## II. FREIGHT TO BE MOVED AND TRADING PARTNERS

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

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

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

**Key:** R = revised.

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these estimates have improved over time, and as a consequence, previously released annual provisional estimates are superseded by the 2007 estimates in this table.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

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



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

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

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

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

**Key:** R = revised.

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

Tons (millions) Value (\$ billions)									
Total	(R) 19,328	Total (R) 1	3,228						
Natural gas & related <sup>1</sup>	2,687	Machinery	1,866						
Gravel	2,048	Electronics	948						
Cereal grains	1,330	Mixed freight	944						
Crude petroleum	1,284	Motorized vehicles	855						
Coal	1,261	Natural gas & related <sup>1</sup>	729						
Nonmetal mineral produc	cts 1,138	Textiles/leather	545						
Gasoline	1,090	Pharmaceuticals	519						
Waste/scrap	926	Unknown	458						
Fuel oils	560	Chemical products	444						
Natural sands	557	Miscellaneous manufactured products	411						

Bulk products comprise nearly two-thirds of the tonnage but only one-fifth of the value of goods moved in 2002.

Motor vehicles, machinery, pharmaceuticals, and other manufactured goods

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

TABLE 2-2. VALUE OF SHIPMENTS BY TRANSPORTATION Mode: 2002, 2007, AND 2035
Source: 2002 and 2035: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, Version 2.2, 2007. 2007: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, 2007 provisional estimates, 2008.

TABLE 2-3. TOP COMMODITIES: 2002

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

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

Pipeline and unknown shipments are combined because data on region-to-region flows by pipeline are statistically uncertain.

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

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

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

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

**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.

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

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

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

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

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

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

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

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

<sup>&#</sup>x27;Truck as a single mode includes shipments that went by private truck only, for-hire truck only, or a combination of both.

<sup>&</sup>lt;sup>2</sup>Private truck refers to a truck operated by a temporary or permanent employee of an establishment or the buyer/receiver of the shipment. <sup>3</sup>Excludes most shipments of crude oil.



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

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

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

**Key:** R = revised.

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

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

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

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

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

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

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

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

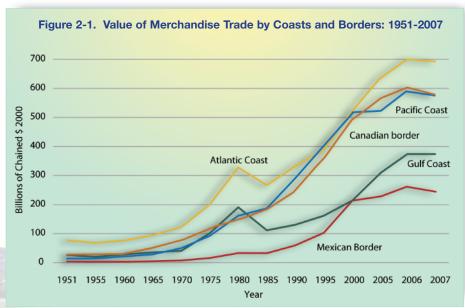


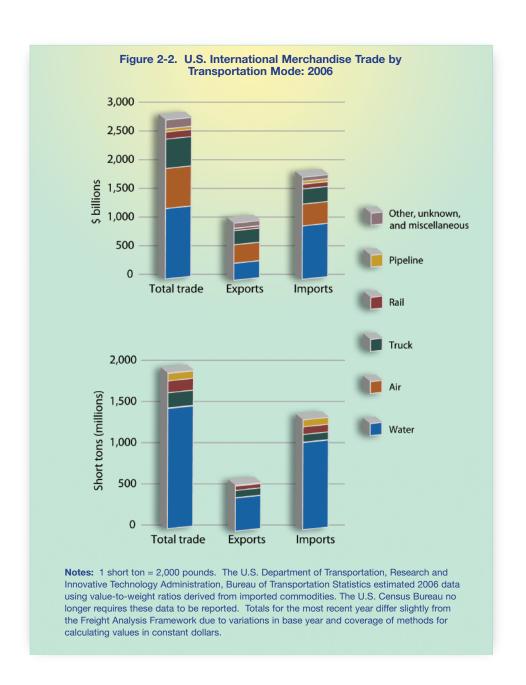
Table 2-6. Domestic Mode of Exports and Imports by Tonnage and Value: 2002 and 2035

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

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

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





Nearly 80 percent of freight tons in U.S. foreign trade are transported by ship.

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



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

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

<sup>&#</sup>x27;Hong Kong has been reported separately since 1989.

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

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

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

	1998	8	200	0	200	6	2007		
	Value	Weight	Value	Weight	Value	Weight	Value	Weight	
	(current US\$	(millions of							
Mode	billions)	short tons)							
Truck	350	NA	429	NA	534	NA	555	NA	
Rail	68	NA	94	NA	129	NA	138	NA	
Air	30	<1	45	1	36	<1	38	1	
Water	21	183	33	194	70	251	74	241	
Pipeline	11	NA	24	NA	57	NA	59	NA	
Other	23	NA	29	NA	40	NA	44	NA	
Total	503	NA	653	NA	865	NA	908	NA	

**Key:** NA = not available.

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

Table 2-7. Top 25 Trading Partners of the United States in Merchandise: 1998-2007

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

Table 2-8. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 1998-2007 Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, TransBorder Freight Data, March 2008.

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

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



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

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

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

**Key:** NA = not available.

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

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

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

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

