II. FREIGHT TO BE MOVED AND TRADING PARTNERS

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

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

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

Many 2007 and 2040 numbers in this table were revised as a result of Freight Analysis Framework (FAF) database improvements in FAF version 3.2.
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 2010 data are provisional estimates, which are based on selected modal and economic trend data. All truck, rail, water, and pipeline movements that involve more than one mode, including exports and imports that change mode at international gateways, are included in multiple modes & mail to avoid double counting. As a consequence, rail and water totals in this table are less than other published sources.

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

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

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



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

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

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

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

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

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

Table 2-3.	Top Commodities:	2007¹
ns of Tons		Rilli

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

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

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



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

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

TABLE 2-3. TOP COMMODITIES: 2007

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

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



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

	Value		Ton	Tons		iles	Miles
							Average
							distance per
Transportation mode	\$ Billions	Percent	Millions	Percent	Billions	Percent	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 Cour	ier 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, tot	al 7	0.5	8	0.4	1	0.5	58

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

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

As measured by the CFS, trucks move more than one-half of all hazardous materials shipped from within the United States. However, truck ton miles of hazardous shipments account for a much smaller share, about one-third of all ton miles, because such shipments travel relatively short distances. By contrast, rail accounts for only 5 percent of hazardous shipments by weight but nearly 29 percent of ton miles.

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

	Value			Ton	S	Ton miles	
Hazard class	Description	\$ 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.



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

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

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

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

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

³Excludes crude oil shipments.

Flammable liquids, especially gasoline, are the predominant hazardous material transported in the United States. In terms of ton miles, flammable liquids account for about 56 percent of total ton miles of hazardous materials shipments. The next largest class of

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

	Millions	of Tons	Billions of 2007 Dollars		
	2007	2040	2007	2040	
Total	2,027	4,403	3,193	9,863	
Truck ²	768	1,940	1,345	3,889	
Rail	265	556	197	422	
Water	141	246	52	93	
Air, air & truck ³	10	35	927	3,619	
Multiple modes & mail ⁴	147	412	278	899	
Pipeline	346	658	137	255	
Other & unknown	50	119	127	497	
No domestic mode ⁵	300	436	130	189	

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

⁴Multiple modes & mail includes U.S. Postal Service, courier shipments, and all intermodal combinations, except air and truck. In this table, oceangoing export and import shipments that move between ports and domestic locations by single modes are classified by the domestic mode rather than multiple modes & mail. ⁵No domestic mode includes waterborne import shipments of crude petroleum offloaded directly at the domestic destination (refineries) with no domestic mode of transportation.

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

hazardous materials, in terms of ton miles, is gases at about 17 percent.

International trade has grown considerably and the movement of these goods within the United States is placing pressure on the domestic transportation network and on all modes. Trucks are the most common mode used to move imports and exports between international gateways and inland locations. This trend is expected to continue with tonnage of international trade forecast to grow at a rate of 2.4 percent per year between 2007 and 2040.

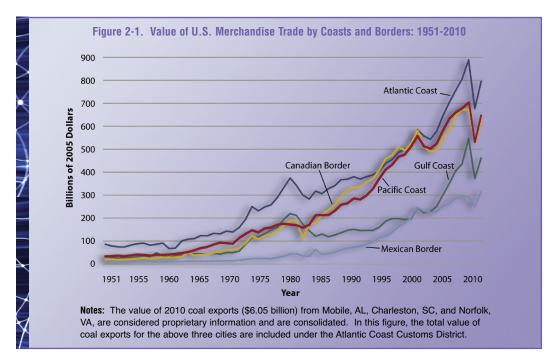




TABLE 2-6. DOMESTIC MODE OF EXPORTS AND IMPORTS BY TONNAGE AND VALUE: 2007 AND 2040

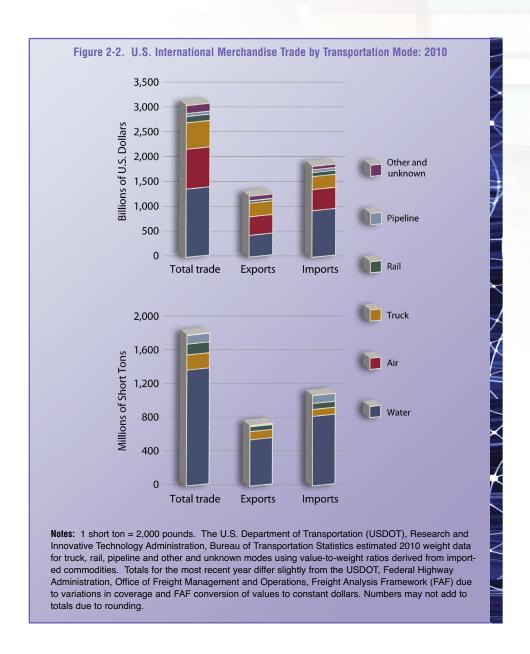
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.2, 2011.

