

Chapter 9 Nonhighway Modes

Summary Statistics from Tables in this Chapter

Source		
	Passenger-miles	(millions)
Table 9.2	<i>Domestic and international air carrier, 2014</i>	869,688
Table 9.10	<i>Amtrak, 2013</i>	6,810
Table 9.11	<i>Commuter rail, 2013</i>	11,862
Table 9.12	<i>Transit rail, 2013</i>	20,381
	Freight ton-miles	(millions)
Table 9.5	<i>Domestic waterborne commerce, 2013</i>	465,000
Table 9.8	<i>Class I railroad, 2013</i>	1,740,687
	Passenger energy use	(trillion Btus)
Table 9.2	<i>Domestic and international air carrier, 2014</i>	2,268.9
Table 9.3	<i>General aviation, 2013</i>	203.6
Table 9.6	<i>Recreational boats, 2013</i>	245.0
Table 9.10	<i>Amtrak, 2013</i>	14.4
Table 9.11	<i>Commuter rail, 2013</i>	32.5
Table 9.12	<i>Transit rail, 2013</i>	49.0
	Freight energy use	(trillion Btus)
Table 9.8	<i>Class I railroad, 2013</i>	514.9



Nonhighway transportation modes accounted for 18.5% of total transportation energy use in 2013.

Table 9.1
Nonhighway Energy Use Shares, 1970–2013

Year	Share of transportation energy use					Nonhighway total	Transportation total (trillion Btu)
	Air	Water	Pipeline	Rail			
1970	8.5%	5.4%	6.4%	3.6%		24.0%	15,395
1971	8.1%	4.8%	6.3%	3.5%		22.8%	16,015
1972	7.7%	4.6%	6.1%	3.4%		21.9%	17,036
1973	7.7%	5.0%	5.6%	3.4%		21.7%	17,874
1974	7.3%	5.1%	5.4%	3.6%		21.5%	17,174
1975	7.3%	5.3%	4.8%	3.2%		20.7%	17,424
1976	7.2%	5.9%	4.3%	3.1%		20.6%	18,492
1977	7.1%	6.2%	4.1%	3.1%		20.4%	19,126
1978	7.1%	6.9%	3.9%	2.9%		20.8%	20,097
1979	7.6%	5.8%	4.4%	3.1%		20.9%	19,652
1980	7.6%	7.4%	4.7%	3.1%		22.8%	18,940
1981	7.8%	6.8%	4.8%	3.0%		22.4%	18,741
1982	7.9%	5.8%	4.7%	2.6%		21.1%	18,237
1983	7.8%	5.3%	4.0%	2.6%		19.8%	18,368
1984	8.5%	5.1%	4.1%	2.8%		20.5%	18,962
1985	8.7%	4.5%	3.9%	2.6%		19.8%	19,205
1986	9.0%	6.5%	3.6%	2.4%		21.5%	20,276
1987	9.1%	6.6%	3.7%	2.4%		21.9%	20,771
1988	9.3%	6.6%	4.1%	2.4%		22.4%	21,327
1989	9.1%	7.0%	4.1%	2.4%		22.6%	21,685
1990	9.5%	6.7%	4.3%	2.3%		22.8%	21,581
1991	9.0%	7.2%	4.1%	2.3%		22.6%	21,182
1992	8.9%	7.3%	3.9%	2.2%		22.3%	21,841
1993	8.9%	6.4%	4.0%	2.3%		21.6%	22,322
1994	9.0%	6.1%	4.1%	2.3%		21.6%	22,930
1995	9.1%	6.3%	4.1%	2.4%		21.9%	23,465
1996	9.2%	5.9%	4.1%	2.4%		21.6%	23,974
1997	9.5%	5.1%	4.2%	2.4%		21.2%	24,328
1998	9.2%	5.0%	3.6%	2.3%		20.2%	24,661
1999	9.6%	5.3%	3.5%	2.3%		20.6%	25,960
2000	9.7%	5.5%	3.4%	2.3%		21.0%	26,273
2001	9.2%	4.6%	3.4%	2.3%		19.6%	25,945
2002	8.4%	4.7%	3.5%	2.3%		18.9%	26,536
2003	8.5%	4.0%	3.2%	2.3%		18.0%	26,715
2004	9.0%	4.8%	3.0%	2.4%		19.2%	27,173
2005	9.2%	5.0%	3.1%	2.4%		19.6%	27,582
2006	9.0%	5.2%	3.0%	2.4%		19.7%	27,760
2007	8.6%	5.3%	3.0%	2.2%		19.2%	29,223
2008	8.4%	5.1%	3.2%	2.2%		18.9%	28,592
2009	7.8%	4.9%	3.4%	2.0%		18.2%	27,107
2010	7.9%	5.5%	3.5%	2.1%		19.0%	27,185
2011	8.1%	5.2%	3.6%	2.3%		19.2%	26,600
2012	7.9%	4.5%	3.8%	2.3%		18.5%	26,214
2013	7.8%	4.0%	4.4%	2.3%		18.5%	26,153

Source:

See Appendix A for Nonhighway Energy Use.



