dollars worth nearly $46 billion each day in 2007. Preliminary Freight Analysis Framework (FAF) estimates show that the tonnage of goods moved in 2011 has not yet surpassed the tonnage moved in 2007. The value of freight transported in 2011, however, does show a slight increase over the 2007 value.

FAF tables and figures in this edition are based on version 3.4 and include minor corrections to last year's report, which is based on version 3.2.

Table 2-1. Weight of Shipments by Transportation Mode: 2007, 2011, and 2040
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

Table 2-2. Value of Shipments by Transportation Mode: 2007, 2011, and 2040[1] (billions of 2007 dollars)

	2007				2011				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**	**16,804**	**13,200**	**1,285**	**2,319**	**39,265**	**27,131**	**5,303**	**6,831**
Truck	10,780	10,225	267	287	10,573	9,921	266	386	21,465	19,315	985	1,166
Rail	512	374	45	93	515	380	47	88	898	555	148	195
Water	340	158	15	167	279	151	19	108	337	138	46	153
Air, air & truck	1,077	151	422	505	1,219	158	420	641	5,043	834	1,997	2,212
Multiple modes & mail	2,877	1,639	394	844	3,099	1,658	473	968	9,925	5,203	1,911	2,811
Pipeline	723	658	4	61	779	693	5	81	776	605	17	154
Other & unknown	341	252	48	41	341	239	55	47	821	482	199	139

[1]Many 2007 and 2040 numbers in this table were revised as a result of Freight Analysis Framework (FAF) database improvements in FAF version 3.4.
[2]Data 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 2011 data are provisional estimates that 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 $1,376 per ton in 2040 when controlling for inflation. Exports at $2,015 per ton and imports at $2,445 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 19 percent of the tons and 31 percent of the value by 2040.

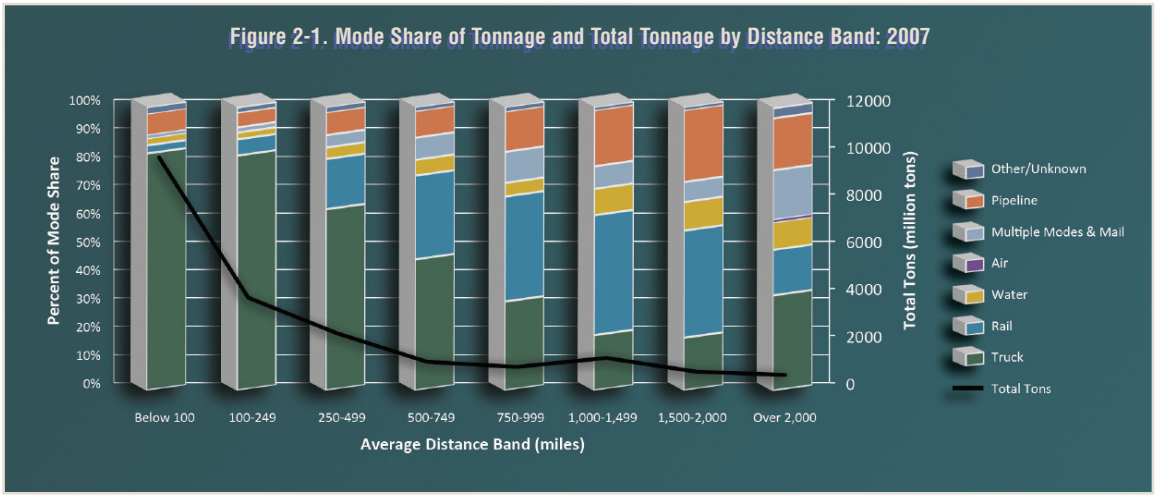
Table 2-3. Total Freight moved by Distance Band: 2007

Distance Band (miles)	Value		Weight		Ton-Miles	
	Percent	Cumulative Percent	Percent	Cumulative Percent	Percent	Cumulative Percent
Below 100	40	40	51	51	7	7
100 - 249	16	56	19	71	10	17
250 - 499	13	69	11	82	13	29
500 - 749	7	76	5	87	9	39
750 - 999	6	82	4	90	10	49
1,000 - 1,499	7	89	6	96	22	71
1,500 - 2,000	4	93	2	98	14	85
Over 2,000	7	100	2	100	15	100

The largest percentage of goods movement occurs close to home. Approximately 50 percent of the weight and 40 percent of the value of goods were moved less than 100 miles between origin and destination in 2007. Less than 10 percent of the weight and 18 percent of the value of goods were moved more than 1,000 miles. Distance, as used in this publication, refers to the Great Circle Distance, which is commonly called "as-the-crow-flies."

TABLE 2-2. VALUE OF SHIPMENTS BY TRANSPORTATION MODE: 2007, 2011, AND 2040
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

TABLE 2-3. TOTAL FREIGHT MOVED BY DISTANCE BAND: 2007
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Managements and Operations, Freight Analysis Framework, version 3.4, 2012.



Trucks carry the largest share of goods by weight for distances less than 750 miles and more than 2,000 miles. Rail is the dominant mode for goods moved over distances greater than 750 miles and less than 2,000 miles, accounting for 37 percent of total freight moved.

By value, trucks moved the largest percentage of goods across all distance bands, with the largest share, 84 percent, occurring for the shortest distances. With increasing distance, the multiple modes and mail category's share increases from 4 percent for local travel to a high of 34 percent for the longest distance band.

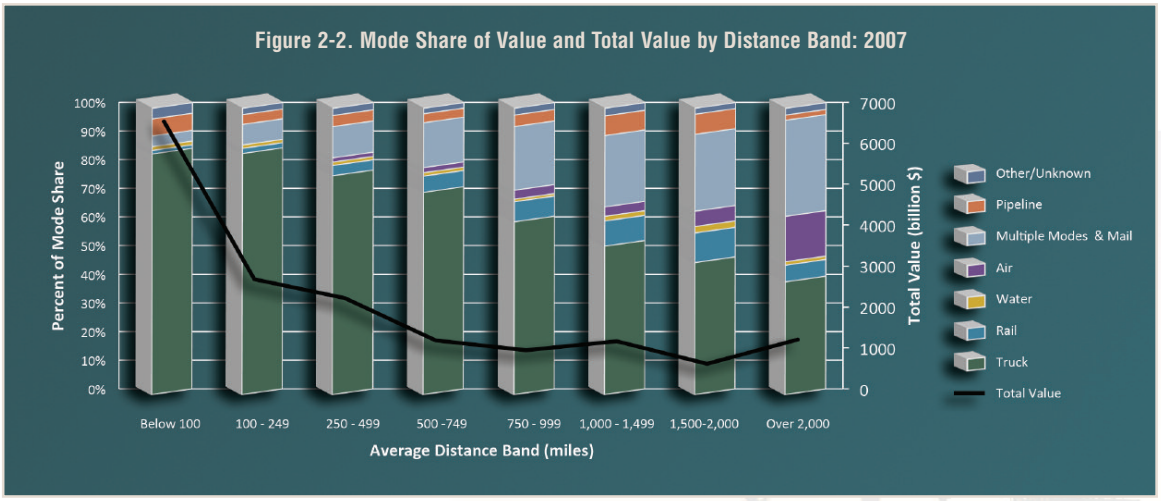
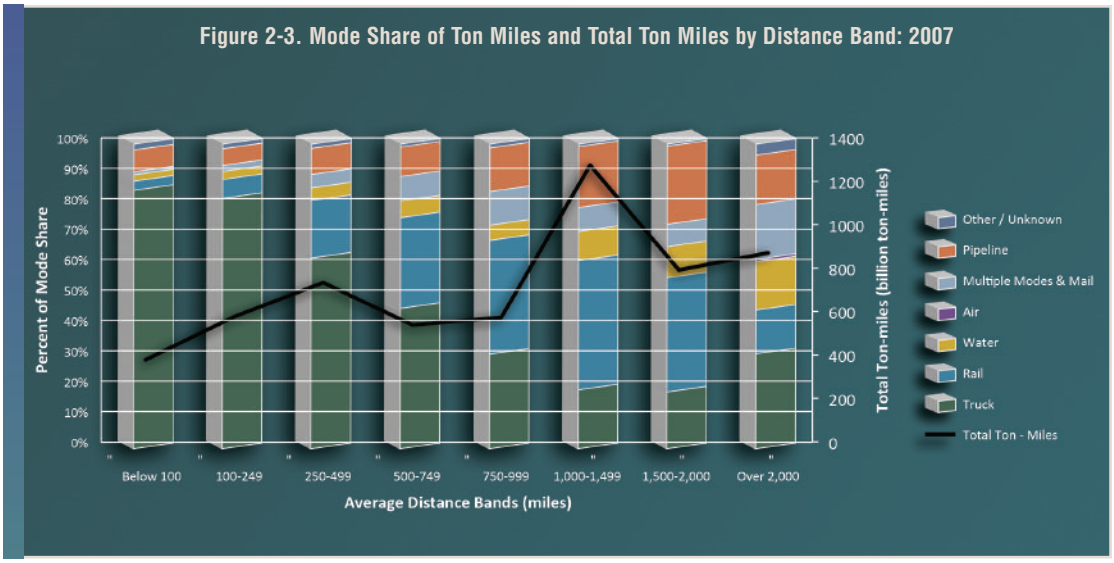


Figure 2-1. Mode Share of Tonnage and Total Tonnage by Distance Band: 2007
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Managements and Operations, Freight Analysis Framework, version 3.4, 2012.

Figure 2-2. Mode Share of Value and Total Value by Distance Band: 2007
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Managements and Operations, Freight Analysis Framework, version 3.4, 2012.

The modal distribution for ton miles is similar to that for tons, with the exception of long-distance water moves.



The top 10 commodities by weight are comprised entirely of bulk products and accounted for 65 percent of total tonnage but only 19 percent of the value of goods moved in 2011. The top 10 commodities by value accounted for 57 percent of total value and 16 percent of all tons. The leading commodities by weight include gravel, cereal grains, natural gas, coke, and asphalt. The leading commodities by value are time-sensitive goods, including machinery, electronics, and motorized vehicles.

Table 2-4. Top Commodities: 2011

Millions of Tons		Billions of Dollars	
Total, all commodities	**17,622**	**Total, all commodities**	**16,804**
Gravel	1,612	Machinery	2,078
Cereal grains	1,574	Electronics	1,289
Natural gas, coke, asphalt[1]	1,507	Motorized vehicles	1,237
Coal	1,413	Mixed freight	980
Waste/scrap	1,187	Pharmaceuticals	815
Non-metallic mineral products	1,011	Textiles/leather	710
Gasoline	989	Gasoline	677
Fuel oils	799	Miseellaneous manufactured products	663
Crude petroleum	781	Plastics/rubber	611
Other foodstuffs	571	Other foodstuffs	589

[1]This 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.

As measured by the Commodity Flow Survey, trucks moved more than one-half of all hazardous materials shipped from within the United States. However, truck ton miles of hazardous materials shipments accounted for a much smaller share, about one-third of all ton miles, because such shipments travel relatively short

Figure 2-3. Mode Share of Ton Miles and Total Ton Miles by Distance Band: 2007
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Managements and Operations, Freight Analysis Framework, version 3.4, 2012.

Table 2-4. Top Commodities: 2011
Sources: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Managements and Operations, Freight Analysis Framework, version 3.4, 2012.

Table 2-5. 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.
[1]Truck as a single mode includes shipments that went by private truck only, for-hire truck only, or a combination of both.
[2]Private truck refers to a truck operated by a temporary or permanent employee of an establishment or the buyer/receiver of the shipment.
[3]Excludes crude oil shipments.
Note: Numbers and percents may not add to totals due to rounding.

distances. By contrast, rail accounted for only six percent of hazardous materials shipments by weight but nearly 29 percent of ton miles.

Flammable liquids, especially gasoline, are the predominant hazardous materials transported in the United States. In terms of ton miles, flammable liquids accounted for about 56 percent of hazardous materials shipments. The next largest class of hazardous materials shipments, in terms of ton miles, is gases at about 17 percent.

Table 2-6. 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 2-5. 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: July 2010), table 1a, available at www.bts.gov/publications/commodity_flow_survey/ as of August 5, 2012.

Table 2-6. 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: July 2010), table 1a, available at www.bts.gov/publications/commodity_flow_survey/ as of August 5, 2012.

Table 2-7. Domestic Mode of Exports and Imports by Tonnage and Value: 2007 and 2040

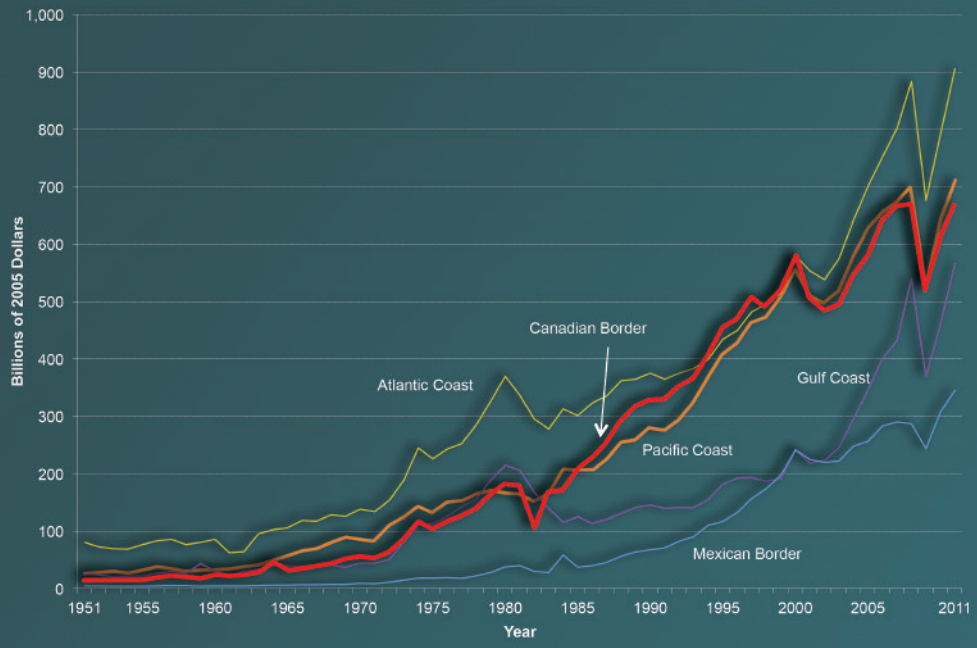
	Millions of Tons		Billions of 2007 Dollars	
	2007	2040	2007	2040
Total	**2,027**	**5,426**	**3,193**	**12,134**
Truck[2]	749	2,365	1,968	7,852
Rail	279	957	200	573
Water	151	268	54	94
Air, air & truck[3]	2	10	206	892
Multiple modes & mail[4]	149	509	278	1,250
Pipeline	346	899	137	350
Other & unknown	51	168	220	1,016
No domestic mode[5]	300	250	130	108

[1]Many 2007 and 2040 numbers in this table were revised as a result of Freight Analysis Framework (FAF) database improvements in FAF version 3.4.
[2]Excludes truck moves to and from airports.
[3]Includes truck moves to and from airports.
[4]Multiple 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.
[5]No 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.

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 3.4 percent per year between 2007 and 2040.

Foreign trade has had a major impact on all U.S. borders and coasts. Since 1951, the

Figure 2-4. Value of Merchandise Trade by Coasts and Borders: 1951-2011



Notes: The value of 2011 coal exports ($9.42 bilion) 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.

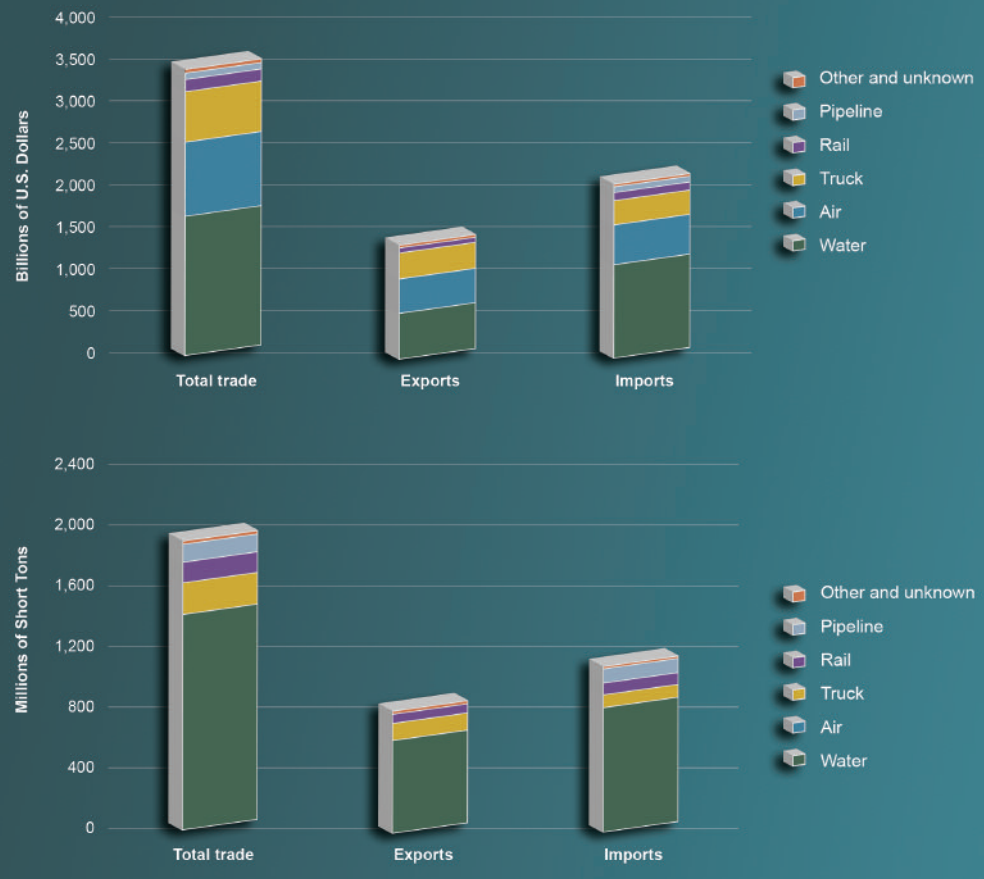
Table 2-7. Domestic Mode of Exports and Imports by Tonnage and Value: 2007 and 2040
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

Figure 2-4. Value of Merchandise Trade by Coasts and Borders: 1951-2011
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); **2000-2011:** 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 30, 2012.

value of merchandise trade has grown by twenty-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 2011, ports and airports on the Atlantic Coast remain the most significant in terms of value.

Approximately 75 percent of freight tons in U.S. foreign trade move by water, but air and truck transportation are also important when freight value is considered. By value, the water share drops to about 48 percent, with air and truck accounting for nearly 26

Figure 2-5. U.S. International Merchandise Trade by Transportation Mode: 2011



Notes: 1 short ton = 2,000 pounds. The U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration, Bureau of Transportation Statistics estimated 2011 weight data for truck, rail, pipeline, and other 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.

Figure 2-5. U.S. International Merchandise Trade by Transportation Mode: 2011
Source: 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 2012). **Truck, rail, and pipeline data:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transporation Statistics, North American Transborder Freight Data, available at www.bts.gov/transborder as of August 10, 2012. **Other and unknown:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transporation Statistics, special tabulation, July 2012.

percent and 18 percent respectively. Rail and pipeline together accounted for about 7 percent of the total.

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 2011, from about 6 percent of total merchandise trade to 14 percent. More recently, between 2010 and 2011, the value of U.S. trade with Mexico grew by 17 percent.

Table 2-8. Top 25 Trading Partners of the United States in Merchandise Trade: 2000, 2005, 2010, and 2011 (billions of current U.S. dollars)

Partner	2011 Rank	2000	2005	2010	2011
Canada	1	406	499	527	596
China	2	116	285	457	503
Mexico	3	248	290	393	461
Japan	4	212	194	181	195
Germany	5	88	119	131	148
United Kingdom	6	85	90	98	107
South Korea	7	68	71	88	100
Brazil	8	29	40	59	75
France	9	50	56	65	68
Taiwan	10	65	57	62	67
Netherlands	11	32	41	54	66
Saudi Arabia	12	20	34	43	61
India	13	14	27	49	58
Venezuela	14	24	40	43	56
Singapore	15	37	36	46	50
Italy	16	36	43	43	50
Switzerland	17	20	24	40	49
Belgium	18	24	32	41	47
Ireland	19	24	38	41	47
Russian Federation	20	10	19	32	43
Hong Kong	21	26	25	31	41
Malaysia	22	37	44	40	40
Nigeria	23	11	26	35	39
Australia	24	19	23	30	38
Colombia	25	11	14	28	37
Top 25 total[1]		**1,746.7**	**2,187.5**	**2,662.4**	**3,041.8**
U.S. total trade		**1,997.3**	**2,575.3**	**3,191.4**	**3,688.3**
Top 25 as % of total		**87.5**	**84.9**	**83.4**	**82.5**

[1]Top 25 trading partners change each year. Totals represent the top 25 trading partners for each year, not necessarily the top 25 trading partners listed here for 2011.
Note: Numbers may not add to totals due to rounding.

Trade with both Canada and Mexico has grown rapidly over the past decade. Trucks carried about 59 percent of the value of goods traded with these two countries.

In addition to trucks transporting the largest share of total trade value with Canada and Mexico, rail is the second largest mover of bidirectional freight moving across both U.S. land borders. Pipelines carry a significant volume of imports from Canada.

TABLE 2-8. TOP 25 TRADING PARTNERS OF THE UNITED STATES IN MERCHANDISE TRADE: 2000, 2005, 2010, AND 2011
Source: U.S. Department of Commerce, International Trade Administration, TradeStats Express, available at www.ita.doc.gov/ as of June 16, 2012.

Table 2-9. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 2000, 2005, 2010, and 2011 (billions of current U.S. dollars and millions of short tons)

	2000		2005		2010		2011	
Mode	**Value**	**Weight**	**Value**	**Weight**	**Value**	**Weight**	**Value**	**Weight**
Truck[1]	429	NA	491	191	557	187	626	208
Rail[1]	94	NA	116	141	131	134	152	142
Air	45	<1	33	<1	45	<1	46	<1
Water	33	194	58	256	81	210	108	188
Pipeline[1]	24	NA	52	86	63	106	81	123
Other[1]	29	NA	39	5	40	9	46	13
Total[1]	**653**	**NA**	**790**	**679**	**918**	**646**	**1,058**	**675**

Key: NA = not available.
[1]The 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 2-10. Value of U.S. Exports to and Imports from Canada and Mexico by Land Transportation Mode: 2000, 2005, 2010, and 2011 (millions of current U.S. dollars)

	2000	2005	2010	2011
Exports to Canada, total	**154,847**	**192,907**	**224,809**	**254,450**
Truck	129,825	151,222	173,588	195,126
Rail	12,947	19,322	26,116	29,569
Pipeline	162	2,394	3,151	6,211
Other[1]	11,913	19,933	21,901	23,488
Mail	<1	37	53	55
Exports to Mexico, total	**97,159**	**104,277**	**138,929**	**163,021**
Truck	82,389	83,341	111,110	127,720
Rail	10,496	15,748	19,632	24,862
Pipeline	302	543	2,038	3,492
Other[1]	3,972	4,623	6,148	6,946
Mail	<1	2	1	2
Imports from Canada, total	**210,270**	**265,402**	**246,252**	**282,582**
Truck	127,816	143,696	123,238	135,528
Rail	49,699	60,606	56,996	65,118
Pipeline	23,117	48,766	57,562	70,743
Other[1]	9,571	12,184	7,288	7,039
Mail	4	<1	0	1
FTZ[2]	63	149	1,167	4,153
Imports from Mexico, total	**113,437**	**135,400**	**181,339**	**204,080**
Truck	88,669	112,268	148,948	167,483
Rail	21,056	20,782	28,484	32,303
Pipeline	12	<1	182	281
Other[1]	1,574	1,990	1,864	1,892
Mail	1	<1	<1	<1
FTZ[2]	2,126	360	1,862	2,120

[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.
[2]Foreign 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.

Table 2-9. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 2000, 2005, 2010, and 2011
Source: Sources: Truck, Rail, Pipeline, and Other: 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 June 14, 2012; **Air and Water:** U.S. Department of Commerce, Census Bureau, Foreign Trade Division, *FT920 - U.S. Merchandise Trade: Selected Highlights* (Washington, DC: annual issues).

Table 2-10. Value of U.S. Exports to and Imports from Canada and Mexico by Land Transportation Mode: 2000, 2005, 2010, and 2011
Sources: 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 June 14, 2012.

Freight 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: 1990, 2000, and 2007-2009

	1990	2000	2007	2008	2009
Public roads, route miles	3,866,926	3,951,101	4,048,523	4,059,343	NA
National Highway System (NHS)	N	161,189	163,746	164,096	NA
Interstates	45,074	46,673	46,934	47,013	NA
Other NHS	N	114,516	116,812	117,083	NA
Other	N	3,789,912	3,884,775	3,895,246	NA
Strategic Highway Corridor Network (STRAHNET)	N	62,066	62,698	62,253	NA
Interstate	N	46,675	46,937	47,013	NA
Non-Interstate	N	15,389	16,031	15,240	NA
Railroad	175,909	170,512	140,134	139,326	139,118
Class I	133,189	120,597	94,313	94,082	93,921
Regional	18,375	20,978	16,930	16,690	12,804
Local	24,337	28,937	28,891	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	208,752	176,996	166,133	173,000	171,328
Gas	1,189,200	1,369,300	1,520,200	1,525,000	1,526,400

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

Trade with both Canada and Mexico has grown rapidly over the past decade. Trucks carried about 59 percent of the value of goods traded with these two countries.

Since 1990, road infrastructure increased slowly despite a large increase in the volume of traffic. Over the same period, rail miles declined by 21 percent while gas pipeline mileage increased by 28 percent.

Table 3-1. Miles of Infrastructure by Transportation Mode: 1990, 2000, and 2007-2009
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 August 30, 2012. **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 August 30, 2012. **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 August 30, 2012. **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 August 30, 2012. **Gas pipelines:** American Gas Association, *Gas Facts* (Arlington, VA: annual issues).