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

Sources: 1951-1970: U.S. Department of Commerce, Census Bureau, Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition (Washington, DC: 1975); 1970-2000: U.S. Department of Commerce, Census Bureau, Statistical Abstract of the United States (Washington, DC: annual issues); 2000-2010: U.S. Department of Commerce, Census Bureau, Foreign Trade Division, FT920 - U.S. Merchandise Trade: Selected Highlights (Washington, DC: annual issues). Implicit GDP Deflator: U.S. Department of Commerce, Bureau of Economic Analysis, Current-Dollar and "Real" Gross Domestic Product, available at www.bea.gov as of August 10, 2011.

²Excludes truck moves to and from airports.

³Includes truck moves to and from airports.



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

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

FIGURE 2-2. U.S. INTERNATIONAL MERCHANDISE TRADE BY TRANSPORTATION MODE: 2010
Sources: Total, water and air data: U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Division, FT920 - U.S. Merchandise Trade: Selected Highlights (Washington, DC: February 2011). Truck, rail, and pipeline data: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transporation Statistics, North American Transborder Freight Data, available at www.bts.gov/transborder as of August 29, 2011. Other and unknown: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transporation Statistics, special tabulation, August 2011.



Table 2-7. Top 25 Trading Partners of the United States in Merchandise Trade: 2000-2010

(billions of current U.S. dollars)

Top 25 as % of tota	I	87.5	84.9	83.3	83.4
U.S. total trade		1,997.3	2,575.3	2,615.7	3,191.4
Top 25 total ¹		1,746.7	2,187.5	2,179.9	2,662.4
Hong Kong	25	26	25	25	31
Thailand	24	23	27	26	32
Russian Federation	23	10	19	24	32
Israel	22	21	27	28	32
Nigeria	21	11	26	23	35
Switzerland	20	20	24	34	40
Malaysia	19	37	44	34	40
Belgium	18	24	32	35	41
Ireland	17	24	38	36	41
Italy	16	36	43	39	43
Saudi Arabia	15	20	34	33	43
Venezuela	14	24	40	37	43
Singapore	13	37	36	38	46
India	12	14	27	38	49
Netherlands	11	32	41	48	54
Brazil	10	29	40	46	59
Taiwan	9	65	57	47	62
France	8	50	56	61	65
South Korea	7	68	71	68	88
United Kingdom	6	85	90	93	98
Germany	5	88	119	115	131
Japan	4	240	194	147	181
Mexico	3	248	203	306	393
Canada China	1 2	406 116	499 285	431 366	527 457
	Rank	2000	2005	2009	2010
2					

¹Top 25 trading partners change each year. Totals represent the top 25 trading partners for each year, not necessarily the top 25 trading partners listed here for 2010. Note: Numbers may not add to totals due to rounding.

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

Canada is this country's top trading partner followed by China and Mexico. China's share of trade with the United States more than doubled between 2000 and 2010, from about 6 percent of total merchandise trade to 14 percent.

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

	2000		20	2005		2009		2010	
Mode	Value	Weight	Value	Weight	Value	Weight	Value	Weight	
Truck ¹	429	NA	491	191	455	155	557	187	
Rail ¹	94	NA	116	141	96	108	131	134	
Air	45	<1	33	<1	39	<1	45	<1	
Water	33	194	58	256	59	189	81	210	
Pipeline ¹	24	NA	52	86	49	99	63	106	
Other ¹	29	NA	39	5	37	6	40	9	
Total ¹	653	NA	790	679	735	557	918	646	

Key: NA = not available.

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

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



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

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

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

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

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

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

¹ "Other" includes "flyaway aircraft" or aircraft moving under their own power (i.e., aircraft moving from the manufacturer to a customer and not carrying any freight), powerhouse (electricity), vessels moving under their own power, pedestrians carrying freight, and unknown. ²Foreign Trade Zones (FTZs) were added as a mode of transport for land import shipments beginning in April 1995. Although FTZs are treated as a mode of transportation in the North American Transborder Freight Data, the actual mode for a specific shipment into or out of an FTZ is unknown because U.S. Customs does not collect this information.

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

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

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