These data include ALL international and domestic certificated route air carrier statistics; therefore, the data are different than those in Chapter 2. Revenue aircraft-miles, passenger-miles, and seat-miles began to rise in 2010. Passenger load factor was 83% in 2014.

Table 9.2
Summary Statistics for U.S. Domestic and International Certificated
Route Air Carriers (Combined Totals), 1970–2014^a

Year	Revenue aircraft-miles (millions)	Revenue passenger-miles (millions)	Available seat-miles (millions)	Available seats per aircraft ^b	Passenger load factor (percentage) ^c	Revenue cargo ton-miles (millions)	Energy use (trillion Btu) ^d
1970	2,542	148,137	264,904	104	55.9%	3,755	1,363.4
1975	2,241	173,324	315,823	141	54.9%	5,062	1,283.4
1980	2,924	267,722	448,479	153	59.7%	7,885	1,386.0
1985	3,462	351,073	565,677	163	62.1%	9,048	1,701.4
1990	4,724	472,236	753,211	159	62.7%	16,403	2,180.2
1991	4,661	463,296	738,030	158	62.8%	16,149	2,085.2
1992	4,899	493,715	772,869	158	63.9%	17,306	2,116.4
1993	5,118	505,996	793,959	155	63.7%	19,083	2,169.7
1994	5,360	537,518	809,259	151	66.4%	21,773	2,271.5
1995	5,627	558,794	832,081	148	67.2%	23,375	2,338.6
1996	5,855	596,164	859,721	147	69.3%	24,892	2,409.1
1997	6,025	620,029	880,715	146	70.4%	27,610	2,513.6
1998	6,220	634,933	899,029	145	70.6%	28,015	2,459.5
1999	6,558	668,626	942,311	144	71.0%	25,147	2,665.0
2000	6,946	708,926	981,080	141	72.3%	30,221	2,750.4
2001	6,814	664,849	950,519	139	69.9%	27,882	2,592.5
2002	6,834	655,215	913,898	134	71.7%	30,507	2,430.1
2003	7,367	674,160	922,440	125	73.1%	32,446	2,470.6
2004	7,479	752,341	1,000,193	134	75.2%	37,958	2,657.2
2005	7,716	795,117	1,029,316	133	77.2%	39,286	2,693.3
2006	8,220	810,086	1,027,526	125	78.8%	38,251	2,661.1
2007	8,415	842,007	1,060,093	126	79.4%	38,433	2,684.6
2008	8,142	823,783	1,040,840	128	79.1%	35,227	2,547.8
2009	7,534	779,997	975,307	129	80.0%	30,317	2,303.2
2010	7,666	809,051	991,934	129	81.6%	35,209	2,335.3
2011	7,783	825,916	1,012,597	130	81.6%	35,713	2,370.3
2012	7,727	832,733	1,012,261	131	82.3%	34,937	2,287.7
2013	7,724	847,971	1,025,569	133	82.7%	33,561	2,271.3
2014	7,739	869,688	1,048,290	135	83.0%	34,471	2,268.9
<i>Average annual percentage change</i>							
1970–2014	2.6%	4.1%	3.2%	0.6%		5.2%	1.2%
2004–2014	0.3%	1.5%	0.5%	0.1%		-1.0%	-1.6%

Sources:

U.S. Department of Transportation, Bureau of Transportation Statistics, www.transtats.bts.gov. (Additional resources: www.transtats.bts.gov and www.rita.dot.gov)

1970–76 Energy Use – Department of Transportation, Civil Aeronautics Board, *Fuel Cost and Consumption*, Washington, DC, 1981, and annual.

^a Data are for all U.S. air carriers reporting on Form 41.

^b Available seats per aircraft is calculated as the ratio of available seat-miles to revenue aircraft-miles.

^c Passenger load factor is calculated as the ratio of revenue passenger-miles to available seat-miles for scheduled and nonscheduled services.

^d Energy use includes fuel purchased abroad for international flights.



General aviation includes: (1) aircraft operating under general operating and flight rules; (2) not-for-hire airplanes with a seating capacity of 20 or more or a maximum payload capacity of 6,000 lbs. or more; (3) rotorcraft external load operations; (4) on-demand and commuter operations not covered under Federal Aviation Regulations Part 121; and (5) agricultural aircraft operations.