Table 3-2. Number of U.S. Vehicles, Vessels, and Other Conveyances: 1990, 2000, and 2007-2009

	1990	2000	2007	2008	2009
Highway[1]	**-**	**-**	**254,403,081**	**255,917,664**	**254,212,610**
Truck, single-unit 2-axle 6-tire or more	-	-	8,116,672	8,288,046	8,356,097
Truck, combination	-	-	2,635,347	2,585,229	2,617,118
Truck, total	-	-	10,752,019	10,873,275	10,973,215
Trucks as percent of all highway vehicles	-	-	4.2	4.2	4.3
Rail					
Class I, locomotive	18,835	20,028	24,143	24,003	24,045
Class I, freight cars[2]	658,902	560,154	460,172	450,297	416,180
Nonclass I, freight cars[2]	103,527	132,448	120,463	109,487	108,233
Car companies and shippers freight cars[2]	449,832	688,194	805,074	833,188	839,020
Water	**39,445**	**41,354**	**40,695**	**40,301**	**40,109**
Nonself-propelled vessels[3]	31,209	33,152	31,654	31,238	31,008
Self-propelled vessels[4]	8,236	8,202	9,041	9,063	9,101

[1]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 pre-2011 editions of *Freight Facts and Figures*.
[2]Beginning with 2001 data, Canadian-owned U.S. railroads are excluded. Canadian-owned U.S. railroads accounted for over 46,000 freight cars in 2000.
[3]Nonself-propelled vessels include dry-cargo barges, tank barges, and railroad-car floats.
[4]Self-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 with improved utilization and the deployment of larger cars.

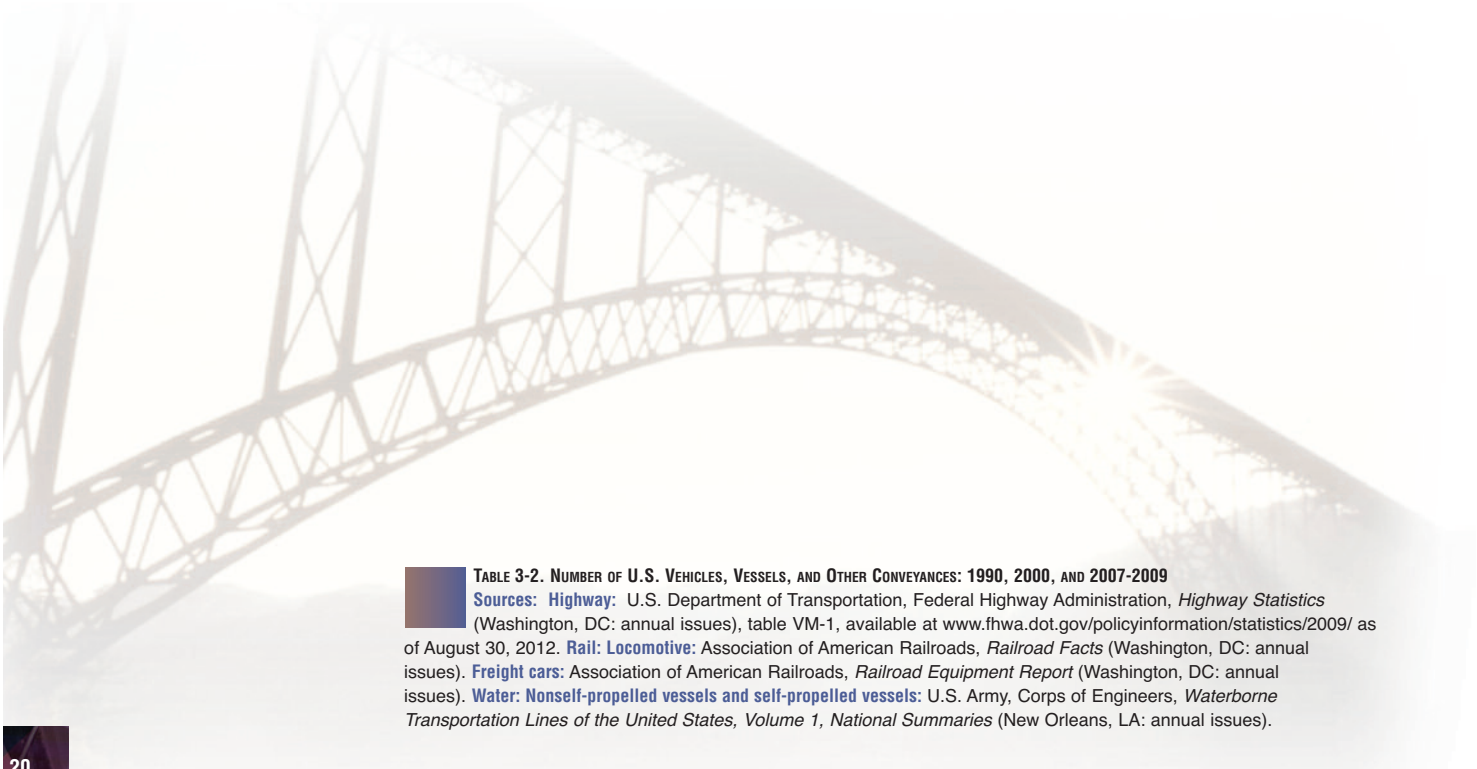
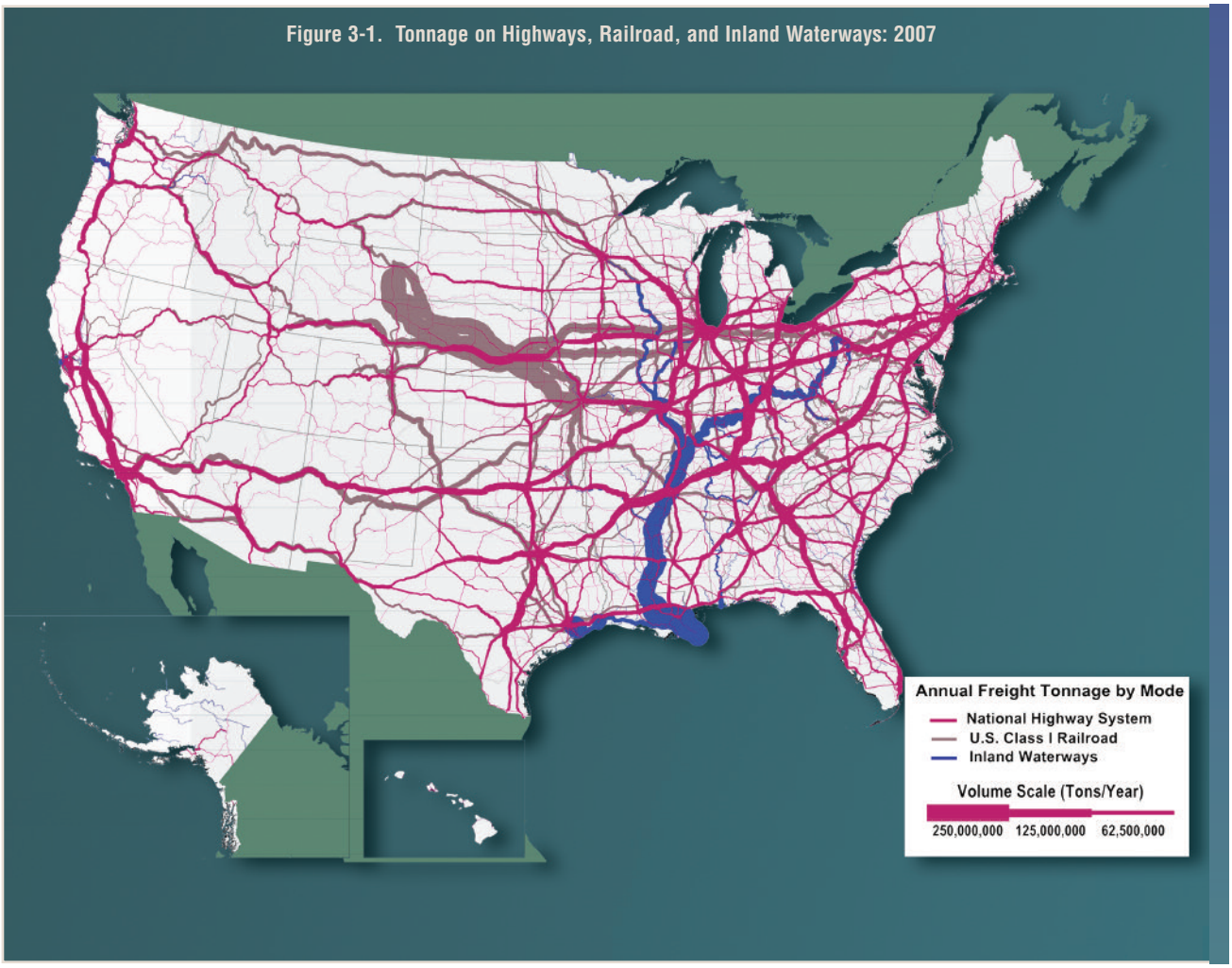


Table 3-2. Number of U.S. Vehicles, Vessels, and Other Conveyances: 1990, 2000, and 2007-2009
Sources: Highway: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: annual issues), table VM-1, available at www.fhwa.dot.gov/policyinformation/statistics/2009/ as of August 30, 2012. **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).

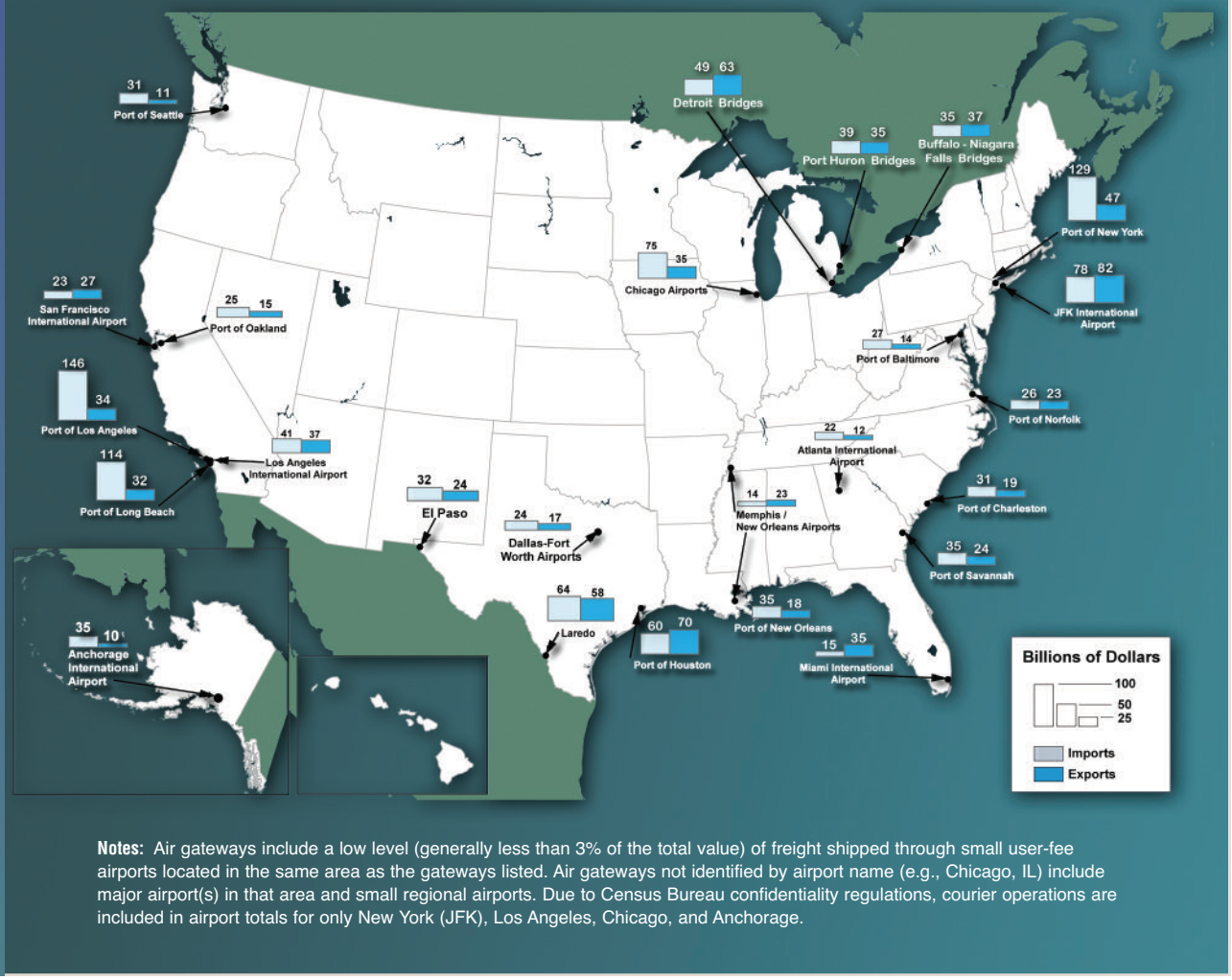


Trucks carry most of the tonnage and value of freight in the United States, but railroads and waterways carry significant volumes over long distances. Rail moves a large volume of coal between the Powder River Basin in Wyoming and the Midwest, while the principal inland waterways movement by volume occurs along the Lower Mississippi River.

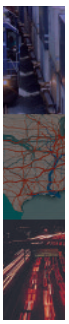
Figure 3-1. Tonnage on Highways, Railroad, and Inland Waterways: 2007

Sources: Highways: U.S. Department of Transportation, Federal Highway Administration, Freight Analysis Framework, Version 3.4, 2012. **Rail:** Based on Surface Transportation Board, Annual Carload Waybill Sample and rail freight flow assignments done by Oak Ridge National Laboratory. **Inland Waterways:** U.S. Army Corps of Engineers (USACE), Annual Vessel Operating Activity and Lock Performance Monitoring System data, as processed for USACE by the Tennessee Valley Authority; and USACE, Institute for Water Resources, Waterborne Foreign Trade Data. Water flow assignments done by Oak Ridge National Laboratory.

Figure 3-2. Top 25 U.S.-International Trade Freight Gateways by Value of Shipments: 2010
(billions of current dollars)

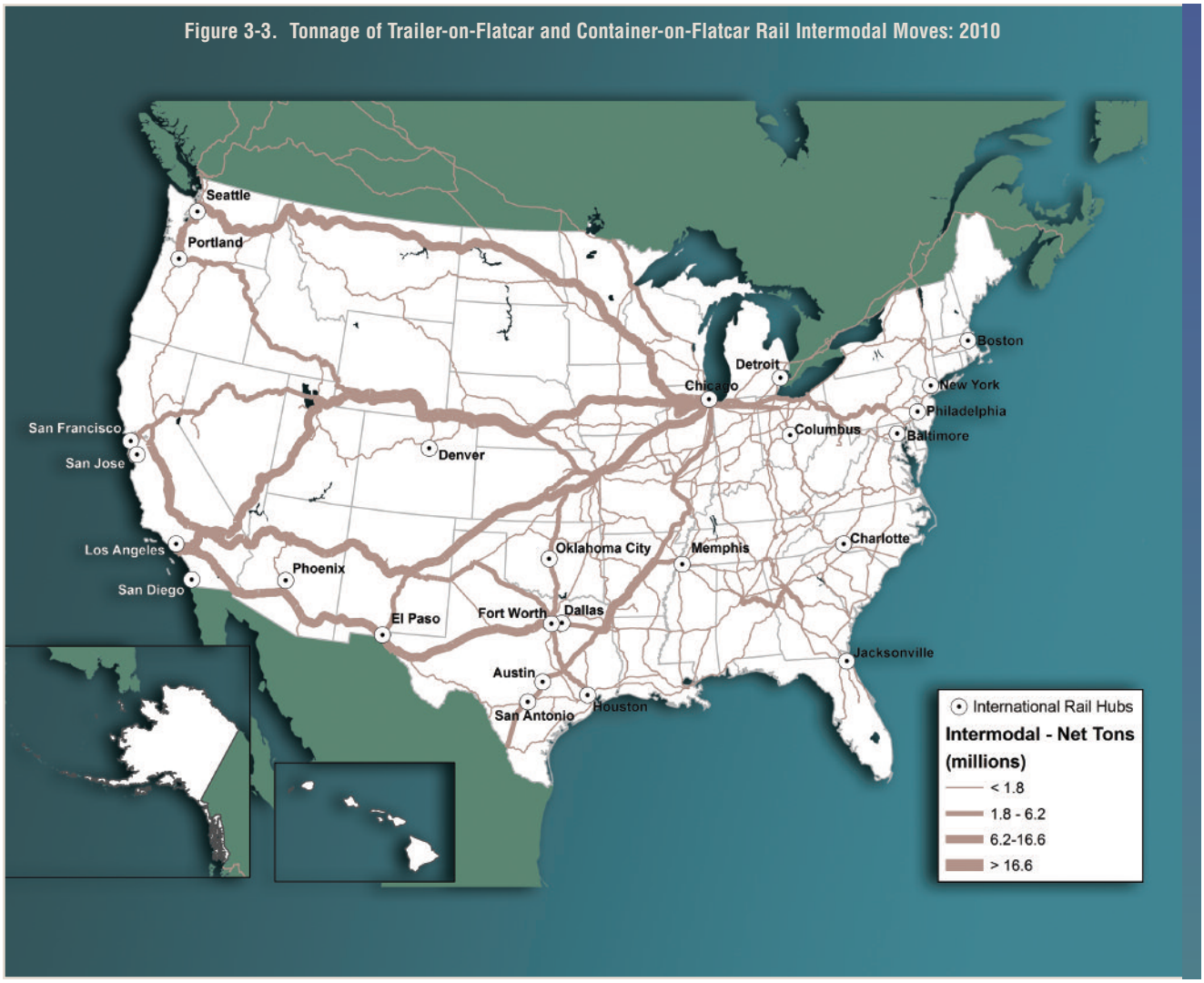


Notes: Air gateways include a low level (generally less than 3% of the total value) of freight shipped through small user-fee airports located in the same area as the gateways listed. Air gateways not identified by airport name (e.g., Chicago, IL) include major airport(s) in that area and small regional airports. Due to Census Bureau confidentiality regulations, courier operations are included in airport totals for only New York (JFK), Los Angeles, Chicago, and Anchorage.



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 11 water ports, 5 land-border crossings, and 9 air gateways.

Figure 3-2. Top 25 U.S.-International Trade Freight Gateways by Value of Shipments: 2010
Sources: Air: U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Division, *USA Trade Online*; **Land:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, TransBorder Freight Data; **Water:** U.S. Army Corps of Engineers, Navigation Data Center, personal communication, as cited in U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics*, table 1-51, available at www.bts.gov/publications/national_transportation_statistics/ as of October 2012.

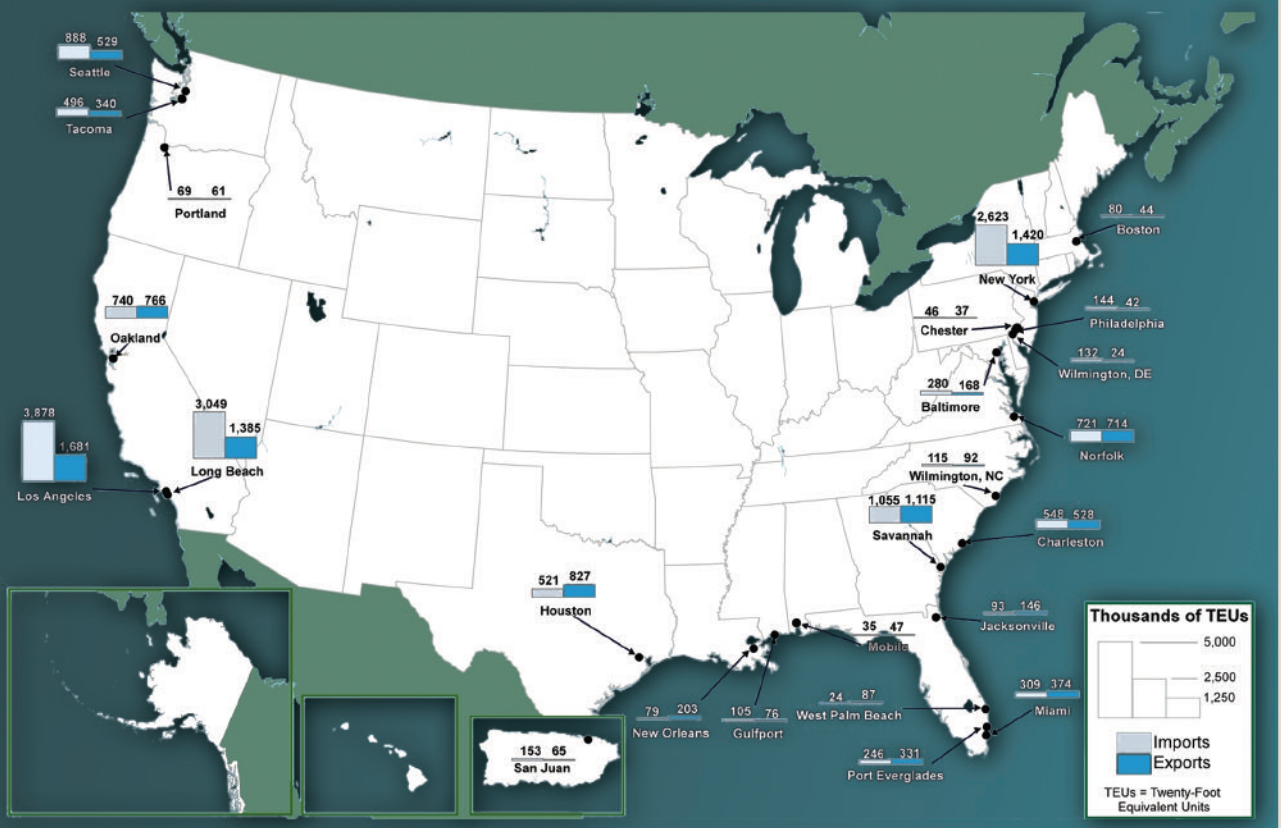


Modes of transportation frequently work together to move high-value, time-sensitive cargo. The classic forms of rail intermodal transportation are trailer-on-flatcar and container-on-flatcar, and these are spread throughout the United States. The largest concentrations are on routes between Pacific Coast 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: 2010
Source: U.S. Department of Transportation, Federal Railroad Administration, special tabulation, August 2012.

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



Note: The data include both government and non-government shipments by vessel into and out of U.S. foreign trade zones, the 50 states, District of Columbia, and Puerto Rico.

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. Containership Calls at U.S. Ports by Vessel Size and Number of Vessels: 2005-2010

Vessel Size (TEUs)	2005	2006	2007	2008	2009	2010
Calls						
< 2,000	3,994	4,146	3,904	3,493	3,290	3,709
2,000-2,999	4,410	3,986	4,099	3,347	2,677	2,761
3,000-3,999	3,624	3,333	2,866	2,460	2,500	2,053
4,000-4,999	4,226	4,782	5,033	5,121	5,305	5,881
> 4,999	2,288	3,344	3,961	4,314	4,434	5,126
Total Calls	**18,542**	**19,591**	**19,863**	**18,735**	**18,206**	**19,530**
Vessels						
< 2,000	207	212	196	196	179	178
2,000-2,999	259	257	230	219	220	206
3,000-3,999	189	177	166	141	147	130
4,000-4,999	234	258	271	284	306	315
> 4,999	193	260	277	326	366	396
Total Vessels	**1,082**	**1,164**	**1,140**	**1,166**	**1,218**	**1,225**

Key: TEU = twenty-foot equivalent unit.

From 2005 to 2010, the number of calls by containership with capacities of 5,000 TEUs or greater has more than doubled. These large containerships accounted for 26 percent of containership calls at U.S. ports in 2010, up from 12 percent in 2005.

In 2010, 7,579 oceangoing vessels made 62,747 calls at U.S. ports, a 13 percent increase from the previous year. Tankers accounted for 35 percent of total calls, followed by containerships (31 percent) and dry bulk vessels (17 percent). Approximately 97 percent of all tankers calling at U.S. ports are double-hull vessels, a 19 percent increase from five years earlier.

