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Introduction

Compiled and published by the Bureau of Transportation Statistics (BTS), U.S. Department of Transportation, *National Transportation Statistics 2002* presents information on the U.S. transportation system¹, including its physical components, safety record, economic performance, energy use, and environmental impact. *National Transportation Statistics 2002* is a companion document to the *Transportation Statistics Annual Report*, which analyzes the data presented here.

The report has four chapters:

- Chapter 1 provides data on the extent, condition, use, and performance of the physical transportation network.
- Chapter 2 details transportation's safety record, giving data on accidents, crashes, fatalities, and injuries for each mode and hazardous materials.
- Chapter 3 focuses on the relationship between transportation and the economy, presenting data on transportation's contribution to the gross domestic product, employment by industry and occupation, and transportation-related consumer and government expenditures.
- Chapter 4 presents data on transportation energy use and transportation-related environmental impacts.

Appendix A profiles each mode,¹ and appendix B contains metric conversions of select tables.

In addition, as part of BTS's ongoing effort to identify and assess the extent of data errors, appendix C includes brief discussions of the quality of the data presented in many of the tables. BTS obtained the data in this report from many sources, including federal government agencies, private industry, and associations. Some of the data are based on samples and are subject to sampling variability. Data from all sources may be subject to omissions and errors in reporting, recording, and processing. Documents cited as sources for the tables often provide detailed information about definitions, methodologies, and statistical reliability.

Generally, data are presented in five-year increments through 1995 and annually thereafter. The web version of the report provides a more comprehensive inventory of the available data than presented here.

¹ The U.S. transportation system comprises six modes: air, highway, transit, rail, water, and pipelines.

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Age^b (thousands)										
Under 18	63,754	62,623	63,949	68,555	69,109	69,603	69,903	70,199	72,294	72,552
18-24 years	30,022	28,902	26,961	25,112	24,843	24,980	25,476	26,011	27,142	27,831
25-34	37,082	41,696	43,174	40,730	40,246	39,559	38,743	37,936	39,892	39,607
35-44	25,634	31,691	37,444	42,555	43,365	44,014	44,498	44,813	45,149	45,019
45-54	22,800	22,460	25,062	31,100	32,358	33,625	34,575	35,802	37,678	39,188
55-64	21,703	22,135	21,116	21,132	21,353	21,816	22,666	23,389	24,275	25,308
65 and over	25,550	28,415	31,083	33,619	33,957	34,185	34,385	34,540	34,992	35,291
Sex^c (thousands)										
Male	110,053	116,160	121,284	128,294	129,504	130,783	132,030	133,277	138,054	139,813
Female	116,493	122,576	127,507	134,510	135,724	137,001	138,218	139,414	143,368	144,984
Metropolitan areas^d (population in millions)										
Large (over 1 million)	119	U	139	147	149	151	153	U	162	U
Medium (250,000-999,999)	41	U	41	44	44	43	43	U	^R 45	U
Small (less than 250,000)	17	U	18	19	19	20	20	U	^R 19	U
Rural / urban^e (thousands)										
Rural	59,495	U	61,656	U	U	U	U	U	59,061	U
Urban	167,051	U	187,053	U	U	U	U	U	222,361	U
Regions^f (millions)										
Northeast	49.1	49.9	50.8	51.4	51.5	51.6	51.7	51.8	53.6	53.8
South	75.4	81.4	85.5	91.8	92.9	94.2	95.3	96.5	100.2	101.8
Midwest	58.9	58.8	59.7	62.0	62.4	62.7	63.0	63.2	64.4	64.7
West	43.2	47.8	52.8	57.6	58.4	59.3	60.3	61.2	63.2	64.5
Immigrants admitted^g	530,639	570,009	1,536,483	720,461	915,900	798,378	654,451	646,568	849,807	1,064,318
Total area^h (square miles)	3,618,770	U	3,717,796	U	U	U	U	U	3,794,083	U
Gross domestic productⁱ (chained \$ 1996 billions)	4,900.9	5,717.1	6,707.9	7,543.8	7,813.2	8,159.5	8,508.9	^R8,859.0	^R9,191.4	9,214.5
Agriculture, forestry, fishing	66.5	97.5	118.3	123.1	130.4	143.7	145.5	^R 154.6	^R 166.7	163.9
Manufacturing	832.3	987.9	1,102.3	1,284.7	1,316.0	1,387.2	1,444.3	^R 1,513.9	^R 1,585.4	1,490.3
Mining	90.6	96.2	105.8	113.0	113.0	117.0	119.7	^R 114.7	^R 101.9	106.8
Construction	249.4	270.5	287.5	299.6	316.4	324.6	348.9	^R 367.8	^R 378.0	371.9
Transportation	154.0	170.9	180.6	225.1	243.4	248.9	257.9	^R 268.6	^R 282.5	270.3
Wholesale / retail trade	621.5	822.7	954.6	1,124.4	1,216.7	1,329.4	1,463.3	^R 1,554.8	^R 1,659.4	1,699.9
Finance, insurance, real estate	1,003.1	1,125.5	1,250.6	1,393.0	1,436.8	1,520.8	1,622.1	^R 1,688.3	^R 1,793.5	1,843.5
Services	928.1	1,103.3	1,361.9	1,510.4	1,564.2	1,632.2	1,699.0	^R 1,768.4	^R 1,826.0	1,843.3
Total civilian labor force (thousands)	106,940	115,461	125,840	132,304	133,943	136,297	137,673	139,368	140,863	141,815
Participation rate of men (percent)	77.4	76.3	76.4	75.0	74.9	75.0	74.9	74.7	^R 74.8	74.4
Participation rate of women (percent)	51.5	54.5	57.5	58.9	59.3	59.8	59.8	60.0	^R 59.9	59.8
Number of households (thousands)	80,776	86,789	93,347	98,990	99,627	101,018	102,528	103,874	^R104,705	108,209
Average size of households	2.76	2.69	2.63	2.65	2.65	2.64	2.62	2.61	^R2.62	2.58
Median household income^{jk} (constant \$ 2001)	36,035	37,059	39,324	39,306	39,869	40,699	42,173	43,335	43,162	42,228
Average household expenditures^k (constant \$ 2001)	U	36,858	37,273	37,215	37,965	38,295	38,540	39,297	39,107	39,518

KEY: R = revised; U = data are not available.

^a Estimates as of July except 1980 and 1990, which are as of April 1.

^b Total population count has been revised since the 1980 census. Numbers by age have not been corrected and may not sum to total.

^c 1995 through 1999 data are estimates.

^d Defined as Metropolitan Statistical Areas and Consolidated Metropolitan Statistical Areas, as of July 1, 1994.

^e As of April 1 of year indicated. The Census Bureau only tabulates urban / rural numbers for the decennial census years.

^f As of July 1 for all years except 1980 and 1990.

^g Fiscal year ending September 30.

^h The Census Bureau calculates square mileage comprising land and water area for the decennial census years. Data for 1980 comprises land and inland water. Data for 1990 comprises land, Great Lakes, inland water, and coastal water. Data for 2000 comprises land, Great Lakes, inland water, territorial water, and coastal water.

ⁱ Estimates for 1980 and 1985 are shown on the basis of the 1972 Standard Industrial Code (SIC); 1990-2001 are based on the 1987 SIC. Values expressed as chained 1996 dollars using industry-specific, chain-type quantity indices from the Bureau of Economic Analysis.

^j Households as of March of following year.

^k Converted to constant 2001 dollars using the CPI-U-RS price index.

SOURCES

U.S. resident population:

1980-99: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 15.

2000-01: *Ibid.*, *Statistical Abstract of the United States 2002* (Washington, DC: 2003), table 15.

Age:

1980-99: *Ibid.*, *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 12.

2000-01: *Ibid.*, *Statistical Abstract of the United States 2002* (Washington, DC: 2003), table 15.

Sex:

1980-99: *Ibid.*, *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 10.

2000-01: *Ibid.*, *Statistical Abstract of the United States 2002* (Washington, DC: 2003), table 12.

Metropolitan areas:

1980-90, 1998: *Ibid.*, *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 32.

2000: *Ibid.*, *Statistical Abstract of the United States 2002* (Washington, DC: 2003), table 28.

Rural / urban:

1980-1990: *Ibid.*, *Statistical Abstract of the United States 2000* (Washington, DC: 2001), table 37.

2000: *Ibid.*, Census 2000: Summary File 2 (SF 2), Internet site <http://www.census.gov/Press-Release/www/2001/sumfile2.html> as of June 18, 2003.

Regions:

1990-99: *Ibid.*, Internet site <http://www.census.gov/population/estimates/state/st-99-3.txt> as of Dec. 29, 1999.

2000-01: *Ibid.*, *Statistical Abstract of the United States 2002* (Washington, DC: 2003), table 18.

Immigrants:

1980-85: *Ibid.*, *Statistical Abstract of the United States 1990* (Washington, DC: 1990), table 6.

1990-96: *Ibid.*, *Statistical Abstract of the United States 1998* (Washington, DC: 1998), table 6.

1997: U.S. Department of Justice, Immigration and Naturalization Service, Office of Policy and Planning, Statistics Branch, *Annual Report, Legal Immigration, Fiscal Year 2000*, No. 6, January 2002, Internet site <http://www.bcis.gov/graphics/shared/aboutus/statistics/IMM2000AR.pdf> as of June 18, 2003.

1998-2001: U.S. Department of Justice, Immigration and Naturalization Service, Office of Policy and Planning, Statistics Branch, *Annual Report, Legal Immigration, Fiscal Year 2001*, No. 7, August 2002, Internet site <http://www.bcis.gov/graphics/shared/aboutus/statistics/IMM2001.pdf> as of June 18, 2003.

Total area:

U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States 2002* (Washington, DC:2003), table 1.

Gross domestic product:

1980-90: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (Washington, DC: November 1997).

1995-96: *Ibid.*, November 1998.

1997: *Ibid.*, November 2001.

1998-2002: *Ibid.*, November 2002.

Civilian labor force:

U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States 2002* (Washington, DC: 2003), table 560.

Participation rates:

U.S. Department of Labor, Bureau of Labor Statistics, *Current Population Survey, Table 2, Employment Status of the Civilian Noninstitutional Population 16 years and Over by Sex, 1971 to Date*, Internet site <ftp://ftp.bls.gov/pub/special.requests/lfi/aat2.txt> as of June 18, 2003.

Number of households:

1980-2001: U.S. Department of Commerce, Bureau of the Census, *Current Population Survey, Table HH-1, Households by Type: 1940 to Present*, Internet site <http://www.census.gov/population/socdemo/hh-fam/tabHH-1.pdf> as of June 17, 2003.

Average size of households:

1980-2001: U.S. Department of Commerce, Bureau of the Census, *Current Population Survey, Table HH-6, Average Population Per Household and Family: 1940 to Present*, Internet site <http://www.census.gov/population/socdemo/hh-fam/tabHH-6.pdf> as of June 17, 2003.

Median household income:

Ibid., *Current Population Survey, Table H-5, Race and Hispanic Origin of Householder -- Households by Median and Mean Income: 1967-2001*, available at <http://www.census.gov/hhes/income/histinc/h05.html> as of June 17, 2003.

Average household expenditures:

U.S. Department of Labor, Bureau of Labor Statistics, *Average Annual Expenditures and Characteristics of All Consumer Units, Consumer Expenditure Survey, 1984-92*, Internet site <http://www.bls.gov/cex/1992/standard/multiyr.pdf> as of June 17, 2003; Ibid., *Average Annual Expenditures and Characteristics of All Consumer Units, Consumer Expenditure Survey, 1993-2001*, Internet site <http://www.bls.gov/cex/2001/standard/multiyr.pdf> as of June 17, 2003.

Chapter 1

The Transportation System

Section A Physical Extent

Table 1-1: System Mileage Within the United States (Statute miles)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Highway ^a	3,545,693	3,689,666	3,730,082	3,838,146	3,859,837	3,863,912	3,866,926	3,883,920	3,901,081	3,905,211	3,906,595	3,912,226	3,919,652	3,945,872	3,906,290	3,917,243	3,936,222	3,948,335	3,966,485
Class I rail ^{b,c}	207,334	199,798	196,479	191,520	164,822	145,764	119,758	116,626	113,056	110,425	109,332	108,264	105,779	102,128	100,570	99,430	99,250	97,817	100,125
Amtrak ^c	N	N	N	N	24,000	24,000	24,000	25,000	25,000	25,000	25,000	24,000	25,000	25,000	22,000	23,000	23,000	23,000	23,000
Transit ^d																			
Commuter rail ^e	N	N	N	N	N	3,574	4,132	4,038	4,013	4,090	4,090	4,160	3,682	4,417	5,172	5,191	5,209	5,209	4,440
Heavy rail	N	N	N	N	N	1,293	1,351	1,369	1,403	1,452	1,455	1,458	1,478	1,527	1,527	1,540	1,558	1,572	1,572
Light rail	N	N	N	N	N	384	483	551	558	537	562	568	638	659	676	802	834	897	943
Navigable channels ^e	25,000	25,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000
Oil pipeline ^f	190,944	210,867	218,671	225,889	218,393	213,605	208,752	203,828	196,545	193,980	190,350	181,912	177,535	179,873	178,648	177,463	176,996	U	U
Gas pipeline ^g	630,950	767,520	913,267	979,263	1,051,774	1,118,875 (R)	1,189,200 (R)	1,208,200 (R)	1,216,100 (R)	1,277,200 (R)	1,288,400 (R)	1,277,600 (R)	1,323,600 (R)	1,331,800 (R)	1,351,200 (R)	1,340,300 (R)	1,369,300 (R)	1,373,500 (R)	1,411,381

KEY: N = data do not exist; R = revised; U = data are not available.

^a All public road and street mileage in the 50 states and the District of Columbia. For years prior to 1980, some miles of nonpublic roadways are included. No consistent data on private road mileage are available. Beginning in 1998, approximately 43,000 miles of Bureau of Land Management Roads are excluded.

^b Data represent miles of road owned (aggregate length of road, excluding yard tracks, sidings, and parallel lines).

^c Portions of Class I freight railroads, Amtrak, and commuter rail networks share common trackage. Amtrak data represent miles of track operated.

^d Transit system mileage is measured in directional route-miles. A directional route-mile is the mileage in each direction over which public transportation vehicles travel while in revenue service. Directional route-miles are computed with regard to direction of service, but without regard to the number of traffic lanes or rail tracks existing in the right-of-way.

^e These are estimated sums of all domestic waterways which include rivers, bays, channels, and the inner route of the Southeast Alaskan Islands, but does not include the Great Lakes or deep ocean traffic. The Waterborne Commerce Statistics Center monitored 12,612 miles as commercially significant inland shallow-draft waterways in 2001.

^f Includes trunk and gathering lines for crude-oil pipeline.

^g Excludes service pipelines. Data not adjusted to common diameter equivalent. Mileage as of the end of each year. Includes gathering, transmission, and distribution mains. Prior to 1990 data also include field lines. See table 1-10 for a more detailed breakout of oil and gas pipeline mileage. In the past, mileage data reported in *Gas Facts* was taken from the American Gas Association's member survey, the Uniform Statistical Report, supplemented with estimates for companies that did not participate. For 2002 and revised data back to 1990, *Gas Facts* mileage data is now based on information reported to the U.S. Department of Transportation on Form 7100.

SOURCES

Highway:

1960-95: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: Annual issues), table HM-212.

1996-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table HM-20.

Class I rail:

1960-2002: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), p. 45, and similar tables in earlier editions.

Amtrak:

1980: Amtrak, Corporate Planning and Development, personal communication (Washington, DC).

1985-2001: Amtrak, Corporate Planning and Development, *Amtrak Annual Report, Statistical Appendix* (Washington, DC: Annual issues).

2002: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), p. 77.

Transit:

1985-2002: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual issues), table 23 and similar tables in earlier editions.

Navigable channels:

1960-96: U.S. Army Corps of Engineers, Ohio River Division, Huntington District, *Ohio River Navigation System Report, 1996, Commerce on the Ohio River and its Tributaries* (Fort Belvoir, VA: 1996), p. 2.

1997-99: *Ibid.*, Waterborne Commerce Statistics Center Databases, personal communication, Aug. 3, 2001.

2000-02: *Ibid.*, personal communication, Aug. 12, 2003 and July 23, 2004.

Oil pipeline:

1960-2000: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 58.

Gas pipeline:

1960-2002: American Gas Association, *Gas Facts* (Arlington, VA: Annual issues), tables 5-1 and 5-3 and similar tables in earlier editions.

Table 1-2: Number of Air Carriers, Railroads, Interstate Motor Carriers, Marine Vessel Operators, and Pipeline Operators

	1960	1965	1970	1975	1980	1985	1990	1995	1996	1997	1998	1999	2000	2001	2002
Air carriers ^a	N	N	39	36	63	102	70	96	96	96	96	94	91	87	83
Major air carriers	N	N	N	N	N	13	14	11	12	13	13	13	15	15	15
Other air carriers	N	N	N	N	N	89	56	85	84	83	83	81	76	72	68
Railroads	607	568	517	477	480	500	530	541	553	550	559	555	560	571	552
Class I railroads	106	76	71	73	39	25	14	11	10	9	9	9	8	8	7
Other railroads	501	492	446	404	441	475	516	530	543	541	550	546	552	563	545
Interstate motor carriers ^b	e	e	e	e	U	U	216,000	346,000	379,000	417,000	477,486	517,297	560,393	592,909	600,104
Marine vessel operators ^c	U	U	U	U	U	U	U (R)	1,381 (R)	1,348 (R)	1,311 (R)	1,235 (R)	1,174 (R)	1,114 (R)	1,063	U
Pipeline operators ^d	N	N	1,123	1,682	2,243	2,204	2,212	2,378	2,338	2,282	2,225	2,216	2,163	1,957	U
Hazardous liquid	N	N	N	N	N	^g 222	187	209	215	217	225	216	243	239	U
Natural gas transmission	N	N	420	432	474	724	866	974	970	954	880	862	828	637	867
Natural gas distribution	N	N	938	^f 1,500	^f 1,932	1,485	1,382	1,444	1,397	1,363	1,366	1,382	1,351	1,305	1,311

KEY: N = data do not exist; R = revised; U = data are not available.

^a Carrier groups are categorized based on their annual operating revenues as major, national, large regional, and medium regional. The thresholds were last adjusted July 1, 1999, and the threshold for major air carriers is currently \$1 billion. The other air carrier category contains all national, large regional, and medium regional air carriers.

^b Figures are for the fiscal year, October through September. The Federal Motor Carrier Safety Administration deletes motor carriers from the Motor Carrier Management Information System (MCMIS) when they receive an official notice of a change in status. This most often occurs when a safety audit or compliance review is attempted. As a result, inactive carriers may be included in the MCMIS.

^c The printed source materials do not contain totals for the number of operators and data files from which the figures can be determined are not available prior to 1993.

^d There is some overlap among the operators for the pipeline modes so the total number of pipeline operators is lower than the sum for the three pipeline modes.

^e Prior to 1980, the source of motor carrier data was the Interstate Commerce Commission (ICC), which was abolished on Jan. 1, 1996. (Certain functions were transferred to the Surface Transportation Board and the Department of Transportation.) The system used by ICC to collect motor carrier data differs significantly from that used by the Federal Motor Carrier Safety Administration in its Motor Carrier Management Information System (MCMIS), which began operations in 1980. The MCMIS is updated weekly, but archive versions are not retained. Because of differences between the two systems, data are not comparable and thus are not included here.

^f Includes master meter and mobile home park natural gas distribution operators. A master meter system is a pipeline system for distributing gas within, but not limited to, a definable area, such as a mobile home park, housing project, or apartment complex, where the operator purchases metered gas from an outside source for resale through a gas distribution pipeline system. The gas distribution pipeline system supplies the ultimate consumer who either purchases the gas directly through a meter or by other means, such as by rents.

^g This value is for 1986. The number of hazardous liquid pipeline operators is not available for prior years.

SOURCES

Air carriers:

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Financial Statistics Quarterly* (Washington, DC: Fourth quarter issues), "Alphabetical List of Air Carriers by Carrier Group ...".

Railroads:

1960-85: Association of American Railroads, *Railroad Ten-Year Trends*, Vol. 2 (Washington, DC), table I-2.

1989-98: *Ibid.*, Vol. 16 (Washington, DC: 1999), p. 10.

1999-2002: *Ibid.*, *Railroad Facts* (Washington, DC: Annual issues), p. 3.

Interstate motor carriers:

1990-2001: U.S. Department of Transportation, Federal Motor Carrier Safety Administration, Motor Carrier Management Information System (MCMIS) data, personal communication, Nov. 6, 2001.

2002: U.S. Department of Transportation, Federal Motor Carrier Safety Administration, Analysis and Information Online, Internet site <http://ai.volpe.dot.gov/mcspa.asp> as of June 4, 2004.

Marine vessel operators:

1995-2001: U.S. Army Corps of Engineers, *Waterborne Transportation Lines of the United States, Volume 1, National Summaries* (New Orleans, LA: Annual issues), table 13.

Pipeline Operators:

U.S. Department of Transportation, Office of Pipeline Safety, personal communication, Dec. 15, 2003.

Table 1-3: Number of U.S. Airports^a

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
TOTAL airports	15,161	16,319	17,490	17,581	17,846	18,317	18,343	18,224	18,292	18,345	18,770	19,098	19,281	19,356	19,572	19,581
Public use, total	4,814	5,858	5,589	5,551	5,545	5,538	5,474	5,415	5,389	5,357	5,352	5,324	5,317	5,294	5,286	5,286
Lighted runways, percent	66.2	68.1	71.4	71.9	72.3	72.8	73.5	74.3	74.5	74.6	74.8	76.1	75.9	76.2	76.1	76.2
Paved runways, percent	72.3	66.7	70.7	71.5	71.6	72.2	72.9	73.3	73.7	74.0	74.2	74.2	74.3	74.6	74.5	74.5
Private use, total	10,347	10,461	11,901	12,030	12,301	12,779	12,869	12,809	12,903	12,988	13,418	13,774	13,964	14,062	14,286	14,295
Lighted runways, percent	15.2	9.1	7.0	6.8	6.6	6.3	6.2	6.4	6.4	6.4	6.3	6.7	7.2	8.0	8.3	9.8
Paved runways, percent	13.3	17.4	31.5	32.0	32.2	32.7	33.0	33.0	32.9	33.0	33.2	31.8	32.0	32.4	32.4	37.4
TOTAL airports	15,161	16,319	17,490	17,581	17,846	18,317	18,343	18,224	18,292	18,345	18,770	19,098	19,281	19,356	19,572	19,581
Certificated ^b , total	730	700	680	669	664	670	672	667	671	660	660	655	651	635	633	628
Civil	N	N	N	N	N	N	577	572	577	566	566	565	563	560	558	555
Military	N	N	N	N	N	N	95	95	94	94	94	90	88	75	75	73
General aviation, total	14,431	15,619	16,810	16,912	17,182	17,637	17,671	17,557	17,621	17,685	18,110	18,443	18,630	18,721	18,939	18,953

KEY: N = data do not exist.