Table 9.3
Summary Statistics for General Aviation, 1970–2013

Calendar year	Total number of aircraft	Aircraft hours flown	
		(thousands)	Energy use (trillion Btu)
1970	131,700 ^a	26,030 ^b	94.3
1975	168,475	30,298	110.7
1980	211,045	41,016	165.9
1981	213,226	40,704	161.2
1982	209,779	36,457	173.6
1983	213,293	35,249	134.2
1984	220,943	36,119	155.3
1985	196,500	31,456	143.9
1986	205,300	31,782	147.9
1987	202,700	30,883	139.1
1988	196,200	31,114	148.5
1989	205,000	32,332	134.1
1990	198,000	32,096	131.8
1991	196,874	29,862	120.0
1992	185,650	26,747	103.7
1993	177,120	24,455	93.6
1994	172,935	24,092	95.3
1995	188,089	26,612	106.6
1996	191,129	26,909	111.0
1997	192,414	27,713	121.1
1998	204,710	28,100	147.4
1999	219,464	31,231	172.1
2000	217,533	29,960	175.2
2001	211,446	27,017	165.1
2002	211,244	27,040	141.5
2003	209,708	27,329	141.4
2004	219,426	28,126	175.9
2005	224,352	26,982	242.4
2006	221,943	27,705	256.3
2007	231,607	27,852	243.6
2008	228,663	26,009	265.7
2009	223,877	23,763	210.3
2010	223,370	24,802	221.2
2011	220,770	24,570	227.1
2012	209,034	24,403	228.8
2013	199,927	22,876	203.6
	<i>Average annual percentage change</i>		
1970–2013	1.0%	-0.3%	1.8%
2003–2013	-0.5%	-1.8%	3.7%

Sources:

U.S. Department of Transportation, Federal Aviation Administration, *General Aviation Activity and Avionics Survey: Calendar Year 2013*, Tables 1.1, 1.4, 5.1, and annual. 2011 Data: *Aviation Forecasts*, Tables 28 and 29, May 2013. (Additional resources: www.faa.gov/data-research/aviation_data_statistics/general_aviation)

^a Active fixed-wing general aviation aircraft only.

^b Includes rotorcraft.



In the early seventies, domestic waterborne commerce accounted for over 60% of total tonnage, but by 1994 foreign tonnage grew to more than half of all waterborne tonnage. Total foreign and domestic tons shipped were about 2.27 billion tons in 2013, down from a peak of 2.59 billion tons in 2006.

Table 9.4
Tonnage Statistics for Domestic and International Waterborne Commerce, 1970–2013
(million tons shipped)

Year	Foreign and domestic total	Foreign total ^a	Domestic total ^b	Percent domestic of total
1970	1,532	581	951	62.1%
1975	1,695	749	946	55.8%
1980	1,999	921	1,077	53.9%
1985	1,788	774	1,014	56.7%
1986	1,874	837	1,037	55.3%
1987	1,967	891	1,076	54.7%
1988	2,088	976	1,112	53.3%
1989	2,140	1,038	1,103	51.5%
1990	2,164	1,042	1,122	51.8%
1991	2,092	1,014	1,079	51.6%
1992	2,132	1,037	1,095	51.4%
1993	2,128	1,060	1,068	50.2%
1994	2,215	1,116	1,099	49.6%
1995	2,240	1,147	1,093	48.8%
1996	2,284	1,183	1,101	48.2%
1997	2,333	1,221	1,113	47.7%
1998	2,340	1,245	1,094	46.8%
1999	2,323	1,261	1,062	45.7%
2000	2,425	1,355	1,070	44.1%
2001	2,393	1,351	1,042	43.5%
2002	2,340	1,319	1,021	43.6%
2003	2,394	1,378	1,016	42.4%
2004	2,552	1,505	1,047	41.0%
2005	2,527	1,499	1,029	40.7%
2006	2,588	1,565	1,023	39.5%
2007	2,564	1,543	1,022	39.9%
2008	2,477	1,521	956	38.6%
2009	2,211	1,354	857	38.8%
2010	2,335	1,441	894	38.3%
2011	2,368	1,480	888	37.5%
2012	2,307	1,422	885	38.4%
2013	2,274	1,383	891	39.2%
		<i>Average annual percentage change</i>		
1970–2013	0.9%	2.0%	-0.2%	
2003–2013	-0.5%	0.0%	-1.3%	

Source:

U.S. Department of the Army, Corps of Engineers, *The U.S. Waterway System, Transportation Facts and Information*, January 2015. (Additional resources: www.navigationsdatacenter.us/index.htm)

^a All movements between the United States and foreign countries and between Puerto Rico and the Virgin Islands and foreign countries are classified as foreign trade.

^b All movements between U.S. ports, continental and noncontiguous, and on the inland rivers, canals, and connecting channels of the United States, Puerto Rico, and the Virgin Islands, excluding the Panama Canal. Beginning in 1996, fish was excluded for internal and intra-port domestic traffic.



The U.S. Army Corps of Engineers Navigation Data Center collects a wealth of waterborne commerce data. Energy use data, however, have never been collected as part of this effort. The energy use data collected by the Energy Information Administration (EIA) on vessel bunkering was formerly displayed on this table. The EIA data include different uses of fuel, not just fuel for domestic waterborne commerce; therefore it was misleading to display those data together.