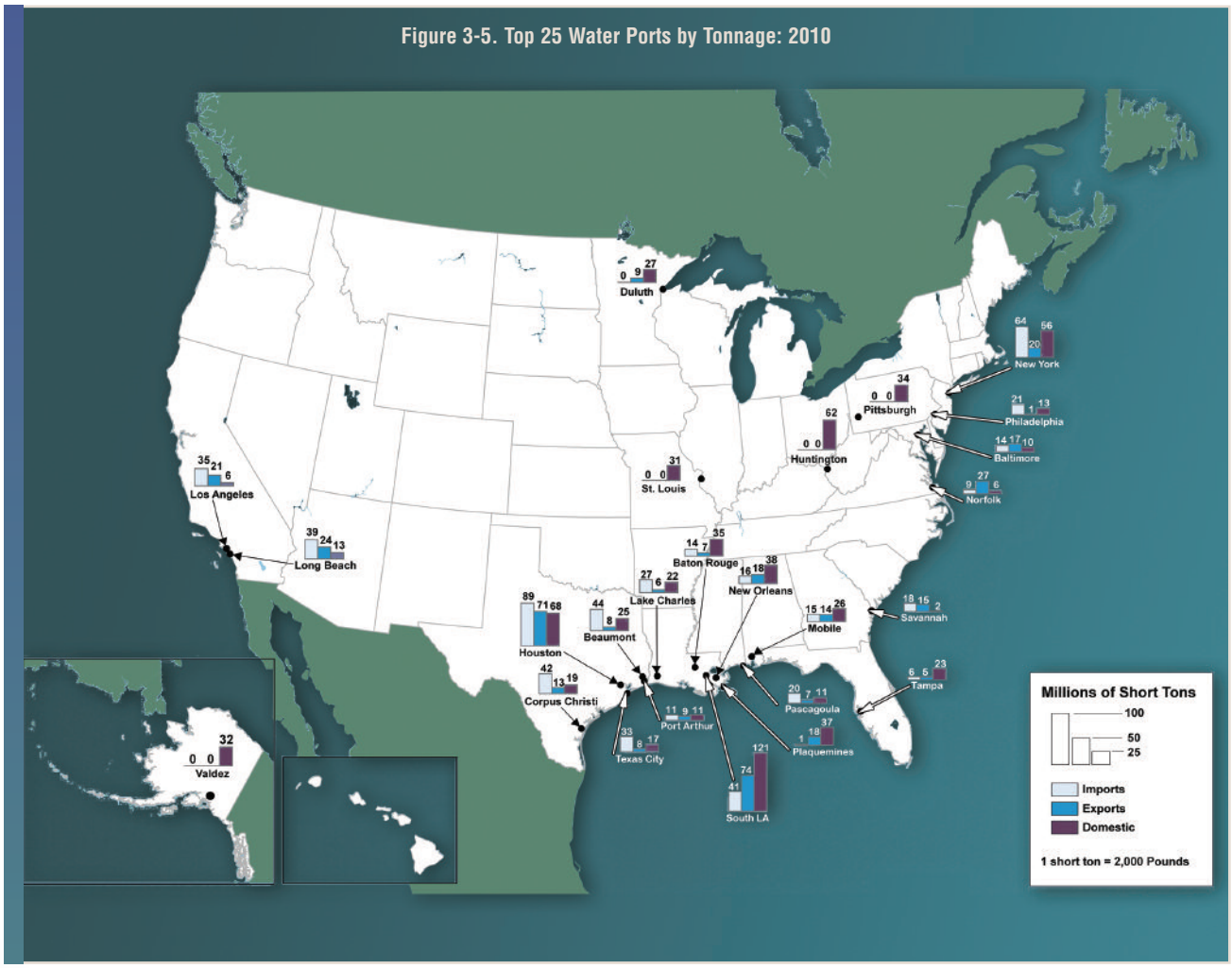
Table 3-4. Number of Vessel Calls at U.S. Ports: 2005-2010

Type	2005	2006	2007	2008	2009	2010	Percent Change, 2005-2010
Tanker	20,118	21,231	21,724	20,907	19,641	21,944	9.1
Double hull	15,869	17,747	19,026	19,036	18,631	21,265	34.0
Product	12,217	13,282	13,277	12,662	11,815	13,257	8.5
Double hull	8,799	10,252	10,811	10,952	10,887	12,622	43.4
Crude	7,901	7,949	8,447	8,245	7,826	8,687	9.9
Double hull	7,070	7,495	8,215	8,084	7,744	8,644	22.3
Container	18,542	19,591	19,863	18,735	18,206	19,530	5.3
Dry Bulk	11,406	12,508	11,040	10,363	8,587	10,716	-6.0
Roll on/Roll off	5,663	6,318	6,077	5,964	4,951	5,849	3.3
Vehicle	3,652	4,182	4,084	4,102	3,336	4,100	12.3
Gas	969	961	917	769	704	813	-16.1
Liquefied Natural Gas	203	213	202	171	201	202	-0.5
Combo	414	334	235	180	135	168	-59.4
General	3,935	4,054	3,948	3,660	3,336	3,727	-5.3
All Types	**61,047**	**64,997**	**63,804**	**60,578**	**55,560**	**62,747**	**2.8**

Key: TEU = twenty-foot equivalent unit.

Table 3-3. Containership Calls at U.S. Ports by Vessel Size and Number of Vessels: 2005-2010
Sources: Lloyd's Marine Intelligence Unit, Vessel Movements Data Files, 2005-2010 (London: Lloyd's Marine Intelligence Unit, 2005-2010); Lloyd's Marine Intelligence Unit, Seasearcher (London: Lloyd's Marine Intelligence Unit, 2011); and Clarkson Research Studies, Clarkson's Vessel Registers (London: Clarkson Research Studies, January 2011).

Table 3-4. Number of Vessel Calls at U.S. Ports: 2005-2010
Sources: Lloyd's Marine Intelligence Unit, Vessel Movements Data Files, 2005-2010 (London: Lloyd's Marine Intelligence Unit, 2005-2010); Lloyd's Marine Intelligence Unit, Seasearcher (London: Lloyd's Marine Intelligence Unit, 2011); and Clarkson Research Studies, Clarkson's Vessel Registers (London: Clarkson Research Studies, January 2011).



Although the top ports for containerized cargo are primarily on the Pacific and Atlantic Coasts, bulk cargo, such as coal, crude petroleum, and grain move through ports on the Gulf Coast and inland waterway system. The top 25 water ports by tonnage handle about two-thirds of the weight of all foreign and domestic goods moved by water.

Figure 3-5. Top 25 Water Ports by Tonnage: 2010
Source: U.S. Army Corps of Engineers, *2010 Waterborne Commerce of the United States, Part 5, National Summaries* (New Orleans, LA: 2011), table 5-2, available at www.ndc.iwr.usace.army.mil//wcsc/wcsc.htm as of June 30, 2012.

The average vessel size per call at U.S. ports increased from 50,083 deadweight tons (DWT) in 2005 to 53,592 DWT in 2010, an increase of 7 percent. The average size of containerships increased by 19 percent in terms of TEU capacity (15 percent in terms of DWT) as carriers expanded the deployment of post-panamax containerships in U.S. trades. Post-panamax refers to vessels that are larger than the width and length of the lock chambers in the Panama Canal.

Table 3-5. Average Vessel Size per Call at U.S. Ports: 2005-2010 (deadweight tons)

Type	2005	2006	2007	2008	2009	2010	Percent Change, 2005-2010
Tanker	72,056	71,831	72,222	72,281	72,066	71,131	-1.3
Double hull	76,240	75,891	76,408	75,034	73,623	72,081	-5.5
Product	37,956	37,669	36,699	36,661	37,345	37,275	-1.8
Double hull	37,799	37,934	36,994	36,936	37,303	37,195	-1.6
Crude	124,784	128,913	128,058	126,984	124,486	122,798	-1.6
Double hull	124,083	127,811	128,278	126,648	124,685	123,018	-0.9
Container	44,593	46,598	47,720	49,213	50,202	51,263	15
TEU	3,314	3,502	3,597	3,744	3,848	3,932	18.6
Dry Bulk	43,276	44,746	45,270	47,306	48,081	50,298	16.2
Roll on/Roll off	19,838	19,751	19,635	20,153	20,628	20,577	3.7
Vehicle	18,506	18,801	18,585	18,896	19,203	19,261	4.1
Gas	41,411	40,738	40,462	40,755	44,487	43,092	4.1
Cubic meters	61,410	60,037	59,369	60,159	66,986	64,433	4.9
Liquefied Natural Gas	70,374	70,962	73,703	70,097	74,465	74,445	5.8
Cubic meters	128,504	130,006	134,832	128,834	135,895	137,028	6.6
Combo	87,151	86,344	93,617	97,607	102,154	109,238	25.3
General	25,101	25,446	25,572	24,585	23,689	23,598	-6
All Types	**50,083**	**50,672**	**51,658**	**52,535**	**53,430**	**53,592**	**7.0**

Key: TEU = twenty-foot equivalent unit.

Table 3-5. Average Vessel Size per Call at U.S. Ports: 2005-2010
Sources: Lloyd's Marine Intelligence Unit, Vessel Movements Data Files, 2005-2010 (London: Lloyd's Marine Intelligence Unit, 2005-2010); Lloyd's Marine Intelligence Unit, Seasearcher (London: Lloyd's Marine Intelligence Unit, 2011); and Clarkson Research Studies, Clarkson's Vessel Registers (London: Clarkson Research Studies, January 2011).

Table 3-6. Top 25 Airports by Landed Weight of All-Cargo Operations: 2000 and 2007-2010[1]

Airport	2010 Rank	Landed weight (thousands of short tons)				
		2000	2007	2008	2009	2010
Memphis, TN (Memphis International)	1	6,318	9,772	9,750	9,464	9,772
Anchorage, AK (Ted Stevens Anchorage International)[2]	2	8,084	10,562	8,976	7,762	9,732
Louisville, KY (Louisville International-Standiford Field)	3	3,987	5,216	5,223	5,139	5,319
Miami, FL (Miami International)	4	2,929	3,715	3,494	3,176	3,453
Chicago, IL (O'Hare International)	5	2,062	2,201	2,103	1,750	2,448
Indianapolis, IN (Indianapolis International)	6	2,884	2,652	2,564	2,288	2,359
Los Angeles, CA (Los Angeles International)	7	2,892	3,431	2,876	1,884	1,977
New York, NY (John F. Kennedy International)	8	2,793	2,557	2,222	1,591	1,962
Fort Worth, TX (Dallas/Fort Worth International)	9	1,691	1,753	1,614	1,436	1,516
Newark, NJ (Newark Liberty International)	10	1,961	1,873	1,727	1,464	1,489
Oakland, CA (Metropolitan Oakland International)	11	1,811	1,811	1,742	1,341	1,324
Atlanta, GA (William B. Hartsfield International)	12	1,090	1,261	1,167	1,278	1,314
Cincinatti, OH (Cincinatti/Northern Kentucky International)[3]	13	912	97	104	564	1,216
Ontario, CA (Ontario International)	14	1,220	1,394	1,350	1,168	1,121
Honolulu, HI (Honolulu International)	15	692	1,134	1,032	1,021	1,062
Philadelphia, PA (Philadelphia International)	16	1,454	1,375	1,264	1,132	994
Houston, TX (George Bush Intercontinental)	17	480	769	754	784	763
Seattle, WA (Seattle-Tacoma International)	18	1,060	691	747	803	697
San Francisco, CA (San Francisco International)	19	1,267	1,039	775	747	652
Denver, CO (Denver International)	20	900	642	625	624	619
Phoenix, AZ (Sky Harbor International)	21	920	711	675	610	607
Portland, OR (Portland International)	22	882	713	656	545	531
Minneapolis, MN (Minneapolis-St Paul International/Wold-Chamberlain)	23	622	612	562	474	512
Chicago/Rockford, IL (Chicago/Rockford International)	24	654	737	710	564	459
Seattle, WA (King County International)	25	428	403	418	447	453
Top 25 airports[4]		**52,381**	**57,715**	**53,621**	**48,153**	**52,350**
United States, all airports[5]		**74,743**	**76,583**	**71,281**	**63,191**	**67,530**
Top 25 as % of U.S. total		**70.1**	**75.4**	**75.2**	**76.2**	**77.5**

[1]Dedicated 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.
[2]Anchorage includes a large share of all-cargo operations in-transit.
[3]The significant 2007 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.
[4]Airport rankings change each year. Totals represent the top 25 airports for each year, not necessarily the top 25 airports listed here for 2010.
[5]Limited to airports with an aggregate landed weight in excess of 100 million pounds (50,000 short tons) annually.
Note: 1 short ton = 2,000 pounds.

The 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 3-6. Top 25 Airports by Landed Weight of All-Cargo Operations: 2000 and 2007-2010
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 June 25, 2012.

Pipelines move large volumes of crude oil and natural gas from producing fields to markets throughout the United States. Based on FAF data, the oil and gas pipeline system moved 1.5 billion tons valued at $723 billion in 2007. Large volumes of crude oil were moved from producing fields in Texas and Louisiana.

Figure 3-6. Crude Oil Tonnage Moved by Pipeline: 2007

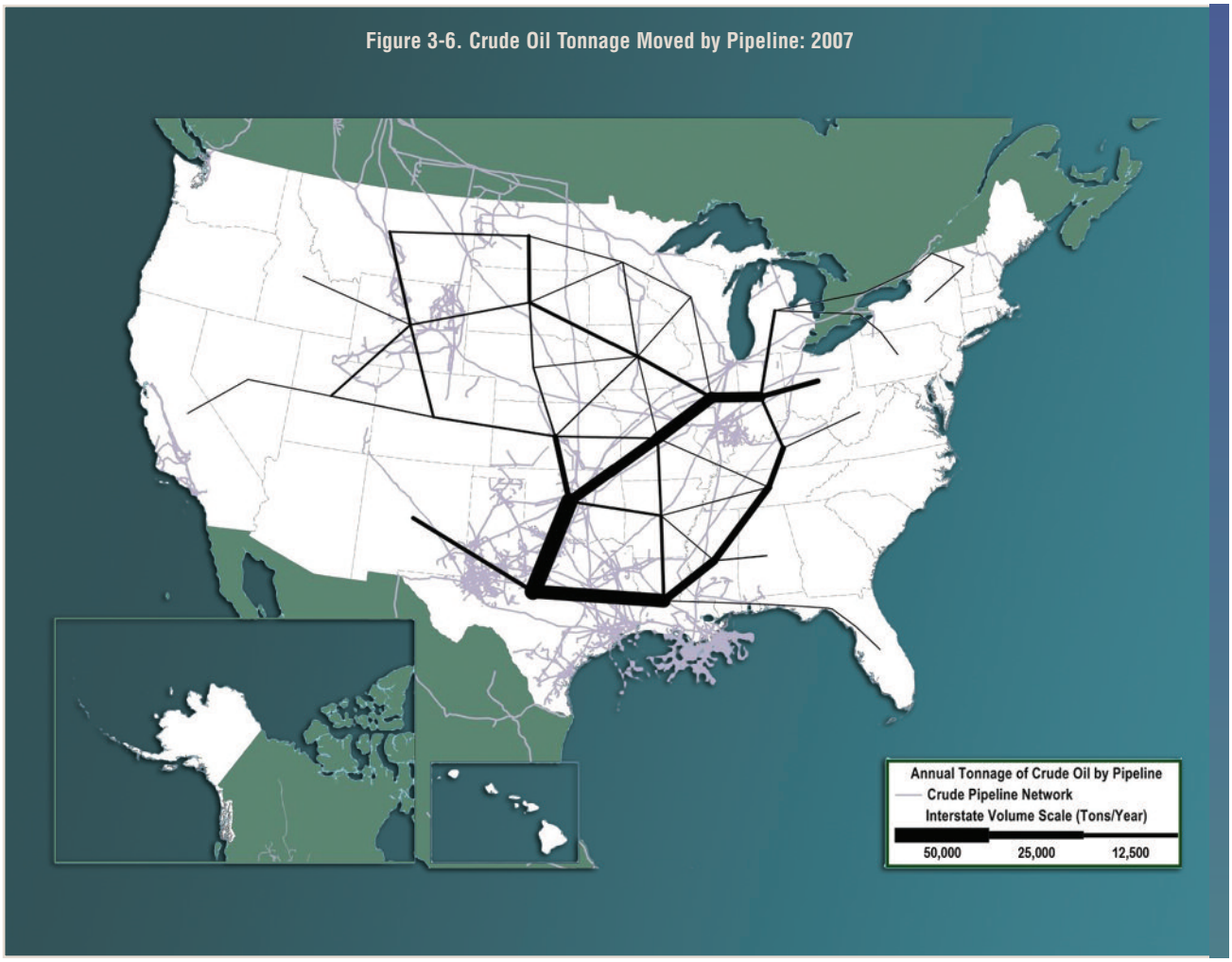
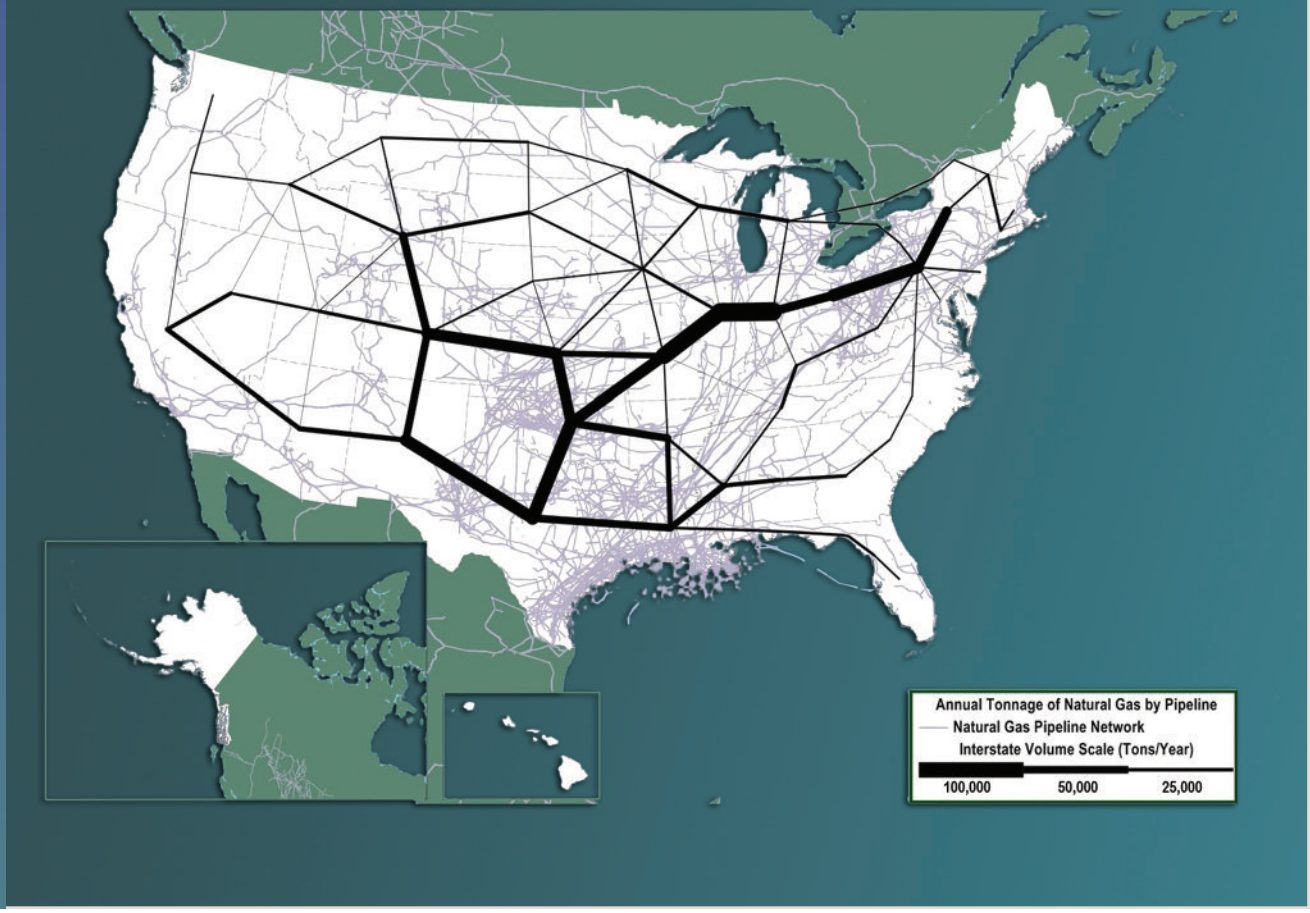


Figure 3-6. Crude Oil Tonnage Moved by Pipeline: 2007
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

Figure 3-7. Natural Gas Tonnage Moved by Pipeline: 2007

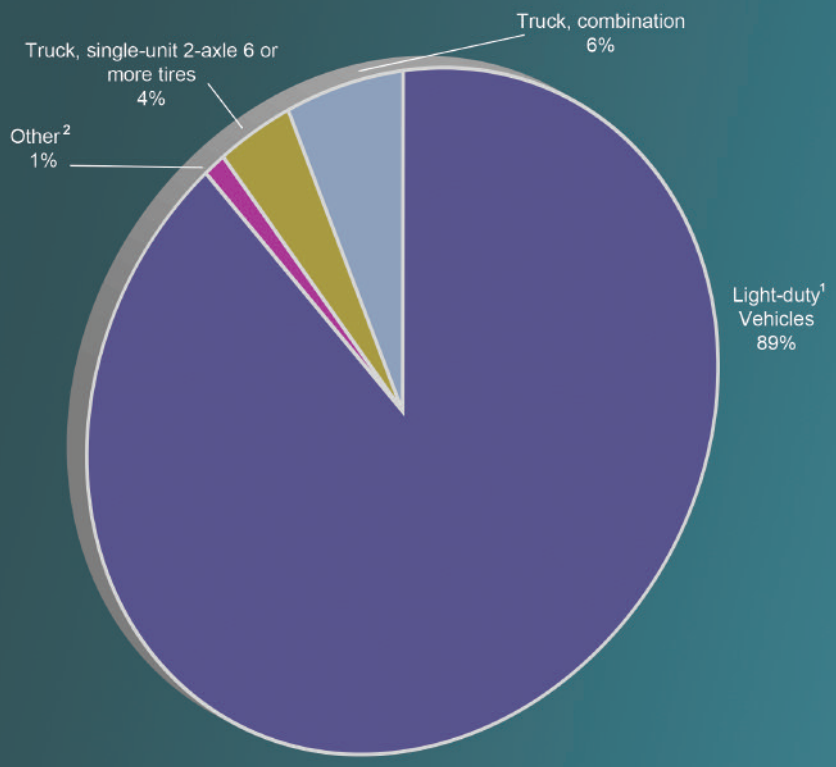


Natural gas is located in many of the same areas as crude oil. Gathering pipelines (or trunk lines) move the gas to processing plants where impurities are removed. From the processing plants, natural gas is moved to customers via an extensive and complex system of interstate/intrastate pipelines and distribution lines.

Figure 3-7. Natural Gas Tonnage Moved by Pipeline: 2007
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

Despite doubling over the past two decades, truck traffic remains a relatively small share of highway traffic as a whole. In 2010, commercial trucks accounted for about 10 percent of highway vehicle miles traveled. Truck tractors hauling semitrailers and other truck combinations accounted for approximately 59 percent of commercial truck travel, while single-unit trucks with six or more tires accounted for the remainder.

Figure 3-8. Share of Highway Vehicle Miles of Traveled by Vehicle Type: 2010



[1]Includes 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.
[2]Includes buses and motorcycles.
Notes: Based on a new methodology, FHWA revised its annual vehicle miles traveled, 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 pre-2011 editions of *Freight Facts and Figures*.

Figure 3-8. Share of Highway Vehicle Miles of Traveled by Vehicle Type: 2010
Source: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics*, table VM-1, available at www.fhwa.dot.gov/policyinformation/statistics/2010/ as of June 25, 2012.

Table 3-7. Trucks and Truck Miles by Average Weight: 1987, 1992, 1997, and 2002[1]

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.
[1]Excludes trucks with an average weight of 10,000 pounds or less.
Notes: Weight includes the empty weight of the vehicle plus the average weight of the load carried. Numbers may not add to totals due to rounding.

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 between 1987 and 2002 for trucks weighing between 10,000 pounds and 26,000 pounds and for trucks weighing over 80,000 pounds. Trucks between 60,000 pounds and 80,000 pounds form the largest category in both number of trucks and vehicle miles traveled because in most cases 80,000 pounds is the maximum weight allowed on the highway system without special permits.

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

Table 3-7. Trucks and Truck Miles by Average Weight: 1987, 1992, 1997, and 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 5, 2012; 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 5, 2012.

185 million weighs were made in 2011, about 65 percent of which were weigh-in-motion, and 35 percent were static. Considerably less than 1 percent of weighs discover violations.

Table 3-8. Commercial Vehicle Weight Enforcement Activities: 2005-2011

	2005	2006	2007	2008	2009	2010	2011
All Weighs	**230,464,926**	**229,450,656**	**217,444,117**	**200,419,382**	**182,256,996**	**198,564,690**	**185,498,220**
Weigh-in-Motion	136,380,657	142,598,736	132,257,618	119,826,305	116,176,399	118,025,789	119,718,032
Static Weighs[1]	94,084,269	86,851,920	85,186,499	80,593,077	66,080,597	80,538,901	65,780,188
Semiportable Scales	493,574	422,860	425,731	357,502	373,073	285,484	323,936
Fixed Scales	93,038,479	85,900,007	84,213,507	79,644,702	65,182,174	79,703,573	64,922,321
Portable Scales	552,216	529,053	547,261	590,873	525,350	549,844	533,931
Violations[2]	**567,949**	**621,391**	**530,350**	**555,168**	**489,975**	**478,576**	**415,545**
Axle Weight Violations	275,442	269,758	233,563	248,813	220,631	216,735	178,209
Gross Weight Violations	118,328	149,561	126,761	120,384	116,291	114,171	84,490
Bridge Weight Violations	174,179	202,072	170,026	185,971	153,053	147,670	152,846
Permits[3]	**3,625,898**	**4,598,227**	**4,827,668**	**5,215,724**	**4,528,654**	**4,838,663**	**4,944,334**
Non-Divisible Trip Permits	2,711,500	3,399,435	3,743,323	3,693,248	3,285,801	3,510,301	3,762,553
Non-Divisible Annual Permits	233,160	250,505	332,148	322,288	298,805	303,230	320,767
Divisible Trip Permits	288,145	426,381	398,003	489,712	369,906	341,737	334,650
Divisible Annual Permits	393,093	521,906	354,194	710,476	574,142	683,395	526,364

[1]Static weighs include the total number of vehicles weighed from semiportable, portable, and fixed scales.
[2]Violations include those from axle, gross, and bridge formula weight limits.
[3]Permits 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 District of Columbia (2008), Hawaii (2008, 2009, 2010, and 2011), Indiana (2005), Massachusetts (2010), New Hampshire (2011) Pennsylvania (2006), South Dakota (2006 and 2007), and Vermont (2011).

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 are made on the Interstate highways.

