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, 2009, and 2040 (millions of tons)

	2007				2009				2040			
	Total	Domestic	Exports[2]	Imports[2]	Total	Domestic	Exports[2]	Imports[2]	Total	Domestic	Exports[2]	Imports[2]
Total	18,581	16,576	656	1,349	16,122	14,397	651	1,073	27,104	22,772	1,811	2,521
Truck	12,766	12,580	95	91	10,868	10,713	86	69	18,445	17,963	274	208
Rail	1,894	1,745	61	87	1,689	1,575	57	57	2,408	2,109	155	144
Water	794	360	52	382	734	351	51	332	1,143	482	105	556
Air, air & truck	13	3	4	6	11	3	4	5	41	5	16	19
Multiple modes & mail[1]	1,531	519	409	603	1,336	458	423	455	3,119	724	1,179	1,216
Pipeline	1,270	1,100	4	166	1,220	1,069	5	147	1,509	1,158	9	342
Other & unknown	313	269	29	15	265	229	27	9	440	331	73	35

[1]In this table, multiple modes & mail includes export and import shipments that move domestically by a different mode than the mode used between the port and foreign location.
[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 2009 data are provisional estimates, which are based on selected modal and economic trend data.

The U.S. transportation system moved, on average, 51 million tons worth $45 billion each day in 2007. Preliminary estimates from the Freight Analysis Framework (FAF) show that tonnage decreased 2.4 percent in 2008 and an additional 11.1 percent in 2009 after years of growth. Early indications suggest that tonnage is starting to rebound in 2010, increasing 4.6 percent since 2009 and reaching 91 percent of 2007 tonnage. Between 2010 and 2040, tonnage is forecast to increase at 1.6 percent per year. Annual tons per capita are forecast to increase 27 percent from 55 in 2010 to 70 in 2040.

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.

TABLE 2-1. WEIGHT OF SHIPMENTS BY TRANSPORTATION MODE: 2007, 2009, AND 2040
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.

Table 2-2. Value of Shipments by Transportation Mode: 2007, 2009, and 2040 (billions of 2007 dollars)

	2007				2009				2040			
	Total	Domestic	Exports[2]	Imports[2]	Total	Domestic	Exports[2]	Imports[2]	Total	Domestic	Exports[2]	Imports[2]
Total	16,536	13,338	1,196	2,002	14,647	12,078	1,053	1,516	39,294	29,444	4,178	5,672
Truck	10,783	10,223	271	289	9,511	9,087	211	213	21,656	20,114	738	804
Rail	511	374	45	92	421	323	46	52	733	477	118	138
Water	286	99	13	173	263	99	14	150	412	128	31	254
Air, air & truck	1,079	152	422	505	884	147	349	388	4,347	740	1,670	1,937
Multiple modes & mail[1]	2,923	1,680	397	846	2,639	1,618	391	630	10,520	6,728	1,476	2,317
Pipeline	623	552	4	67	595	532	4	60	728	585	9	134
Other & unknown	331	257	44	30	334	273	39	22	898	672	138	88

[1]In this table, multiple modes & mail includes export and import shipments that move domestically by a different mode than the mode used between the port and foreign location.
[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 2009 data are provisional estimates, which are based on selected modal and economic trend data.

The value of freight moved is expected to increase faster than the weight, rising from $890 per ton in 2007 to $2,145 per ton in 2040 when controlling for inflation. Exports at $1,825 per ton and imports at $1,484 per ton are significantly higher than domestic shipments at $805 per ton in 2007, but the relative differences are expected to be much less in 2040 when exports reach $2,831 per ton, imports reach $2,793 per ton, and domestic shipments reach $2,019 per ton in 2007 dollars. Exports and imports accounted for 11 percent of the tons and 19 percent of the value in 2007 and are forecast to reach 16 percent of the tons and 21 percent of the value in 2040.

Table 2-3. Top Commodities: 2007

Millions of Tons		Billions of Dollars	
Total, all commodities	**18,581**	**Total, all commodities**	**16,536**
Gravel	2,263	Machinery	1,762
Cereal grains	1,475	Electronics	1,432
Coal	1,444	Motorized vehicles	1,269
Non-metal mineral products	1,392	Mixed freight	1,058
Waste/scrap	1,323	Pharmaceuticals	880
Natural gas & related[1]	1,277	Textiles/leather	696
Gasoline	1,005	Gasoline	691
Fuel oils	744	Miscellaneous manufactured products	689
Natural sands	570	Plastics/rubber	579
Crude petroleum	558	Articles of base metal	573

[1]Natural gas, selected coal products, and products of petroleum refining, excluding gasoline, aviation fuel, and fuel oil.