Table 9.5
Summary Statistics for Domestic Waterborne Commerce, 1970–2013

Year	Number of vessels ^a	Ton-miles (billions)	Tons shipped ^b (millions)	Average length of haul (miles)
1970	25,832	596	949	628.2
1975	31,666	566	944	599.9
1980	38,792	922	1,074	856.4
1985	41,672	893	1,011	883.5
1990	41,119	834	1,118	745.7
1991	39,233	848	1,074	789.9
1992	39,210	857	1,090	785.7
1993	39,064	790	1,063	742.7
1994	39,064	815	1,093	745.5
1995	39,445	808	1,086	743.6
1996	41,104	765	1,093	699.4
1997	41,419	707	1,106	639.5
1998	42,032	673	1,087	619.0
1999	41,766	656	1,056	621.1
2000	39,641	646	1,064	606.8
2001	41,588	622	1,037	599.7
2002	41,002	612	1,016	602.5
2003	39,983	606	1,010	600.3
2004	40,290	621	1,042	596.4
2005	41,354	591	1,024	577.4
2006	41,109	562	1,018	548.7
2007	40,695	553	1,016	544.2
2008	40,301	521	952	546.7
2009	40,109	477	852	559.7
2010	40,512	503	894	562.8
2011	40,521	500	888	563.5
2012	40,530	475	885	536.5
2013	39,999	465	891	521.8
<i>Average annual percentage change</i>				
1970–2013	1.0%	-0.6%	-0.1%	-0.4%
2003–2013	0.0%	-2.6%	-1.2%	-1.4%

Sources:

Number of vessels 1970–92, 1995–2010 – U.S. Department of the Army, Corps of Engineers, *Waterborne Transportation Lines of the United States, 2011*, New Orleans, LA, 2012, Table 2, p. 6, and annual. 1993–94 – U.S. Department of the Army, Corps of Engineers, *The U.S. Waterway System-Facts*, Navigation Data Center, New Orleans, Louisiana, January 1996.

Ton-miles, tons shipped, average length of haul – U.S. Department of the Army, Corps of Engineers, *Waterborne Commerce of the United States, Calendar Year 2011, Part 5: National Summaries*, New Orleans, LA, 2012, Table 1-4, pp. 1-6, 1-7, and annual. (Additional resources: www.navigationdatacenter.us/index.htm)

Number of vessels, ton-miles, tons shipped and average length of haul, 2011-2013 – U.S. Department of the Army, Corps of Engineers, *The U.S. Waterway System, Transportation Facts and Information Fact Card*.

^a Grand total for self-propelled and non-self-propelled.

^b These figures are not consistent with the figures on Table 9.4 because intra-territory tons are not included in this table. Intra-territory traffic is traffic between ports in Puerto Rico and the Virgin Islands.



The data displayed in this table come from the Environmental Protection Agency's NONROAD2008a model.

Table 9.6
Recreational Boat Energy Use, 1970–2013

Year	Number of boats (thousands)	Diesel fuel	Gasoline	Total energy use
		(trillion Btu)		
1970	10,087	5.5	151.7	157.2
1971	10,137	6.5	152.6	159.2
1972	10,187	7.6	153.6	161.2
1973	10,237	8.6	154.5	163.2
1974	10,287	9.7	155.5	165.1
1975	10,337	10.7	156.4	167.1
1976	10,387	11.8	157.4	169.1
1977	10,437	12.8	158.3	171.1
1978	10,487	13.9	159.3	173.1
1979	10,537	14.9	160.2	175.1
1980	10,587	16.0	161.2	177.1
1981	10,637	17.0	162.1	179.1
1982	10,687	18.0	163.1	181.1
1983	10,737	19.1	164.0	183.1
1984	10,787	20.1	165.0	185.1
1985	10,837	21.2	165.9	187.1
1986	10,887	22.2	166.9	189.1
1987	10,937	23.3	167.8	191.1
1988	11,030	24.3	170.4	194.7
1989	11,122	25.4	172.9	198.3
1990	11,215	26.4	175.4	201.8
1991	11,327	27.5	178.7	206.2
1992	11,440	28.5	182.0	210.5
1993	11,553	29.5	185.3	214.8
1994	11,770	30.6	192.5	223.1
1995	11,988	31.6	199.7	231.3
1996	12,206	32.7	206.8	239.5
1997	12,244	33.7	207.2	240.9
1998	12,283	34.8	207.4	242.2
1999	12,321	35.8	207.1	243.0
2000	12,359	36.8	206.6	243.4
2001	12,464	37.9	206.9	244.9
2002	12,568	39.0	206.7	245.7
2003	12,673	40.2	206.0	246.2
2004	12,777	41.3	205.0	246.2
2005	12,882	42.4	203.7	246.1
2006	12,984	43.5	202.5	245.9
2007	13,086	44.6	201.2	245.8
2008	13,189	45.7	200.0	245.7
2009	13,291	46.8	198.8	245.6
2010	13,393	47.9	197.3	245.2
2011	13,497	49.0	195.9	244.9
2012	13,602	50.1	194.7	244.8
2013	13,707	51.2	193.8	245.0
<i>Average annual percentage change</i>				
1970–2013	0.5%	3.6%	0.4%	0.7%
2003–2013	0.8%	2.4%	-0.6%	0.0%

Source:

U.S. Environmental Protection Agency, NONROAD2008a model, downloadable file from www.epa.gov/otaq/nonrdmdl.htm.