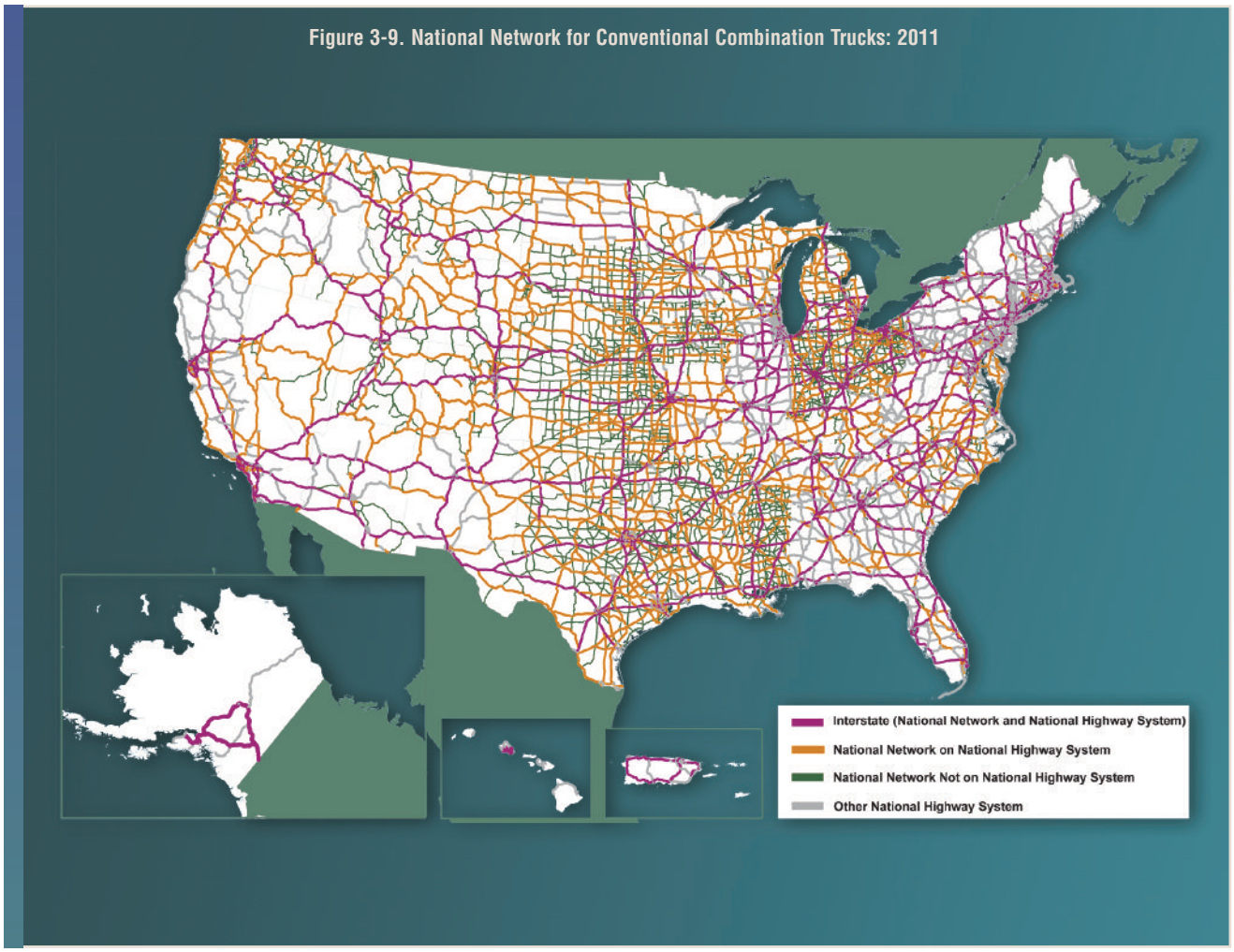
Table 3-9. Annual Vehicle Distance Traveled by Highway Category and Vehicle Type: 2011

	Combination Trucks	Single-Unit Trucks[1]	Other[2]	Light-duty Vehicles[3]	Total, All Motor Vehicles
Interstate vehicle miles (millions)	85,041	25,691	7,312	605,295	723,339
Interstate percent	48.3	23.2	22.7	22.9	24.4
Non-Interstate vehicle miles (millions)	90,871	84,982	24,939	2,042,363	2,243,154
Non-Interstate percent	51.7	76.8	77.3	77.1	75.6
Total vehicle miles, all roadways	**175,911**	**110,674**	**32,251**	**2,647,659**	**2,966,494**

[1]Trucks on a single frame with at least two axles and six tires.
[2]Includes buses and motorcycles.
[3]Includes 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.
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 pre-2011 editions of *Freight Facts and Figures*. Numbers may not add to totals due to rounding.

Table 3-8. Commercial Vehicle Weight Enforcement Activities: 2005-2011
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 23 CFR Part 657, August 10, 2012.

Table 3-9. Annual Vehicle Distance Traveled by Highway Category and Vehicle Type: 2011
Source: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics*, Table VM-1, available at www.fhwa.dot.gov/policy/information/statistics/2010/ as of July 20, 2012.



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 3-9. National Network for Conventional Combination Trucks: 2011
Source: 23 CFR Part 658, Appendix A, as of September 3, 2012.

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 semitrailer and a 28-foot trailer, only 14 states and 6 state turnpike authorities allow LCVs on at least some parts of their road networks. Allowable routes for LCVs have been frozen since 1991.

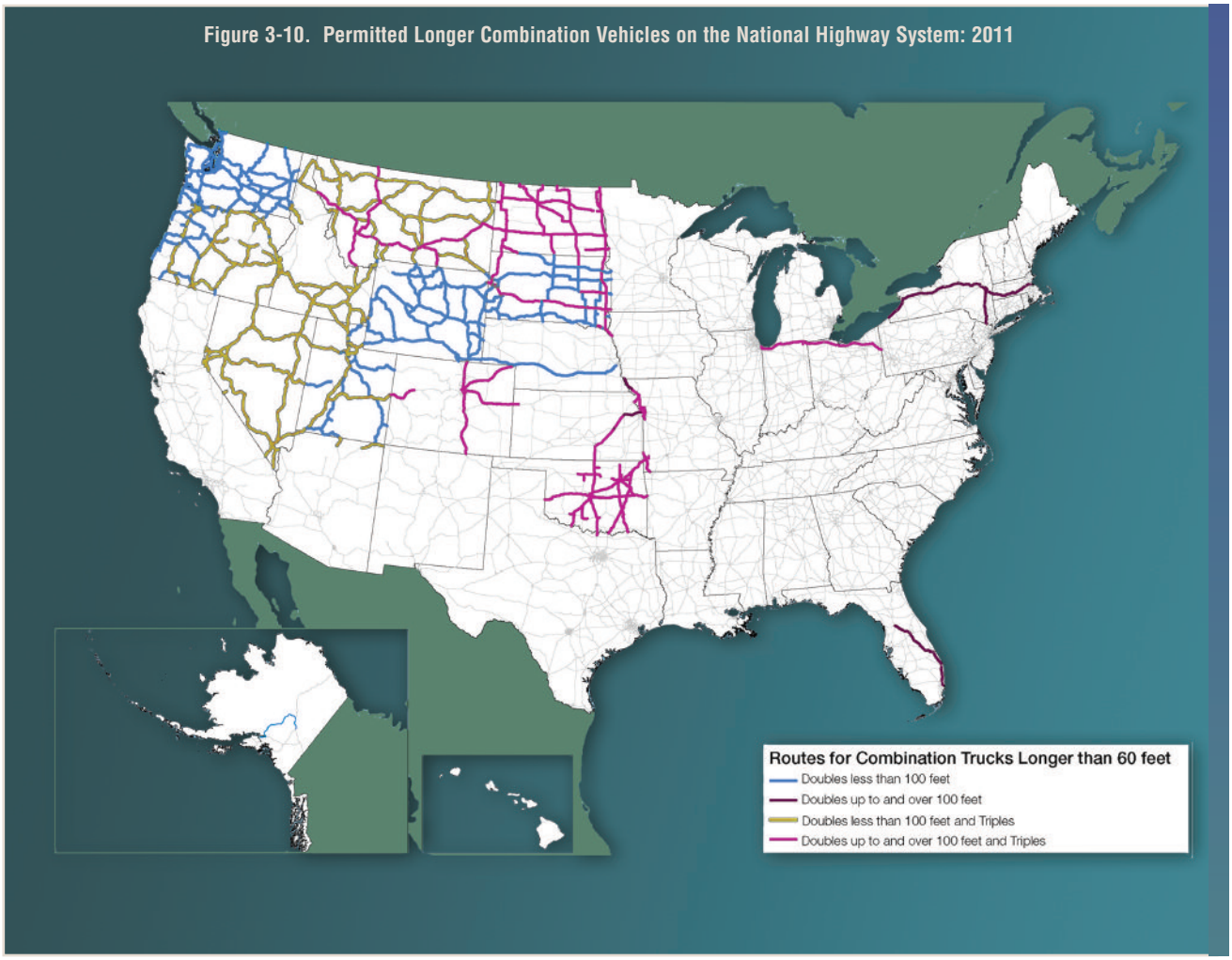


Figure 3-10. Permitted Longer Combination Vehicles on the National Highway System: 2011
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Operations and Technology Team, special tabulation, 2012.

Table 3-10. Trucks, Truck Miles, and Average Distance by Range of Operations and Jurisdictions: 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.

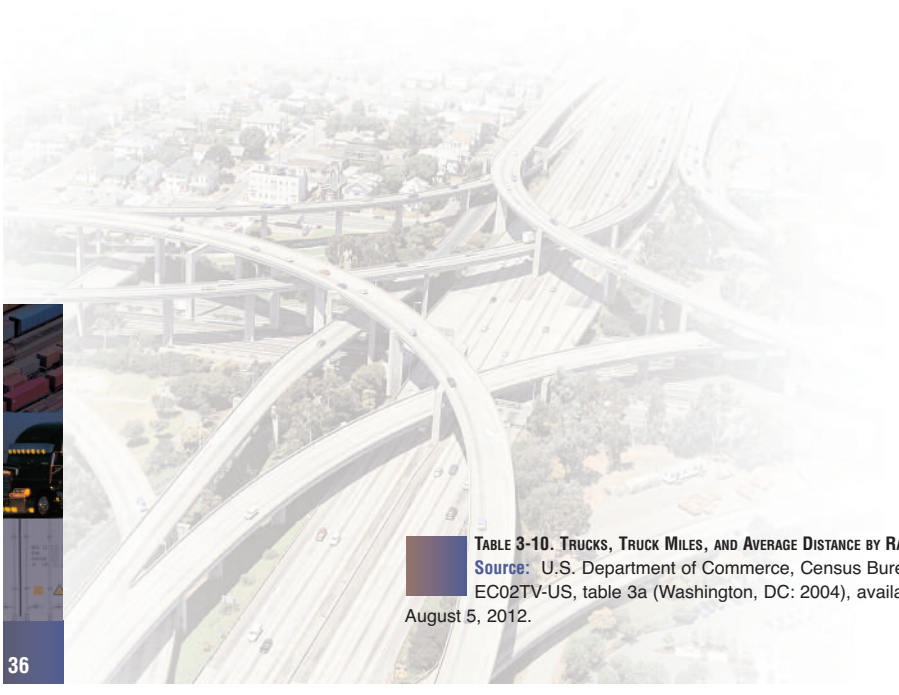


Table 3-10. Trucks, Truck Miles, and Average Distance by Range of Operations and Jurisdictions: 2002
Source: U.S. Department of Commerce, Census Bureau, *2002 Vehicle Inventory and Use Survey: United States*, EC02TV-US, table 3a (Washington, DC: 2004), available at www.census.gov/prod/ec02/ec02tv-us.pdf as of August 5, 2012.

Approximately three-fourths of the miles traveled by trucks larger than pickups, minivans, and other light vans 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.

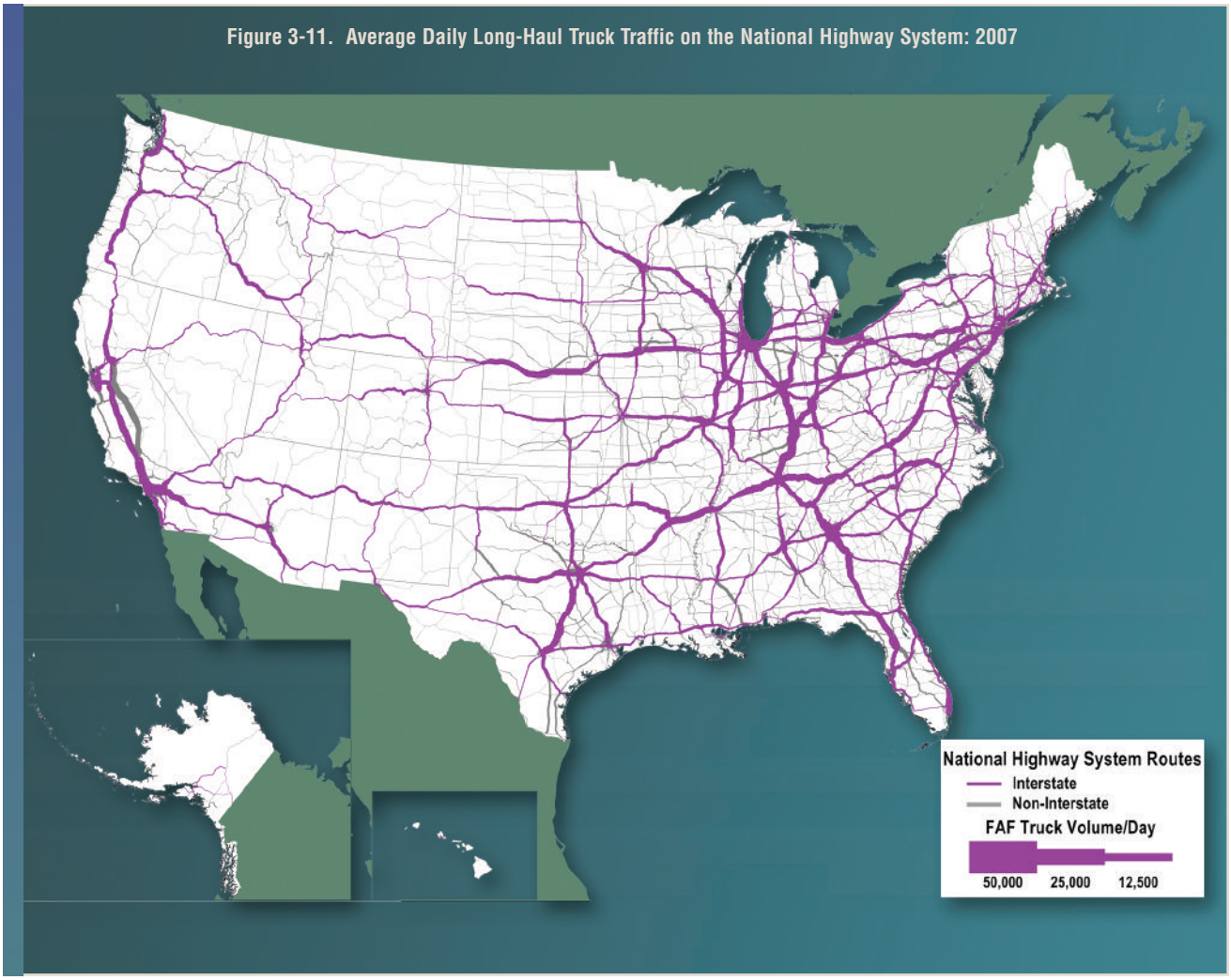
Table 3-11. Truck Miles by Products Carried: 2002

Products carried	Millions of miles
Total[1]	**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
Nometallic 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 rushed 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

[1]Excludes pickups, minivans, other light vans, and sport utility vehicles.
[2]Detail lines may not add to total because multiple products/hazardous materials may be carried at the same time.
[3]Vehicles 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

Table 3-11. 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 5, 2012.

Figure 3-11. 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 3-11. 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 3.4, 2012.

By 2040, long-haul freight truck traffic in the United States is expected to increase dramatically on the National Highway System. Forecast data indicate that truck travel may reach 590 million miles per day.

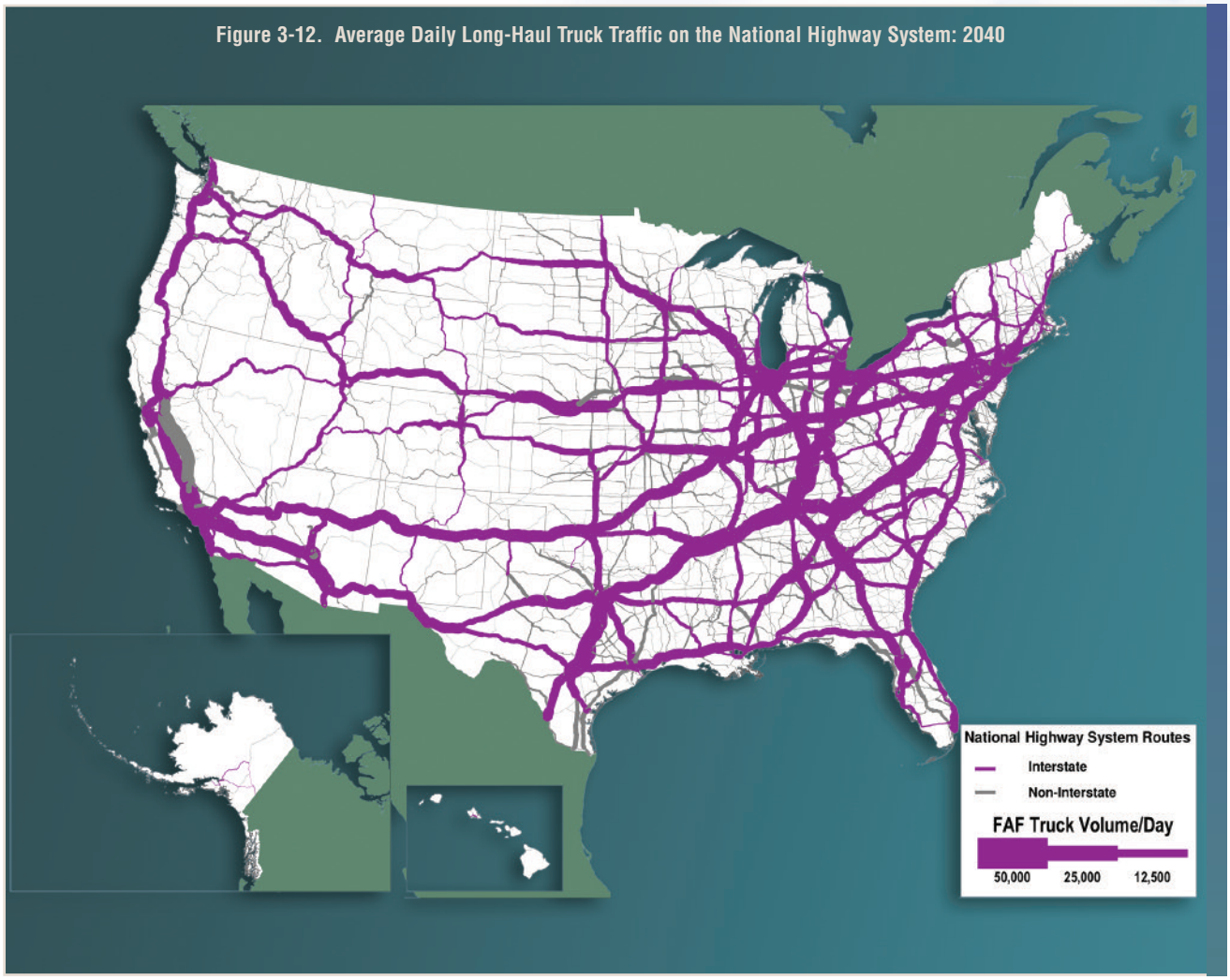
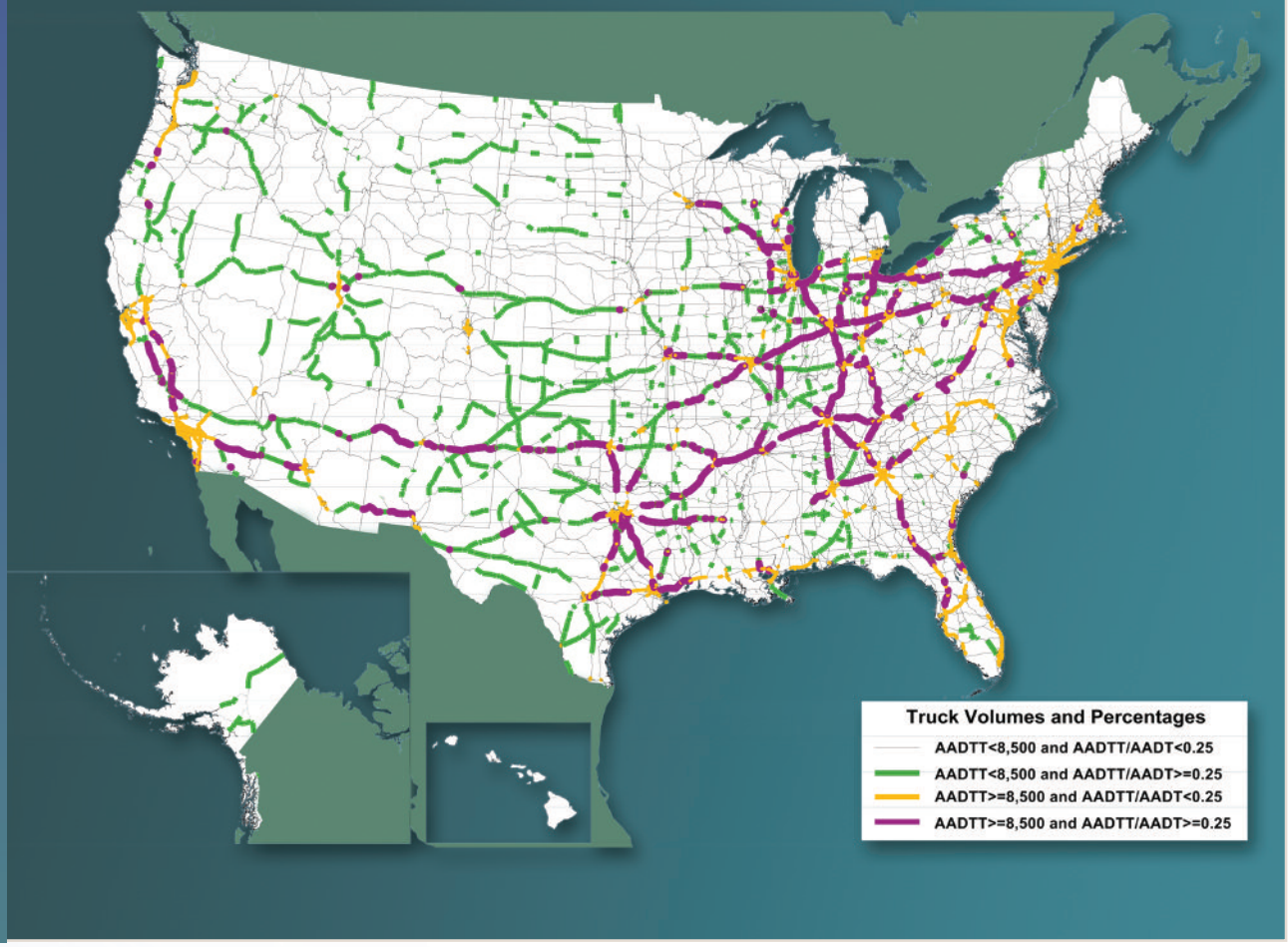


Figure 3-12. Average Daily Long-Haul Truck Traffic on the National Highway System: 2040
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

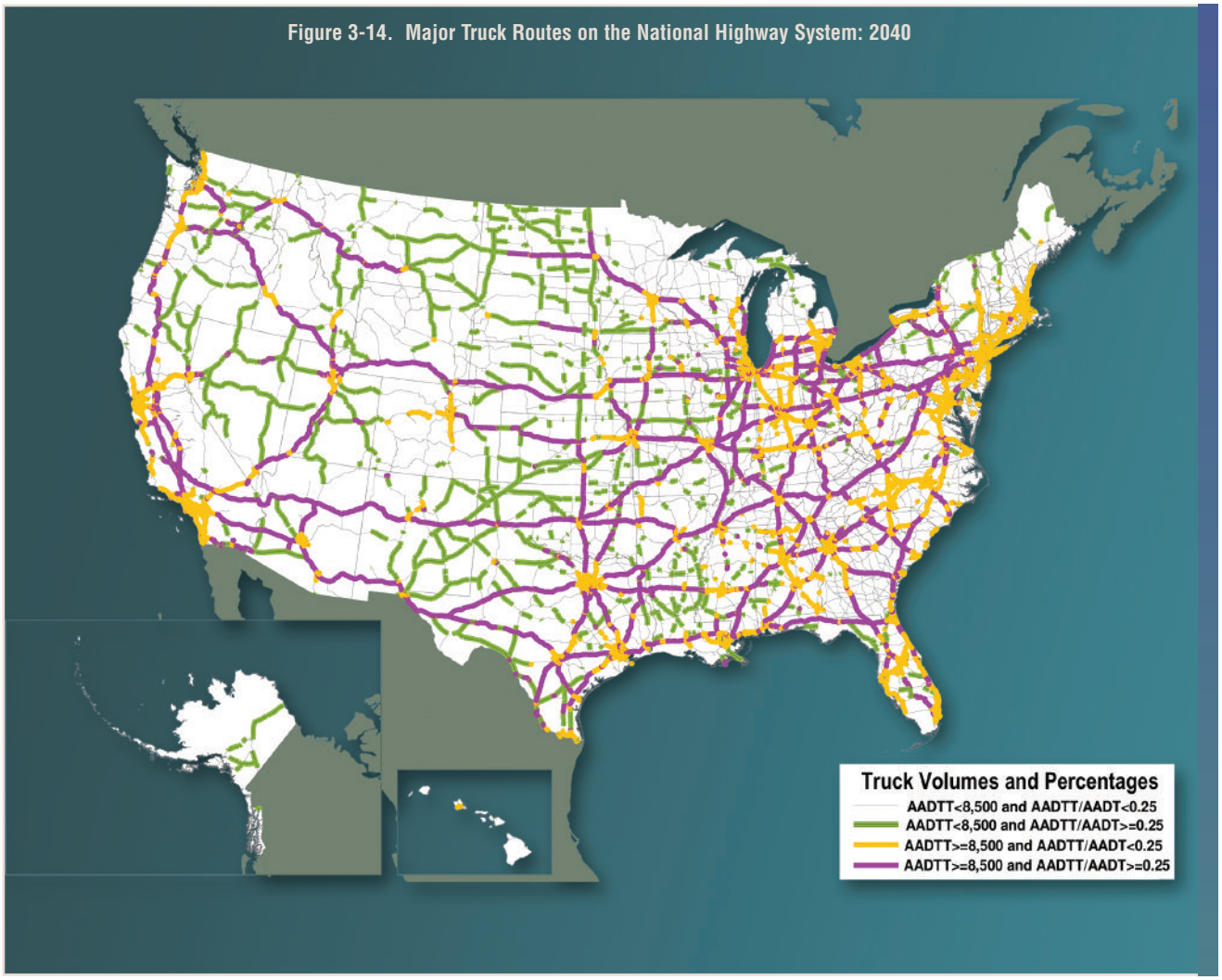
Figure 3-13. Major Truck Routes on the National Highway System: 2007



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 National Highway System (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 haul approximately 50 million tons per year.