^a Includes civil and joint-use civil-military airports, heliports, STOL (short takeoff and landing) ports, and seaplane bases in the United States and its territories.

^b Certificated airports serve air-carrier operations with aircraft seating more than 30 passengers.

SOURCES

1980-2003: U.S. Department of Transportation, Federal Aviation Administration, *Administrator's Fact Book* (Washington, DC: Annual issues), Internet site <http://www.ama500.jccbi.gov/factbook/> as of May 21, 2004.

Table 1-4: Public Road and Street Mileage in the United States by Type of Surface^a (Thousands of miles)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL paved and unpaved	3,546	3,690	3,730	3,838	3,860	3,864	3,867	3,884	3,901	3,905	3,907	3,912	3,934	3,958	3,949	3,930	3,950	3,962	3,981
Paved ^b , total	1,230	1,455	1,658	1,855	2,073	2,114	2,255	2,280	2,303	2,278	2,342	2,378	2,381	2,410	2,420	2,451	2,504	2,523	2,578
Low and intermediate type	672	758	897	967	1,041	1,015	1,025	1,030	1,026	1,010	1,043	1,062	1,066	^d N	^{d}N	^{d}N	^{d}N	^{d}N	^{d}N
High-type	558	696	762	888	1,032	1,099	1,230	1,250	1,277	1,268	1,299	1,316	1,314	^d N	^{d}N	^{d}N	^{d}N	^{d}N	^{d}N
Unpaved ^c , total	2,315	2,235	2,072	1,983	1,787	1,750	1,612	1,604	1,598	1,628	1,564	1,534	1,554	1,548	1,529	1,479	1,446	1,439	1,403

KEY: N = data do not exist.

^a 1960-95 data include the 50 states and the District of Columbia; 1996-2002 data include the 50 states, District of Columbia, and Puerto Rico.

^b Paved mileage includes the following categories: low type (an earth, gravel, or stone roadway that has a bituminous surface course less than 1" thick); intermediate type (a mixed bituminous or bituminous penetration roadway on a flexible base having a combined surface and base thickness of less than 7"); high-type flexible (a mixed bituminous or bituminous penetration roadway on a flexible base having a combined surface and base thickness of 7" or more; high-type composite (a mixed bituminous or bituminous penetration roadway of more than 1" compacted material on a rigid base with a combined surface and base thickness of 7" or more; high-type rigid (Portland cement concrete roadway with or without a bituminous wearing surface of less than 1").

^c Unpaved mileage includes the following categories: unimproved roadways using the natural surface and maintained to permit passability; graded and drained roadways of natural earth aligned and graded to permit reasonably convenient use by motor vehicles, and that have adequate drainage to prevent serious impairment of the road by normal surface water—surface may be stabilized; and soil, gravel, or stone roadways drained and graded with a surface of mixed soil, gravel, crushed stone, slag, shell, etc.—surface may be stabilized. The percentage of unpaved roads that are nonsurfaced dropped from approximately 42% in the 1960s to about 37% in the first half of the 1970s, to about 32% in 1980 and has held at about 22% since 1985.

^d Source no longer sorts data into these particular categories for paved minor collectors and local public roads.

NOTES

A public road is any road under the jurisdiction of and maintained by a public authority (federal, state, county, town or township, local government or instrumentality thereof) and open to public travel. No consistent data on private road mileage are available (although prior to 1980 some nonpublic roadway mileage are included). Most data are provided by the states to the US DOT Federal Highway Administration (FHWA). Some years contain FHWA estimates for some states.

Numbers may not add to totals due to rounding.

SOURCES

1960-95: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table HM-212.

1996-2002: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table HM-12.

Table 1-5: U.S. Public Road and Street Mileage by Functional System^a

	1990	1991	1992	1993	1994	1995	1996	1997	^b 1998	1999	2000 ^R	2001	2002
TOTAL urban and rural mileage	3,866,926	3,883,920	3,901,081	3,905,211	3,906,595	3,912,226	3,919,652	3,945,872	3,906,290	3,917,243	3,936,222	3,948,335	3,966,485
Urban mileage, total	744,644	749,862	785,066	805,877	813,785	819,706	826,765	836,740	841,642	846,085	852,243	877,004	894,724
Principal arterials, Interstates	11,527	11,602	12,516	12,877	13,126	13,164	13,217	13,247	13,312	13,343	13,379	13,406	13,491
Principal arterials, other freeways, and expressways	7,668	7,709	8,491	8,841	8,994	8,970	9,027	9,063	9,127	9,132	9,140	9,126	9,323
Principal arterials, other	51,968	52,515	51,900	52,708	53,110	52,796	52,983	53,223	53,132	53,199	53,314	53,056	53,439
Minor arterials	74,659	74,795	80,815	86,821	87,857	88,510	89,020	89,185	89,496	89,432	89,789	89,962	90,411
Collectors	78,254	77,102	82,784	84,854	86,089	87,331	87,790	88,049	88,071	88,005	88,200	88,713	89,247
Local	520,568	526,139	548,560	559,776	564,609	568,935	574,728	583,973	588,504	592,974	598,421	622,741	638,813
Rural mileage, total	3,122,282	3,134,058	3,116,015	3,099,334	3,092,810	3,092,520	3,092,887	3,109,132	3,064,648	3,071,158	3,083,979	3,071,331	3,071,761
Principal arterials, Interstates	33,547	33,677	32,951	32,631	32,457	32,580	32,820	32,817	32,813	32,974	33,048	33,061	32,992
Principal arterials, other	83,802	86,747	94,947	96,770	97,175	97,948	98,131	98,257	98,852	98,838	98,919	99,185	98,853
Minor arterials	144,774	141,795	137,685	137,577	138,120	137,151	137,359	137,497	137,308	137,462	137,575	137,587	137,568
Major collectors	436,352	436,746	434,072	432,222	431,115	431,712	432,117	432,714	432,408	432,934	433,121	433,284	430,946
Minor collectors	293,922	293,511	284,504	282,182	282,011	274,081	273,198	272,362	272,140	271,676	271,803	271,377	270,700
Local	2,129,885	2,141,582	2,131,856	2,117,952	2,111,932	2,119,048	2,119,262	2,135,485	2,091,127	2,097,274	2,109,513	2,096,837	2,100,702

KEY: R = revised.

^a Includes the 50 states and the District of Columbia. When states did not submit reports, data were estimated by the U.S. Department of Transportation, Federal Highway Administration.

^b Beginning in 1998, approximately 43,000 miles of Bureau of Land Management roads are excluded.

NOTE

A public road is any road under the ownership of and maintained by a public authority (federal, state, county, town or township, local government or instrumentality thereof) and open to public travel. No consistent data on private road mileage are available. For more detailed information, including breakouts of mileage by ownership and type of surface, see the source document.

SOURCES

1990-95: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table HM-220.

1996-2002: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table HM-20, Internet site www.fhwa.dot.gov/policy/ohpi as of December 2003.

Table 1-6: Estimated U.S. Roadway Lane-Miles by Functional System^a

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	^d 1998	1999	2000 ^R	2001	2002
TOTAL lane-miles	7,922,174	8,017,994	8,051,081	8,087,793	8,124,090	8,132,196	8,143,014	8,158,253	8,178,654	8,242,437	8,160,858	8,177,983	8,224,245	8,251,847	8,295,171
Urban, total	1,395,245	1,542,339	1,670,496	1,682,752	1,758,731	1,803,775	1,825,877	1,840,107	1,857,649	1,882,676	1,891,608	1,895,986	1,915,503	1,967,047	2,006,436
Interstates	48,458	57,295	62,214	62,826	67,266	69,184	70,832	71,377	71,790	72,257	73,006	73,293	73,912	74,463	75,107
Other arterials ^b	333,673	371,649	399,376	402,360	418,208	435,386	442,474	445,828	449,480	453,623	454,060	450,411	456,181	457,567	462,855
Collectors	145,128	162,377	167,770	165,288	176,137	179,653	183,353	185,032	186,923	188,850	187,533	186,334	188,570	189,538	190,843
Local	867,986	951,018	1,041,136	1,052,278	1,097,120	1,119,552	1,129,218	1,137,870	1,149,456	1,167,946	1,177,009	1,185,948	1,196,840	1,245,479	1,277,631
Rural, total	6,526,929	6,475,655	6,380,585	6,405,041	6,365,359	6,328,421	6,317,137	6,318,146	6,321,005	6,359,761	6,269,250	6,281,997	6,308,742	6,284,800	6,288,735
Interstates	130,980	131,907	135,871	136,503	133,467	132,138	131,266	131,916	132,963	133,165	133,231	134,198	134,587	134,638	134,570
Other arterials ^b	507,098	510,005	517,342	517,813	526,714	525,906	529,818	530,706	532,856	536,989	537,993	539,293	540,457	542,337	544,011
Collectors ^c	1,431,267	1,466,789	1,467,602	1,467,561	1,441,466	1,434,473	1,432,189	1,417,428	1,416,662	1,418,637	1,415,774	1,413,953	1,414,667	1,414,155	1,408,752
Local	4,457,584	4,366,954	4,259,770	4,283,164	4,263,712	4,235,904	4,223,864	4,238,096	4,238,524	4,270,970	4,182,252	4,194,553	4,219,031	4,193,670	4,201,402

KEY: R = revised.^a Includes the 50 States and the District of Columbia.^b For urban: the sum of other freeways and expressways, other principal arterials, and minor arterials. For rural: the sum of other principal arterials and minor arterials.^c Includes minor and major collectors.^d Beginning in 1998, approximately 86,000 lane-miles of Bureau of Land Management roads are excluded.**NOTE**

In estimating rural and urban lane mileage, the U.S. Department of Transportation, Federal Highway Administration assumed that rural minor collectors and urban/rural local roads are two lanes wide.

SOURCES

1980-95: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, table HM-260 (unpublished).

1996-2002: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table HM-60, Internet address www.fhwa.dot.gov/policy/ohpi as of December 2003.

Table 1-7: Number of Stations Served by Amtrak and Rail Transit, Fiscal Year

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Amtrak	510	503	491	487	498	504	516	523	524	535	540	530	542	516	508	510	515	512	515
Rail transit	1,822	1,895	1,920	2,164	2,027	2,143	2,169	2,192	2,240	2,286	2,376	2,382	2,325	2,391	2,524	2,567	2,595	2,621	2,784

NOTES

Rail transit is the sum of commuter rail, heavy rail, and light rail. In several large urban areas, Amtrak and commuter rail stations are shared. Starting in 2001 stations serving the Alaska Railroad are included in the rail transit total.

Rail transit data for 2002 include service both directly operated and purchased. Prior to 2002, data only include directly operated service.

SOURCES**Amtrak:**

Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues).

Rail transit:

U.S. Department of Transportation, Federal Transit Administration, National Transit Database (Washington, DC: Annual issues), table 21 (for 2002 issue) and similar tables in earlier editions.

Table 1-8: ADA Lift- or Ramp-Equipped Transit Buses

	1993			1994			1995			1996			1997			1998			1999			2000			2001			2002		
	Number	ADA equipped	Percent																											
TOTAL transit buses	55,726	29,088	52.2	57,023	31,065	54.5	57,322	35,381	61.7	57,369	38,316	66.8	58,975	40,932	69.4	60,830	46,278	76.1	63,618	51,213	80.5	65,324	54,585	83.6	67,379	58,785	87.2	68,418	64,407	91.4
Small buses	3,964	3,146	79.4	4,738	3,795	80.1	5,372	4,539	84.5	5,998	5,269	87.8	6,853	6,194	90.4	7,147	6,545	91.6	8,265	7,722	93.4	8,850	8,366	94.5	9,622	9,176	95.4	9,822	9,743	99.2
Medium buses	3,542	1,911	54.0	3,693	2,153	58.3	3,879	2,561	66.0	4,233	3,081	72.8	5,136	4,143	80.7	5,929	5,150	86.9	6,613	5,959	90.1	7,455	6,926	92.9	7,830	7,337	93.7	8,693	8,550	98.4
Large buses	46,413	23,338	50.3	46,979	24,398	51.9	46,355	27,420	59.2	45,587	29,073	63.8	45,502	29,684	65.2	46,188	33,512	72.6	46,891	36,029	76.8	47,017	37,581	79.9	47,925	40,501	84.5	47,764	44,035	92.2
Articulated buses	1,807	693	38.4	1,613	719	44.6	1,716	861	50.2	1,551	893	57.6	1,484	911	61.4	1,566	1,071	68.4	1,849	1,503	81.3	2,002	1,712	85.5	2,002	1,771	88.5	2,139	2,079	97.2

KEY: ADA = Americans with Disabilities Act of 1992.

NOTES

Includes buses of transit agencies receiving federal funding for bus purchases, and buses of agencies not receiving federal funds that voluntarily report data to the Federal Transit Administration.

Large buses have more than 35 seats; medium buses have 25-35 seats; small buses have less than 25 seats; articulated buses are extra-long buses that measure between 54 and 60 feet.

SOURCE

U.S. Department of Transportation, Federal Transit Administration, 2002 *National Transit Summaries and Trends* (Washington, DC: 2003).

Table 1-9: ADA-Accessible Rail Transit Stations by Agency

Type of rail transit / agency	Primary city served	Number of stations							Number of ADA-accessible stations						
		1996	1997	1998	1999	2000	2001	2002	1996	1997	1998	1999	2000	2001	2002
Heavy rail															
Bay Area Rapid Transit	San Francisco, CA	36	39	39	39	39	39	39	36	39	39	39	39	39	39
Los Angeles County Metropolitan Transportation Authority	Los Angeles, CA	5	8	8	13	16	16	16	5	8	8	13	16	16	16
Washington Metropolitan Area Transit Authority	Washington, DC	74	75	75	76	78	83	83	74	75	75	76	78	83	54
Miami-Dade Transit Agency	Miami, FL	21	21	21	21	21	21	21	0	0	0	0	0	0	21
Metropolitan Atlanta Rapid Transit Authority	Atlanta, GA	36	36	36	36	36	38	38	36	36	36	36	36	38	38
Chicago Transit Authority	Chicago, IL	140	141	141	142	142	144	144	0	0	0	14	54	64	64
Massachusetts Bay Transportation Authority	Boston, MA	53	53	53	53	53	53	53	33	33	33	37	37	38	40
Mass Transit Administration - Maryland DOT	Baltimore, MD	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Metropolitan Transportation Authority New York City Transit	New York, NY	468	468	468	468	468	468	468	28	30	30	31	41	41	44
Port Authority Trans-Hudson Corporation (PATH)	New York, NY	13	13	13	13	13	13	11	6	6	6	6	6	6	5
Metropolitan Transit Authority Staten Island Railway	New York, NY	22	22	22	22	22	23	23	2	2	2	2	2	3	4
Greater Cleveland Regional Transit Authority	Cleveland, OH	18	18	18	18	18	18	18	4	6	6	7	8	8	9
Southeastern Pennsylvania Transportation Authority	Philadelphia, PA	76	76	76	76	76	76	53	4	4	4	4	4	4	13
Port Authority Transit Corporation (PATCO)	Philadelphia, PA	13	13	13	13	13	13	13	3	3	5	5	5	5	5
Commuter rail															
Allamont Commuter Express Authority	San Jose, CA	U	U	U	U	U	U	10	U	U	U	U	U	U	10
North San Diego County Transit Development Board	San Diego, CA	U	U	U	U	U	U	8	U	U	U	U	U	U	8
Peninsula Corridor Joint Powers Board	San Francisco, CA	U	U	U	U	U	U	34	U	U	U	U	U	U	22
Southern California Regional Railroad Authority	Los Angeles, CA	U	45	46	46	47	49	51	U	45	46	46	47	49	51
Connecticut Department of Transportation	New Haven, CT	U	U	U	U	U	U	8	U	U	U	U	U	U	8
Tri-County Commuter Rail Authority	Miami, FL	U	U	U	U	U	U	18	U	U	U	U	U	U	18
Northeast Illinois Regional Commuter Railroad Corporation	Chicago, IL	226	226	226	227	227	227	227	91	104	104	111	115	125	131
Northern Indiana Commuter Transportation District	Chicago, IL	18	18	18	18	18	18	20	7	7	7	7	7	7	11
Massachusetts Bay Transportation Authority	Boston, MA	U	U	117	119	120	121	124	U	U	67	69	74	75	78
Mass Transit Administration - Maryland DOT	Baltimore, MD	U	U	U	U	U	U	42	U	U	U	U	U	U	22
New Jersey Transit Corporation	New York, NY	158	158	158	162	162	162	167	22	22	41	46	46	46	51
Metropolitan Transportation Authority Long Island Railroad	New York, NY	134	134	124	124	124	124	124	15	15	88	97	97	97	99
Metropolitan Transportation Authority Metro-North Railroad Company	New York, NY	106	106	106	106	108	108	109	17	19	20	20	20	28	29
Pennsylvania Department of Transportation	Pennsylvania, PA	U	U	U	U	U	U	4	U	U	U	U	U	U	3
Southeastern Pennsylvania Transportation Authority	Philadelphia, PA	181	177	177	177	177	177	153	25	30	30	30	30	30	48
Dallas Area Rapid Transit	Dallas, TX	U	U	U	U	U	U	4	U	U	U	U	U	U	4
Fort Worth Transportation Authority	Fort Worth, TX	U	U	U	U	U	U	5	U	U	U	U	U	U	5
Virginia Railway Express	Washington, DC	U	U	U	U	U	U	18	U	U	U	U	U	U	18
Central Puget Sound Regional Transit Authority	Seattle, WA	U	U	U	U	U	U	7	U	U	U	U	U	U	7
Light rail															
Los Angeles County Metropolitan Transportation Authority	Los Angeles, CA	36	36	36	36	36	36	36	36	36	36	36	36	36	36
San Francisco Municipal Railway	San Francisco, CA	11	11	11	11	11	11	9	0	0	0	0	0	0	9
Sacramento Regional Transit District	Sacramento, CA	28	28	28	29	29	29	29	0	0	0	29	29	29	29
San Diego Trolley, Inc.	San Diego, CA	38	41	49	49	49	49	49	38	41	49	49	49	49	48
Santa Clara Valley Transit Authority	San Jose, CA	33	34	34	34	47	49	44	5	5	5	5	21	23	44
Regional Transportation District	Denver, CO	15	15	15	15	20	20	20	15	15	15	15	20	20	20
Regional Transit Authority of Orleans and Jefferson	New Orleans, LA	2	9	9	9	9	9	9	2	9	9	9	9	9	9
Massachusetts Bay Transportation Authority	Boston, MA	95	95	95	95	95	78	78	9	9	9	12	12	16	16
Mass Transit Administration - Maryland DOT	Baltimore, MD	24	24	32	32	32	32	32	24	24	32	32	32	32	32
City of Detroit Department of Transportation	Detroit, MI	NA	NA	NA	NA	NA	8	8	NA	NA	NA	NA	NA	0	0
Bi-State Development Agency	St. Louis, MO	18	18	18	18	18	26	26	18	18	18	18	18	26	26
New Jersey Transit Corporation	Newark, NJ	11	11	11	11	11	11	26	0	0	0	0	0	0	15

Niagara Frontier Transit Metro System, Inc.	Buffalo, NY	14	14	14	14	14	14	15	7	7	7	7	7	7	7
Greater Cleveland Regional Transit Authority	Cleveland, OH	33	33	33	34	34	34	34	2	5	5	7	7	8	8
Tri-County Metropolitan Transportation District of Oregon	Portland, OR	27	27	29	47	47	47	52	26	26	28	46	46	46	52
Port Authority of Allegheny County	Pittsburgh, PA	13	13	13	13	13	13	14	0	13	13	13	13	13	14
Southeastern Pennsylvania Transportation Authority	Philadelphia, PA	64	64	64	64	64	64	68	0	0	0	0	0	0	3
Memphis Area Transit Authority	Memphis, TN	20	20	27	28	28	28	1	20	20	27	28	28	28	1
Dallas Area Rail Transit Authority	Dallas, TX	14	20	20	20	20	22	29	14	20	20	20	20	22	29
Galveston-Island Transit	Galveston, TX	3	3	3	U	U	U	3	3	3	3	U	U	U	3
Utah Transit Authority	Salt Lake City, UT	NA	NA	NA	16	16	20	20	NA	NA	NA	16	16	20	20
King County Department of Transportation	Seattle, WA	14	14	14	9	9	9	U	14	14	14	9	9	9	U
Kenosha Transit	Kenosha, WI	NA	NA	NA	NA	1	1	2	NA	NA	NA	NA	0	0	1

KEY: ADA = Americans with Disabilities Act of 1992; NA = not applicable; U = data are not available

NOTE

Rail transit data for 2002 includes both directly operated and purchased. Prior to 2002, the data include directly operated service only.

SOURCE

U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual Issues), table 21, Internet site <http://www.ntdprogram.com/NTD/ntdhome.nsf?OpenDatabase> as of February 2004.

Table 1-10: U.S. Oil and Gas Pipeline Mileage

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Oil pipeline, total	190,944	210,867	218,671	225,889	218,393	213,605	208,752	203,828	196,545	193,980	190,350	181,912	177,535	179,873	178,648	177,463	176,996	U	U
Crude lines ^a	141,085	149,424	146,275	145,679	129,831	117,812	118,805	115,860	110,651	107,246	103,277	97,029	92,610	91,523	87,663	86,369	85,480	U	U
Product lines	49,859	61,443	72,396	80,210	88,562	95,793	89,947	87,968	85,894	86,734	87,073	84,883	84,925	88,350	90,985	91,094	91,516	U	U
Gas pipeline ^b , total	630,950	767,520	913,267	979,263	1,051,774	1,118,875	(R) 1,189,200	(R) 1,208,200	(R) 1,216,100	(R) 1,277,200	(R) 1,288,400	(R) 1,277,600	(R) 1,323,600	(R) 1,331,800	(R) 1,351,200	(R) 1,340,300	(R) 1,369,300	(R) 1,373,500	1,411,381
Distribution mains	391,400	494,500	594,800	648,200	701,800	753,400	(R) 864,600	(R) 891,400	(R) 892,000	(R) 951,800	(R) 955,600	(R) 949,800	(R) 1,001,800	(R) 1,003,100	(R) 1,022,100	(R) 1,007,500	(R) 1,045,600	(R) 1,066,300	1,079,565
Transmission pipelines ^c	183,700	211,300	252,200	262,600	266,500	271,200	(R) 292,200	(R) 294,100	(R) 291,500	(R) 293,300	(R) 301,500	(R) 296,900	(R) 292,200	(R) 294,000	(R) 300,100	(R) 301,000	(R) 296,600	(R) 287,100	309,503
Gathering lines ^d	55,800	61,700	66,300	68,500	83,500	94,300	(R) 32,400	(R) 32,700	(R) 32,600	(R) 32,100	(R) 31,300	(R) 30,900	(R) 29,600	(R) 34,700	(R) 29,000	(R) 31,800	(R) 27,100	(R) 20,100	22,313

KEY: R = revised; U = data are not available.