The Interstate Commerce Commission designates Class I railroads on the basis of annual gross revenues. In 2013, seven railroads were given this designation. The number of railroads designated as Class I has changed considerably in the last 30 years; in 1976 there were 52 railroads given Class I designation.

Table 9.7
Class I Railroad Freight Systems in the United States
Ranked by Revenue Ton-Miles, 2013

Railroad	Revenue ton-miles (billions)	Percent
Burlington Northern and Santa Fe Railway Company	675	38.9%
Union Pacific Railroad Company	514	29.5%
CSX Transportation	227	13.0%
Norfolk Southern Railway	194	11.1%
Canadian National, Grand Trunk Corporation	59	3.4%
Canadian Pacific Soo Railway	40	2.3%
Kansas City Southern Railway Company	31	1.8%
Total	1,740	100.0%

Source:

Association of American Railroads, *Railroad Facts, 2014 Edition*, Washington, DC, November 2014, p. 68.
 (Additional resources: www.aar.org)



Revenue ton-miles for Class I freight railroads was over 1.7 trillion in 2013. Though there are many regional and local freight railroads, the Class I freight railroads accounted for 94% of the railroad industry's freight revenue in 2013 and 69% of the industry's mileage operated. The energy intensity of Class I railroads hit an all-time low of 289 Btu/ton-mile in 2010 and continued to be below 300 Btu/ton-mile in 2013.

Table 9.8
Summary Statistics for Class I Freight Railroads, 1970–2013

Year	Number of locomotives in service ^a	Number of freight cars (thousands) ^b	Train-miles (millions)	Car-miles (millions)	Tons originated ^c (millions)	Average length of haul (miles)	Revenue ton-miles (millions)	Energy intensity (Btu/ton-mile)	Energy use (trillion Btu)
1970	27,077 ^d	1,424	427	29,890	1,485	515	764,809	691	528.1
1975	27,846	1,359	403	27,656	1,395	541	754,252	687	518.3
1980	28,094	1,168	428	29,277	1,492	616	918,958	597	548.7
1981	27,421	1,111	408	27,968	1,453	626	910,169	572	521.0
1982	26,795	1,039	345	23,952	1,269	629	797,759	553	440.8
1983	25,448	1,007	346	24,358	1,293	641	828,275	525	435.1
1984	24,117	948	369	26,409	1,429	645	921,542	510	469.9
1985	22,548	867	347	24,920	1,320	665	876,984	497	436.1
1986	20,790	799	347	24,414	1,306	664	867,722	486	421.5
1987	19,647	749	361	25,627	1,372	688	943,747	456	430.3
1988	19,364	725	379	26,339	1,430	697	996,182	443	441.4
1989	19,015	682	383	26,196	1,403	723	1,013,841	437	442.6
1990	18,835	659	380	26,159	1,425	726	1,033,969	420	434.7
1991	18,344	633	375	25,628	1,383	751	1,038,875	391	405.8
1992	18,004	605	390	26,128	1,399	763	1,066,781	393	419.2
1993	18,161	587	405	26,883	1,397	794	1,109,309	389	431.6
1994	18,505	591	441	28,485	1,470	817	1,200,701	388	465.4
1995	18,812	583	458	30,383	1,550	843	1,305,688	372	485.9
1996	19,269	571	469	31,715	1,611	842	1,355,975	368	499.4
1997	19,684	568	475	31,660	1,585	851	1,348,926	370	499.7
1998	20,261	576	475	32,657	1,649	835	1,376,802	365	502.0
1999	20,256	579	490	33,851	1,717	835	1,433,461	363	520.0
2000	20,028	560	504	34,590	1,738	843	1,465,960	352	516.0
2001	19,745	500	500	34,243	1,742	859	1,495,472	346	517.3
2002	20,506	478	500	34,680	1,767	853	1,507,011	345	520.3
2003	20,774	467	516	35,555	1,799	862	1,551,438	344	533.9
2004	22,015	474	535	37,071	1,844	902	1,662,598	341	566.2
2005	22,779	475	548	37,712	1,899	894	1,696,425	337	571.4
2006	23,732	475	563	38,995	1,957	906	1,771,897	330	584.5
2007	24,143	460	543	38,186	1,940	913	1,770,545	320	566.9
2008	24,003	450	524	37,226	1,934	919	1,777,236	305	542.5
2009	24,045	416	436	32,115	1,668	919	1,532,214	291	446.6
2010	23,893	398	476	35,541	1,851	914	1,691,004	289	488.1
2011	24,250	381	493	36,649	1,885	917	1,729,256	298	514.6
2012	24,707	381	500	36,525	1,760	973	1,712,567	294	504.0
2013	25,033	374	504	35,253	1,758	990	1,740,687	296	514.9
<i>Average annual percentage change</i>									
1970–2013	-0.2%	-3.1%	0.4%	0.4%	0.4%	1.5%	1.9%	-2.0%	-0.1%
2003–2013	1.9%	-2.2%	-0.2%	-0.1%	-0.2%	1.4%	1.2%	-1.5%	-0.4%

Source:

Association of American Railroads, *Railroad Facts, 2014 Edition*, Washington, DC, November 2014, pp. 30, 31, 36, 37, 39, 51 and 54. (Additional resources: www.aar.org)

^a Does not include self-powered units.