Figure 3-13. 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 3.4, 2012.

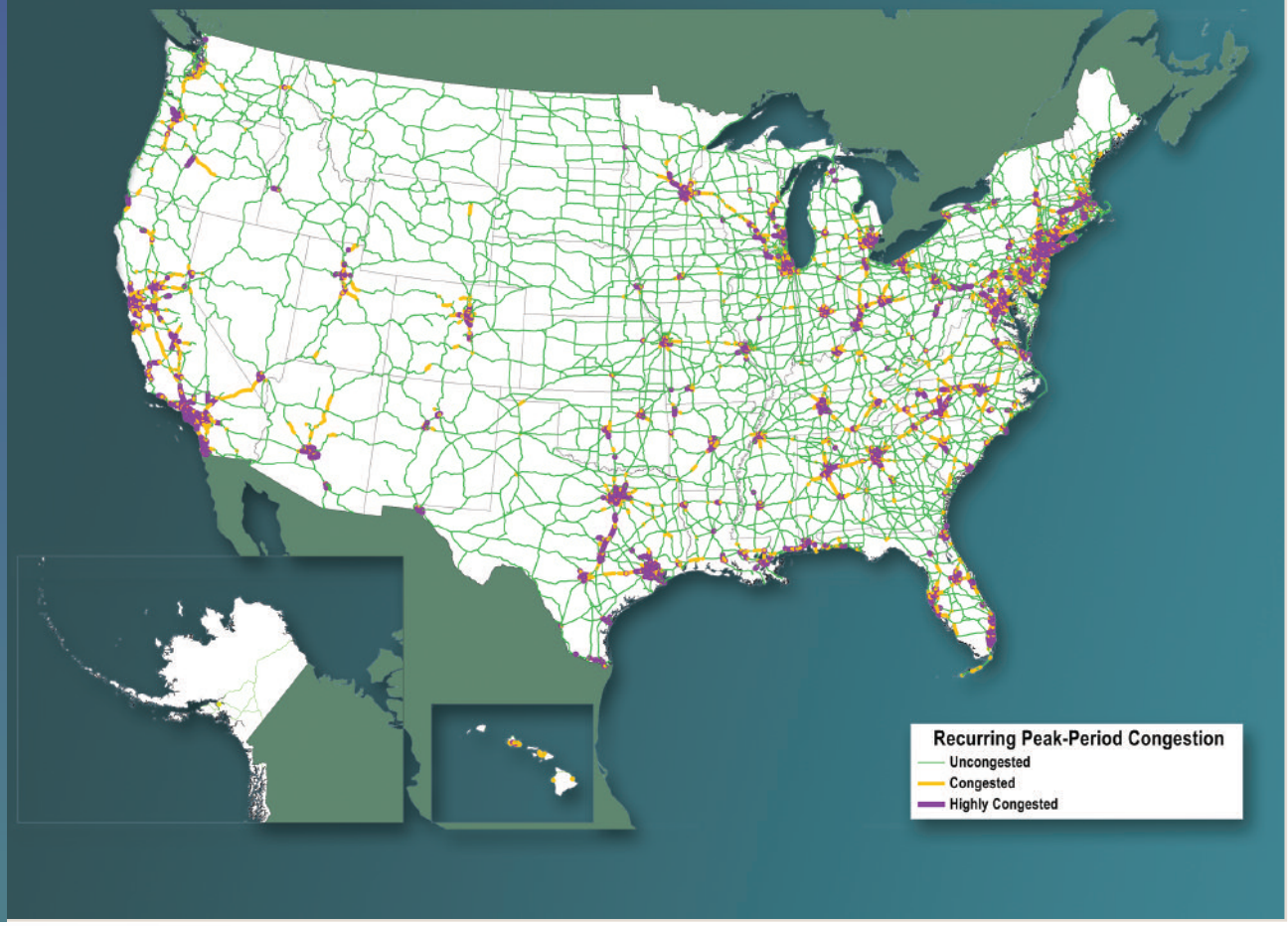
Figure 3-14. Major Truck Routes on the National Highway System: 2040



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 reach 22,600 miles, an increase of more than 250 percent from 2007.

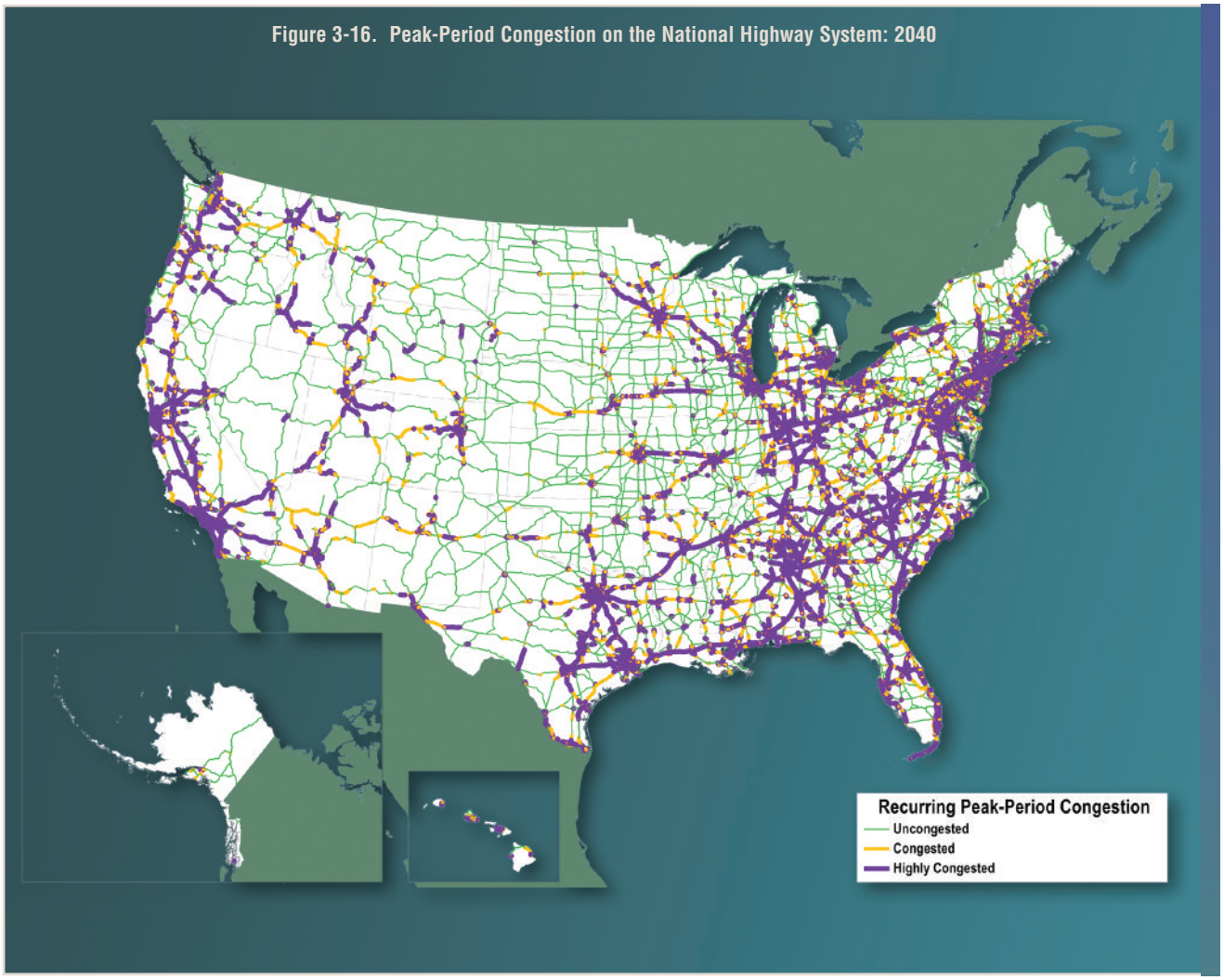
Figure 3-14. Major Truck Routes on the National Highway System: 2040
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

Figure 3-15. 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.

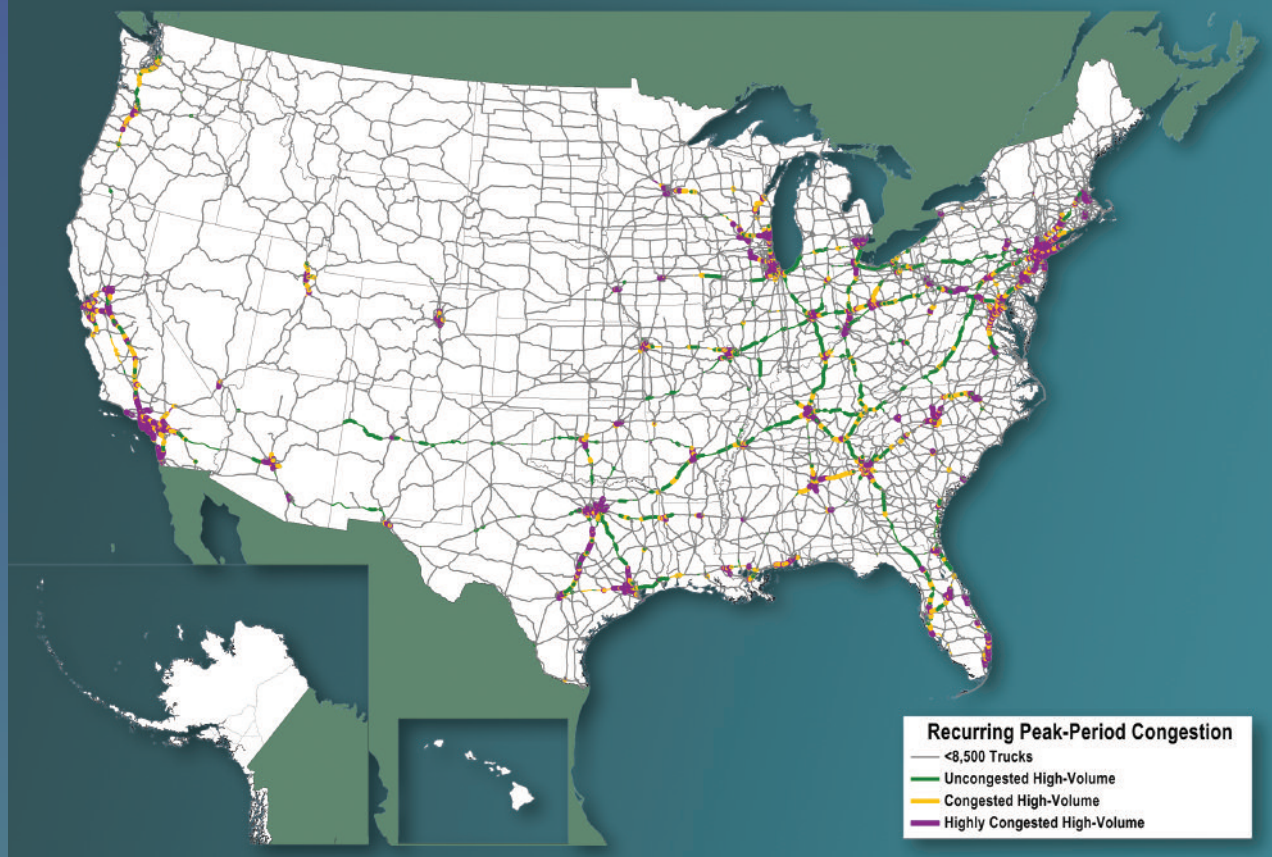
Figure 3-15. Peak-Period Congestion on the National Highway System: 2007
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Performance Monitoring System, and Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.



Assuming no changes in network capacity, increases in truck and passenger vehicle traffic are forecast to expand areas of recurring peak-period congestion to 37 percent of the NHS in 2040 compared with 11 percent in 2007. This will slow traffic on 21,000 miles of the NHS and create stop-and-go conditions on an additional 40,000 miles.

Figure 3-16. 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 3.4, 2012.

Figure 3-17. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2007



Notes: High-volume truck portions of the National Highway System carry more than 8,500 trucks per day, including freight-hauling long-distance trucks, freight-hauling local trucks, and other trucks with six or more tires. Highly congested segments are stop-and-go conditions with volume/service flow rations greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95. The volume/service flow ratio is estimated using the procedures outlined in the HPMS Field Manual, Appendix N.

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 3-17. 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 3.4, 2012.

Assuming no change in network capacity, the number of NHS miles with recurring congestion and a large number of trucks is forecast to increase significantly between 2007 and 2040. On highways carrying more than 8,500 trucks per day, recurring congestion will slow traffic on close to 8,100 miles and create stop-and-go conditions on an additional 26,800 miles.

Figure 3-18. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2040

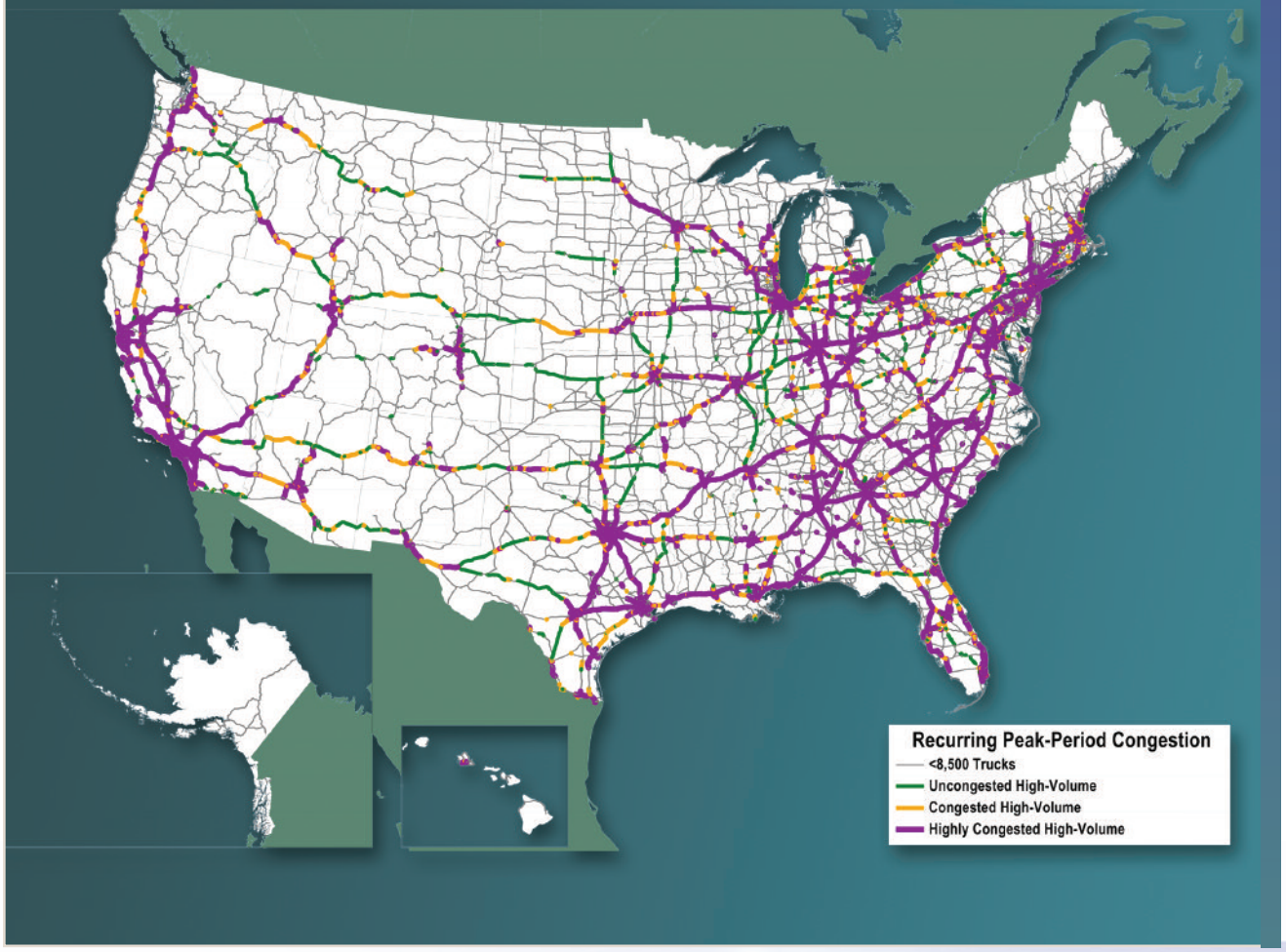
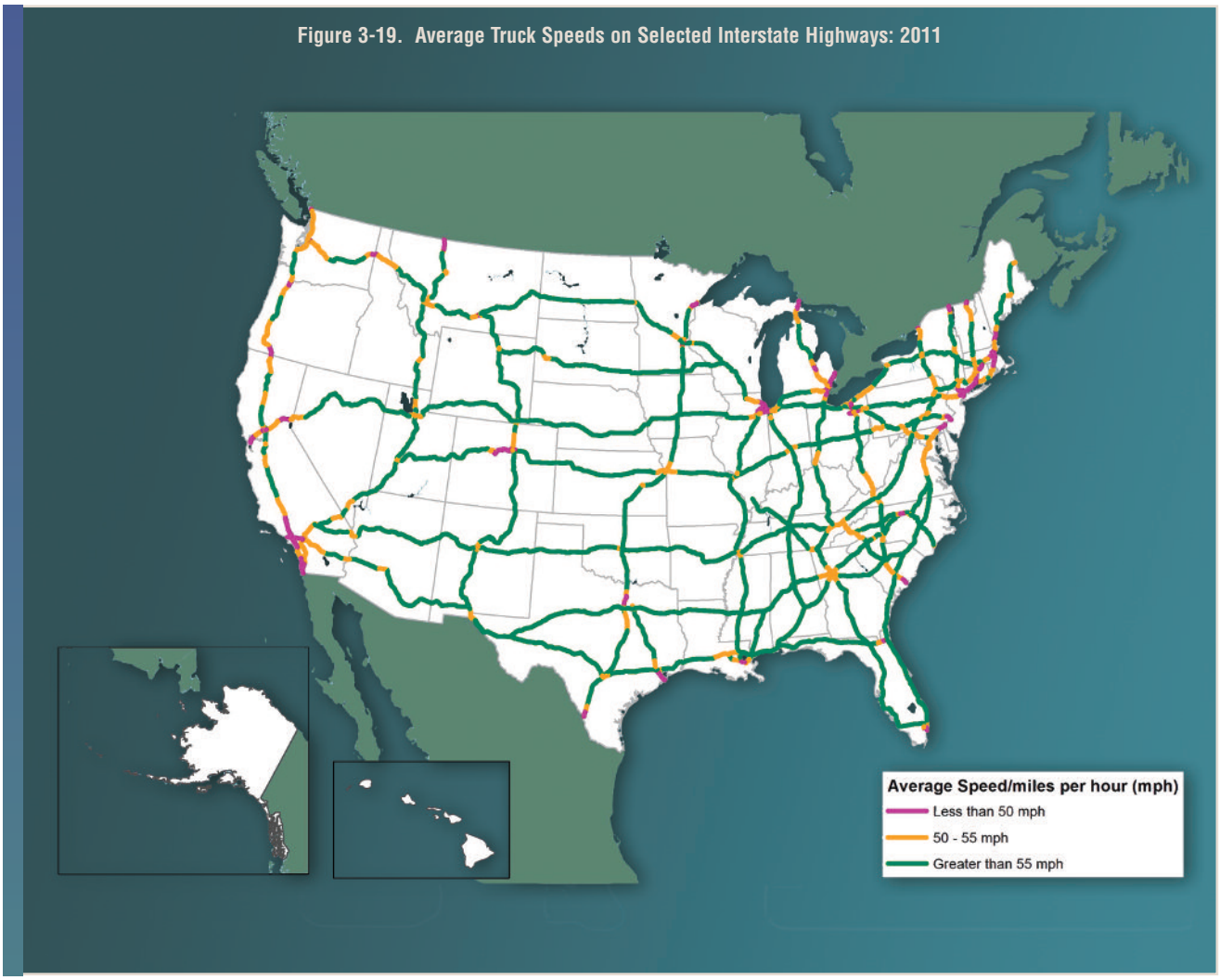


Table 3-18. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2040
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Performance Monitoring System, and Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

Figure 3-19. Average Truck Speeds on Selected Interstate Highways: 2011



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 on 25 freight-significant corridors on an annual basis. Average truck speeds drop below 55 miles per hour (mph) near major urban areas, border crossings and gateways, and in mountainous terrain.

Figure 3-19. Average Truck Speeds on Selected Interstate Highways: 2011
Source: U.S. Department of Transportation, Federal Highway Administration Office of Freight Management and Operations, Freight Performance Measurement Program, 2012.

To better understand the intensity of truck congestion and reliably issues, FHWA combined truck volumes from the Freight Analysis Framework with average truck speeds measured in the Freight Performance Measurement Program. This type of information is useful to private- and public-sector freight stakeholders that wish to better understand the severity of congestion and mobility constraints experienced along the highway transportation system. Many major urban areas have Interstates with significant truck volumes that are experiencing average speeds of less than 55 mph.

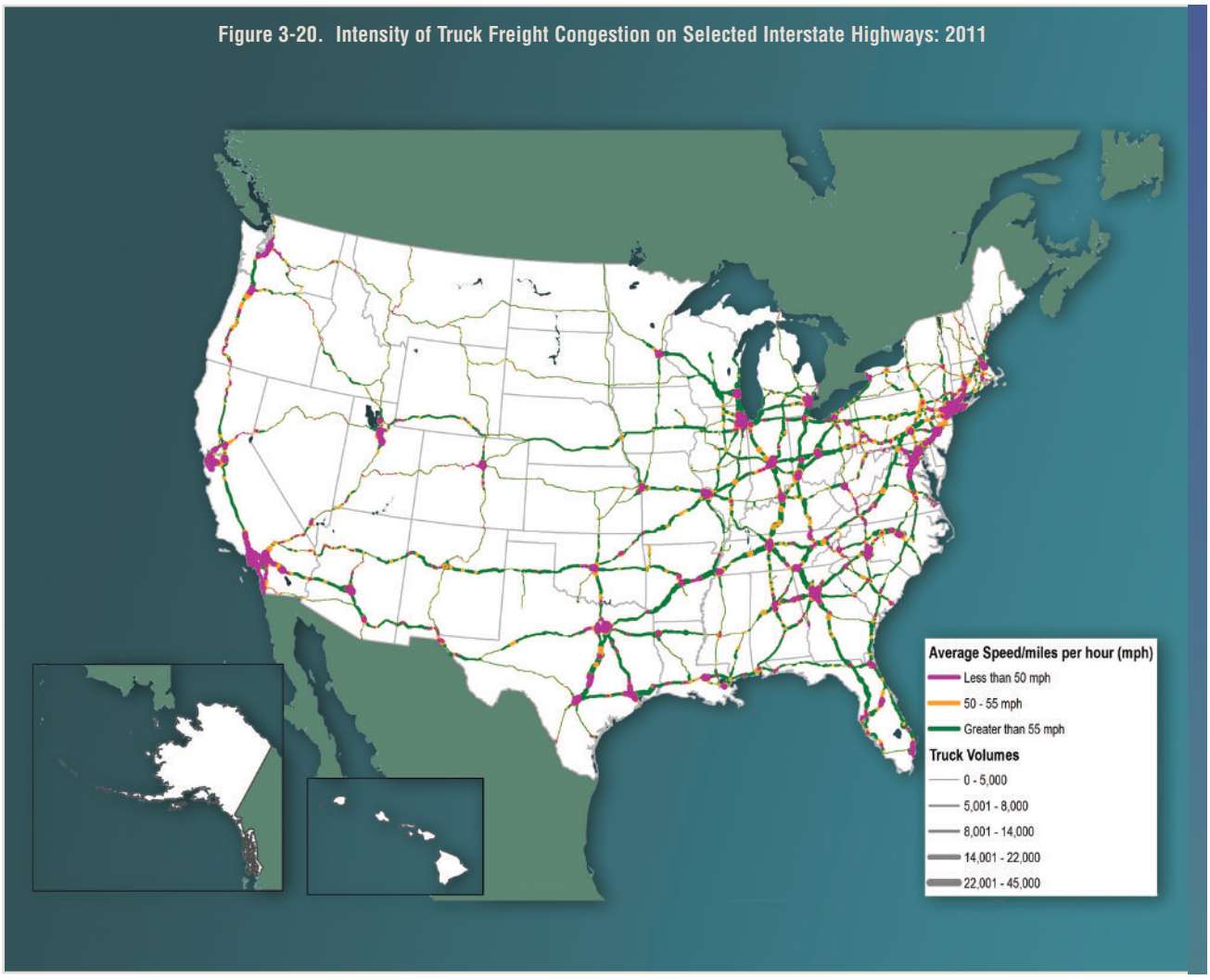


Figure 3-20. Intensity of Truck Freight Congestion on Selected Interstate Highways: 2011
Source: U.S. Department of Transportation, Federal Highway Administration Office of Freight Management and Operations, Freight Performance Measurement Program, 2012.