^a Includes trunk and gathering lines.

^b Excludes service pipe. Data are not adjusted to common diameter equivalent. Mileage as of the end of each year.

^c After 1975, includes 5,000-6,200 miles of underground storage pipe.

^d Before 1990, data include field line mileage.

NOTE

In the past, mileage data reported in *Gas Facts* was taken from the American Gas Association's member survey, the Uniform Statistical Report, supplemented with estimates for companies that did not participate. For 2002 and revised data back to 1990, *Gas Facts* mileage data is now based on information reported to the U.S. Department of Transportation on Form 7100.

SOURCES

Oil pipeline:

1960-2000: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 58.

Gas pipeline:

1960-2002: American Gas Association, *Gas Facts* (Washington, DC: Annual issues), tables 5-1 and 5-3, and similar tables in earlier editions.

Section B

Vehicle, Aircraft, and Vessel Inventory

Table 1-11: Number of U.S. Aircraft, Vehicles, Vessels, and Other Conveyances

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	
Air																			
Air carrier ^a	2,135	2,125	2,679	2,495	3,808	4,678	6,083	6,054	7,320	7,297	7,370	7,411	7,478	7,616	8,111	8,228	^R 8,055	8,497	
General aviation ^b (active fleet)	76,549	95,442	131,743	168,475	211,045	210,654	198,000	196,874	185,650	177,120	172,935	188,089	191,129	192,414	204,710	219,464	217,533	211,446	
Highway, total (registered vehicles)	74,431,800	91,739,623	111,242,295	137,912,779	161,490,159	177,133,282	193,057,376	192,313,834	194,427,346	198,041,338	201,801,921	205,427,212	210,441,249	211,580,033	215,496,003	220,461,056	225,821,241	235,331,381	
Passenger car	61,671,390	75,257,588	89,243,557	106,705,934	121,600,843	127,885,193	133,700,496	128,299,601	126,581,148	127,327,189	127,883,469	128,386,775	129,728,341	129,748,704	131,838,538	132,432,044	133,621,420	137,633,467	
Motorcycle	574,032	1,381,956	2,824,098	4,964,070	5,693,940	5,444,404	4,259,462	4,177,365	4,065,118	3,977,856	3,756,555	3,897,191	3,871,599	3,826,373	3,879,450	4,152,433	4,346,068	4,903,056	
Other 2-axle 4-tire vehicle	N	i	14,210,591	20,418,250	27,875,934	37,213,863	48,274,555	53,033,443	57,091,143	59,993,706	62,903,589	65,738,322	69,133,913	70,224,082	71,330,205	75,356,376	79,084,979	84,187,636	
Truck, single-unit 2-axle 6-tire or more	N	13,999,285	3,681,405	4,231,622	4,373,784	4,593,071	4,486,981	4,480,815	4,369,842	4,407,850	4,906,385	5,023,670	5,266,029	5,293,358	5,734,925	5,762,864	5,926,030	5,703,500	
Truck, combination	^h 11,914,249	786,510	905,082	1,130,747	1,416,869	1,403,266	1,708,895	1,691,331	1,675,363	1,680,305	1,681,500	1,695,751	1,746,586	1,789,968	1,997,345	2,028,562	2,096,619	2,154,174	
Bus	272,129	314,284	377,562	462,156	528,789	593,485	626,987	631,279	644,732	654,432	670,423	685,503	694,781	697,548	715,540	728,777	746,125	749,548	
Transit^c																			
Motor bus	49,600	49,600	49,700	50,811	59,411	64,258	58,714	60,377	63,080	64,850	68,123	67,107	71,678	72,770	72,142	74,228	75,013	^P 76,075	
Light rail cars	2,856	1,549	1,262	1,061	1,013	717	913	1,095	1,058	1,025	1,054	999	1,140	1,229	1,220	1,297	1,577	^P 1,366	
Heavy rail cars	9,010	9,115	9,286	9,608	9,641	9,326	10,419	10,331	10,245	10,261	10,138	10,157	10,201	10,242	10,301	10,306	10,591	^P 10,718	
Trolley bus	3,826	1,453	1,050	703	823	676	832	752	907	851	877	885	871	859	880	859	951	^P 600	
Commuter rail cars and locomotives	N	N	N	N	4,500	4,035	4,415	4,370	4,413	4,494	4,517	4,565	4,665	4,943	4,963	4,883	5,073	^P 5,124	
Demand response	N	N	N	N	N	14,490	16,471	17,879	20,695	23,527	28,729	29,352	30,804	32,509	29,646	31,884	33,080	^P 34,661	
Other ^d	N	N	N	N	N	867	1,197	1,595	1,853	2,308	2,505	2,809	3,003	3,808	4,703	5,059	5,208	^P 5,727	
Rail																			
Class I, Freight cars	1,658,292	1,478,005	1,423,921	1,359,459	1,168,114	867,070	658,902	633,489	605,189	587,033	590,930	583,486	570,865	568,493	575,604	579,140	560,154	499,860	
Class I, Locomotive	29,031	27,780	27,077	27,846	28,094	22,548	18,835	18,344	18,004	18,161	18,505	18,812	19,269	19,684	20,261	20,256	20,028	19,745	
Nonclass I freight cars	32,104	37,164	29,787	29,407	102,161	111,086	103,527	97,492	90,064	88,513	86,120	84,724	87,364	116,108	121,659	126,762	132,448	125,470	
Car companies and shippers freight cars	275,090	^R 285,493	330,473	334,739	440,552	443,530	449,832	458,679	477,883	497,586	515,362	550,717	582,344	585,818	618,404	662,934	688,194	688,806	
Amtrak, Passenger train car	N	N	N	1,913	2,128	1,854	1,863	1,786	1,796	1,853	1,852	1,722	1,730	1,728	1,962	1,992	1,894	2,084	
Amtrak, Locomotive	N	N	N	355	419	291	318	316	336	360	338	313	299	332	345	329	378	401	
Water																			
Nonself-propelled vessels ^e	16,777	17,033	19,377	25,515	31,662	33,597	31,209	j	30,899	30,785	30,730	31,360	32,811	33,011	33,509	33,387	33,152	33,042	
Self-propelled vessels ^f	6,543	6,083	6,455	6,144	7,126	7,522	8,236	j	8,311	8,323	8,334	8,281	8,293	8,408	8,523	8,379	8,202	8,546	
Oceangoing steam and motor ships (1,000 gross tons and over)	2,926	2,376	1,579	857	864	737	636	619	603	565	543	509	495	477	470	463	454	443	
Recreational boats ^g	2,450,484	4,138,140	5,128,345	7,303,286	8,577,857	9,589,483	10,996,253	11,068,440	11,132,386	11,282,736	11,429,585	11,734,710	11,877,938	12,312,982	12,565,930	12,738,271	12,782,143	12,876,346	

KEY: N = data do not exist; P = preliminary; R = revised; U = unavailable.

^a Air carrier aircraft are those carrying passengers or cargo for hire under 14 CFR 121 and 14 CFR 135. Beginning in 1990, the number of aircraft is the monthly average of the number of aircraft reported in use for the last three months of the year. Prior to 1990, it was the number of aircraft reported in use during December of a given year.

^b 1991-94 data revised to reflect changes in adjustment for nonresponse bias with 1996 telephone survey factors; 1995-97 data may not be comparable to 1994 and earlier years due to changes in methodology. Includes air taxi aircraft.

^c Prior to 1984, excludes most rural and smaller systems funded via Sections 18 and 16(b)(2), Urban Mass Transportation Act of 1964, as amended. Also prior to 1984, includes total vehicles owned and leased.

^d Other includes aerial tramway, automated guideway transit, cablecar, ferry boat, inclined plane, monorail, and vanpool.

^e Nonself-propelled vessels include dry-cargo barges, tank barges, and railroad-car floats.

^f Self-propelled vessels include dry-cargo and/or passenger, offshore supply vessels, railroad-car ferries, tankers, and towboats.

^g Recreational vessels that are required to be numbered in accordance with Chapter 123 of Title 46 U.S.C.

^h Included in single-unit truck.

ⁱ All trucks.

^j Data for Jan. 1, 1991-June 30, 1991 included in 1990 figure.

NOTES

Transit motor bus figure is also included as part of bus in the highway category.
For more detail on oceangoing vessels, see table 1-20.

SOURCES

Air:

Air carrier:

1960-65: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, 1970* (Washington, DC: 1970), table 5.3.

1970-75: *Ibid.*, 1979 edition (Washington, DC: 1979), table 5.1.

1980-85: *Ibid.*, *Calendar Year 1986* (Washington, DC: 1986), table 5.1.

1990-94: *Ibid.*, *Calendar Year 1997* (Washington, DC: unpublished), table 5.1, personal communication, Mar. 19, 1999.

1995-2001: Aerospace Industries Association, *Aerospace Facts and Figures* (Washington DC: 2002/2003), "Active U.S. Air Carrier Fleet".

General aviation:

1960-65: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, 1969* (Washington, DC: 1969), table 9.10.
1970-75: Ibid., *Calendar Year 1976* (Washington, DC: 1976), table 8-6.
1980: Ibid., *General Aviation Activity Survey, Calendar Year 1980* (Washington, DC: 1981), table 1-3.
1985: Ibid., *Calendar Year 1985* (Washington, DC: 1987), table 2-9.
1990-2001: Ibid., *General Aviation and Air Taxi Activity Survey, Calendar Year 2001* (Washington, DC: 2003), table 1.2.

Highway:

Passenger car:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table MV-201.
1995-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Motorcycle:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table MV-201.
1995-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Other 2-axle 4-tire vehicles:

1970-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.
1995-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Single-unit and combination trucks, and buses:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.
1995-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Transit:

1960-97: American Public Transit Association, *Transit Fact Book* (Washington, DC: 1999), table 44.
1998-2001: Ibid., *Public Transportation Fact Book* (Washington, DC: 2002), table 46.

Rail (all categories, except Amtrak):

1960-2001: Association of American Railroads, *Railroad Facts 2002* (Washington, DC: 2002).

Amtrak:

Passenger train-cars and locomotives:

1975-80: Amtrak, State and Local Affairs Department, personal communication.
1985-2000: Ibid., *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues), p. 47.
2001: Association of American Railroads, Internet site http://www.aar.org/PubCommon/Documents/AboutTheIndustry/RRProfile_AMTRAK.pdf

Water transportation:

Nonsel-propelled vessels and self-propelled vessels:

1960-2001: U.S. Army, Corps of Engineers, *Waterborne Transportation Lines of the United States, Volume 1, National Summaries* (New Orleans, LA: Annual issues).

Oceangoing steam motor ships:

1960-2000: U.S. Department of Transportation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues).
2001: Ibid., personal communication, Aug. 11, 2003.

Recreational boats:

1960-2001: U.S. Department of Transportation, U.S. Coast Guard, *Boating Statistics* (Washington, DC: Annual issues).

Table 1-12: Sales or Deliveries of New Aircraft, Vehicles, Vessels, and Other Conveyances

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Civilian aircraft (shipments)																			
Transport ^a	245	233	311	315	387	278	521	589	567	408	309	256	269	374	559	620	485	526	379
Helicopters	N	598	482	864	1,366	384	603	571	324	258	308	292	278	346	363	361	493	415	318
General aviation	7,588	11,852	7,283	14,072	11,881	2,029	1,144	1,021	899	964	928	1,077	1,115	1,549	2,193	2,475	2,802	2,618	2,203
Highway																			
Passenger car (new retail sales)	6,641,000	9,332,000	8,399,000	8,624,000	8,979,000	11,043,000	9,300,000	8,175,000	8,214,000	8,518,000	8,990,000	8,635,000	8,526,000	8,272,000 (R)	8,141,721 (R)	8,698,284 (R)	8,846,625 (R)	8,422,625 (R)	8,103,229
Motorcycle (new retail sales) ^b	N	N	1,125,000	940,000	1,070,000	710,000	303,000	280,000	278,000	293,000	306,000	309,000	330,000	356,000	432,000	546,000	710,000	850,000	936,000
Truck (factory sales) ^c	1,194,475	1,716,564	1,660,446	2,231,630	1,667,283	3,356,905	3,692,474	3,363,445	4,039,518	4,870,675	5,617,866	5,689,551	5,748,147	6,125,935	6,407,702	7,345,059	7,022,478	6,223,586	6,963,720
Bus; includes school bus (factory sales)	i	35,241	31,994	40,530	34,385	33,533	32,731	24,058	22,484	24,549	22,409	23,918	27,583	26,882	27,483	i	i	i	i
Recreational vehicle (shipments)	N	192,830	380,300	339,600	178,500	351,700	347,300	293,700	382,700	420,200	518,800	475,200	466,800	438,800	441,300	481,200	418,300	321,000	378,700
Bicycle ^d	N	N	N	N	9,000,000	11,400,000	10,800,000	11,600,000	11,600,000	13,000,000	12,500,000	12,000,000	10,900,000	11,000,000	11,100,000	11,600,000	11,900,000	11,300,000	13,600,000
Transit (deliveries)																			
Motor bus ^e	2,415	3,000	1,424	5,261	4,572	3,367	4,779	4,722	3,426	4,836	5,418	6,022	6,016	6,329	7,135	6,815	7,696	(R) 11,018	7,214
Light rail	0	0	0	0	32	63	55	17	35	54	72	38	39	76	80	123	136	111	107
Heavy rail	416	580	308	127	130	441	10	6	163	260	55	72	10	34	120	122	204	751	828
Trolley bus	0	0	0	1	98	0	118	149	0	24	36	3	3	0	54	0	0	(R) 149	88
Commuter rail	214	666	302	2,165	152	179	83	187	110	8	47	38	111	198	122	132	116	54	166
Class I rail (deliveries)																			
Freight car ^f	57,047	77,822	66,185	72,392	85,920	12,080	32,063	24,678	25,761	35,239	48,819	60,853	57,877	50,396	75,685	74,223	55,791	(R) 34,260	17,714
Locomotive	389	1,387	1,029	772	1,480	522	530	472	321	504	821	928	761	743	889	709	640	710	745
Amtrak (deliveries)																			
Passenger train car	N	N	N	109	109	N	58	0	0	0	64	76	92	10	0	0	26	U	U
Locomotive	N	N	N	30	17	10	0	0	20	26	18	10	0	111	35	0	4	U	U
Water transport																			
Merchant vessel ^g	20	13	13	15	23	14	0	0	3	0	1	1	0	1	4	2	0	2	2
Recreational boat ^h	N	N	N	N	569,700	636,800	(R) 494,700	448,000	466,750	498,775	576,200	663,760	634,750	610,100	(R) 573,300	(R) 585,300	(R) 576,900	(R) 882,300	845,200

KEY: N = data do not exist; R = revised; U = data are not available.

^a U.S.-manufactured fixed-wing aircraft over 33,000 pounds empty weight, including all jet transports plus the 4-engine turboprop-powered Lockheed L-100.

^b Includes domestic and imported vehicles. Prior to 1985, all terrain vehicles (ATVs) were included in the motorcycle total. In 1995, the Motorcycle Industry Council revised its data for the years 1985 to present to exclude ATVs from its totals.

^c Includes large passenger or utility vehicles that may be considered cars in other tables, and starting in 1999 includes buses.

^d Includes domestic and imported vehicles, wheel sizes 20 inches and over. Data from 1997 onwards are projections.

^e Buses or bus-type vehicles only. Includes demand response. Excludes vanpool vans and most rural and smaller systems prior to 1984. Transit motor bus figure is also included as part of the bus total in the highway category.

^f Includes all railroads and private car owners.

^g Self-propelled, 1,000 or more gross tons.

^h Retail unit estimates. Includes outboard, inboard, and sterndrive boats, jet boats (since 1995), personal watercraft (since 1991), sailboats, canoes, and kayaks (since 2001). Also includes inflatable boats (until 1992) and sailboards (until 1990).

ⁱ Included in truck figure.

SOURCES

Civilian aircraft:

1960-2002: Aerospace Industries Association, *Aerospace Facts and Figures* (Washington, DC: Annual issues), "Civil Aircraft Shipments".

Highway:

Passenger cars and trucks:

1960-97: American Automobile Manufacturers Association, *Motor Vehicle Facts & Figures, 1998* (Southfield, MI: 1999), p. 21 (passenger car) and p. 6 (truck).

1998-2002: Ward's Communications, *Motor Vehicle Facts & Figures, 2003* (Detroit, MI: 2003), p. 21 (passenger car) and p. 8 (truck).

Motorcycles:

1970-2000: Motorcycle Industry Council, Inc., *Motorcycle Statistical Annual, 2001* (Irvine, CA: 2002), p. 8 and similar tables in earlier editions.

2001-2002: Motorcycle Industry Council, Inc., "Motorcycle Sales Rev Up for 11th Straight Year," media release, Feb. 13, 2004, Internet site <http://www.mic.org> as of June 24, 2004.

Buses:

1965-97: American Automobile Manufacturers Association, *Motor Vehicle Facts & Figures, 1998* (Detroit, MI: 1998), p. 6 and similar tables in earlier editions.

1998: Ward's Communications, *Motor Vehicle Facts & Figures, 1999* (Detroit, MI: 1999), p. 6 and similar tables in earlier editions.

Recreational vehicles:

1965-97: *Ibid.*, *Motor Vehicle Facts & Figures, 1998* (Detroit, MI: 1998), p. 12 and similar tables in earlier editions.

1998-2002: Ward's Communications, *Motor Vehicle Facts & Figures, 2003* (Detroit, MI: 2003), p. 11.

Bicycles:

1980-2002: National Bicycle Dealers Association, "Industry Overview," Internet site <http://www.nbda.com> as of Apr. 21, 2003 and personal communication on Sept. 24, 1996.

Transit:

1960-2002: American Public Transit Association, *Public Transportation Fact Book 2003* (Washington, DC: 2003), table 28 and similar tables in earlier editions.

Class I rail:

1960-2002: Association of American Railroads, *Railroad Facts* (Washington, DC: 2003), p. 55 and similar tables in earlier editions.

Amtrak:

1975-80: Ibid., *Railroad Facts* (Washington, DC: 1997), p. 17 and similar tables in earlier editions.

1985-2000: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues).

Water:

Merchant vessel:

1960-2002: U.S. Department of Transportation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues) and personal communication on Sept. 2, 2003.

Recreational boat:

1980-2002: National Marine Manufacturers Association, *Boating 2001* (Chicago, IL: 2002), annual retail unit estimates, Internet site <http://www.nmma.org> as of June 25, 2004.

Table 1-13: Active Air Carrier and General Aviation Fleet by Type of Aircraft

	1965	1970	1975	1980	¹ 1985	¹ 1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
AIR CARRIER^a	2,125	2,679	2,495	3,805	4,678	6,083	6,054	7,320	7,297	7,370	7,411	7,478	7,616	8,111	8,228	8,055	8,497	8,194
Fixed Wing	2,104	2,663	2,488	3,803	4,673	6,072	6,048	7,187	7,173	7,242	7,293	7,357	7,482	7,994	8,106	8,016	8,370	8,161
Turbojet, total	725	2,136	2,114	2,526	3,164	4,148	4,167	4,446	4,584	4,636	4,832	4,922	5,108	5,411	5,630	5,956	6,296	6,383
Four engine	511	931	602	436	322	432	410	389	410	420	435	440	450	447	441	432	419	365
Three engine	173	659	994	1,347	1,488	1,438	1,376	1,381	1,292	1,236	1,210	1,212	1,224	1,238	1,181	1,061	996	790
Two engine	41	546	518	743	1,354	2,278	2,381	2,676	2,882	2,980	3,187	3,270	3,434	3,726	4,008	4,463	4,881	5,228
Turboprop, total	312	374	260	682	1,073	1,595	1,598	1,894	1,868	1,782	1,713	1,696	1,646	1,832	1,788	1,475	1,494	1,250
Four engine	215	110	68	92	108	88	75	107	102	87	81	56	45	39	28	29	24	17
Two engine	89	259	192	590	965	1,507	1,523	1,787	1,751	1,695	1,632	1,635	1,596	1,789	1,759	1,440	1,470	1,233
One engine	8	5	N	N	N	N	N	N	15	0	0	5	5	4	1	0	0	0
Piston, total	1,067	153	114	595	436	329	283	847	721	824	748	739	728	751	688	585	580	528
Four engine	447	34	37	73	38	31	26	20	22	19	15	18	19	17	19	17	16	12
Three engine	590	110	69	N	4	6	5	5	0	5	1	7	4	3	3	3	3	3
Two engine	30	9	8	522	394	292	252	415	293	335	333	317	298	391	292	255	173	154
One engine	N	N	N	N	N	N	N	407	406	465	399	397	407	340	374	310	388	359
Helicopter	21	16	7	2	5	11	6	133	124	128	118	121	134	117	122	39	127	33
GENERAL AVIATION (GENERAL FLEET)^b	95,442	161,743	168,475	211,043	196,500	198,000	196,874	185,650	177,120	172,935	188,089	191,129	192,414	204,710	219,464	217,533	211,446	211,244
Fixed Wing	^c 93,130	127,934	161,570	200,094	184,700	184,500	182,585	171,671	156,936	150,158	162,342	163,691	166,854	175,203	184,723	183,276	177,697	176,283
Turbojet, total	N	950	1,776	2,992	4,100	4,100	4,126	4,004	3,663	3,914	4,559	4,424	5,178	6,066	7,120	7,001	7,787	8,355
Two engine	N	^d 822	^d 1,742	2,551	3,600	3,700	3,863	3,738	3,426	3,652	4,071	4,077	4,638	5,513	6,387	6,215	5,643	7,655
Other	N	128	^e 34	441	50	400	263	266	237	262	488	347	539	552	733	786	831	701
Turboprop, total	N	1,458	2,519	4,089	5,000	5,300	4,941	4,786	4,116	4,092	4,995	5,716	5,619	6,174	5,679	5,762	6,596	6,841
Two engine	N	1,287	^d 2,486	3,966	4,900	4,900	4,415	4,187	3,443	3,605	4,295	4,917	4,939	5,076	4,641	5,040	5,643	5,703
One engine	N	138	33	N	N	N	N	N	650	481	668	719	650	1,033	1,018	678	915	1,108
Other	N	33	N	123	100	400	526	599	24	7	32	80	29	65	21	45	38	30
Piston, total	92,556	125,526	157,275	193,013	175,600	175,200	173,518	162,881	149,156	142,152	152,788	153,551	156,056	162,963	171,923	170,513	163,314	161,087
Two engine	^d 11,422	15,835	^d 20,331	24,366	22,100	21,100	20,551	17,966	15,626	14,750	15,706	16,082	15,938	18,659	20,930	20,951	18,192	17,483
One engine	81,134	109,492	136,944	168,435	153,400	154,000	152,836	144,837	133,516	127,351	137,049	137,401	140,038	144,234	150,886	149,422	145,034	143,503
Other	N	199	N	212	100	100	131	77	14	51	33	68	79	70	108	140	89	101
Rotorcraft	1,503	2,255	4,073	6,001	6,000	6,900	6,238	5,979	4,721	4,728	5,830	6,570	6,786	7,425	7,448	7,150	6,783	6,648
Piston	N	1,666	2,499	2,794	2,700	3,200	2,390	2,348	1,846	1,627	1,863	2,507	2,259	2,545	2,564	2,680	2,292	2,351
Turbine, total	N	589	1,574	3,207	3,300	3,700	3,848	3,631	2,875	3,101	3,967	4,063	4,527	4,881	4,884	4,470	4,491	4,297
Multiengine	N	N	N	N	N	N	N	N	629	616	733	643	764	843	839	694	884	686
One engine	N	589	N	N	N	N	N	N	2,246	2,485	3,234	3,420	3,762	4,038	4,045	3,776	3,607	3,611
Other Aircraft	809	1,554	2,832	4,945	5,800	6,600	8,051	8,000	5,037	5,906	4,741	4,244	4,092	5,580	6,765	6,700	6,545	6,377
Gliders	N	N	N	N	N	N	N	N	1,814	2,976	2,182	1,934	2,016	2,105	2,041	2,041	1,904	1,951
Lighter-than-Air	N	N	N	N	N	N	N	N	3,223	2,931	2,559	2,310	2,075	3,475	4,725	4,660	4,641	4,426
Experimental	N	N	N	N	N	N	N	N	10,426	12,144	15,176	16,625	14,680	16,502	20,528	20,407	20,421	21,936
Amateur Built	N	N	N	N	N	N	N	N	6,171	8,833	9,328	11,566	10,261	13,189	16,858	16,739	16,736	18,168
Exhibition	N	N	N	N	N	N	N	N	1,868	637	2,245	2,094	1,798	1,630	1,999	1,973	2,052	2,190
Other	N	N	N	N	N	N	N	N	2,387	2,674	3,603	2,965	2,620	1,684	1,671	1,694	1,633	1,578

KEY: N = data do not exist; R = revised.