^b Does not include private or shipper-owned cars. Beginning in 2001, Canadian-owned U.S. railroads are excluded.

^c Tons originated is a more accurate representation of total tonnage than revenue tons. Revenue tons often produces double-counting of loads switched between rail companies.

^d Data represent total locomotives used in freight and passenger service. Separate estimates are not available.



According to the 2012 Commodity Flow Survey, 7% of all freight ton-miles are rail intermodal shipments (truck/rail or rail/water). See Table 5.16 for details. The number of trailers and containers moved by railroads has increased more than seven-fold from 1965 to 2013. Containerization has increased in the last two decades, evidenced by the 392% increase in the number of containers from 1988 to 2013. The number of trailers moved by rail has fallen to an all-time low in 2013.

Table 9.9
Intermodal Rail Traffic, 1965–2013^a

Year	Trailers & containers	Trailers	Containers
1965	1,664,929	b	b
1970	2,363,200	b	b
1975	2,238,117	b	b
1980	3,059,402	b	b
1981	3,150,522	b	b
1982	3,396,973	b	b
1983	4,090,078	b	b
1984	4,565,743	b	b
1985	4,590,952	b	b
1986	4,997,229	b	b
1987	5,503,819	b	b
1988	5,779,547	3,481,020	2,298,527
1989	5,987,355	3,496,262	2,491,093
1990	6,206,782	3,451,953	2,754,829
1991	6,246,134	3,201,560	3,044,574
1992	6,627,841	3,264,597	3,363,244
1993	7,156,628	3,464,126	3,692,502
1994	8,128,228	3,752,502	4,375,726
1995	7,936,172	3,492,463	4,443,709
1996	8,143,258	3,302,128	4,841,130
1997	8,698,308	3,453,907	5,244,401
1998	8,772,663	3,353,032	5,419,631
1999	8,907,626	3,207,407	5,700,219
2000	9,176,890	2,888,630	6,288,260
2001	8,935,444	2,603,423	6,332,021
2002	9,312,360	2,531,338	6,781,022
2003	9,955,605	2,625,837	7,329,768
2004	10,993,662	2,928,123	8,065,539
2005	11,693,512	2,979,906	8,713,606
2006	12,282,221	2,882,699	9,399,522
2007	12,026,631	2,600,635	9,425,996
2008	11,499,978	2,478,890	9,021,088
2009	9,875,967	1,639,603	8,236,364
2010	11,283,151	1,684,684	9,598,467
2011	11,892,418	1,698,615	10,193,803
2012	12,267,416	1,518,323	10,749,093
2013	12,831,692	1,505,032	11,326,660
	<i>Average annual percentage change</i>		
1965–2013	4.3%	b	b
2003–2013	2.6%	-5.4%	4.4%

Source:

Association of American Railroads, *Railroad Facts, 2014 Edition*, Washington, DC, November 2014, p. 29.
(Additional resources: www.aar.org)

^a Beginning in 1995, the Grand Trunk Western Railroad and the Soo Line Railroad Company are excluded. Beginning in 1999, the Illinois Central data are excluded. Beginning in 2002, the Wisconsin Central data are excluded.

^b Data are not available.



The National Railroad Passenger Corporation, known as Amtrak, began operation in 1971. Amtrak revenue passenger-miles have grown at an average annual rate of 3.0% from 1971 to 2013.

Table 9.10
Summary Statistics for the National Railroad Passenger Corporation (Amtrak), 1971–2013