Bulk shipments account for about 85 percent of the tonnage but only 30 percent of the value of goods moved in 2007. Top commodities include gravel, cereal grains, and coal. Higher value, time-sensitive shipments account for two-thirds of the value of all commodity movements but only one-eighth of the tonnage. Top commodities include machinery, electronics, and motorized vehicles.

TABLE 2-2. VALUE OF SHIPMENTS BY TRANSPORTATION MODE: 2007, 2009, AND 2040
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.

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 3.1, 2010.

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

	Value		Tons		Ton miles		Miles
Transportation mode	**$ Billion**	**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	1203	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.

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		Tons		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.

Table 2-4. Hazardous Materials Shipments by Transportation Mode: 2007
Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2007 Commodity Flow Survey, Hazardous Materials* (Washington, DC: February 2010), table 1a, available at www.bts.gov/publications/commodity_flow_survey/ as of May 25, 2010.

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 May 25, 2010.

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

International trade has grown 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.

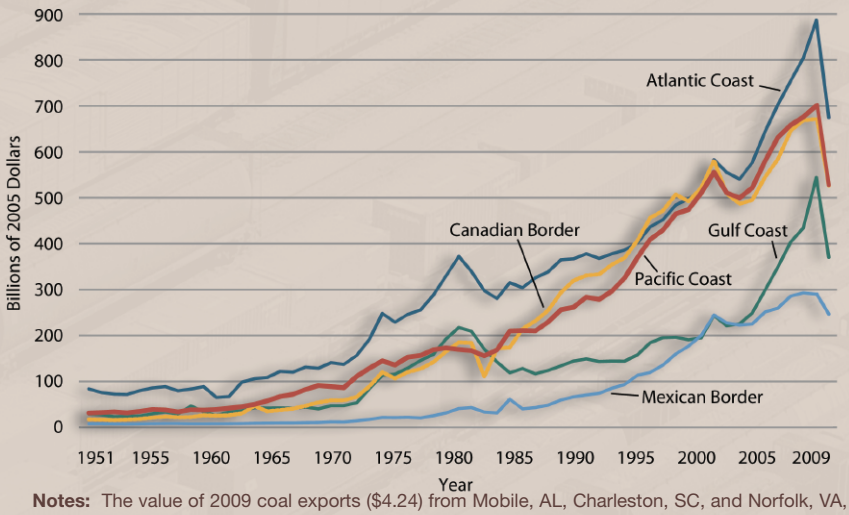
Foreign trade has had a major impact on all U.S. borders and coasts. Since 1951, the value of merchandise trade has grown by fourteen-fold in inflation-adjusted terms. However, overall growth has been affected by short-term

Table 2-6. 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	2,005	4,332	3,198	9,850
Truck[1]	763	1,911	1,343	3,880
Rail	259	543	197	419
Water	137	235	52	92
Air, air & truck[2]	10	35	927	3,606
Multiple modes & mail[3]	152	426	287	929
Pipeline	344	653	147	274
Other & unknown	41	102	112	457
No domestic mode[4]	298	426	134	193

[1]Excludes truck moves to and from airports.
[2]Includes truck moves to and from airports.
[3]Multiple modes & mail include 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.
[4]No domestic mode includes waterbourne import shipments of crude petroleum off-loaded directly at the domestic destination (refineries) with no domestic mode of transportation.
Note: Numbers may not add to totals due to rounding.