Table 3-12. Top 25 Truck Bottlenecks on Freight-Significant Highways: 2011

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	30.09	22.44	33.01	1.47
Fort Lee, NJ: I-95 at SR-4	2	31.29	23.86	34.76	1.46
Louisville, KY: I-65 at I-64/I-71	3	40.51	31.95	44.84	1.40
Austin , TX: I-35	4	34.87	20.69	43.37	2.10
Atlanta, GA: I-285 at I-85 (North)	5	44.69	33.74	50.20	1.49
Chicago, IL: I-90 at I-94 (North)	6	34.46	21.56	40.41	1.87
Dallas, TX: I-45 at I-30	7	40.50	31.60	44.26	1.40
Los Angeles, CA: SR-60 at SR-57	8	47.38	39.27	50.56	1.29
Cincinnati, OH: I-71 at I-75	9	46.46	37.52	50.18	1.34
Denver, CO: I-70 at I-25	10	42.25	34.40	46.10	1.34
St. Louis, MO: I-70 at I-64 (West)	11	44.21	39.17	46.35	1.18
Indianapolis, IN: I-65 at I-70 North	12	50.69	46.44	52.37	1.13
Atlanta, GA: I-75 at I-285 (North)	13	49.54	40.31	53.56	1.33
Houston, TX: I-610 at US 290	14	47.52	39.18	51.43	1.31
Houston, TX: I-10 at I-45	15	47.58	40.20	50.86	1.27
Ft. Worth, TX: I-35W at I-30	16	45.30	37.48	48.85	1.30
Houston, TX: I-45 at US-59	17	38.49	28.76	43.53	1.51
Nashville, TN: I-24 at I-440N Interchange	18	48.62	39.58	52.79	1.33
Indianapolis, IN: I-65 at I-70 South	19	50.98	47.56	52.28	1.10
Los Angeles, CA: I-710 at I-105	20	45.78	35.88	50.03	1.39
Buffalo-Niagara Falls, NY: I-90 at I-290	21	44.04	40.98	45.51	1.11
Washington , DC: I-495 at I-66	22	38.87	32.26	41.09	1.27
Philadelphia, PA: I-76 at US-30	23	36.14	29.52	38.83	1.32
Dallas, TX: US 75 at I-635	24	46.61	35.82	51.29	1.43
Houston, TX: I-45 at I-610 north	25	48.94	41.60	52.25	1.26

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 2011. 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

Table 3-12. Top 25 Truck Bottlenecks on Freight-Significant Highways: 2011
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Performance Measurement Program, special tabulation, 2012.

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.

Several monitored locations have recorded significant improvements in performance from 2010 to 2011 when looking at averages over 24 hours.

Table 3-13. Largest Improvements in Average Speed for Congested Freight Highway Locations: 2011

Location	Average Speed (mph)			Peak Period Average Speed (mph)			Non-Peak Period Average Speed (mph)		
	2010	2011	Percent change, 2010 to 2011	2010	2011	Percent change, 2010 to 2011	2010	2011	Percent change, 2010 to 2011
Minneapolis-St. Paul, MN: I-35 W at 62 E-W	40.70	50.13	23.2	33.24	42.76	28.7	44.27	53.83	21.6
Houston, TX: I-10 at US 59	41.01	48.85	19.1	31.02	40.23	29.7	46.41	53.10	14.4
Houston, TX: I-10 at I-45	41.28	47.58	15.3	32.18	40.20	24.9	45.51	50.86	11.7
Chicago, IL: I-290 at I-355	47.66	54.12	13.5	43.17	52.01	20.5	49.48	54.95	11.0
Kansas City, MO: I-70 at I-670 at US71	43.70	48.36	10.7	42.33	46.98	11.0	44.20	48.88	10.6

Key: mph = miles per hour.

Table 3-13. Largest Improvements in Average Speed for Congested Freight Highway Locations: 2011
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Performance Measurement Program, special tabulation, 2012.

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 3-14. Maximum Posted Speed Limits on Rural Interstates: 2012

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	65[2]	65[2]
Louisiana	75	75
Maine	75	75
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	[3]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	70[4]	75[4]
Utah	75[5]	75[5]
Vermont	65	65
Virginia	70[6]	70[6]
Washington	60	70
West Virginia	70	70
Wisconsin	65	65
Wyoming	75	75

[1]Urban Interstate.
[2]Effective July 10, 2007, the posted speed limit is 70 miles per hour (mph) in designated areas on I-75 and I-71.
[3]The posted speed limit is 70 mph on the Ohio Turnpike.
[4]In sections of I-10 and I-20 in rural West Texas, the speed limit for passenger cars and light trucks is 80 mph. For large trucks, the speed limit is 70 mph in the daytime and 65 mph at night. For cars, it is also 65 mph at night.
[5]Portions of I-15 have a posted limit of 80 mph.
[6]Effective July 1, 2010, the posted limit may be as high as 70 mph where indicated by lawfully placed signs, erected subsequent to a traffic engineering study.

Table 3-14. Maximum Posted Speed Limits on Rural Interstates: 2012
Source: Insurance Institute for Highway Safety, Maximum Posted Speed Limits for Passenger Vehicles, available at www.iihs.org/laws/speedlimits.aspx as of July 20, 2012.

Analysis has shown truck speed and reliability decrease in urban areas. FHWA uses Freight Performance Measurement Program data to measure truck speeds within 14 very large Census Metropolitan Statistical Areas. In 2011, five of the fourteen metropolitan areas had average truck speeds of less than 50 mph on their Interstates.

Table 3-15. Average Truck Speeds on Selected Metropolitan Interstates: 2011 (miles per hour)

Metropolitan Area	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Atlanta, GA	53.50	53.91	53.78	53.70
Boston, MA	47.36	48.01	47.67	46.85
Chicago, IL	51.40	50.37	50.09	51.46
Dallas, TX	54.89	55.49	55.31	55.41
Detroit, MI	48.46	49.58	49.38	49.21
Houston, TX	53.62	54.16	52.79	53.51
Los Angeles, CA	43.32	43.28	43.10	42.55
Miami, FL	56.98	56.99	57.26	56.78
New York, NY	50.47	50.90	50.37	50.73
Philadelphia, PA	47.05	46.59	47.02	47.26
Phoenix, AZ	57.13	57.01	56.91	57.62
San Francisco, CA	47.57	46.78	46.08	44.46
Seattle, WA	50.91	51.61	51.19	51.39
Washington, DC	54.97	53.94	53.66	54.35

Intercity travel-time reliability is a key freight performance measure. It influences logistics, operational strategies, and load optimization. FHWA analyzed the truck trip reliability of 22 top freight origins and destinations. Travel time between San Diego and Los Angeles

Table 3-16. Truck Trip Reliability as Indicated by Minimum and Maximum Travel Times Between Selected City-Pairs: January-March 2012

LOCATION	Northbound/ Eastbound Minimum	Northbound/ Eastbound Maximum	Maximum/ Minimum Percent Change	Southbound/ Westbound Minimum	Southbound/ Westbound Maximum	Maximum/ Minimum Percent Change
Atlanta, GA - Savannah, GA	3:55:15	4:17:30	9.46	3:56:00	4:13:33	7.44
Chicago, IL - Milwaukee, WI	1:31:00	1:54:06	25.38	1:31:00	2:22:21	56.43
Chicago, IL - Nashville, TN	7:37:53	8:07:31	6.47	7:39:03	8:09:19	6.59
Detroit, MI - Grand Rapids, MI	2:31:33	2:48:19	11.06	2:32:56	2:44:07	7.31
Houston, TX - Beaumont, TX	1:23:44	1:31:59	9.85	1:24:12	1:35:18	13.18
Houston, TX - Dallas, TX	3:42:40	4:17:48	15.78	3:43:07	4:13:14	13.50
Houston, TX - San Antonio, TX	3:06:17	3:37:32	16.78	3:06:01	3:34:27	15.29
Indianapolis, IN - Chicago, IL	3:01:07	3:23:58	12.62	3:01:12	3:25:36	13.47
Las Vegas, NV - Los Angeles, CA	4:14:04	5:18:51	25.50	4:13:51	4:46:54	13.02
Los Angeles, CA - San Francisco, CA	6:54:12	7:36:33	10.22	6:53:14	7:54:08	14.74
Miami, FL - Tampa, FL	4:30:59	5:36:42	24.25	4:33:44	5:08:28	12.69
Nashville, TN - Indianapolis, IN	4:36:32	4:59:56	8.46	4:37:15	5:06:23	10.51
New York, NY - Albany, NY	2:34:48	3:09:27	22.38	2:34:32	2:49:02	9.38
New York, NY - Buffalo, NY	7:07:44	7:24:49	3.99	7:08:00	7:47:03	9.12
New York, NY - Hartford, CT	1:53:03	2:35:56	37.93	1:51:13	2:29:56	34.81
Philadelphia, PA - New York, NY	1:48:39	2:30:31	38.53	1:50:40	2:38:12	42.95
Phoenix, AZ - Los Angeles, CA	6:13:09	7:11:22	15.60	6:18:12	6:56:05	10.02
Phoenix, AZ - Tucson, AZ	1:48:52	2:07:09	16.79	1:48:52	2:15:31	24.48
San Antonio, TX - Austin, TX	1:26:00	2:08:40	49.61	1:21:13	1:38:21	21.10
San Diego, CA - Los Angeles, CA	1:31:38	2:21:38	54.57	1:30:44	2:50:54	88.35
San Francisco, CA - Sacramento, CA	1:34:30	2:32:00	60.85	1:32:39	2:04:12	34.05
Seattle, WA - Portland, OR	2:54:37	3:30:49	20.73	2:53:40	3:30:53	21.43
Tampa, FL - Orlando, FL	1:21:05	1:41:19	24.95	1:21:05	1:51:24	37.39
Washington, DC - Baltimore, MD	0:52:40	1:10:41	34.21	0:53:25	1:13:00	36.66

Notes: Travel times are shown in hours, minutes, and seconds. The trip times were calculated between city centers using Interstate average travel speed data from the Freight Performance Measurement Program.

Table 3-15. Average Truck Speeds on Selected Metropolitan Interstates: 2011
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Performance Measurement Program, 2012.

Table 3-16. Truck Trip Reliability as Indicated by Minimum and Maximum Travel Times Between Selected City-Pairs: January-March 2012
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Performance Measurement Program, special tabulation, 2012.

Table 3-17. Average Time for Commercial Vehicles to Travel a Mile at Selected U.S.-Canada Border Crossings: 2011

Location	Direction	Average Minutes per Mile
Ambassador Bridge - Detroit, MI	Inbound	6.16
	Outbound	4.22
Port Huron, MI	Inbound	5.58
	Outbound	4.19
Peace Bridge - Buffalo, NY	Inbound	5.34
	Outbound	4.83
Lewiston-Queenston Bridge - Lewiston, NY	Inbound	4.63
	Outbound	4.46
Champlain, NY	Inbound	4.94
	Outbound	3.68
Blaine, WA	Inbound	7.75
	Outbound	6.52
Alexandria Bay, NY	Inbound	5.28
	Outbound	4.02
Pembina, ND	Inbound	5.73
	Outbound	4.62
Derby, VT	Inbound	4.63
	Outbound	3.54
Calais, ME	Inbound	5.55
	Outbound	3.77
Sumas, WA	Inbound	6.56
	Outbound	5.13
Highgate, VT	Inbound	3.58
	Outbound	2.82
Houlton, ME	Inbound	4.72
	Outbound	2.98
Sweetgrass, MT	Inbound	9.26
	Outbound	7.41
Jackman, ME	Inbound	2.85
	Outbound	3.43

Note: Travel times are shown in hours, minutes, and seconds. The trip times were calculated between city centers using Interstate average travel speed data from the Freight Performance Measurement Program.

showed the greatest change, increasing nearly 55 minutes in the northbound direction and more than 88 minutes in the southbound direction. Other city pairs also showed large differences in travel-time reliability.

Border crossings are potential bottlenecks in the freight transportation network. FHWA monitors truck crossing times at 15 U.S.-Canada border crossings. At all but two borders, transit times were longer for inbound U.S. traffic than for travel to Canada.

The U.S. Department of Transportation in partnership with the Texas Department of Transportation also measures transit times from Mexico to the Unites States at the Bridge

Table 3-17. Average Time for Commercial Vehicles to Travel a Mile at Selected U.S.-Canada Border Crossings: 2011
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, 2012.

of the Americas and the Pharr-Reynosa International Bridge. The data are collected using radio frequency identification technology installed at the start of the crossing (typically the end of the queue) and at the vehicle safety inspection station exit (the end of the crossing trip). Vehicle identification information is anonymously collected and time-stamped at each reader station, and travel time is calculated between the reader stations.

Table 3-18. Average Truck Transit Time at Selected U.S.-Mexico Border Crossings: 2011

Month	Bridge of the Americas - El Paso, Texas (minutes)	International Bridge - Pharr, Texas (minutes)
January	55	57
February	48	66
March	64	73
April	60	65
May	57	63
June	45	60
July	47	52
August	40	53
September	40	47
October	49	50
November	46	58
December	49	52

Table 3-18. Average Truck Transit Time at Selected U.S.-Mexico Border Crossings: 2011
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations; U.S. Department of Transportation, Intelligent Transportation Systems Joint Program Office; and Texas Department of Transportation, 2012.

IV. ECONOMIC CHARACTERISTICS OF 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.

Table 4-1. Transportation Fixed Assets: 2000, 2005, and 2009-2011 (billions of current dollars)

	2000	2005	2009	2010	2011	Percent change, 2000 to 2011
Private Sector						
Transportation Equipment[1]	828	980	(R) 1,000	(R) 987	1,037	25.2
Transportation Structures[2]	450	557	(R) 638	(R) 657	680	51.3
Public Sector						
Highways	1,435	2,056	2,836	2,939	3,132	118.2
Transportation Structures[2]	261	413	564	(R) 590	635	143.6
Federal	6	10	14	14	15	131.3
State and Local	254	403	551	(R) 576	621	143.9

Key: R = revised.
[1]Includes trucks, truck trailers, buses, automobiles, aircraft, ships, boats, and railroad equipment.
[2]Includes physical structures for all modes of transportation.

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 and maintained 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 nearly $46.4 trillion in 2011 (current U.S. dollars). Transportation equipment and structures (private and public) accounted for nearly 12 percent of the total in 2011. The components of transportation fixed assets and their 2011 values are private transportation equipment ($1.04 trillion), private transportation structures ($680 billion), and government transportation structures ($3.77 trillion).[1]

[1]Fixed assets 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, 2005, and 2009-2011
Source: U.S. Department of Commerce, Bureau of Economic Analysis, National Economic Accounts, Fixed Assests Tables, tables 2.1, 3.1s, and 7.1b, available at www.bea.gov/iTable/index_FA.cfm as of August 30, 2012.

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 2010

	Class I		Non-Class I		Total	
	2000	2010	2000	2010	2000	2010
Number of railroads	8	7	552	558	560	565
Freight revenue (billions of current dollars)	33.1	56.3	3.2	3.3	36.3	59.6
Operating revenue (billions of current dollars)	34.1	58.4	NA	NA	NA	NA
Employees	168,360	151,854	23,448	17,426	191,808	169,280

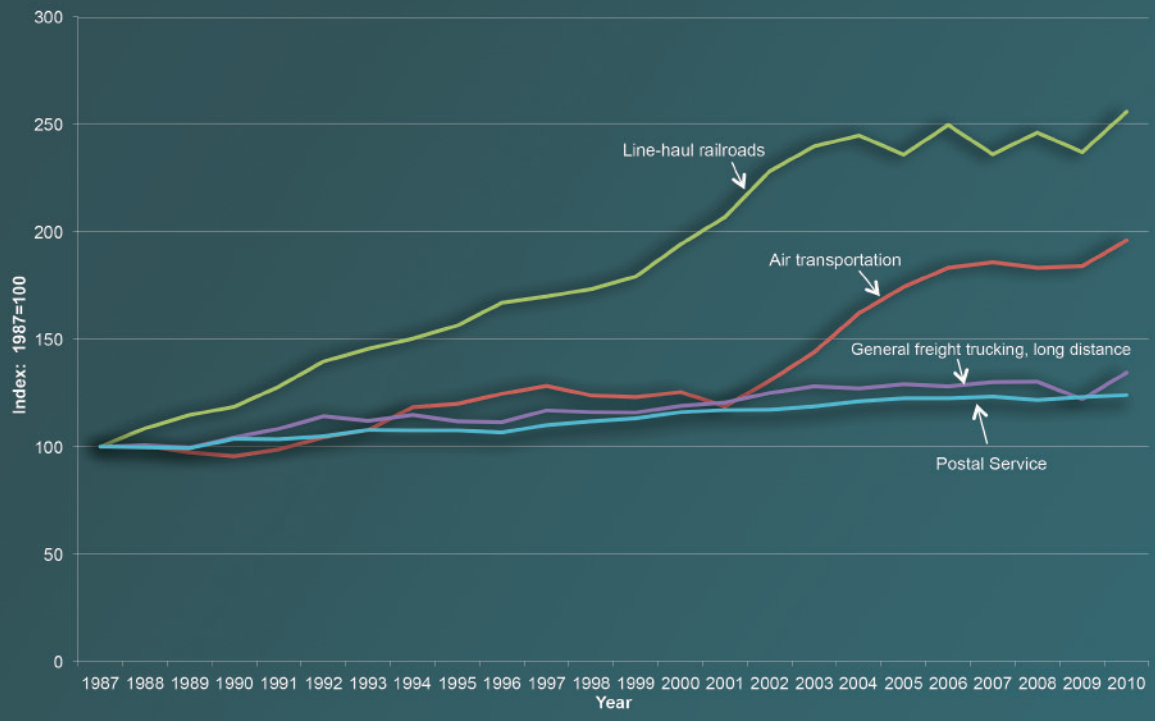
Key: NA = not available.

Railroads include Class I (national), Class II (regional), and Class III (local) carriers. Revenue grew while employment declined in national, regional, and local railroads between 2000 and 2010.

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 July 19, 2012; **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 July 19, 2012.

Table 4-3. Economic Characteristics of Freight Railroads: 2000 and 2010
Source: Association of American Railroads, Railroad Facts (Washington, DC: annual issues), p. 3.

Figure 4-1. Productivity in Selected Transportation Industries: 1987-2010
(Output per Employee[1])



[1]Based on the number of paid hours. Real gross domestic product (GDP) in the business and nonfarm business sectors is the basis of the output components of the productivity measures. These output components are based on and are consistent with the National Income and Product Accounts, including the GDP measure, prepared by the Bureau of Economic Analysis of the U.S. Department of Commerce.
Notes: In 2009, the Bureau of Labor Statistics (BLS) revised its data for air transportation output per hour worked to include both full-time and part-time workers. Prior to 2009, BLS assumed all air transportation workers were full-time employees.

Productivity has been relatively stable after years of improvement. Between 1987 and 2010, output-per-hour worked more than doubled in line-haul railroading and grew by 34 percent in long-distance, general-freight trucking. Line-haul railroads do not include switching and terminal operations or short-distance (or local) railroads. Long-distance, general-freight trucking establishments exclude local trucking and truck operators that require specialized equipment, such as flatbeds, tankers, or refrigerated trailers.

Figure 4-1. Productivity in Selected Transportation Industries: 1987-2010
Source: U.S. Department of Labor, Bureau of Labor Statistics, Industry Productivity, available at www.bls.gov/lpc/ as of September 5, 2012.

Table 4-4. Employment in For-Hire Transportation Establishments Primarily Serving Freight: 1990, 2000, and 2009-2011[1] (thousands)

	1990	2000	2009	2010	2011
Total U.S. labor force[2]	**109,487**	**131,785**	**130,807**	**(R)130,346**	**132,186**
Transportation and warehousing	**3,476**	**4,410**	**4,236**	**(R)4,235**	**4,322**
Rail transportation	272	232	218	(R)223	232
Water transportation	57	56	63	63	63
Truck transportation	1,122	1,406	1,268	(R)1,271	1,318
Air Transportation[3]	541	628	460	454	456
Pipeline transportation	60	46	43	42	43
Support activities for transportation[4]	364	537	549	(R)548	574
Couriers and messengers	375	605	546	527	522
Warehousing and storage	407	514	637	(R)643	650

Key: R = revised.
[1]Annual averages.
[2]Excludes farm employment.
[3]Data for air transportation includes passenger and freight transportation employment.
[4]Industries 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.

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 15 percent and 28 percent, respectively, between 1990 and 2011. Trucking in 2011 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 approxi-

Table 4-4. Employment in For-Hire Transportation Establishments Primarily Serving Freight: 1990, 2000, and 2009-2011
Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Employment Statistics survey, available at www.bls.gov/ces as of July 16, 2012.

Table 4-5. Employment in Selected Freight Transportation and Freight Transportation-Related Occupations: 2000 and 2009-2011

Occupation (SOC code)	2000	2009	2010	2011
Vehicle operators, pipeline operators, and primary support				
Driver/sales worker (53-3031)	373,660	363,050	371,670	387,950
Truck drivers, heavy and tractor-trailer (53-3032)	1,577,070	1,550,930	1,466,740	1,508,620
Truck drivers, light or delivery services (53-3033)	1,033,220	834,780	780,260	771,210
Locomotive engineers (53-4011)	29,390	43,560	40,750	38,790
Rail yard engineers, dinkey operators, and hostlers (53-4013)	4,020	5,360	5,600	5,060
Railroad brake, signal, and switch operators (53-4021)	16,830	24,270	22,760	23,830
Railroad conductors and yardmasters (53-4031)	40,380	41,540	42,700	44,280
Sailors and marine oilers (53-5011)	30,090	31,950	31,690	31,280
Captains, mates, and pilots of water vessels (53-5021)	21,080	30,450	29,280	30,220
Ship engineers (53-5031)	7,370	10,850	9,470	10,010
Bridge and lock tenders (53-6011)	4,790	4,290	3,250	3,420
Gas compressor and gas pumping station operators (53-7071)	6,510	4,160	4,040	3,870
Pump operators, except wellhead pumpers (53-7072)	13,730	10,310	9,440	12,150
Transportation equipment manufacturing and maintenance occupations				
Bus and truck mechanics and diesel engine specialists (49-3031)	258,800	232,810	222,770	222,940
Rail car repairers (49-3043)	10,620	20,910	19,280	19,480
Transportation Infrastructure construction and maintenance occupations				
Rail-track laying and maintenance equipment operators (47-4061)	9,940	14,880	15,520	15,590
Signal and track switch repairers (49-9097)	5,540	6,450	7,400	8,300
Dredge operators (53-7031)	3,100	1,990	1,720	1,590
Secondary support service occupations				
Dispatchers, except police, fire, and ambulance (43-5032)	167,180	185,100	180,540	182,310
Postal service mail carriers (43-5052)	354,980	339,030	324,990	315,330
Shipping, receiving, and traffic clerks (43-5071)	864,530	715,130	687,850	687,940
Transportation inspectors (53-6051)	26,520	24,250	24,280	24,810
Tank car, truck, and ship loaders (53-7121)	17,480	11,560	10,390	10,960

Key: SOC = Standard Occupational Classification.

mately 2.67 million truck drivers in 2011; about 57 percent of these professionals drive heavy/tractor trailer trucks, 29 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 may be an issue in the future.

Table 4-5. Employment in Selected Freight Transportation and Freight Transportation-Related Occupations: 2000 and 2009-2011
Source: U.S. Department of Labor, Bureau of Labor Statistics, National Occupational Employment and Wages, 2010, available at www.bls.gov/oes as of July 16, 2012.