^a Air carrier aircraft are aircraft carrying passengers or cargo for hire under 14 CFR 121 (large aircraft-more than 30 seats) and 14 CFR 135 (small aircraft-30 seats or less). This definition is more encompassing than that in the Federal Aviation Administration (FAA) Aviation Forecast- jet aircraft, 60 seats or more carrying passengers or cargo for hire. Beginning in 1990, the number of aircraft is the monthly average reported in use for the last three months of the year. Prior to 1990, it was the number of aircraft reported in use during December of a given year.

^b Columns may not add to totals due to estimation procedures and rounding. Beginning in 1993, excludes commuters. Prior to 1993, single engine turboprops were included in "Other turboprops"; single and multiengine turbine rotorcraft were not shown separately; gliders and lighter-than-air aircraft were combined into the "Other" category; and experimental aircraft were included in the appropriate aircraft type. For example, prior to 1993, the single engine piston aircraft type included both experimental and nonexperimental aircraft. Starting in 1993, that aircraft type only includes nonexperimental aircraft. Due to changes in methodology beginning in 1995, estimates may not be comparable to those for 1994 and earlier years. Values for 1991 through 1994 were revised to reflect changes in adjustment for nonresponse bias.

^c Total includes 574 turbine aircraft of unspecified subtype.

^d Multiengine.

^e Single-engine.

^f Source reported rounded data for general aviation.

NOTES

Prior to 1970, aircraft counts included aircraft retained in FAA data systems until the owners requested that they be deregistered. As a result, thousands of aircraft that had been destroyed over the years remained in the system. Since 1970, annual verification of aircraft registrations is required. Failure to comply with this requirement leads to revocation of the registration certificate and exclusion of the aircraft from the official count of the following year. Listed engine configurations (e.g., two-, three-, multi-) represent all applicable combinations for each aircraft type. Totals may not agree with those in other tables as revisions to prior year data are reported at the aggregate level only.

SOURCES

Air carriers:

1965: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, 1966 Edition*. (Washington, DC: 1966), table 7.5.

1970: Ibid., *Calendar Year 1971*. (Washington, DC: 1972), table 5.5.

1975: Ibid., *Calendar Year 1975*. (Washington, DC: Dec. 31, 1975), table 5.3.

1980: Ibid., *Calendar Year 1980*. (Washington, DC: Dec. 31, 1980), table 5.2.

1985: Ibid., *Calendar Year 1993*. FAA-APO-95-5 (Washington, DC: 1995), table 5.2.

1990-94: Ibid., *Calendar Year 1996*, Internet site: <http://www.api.faa.gov/handbook96/toc96.htm>, as of Mar. 31, 2000, table 5.2.

1995-2002: Aerospace Industries Association, *Aerospace Facts and Figures* (Washington DC: 2003/2004), "Active U.S. Air Carrier Fleet," and similar tables in earlier editions.

General aviation:

1965: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, 1966 Edition*. (Washington, DC: 1966), table 5.1.

1970: Ibid., *Calendar Year 1971*. (Washington, DC: 1972), table 8.3.

1975: Ibid., *Calendar Year 1975*. (Washington, DC: Dec. 31, 1975), table 8.4.

1980: Ibid., *General Aviation Activity and Avionics Survey, Annual Report Calendar Year 1980*, FAA-MS-81-5 (Washington, DC: December 1985), table 2-6.

1985: Ibid., *Annual Summary Report 1994 Data*, FAA-APO-95-10 (Washington, DC: 1996), table 1.2.

1990: Ibid., *General Aviation and Air Taxi Activity Survey, Calendar Year 1999* (Washington, DC: 2001), table 1.2.

1991-2002: Ibid., *General Aviation and Air Taxi Activity Survey, Calendar Year 2002* (Washington, DC: 2004), table 1.2.

Table 1-14: U.S. Automobile and Truck Fleets by Use (Thousands)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001 ^e	2002 ^e	2003 ^e
TOTAL automobiles and trucks in fleets	U	U	U	U	U	15,257	15,570	15,869	16,879	15,530	15,196	13,642	11,985	12,128
Automobiles in fleets, total	U	U	U	U	U	9,042	9,124	9,225	9,550	7,742	7,346	6,640	5,600	5,647
Automobiles in fleets of 25 or more (10 or more cars for 1999-2001 and 15 or more cars for 2002-03) ^a														
Business ^b	2,889	2,628	2,492	1,751	1,722	1,326	1,295	1,188	1,159	3,195	2,950	2,620	930	929
Government ^c	538	504	516	401	428	1,214	1,209	1,218	1,030	885	883	734	1,360	1,420
Utilities	551	544	548	386	382	376	376	377	359	320	317	U ^f	U ^f	U ^f
Police	249	250	264	264	266	269	274	280	289	302	306	312	317	317
Taxi (includes vans)	141	141	140	140	141	139	130	181	190	135	136	142	148	148
Rental (includes vans and SUVs)	990	1,160	1,448	1,501	1,473	1,518	1,590	1,608	1,602	1,733	1,581	1,542	1,555	1,520
Automobiles in fleets of 4 to 24 (4 to 9 cars for 1999-2001 and 5 to 14 cars for 2002-03) ^a	U	U	U	U	U	4,200	4,250	4,373	4,921	1,172	1,173	1,290	1,290	1,313
Trucks in fleets, total	U	U	U	U	U	6,215	6,446	6,644	7,329	7,788	7,850	7,002	6,385	6,481
Trucks in fleets of 25 or more (10 or more trucks for 1999-2001 and 15 or more cars for 2002-03) ^a														
Business ^d	U	U	1,080	1,378	1,375	1,205	1,275	1,332	1,360	3,016	3,026	2,820	2,180	2,181
Government ^c	U	U	297	632	646	2,221	2,215	2,223	2,010	2,400	2,408	2,052	2,070	2,102
Utilities	U	U	593	493	487	480	482	483	459	499	498	U ^f	U ^f	U ^f
Other (police, taxi, etc.)	U	U	7	7	7	7	7	7	8	8	8	9	9	9
Rental trucks (not including vans and SUVs)	U	U	304	308	363	202	197	179	181	213	248	246	251	289
Trucks in fleets of 4 to 24 (4 to 9 trucks for 1999-2001 and 5 to 14 cars from 2002-03) ^a	U	U	U	U	U	2,100	2,270	2,420	3,311	1,652	1,662	1,875	1,875	1,900

KEY: SUV = sport utility vehicle; U = data are not available.

^a The data source, Bobit Publishing, changed data collection categories in 1999 and again in 2002.

^b Includes driver schools.

^c Includes military vehicles and federal, state, county, and local government vehicles.

^d Businesses with Class 1-5 trucks may include leasing, construction, plumbing, heating, food distribution, pest control, cable TV, etc.

^e 2001-2003 data do not include employee-owned fleet information as the source has stopped publishing the data.

^f Business and utility data have been combined in the 2002, 2003, and 2004 *Automotive Fleet Fact Book*.

SOURCE

Bobit Publishing Co., *Automotive Fleet Fact Book*, annual issues.

Table 1-15: Annual U.S. Motor Vehicle Production and Factory (Wholesale) Sales (Thousands)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Production, total	7,905	11,120	8,284	8,987	8,010	11,653	9,783	8,811	9,702	10,898	12,263	11,985	11,833	12,119	12,003	13,025	12,774	11,425	12,280
Passenger cars	6,703	9,335	6,550	6,717	6,376	8,185	6,077	5,439	5,664	5,981	6,614	6,351	6,083	5,927	5,554	5,638	5,542	4,879	5,019
Commercial vehicles ^a	1,202	1,785	1,734	2,270	1,634	3,468	3,706	3,372	4,038	4,917	5,649	5,635	5,749	6,192	6,448	7,387	7,231	6,546	7,261
Factory (wholesale) sales, total	7,869	11,057	8,239	8,985	8,067	11,467	9,775	8,795	9,747	10,857	12,189	12,023	11,916	12,223	12,112	12,127	12,527	11,108	U
Passenger cars	6,675	9,306	6,547	6,713	6,400	8,002	6,050	5,407	5,685	5,962	6,549	6,310	6,140	6,070	5,677	5,428	5,504	4,884	U
Commercial vehicles ^a	1,194	1,752	1,692	2,272	1,667	3,464	3,725	3,388	4,062	4,895	5,640	5,713	5,776	6,153	6,435	6,699	7,022	6,224	6,964

KEY: U = Data are not available.

^a Includes trucks under 10,000 pounds gross vehicle weight rating (GVWR), such as compact and conventional pickups, sport utility vehicles, minivans, and vans, and trucks and buses over 10,000 pounds GVWR.

NOTES

Factory sales can be greater than production total because of sales from previous year's inventory. Numbers may not add to totals due to roundings.

SOURCE

1960-2002: Ward's, *Motor Vehicle Facts & Figures 2003* (Southfield, MI: 2004), p. 3.

Table 1-16: Retail^a New Passenger Car Sales (Thousands)

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL new passenger car sales	8,400	8,624	8,979	11,042	9,300	8,175	8,213	8,518	8,991	8,635	8,527	8,272	8,142	8,698	8,847	8,423	8,103
Domestic ^b	7,119	7,053	6,581	8,205	6,897	6,137	6,277	6,742	7,255	7,129	7,254	6,917	6,762	6,979	6,831	6,325	5,878
Imports	1,280	1,571	2,398	2,838	2,403	2,038	1,937	1,776	1,735	1,506	1,273	1,355	1,380	1,719	2,016	2,098	2,226
Japan	313	808	1,906	2,218	1,719	1,500	1,452	1,328	1,239	982	727	726	691	758	863	837	923
Germany	750	493	305	424	265	193	201	186	192	207	238	297	367	467	517	523	547
Other	217	271	187	196	419	345	284	262	303	317	308	332	322	494	637	738	756

^a Retail new car sales include both sales to individuals and to corporate fleets. It also includes leased cars.

^b Includes cars produced in Canada and Mexico.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

1970: American Automobile Manufacturers Association, *Motor Vehicle Facts & Figures 1992* (Detroit, MI: 1992), p. 16.

1980: Ibid., *Motor Vehicle Facts & Figures 1997* (Detroit, MI: 1997), p. 19.

1975, 1985-2002: Ward's, *Motor Vehicle Facts & Figures 2003* (Southfield, MI: 2003), p. 21.

Table 1-17: New and Used Passenger Car Sales and Leases (Thousands)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
TOTAL new and used passenger car sales	46,830	45,465	45,164	46,575	(R) 49,131	(R) 50,394	49,328	(R) 49,510	48,983	49,436	50,472	51,046	(R) 51,127	51,187
New passenger car sales ^a	9,300	8,175	8,214	8,518	(R) 8,990	(R) 8,636	8,527	(R) 8,273	8,142	8,697	8,852	8,422	(R) 8,102	7,615
Used passenger car sales ^b	37,530	37,290	36,950	38,057	40,141	41,758	40,801	41,237	40,841	40,739	41,620	42,624	43,025	43,572
Value of transactions (\$ billions)	220	229	246	257	291	319	329	336	335	350	(R) 357	367	(R) 350	366
Average price (current \$)	5,857	6,143	6,656	6,742	7,245	7,644	8,073	8,139	8,211	8,587	(R) 8,578	(R) 8,619	(R) 8,130	8,409
New passenger car leases ^c	534	667	882	1,197	1,715	1,795	1,806	2,062	2,174	2,301	2,272	2,015	1,732	1,683

KEY: R = revised.

^a Includes leased cars.

^b Used car sales include sales from franchised dealers, independent dealers, and casual sales.

^c Consumer leases only.

SOURCES

New passenger car sales:

U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Wealth Division, unpublished data.

Used passenger car sales:

1990-91: ADT Automotive, *2001 Used Car Market Report* (Nashville, TN: 2000), p. 5.

1992-2003: Manheim Auctions, *2004 Used Car Market Report*, Internet site www.manheimnews.com/UCMR/reports/UCMR2004dy7r990/assets/pdfs/ucmr_2004.pdf as of Aug. 5, 2004, and similar tables in earlier editions.

Leased passenger cars:

CNW Marketing / Research, personal communications, May 31, 2000, Aug. 13, 2001, Aug. 26, 2002, July 18, 2003, and June 29, 2004.

Table 1-18: Retail Sales of New Cars by Sector (Thousands)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
TOTAL Sales of new cars	6,641	9,333	8,402	8,538	8,982	10,978	9,300	8,175	8,214	8,518	(R) 8,990	(R) 8,636	8,527	(R) 8,273	8,142	8,697	8,852	8,422	(R) 8,102	7,615
Consumer	5,645	7,103	6,252	5,907	6,100	7,092	5,677	4,424	4,566	(R) 4,656	4,600	(R) 4,326	4,079	(R) 3,908	(R) 3,981	4,389	(R) 4,680	(R) 4,634	(R) 4,521	4,336
Business	930	2,140	2,056	2,508	2,758	3,754	3,477	3,648	3,529	(R) 3,672	(R) 4,183	(R) 4,070	(R) 4,223	(R) 4,166	(R) 3,943	(R) 4,076	(R) 3,949	(R) 3,566	(R) 3,376	3,082
Government	66	89	94	123	124	132	147	103	119	(R) 190	(R) 207	(R) 241	(R) 225	(R) 199	(R) 218	(R) 232	(R) 224	(R) 222	(R) 205	197
Percentage of total sales																				
Consumer	85.0	76.1	74.4	69.2	67.9	64.6	61.0	54.1	55.6	54.7	51.2	50.1	47.8	(R) 47.2	48.9	50.5	(R) 52.9	(R) 55.0	(R) 55.8	56.9
Business	14.0	22.9	24.5	29.4	30.7	34.2	37.4	44.6	43.0	(R) 43.1	(R) 46.5	(R) 47.1	(R) 49.5	(R) 50.4	(R) 48.4	(R) 46.9	(R) 44.6	(R) 42.3	(R) 41.7	40.5
Government	1.0	1.0	1.1	1.4	1.4	1.2	1.6	1.3	1.5	(R) 2.2	(R) 2.3	(R) 2.8	(R) 2.6	(R) 2.4	(R) 2.7	(R) 2.7	(R) 2.5	(R) 2.6	(R) 2.5	2.6

KEY: R = revised.**NOTES**

Includes imported cars, but not vans, trucks, or sport utility vehicles.

Numbers may not add to totals due to rounding.

SOURCE

U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Wealth Division, unpublished data.

Table 1-19: Period Sales, Market Shares, and Sales-Weighted Fuel Economies of New Domestic and Imported Automobiles

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Sales^a (thousands)																
TOTAL units	9,095	10,969	9,224	8,380	8,107	8,388	8,916	8,725	8,652	8,261	8,071	8,646	8,978	8,308	8,336	7,698
Minicompact	428	52	77	96	108	84	57	45	34	40	12	13	19	33	54	80
Subcompact	3,441	2,382	2,030	2,256	2,074	1,945	2,015	1,518	1,315	1,510	1,491	1,622	1,789	922	636	459
Compact	599	3,526	3,156	2,425	2,451	2,655	3,077	3,290	3,493	2,937	2,309	2,367	2,398	3,058	3,217	3,018
Midsized	3,073	3,118	2,512	2,306	2,250	2,446	2,360	2,499	2,488	2,531	3,107	3,359	3,352	2,669	2,918	2,624
Large	1,336	1,516	1,279	1,161	1,141	1,187	1,340	1,321	1,259	1,162	1,050	1,181	1,297	1,507	1,377	1,351
Two-seater	216	374	170	135	83	70	67	53	62	81	101	103	122	118	134	165
Market share, percent																
Minicompact	4.7	0.5	0.8	1.1	1.3	1.0	0.6	0.5	0.4	0.5	0.2	0.1	0.2	0.4	0.6	1.0
Subcompact	37.8	21.7	22.0	26.9	25.6	23.2	22.6	17.4	15.2	18.3	18.5	18.8	19.9	11.1	7.6	6.0
Compact	6.6	32.1	34.2	28.9	30.2	31.7	34.5	37.7	40.4	35.6	28.6	27.4	26.7	36.8	38.6	39.2
Midsized	33.8	28.4	27.2	27.5	27.7	29.2	26.5	28.6	28.8	30.6	38.5	38.9	37.3	32.1	35.0	34.1
Large	14.7	13.8	13.9	13.9	14.1	14.2	15.0	15.1	14.6	14.1	13.0	13.7	14.4	18.1	16.5	17.5
Two-seater	2.4	3.4	1.8	1.6	1.0	0.8	0.8	0.6	0.7	1.0	1.3	1.2	1.4	1.4	1.6	2.1
Fuel economy, mpg																
Fleet	23.2	27.0	27.6	27.7	27.7	27.8	27.8	28.0	28.3	28.3	28.3	28.0	28.2	28.5	28.5	28.7
Minicompact	29.4	32.7	26.4	29.3	30.6	29.9	27.8	27.0	27.2	26.3	23.9	24.8	25.6	24.6	26.2	29.0
Subcompact	27.3	30.1	31.3	31.6	31.8	31.9	31.3	31.7	32.1	32.6	31.3	31.0	31.1	29.6	27.6	27.1
Compact	22.3	29.6	28.9	28.8	28.7	29.3	29.8	30.2	30.4	30.0	30.8	30.2	30.4	31.3	31.5	31.5
Midsized	21.3	24.9	25.9	25.9	25.8	25.7	25.6	25.9	26.4	26.3	26.9	27.0	26.8	27.2	27.4	28.0
Large	19.3	22.3	23.5	23.3	23.7	24.0	24.2	24.1	24.2	24.5	24.6	24.4	25.3	25.4	25.5	25.9
Two-seater	21.0	27.6	28.0	27.3	25.9	24.8	23.9	24.7	25.4	26.3	25.4	25.2	25.8	26.5	25.2	25.1

KEY: mpg = miles per gallon.

^a Sales period is October 1 of the previous year through September 30 of the current year. These figures represent only those sales that could be matched to corresponding U.S. Environmental Protection Agency fuel economy values.

NOTE

Numbers may not add to totals due to rounding.

SOURCE

Light-Duty Vehicle MPG and Market Shares System Database, as cited in Oak Ridge National Laboratory, *Transportation Energy Data Book*, Edition 24, table 4.7, p. 4-7, and similar tables in earlier editions (Oak Ridge, TN).