Figure 2-1. Value of Merchandise Trade by Coasts and Borders: 1951-2009

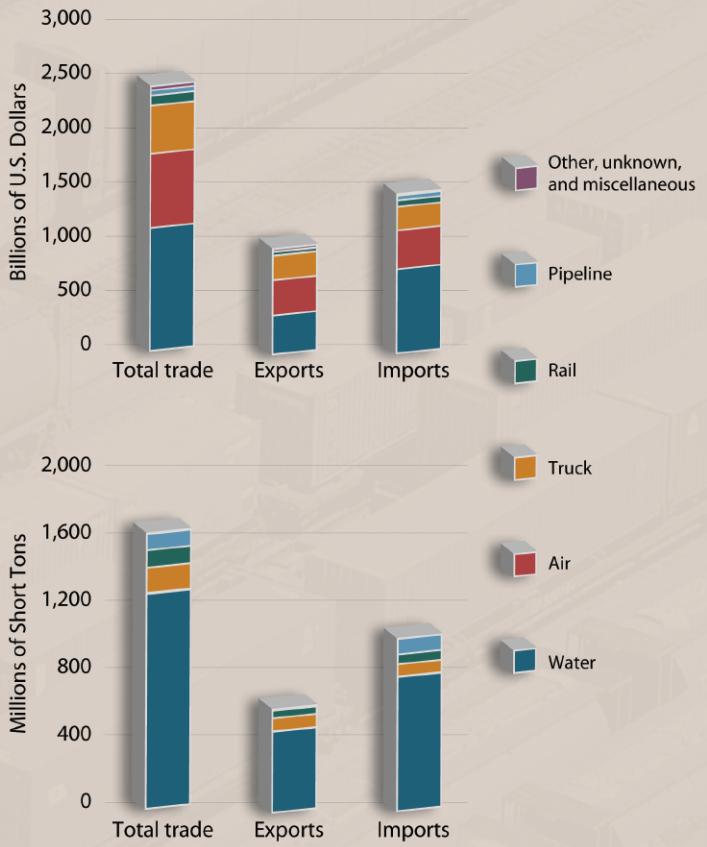


Notes: The value of 2009 coal exports ($4.24) from Mobile, AL, Charleston, SC, and Norfolk, VA, are considered proprietary information and are consolidated. In this figure, the total value of coal exports for the above three cities are included under the Atlantic Coast Customs District.

Table 2-6. Domestic Mode of Exports and Imports by Tonnage and Value: 2007 and 2040
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.

Figure 2-1. Value of Merchandise Trade by Coasts and Borders: 1951-2009
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); **2000-2009:** 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, 2010.

Figure 2-2. U.S. International Merchandise Trade by Transportation Mode: 2009



Notes: 1 short ton = 2,000 pounds. The U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration, Bureau of Transportation Statistics estimated 2009 weight data for truck, rail, and pipeline 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.

downturns, such as between 1981 and 1986 and in 2009. In 2009, ports and airports on the Atlantic Coast remain the most significant in terms of value, but Gulf Coast ports also have experienced rapid growth in recent years.

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 water share drops to 47 percent, with air and truck accounting for 28 percent and 18 percent respectively. Rail and pipeline account for the balance.

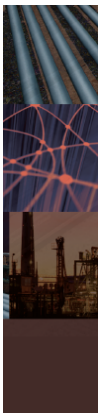


Figure 2-2. U.S. International Merchandise Trade by Transportation Mode: 2009
Sources: Total, water and air data: U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Division, *FT920 - U.S. Merchandise Trade: Selected Highlights* (Washington, DC: January 2010). **Truck, rail, and pipeline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

Table 2-7. Top 25 Trading Partners of the United States in Merchandise Trade: 1999-2009 (billions of current U.S. dollars)

Partner	2009 Rank	1999	2004	(R) 2008	2009
Canada	1	362	445	601	431
China	2	95	231	408	366
Mexico	3	197	267	367	306
Japan	4	189	184	204	147
Germany	5	82	109	152	115
United Kingdom	6	78	82	112	93
South Korea	7	54	72	83	68
France	8	45	53	73	61
Netherlands	9	28	37	61	48
Taiwan	10	54	56	61	47
Brazil	11	25	35	63	46
Italy	12	33	39	52	39
Singapore	13	34	35	44	38
India	14	13	22	43	38
Venezuela	15	17	30	64	37
Ireland	16	17	36	39	36
Belgium	17	22	29	46	35
Malaysia	18	31	39	44	34
Switzerland	19	18	21	40	34
Saudi Arabia	20	16	26	67	33
Israel	21	18	24	37	28
Australia	22	17	22	33	28
Thailand	23	19	24	33	26
Hong Kong	24	23	25	28	25
Russian Federation	25	8	15	36	24
Top 25 total[1]		**1,504.7**	**1,960.5**	**2,789.4**	**2,179.9**
U.S. total trade		**1,717.6**	**2,287.6**	**3,611.0**	**2,615.7**
Top 25 as % of total		**87.6**	**85.7**	**77.0**	**83.3**

Key: R = revised.
[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 2009.
Note: Numbers may not add to totals due to rounding.