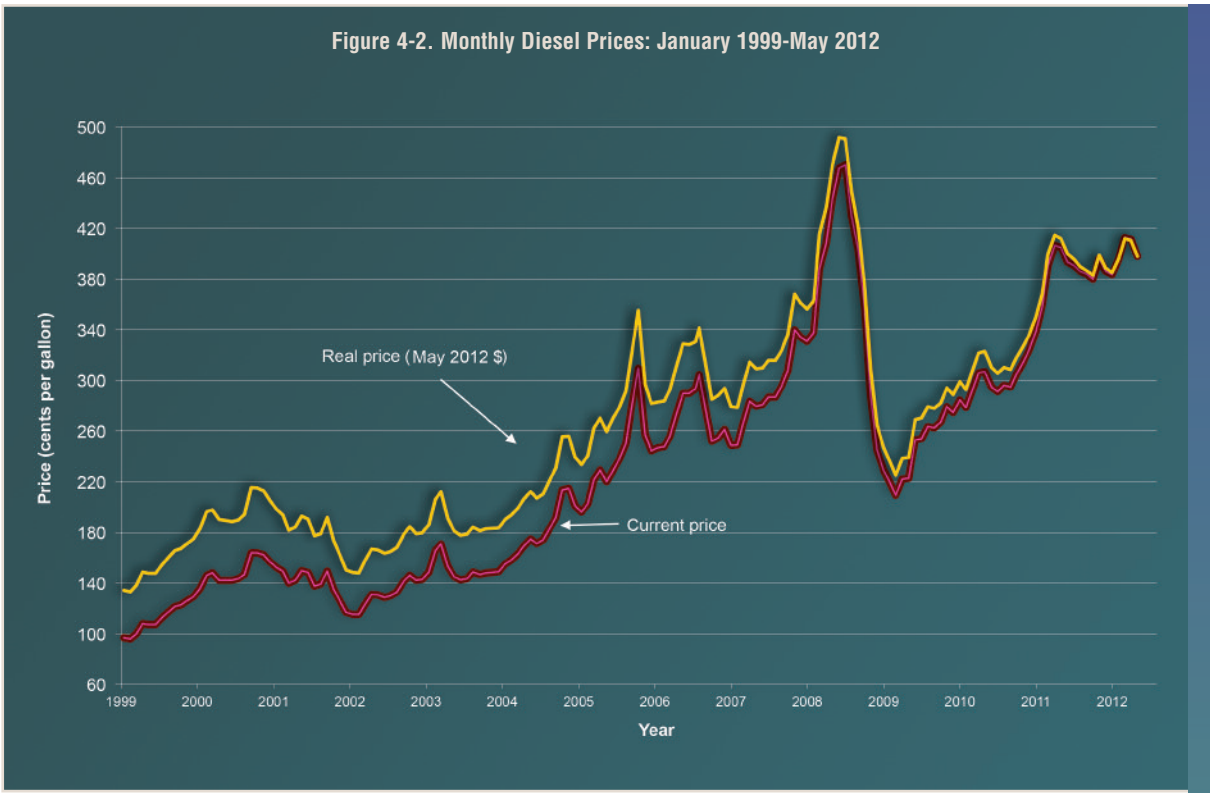
Table 4-6. Producer Price Indices for Selected Transportation Services: 1990, 2000, 2003, and 2006-2010

	1990	2000	2003	2006	2007	2008	2009	2010
Air Transportation (NAICS 481)[1]	**NA**	**147.7**	**162.1**	**180.4**	**183.7**	**203.8**	**188.5**	**202.9**
Scheduled Air Transportation (NAICS 4811)[2]	110.2	180.1	198.5	220.5	224.5	248.9	229.1	247.7
Scheduled Freight Air Transportation (NAICS 481112)	NA	NA	100.0	108.4	109.0	127.8	119.1	130.2
Nonscheduled Air Transportation (NAICS 4812)[3]	NA	107.3	117.8	136.8	148.5	165.8	160.4	165.4
Rail Transportation (NAICS 482)[3]	**NA**	**102.6**	**108.8**	**135.9**	**140.9**	**157.3**	**148.5**	**156.2**
Line -Haul Railroads (NAICS 482111)[4]	107.5	114.5	121.4	151.2	157.2	175.5	165.6	174.3
Water Transportation (NAICS 483)	**NA**	**NA**	**100.0**	**111.1**	**113.5**	**127.0**	**116.1**	**125.5**
Deep Sea Freight Transportation (NAICS 483111)[5]	113.1	155.8	219.9	233.3	230.0	258.3	218.8	244.8
Coastal and Great Lakes Freight Transportation (NAICS 483113)	NA	NA	100.0	119.9	130.2	141.8	137.4	146.7
Inland Water Freight Transportation (NAICS 483211)	100.0	117.9	124.7	182.9	186.1	218.3	211.4	217.4
Truck Transportation (NAICS 484)	**NA**	**NA**	**100.0**	**113.2**	**115.4**	**123.0**	**117.3**	**119.4**
General Freight Trucking (NAICS 4841)	NA	NA	100.0	114.1	116.5	123.6	117.5	119.3
General Freight Trucking, Local (NAICS 48411)	NA	NA	100.0	115.3	119.6	130.2	126.0	127.2
General Freight Trucking, Long Distance (NAICS 48412)	NA	NA	100.0	113.8	115.9	122.2	115.5	117.5
Specialized Freight Trucking (NAICS 4842)	NA	NA	100.0	111.4	113.1	122.1	117.4	119.9
Used Household and Office Goods Moving (NAICS 48421)	NA	NA	100.0	107.8	108.8	112.2	112.8	114.7
Specialized Freight (except Used Goods) Trucking, Local (NAICS 48422)	NA	NA	100.0	112.3	114.2	126.7	123.9	126.5
Specialized Freight (except Used Goods) Trucking, Long Distance (NAICS 48423)	NA	NA	100.0	112.8	114.8	123.6	113.2	115.8
Pipeline Transportation (NAICS 486)	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Pipeline Transportation of Crude Oil (NAICS 4861)	NA	NA	100.0	112.0	125.4	137.1	141.0	183.4
Other Pipeline Transportation (NAICS 4869)[6]	NA	NA	100.0	108.2	115.0	121.6	128.7	133.8
Support Activities for Transportation (NAICS 488)	**NA**	**NA**	**100.0**	**106.5**	**108.5**	**111.7**	**108.6**	**110.7**
Support Activities for Water Transportation (NAICS 4883)[7]	NA	NA	100.0	107.7	112.7	117.3	116.8	120.2
Navigational Services to Shipping (NAICS 48833)	NA	NA	100.0	113.9	120.6	133.8	122.9	122.9
Freight Transportation Arrangement (NAICS 4885)[3]	NA	98.3	97.9	98.8	100.2	102.5	94.8	95.2
Postal Service (NAICS 491)	**100.0**	**135.2**	**155.0**	**164.7**	**171.9**	**178.9**	**185.0**	**187.7**
Couriers and Messengers (NAICS 492)	**NA**	**NA**	**100.0**	**121.5**	**131.5**	**142.0**	**141.5**	**153.4**

Key: NA = not available; NAICS = North American Industry Classification System.
[1]Base year = 1992.
[2]Base year = 1989.
[3]Base year = 1996.
[4]Base year = 1984.
[5]Base year = 1988.
[6]Other pipeline transportation includes pipeline transportation of refined petroleum products (NAICS 48691).
[7]Support 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 2009 to 2010, the prices charged for transportation purchased from carriers and support activities have gone up in most industries. Air and water transportation prices both increased by about eight percent, and rail increased by more than five percent.

Table 4-6. Producer Price Indices for Selected Transportation Services: 1990, 2000, 2003, and 2006-2010
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 July 16, 2012.



Diesel prices were about 142 percent higher in May 2012 than 10 years earlier (in inflation-adjusted terms).

FIGURE 4-2. MONTHLY DIESEL PRICES: JANUARY 1999-MAY 2012
Source: Diesel price: U.S. Department of Energy, Energy Information Agency, U.S. Petroleum Prices, available at www.eia.doe.gov as of July 16, 2012. **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 July 16, 2012.

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

Growing demand for freight transportation heightens concerns about its safety, energy consumption, and environmental impacts. While safety in all freight modes continues to be monitored actively, the availability of energy consumption data has declined with the discontinuation of the Vehicle Inventory and Use Survey.

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

Table 5-1. Fatalities by Freight Transportation Mode: 1990, 2000, and 2009-2011

	1990	2000	2009	2010	2011
Total transportation fatalities (passenger and freight)	**47,350**	**44,384**	**35,929**	**U**	**U**
Highway (passenger and freight)	**44,599**	**41,945**	**(R)33,883**	**32,885**	**U**
Large truck occupants[1]	705	754	(R)499	529	U
Others killed in crashes involving large trucks	4,567	4,528	(R)2,551	3,146	U
Large truck occupants[1] (percent)	1.6	1.8	1.5	1.6	U
Others killed in crashes involving large trucks (percent)	10.2	10.8	7.5	9.6	U
Railroad (passenger and freight)	**1,297**	**937**	**695**	**(R)730**	**694**
Highway-rail crossing[2]	698	425	247	(R)257	249
Railroad[2,3]	599	512	448	(R)473	445
Waterborne (passenger and freight)	**186**	**111**	**185**	**160**	**232**
Vessel-related[4]	85	42	54	28	41
Freight ship	0	0	1	1	10
Tank ship	5	0	1	0	1
Tug/towboat	13	1	3	0	4
Offshore supply	2	0	0	0	1
Fishing vessel	47	26	25	14	9
Mobile offshore drilling units	0	0	1	0	0
Platform	1	0	0	0	0
Freight barge	0	0	0	0	0
Tank barge	0	0	0	0	1
Miscellaneous[5]	11	15	23	13	15
Not vessel-related[4]	101	69	131	132	191
Pipeline	**9**	**38**	**13**	**(R)19**	**12**
Hazardous liquid pipeline	3	1	4	1	1
Gas pipeline	6	37	9	(R)18	11

Key: R = revised; U = unavailable at date of publication.
[1]Large trucks are defined as trucks over the 10,000 pound gross vehicle weight rating, including single-unit trucks and truck tractors.
[2]Includes Amtrak.
[3]Includes train accidents and other incidents. Most fatalities involve trespassers who are included under other incidents (411 in 2011).
[4]Vessel-related casualties include those involving damage to vessels such as collisions or groundings. Fatalities not related to vessel casualties include deaths from falling overboard or from accidents involving onboard equipment.
[5]Includes 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: 1990, 2000, and 2009-2011
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 October, 1, 2012. **Highway: 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- 2011:** U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts - Highlights* (March 2012). **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 October 1, 2012. **Waterborne:** U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, September 15, 2012. **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 October 1, 2012.

waterborne casualties that are not vessel related. Trucks accounted for approximately 11 percent of all highway fatalities in 2010. The vast majority of fatalities involve passenger travel on highways.

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

Table 5-2. Injured Persons by Freight Transportation Mode: 1990, 2000, and 2009-2011

	1990	2000	2009	2010	2011
Highway (passenger and freight)	**3,230,666**	**3,188,750**	**2,217,000**	**1,542,000**	**U**
Large truck occupants[1]	41,822	30,832	17,000	20,000	U
Others injured in crashes involving large trucks	108,000	109,000	56,000	60,000	U
Large truck occupants[1] (percent)	1.3	1.0	0.8	1.3	U
Others injured in crashes involving large trucks (percent)	3.3	3.4	2.5	3.9	U
Railroad (passenger and freight)	**25,143**	**11,643**	**7,968**	**(R) 8,337**	**8,228**
Highway-rail grade crossing[2]	2,407	1,219	741	(R) 875	1,002
Railroad[2,3]	22,736	10,434	7,227	(R) 7,462	7,226
Waterborne (passenger and freight)	**NA**	**665**	**722**	**509**	**912**
Vessel-related[4]	175	151	186	135	247
Freight ship	10	5	8	17	24
Tank ship	13	3	4	0	10
Tug/towboat	19	18	39	0	27
Offshore supply	9	6	0	3	1
Fishing vessel	31	21	35	15	46
Mobile offshore drilling units	13	0	1	10	6
Platform	9	0	0	0	0
Freight barge	3	2	0	0	4
Tank barge	3	0	1	0	0
Miscellaneous[5]	12	96	98	90	129
Not related to vessel casualties[4]	NA	514	536	374	665
Pipeline	**76**	**81**	**(R) 62**	**(R) 104**	**55**
Hazardous liquid pipeline	7	4	4	4	2
Gas pipeline	69	77	(R) 58	99	53

Key: NA = not available; R = revised; U = unavailable at date of publication.
[1]Large trucks are defined as trucks over the 10,000 pound gross vehicle weight rating, including single-unit trucks and truck tractors.
[2]Includes Amtrak.
[3]Includes train accidents and other incidents. Most injuries involve workers on duty and are included under other incidents (4,199 in 2011).
[4]Vessel-related injuries include those involving damage to vessels, such as collisions or groundings. Injuries not related to vessel casualties include those from falls overboard or from accidents involving onboard equipment.
[5]Includes industrial vessel, oil recovery, passenger (inspected), passenger (uninspected), recreational, research vessel, unclassified, and unknown data.

Table 5-2. Injured Persons by Freight Transportation Mode: 1990, 2000, and 2009-2011
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 October, 1, 2012. **Highway: 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). **2009-2011:** U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts - Highlights* (March 2012). **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 October 1, 2012. **Waterborne:** U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, September 15, 2012. **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 October 1, 2012.

Table 5-3. Crashes, Accidents, and Incidents by Freight Transportation Mode: 1990, 2000, and 2009-2011

	1990	2000	2009	2010	2011
Highway (passenger and freight)	**6,471,000**	**6,394,000**	**5,505,000**	**5,419,000**	**U**
Large truck[1]	371,801	437,861	296,000	276,000	U
Large truck[1] (percent of total)	5.7	6.8	5.4	5.1	U
Rail (passenger and freight)					
Highway-rail grade crossing[2,3]	5,715	3,502	(R)1,932	(R)2,027	2,011
Railroad[2,4]	2,879	2,983	(R)1,910	(R)1,902	2,003
Waterborne (passenger and freight)					
Vessel-related	3,613	5,403	5,475	5,434	6,381
Pipeline					
Hazardous liquid pipeline	140	135	106	(R)121	140
Gas pipeline	290	290	271	(R)257	281

Key: NA = not available; R = revised; U = unavailable at date of publication.
[1]Large trucks are defined as trucks over the 10,000 pound gross vehicle weight rating, including single-unit trucks and truck tractors.
[2]Includes Amtrak.
[3]Includes both accidents and incidents. Most highway-rail grade crossing accidents are also counted under highway.
[4]Train accidents only.

The number of crashes and other freight transportation accidents has declined in all modes except water over the 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: 1990, 2000, and 2009-2011

	1990	2000	2009	2010	2011
Total	**8,879**	**17,557**	**(R)14,818**	**(R)14,796**	**15,016**
Accident-related	297	394	290	(R)359	375
Air	**297**	**1,419**	**(R)1,356**	**1,293**	**1,400**
Accident-related	0	3	2	2	2
Highway	**7,296**	**15,063**	**12,730**	**12,635**	**12,803**
Accident-related	249	329	251	(R)321	333
Rail	**1,279**	**1,058**	**(R)642**	**(R)749**	**742**
Accident-related	48	62	37	(R)35	40
Water[1]	**7**	**17**	**90**	**105**	**71**
Accident-related	0	0	0	1	0
Other[2]	**0**	**0**	**NA**	**NA**	**NA**
Accident-related	0	0	NA	NA	NA

Key: NA = not available; R = revised.
[1]Water 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.
[2]Other category includes freight forwarders and modes not otherwise specified.
Notes: Hazardous materials transportation incidents required to be reported are defined in the Code of Federal Regulations (CFR), 49 CFR 171.15, 171.16 (Form F 5800.1). Hazardous materials deaths and injuries are caused by the hazardous material in commerce. Accident related means vehicular accident or derailment. Each modal total also includes fatalities caused by human error, package failure, and causes not elsewhere classified. As of 2005, the "Other" data is no longer included in the hazardous materials information system report.

Table 5-3. Crashes, Accidents, and Incidents by Freight Transportation Mode: 1990, 2000, and 2009-2011
Sources: Highway: U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts, Large Trucks* (annual issues). **2008-2010:** U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts - Highlights* (August 2012). **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 September 20, 2012. **Waterborne:** U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, September 6, 2012. **Pipeline:** U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Pipeline Safety Program, Pipeline Library, available at http://phmsa.dot.gov/pipeline/library/data-stats as of September 20, 2012.

Table 5-4. Hazardous Materials Transportation Incidents: 1990, 2000, and 2009-2011
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 September 20, 2012.

vehicular crash or derailment (referred to as "accident related"). Approximately two percent of incidents were accident related in 2011, but they accounted for 76 percent of all property damage. Most hazardous materials incidents occur because of human error or package failure, particularly during loading and unloading.

Table 5-5a. Commercial Motor Carrier Compliance Reviews by Safety Rating: 2011

	2011		
Safety rating	**Federal**	**State**	**Total**
Satisfactory	3,466	1,862	5,328
Conditional	2,365	1,175	3,540
Unsatisfactory	207	114	321
Not rated	158	1,620	1,778
Total	**6,196**	**4,771**	**10,967**

Notes: These data include any review that resulted in a safety rating, including Motor Carrier Safety Compliance Reviews or CSA2010 reviews. As a result, the total number of reviews in this table differs from the total in Table 5- 5b because that table includes reviews that did not result in a formal safety rating. 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.

The safety fitness of motor carriers is a top priority of the U.S. Department of Transportation. As part of its efforts to improve safety, federal and state governments conducted 10,967 safety compliance reviews that resulted in a formal safety rating in 2011. Of that total, only about three percent of motor carriers received an unsatisfactory rating.

Federal and state governments also conduct shipper, cargo tank facility, and onsite comprehensive safety analysis reviews.

Table 5-5b. Commercial Motor Carrier Compliance Reviews by Type: 2008-2011

	2008			2009			2010			2011		
Review Type	**Federal**	**State**	**Total**	**Federal**	**State**	**Total**	**Federal**	**State**	**Total**	**Federal**	**State**	**Total**
Total Reviews	**11,105**	**7,007**	**18,112**	**12,326**	**7,979**	**20,305**	**12,309**	**7,877**	**20,186**	**11,094**	**7,335**	**18,429**
Motor Carrier Safety Compliance Reviews	9,642	5,971	15,613	10,084	6,429	16,513	8,859	5,705	14,564	4,614	3,657	8,271
Cargo Tank Facility Reviews	79	15	94	84	22	106	121	23	144	78	19	97
Shipper Reviews	293	50	343	341	38	379	310	80	390	271	61	332
Non-Rated Reviews (excludes SCR & CSA2010)	841	669	1,510	1,243	815	2,058	1,725	636	2,361	959	541	1,500
CSA Offsite	209	267	476	136	207	343	333	356	689	316	300	616
CSA Onsite Focused / Focused CR	36	29	65	260	260	520	591	615	1,206	4,324	1,903	6,227
CSA Onsite Comprehensive*	5	6	11	178	208	386	369	458	827	529	853	1,382
Total Security Contact Reviews	**1,310**	**487**	**1,797**	**1,378**	**581**	**1,959**	**1,276**	**621**	**1,897**	**603**	**301**	**904**

Key: SCR = Security Contact Reviews; CSA = Compliance, Safety, Accountability; CR = Compliance Review.
Notes: These data include all compliance reviews conducted in the specified years. As a result, the total number of reviews in this table differs from the total in Table 5-5a because that table only includes reviews that reulted in a formal safety rating. 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.

Table 5-5a. Commercial Motor Carrier Compliance Reviews by Safety Rating: 2011
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 September 3, 2012.

Table 5-5b. Commercial Motor Carrier Compliance Reviews by Type: 2008-2011
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 September 3, 2012.

Table 5-6. Roadside Safety Inspection Activity Summary By Inspection Type: 2000 and 2009-2011

	2000		2009		2010		2011	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All inspections								
Number of inspections	2,453,776	100.0	3,530,382	100.0	3,569,373	100.0	3,601,302	100.0
With no violations	639,593	26.1	1,176,351	33.3	1,225,324	34.3	1,342,133	37.3
With violations	1,814,183	73.9	2,354,031	66.7	2,344,049	65.7	2,259,169	62.7
Driver inspections								
Number of inspections	2,396,688	100.0	3,429,882	100.0	3,470,871	100.0	3,484,536	100.0
With no violations	1,459,538	60.9	2,100,760	61.2	2,316,960	66.8	2,422,611	69.5
With violations	937,150	39.1	1,329,122	38.8	1,153,911	33.2	1,061,925	30.5
With OOS violations	191,031	8.0	196,625	5.7	183,350	5.3	173,980	5.0
Vehicle inspections								
Number of inspections	1,908,300	100.0	2,349,072	100.0	2,413,094	100.0	2,425,973	100.0
With no violations	584,389	30.6	779,891	33.2	834,551	34.6	880,172	36.3
With violations	1,323,911	69.4	1,569,181	66.8	1,578,543	65.4	1,545,801	63.7
With OOS violations	452,850	23.7	506,878	21.6	480,416	19.9	491,730	20.3
Hazardous materials inspections								
Number of inspections	133,486	100.0	222,587	100.0	211,154	100.0	208,852	100.0
With no violations	101,098	75.7	153,219	68.8	180,522	85.5	183,150	87.7
With violations	32,388	24.3	69,368	31.2	30,632	14.5	25,702	12.3
With OOS violations	9,964	7.5	10,323	4.6	9,210	4.4	7,998	3.8

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.

Less than one-fourth of all roadside inspections of commercial vehicles resulted in the vehicle being placed out of service (OOS) for a serious violation. A much lower percentage of driver and hazardous materials inspections results in OOS orders. In 2011, five percent of driver inspections and less than four percent of hazardous materials inspections resulted in an OOS order.

Table 5-6. Roadside Safety Inspection Activity Summary By Inspection Type: 2000 and 2009-2011
Source: 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, July 17, 2012.

Table 5-7. Fuel Consumption by Transportation Mode: 2007-2010

	2007	2008	2009	2010
Highway[1]				
Gasoline, diesel and other fuels (million gallons)	176,203	170,765	168,140	169,679
Truck, total	47,219	47,704	(R) 44,303	44,957
Single-unit 2-axle 6-tire or more truck	16,314	17,144	(R) 16,253	15,072
Combination truck	30,904	30,561	(R) 28,050	29,885
Truck (percent of total)	26.8	27.9	(R) 26.3	26.5
Rail, Class I (in freight service)				
Distillate / diesel fuel (million gallons)	4,062	3,886	3,192	3,494
Water				
Residual fuel oil (million gallons)	6,327	5,066	4,543	4,206
Distillate / diesel fuel oil (million gallons)	1,924	1,187	1,266	1,343
Gasoline (million gallons)	1,222	1,136	1,130	1,167
Pipeline				
Natural gas (million cubic feet)	621,364	647,956	(R) 670,174	668,847

Key: R = revised.
[1]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 pre-2011 editions of *Freight Facts and Figures*.

Fuel consumption is a major concern for environmental and other reasons. In recent years, increases in fuel costs, a slight decrease in the number of trucks on the road, and improved energy efficiency have affected the number of gallons of fuel burned by commercial trucks. From 2007 to 2010, truck fuel consumption declined by nearly five percent. Fuel use in Class I freight railroads declined 14 percent, from 4.1 billion gallons in 2007 to 3.5 billion gallons in 2010.

In 2010, trucking accounted for a large majority of freight transportation energy consumption, followed by water, a distant second.

Table 5-8. Energy Consumption by Transportation Mode: 2007-2010 (trillions of BTUs)

	2007	2008	2009	2010
Truck	6,326	6,382	(R)5,922	6,029
Class I Rail	563	539	443	485
Water	1,367	1,065	997	962
Pipeline (natural gas only)	642	668	(R)691	690

Key: BTU = British Thermal Unit; R = revised.
[1]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 pre-2011 editions of *Freight Facts and Figures*.

Table 5-7. Fuel Consumption by Transportation Mode: 2007-2010
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 2010* (Washington, DC: 2011), 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/2010/ as of July 20, 2012. **Pipeline:** U.S. Department of Energy, *Natural Gas Annual 2010*, (Washington, DC: December 2011), table 15 and similar tables in earlier editions.

Table 5-8. Energy Consumption by Transportation Mode: 2007-2010
Source: 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 2010* (Washington, DC: 2011), 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/2010/ as of July 20, 2012. **Pipeline:** U.S. Department of Energy, *Natural Gas Annual 2010*, (Washington, DC: December 2011), table 15 and similar tables in earlier editions.

Miles per gallon for single-unit trucks (based on total travel and fuel consumption) have been relatively stable in recent years. In 2010, single-unit trucks consumed nearly 1.2 billion fewer gallon than the previous year.

Table 5-9. Single-Unit Truck Fuel Consumption and Travel: 2007-2010

	2007	2008	2009	2010
Number registered (thousands)	8,117	8,288	8,356	8,217
Vehicle miles (millions)	119,979	126,855	(R)120,207	110,674
Fuel consumed (million gallons)	16,314	17,144	(R)16,253	15,072
Average miles traveled per vehicle	14,782	15,306	(R)14,386	13,469
Average miles traveled per gallon	7.4	7.4	7.4	7.3
Average fuel consumed per vehicle (gallons)	2,010	2,068	(R)1,945	1,834

Key: R = revised.
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 pre-2011 editions of *Freight Facts and Figures*.

Table 5-10. Combination Truck Fuel Consumption and Travel: 2007-2010

	2007	2008	2009	2010
Number registered (thousands)	2,635	2,585	2,617	2,553
Vehicle miles traveled (millions)	184,199	183,826	(R)168,100	175,911
Fuel consumed (million gallons)	30,904	30,561	(R)28,050	29,885
Average miles traveled per vehicle	69,896	71,106	(R)64,231	68,907
Average miles traveled per gallon	6.0	6.0	6.0	5.9
Average fuel consumed per vehicle (gallons)	11,727	11,821	(R)10,718	11,706

Key: R = revised.
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 pre-2011 editions of *Freight Facts and Figures*.

Miles per gallon by combination trucks (based on total travel and fuel consumption) also remained stable between 2007 and 2010. During the same period, vehicle miles traveled by combination trucks declined by 8.3 billion (about 4 percent).

Table 5-9. Single-Unit Truck Fuel Consumption and Travel: 2007-2010
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/2010/ as of June 25, 2012.

Table 5-10. Combination Truck Fuel Consumption and Travel: 2007-2010
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/2010/ as of June 25, 2012.

Table 5-11. Energy Intensities of Domestic Freight Transportation Modes: 2007-2010

	2007	2008	2009	2010
Highway[1] (Btu per vehicle mile)	21,238	21,008	(R)21,024	21,463
Railroad (Class I) (Btu per freight car mile)	14,846	14,573	13,907	13,733
Railroad (Class I) (Btu per ton mile)	320	305	291	289
Domestic Water (Btu per ton mile)	225	252	225	217

Key: Btu = British thermal unit; R = revised.
[1]Based 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 pre-2011 editions of *Freight Facts and Figures*.

Energy intensity is the amount of energy used to produce 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 and water have improved.

Table 5-12. Estimated National Average Vehicle Emissions Rates of Heavy-Duty and Light-Duty Vehicles: 2000, 2005, 2010, and 2011 (grams per mile)

	2000	2005	2010	2011
Gasoline				
Cars				
Exhaust HC	0.88	0.49	0.29	0.26
Nonexhaust HC	0.61	0.38	0.22	0.19
Total HC	1.49	0.87	0.51	0.45
Exhaust CO	15.21	8.44	5.17	4.75
Exhaust NO_x	1.98	1.24	0.77	0.69
Light trucks				
Exhaust HC	1.31	0.98	0.74	0.69
Nonexhaust HC	0.63	0.44	0.33	0.31
Total HC	1.94	1.43	1.08	1.00
Exhaust CO	23.44	16.08	11.77	11.06
Exhaust NO_x	2.85	2.04	1.59	1.50
Heavy trucks				
Exhaust HC	2.75	1.87	1.30	1.19
Nonexhaust HC	1.22	0.94	0.76	0.70
Total HC	3.96	2.81	2.06	1.89
Exhaust CO	62.89	47.27	35.27	32.95
Exhaust NO_x	5.84	4.50	3.56	3.45
Diesel				
Cars				
Exhaust HC	0.26	0.16	0.08	0.07
Exhaust CO	1.14	0.57	0.54	0.63
Exhaust NO_x	1.36	1.96	1.23	1.09
Light trucks				
Exhaust HC	0.65	0.66	0.60	0.55
Exhaust CO	3.51	3.74	3.40	3.15
Exhaust NO_x	6.04	5.83	4.62	4.26
Heavy trucks				
Exhaust HC	1.06	1.10	0.92	0.86
Exhaust CO	4.59	4.64	3.57	3.28
Exhaust NO_x	23.20	16.84	10.97	9.84

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 pre-2011 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 pre-2011 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 58 percent.