Table 1-20: Period Sales, Market Shares, and Sales-Weighted Fuel Economies of New Domestic and Imported Light Trucks

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Sales^a (thousands)																
TOTAL units	2,217	4,235	4,515	4,048	4,392	5,056	5,724	5,934	6,237	6,527	7,138	8,002	8,307	8,020	8,673	8,617
Small pickups	516	864	1,136	1,004	1,001	1,093	1,160	1,068	1,010	978	891	1,111	1,072	819	762	744
Large pickups	1,115	1,691	1,116	934	1,038	1,117	1,405	1,473	1,607	1,594	1,947	2,022	1,969	1,988	2,210	2,077
Small vans	14	438	1,012	948	1,038	1,203	1,350	1,331	1,307	1,298	1,273	1,372	1,272	1,141	1,165	1,066
Large vans	328	536	319	248	281	315	321	328	293	304	331	364	369	324	350	322
Small SUV	52	442	402	349	382	416	433	510	580	350	487	662	756	895	878	853
Medium SUV	152	187	434	493	582	785	916	1,077	1,272	1,448	1,586	1,758	2,167	2,069	2,448	2,692
Large SUV	40	78	94	72	71	126	140	149	168	555	622	713	702	785	861	864
Market share, percent																
Small pickups	23.3	20.4	25.2	24.8	22.8	21.6	20.3	18.0	16.2	15.0	12.5	13.9	12.9	10.2	8.8	8.6
Large pickups	50.3	39.9	24.7	23.1	23.6	22.1	24.5	24.8	25.8	24.4	27.3	25.3	23.7	24.8	25.5	24.1
Small vans	0.6	10.3	22.4	23.4	23.6	23.8	23.6	22.4	21.0	19.9	17.8	17.1	15.3	14.2	13.4	12.4
Large vans	14.8	12.7	7.1	6.1	6.4	6.2	5.6	5.5	4.7	4.7	4.6	4.5	4.4	4.0	4.0	3.7
Small SUV	2.3	10.4	8.9	8.6	8.7	8.2	7.6	8.6	9.3	5.4	6.8	8.3	9.1	11.2	10.1	9.9
Medium SUV	6.9	4.4	9.6	12.2	13.3	15.5	16.0	18.1	20.4	22.2	22.2	22.0	26.1	25.8	28.2	31.2
Large SUV	1.8	1.8	2.1	1.8	1.6	2.5	2.4	2.5	2.7	8.5	8.7	8.9	8.5	9.8	9.9	10.0
Fuel economy, mpg																
Fleet	18.1	20.4	20.5	20.6	20.4	20.5	20.4	20.2	20.4	20.1	20.3	20.0	20.4	20.5	20.2	20.5
Small pickups	25.5	26.8	24.5	24.6	23.7	23.3	24.1	24.4	24.8	24.1	24.1	22.6	22.0	21.3	21.3	21.7
Large pickups	17.0	19.0	17.5	17.5	17.8	18.0	18.5	17.8	17.9	18.5	18.3	18.1	18.7	19.0	18.4	18.3
Small vans	19.6	23.9	22.3	22.2	21.9	22.4	21.6	22.4	22.3	22.5	23.0	22.8	23.0	23.2	23.0	23.5
Large vans	16.3	16.4	17.1	17.4	17.2	17.5	17.5	17.2	17.3	18.0	18.2	17.7	18.2	18.3	18.5	17.9
Small SUV	17.7	22.1	22.5	21.8	21.7	21.9	21.8	22.0	22.6	23.3	23.7	23.6	23.8	24.3	25.3	25.4
Medium SUV	14.9	17.2	19.7	19.9	19.8	19.9	19.5	19.2	19.6	19.1	20.0	20.0	20.4	20.5	20.5	21.3
Large SUV	13.7	17.1	16.5	16.4	15.8	16.4	16.4	16.1	17.3	17.5	17.4	17.1	17.5	17.6	17.5	17.6

KEY: mpg = miles per gallon; SUV = sport utility vehicle.

^a Sales period is October 1 of the previous year through September 30 of the current year. These figures represent only those sales that could be matched to corresponding U.S. Environmental Protection Agency fuel economy values.

NOTES

Fleet sales total cannot be compared with truck sales in table 1-12 for the following reasons: 1) this table includes both domestic and imported trucks, whereas the numbers in table 1-12 are for domestic trucks only; and 2) this table covers only light trucks, whereas the numbers in table 1-12 include heavy trucks.

Numbers may not add to totals due to rounding.

SOURCE

Light-Duty Vehicle MPG and Market Shares System Database, as cited in Oak Ridge National Laboratory, *Transportation Energy Data Book*, Edition 24, table 4.8, p. 4-8, and similar tables in earlier editions (Oak Ridge, TN).

Table 1-21: Number of Trucks by Weight

	Thousands of trucks		Percent change 1992-97
	1992	1997	
ALL trucks	59,200.8	72,800.3	23.0%
Light Trucks			
Less than 6,001 lb	50,545.7	62,798.4	24.2%
Medium Trucks			
6,001 to 10,000 lb	4,647.5	5,301.5	14.1%
10,001 to 14,000 lb	694.3	818.9	17.9%
14,001 to 16,000 lb	282.4	315.9	11.9%
16,001 to 19,500 lb	282.3	300.8	6.6%
Light-heavy Trucks			
19,501 to 26,000 lb	732.0	729.3	-0.4%
Heavy Trucks			
26,001 to 33,000 lb	387.3	427.7	10.4%
33,001 to 40,000 lb	232.6	256.7	10.4%
40,001 to 50,000 lb	338.6	399.9	18.1%
50,001 to 60,000 lb	226.7	311.4	37.4%
60,001 to 80,000 lb	781.1	1,069.8	37.0%
80,001 to 100,000 lb	33.3	46.3	39.0%
100,001 to 130,000 lb	12.3	17.9	45.5%
130,000 lb or more	4.6	5.9	28.3%
Not reported	<50	<50	N

KEY: lb = pound; N = data do not exist.

NOTES

Average vehicle weight is the empty weight of the vehicle plus the average load of the vehicle.

Excludes vehicles owned by Federal, state, or local governments; ambulances; buses; motor homes; farm tractors; unpowered trailer units; and trucks reported to have been sold, junked, or wrecked prior to July 1 of the year preceding the survey.

SOURCE

U.S. Census Bureau, *1997 Economic Census: Vehicle Inventory and Use Survey: United States*, EC97TV-US (Washington, DC: 1999).

Table 1-22: World Motor Vehicle Production, Selected Countries (Thousands)

	Passenger cars ^a												
	1961	1971	1981	1991	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL world	11,391	26,453	27,407	35,287	35,730	36,111	37,318	38,474	37,286	38,816	40,732	40,144	41,215
U.S. percent of world	48%	32%	23%	15%	19%	18%	16%	15%	15%	15%	14%	12%	12%
Argentina	78	193	139	114	338	227	269	366	353	225	239	170	111
Australia	182	393	352	269	323	314	303	320	350	294	324	286	307
Austria	8	1	7	14	45	59	97	98	91	124	116	131	131
Belgium	N	279	216	253	409	386	368	356	319	218	912	1,059	937
Brazil	98	342	406	705	1,248	1,297	1,459	1,680	1,244	1,102	1,348	1,482	1,521
Canada	328	1,083	803	1,060	1,214	1,337	1,279	1,374	1,122	1,626	1,551	1,275	1,369
China	N	N	N	81	250	321	382	482	507	570	620	704	1,091
Czech Republic ^b	59	149	181	173	174	208	263	321	368	348	428	457	441
France	988	2,694	2,612	3,188	3,175	3,051	3,148	2,259	2,603	2,676	2,883	3,182	3,284
Germany	1,802	3,829	3,758	4,677	4,094	4,360	4,540	4,678	5,348	5,310	4,803	5,301	4,799
India	22	42	42	179	237	330	396	410	384	519	514	548	706
Italy	694	1,701	1,257	1,633	1,341	1,422	1,318	1,563	1,402	1,410	1,422	1,272	1,126
Japan	250	3,718	6,974	9,753	7,802	7,611	7,864	8,491	8,056	8,100	8,363	8,118	8,619
South Korea	N	N	69	1,158	1,806	2,003	2,265	2,308	1,625	2,362	2,602	2,471	2,651
Malaysia	N	N	N	102	137	164	176	280	126	200	280	345	U
Mexico	N	154	355	720	857	699	798	855	953	994	1,130	1,001	960
Netherlands	13	78	78	85	92	100	145	197	243	262	215	189	182
Poland	14	86	248	168	349	347	353	295	460	651	533	367	287
Portugal	N	N	N	N	38	41	119	186	181	187	191	177	183
Romania	N	N	N	84	85	71	76	108	104	88	58	57	U
Russia	149	518	1,324	1,308	796	838	868	982	U	946	966	1,022	981
Spain	55	453	855	1,943	1,974	2,131	2,213	2,342	2,217	2,029	2,445	2,211	2,267
Sweden	110	287	258	269	353	388	368	376	368	385	260	248	238
Taiwan	N	N	N	266	291	282	265	268	293	255	265	195	245
Turkey	N	13	25	196	213	233	208	243	U	U	297	175	204
United Kingdom	1,004	1,742	955	1,237	1,467	1,532	1,686	1,698	1,748	1,787	1,629	1,492	1,628
United States	5,522	8,584	6,253	5,439	6,614	6,351	6,083	5,927	5,554	5,638	5,542	4,879	5,019
Yugoslavia, Federal Republic of	15	114	240	213	8	8	9	11	U	U	U	U	U

	Commercial vehicles ^c												
	1961	1971	1981	1991	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL world	3,809	6,948	9,729	11,996	13,952	13,926	14,147	14,988	14,811	16,132	16,796	16,181	17,757
U.S. percent of world	30%	30%	17%	28%	40%	40%	40%	41%	44%	46%	43%	40%	41%
Argentina	58	60	33	25	70	59	44	80	105	80	101	66	48
Australia	49	77	40	15	31	17	19	29	34	17	25	34	37
Austria	5	6	8	6	3	9	9	10	12	16	25	24	20
Belgium	1	17	41	84	70	82	69	74	87	74	121	129	119
Brazil	47	174	374	255	334	332	346	388	329	242	323	316	271
Canada	63	277	520	829	1,106	1,071	1,118	1,198	1,050	1,430	1,411	1,258	1,260
China	N	N	N	628	1,103	1,114	1,084	1,096	1,121	1,235	1,389	1,628	2,160
Czech Republic ^b	17	28	49	29	6	8	9	47	42	27	27	8	6
France	217	316	408	423	383	424	443	322	351	357	469	447	409
Germany	411	312	358	358	262	307	303	345	379	378	395	390	346
India	32	47	107	176	238	306	366	336	129	261	282	277	186
Italy	65	116	176	245	194	245	227	254	290	291	316	308	301
Japan	789	2,093	4,206	3,492	2,752	2,585	2,482	2,484	1,994	1,805	1,781	1,660	1,639
South Korea	N	N	65	340	506	523	548	510	329	471	513	475	496
Malaysia	N	N	N	0	0	0	0	0	7	5	15	14	U
Mexico	N	57	242	269	266	236	422	503	500	540	792	856	845
Netherlands	6	13	12	26	23	32	19	20	28	25	52	50	49
Poland	22	60	60	25	16	34	48	27	39	44	24	20	23
Portugal	N	N	N	26	87	16	13	81	90	65	56	62	68
Romania	N	N	N	10	5	22	23	21	23	19	14	12	U
Russia	406	612	874	744	206	156	136	192	U	226	237	228	239
Spain	20	79	132	139	168	203	199	220	609	644	587	639	588
Sweden	22	30	55	75	82	102	95	104	114	109	36	38	38
Taiwan	N	N	N	116	132	124	101	113	112	95	100	77	92
Turkey	N	12	22	46	31	49	69	102	U	U	133	95	142
United Kingdom	443	456	230	217	228	233	238	238	233	186	189	193	193
United States	1,131	2,088	1,690	3,372	5,649	5,635	5,716	6,192	6,452	7,387	7,228	6,546	7,261
Yugoslavia, Federal Republic of	5	18	27	26	2	2	1	2	U	U	U	U	U

Total Passenger cars ^a and Commercial vehicles ^c													
	1961	1971	1981	1991	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL world	15,200	33,401	37,136	47,283	49,682	50,036	51,465	53,463	52,098	54,948	57,528	56,325	58,973
U.S. percent of world	44%	32%	21%	19%	25%	24%	23%	23%	23%	24%	22%	20%	21%
Argentina	136	253	172	139	409	286	313	446	458	305	340	236	159
Australia	231	470	392	284	354	331	322	349	384	311	348	319	344
Austria	13	7	15	20	48	68	106	108	103	139	141	155	151
Belgium	1	296	257	337	479	468	437	430	406	291	1,033	1,187	1,056
Brazil	145	516	780	960	1,582	1,629	1,805	2,067	1,573	1,344	1,671	1,798	1,793
Canada	391	1,360	1,323	1,889	2,321	2,408	2,397	2,571	2,173	3,057	2,962	2,532	2,629
China	N	N	N	709	1,353	1,435	1,466	1,578	1,628	1,805	2,009	2,332	3,251
Czech Republic ^b	76	177	230	202	180	216	272	369	411	376	455	465	447
France	1,205	3,010	3,020	3,611	3,558	3,475	3,591	2,581	2,954	3,033	3,352	3,628	3,693
Germany	2,213	4,141	4,116	5,035	4,356	4,667	4,843	5,023	5,727	5,688	5,198	5,692	5,145
India	54	89	149	355	475	636	762	746	513	780	796	825	892
Italy	759	1,817	1,433	1,878	1,534	1,667	1,545	1,817	1,693	1,701	1,738	1,580	1,427
Japan	1,039	5,811	11,180	13,245	10,554	10,196	10,346	10,975	10,050	9,905	10,145	9,777	10,258
South Korea	N	N	134	1,498	2,312	2,526	2,813	2,818	1,954	2,832	3,115	2,946	3,148
Malaysia	N	N	N	102	137	164	176	280	134	205	295	359	U
Mexico	N	211	597	989	1,123	935	1,220	1,358	1,453	1,534	1,923	1,857	1,805
Netherlands	19	91	90	111	115	132	164	218	271	287	267	239	231
Poland	36	146	308	193	365	381	401	322	499	695	556	387	310
Portugal	N	N	N	26	125	57	132	267	271	252	247	240	251
Romania	N	N	N	94	90	93	99	129	127	107	72	69	U
Russia	555	1,130	2,198	2,052	1,002	994	1,004	1,174	U	1,172	1,203	1,250	1,220
Spain	75	532	987	2,082	2,142	2,334	2,412	2,562	2,826	2,672	3,033	2,850	2,855
Sweden	132	317	313	344	435	490	463	480	483	494	296	286	276
Taiwan	N	N	N	382	423	406	366	381	405	350	365	272	337
Turkey	N	25	47	242	244	282	277	344	U	U	431	271	347
United Kingdom	1,447	2,198	1,185	1,454	1,695	1,765	1,924	1,936	1,981	1,973	1,817	1,685	1,821
United States	6,653	10,672	7,943	8,811	12,263	11,985	11,799	12,119	12,006	13,025	12,771	11,425	12,280
Yugoslavia, Federal Republic of	20	132	267	239	9	10	10	14	U	U	U	U	U

KEY: N = data do not exist; U = data are not available.

^a Does not include minivans, pickups, and sport utility vehicles.

^b Formerly Czechoslovakia.

^c Includes all trucks and buses. Light trucks, such as pickups, sport utility vehicles, and minivans are included under commercial vehicles.

NOTES

Prior to 2000, the country of manufacture was recognized as the producing country. To conform with current OICA (International Organization of Motor Vehicle Manufacturers) practices, starting in 2000, the country of final assembly was recognized as the producing country. This explains the sudden change in trends across some countries from 1999 to 2000.

Numbers may not add to totals due to rounding.

SOURCE

Ward's, *Motor Vehicle Facts & Figures 2003* (Southfield, MI: 2003), p. 12 and similar tables in previous editions.

Table 1-23: Number and Size of the U.S. Flag Merchant Fleet and Its Share of the World Fleet (Oceangoing ships of 1,000 gross tons and over)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
World fleet	17,317	18,329	19,980	22,872	24,867	25,555	23,596	23,943	23,753	24,331	25,092	25,608	26,858	27,557	27,825	28,259	28,318	28,296	28,761
U.S. fleet	2,926	2,376	1,579	857	864	737	636	619	603	565	543	509	495	477	470	463	454	443	426
U.S. share of the world fleet	17%	13%	8%	4%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%
Freighters, total	2,138	1,747	1,076	511	471	417	367	359	349	322	308	295	292	288	289	284	286	283	276
Deadweight tons (DWT) (thousands)	21,877	18,127	11,733	7,051	6,885	7,353	7,265	7,156	7,211	7,040	6,866	6,517	6,419	6,458	6,732	6,696	6,680	6,635	6,404
General cargo ^a	N	N	N	356	259	209	166	165	182	169	152	142	146	142	140	137	136	132	126
DWT (thousands)	N	N	N	4,640	3,329	2,980	2,605	2,592	2,973	2,913	2,677	2,472	2,467	2,420	2,400	2,404	2,362	2,162	1,838
Containership	N	N	N	109	121	104	92	92	83	87	86	81	83	85	91	89	90	91	90
DWT (thousands)	N	N	N	1,773	2,289	2,651	2,856	2,856	2,722	2,812	2,802	2,600	2,639	2,743	3,096	3,056	3,058	3,200	3,292
Partial containerships	N	N	N	37	68	63	59	52	30	3	3	3	1	1	N	N	N	N	N
DWT (thousands)	N	N	N	510	940	904	836	741	456	57	57	57	17	17	N	N	N	N	N
RO / RO	N	N	N	9	23	41	50	50	54	63	67	69	62	60	58	58	60	60	60
DWT (thousands)	N	N	N	128	327	818	968	967	1,060	1,258	1,330	1,388	1,296	1,278	1,236	1,236	1,260	1,273	1,273
Tankers, total	422	341	294	267	308	258	233	226	220	210	200	181	173	161	154	154	142	130	120
DWT (thousands)	7,815	7,561	7,739	9,711	16,152	15,534	15,641	14,993	14,180	13,048	11,945	11,028	10,378	9,696	9,289	9,373	8,447	7,532	6,552
Petroleum/chemical ships ^b	N	N	N	N	N	244	219	212	206	196	186	167	159	148	145	146	142	130	120
DWT (thousands)	N	N	N	N	N	14,574	14,681	14,033	13,279	12,143	11,040	10,123	9,473	8,857	8,737	8,845	8,447	7,532	6,552
Liquefied petroleum/natural gas ships	N	N	N	N	N	14	14	14	14	14	14	14	14	13	9	8	N	N	N
DWT (thousands)	N	N	N	N	N	960	960	960	901	905	905	905	905	839	552	528	N	N	N
Combination / passenger and cargo, total	309	227	171	60	65	37	10	10	11	12	13	13	15	14	12	11	11	13	12
DWT (thousands)	2,070	1,488	1,107	388	446	299	91	92	97	104	115	115	139	136	116	99	99	105	100
Bulk carriers, total	57	61	38	19	20	25	26	24	23	21	22	20	15	14	15	14	15	17	18
DWT (thousands)	805	1,107	767	544	607	1,152	1,270	1,014	991	949	1,042	925	575	321	604	579	604	706	797

KEY: N = data do not exist; RO/RO = roll-on/roll-off vessels.

^a Includes barge carriers.

^b Includes integrated tug/barges.

NOTES

Excludes nonmerchant type and/or U.S. Navy-owned vessels currently in the National Defense Reserve Fleet.

Excludes ships operating exclusively on the Great Lakes and inland waterways and special types such as: channel ships, icebreakers, cable ships, and merchant ships owned by military forces. All data are as of December 31 of year shown.

SOURCE

1960-2002: U.S. Department of Transportation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues), and unpublished revisions.

Section C

Condition

Table 1-24: U.S. Airport Runway Pavement Conditions

	1986	1990	1993	1997	1999	2000	2001	2002	2003
NPIAS^a airports, number	3,243	3,285	3,294	3,331	3,344	3,361	3,364	3,358	3,346
Good condition (percent)	61%	61%	68%	72%	72%	73%	73%	71%	75%
Fair condition (percent)	28%	29%	25%	23%	23%	22%	22%	24%	21%
Poor condition (percent)	11%	10%	7%	5%	5%	5%	5%	5%	4%
Commercial service airports^b, number	550	568	554	566	547	546	546	536	510
Good condition (percent)	78%	78%	79%	79%	78%	79%	79%	79%	80%
Fair condition (percent)	15%	17%	18%	19%	20%	19%	19%	19%	18%
Poor condition (percent)	7%	5%	3%	2%	2%	2%	2%	2%	2%

KEY: NPIAS = National Plan of Integrated Airport Systems.

^a The U.S. Department of Transportation, Federal Aviation Administration's (FAA's) National Plan of Integrated Airport Systems is composed of all commercial service airports, all reliever airports, and selected general aviation airports. It does not include over 1,000 publicly owned public-use landing areas, privately owned public-use airports, and other civil landing areas not open to the general public. NPIAS airports account for almost all enplanements. In 2001, there were 15,942 non-NPIAS airports. See table 1-3 for more detail on airports.

^b Commercial service airports are defined as public airports receiving scheduled passenger service, and having at least 2,500 enplaned passengers per year.

NOTES

Data are as of January 1 of each year. Runway pavement condition is classified by the FAA as follows:

Good: All cracks and joints are sealed.

Fair: Mild surface cracking, unsealed joints, and slab edge spalling.

Poor: Large open cracks, surface and edge spalling, vegetation growing through cracks and joints.

SOURCES

Condition:

1986-90: U.S. Department of Transportation, Federal Aviation Administration, *National Plan of Integrated Airport Systems* (Washington DC: 1991).

1993: Ibid. (Washington DC: 1995).

1997, 1999-2003: U.S. Department of Transportation, Federal Aviation Administration, Office of Airport Planning and Programming, National Planning Division, personal communication, 1997, 2000, Aug. 20, 2001, May 27, 2002, and Jan. 29, 2004.

Total number of airports:

1986-2003: Ibid., June 23, 2000, Aug. 20, 2001, May 27, 2002, and Jan. 29, 2004.

Table 1-25: Median Age of Automobiles and Trucks in Operation in the United States

Year	Automobiles	Light trucks ^a	All trucks ^b
1970	4.9	N	5.9
1975	5.4	N	5.8
1980	6.0	N	6.3
1985	6.9	N	7.6
1990	6.5	N	6.5
1991	6.7	N	6.8
1992	7.0	N	7.2
1993	7.3	7.1	7.5
1994	7.5	7.2	7.5
1995	7.7	7.4	7.6
1996	7.9	7.5	7.7
1997	8.1	7.3	7.8
1998	8.3	7.1	7.6
1999	8.3	6.9	7.2
2000	8.3	6.7	6.9
2001	(R) 8.3	6.1	6.8
2002	8.4	6.6	6.8
2003	8.6	6.5	6.7

KEY: R = revised.

NOTE

The National Household Travel Survey (formerly the Nationwide Personal Transportation Survey), conducted by the U.S. Department of Transportation, estimates the mean age of household vehicles for several years:

	1969	1977	1983	1990	1995	2001
Automobile	5.1	5.5	7.2	7.6	8.2	8.5
Van	N	6.4	8.5	5.9	6.7	7.0
Sport utility	N	N	N	N	6.6	6.1
Pickup	N	7.3	8.5	8.4	9.7	9.4
Other truck	N	11.6	12.4	14.5	14.9	16.8
RV/motor home	N	4.5	10.7	10.4	13.2	12.5

The 1969, 1977, 1983, and 1990 surveys do not include a separate category for sports utility vehicles (SUV), while the 1995 and 2001 surveys do. In the 1990, most SUVs were classified as automobiles. **SOURCE:** U.S. Department of Transportation, Federal Highway Administration, *1995 Nationwide Personal Transportation Survey: Summary of Travel Trends* (Washington, DC: 1999); U.S. Department of Transportation, Federal Highway Administration, Bureau of Transportation Statistics, 2001 National Household Travel Survey (NHTS) data, available at Internet site <http://nhts.ornl.gov/2001/index.shtml> as of Aug. 21, 2003.