Canada is this country's top trading partner followed by China and Mexico. China's share of trade with the United States almost tripled between 1999 and 2009, from 5 percent of total merchandise trade to 14 percent.

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.

Table 2-8. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 1999-2009 (billions of current U.S. dollars and millions of short tons)

	1999		2004		2008		2009	
Mode	**Value**	**Weight**	**Value**	**Weight**	**Value**	**Weight**	**Value**	**Weight**
Truck[1]	385	NA	453	NA	554	182	455	155
Rail[1]	78	NA	108	NA	140	148	96	108
Air	34	1	32	<1	41	<1	39	<1
Water	23	183	46	244	93	232	59	189
Pipeline[1]	12	NA	39	NA	88	99	49	99
Other[1]	25	NA	34	NA	47	7	37	6
Total[1]	**559**	**NA**	**712**	**NA**	**964**	**668**	**735**	**557**

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 rations derived from imported commodities that vary by country, mode, and commodity.
Notes: 1 short ton = 2,000 pounds. 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 (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: 1999-2009
Source: U.S. Department of Commerce, International Trade Administration, TradeStats Express, available at www.ita.doc.gov/ as of August 9, 2010.

TABLE 2-8. VALUE AND TONNAGE OF U.S. MERCHANDISE TRADE WITH CANADA AND MEXICO BY TRANSPORTATION MODE: 1999-2009
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 July 27, 2010; U.S. Department of Commerce, Census Bureau, Foreign Trade Division, *FT920 - U.S. Merchandise Trade: Selected Highlights* (Washington, DC: annual issues).

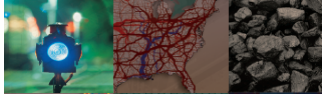
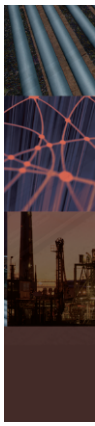


Table 2-9. Value of U.S. Exports to and Imports from Canada and Mexico by Land Transportation Mode: 1999-2009 (millions of current U.S. dollars)

	1999	2004	2008	2009
Exports to Canada, total	**146,374**	**171,878**	**235,681**	**184,653**
Truck	123,140	135,897	178,593	142,545
Rail	11,755	16,597	29,438	19,973
Pipeline	114	1,584	4,313	2,632
Other[1]	11,360	17,777	23,294	19,456
Mail	6	23	43	48
Exports to Mexico, total	**76,129**	**97,304**	**129,587**	**110,378**
Truck	66,924	79,349	100,264	89,417
Rail	5,711	13,633	21,965	15,291
Pipeline	144	87	1,250	788
Other[1]	3,350	4,216	6,107	4,882
Mail	<1	2	<1	<1
Imports from Canada, total	**183,724**	**236,735**	**301,128**	**201,089**
Truck	118,901	132,762	141,353	105,079
Rail	46,255	57,947	63,757	41,058
Pipeline	12,056	36,828	82,018	45,630
Other[1]	6,387	8,994	13,555	9,098
Mail	13	<1	<1	<1
FTZ[2]	111	203	445	223
Imports from Mexico, total	**95,023**	**127,646**	**163,478**	**140,576**
Truck	76,448	104,944	134,224	117,787
Rail	14,693	20,183	25,265	19,303
Pipeline	2	<1	193	155
Other[1]	1,256	1,839	2,717	2,175
Mail	<1	<1	<1	<1
FTZ[2]	2,624	680	1,079	1,156

[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 and miscellaneous.
[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 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.



In addition to total trade 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. Pipelines also carry a significant volume of imports from Canada.

TABLE 2-9. VALUE OF U.S. EXPORTS TO AND IMPORTS FROM CANADA AND MEXICO BY LAND TRANSPORTATION MODE: 1999-2009
Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, North American Transborder Freight Data, available at www.bts.gov/transborder as of August 10, 2010.