Year	Number of locomotives in service	Number of passenger cars	Train-miles (thousands)	Car-miles (thousands)	Revenue passenger-miles (millions)	Average trip length (miles)	Energy intensity (Btu per revenue passenger-mile)	Energy use (trillion Btu)
1971	^a	1,165	16,537	140,147	1,993	188	^a	^a
1975	355	1,913	30,166	253,898	3,753	224	3,548	13.3
1980	448	2,128	29,487	235,235	4,503	217	3,065	13.8
1985	382	1,818	30,038	250,642	4,785	238	2,703	12.9
1986	369	1,793	28,604	249,665	5,011	249	2,481	12.4
1987	381	1,850	29,515	261,054	5,361	259	2,450	13.1
1988	391	1,845	30,221	277,774	5,686	265	2,379	13.5
1989	312	1,742	31,000	285,255	5,859	274	2,614	15.3
1990	318	1,863	33,000	300,996	6,057	273	2,505	15.2
1991	316	1,786	34,000	312,484	6,273	285	2,417	15.2
1992	336	1,796	34,000	307,282	6,091	286	2,534	15.4
1993	360	1,853	34,936	302,739	6,199	280	2,565	15.9 ^b
1994	411	1,874	34,940	305,600	5,869	276	2,302	13.4
1995	422	1,907	31,579	282,579	5,401	266	2,501	13.5
1996	348	1,501	30,542	277,750	5,066	257	2,690	13.6
1997	292	1,572	32,000	287,760	5,166	255	2,811	14.5
1998	362	1,347	32,926	315,823	5,325	251	2,788	14.8
1999	385	1,285	34,080	349,337	5,289	245	2,943	15.6
2000	385	1,891	35,404	371,215	5,574	243	3,235	18.0
2001	401	2,084	36,512	377,705	5,571	238	3,257	18.1
2002	372	2,896	37,624	378,542	5,314	228	3,212	17.1
2003	442	1,623	37,459	331,864	5,680	231	2,800	15.9
2004	276	1,211	37,159	308,437	5,511	219	2,760	15.2
2005	258	1,186	36,199	264,796	5,381	215	2,709	14.6
2006	319	1,191	36,083	263,908	5,410	220	2,650	14.3
2007	270	1,164	37,484	266,545	5,784	218	2,516	14.5
2008	278	1,177	37,736	271,762	6,179	215	2,398	14.8
2009	274	1,214	38,300	282,764	5,914	217	2,435	14.4
2010	282	1,274	37,453	294,820	6,420	220	2,271	14.6
2011	287	1,301	37,090	296,315	6,568	213	2,214	14.5
2012	485	2,090	37,640	319,088	6,804	218	2,120	14.4
2013	418	1,447	38,410	324,949	6,810	218	2,118	14.4
<i>Average annual percentage change</i>								
1971–2013	^a	1.4%	2.0%	2.0%	3.0%	0.4%	^a	^a
2003–2013	-0.6%	-1.1%	0.3%	-0.2%	1.8%	-0.6%	-2.8%	-1.0%

Sources:

1971–83 – Association of American Railroads, Economics and Finance Department, *Statistics of Class I Railroads*, Washington, DC, and annual.

1984–88 – Association of American Railroads, *Railroad Facts*, 1988 Edition, Washington, DC, December 1989, p. 61, and annual.

1989–93 – Personal communication with the Corporate Accounting Office of Amtrak, Washington, D.C.

1994–2013 – Number of locomotives in service, number of passenger cars, train-miles, car-miles, revenue passenger-miles, and average trip length - Association of American Railroads, *Railroad Facts*, 2014 Edition, Washington, DC, 2014, p. 77; personal communication with Amtrak, Washington, DC.

Energy use – Personal communication with the Amtrak, Washington, DC. (Additional resources: www.amtrak.com, www.aar.org)

^a Data are not available.

^b Energy use for 1994 on is not directly comparable to earlier years. Some commuter rail energy use may have been inadvertently included in earlier years.



Commuter rail, which is also known as regional rail or suburban rail, is long-haul rail passenger service operating between metropolitan and suburban areas, whether within or across state lines. Commuter rail lines usually have reduced fares for multiple rides and commutation tickets for regular, recurring riders.

Table 9.11
Summary Statistics for Commuter Rail Operations, 1984–2013

Year	Number of passenger vehicles	Vehicle-miles (millions)	Passenger trips (millions)	Passenger-miles (millions)	Average trip length (miles)	Energy intensity (Btu/passenger-mile)	Energy use (trillion Btu)	
1984	4,075	167.9	267	6,207	23.2	2,804	17.4	
1985	4,035	182.7	275	6,534	23.8	2,826	18.5	
1986	4,440	188.6	306	6,723	22.0	2,926	19.7	
1987	4,686	188.9	311	6,818	21.9	2,801	19.1	
1988	4,649	202.2	325	6,964	21.4	2,872	19.7	
1989	4,472	209.6	330	7,211	21.9	2,864	20.7	
1990	4,982	212.7	328	7,082	21.6	2,822	20.0	
1991	5,126	214.9	318	7,344	23.1	2,770	20.3	
1992	5,164	218.8	314	7,320	23.3	2,629	19.2	
1993	4,982	223.9	322	6,940	21.6	2,976	20.7	
1994	5,126	230.8	339	7,996	23.6	2,682	21.4	
1995	5,164	237.7	344	8,244	24.0	2,632	21.7	
1996	5,240	241.9	352	8,351	23.7	2,582	21.6	
1997	5,426	250.7	357	8,038	22.5	2,724	21.9	
1998	5,536	259.5	381	8,704	22.8	2,646	23.0	
1999	5,550	265.9	396	8,766	22.1	2,714	23.8	
2000	5,498	270.9	413	9,402	22.8	2,551	24.0	
2001	5,572	277.3	419	9,548	22.8	2,515	24.0	
2002	5,724	283.7	414	9,504	22.9	2,514	23.9	
2003	5,959	286.0	410	9,559	23.3	2,545	24.3	
2004	6,228	294.7	414	9,719	23.5	2,569	25.0	
2005	6,392	303.4	423	9,473	22.4	2,743	26.0	
2006	6,403	314.7	441	10,361	23.5	2,527	26.2	
2007	6,391	325.7	459	11,153	24.3	2,638	29.4	
2008	6,617	310.2	472	11,049	23.4	2,656	29.3	
2009	6,941	343.5	468	11,232	24.0	2,811	31.6	
2010	6,927	345.3	464	10,874	23.4	2,897	31.5	
2011	7,193	345.2	466	11,427	24.5	2,780	31.8	
2012	7,059	346.4	471	11,181	23.7	2,823	31.6	
2013	7,310	359.1	480	11,862	24.7	2,737	32.5	
			<i>Average annual percentage change</i>					
1984–2013	2.0%	2.7%	2.0%	2.3%	0.2%			
2003–2013	2.1%	2.3%	1.6%	2.2%	0.6%			