^a Gross vehicle weight 1-3.

^b Gross vehicle weight 1-8.

KEY: N = data do not exist.

NOTE

Data are as of July 1 of each year.

SOURCE

The R.L. Polk Co., Internet site <http://www.polk.com> as of Feb. 9, 2004.

TABLE 1-26: Condition of U.S. Roadways by Functional System

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
RURAL													
Interstates miles reported	33,547	33,677	33,027	29,089	31,502	31,254	31,312	31,431	30,498	32,820	32,888	32,951	32,907
Poor, percent	8.7	7.6	5.2	7.0	6.5	6.3	3.9	3.6	4.1	2.4	2.1	1.9	2.1
Mediocre, percent	^b	^b	14.1	27.7	26.5	20.7	19.1	19.1	16.5	14.0	12.2	11.7	10.2
Fair, percent	31.9	31.7	17.4	20.9	23.9	22.3	21.7	20.7	17.8	18.1	16.9	15.4	15.5
Good, percent	^b	^b	27.6	36.1	33.2	36.9	38.8	41.0	42.6	44.0	44.8	43.3	44.0
Very good, percent	59.5	60.7	35.6	8.3	9.9	13.9	16.6	15.7	19.0	21.5	23.9	27.7	28.2
Unpaved, percent	N	N	N	N	N	N	N	N	N	N	N	N	N
Miles not reported^a	N	N	N	3,563	955	1,326	1,508	1,382	2,313	153	162	109	84
Other principal arterials miles reported	83,802	85,729	94,798	78,296	89,506	89,265	92,103	92,170	93,333	97,247	(R) 97,297	97,947	97,854
Poor, percent	3.4	3.6	3.3	2.9	2.4	4.4	1.4	1.6	1.4	0.9	0.8	0.7	0.7
Mediocre, percent	^b	^b	5.9	9.2	8.2	7.6	5.8	4.9	4.6	3.7	3.2	3.0	2.7
Fair, percent	42.6	44.5	34.6	54.8	57.4	51.1	49.1	47.7	43.3	41.5	38.7	37.3	35.6
Good, percent	^b	^b	28.5	26.7	26.6	27.9	34.4	37.2	38.3	40.5	42.9	42.5	44.2
Very good, percent	53.8	51.9	27.6	6.4	5.4	9.0	9.3	8.6	12.3	13.5	14.4	16.5	16.7
Unpaved, percent	N	N	N	N	N	N	N	N	N	N	N	N	N
Miles not reported^a	N	N	N	17,905	7,489	8,683	6,028	6,083	5,524	1,587	(R) 1,619	1,247	1,009
Minor arterials miles reported	144,735	142,866	137,637	134,837	124,877	121,443	126,381	126,525	130,591	135,192	(R) 136,096	134,698	136,955
Poor, percent	4.6	4.3	3.9	3.9	3.5	3.7	2.3	2.3	1.9	1.7	1.7	1.7	1.3
Mediocre, percent	^b	^b	7.1	9.1	10.5	9.0	8.2	6.7	6.0	5.2	5.3	5.2	4.5
Fair, percent	48.2	47.3	36.4	53.5	57.9	54.7	50.7	50.4	47.2	47.3	46.2	44.9	43.6
Good, percent	^b	^b	25.3	25.0	23.6	23.9	31.0	33.6	34.3	34.4	35.6	36.9	39.1
Very good, percent	47.2	48.4	26.8	8.5	4.5	8.7	7.7	7.0	10.6	11.4	11.2	11.3	11.6
Unpaved, percent	-	-	N	N	N	N	N	N	N	N	N	N	N
Miles not reported^a	N	N	N	12,740	13,294	15,708	10,978	10,978	6,664	1,968	(R) 1,436	2,883	606
Major collectors miles reported	436,365	436,737	434,175	432,223	431,111	431,712	432,117	386,122	171,134	(R) 389,134	(R) 388,488	389,573	389,125
Poor, percent	8.9	7.7	7.8	6.8	6.5	6.5	6.7	7.8	8.8	(R) 15.4	8.5	7.6	7.7
Mediocre, percent	^b	^b	11.0	12.4	11.3	11.4	10.3	12.3	13.0	(R) 15.8	12.7	12.8	11.8
Fair, percent	43.8	45.2	32.3	37.7	33.5	30.8	34.4	37.6	33.5	(R) 44.8	43.7	43.7	43.4
Good, percent	^b	^b	17.7	16.3	16.1	17.4	20.0	23.0	21.3	(R) 17.2	22.0	23.4	24.9
Very good, percent	36.2	36.1	20.4	15.9	21.9	23.7	18.4	19.3	23.4	(R) 6.7	13.2	12.5	12.2
Unpaved, percent	11.1	11.0	10.7	10.9	10.7	10.2	10.1	N	N	N	N	N	N
Miles not reported^a	N	N	N	N	N	N	N	2,402	217,566	N	N	N	N
URBAN													
Interstates miles reported	11,527	11,603	12,466	10,738	12,338	12,307	12,430	12,477	12,231	13,109	13,139	13,261	13,367
Poor, percent	8.6	7.7	7.1	10.6	13.0	10.4	8.6	9.0	9.4	7.3	6.5	7.4	7.7
Mediocre, percent	^b	^b	13.2	30.9	29.9	26.8	28.3	27.0	25.5	23.1	21.7	20.8	20.6
Fair, percent	32.2	32.3	17.0	23.6	24.2	23.8	24.7	24.4	21.8	(R) 22.5	21.4	20.9	20.3
Good, percent	^b	^b	28.0	28.3	26.7	27.5	30.7	32.9	32.0	34.9	37.1	35.9	36.0
Very good, percent	59.1	60.0	34.7	6.5	6.2	11.4	7.6	6.7	11.4	12.0	13.3	14.9	15.4
Unpaved, percent	N	N	N	N	N	N	N	N	N	N	N	N	N
Miles not reported^a	N	N	N	2,140	788	857	787	771	1,040	230	226	147	123
Other freeways and expressway miles reported	7,670	7,714	8,465	7,011	7,618	7,804	8,410	8,480	8,772	8,860	(R) 8,796	8,955	9,242
Poor, percent	2.2	2.3	2.6	3.8	5.3	4.8	3.4	3.3	3.2	2.6	2.8	3.1	2.7
Mediocre, percent	^b	^b	5.9	9.4	12.7	9.8	8.7	8.7	8.7	(R) 8.1	8.1	7.1	7.6
Fair, percent	43.9	44.2	32.4	60.6	58.1	54.7	54.7	58.5	54.3	53.6	(R) 50.7	50.6	48.6
Good, percent	^b	^b	28.1	22.7	20.9	20.4	26.3	25.2	27.1	(R) 29.0	31.6	31.5	33.3
Very good, percent	53.9	53.5	31.0	3.5	2.9	10.3	6.8	4.2	6.6	6.8	6.8	7.7	7.9
Unpaved, percent	N	N	N	N	N	N	N	N	N	N	N	N	N
Miles not reported^a	N	N	N	1,846	1,377	1,166	617	579	397	281	(R) 353	176	82
Other principal arterials miles reported	51,987	52,349	52,165	30,337	38,598	41,444	44,498	45,009	44,886	48,045	(R) 47,890	48,931	50,016
Poor, percent	5.9	6.6	6.8	9.2	12.5	12.4	11.8	12.1	12.9	12.5	13.2	12.9	13.3
Mediocre, percent	^b	^b	11.5	13.3	16.3	14.7	14.1	14.6	18.5	18.1	16.8	16.4	16.4
Fair, percent	49.0	49.1	34.8	55.0	50.8	47.2	48.9	49.5	45.3	45.2	45.1	45.7	46.1
Good, percent	^b	^b	21.4	19.3	16.6	15.9	17.5	17.8	17.6	18.8	19.4	19.5	19.4
Very good, percent	45.1	44.3	25.3	3.3	3.8	9.7	7.7	6.0	5.8	5.4	5.4	5.5	4.9
Unpaved, percent	N	N	N	N	N	N	N	N	N	N	N	N	N
Miles not reported^a	N	N	N	22,498	14,492	11,352	8,485	8,209	8,246	5,154	(R) 5,426	4,126	3,422
Minor arterials miles reported	74,656	74,979	80,368	86,819	87,852	88,510	89,020	88,484	45,275	(R) 88,663	(R) 88,338	88,260	89,559
Poor, percent	8.9	7.4	7.9	7.9	6.7	6.7	6.9	7.2	5.7	(R) 19.4	10.0	10.5	10.5
Mediocre, percent	^b	^b	14.3	13.8	12.3	13.6	13.0	13.0	12.2	(R) 17.4	16.0	15.9	16.1
Fair, percent	48.5	49.9	34.1	40.2	38.1	36.9	37.9	37.9	36.0	(R) 40.7	39.8	41.1	40.7
Good, percent	^b	^b	19.2	18.4	20.5	20.4	20.7	21.4	22.1	(R) 14.2	16.9	16.8	17.4
Very good, percent	42.1	42.1	24.0	19.4	22.1	22.1	21.1	20.6	24.0	(R) 8.3	17.3	15.7	15.3
Unpaved, percent	0.5	0.6	0.5	0.4	0.3	0.3	0.4	N	N	N	N	N	N
Miles not reported^a	N	N	N	N	N	N	N	374	43,435	N	N	N	N
Collectors miles reported	78,248	77,097	82,657	84,856	86,098	87,331	87,790	86,666	53,806	(R) 86,821	(R) 86,030	86,267	87,754
Poor, percent	16.5	11.2	10.5	10.6	9.8	9.7	9.7	10.6	8.1	(R) 22.1	14.7	14.6	15.4
Mediocre, percent	^b	^b	16.9	16.8	16.2	16.8	16.6	16.0	12.8	(R) 17.5	17.4	17.3	17.4
Fair, percent	50.4	53.5	35.2	40.0	40.0	39.0	39.2	39.0	39.4	(R) 37.7	35.7	36.6	36.8
Good, percent	^b	^b	17.3	16.1	17.0	17.2	18.2	18.4	18.8	(R) 12.8	14.2	13.5	13.7
Very good, percent	31.7	34.2	19.1	15.5	16.0	16.6	15.4	15.9	20.9	(R) 9.9	18.0	18.1	16.7

Unpaved, percent	1.3	1.1	1.1	1.0	0.9	0.8	0.9	N	N	N	N	N	N
Miles not reported ^a	N	N	N	N	N	N	N	663	32,921	N	N	N	N

KEY: N = data do not exist; - = value too small to report.

^a Historical differences in miles not reported result from the transition from the Present Serviceability Rating (PSR) to the International Roughness Indicator (IRI).

^b Included in row below.

NOTES

Because of the transition to a new indicator for pavement condition beginning with U.S. Department of Transportation, Federal Highway Administration (FHWA) data published in 1993, comparisons between pre-1993 data and 1993 and later data are difficult. Thus, trend comparisons should be made with care. For additional information, the reader is referred to the accuracy profile for this table in the appendix. Total mileage in this table will not match that in table 1-5 because of a change in the method of creating mileage-based tables derived from the Highway Performance Monitoring System, beginning with the 1997 issue of FHWA's Highway Statistics.

Data are for the 50 states and the District of Columbia.

Numbers may not add to totals due to rounding.

SOURCES

1990-92: U.S. Department of Transportation, Federal Highway Administration *Highway Statistics* (Washington, DC: Annual issues), table HM-63.

1993-2002: *Ibid.*, table HM-63 for rural major collector, urban minor arterial, and urban collector, and table HM-64 for all other categories.

Table 1-27: Condition of U.S. Highway Bridges

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
TOTAL bridges	572,205	574,036	572,197	573,716	576,460	581,135	581,863	582,751	582,976	585,542	589,674	589,685	590,877	590,753
Urban bridges	108,770	112,363	115,312	117,488	121,141	122,537	124,950	127,633	128,312	130,339	133,384	133,401	135,337	135,228
Rural bridges	463,435	461,673	456,885	456,228	455,319	458,598	456,913	455,118	454,664	455,203	456,290	456,284	455,540	455,525
Urban deficient bridges, total	47,113	47,874	42,566	42,443	42,716	42,692	43,181	41,711	41,661	42,032	42,093	42,088	42,179	42,189
Structurally	16,847	17,032	16,323	15,932	15,692	15,205	15,094	14,846	14,073	12,967	12,695	12,705	12,504	12,310
Functionally	30,266	30,842	26,243	26,511	27,024	27,487	28,087	26,865	27,588	29,065	29,398	29,383	29,675	29,879
Rural deficient bridges, total	191,107	184,253	156,525	149,537	144,799	142,575	139,545	134,174	130,911	128,018	122,993	122,946	120,612	118,381
Structurally	121,018	117,502	102,375	96,048	91,991	89,112	86,424	83,629	78,999	75,183	70,881	70,890	68,762	67,391
Functionally	70,089	66,751	54,150	53,489	52,808	53,463	53,121	50,545	51,912	52,835	52,112	52,056	51,850	50,990
All deficient bridges, total	238,220	232,127	199,091	191,980	187,515	185,267	182,726	175,885	172,572	170,050	165,086	165,034	162,791	160,570
Structurally	137,865	134,534	118,698	111,980	107,683	104,317	101,518	98,475	93,072	88,150	83,576	83,595	81,266	79,701
Functionally	100,355	97,593	80,393	80,000	79,832	80,950	81,208	77,410	79,500	81,900	81,510	81,439	81,525	80,869

NOTES

U.S. totals include the 50 states, the District of Columbia, and Puerto Rico.

Structurally deficient bridges are defined as those needing significant maintenance attention, rehabilitation, or replacement.

Functionally deficient bridges are defined as those that do not have the lane widths, shoulder widths, or vertical clearances adequate to serve traffic demand, or the bridge may not be able to handle occasional roadway flooding.

Table includes: Rural—Interstate, principal arterial, minor arterial, major collector, minor collector and local roads; Urban—Interstate, other freeways or expressways, other principal arterial, minor arterial, collector, and local roads.

Data for 1990, 1992, 1997-99, and 2001 are as of December of those years; data for 1991 and 1994-96 are as of June of those years; data for 1993 are as of September of that year; data for 2000 are as of August of that year; data for 2002-03 are as of July of those years.

SOURCES

1990-2000: U.S. Department of Transportation, Federal Highway Administration, Office of Bridge Technology, National Bridge Inventory Database, personal communication, Aug. 14, 2001.

2001: U.S. Department of Transportation, Federal Highway Administration, Office of Bridge Technology, National Bridge Inventory Database, *Count of Bridges by Highway System*, Internet site <http://www.fhwa.dot.gov/bridge/britab.htm> as of Aug. 28, 2002.

2002-03: Ibid., National Bridge Inventory Database, CD-ROM (Washington, DC: Annual Issues), June 23, 2003 and July 20, 2004.

Table 1-28: Average Age of Urban Transit Vehicles (Years)

	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Transit rail														
Commuter rail locomotives ^a	16.3	15.7	15.3	15.8	15.6	15.3	15.9	17.6	17.0	14.7	13.2	13.4	14.2	16.0
Commuter rail passenger coaches	19.1	17.6	17.3	19.3	18.6	20.1	21.4	24.1	21.6	19.4	17.5	16.9	18.1	20.1
Commuter rail self-propelled passenger cars	12.3	15.9	16.5	17.6	18.2	16.0	19.8	21.1	22.3	23.2	24.3	25.4	26.2	27.1
Heavy-rail passenger cars	17.1	16.2	16.9	17.7	17.8	15.8	19.3	20.2	21.1	22.0	22.5	22.9	21.7	20.0
Light rail vehicles (streetcars)	20.6	15.2	16.6	17.0	14.9	16.7	16.8	16.0	15.9	15.7	15.7	16.1	16.4	16.3
Transit bus^b														
Articulated	3.4	7.6	8.2	9.1	9.5	9.1	10.9	11.5	11.9	11.3	8.6	6.5	5.9	5.8
Full-size	8.1	8.2	8.0	8.3	8.5	9.9	8.7	8.8	8.6	8.5	8.4	8.1	7.8	7.5
Mid-size	5.6	6.6	6.7	6.8	6.4	7.2	6.9	6.3	5.8	5.7	5.6	5.6	5.7	5.6
Small	4.8	3.9	4.0	4.1	4.0	4.4	4.1	4.1	4.0	4.0	4.1	4.2	4.1	4.0
Trolley	U	10.9	10.3	11.2	12.0	11.1	13.1	14.0	14.7	14.6	15.6	16.4	20.4	15.4
Other														
Vans	3.8	2.8	3.0	3.1	3.1	3.9	3.1	3.1	3.0	2.9	3.1	3.1	3.3	4.9
Ferry boats	U	21.7	19.6	22.7	24.7	23.5	23.4	25.3	25.4	25.8	25.1	25.6	24.7	26.8

KEY: U = data are not available.

^a Locomotives used in Amtrak intercity passenger services are not included.

^b Full-size buses have more than 35 seats; mid-size buses have 25-35 seats; small buses have fewer than 25 seats.

SOURCE

1985-2001: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual issues), table 29 and similar tables in earlier editions.

All data, except full-size, mid-size, and small transit bus:

2002: Ibid., *National Transit Database* (Washington, DC: Annual issues), table 25.

Full-size, mid-size, and small transit bus:

2002: Ibid., *National Transit Summaries and Trends* (Washington, DC: Annual issues), p. 74.

Table 1-29: Class I Railroad Locomotive Fleet by Year Built (Locomotive units)

Year built ^a	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total	18,835	18,344	18,004	18,161	18,505	18,812	19,269	19,684	20,261	20,256	20,028	19,745	20,506
Before 1970	5,117	4,353	4,038	3,766	3,535	b	b	b	b	b	f	f	f
1970-74	3,852	3,617	3,384	3,248	3,184	^c 6,048	^c 5,783	^c 5,529	^c 5,565	^c 5,196	f	f	f
1975-79	4,432	4,375	4,292	4,352	4,275	4,254	4,274	4,219	4,116	4,000	^g 8,541	^g 7,862	^g 7,133
1980-84	2,837	2,826	2,784	2,730	2,625	2,754	2,735	2,728	2,723	2,581	2,411	2,153	1,790
1985-89	1,989	1,985	1,970	1,968	1,971	1,890	1,866	1,829	1,830	1,779	1,775	1,672	1,807
1990	608	605	604	604	599	^d 2,965	^d 2,959	^d 2,958	^d 2,736	^d 2,688	^d 2,648	^d 2,667	^d 2,702
1991		583	595	595	594	e	e	e	e	e	e	e	e
1992			337	340	339	e	e	e	e	e	e	e	e
1993				558	602	e	e	e	e	e	e	e	e
1994					781	e	e	e	e	e	e	e	e
1995						901	945	983	953	951	973	^h 4,020	^h 4,582
1996							707	696	708	706	697	i	i
1997								742	741	743	745	i	i
1998									889	890	890	i	i
1999										722	713	i	i
2000											635	691	987
2001												680	810
2002													695

^a Disregards year of rebuilding.

^b Included in 1970-74 category.

^c Includes all locomotives built before 1975.

^d Includes locomotives built between 1990-94.

^e Included in 1990 category.

^f Included in 1975-79 category.

^g Includes all locomotives built before 1980.

^h Includes locomotives built between 1995-99.

ⁱ Included in 1995 category.

SOURCE

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual issues), p. 50 and similar pages in earlier editions.

Table 1-30: Age and Availability of Amtrak Locomotive and Car Fleets

	1972	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Locomotives																		
Percent available for service ^a	N	87	83	93	84	86	83	84	85	88	88	88	88	90	89	U	U	U
Average age (years) ^b	22.3	14.4	7.4	7.0	12.0	13.0	13.0	13.2	13.4	13.9	14.4	12.0	12.6	12.8	11.2	U	U	U
Passenger and other train cars																		
Percent available for service ^a	N	82	77	90	90	92	90	89	88	90	90	91	93	91	91	U	U	U
Average age (years) ^b	22.0	24.7	14.3	14.2	20.0	21.0	21.5	22.6	22.4	21.8	20.7	19.8	21.1	22.2	19.4	U	U	U

KEY: N = data do not exist; U = data are not available.

^a Year-end daily average. Active units less backshop units undergoing heavy maintenance less back-ordered units undergoing progressive maintenance and running repairs.

^b Year-end average.

NOTE

1972 was Amtrak's first full fiscal year of operation.

SOURCES

1972-80: Amtrak, *Amtrak Annual Report* (Washington, DC: Annual issues).

1985-2000: Ibid., *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues).