Table 5-11. Energy Intensities of Domestic Freight Transportation Modes: 2007-2010
Source: Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 31* (Oak Ridge, TN: annual issues), table 2.15, available at http://cta.ornl.gov/data/index.shtml as of August 5, 2012.

Table 5-12. Estimated National Average Vehicle Emissions Rates of Heavy-Duty and Light-Duty Vehicles: 2000, 2005, 2010, and 2011
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: Tons (thousands)	NO_x Emissions: Percent	NO_x Emissions: As a percent of: All mobile sources	NO_x Emissions: As a percent of: All sources	PM-10 Emissions: Tons (thousands)	PM-10 Emissions: Percent	PM-10 Emissions: As a percent of: All mobile sources	PM-10 Emissions: As a percent of: 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, enormous strides have been made in reducing freight emissions of NO_X 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. Nitrogen Oxides (NO_X) Emissions by Freight Transportation Mode: 2002 and 2020

	Tons (thousands)		
	2002	2020	Percent change, 2002 to 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 July 16, 2012.

Table 5-14. 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 July 16, 2012.

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

	Tons (thousands)		
	2002	2020	Percent change, 2002 to 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 emissions. 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 (CO_2), 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.

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

TABLE 5-15. 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 July 16, 2012.

Table 5-16. U.S. Greenhouse Gas Emissions by Economic End-Use Sector: 1990, 2005, and 2007-2010 (electricity-related emissions distributed among sectors)[1] (millions of metric tonnes of CO2 equivalent)

Sector	(R)1990	(R)2005	2007	(R)2008	(R)2009	2010
Industry[2]	2,237.7	2,159.9	2,185.9	2,131.5	1,905.8	2,019.0
Transportation[3]	1,548.3	2,022.3	2,007.6	1,894.6	1,823.9	1,838.6
Commercial	939.4	1,193.6	1,216.9	1,213.3	1,151.3	1,171.0
Residential	953.2	1,244.6	1,238.5	1,227.3	1,162.9	1,226.6
Agriculture	462.9	525.5	550.5	533.3	518.9	521.1
U.S. Territories[4]	33.7	58.2	53.5	48.4	45.5	45.5
Total	**6,175.2**	**7,204.2**	**7,252.8**	**7,048.3**	**6,608.3**	**6,821.8**

Key: CO_2 = carbon dioxide; R = revised.

[1]Emissions 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.

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

[3]Includes emissions from military aircraft (12.5 million of metric tonnes in 2010) and "other" transportation, primarily lubricants (9.5 million of metric tonnes in 2010). Emissions from international bunker fuels are not included.

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

Notes: Greenhouse gas (GHG) emissions include CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. CO_2 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 CO_2 by weight. Numbers may not add to totals due to rounding.

From 1990 to 2010, transportation GHG emissions rose by nearly 19 percent. However, transportation sector emissions decreased by 8 percent from 2007 to 2010, likely the result of the economic downtown and higher fuel prices, which led to a decrease in vehicle miles traveled and fuel consumption.

Table 5-16. U.S. Greenhouse Gas Emissions by Economic End-Use Sector: 1990, 2005, and 2007-2010

Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010*, EPA 430-R-12-001 (Washington, DC: April 15, 2012), table ES-8, available at http://epa.gov/climatechange/emissions/usinventoryreport.html as of May 10, 2012.

CO_2 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 62 percent of transportation sector CO_2 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 CO_2 Emissions from Fossil Fuel Combustion by Fuel Type: 1990, 2005, and 2007-2010 (millions of metric tonnes of CO_2 equivalent)

Fuel	1990	2005	2007	2008	(R)2009	2010
Petroleum	**1,449.9**	**1,863.5**	**1,858.7**	**(R)1,753.2**	**1,690.0**	**1,705.4**
Motor gasoline	983.7	1,187.8	1,181.2	1,130.3	1,128.5	1,117.0
Distillate fuel oil	262.9	458.1	476.3	443.5	402.9	418.9
Jet fuel	176.2	194.2	168.7	155.1	139.6	140.5
Residual fuel[1]	22.6	19.3	29.0	19.9	15.4	25.3
Aviation gasoline	3.1	2.4	2.2	2.0	1.8	1.9
Liquefied petroleum gas	1.4	1.7	1.4	(R)2.5	1.7	1.8
Natural Gas	**36.0**	**33.1**	**35.2**	**(R)36.7**	**37.9**	**40.1**
Transportation Total[2]	**1,485.9**	**1,896.6**	**1,893.9**	**(R)1,789.8**	**1,727.9**	**1,745.5**
U.S. Total[2]	**(R)4,738.3**	**(R)5,746.5**	**5,757.8**	**(R)5,571.5**	**5,206.2**	**5387.8**
Transportation Sector as % of Total	**31.4**	**33.0**	**32.9**	**(R)32.1**	**33.2**	**32.4**

Key: CO_2 = carbon dioxide; R = revised.
[1]Fluctuations in emissions estimates reflect data collection problems.
[2]Electricity-related emissions are not included in the transportation sector and U.S. totals.
Notes: CO_2 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 CO_2 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 CO_2 Emissions from Fossil Fuel Combustion by Fuel Type: 1990, 2005, and 2007-2010
Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010*, EPA 430-R-12-001 (Washington, DC: April 15, 2012), Annex 2, tables A-11, A-12, A-13, A-14, A-16, and A-31, available at http://epa.gov/climatechange/emissions/usinventoryreport.html as of May 10, 2012.

Table 5-18. U.S. Greenhouse Gas Emissions from Domestic Freight Transportation: 1990, 2005, and 2007-2010 (millions of metric tonnes of CO_2 equivalent)

Mode	1990	2005	2007	(R)2008	(R)2009	2010	Percent change, 1990 to 2010
Trucking	231.1	(R)408.5	444.7	427.1	389.3	402.2	74.0
Freight Rail	34.5	46.7	47.8	44.4	37.2	40.0	15.6
Ships and Other Boats[1]	30.6	27.9	37.9	(R)22.6	17.0	26.5	-13.4
Pipelines[2]	36.0	32.2	34.2	35.6	36.6	38.8	7.5
Commercial Aircraft	23.7	26.0	20.3	17.3	15.6	16.4	-30.8
Freight Total	**356.0**	**(R)541.3**	**584.9**	**546.9**	**495.7**	**524.0**	**47.2**
Passenger Total	**1,145.7**	**1,452.5**	**1,396.1**	**1,321.7**	**1,305.3**	**1,292.3**	**12.8**
Transportation Total[3]	**1,548.3**	**(R)2,022.3**	**2,007.6**	**1,894.6**	**1,823.9**	**1,838.6**	**25.2**
Freight as % of Transportation Total	**23.0**	**26.8**	**29.1**	**28.9**	**27.2**	**28.5**	**23.9**

Key: CO_2 = carbon dioxide; R = revised.
[1]Fluctuations in emissions estimates reflect data collection problems.
[2]Includes only CO_2 emissions from natural gas used to power pipelines.
[3]Includes greenhouse gas emissions from military aircraft (12.5 million metric tonnes in 2010); "other" transportation, primarily lubricants (9.5 million metric tonnes in 2010); 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 nearly four times as fast as that for passenger travel. 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, 2005, and 2007-2010
Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010*, EPA 430-R-12-001 (Washington, DC: April 15, 2012), table ES-8 and Annex 3, tables A-113 and A-114, available at www.epa.gov/climatechange/emissions/usinventoryreport.html as of May 10, 2012.

Between 1990 and 2010, medium- and heavy-duty truck emissions rose by 74 percent, the largest percentage increase of any major transportation mode. An increase in truck freight movement is largely responsible for the rise in emissions over the last 20 years.

Table 5-19. Medium- and Heavy-Duty Truck Greenhouse Gas Emissions: 1990, 2005, and 2007-2010 (millions of metric tonnes of CO_2 equivalent)

	1990	2005	2007	(R)2008	(R)2009	2010
Carbon dioxide	230.1	396.0	431.6	413.9	376.3	389.3
Methane	0.2	(R)0.2	0.2	0.2	0.2	0.2
Nitrous Oxide	0.8	(R)1.2	1.5	1.4	1.2	1.1
Hydrofluorocarbons	<0.05	(R)11.1	11.5	11.6	11.6	11.6
Total Truck	**231.1**	**(R)408.5**	**444.7**	**427.1**	**389.3**	**402.3**
Total U.S. Transportation[1]	**1,548.3**	**(R)2,022.3**	**2,007.6**	**1,894.6**	**1,823.90**	**1,838.6**
Total U.S.[1]	**(R)6,175.2**	**(R)7,204.2**	**7,252.8**	**7,048.3**	**6,608.30**	**6,821.8**
Truck share of transportation total (percent)	**14.9**	**20.2**	**22.2**	**22.5**	**21.3**	**21.9**
Truck share of U.S. total (percent)	**3.7**	**5.7**	**6.1**	**5.7**	**5.9**	**5.9**

Key: CO_2 = carbon dioxide; R = revised.
[1]Transportation and U.S. totals include greenhouse gas emissions from military aircraft (12.5 million metric tonnes in 2010); "other" transportation, primarily lubricants (9.5 million metric tonnes in 2010); and electricity-related emissions. Emissions from international bunker fuels are not included.
Notes: CO_2 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 CO_2 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, 2005, and 2007-2010
Source: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010*, EPA 430-R-12-001 (Washington, DC: April 15, 2012), tables 2-15 and ES-8, available at http://epa.gov/climatechange/emissions/usinventoryreport.html as of May 10, 2012.

APPENDIX. SELECTED METRIC DATA

Table 2-1M. Weight of Shipments by Transportation Mode: 2007, 2011, and 2040[1] (millions of metric tonnes)

	2007				2011				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**	**15,987**	**13,913**	**812**	**1,261**	**25,874**	**20,951**	**2,388**	**2,535**
Truck	11,592	11,418	86	88	10,253	10,038	97	118	17,042	16,405	334	304
Rail	1,723	1,583	56	84	1,719	1,538	98	84	2,513	1,979	352	182
Water	862	457	59	346	749	455	68	225	971	507	149	315
Air, air & truck	12	2	4	5	15	2	4	9	48	6	18	25
Multiple modes & mail	1,283	380	353	550	1,468	371	496	600	3,243	586	1,403	1,255
Pipeline	1,367	1,204	4	159	1,499	1,281	5	213	1,579	1,140	15	424
Other & unknown	287	241	33	13	284	228	43	12	477	329	118	31

[1]Many 2007 and 2040 numbers in this table were revised as a result of Freight Analysis Framework (FAF) database improvements in FAF version 3.4.
[2]Data 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 2011 data are provisional estimates that 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 2-4M. Top Commodities: 2011

Millions of Metric Tonnes		Billions of Dollars	
Total, all commodities	**15,987**	**Total, all commodities**	**16,804**
Gravel	1,462	Machinery	2,078
Cereal grains	1,428	Electronics	1,289
Natural gas, coke, asphalt[1]	1,367	Motorized vehicles	1,237
Coal	1,282	Mixed freight	980
Waste/scrap	1,077	Pharmaceuticals	815
Non-metallic mineral products	917	Textiles/leather	710
Gasoline	897	Gasoline	677
Fuel oils	725	Misecllaneous manufactured products	663
Crude petroleum	708	Plastics/rubber	611
Other foodstuffs	518	Other foodstuffs	589

[1]This 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, 2011, and 2040
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

Table 2-4M. Top Commodities: 2011
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Managements and Operations, Freight Analysis Framework, version 3.4, 2012.

Table 2-5M. 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.
[1]Truck as a single mode includes shipments that went by private truck only, for-hire truck only, or a combination of both.
[2]Private truck refers to a truck operated by a temporary or permanent employee of an establishment or the buyer/receiver of the shipment.
[3]Excludes 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.

2-6M. 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 2-5M. 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: July 2010), table 1a, available at www.bts.gov/publications/commodity_flow_survey/ as of August 5, 2012.

2-6M. 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: July 2010), table 1a, available at www.bts.gov/publications/commodity_flow_survey/ as of August 5, 2012.

Table 2-7M. Domestic Mode of Exports and Imports by Tonnage and Value: 2007 and 2040[1]

	Millions of Metric Tonnes		Billions of 2007 Dollars	
	2007	2040	2007	2040
Total	**1,839**	**4,922**	**3,193**	**12,134**
Truck[2]	680	2,145	1,968	7,852
Rail	253	868	200	573
Water	137	243	54	94
Air, air & truck[3]	2	9	206	892
Multiple modes & mail[4]	135	462	278	1,250
Pipeline	314	816	137	350
Other & unknown	47	152	220	1,016
No domestic mode[5]	272	227	130	108

[1]Many 2007 and 2040 numbers in this table were revised as a result of Freight Analysis Framework (FAF) improvements. The current version is now FAF 3.4.
[2]Excludes truck moves to and from airports.
[3]Includes truck moves to and from airports.
[4]Multiple 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.
[5]No domestic mode includes waterborne import shipments of crude petroleum offloaded 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 2-9M. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 2000, 2005, 2010, and 2011 (billions of current U.S. dollars and millions of metric tonnes)

	2000		2005		2010		2011	
Mode	**Value**	**Weight**	**Value**	**Weight**	**Value**	**Weight**	**Value**	**Weight**
Truck[1]	429	NA	491	173	557	170	626	189
Rail[1]	94	NA	116	128	131	122	152	129
Air	45	<1	33	<1	45	<1	46	<1
Water	33	176	58	232	81	190	108	171
Pipeline[1]	24	NA	52	78	63	96	81	112
Other[1]	29	NA	39	5	40	8	46	12
Total[1]	**653**	**NA**	**790**	**616**	**918**	**586**	**1058**	**612**

Key: NA = not available.
[1]The 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. Mode "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 2-7M. 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 3.4, 2012.

TABLE 2-9M. VALUE AND TONNAGE OF U.S. MERCHANDISE TRADE WITH CANADA AND MEXICO BY TRANSPORTATION MODE: 2000, 2005, 2010, AND 2011
Source: Truck, Rail, Pipeline, and Other: 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 June 14, 2012; **Air and Water:** 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: 1990, 2000, and 2007-2009

	1990	2000	2007	2008	2009
Public roads, route kilometers	6,222,926	6,358,386	6,515,164	6,532,576	NA
National Highway System (NHS)	N	417,439	263,511	264,075	NA
Interstates	72,536	75,109	75,529	75,657	NA
Other NHS	N	184,287	187,982	188,418	NA
Other	N	6,098,989	6,251,650	6,268,500	NA
Strategic Highway Corridor Network (STRAHNET)	N	99,881	100,898	100,182	NA
Interstate	N	75,113	75,534	75,657	NA
Non-Interstate	N	24,765	25,798	24,525	NA
Railroad	283,085	274,400	225,513	224,213	223,878
Class I	214,337	194,073	151,775	151,403	151,144
Regional	29,570	33,759	27,245	26,859	20,605
Local	39,165	46,567	46,493	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	335,938	284,834	267,353	278,404	275,713
Gas	1,913,743	2,203,573	2,446,411	2,454,136	2,456,389

Key: N = not applicable; NA = not available.
Note: 1 kilometer = 0.6214 miles.

Table 3-1M. Kilometers of Infrastructure by Transportation Mode: 1990, 2000, and 2007-2009
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 August 30, 2012. **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 August 30, 2012. **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 August 30, 2012. **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 August 30, 2012. **Gas pipelines:** American Gas Association, *Gas Facts* (Arlington, VA: annual issues).

Table 3-6M. Top 25 Airports by Landed Weight of All-Cargo Operations: 2000 and 2007-2010[1]

Airport	2010 Rank	Landed weight (thousands of metric tonnes) 2000	2007	2008	2009	2010
Memphis, TN (Memphis International)	1	5,732	8,865	8,845	8,586	8,865
Anchorage, AK (Ted Stevens Anchorage International)[2]	2	7,334	9,582	8,143	7,042	8,829
Louisville, KY (Louisville International-Standiford Field)	3	3,617	4,732	4,738	4,662	4,825
Miami, FL (Miami International)	4	2,657	3,370	3,170	2,881	3,133
Chicago, IL (O'Hare International)	5	1,871	1,997	1,908	1,588	2,221
Indianapolis, IN (Indianapolis International)	6	2,616	2,406	2,326	2,076	2,140
Los Angeles, CA (Los Angeles International)	7	2,624	3,113	2,609	1,709	1,794
New York, NY (John F. Kennedy International)	8	2,534	2,320	2,016	1,443	1,780
Fort Worth, TX (Dallas/Fort Worth International)	9	1,534	1,590	1,464	1,303	1,375
Newark, NJ (Newark Liberty International)	10	1,779	1,699	1,567	1,328	1,351
Oakland, CA (Metropolitan Oakland International)	11	1,643	1,643	1,580	1,217	1,201
Atlanta, GA (William B. Hartsfield International)	12	989	1,144	1,059	1,159	1,192
Cincinatti, OH (Cincinatti/Northern Kentucky International)[3]	13	827	88	94	512	1,103
Ontario, CA (Ontario International)	14	1,107	1,265	1,225	1,060	1,017
Honolulu, HI (Honolulu International)	15	628	1,029	936	926	963
Philadelphia, PA (Philadelphia International)	16	1,319	1,247	1,147	1,027	902
Houston, TX (George Bush Intercontinental)	17	435	698	684	711	692
Seattle, WA (Seattle-Tacoma International)	18	962	627	678	728	632
San Francisco, CA (San Francisco International)	19	1,149	943	703	678	591
Denver, CO (Denver International)	20	816	582	567	566	562
Phoenix, AZ (Sky Harbor International)	21	835	645	612	553	551
Portland, OR (Portland International)	22	800	647	595	494	482
Minneapolis, MN (Minneapolis-St Paul International/Wold-Chamberlain)	23	564	555	510	430	464
Chicago/Rockford, IL (Chicago/Rockford International)	24	593	669	644	512	416
Seattle, WA (King County International)	25	388	366	379	406	411
Top 25 airports[4]		**47,520**	**52,359**	**48,645**	**43,684**	**47,492**
United States, all airports[5]		**67,806**	**69,476**	**64,666**	**57,327**	**61,263**
Top 25 as % of U.S. total		**70.1**	**75.4**	**75.2**	**76.2**	**77.5**

[1]Dedicated 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.
[3]The significant 2007 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.
[4]Airport rankings change each year. Totals represent the top 25 airports for each year, not necessarily the top 25 airports listed here for 2010.
[5]Limited to airports with an aggregate landed weight in excess of 100 million pounds (50,000 short tons) annually.
Notes: 1 metric tonne = 1.1023 short tons.

Table 3-6M. Top 25 Airports by Landed Weight of All-Cargo Operations: 2000 and 2007-2010
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 June 25, 2012.

Table 3-7M. Trucks and Truck Kilometers by Average Weight: 1987, 1992, 1997, and 2002[1]

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	135.2
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.
[1]Excludes trucks with an average weight of 4,536 kilograms (10,000 pounds) or less.
Notes: 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 3-10M. Trucks, Truck Kilometers, and Average Distance by Range of Operations and Jurisdictions: 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..

Table 3-7M. Trucks and Truck Kilometers by Average Weight: 1987, 1992, 1997, and 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 5, 2012; 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 5, 2012.

Table 3-10M. 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 5, 2012.

Table 3-11M. Truck Kilometers by Products Carried: 2002[1]

Products carried	Millions of kilometers
Total[2]	**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
Nometallic 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 rushed 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

[1]Excludes pickups, minivans, other light vans, and sport utility vehicles.
[2]Detail 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 3-11M. 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 5, 2012.

Table 5-7M. Fuel Consumption by Transportation Mode: 2007-2010

	2007	2008	2009	2010
Highway[1]				
Gasoline, diesel and other fuels (million liters)	666,929	646,349	636,412	642,238
Truck, total	178,724	180,562	(R)167,686	170,162
Single-unit 2-axle 6-tire or more truck	61,750	64,888	(R)61,516	57,047
Combination truck	116,973	115,673	(R)106,170	113,115
Truck (percent of total)	26.8	27.9	(R)26.3	26.5
Rail, Class I (in freight service)				
Distillate / diesel fuel (million liters)	15,375	14,709	12,082	13,225
Water				
Residual fuel oil (million liters)	23,948	19,174	17,197	15,919
Distillate / diesel fuel oil (million liters)	7,282	4,495	4,793	5,085
Gasoline (million liters)	4,625	4,301	4,278	4,417
Pipeline				
Natural gas (million cubic meters)	17,595	18,348	(R)18,977	18,940

Key: R = revised.
[1]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 pre-2011 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: 2007-2010

	2007	2008	2009	2010
Number registered (thousands)	8,117	8,288	8,356	8,217
Vehicle kilometers (millions)	193,079	204,144	(R)193,445	178,104
Fuel consumed (million liters)	61,750	64,888	(R)61,516	57,047
Average kilometers traveled per vehicle	23,788	24,631	(R)23,150	21,675
Average kilometers traveled per liter	3.1	3.1	3.1	3.1
Average fuel consumed per vehicle (liters)	7,608	7,827	(R)7,362	6,942

Key: R = revised.
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 pre-2011 editions of *Freight Facts and Figures*.

Table 5-7M. Fuel Consumption by Transportation Mode: 2007-2010
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 2010* (Washington, DC: 2011), 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/2010/ as of July 20, 2012. **Pipeline:** U.S. Department of Energy, *Natural Gas Annual 2010*, (Washington, DC: December 2011), table 15 and similar tables in earlier editions.

Table 5-9M. Single-Unit Truck Fuel Consumption and Travel: 2007-2010
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/2010/ as of June 25, 2012.

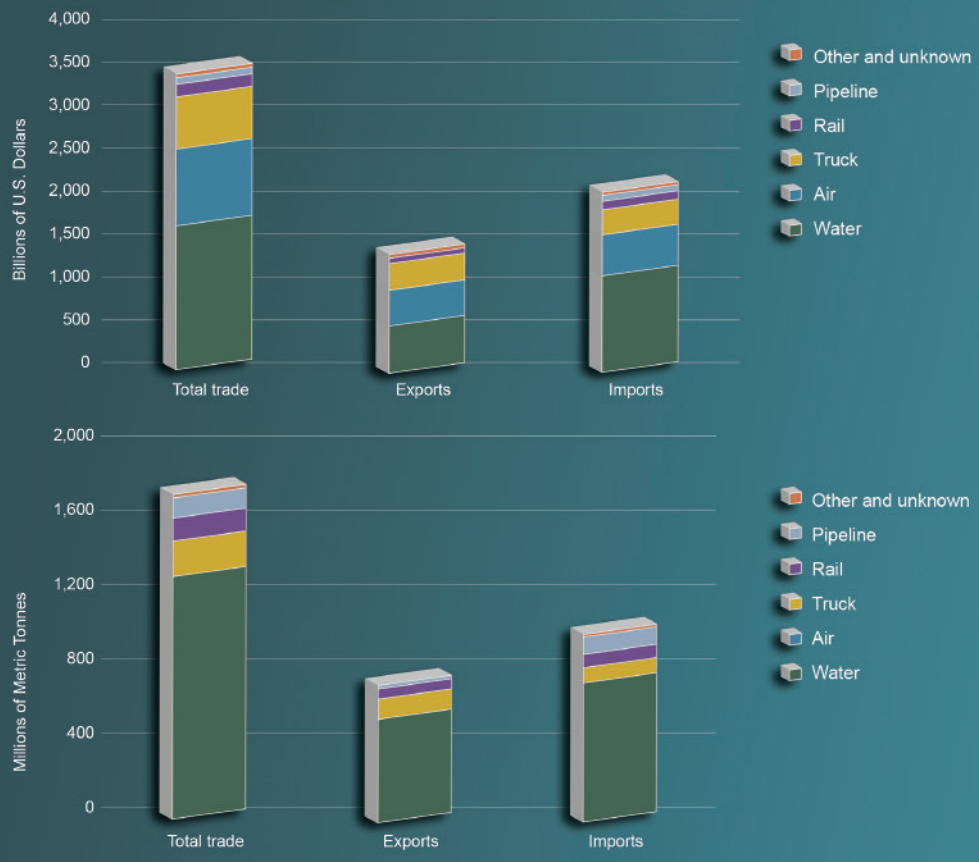
Table 5-10M. Combination Truck Fuel Consumption and Travel: 2007-2010

	2007	2008	2009	2010
Number registered (thousands)	2,635	2,585	2,617	2,553
Vehicle kilometers traveled (millions)	296,426	295,826	(R)270,518	283,088
Fuel consumed (million liters)	116,973	115,673	(R)106,170	113,115
Average kilometers traveled per vehicle	112,481	114,429	(R)103,365	110,890
Average kilometers traveled per liter	2.5	2.6	2.5	2.5
Average fuel consumed per vehicle (liters)	44,387	44,743	(R)40,567	44,309

Key: R = revised.
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 pre-2011 editions of *Freight Facts and Figures.*

Table 5-10M. Combination Truck Fuel Consumption and Travel: 2007-2010
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/2010/ as of June 25, 2012.

Figure 2-5M. U.S. International Merchandise Trade by Transportation Mode: 2011



Notes: 1 short ton = 2,000 pounds. The U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration, Bureau of Transportation Statistics estimated 2011 weight data for truck, rail, pipeline, and other 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 2-5M. U.S. International Merchandise Trade by Transportation Mode: 2011
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 2012). **Truck, rail, and pipeline data:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transporation Statistics, North American Transborder Freight Data, available at www.bts.gov/transborder as of August 10, 2012. **Other and unknown:** U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transporation Statistics, special tabulation, July 2012.

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16. Abstract

This report provides an overview of freight transportation, focusing on the volume and value of freight shipments, the extent of the freight network, industry employment and productivity patterns, and related safety, energy use, and environmental effects. Economic and social characteristics of the United States also are provided as background information. Metric data are available for several tables as well.

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