Source:

American Public Transportation Association, *2015 Public Transportation Fact Book*, Washington, DC, June 2015, Appendix A. (Additional resources: www.apta.com)



This table on transit rail operations includes data on light rail and heavy rail systems. Light rail vehicles are usually single vehicles driven electrically with power drawn from overhead wires. Heavy rail is characterized by high speed and rapid acceleration of rail cars operating on a separate right-of-way.

Table 9.12
Summary Statistics for Rail Transit Operations, 1970–2013^a

Year	Number of passenger vehicles	Vehicle-miles (millions)	Passenger trips (millions) ^b	Passenger-miles (millions) ^c	Average trip length (miles) ^d	Energy intensity (Btu/passenger-mile) ^e	Energy use (trillion Btu)
1970	10,548	440.8	2,116	12,273	^f	2,157	26.5
1975	10,617	446.9	1,797	10,423	^f	2,625	27.4
1980	10,654	402.2	2,241	10,939	4.9	2,312	25.3
1985	11,109	467.8	2,422	10,777	4.4	2,809	30.3
1986	11,083	492.8	2,467	11,018	4.5	3,042	33.5
1987	10,934	508.6	2,535	11,603	4.6	3,039	35.3
1988	11,370	538.3	2,462	11,836	4.8	3,072	36.2
1989	11,261	553.4	2,704	12,539	4.6	2,909	36.5
1990	11,332	560.9	2,521	12,046	4.8	3,024	36.4
1991	11,426	554.8	2,356	11,190	4.7	3,254	36.4
1992	11,303	554.0	2,395	11,438	4.8	3,155	36.1
1993	11,286	549.8	2,234	10,936	4.9	3,373	36.9
1994	11,192	565.8	2,453	11,501	4.7	3,338	38.4
1995	11,156	571.8	2,284	11,419	5.0	3,340	38.1
1996	11,341	580.7	2,418	12,487	5.2	3,017	37.7
1997	11,471	598.9	2,692	13,091	4.9	2,856	37.4
1998	11,521	609.5	2,669	13,412	5.0	2,823	37.9
1999	11,603	626.4	2,813	14,108	5.0	2,785	39.3
2000	12,168	648.0	2,952	15,200	5.1	2,797	42.5
2001	12,084	662.4	3,064	15,615	5.1	2,803	43.8
2002	12,479	681.9	3,025	15,095	5.0	2,872	43.3
2003	12,236	694.2	3,005	15,082	5.0	2,837	42.8
2004	12,480	709.7	3,098	15,930	5.1	2,750	43.8
2005	12,755	715.4	3,189	16,118	5.1	2,783	44.9
2006	12,853	726.4	3,334	16,587	5.0	2,707	44.9
2007	13,032	741.2	3,879	18,070	4.7	2,577	46.6
2008	13,346	762.8	4,001	18,941	4.7	2,521	47.8
2009	13,529	775.3	3,955	19,004	4.8	2,516	47.8
2010	13,614	759.6	4,007	18,580	4.6	2,520	46.8
2011	13,328	744.1	4,083	19,520	4.8	2,459	48.0
2012	12,455	749.5	4,192	19,835	4.7	2,398	47.6
2013	12,434	774.3	4,275	20,381	4.8	2,404	49.0
<i>Average annual percentage change</i>							
1970–2013	0.4%	1.3%	1.6%	1.2%	-0.1% ^g	0.3%	1.4%
2003–2013	0.2%	1.1%	3.6%	3.1%	-0.4%	-1.6%	1.4%

Sources:

American Public Transportation Association, *2015 Public Transportation Fact Book*, Washington, DC, June 2015, Appendix A. (Additional resources: www.apta.com)
Energy use – See Appendix A for Rail Transit Energy Use.

^a Heavy rail and light rail. Series not continuous between 1983 and 1984 because of a change in data source by the American Public Transit Association (APTA). Beginning in 1984, data provided by APTA are taken from mandatory reports filed with the Urban Mass Transit Administration (UMTA). Data for prior years were provided on a voluntary basis by APTA members and expanded statistically.

^b 1970–79 data represents total passenger rides; after 1979, data represents unlinked passenger trips.

^c Estimated for years 1970–76 based on an average trip length of 5.8 miles.

^d Calculated as the ratio of passenger-miles to passenger trips.

^e Large system-to-system variations exist within this category.

^f Data are not available.

^g Average annual percentage change is calculated for years 1980–2013.