TABLE 1–31: U.S. Flag Vessels by Type and Age (Number of vessels)

Age ^a	Vessel type							Total ^b
	Dry cargo	Tanker	Towboat	Passenger ^c	Offshore support / crewboats ^d	Dry barge	Tank / liquid barge ^e	
1990–91, total^b	900	257	5,210	721	1,168	27,110	3,874	39,342
<6	80	6	132	151	85	2,335	162	2,951
6–10	161	38	706	120	318	4,570	316	6,229
11–15	212	50	1,029	110	474	7,639	829	10,343
16–20	141	35	844	80	144	6,374	750	8,368
21–25	82	38	750	65	84	2,607	759	4,385
>25	196	86	1,718	188	51	3,372	1,049	6,660
1992, total^b	497	249	5,203	1,201	1,205	26,981	3,864	39,313
<6	36	5	134	219	93	3,224	296	4,012
6–10	73	28	398	198	208	1,783	121	2,829
11–15	135	54	1,137	203	567	9,114	902	12,150
16–20	73	33	926	169	189	6,696	740	8,853
21–25	31	42	716	122	91	2,475	677	4,167
>25	124	82	1,874	287	53	3,496	1,123	7,049
1993, total^b	470	205	5,219	1,243	1,197	26,982	3,970	39,306
<6	25	3	135	207	103	3,558	325	4,356
6–10	67	22	205	221	107	1,070	68	1,764
11–15	135	43	1,221	211	597	8,810	869	11,894
16–20	70	33	968	164	218	6,772	791	9,019
21–25	41	31	674	129	106	2,904	655	4,543
>25	128	73	2,008	311	64	3,713	1,256	7,555
1994, total^b	778	202	5,179	928	1,236	26,757	3,966	39,064
<6	46	4	146	157	107	3,630	399	4,489
6–10	103	12	151	185	61	1,171	36	1,719
11–15	200	36	1,135	123	540	7,903	754	10,691
16–20	130	44	966	122	309	6,314	799	8,684
21–25	90	32	664	82	130	3,873	638	5,509
>25	206	74	2,107	259	86	3,706	1,327	7,765
1995, total^b	726	178	5,127	954	1,288	27,375	3,985	39,641
<6	38	5	168	149	119	3,975	489	4,943
6–10	90	8	134	195	58	1,483	46	2,014
11–15	168	34	959	133	463	6,387	611	8,760
16–20	135	38	988	121	412	6,507	736	8,939

21-25	80	29	726	91	141	4,897	697	6,661
>25	213	64	2,146	263	92	3,966	1,403	8,148
1996, total^b	713	161	5,177	967	1,274	28,775	4,036	41,104
<6	43	7	205	153	123	5,189	573	6,293
6-10	74	8	118	188	61	2,041	87	2,577
11-15	141	29	715	142	351	4,505	346	6,229
16-20	155	36	1,036	119	460	7,234	840	9,881
21-25	79	23	842	87	155	5,416	723	7,325
>25	229	62	2,386	290	144	4,766	1,576	9,453
1997, total^b	692	147	5,173	1,025	1,369	29,040	3,971	41,419
<6	52	8	227	150	122	5,515	519	6,593
6-10	66	2	118	187	94	2,582	181	3,230
11-15	96	27	396	152	223	1,800	137	2,831
16-20	183	36	1,173	131	588	8,943	928	11,982
21-25	84	21	918	102	177	5,772	727	7,801
>25	209	53	2,332	302	159	4,284	1,477	8,816
1998, total^b	714	135	5,237	1,011	1,423	29,557	3,952	42,032
<6	56	12	247	150	163	5,877	485	6,991
6-10	55	3	124	168	105	3,117	267	3,839
11-15	105	19	196	166	111	1,113	72	1,782
16-20	179	31	1,198	129	634	8,591	865	11,626
21-25	88	22	979	106	211	5,909	763	8,076
>25	230	48	2,487	292	195	4,817	1,499	9,573
1999, total^b	695	142	5,098	970	1,470	29,414	3,973	41,766
<6	60	12	302	144	245	6,640	565	7,968
6-10	49	3	140	146	114	3,192	298	3,943
11-15	97	12	146	183	61	1,231	39	1,769
16-20	146	35	1,101	120	571	7,414	742	10,129
21-25	99	30	953	95	283	5,302	760	7,522
>25	243	50	2,447	282	191	5,491	1,560	10,267
2000, total^b	737	135	4,995	918	1,414	29,141	4,011	41,354
<6	66	11	325	134	246	6,721	582	8,085
6-10	50	4	143	118	106	3,051	329	3,802
11-15	113	8	142	178	58	1,565	48	2,112
16-20	136	34	929	124	454	5,846	602	8,125
21-25	105	30	954	90	332	5,365	712	7,588
>25	263	48	2,497	271	214	6,461	1,714	11,470
2001, total^b	966	120	5,150	733	1,573	28,920	4,122	41,588
<6	114	12	369	84	305	6,830	623	8,337
6-10	76	3	167	81	111	2,815	388	3,641

11-15	132	5	125	138	68	2,043	85	2,596
16-20	139	32	692	110	372	4,241	329	5,916
21-25	154	28	972	77	452	6,126	805	8,614
>25	347	40	2,818	240	262	6,712	1,884	12,306
2002, total	989	108	5,180	750	1,591	28,313	4,068	41,002
<6	113	13	369	70	322	6,117	595	7,599
6-10	86	3	185	92	96	3,416	419	4,298
11-15	130	2	142	136	89	2,499	172	3,170
16-20	114	22	381	117	228	1,669	134	2,665
21-25	175	35	1,091	75	547	7,702	843	10,468
>25	368	33	3,004	256	305	6,731	1,904	12,603

^a Age is based on the year the vessel was built or rebuilt.

^b Totals may be greater than sum of columns because of unclassified vessels and vessels of unknown age; figures

^c Includes passenger excursion/sightseeing, combination passenger and dry-cargo vessels, and ferries.

^d In 1992, offshore supply boats were designated as crewboats.

^e In 1992, tank barges were designated as liquid barges.

SOURCE

U.S. Army Corps of Engineers, *Waterborne Transportation Lines of the United States, Volume 1, National Summaries* (New Orleans, LA: Annual issues), table 4 in 2002 and similar tables in previous years; also available on Internet site <http://www.iwr.usace.army.mil> as of June 2004.

Section D

Travel and Goods Movement

Table 1-32: U.S. Vehicle-Miles (Millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Air																			
Air carrier, large certificated, domestic, all services	858	1,134	2,068	1,948	2,523	3,046	3,963	3,854	3,995	4,157	4,380	4,629	4,811	4,911	5,035	5,332	5,664	(R) 5,616	6,085
General aviation ^a	1,769	2,562	3,207	4,238	5,204	4,673	4,548	4,400	3,465	3,253	3,358	3,795	3,524	3,877	N	N	N	N	N
Highway^b, total	718,762	887,812	1,109,724	1,327,664	1,527,295	1,774,826	2,144,362	2,172,050	2,247,151	2,296,378	2,357,588	2,422,696	2,485,848	2,561,695	2,631,522	2,691,056	2,746,925	(R) 2,797,287	2,855,756
Passenger car ^{b,c}	587,012	722,696	916,700	1,033,950	1,111,596	1,246,798	1,408,266	1,358,185	1,371,569	1,374,709	1,406,089	1,438,294	1,469,854	1,502,556	1,549,577	1,569,100	1,600,287	(R) 1,628,332	1,658,640
Motorcycle ^c	h	h	2,979	5,629	10,214	9,086	9,557	9,178	9,557	9,906	10,240	9,797	9,920	10,081	10,283	10,584	10,469	(R) 9,639	9,553
Other 2-axle 4-tire vehicle ^b	h	h	123,286	200,700	290,935	390,961	574,571	649,394	706,863	745,750	764,634	790,029	816,540	850,739	868,275	901,022	923,059	(R) 943,207	966,184
Truck, single-unit 2-axle 6-tire or more	98,551	128,769	27,081	34,606	39,813	45,441	51,901	52,898	53,874	56,772	61,284	62,705	64,072	66,893	68,021	70,304	70,500	(R) 72,448	75,887
Truck, combination	28,854	31,665	35,134	46,724	68,678	78,063	94,341	96,645	99,510	103,116	108,932	115,451	118,899	124,584	128,359	132,384	135,020	(R) 136,584	138,643
Bus	4,346	4,681	4,544	6,055	6,059	4,478	5,726	5,750	5,778	6,125	6,409	6,420	6,563	6,842	7,007	7,662	7,590	(R) 7,077	6,849
Transit^d, total	2,143	2,008	1,883	2,176	2,287	2,791	3,242	3,306	3,355	3,435	3,468	3,550	3,650	3,746	3,794	3,972	4,081	4,196	(P) 4,277
Motor bus ^e	1,576	1,528	1,409	1,526	1,677	1,863	2,130	2,167	2,178	2,210	2,162	2,184	2,221	2,245	2,175	2,276	2,315	2,377	(P) 2,411
Light rail	75	42	34	24	18	17	24	28	29	28	34	35	38	41	44	49	53	54	(P) 61
Heavy rail	391	395	407	423	385	451	537	527	525	522	532	537	543	558	566	578	595	608	(P) 621
Trolley bus	101	43	33	15	13	16	14	14	14	13	14	14	14	14	14	14	15	13	(P) 14
Commuter rail	N	N	N	173	179	183	213	215	219	224	231	238	242	251	260	266	271	277	(P) 284
Demand responsive ^e	N	N	N	N	N	247	306	335	364	406	464	507	548	585	671	718	759	789	(P) 803
Ferry boat	N	N	N	N	i	i	2	2	2	3	2	3	2	3	3	3	3	3	(P) 3
Other	N	N	N	15	15	15	16	19	24	30	29	34	43	50	63	69	71	75	(P) 80
Rail																			
Class I freight, train-miles	404	421	427	403	428	347	380	375	390	405	441	458	469	475	475	490	504	500	500
Class I freight, car-miles	28,170	29,336	29,890	27,656	29,277	24,920	26,159	25,628	26,128	26,883	28,485	30,383	31,715	31,660	32,657	33,851	34,590	34,243	34,680
Intercity/Amtrak ^f , train-miles	209	172	93	30	30	30	33	34	34	35	34	32	30	32	33	34	35	36	38
Intercity/Amtrak ^f , car-miles	2,208	1,775	690	253	235	251	301	313	307	303	304	292	276	288	312	342	368	378	379
Total train-miles^g	613	593	520	433	458	377	413	409	424	440	475	490	499	507	508	524	539	536	537

KEY: N = data do not exist; P = preliminary; R = revised.

^a All operations other than those operating under 14 CFR 121 and 14 CFR 135. Data for 1996 are estimated using new information on nonrespondents and are not comparable to earlier years. Mileage in source is multiplied by 1.151 to convert to nautical-miles for 1985-1997.

^b In July 1997, the FHWA published revised vehicle-miles data for the highway modes for many years. The major change reflected the reassignment of some vehicles from the passenger car category to the other 2-axle 4-tire vehicle category. This category was calculated prior to rounding.

^c U.S. Department of Transportation, Federal Highway Administration (FHWA), provides data separately for passenger car and motorcycle in its annual *Highway Statistics* series. However, the 1995 summary report provides updated data for passenger car and motorcycle combined. Passenger car figures in this table were computed by U.S. Department of Transportation, Bureau of Transportation Statistics, by subtracting the most current motorcycle figures from the aggregate passenger car and motorcycle figures.

^d Prior to 1985, excludes demand responsive and most rural and smaller systems funded via Sections 18 and 16(b)2, Federal Transit Act. The series is not continuous between 1980 and 1985. Transit rail modes are measured in car-miles. Car-miles measure individual vehicle-miles in a train. A 10-car train traveling 1 mile would equal 1 train-mile and 10 car-miles.

^e Motor bus and demand responsive figures are also included in the bus figure for highway.

^f Amtrak began operations in 1971.

^g Although both train-miles and car-miles are shown for rail, only train-miles are included in the total. A train-mile is the movement of a train, which can consist of multiple vehicles (cars), the distance of 1 mile. This differs from a vehicle-mile, which is the movement of 1 vehicle the distance of 1 mile. A 10-vehicle train traveling 1 mile would be measured as 1 train-mile and 10 vehicle-miles. Caution should be used when comparing train-miles with vehicle miles.

^h 1960-65, motorcycle data are included in passenger car, and other 2-axle 4-tire vehicle data included in single-unit 2-axle 6-tire or more truck.

ⁱ Ferry boat included with other.

SOURCES

Air:

Air carrier:

- 1960: Civil Aeronautics Board, *Handbook of Airline Statistics 1969* (Washington, DC: 1970), part III, table 2.
1965-70: *Ibid.*, *Handbook of Airline Statistics 1973* (Washington, DC: 1974), part III, table 2.
1975-80: *Ibid.*, *Air Carrier Traffic Statistics* (Washington, DC: 1976, 1981), p. 4 (December 1976) and p. 2 (December 1981).
1985-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), p. 3, line 25 plus line 46.

General aviation:

- 1960-65: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation 1972* (Washington, DC: 1973), table 9.10.
1970-75: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation 1976* (Washington, DC: 1976), table 8-5.
1980: U.S. National Transportation Safety Board estimate, personal communication, Dec. 7, 1998.
1985-92: *Ibid.*, *General Aviation Activity and Avionics Survey* (Washington, DC: Annual issues,) table 3.3.
1993-97: *Ibid.*, *General Aviation and Air Taxi Activity and Avionics Survey* (Washington, DC: Annual issues), table 3.3.

Highway:

Passenger car and motorcycle:

- 1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site <http://www.fhwa.dot.gov/ohim/summary95/index.html>, as of July 28, 2000, table VM-201A.
1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Motorcycle:

- 1970-80: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1985* (Washington, DC: 1986), table VM-201A.
1985-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Other 2-axle 4-tire vehicle:

- 1970-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site <http://www.fhwa.dot.gov/ohim/summary95/index.html>, as of July 28, 2000, table VM-201A.
1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Single-unit 2-axle 6-tires or more truck, combination truck, and bus:

- 1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site <http://www.fhwa.dot.gov/ohim/summary95/index.html>, as of July 28, 2000, table VM-201A.
1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Transit:

- 1960-2002: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: 2004), table 18, 103, and similar tables in earlier editions.

Rail:

Class I rail freight train- and car-miles:

- 1960-2002: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), p. 33 (train-miles) and p. 34 (car-miles).

Intercity/Amtrak train-miles:

- 1960-70: Association of American Railroads, *Yearbook of Railroad Facts* (Washington, DC: 1975), p. 39.
1975-2001: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues).

Intercity/Amtrak car-miles:

- 1960-75: Association of American Railroads, *Yearbook of Railroad Facts* (Washington, DC: 1975), p. 40.
1980-2000: Amtrak, Amtrak Corporate Reporting, Route Profitability System, personal communication, 2001.
2001-02: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), p. 77.

TABLE 1-33: Roadway Vehicle-Miles Traveled (VMT) and VMT per Lane-Mile by Functional Class

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Urban VMT, total (millions)	855,265	1,044,098	1,275,484	1,288,497	1,363,054	1,409,672	1,449,247	1,489,534	1,523,886	1,552,956	1,595,620	1,627,618	(R) 1,663,773	1,676,379	1,727,596
Interstate	161,242	216,188	278,901	285,325	303,265	317,399	330,577	341,528	351,579	361,433	374,622	383,259	(R) 393,465	399,890	408,618
Other arterials ^a	484,189	578,270	699,233	707,518	745,618	773,978	797,899	815,170	834,623	846,627	862,996	878,153	(R) 900,392	913,726	937,357
Collector	83,043	89,578	106,297	107,281	116,065	117,887	120,088	126,929	129,310	130,146	131,905	131,603	(R) 135,372	137,922	141,874
Local	126,791	160,062	191,053	188,373	198,106	200,408	200,683	205,907	208,374	214,750	226,097	234,603	(R) 234,544	224,841	239,747
Rural VMT, total (millions)	672,030	730,728	868,878	883,553	884,097	886,706	908,341	933,289	960,194	999,277	1,032,528	1,062,623	(R) 1,083,152	1,105,083	1,128,160
Interstate	135,084	154,357	200,173	205,011	205,557	208,308	215,568	223,382	232,565	240,255	251,520	260,166	(R) 268,180	274,024	279,962
Other arterials ^a	262,774	282,803	330,866	334,755	344,062	349,567	357,329	368,595	378,847	392,057	403,484	413,320	(R) 420,599	426,945	433,805
Collector ^b	189,468	206,669	240,460	245,630	234,910	226,296	230,529	236,148	241,030	254,100	257,868	264,453	(R) 267,231	270,962	275,007
Local	84,704	86,899	97,379	98,157	99,568	102,535	104,915	105,164	107,752	112,865	119,656	124,684	(R) 127,142	133,152	139,386
Urban VMT per lane-mile, total (thousands)	613	677	764	766	775	782	794	810	820	825	844	858	869	852	861
Interstate	3,327	3,773	4,483	4,542	4,508	4,588	4,667	4,784	4,897	5,002	5,131	5,229	(R) 5,323	5,370	5,440
Other arterials ^a	1,451	1,556	1,751	1,758	1,783	1,778	1,803	1,829	1,857	1,866	1,901	1,950	(R) 1,974	1,997	2,025
Collector	572	552	634	649	659	656	655	686	692	689	703	706	718	728	743
Local	146	168	184	179	181	179	178	181	181	184	192	198	(R) 196	181	188
Rural VMT per lane-mile, total (thousands)	103	113	136	138	139	140	144	148	152	157	165	169	172	176	179
Interstate	1,031	1,170	1,473	1,502	1,540	1,576	1,642	1,693	1,749	1,804	1,888	1,939	(R) 1,993	2,035	2,080
Other arterials ^a	518	555	640	646	653	665	674	695	711	730	750	766	(R) 778	787	797
Collector ^b	132	141	164	167	163	158	161	167	170	179	182	187	189	192	195
Local	19	20	23	23	23	24	25	25	25	26	29	30	30	32	33

KEY: R = revised.^a For urban: the sum of other freeways and expressways, other principal arterials, and minor arterials.

For rural: the sum of other principal arterials and minor arterials.

^b Collector is the sum of major and minor collectors (rural only).**NOTE**

See table 1-6 for estimated highway lane-miles by functional class.

SOURCES1980-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-202.1995-2002: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table VM-2 and VM-2A.**Lane-miles:**

1980-95: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, unpublished data, 1997, table HM-260.

1996-2002: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table HM-60.

Table 1-34: U.S. Air Carrier Aircraft Departures, Enplaned Revenue Passengers, and Enplaned Revenue Tons

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
AIRCRAFT DEPARTURES															
Total performed ^a	4,555,516	5,156,848	5,505,659	6,641,681	6,545,000	6,606,609	7,193,841	7,513,232	8,030,530	8,204,674	8,095,888	8,248,269	8,605,486	8,951,773	8,597,344
Total scheduled	4,530,535	5,204,564	5,591,596	6,758,571	7,024,412	6,703,670	7,058,097	7,359,093	7,920,467	8,064,653	7,907,554	8,094,020	8,432,940	12,452,678	8,371,976
Large hubs															
Performed	2,437,958	2,887,239	3,439,446	4,167,868	4,114,950	4,078,211	4,480,575	4,756,589	5,162,534	5,257,541	5,266,560	5,416,158	5,645,179	5,888,557	5,640,977
Scheduled	2,409,874	2,905,923	3,487,660	4,237,466	4,312,032	4,144,325	4,443,937	4,713,178	5,147,875	5,243,646	5,219,161	5,405,728	5,570,419	9,494,118	5,558,323
Medium hubs															
Performed	902,652	1,048,726	1,185,008	1,394,833	1,256,306	1,301,977	1,310,322	1,471,377	1,439,639	1,425,280	1,430,537	1,429,730	1,499,243	1,572,495	1,555,145
Scheduled	899,543	1,058,438	1,201,540	1,417,762	1,352,515	1,312,257	1,268,316	1,398,144	1,387,833	1,356,162	1,352,944	1,345,197	1,404,482	1,507,479	1,451,072
Small hubs															
Performed	640,589	598,559	514,176	669,450	689,518	771,529	841,685	710,569	738,231	754,914	695,841	714,920	746,625	777,318	758,195
Scheduled	644,133	608,738	524,048	679,103	858,429	783,305	794,279	685,421	711,947	722,170	660,685	674,812	770,092	758,396	747,745
Nonhubs															
Performed	574,317	622,324	367,029	409,530	484,226	454,892	561,259	574,697	690,126	766,939	702,950	687,461	714,439	713,403	643,027
Scheduled	576,985	631,465	378,348	424,240	501,436	463,783	551,565	562,350	672,812	742,675	674,764	668,283	687,947	692,685	614,836
ENPLANED REVENUE PASSENGERS ^b															
Large hubs	133,975,900	197,679,376	264,507,144	317,595,099	313,375,097	319,582,090	340,048,661	372,731,005	392,601,890	417,339,694	426,246,423	442,402,443	458,665,099	478,845,117	444,795,896
Medium hubs	36,539,613	51,664,627	65,770,376	80,466,373	72,985,169	80,800,955	79,032,913	88,601,244	85,929,285	89,018,764	90,779,705	91,755,793	96,394,866	101,986,095	98,649,285
Small hubs	19,406,607	23,393,324	24,240,726	30,771,383	31,224,974	36,879,632	37,334,956	34,443,996	33,561,098	37,122,974	36,298,979	37,675,305	38,644,557	40,116,465	36,413,142
Nonhubs	6,860,024	8,671,525	8,823,251	9,711,146	10,734,008	10,363,311	11,896,499	12,681,949	13,963,210	14,702,309	15,290,580	16,501,777	16,924,194	17,955,316	15,797,178
ENPLANED REVENUE TONS ^c															
Freight, total	2,764,763	3,562,187	2,601,027	4,732,726	4,854,513	5,053,678	6,383,887	6,802,375	7,204,479	8,047,795	11,163,448	11,784,514	12,067,717	^R 14,989,871	^R 15,767,438
Large hubs	2,265,665	3,008,311	2,047,988	3,001,217	2,960,604	3,067,778	3,678,851	4,025,517	4,402,327	4,653,189	5,691,363	6,208,629	5,993,061	6,661,817	7,063,435
Medium hubs	358,044	414,325	469,957	1,446,744	1,507,017	1,633,136	1,857,865	2,022,282	1,950,318	2,169,411	3,855,449	3,897,242	4,382,712	4,450,393	6,645,641
Small hubs	99,133	73,795	48,127	191,358	222,247	267,619	516,199	432,680	541,062	755,232	963,093	1,019,615	1,053,050	930,518	1,290,734
Nonhubs	41,922	65,756	35,855	93,407	164,645	85,145	330,973	321,896	310,772	469,962	653,542	659,028	638,894	^R 645,477	767,627
Mail, total	896,298	1,526,125	1,423,443	1,566,098	1,562,991	1,682,632	1,819,203	1,915,706	2,160,538	2,285,503	2,356,781	2,299,255	2,844,130	2,301,666	4,222,923
Large hubs	677,179	1,091,059	1,082,567	1,146,589	1,095,019	1,201,545	1,320,176	1,406,910	1,546,568	1,630,445	1,699,154	1,662,643	2,183,127	1,649,611	1,179,946
Medium hubs	151,498	255,929	268,179	292,899	321,041	321,051	324,441	344,200	442,814	466,583	473,577	482,710	502,096	503,965	407,337
Small hubs	48,486	148,116	59,917	108,656	126,070	144,918	152,692	136,111	136,008	157,137	148,818	127,748	126,793	108,582	93,841
Nonhubs	19,134	31,021	12,781	17,954	20,861	15,117	21,894	28,485	35,149	31,338	45,232	26,154	32,114	39,508	2,541,799

KEY: R = revised.

^a Total performed includes scheduled departures performed minus those scheduled departures that did not occur plus unscheduled service.

^b The number of persons receiving air transportation from an air carrier for which remuneration is received by the carrier, excluding persons receiving reduced rate charges, such as air carrier employees, infants, and others (except ministers of religion, elderly individuals, and handicapped individuals).

^c The number of short tons of freight transported by an air carrier aboard an aircraft.

NOTES

Data are for all scheduled and nonscheduled service by large certificated U.S. air carriers at all airports served within the 50 states, the District of Columbia, and other U.S. areas designated by the Federal Aviation Administration. Not all scheduled service is actually performed. Moreover, for several years, total performed departures exceed total scheduled departures because nonscheduled departures are included in the totals. Prior to 1993, all scheduled and some nonscheduled enplanements for certificated air carriers were included; no enplanements were included for air carriers offering charter service only. Prior to 1990, freight includes both freight and express shipments, and mail includes priority and nonpriority U.S. mail and foreign mail; beginning in 1990, only aggregate numbers are reported.

Large certificated air carriers operate aircraft with seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds and hold Certificates of Public Convenience and Necessity issued by the U.S. Department of Transportation authorizing the performance of air transportation. Data for commuter, intrastate, and foreign-flag air carriers are not included.

Air traffic hubs are designated as geographical areas based on the percentage of total passengers enplaned in the area. A hub may have more than one airport in it. (This definition of hub should not be confused with the definition used by the airlines in describing their "hub-and-spoke" route structures) Individual communities fall into four hub classifications as determined by each community's percentage of total enplaned revenue passengers in all services and all operations of U.S. certificated route carriers within the 50 states, the District of Columbia, and other U.S. areas. Classifications are based on the percentage of total enplaned revenue passengers for each year according to the following: one percent or more = large, 0.25 to 0.9999 percent = medium, 0.05 to 0.249 percent = small, less than 0.05 = nonhub.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Airport Activity Statistics of Certified Route Air Carriers* (Washington, DC: Annual issues), tables 2, 3, 4, and 5.

Table 1-35: Average Length of Haul, Domestic Freight and Passenger Modes (Miles)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Freight																			
Air carrier	953	943	1,014	1,082	1,052	1,157	1,389	1,346	1,391	1,347	1,221	1,160	1,181	1,077	1,078	1,001	982	973	U
Truck ^a	272	259	263	286	363	366	391	398	410	407	392	416	426	435	442	458	473	485	U
Class I rail	461	503	515	541	616	665	726	751	763	794	817	843	842	851	835	835	843	859	853
Coastwise (water)	1,496	1,501	1,509	1,362	1,915	1,972	1,604	1,705	1,762	1,650	1,652	1,652	1,526	1,330	1,261	1,279	1,251	1,228	1,219
Lakewise (water)	522	494	506	530	536	524	553	535	519	514	508	514	508	507	505	501	506	509	529
Internal (water)	282	297	330	358	405	435	470	483	479	468	482	494	477	466	472	488	481	476	483
Intraport (water)	U	U	U	16	17	15	13	13	12	12	16	16	17	15	15	15	16	15	15
Crude (oil pipeline)	325	320	300	633	871	777	812	822	830	790	778	797	779	781	767	766	U	U	U
Petroleum products (oil pipeline)	269	335	357	516	414	391	387	379	379	406	414	402	413	413	420	418	U	U	U
Passenger																			
Air carrier, domestic, scheduled	583	614	678	698	736	758	803	806	806	799	787	791	802	817	812	824	833	(R) 850	842
Bus, intercity	79	94	106	113	125	121	141	143	136	138	138	140	143	144	144	143	143	U	U
Commuter rail	21	21	22	23	23	24	22	23	23	22	21	24	24	23	23	23	23	23	23
Amtrak ^b	N	N	N	236	216	231	273	285	286	280	279	268	256	256	251	248	244	237	U

KEY: N = data do not exist; R = revised; U = data are not available.

^a Total Class I and Class II motor carriers of freight (less-than-truckload, specialized carrier for truckload, and others).

^b Amtrak began operations in 1971. Data are reported for fiscal years.

NOTES

Average length of haul for freight is calculated by dividing ton-miles in table 1-46 by estimates of tonnage from the various data sources. The calculation of average length of haul for passenger trips varies by mode: for air carrier it is calculated by dividing revenue passenger-miles by revenue passenger enplanements; for commuter rail, intercity bus, and Amtrak it is calculated by dividing passenger-miles by number of passengers.

SOURCES

Freight:

Air carrier, truck:

Eno Transportation Foundation, Inc., *Transportation In America, 2002* (Washington, DC: 2002), p. 65.

Class I rail:

Association of American Railroads, *Railroad Facts* (Washington, DC: 2003), p. 36.

Water:

U.S. Army Corps of Engineers, *Waterborne Commerce of the United States, Part 5* (New Orleans, LA: Annual issues), section 1, table 1-4.

Oil pipeline:

1960-70: Transportation Policy Associates, Washington, DC, personal communication.

1975-99: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 65.

Passenger:

Air carrier:

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues), p. 3, line 34.

Intercity bus:

Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 64.

Commuter Rail:

1960-2000: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 64.

2001-02: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: annual issues), table 19 and similar tables in earlier editions.

Amtrak:

1970-85: Amtrak, corporate communication, Jan. 26, 1999.

1990-2001: Amtrak, *Amtrak Annual Report* (Washington, DC: 2003), Statistical Appendix.

Table 1-36: Worldwide Commercial Space Launches

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	TOTAL 1990-2003
TOTAL space launches	15	12	14	11	15	23	24	38	41	39	35	16	24	17	324
United States, total	9	6	6	5	5	12	11	17	22	15	7	3	5	5	128
Athena	0	0	0	0	0	1	0	1	1	3	0	0	0	0	6
Atlas	1	2	3	3	4	8	7	6	5	4	3	1	3	4	54
Conestoga	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Delta	5	4	3	1	1	1	3	7	11	5	2	1	2	0	46
Pegasus	0	0	0	1	0	1	1	3	4	2	2	0	0	1	15
Taurus	0	0	0	0	0	0	0	0	1	1	0	1	0	0	3
Titan	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Europe, total	5	6	6	6	8	8	9	11	9	8	12	8	10	4	110
Ariane 4	5	6	6	6	8	8	9	11	9	8	8	6	7	1	98
Ariane 5	0	0	0	0	0	0	0	0	0	0	4	2	3	3	12
Russia, total	0	0	0	0	0	0	2	7	5	13	13	3	8	5	56
Cosmos	0	0	0	0	0	0	0	0	0	1	2	0	0	1	4
Dnepr	0	0	0	0	0	0	0	0	0	1	1	0	1	0	3
Proton	0	0	0	0	0	0	2	6	4	5	6	2	5	1	31
Rocket	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3
Shtil	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Soyuz	0	0	0	0	0	0	0	0	0	6	3	0	0	2	11
Start	0	0	0	0	0	0	0	1	0	0	1	1	0	0	3
Ukraine, total	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Zenit 2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
China, total	1	0	2	0	2	3	2	3	4	1	0	0	0	0	18
Long March 2C	0	0	0	0	0	0	0	1	4	1	0	0	0	0	6
Long March 2E	0	0	2	0	1	3	0	0	0	0	0	0	0	0	6
Long March 3	1	0	0	0	1	0	1	0	0	0	0	0	0	0	3
Long March 3B	0	0	0	0	0	0	1	2	0	0	0	0	0	0	3
Sea Launch^a, total	0	0	0	0	0	0	0	0	0	2	3	2	1	3	11
Zenit 3SL	0	0	0	0	0	0	0	0	0	2	3	2	1	3	11

^a Sea Launch is an international venture involving organizations in four countries and uses its own launch facility outside national borders. Their first commercial launch, in 1999, was licensed by the Federal Aviation Administration.

NOTE

A commercial launch is a launch that is internationally competed (i.e., available in principle to international launch providers) or whose primary payload is commercial in nature. FAA-licensed launches carrying captive government (NASA and DOD) or industry payloads (ORBCOMM, Delta 3 demosat, Zenit 3SL demosat, and others) are counted here. Data are for orbital launches only.

SOURCES

1990–99: U.S. Department of Transportation, Federal Aviation Administration, Associate Administrator for Commercial Space Transportation, personal communication, June 4, 2002.

2000-2003: U.S. Department of Transportation, Federal Aviation Administration, *Commercial Space Transportation: 2003 Year in Review* (Washington, DC: January 2004), Internet site <http://ast.faa.gov/> as of June 7, 2004.

Table 1-37: U.S. Passenger-Miles (Millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Air, total	33,399	57,626	117,542	147,400	219,068	290,136	358,873	350,185	365,564	372,130	398,199	414,688	446,652	463,112	476,362	502,457	531,329	502,406	482,149
Air carrier, certificated, domestic, all services	31,099	53,226	108,442	136,000	204,368	277,836	345,873	338,085	354,764	362,230	388,399	403,888	434,652	450,612	463,262	488,357	516,129	(R) 486,506	482,149
General aviation ^a	2,300	4,400	9,100	11,400	14,700	12,300	13,000	12,100	10,800	9,900	9,800	10,800	12,000	12,500	13,100	14,100	15,200	15,900	U
Highway, total^b	1,272,078	1,555,237	2,042,002	2,404,954	2,653,510	3,012,953	3,561,209	3,600,322	3,697,719	3,768,066	3,837,512	3,868,070	3,968,386	4,089,366	4,200,635	4,304,270	4,390,076	(R) 4,643,794	4,733,824
Passenger car ^{b,c}	1,144,673	1,394,803	1,750,897	1,954,166	2,011,989	2,094,621	2,281,391	2,200,260	2,208,226	2,213,281	2,249,742	2,286,887	2,337,068	2,389,065	2,463,828	2,494,870	2,544,457	(R) 2,556,481	2,604,065
Motorcycle ^{b,c}	g	g	3,277	6,192	12,257	11,812	12,424	11,656	11,946	12,184	12,390	10,777	10,912	11,089	11,311	11,642	11,516	(R) 11,760	11,655
Other 2-axle 4-tire vehicle ^e	h	h	225,613	363,267	520,774	688,091	999,754	1,116,958	1,201,667	1,252,860	1,269,292	1,256,146	1,298,299	1,352,675	1,380,557	1,432,625	1,467,664	(R) 1,678,853	1,719,750
Truck, single-unit 2-axle 6-tire or more	98,551	128,769	27,081	34,606	39,813	45,441	51,901	52,898	53,874	56,772	61,284	62,705	64,072	66,893	68,021	70,304	70,500	(R) 85,489	89,547
Truck, combination	28,854	31,665	35,134	46,724	68,678	78,063	94,341	96,645	99,510	103,116	108,932	115,451	118,899	124,584	128,359	132,384	135,020	(R) 161,169	163,599
Bus ^d	N	N	N	N	N	94,925	121,398	121,906	122,496	129,852	135,871	136,104	139,136	145,060	148,558	162,445	160,919	(R) 150,042	145,208
Transit, total^f	(I) 4,197	(I) 4,128	(I) 4,592	(I) 4,513	39,854	39,581	41,143	40,703	40,241	39,384	39,585	39,808	41,378	42,339	44,128	45,857	47,666	49,070	(P) 48,324
Motor bus ^d	N	N	N	N	21,790	21,161	20,981	21,090	20,336	20,247	18,832	18,818	19,096	19,604	20,360	21,205	21,241	22,022	(P) 21,841
Light rail	N	N	N	N	381	350	571	662	701	705	833	860	957	1,035	1,128	1,206	1,356	1,437	(P) 1,432
Heavy rail	N	N	N	N	10,558	10,427	11,475	10,528	10,737	10,231	10,668	10,559	11,530	12,056	12,284	12,902	13,844	14,178	(P) 13,663
Trolley bus	N	N	N	N	219	306	193	195	199	188	187	187	184	189	182	186	192	187	(P) 188
Commuter rail	4,197	4,128	4,592	4,513	6,516	6,534	7,082	7,344	7,320	6,940	7,996	8,244	8,351	8,038	8,704	8,766	9,402	9,548	(P) 9,504
Demand responsive ^d	N	N	N	N	N	364	431	454	495	562	577	607	656	754	735	813	839	855	(P) 853
Ferry boat	N	N	N	N	j	j	286	282	271	260	260	260	265	294	294	310	330	325	(P) 333
Other	N	N	N	N	390	439	124	148	182	251	232	273	339	369	441	469	462	518	(P) 510
Rail																			
Intercity / Amtrak ^l	17,064	13,260	6,179	3,931	4,503	4,825	6,057	6,273	6,091	6,199	5,921	5,545	5,050	5,166	5,304	5,330	5,498	5,559	5,468

KEY: N = data do not exist; P = preliminary; R = revised.

^a All operations other than those operating under 14 CFR 121 and 14 CFR 135.

^b In July 1997, FHWA published revised passenger-miles data for the highway modes for a number of years. The major change reflected the reassignment of some vehicles from the passenger car category to the other 2-axle 4-tire vehicle category. Passenger-miles for passenger car, motorcycle, and other 2-axle 4-tire vehicles were derived by multiplying vehicle-miles for these vehicles by average vehicle occupancy rates, provided by the Nationwide Personal Transportation Survey (1977, 1983, and 1995) and the National Household Travel Survey (2001).

^c U.S. Department of Transportation, Federal Highway Administration (FHWA), provides data separately for passenger car and motorcycle in its annual *Highway Statistics* series. However, the 1995 summary report provides updated data for passenger car and motorcycle combined. Passenger car figures in this table were computed by U.S. Department of Transportation, Bureau of Transportation Statistics by subtracting the most current motorcycle figures from the aggregate passenger car and motorcycle figures.

^d Motor bus and demand responsive figures are also included in the bus figure for highway.

^e Prior to 1985, excludes demand responsive and most rural and smaller systems funded via Sections 18 and 16(b)2, Federal Transit Act. The series is not continuous between 1980 and 1985. Transit rail modes are measured in car-miles. Car-miles measure individual vehicle-miles in a train. A 10-car train traveling 1 mile would equal 1 train-mile and 10 car-miles.

^f Amtrak began operations in 1971. Does not include contract commuter passengers.

^g Included in passenger car.

^h Included in other single-unit 2-axle 6-tire or more truck.

ⁱ Includes commuter rail figures only.

^j Ferryboat included in other.

NOTE

Air carrier passenger-miles are computed by summing the products of the aircraft-miles flown on each interairport segment multiplied by the number of passengers carried on that segment. Highway passenger-miles from 1960 to 1994 are calculated by multiplying vehicle-miles of travel as cited by FHWA by the average number of occupants for each vehicle type. Average vehicle occupancy rates are based on various sources, such as the National Household Travel Survey, conducted by the Federal Highway Administration, and the Vehicle Inventory and Use Survey, conducted by the Bureau of the Census. Transit passenger-miles are the cumulative sum of the distances ridden by each passenger. Rail passenger-miles represent the movement of 1 passenger for 1 mile.

SOURCES

Air:

Air carrier, domestic, all services:

1960: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969* (Washington, DC: 1970), part III, table 2.

1965-70: *Ibid.*, *Handbook of Airline Statistics, 1973* (Washington, DC: 1974), part III, table 2.

1975-80: *Ibid.*, *Air Carrier Traffic Statistics* (Washington, DC: 1976, 1981), p. 4 (December 1976) and p. 2 (December 1981).

1985-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), page 3, line 1.

General aviation:

1960-2001: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), pp. 45-46.

Highway:

Passenger car and motorcycle:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site

<http://www.fhwa.dot.gov/ohim/summary95/index.html> as of July 28, 2000, table VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site <http://www.fhwa.dot.gov/policy/ohpi/hss/index.htm>.

Motorcycle:

1970-80: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1985* (Washington, DC: 1986), table VM-201A.

1985-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site <http://www.fhwa.dot.gov/policy/ohpi/hss/index.htm>.

Other 2-axle 4-tire vehicle:

1970-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site

<http://www.fhwa.dot.gov/ohim/summary95/index.html> as of July 28, 2000, table VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site <http://www.fhwa.dot.gov/policy/ohpi/hss/index.htm>.

Single-unit 2-axle 6-tires or more truck, combination truck, and bus:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site

<http://www.fhwa.dot.gov/ohim/summary95/index.html> as of July 28, 2000, table VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site <http://www.fhwa.dot.gov/policy/ohpi/hss/index.htm>.

Transit:

Ferryboat:

1992: American Public Transit Association, personal communication, July 19, 2000.

1996-99: American Public Transit Association, personal communication, Aug. 13, 2001.

2000-02: *Ibid.*, *Public Transportation Fact Book* (Washington, DC: 2004), table 103 and similar tables in earlier editions.

All other data:

1960-2002: American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: 2004), table 8 and similar tables in earlier editions.

Rail, Intercity / Amtrak:

1960-80: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual issues).

1985: Amtrak, *Amtrak FY95 Annual Report* Statistical Appendix (Washington, DC: 1996), p. 4.

1990-2002: *Ibid.*, *Amtrak Annual Report* Statistical Appendix (Washington, DC: Annual issues).

Table 1-38: Principal Means of Transportation to Work (Thousands)

	1985		1989		1993		1997		1999		2001	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All workers	99,592	100.0	106,630	100.0	103,741	100.0	116,469	100.0	118,041	100.0	120,191	100.0
Automobile, total	86,148	86.5	93,943	88.1	91,301	88.0	101,908	87.5	103,467	87.7	105,586	87.8
Drives self	72,137	72.4	81,322	76.3	79,449	76.6	90,207	77.5	92,363	78.2	93,942	78.2
Carpool, total	14,011	14.1	12,621	11.8	11,852	11.4	11,701	10.0	11,104	9.4	11,644	9.7
2-person	10,381	10.4	9,708	9.1	9,105	8.8	9,294	8.0	8,705	7.4	9,036	7.5
3-person	2,024	2.0	1,748	1.6	1,684	1.6	1,526	1.3	1,454	1.2	1,635	1.4
4+ person	1,606	1.6	1,165	1.1	1,063	1.0	881	0.8	945	0.8	973	0.8
Public transportation ^a	5,091	5.1	4,880	4.6	4,740	4.6	5,337	4.6	5,779	4.9	5,627	4.7
Taxicab	129	0.1	152	0.1	117	0.1	139	0.1	144	0.1	133	0.1
Bicycle or motorcycle	958	1.0	795	0.7	744	0.7	738	0.6	749	0.6	847	0.7
Walks only	4,032	4.0	3,634	3.4	3,227	3.1	3,869	3.3	3,627	3.1	3,408	2.8
Other means ^b	286	0.3	491	0.5	474	0.5	867	0.7	987	0.8	1,049	0.9
Works at home	2,947	3.0	2,736	2.6	3,137	3.0	3,611	3.1	3,288	2.8	3,401	2.8

^a Public transportation refers to bus, streetcar, subway, or elevated trains.

^b Other means include ferryboats, surface trains, and van service.

NOTES

Principal means of transportation refers to the mode used most often, when different means of transportation were used on different days of the week, or the mode used for the longest distance during the trip to work, when more than one mode is used to get to work each day.
Numbers may not add to totals due to roundings

SOURCE

U.S. Department of Housing and Urban Development, *American Housing Survey* (Washington, DC: various years).

**Table 1-39: Long-Distance Travel in the United States by Selected Trip Characteristics: 2001
(Roundtrips of 50 miles or more, one way)**

	Person trips (thousands)		Person-miles (millions)		Personal-use vehicle trips (thousands)		Personal-use vehicle- miles (millions)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
TOTAL	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
Principal means of transportation	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
Personal-use vehicle	2,336,094	89.3	760,325	55.9	2,336,094	100.0	760,325	100.0
Airplane	193,290	7.4	557,609	41.0	NA	NA	NA	NA
Commercial airplane	187,063	7.1	551,314	40.5	NA	NA	NA	NA
Bus	55,443	2.1	27,081	2.0	NA	NA	NA	NA
Intercity	22,941	0.9	9,945	0.7	NA	NA	NA	NA
Charter or tour	32,502	1.2	17,136	1.3	NA	NA	NA	NA
Train	21,144	0.8	10,546	0.8	NA	NA	NA	NA
Ship, boat, or ferry	2,040	0.1	4,278	0.3	NA	NA	NA	NA
Other	3,728	0.1	840	0.1	NA	NA	NA	NA
Not reported	5,388	0.2	133	0.0	NA	NA	NA	NA
Roundtrip distance	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
Less than 200 miles	1,249,018	47.7	175,171	12.9	1,209,312	51.8	170,441	22.4
200–299 miles	456,100	17.4	110,937	8.2	439,120	18.8	106,748	14.0
300–499 miles	377,177	14.4	144,972	10.7	355,501	15.2	136,328	17.9
500–999 miles	269,109	10.3	185,695	13.6	231,182	9.9	157,405	20.7
1,000-1,999 miles	132,548	5.1	189,468	13.9	71,481	3.1	97,652	12.8
2,000 miles or more	133,174	5.1	554,569	40.8	29,498	1.3	91,749	12.1
Mean (miles)	520	NA	NA	NA	325	NA	NA	NA
Median (miles)	209	NA	NA	NA	194	NA	NA	NA
Calendar quarter	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
1st quarter	576,111	22.0	291,733	21.4	510,906	21.9	162,400	21.4
2nd quarter	684,382	26.2	397,302	29.2	602,396	25.8	199,958	26.3
3rd quarter	733,488	28.0	374,407	27.5	667,600	28.6	220,300	29.0
4th quarter	623,146	23.8	297,371	21.9	555,192	23.8	177,666	23.4
Main purpose of trip	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
Commute	330,369	12.6	67,599	5.0	318,336	13.6	57,571	7.6
Business	399,312	15.3	279,337	20.5	316,006	13.5	100,665	13.2
Pleasure	1,464,914	56.0	827,035	60.8	1,322,501	56.6	476,681	62.7
Visit relatives or friends	663,203	25.3	357,095	26.2	609,457	26.1	220,583	29.0
Leisure ^a	786,532	30.1	456,201	33.5	700,467	30.0	250,863	33.0
Rest or relaxation	73,810	2.8	30,431	2.2	68,750	2.9	21,602	2.8
Sightseeing	39,764	1.5	20,591	1.5	34,721	1.5	12,828	1.7
Outdoor recreation	125,627	4.8	44,203	3.2	116,724	5.0	34,802	4.6
Entertainment	176,062	6.7	61,561	4.5	154,347	6.6	43,581	5.7
Personal business	245,679	9.4	108,752	8.0	229,706	9.8	76,814	10.1
Other	176,202	6.7	77,342	5.7	149,019	6.4	48,437	6.4
Not reported	651	0.02	748	0.05	526	0.02	157	0.02
Nights away from home	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
None	1,472,089	56.2	321,353	23.6	1,401,406	60.0	279,249	36.7
1–3 nights	821,311	31.4	431,155	31.7	728,311	31.2	284,967	37.5
4–7 nights	230,335	8.8	326,913	24.0	155,194	6.6	124,495	16.4
8 or more nights	93,392	3.6	281,390	20.7	51,183	2.2	71,613	9.4
Mean, excluding none (nights)	3.5	NA	NA	NA	3.0	NA	NA	NA

Type of lodging at destination	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
Friend's or relative's home	480,887	18.4	370,166	27.2	416,652	17.8	204,705	26.9
Hotel, motel, or resort	369,065	14.1	469,505	34.5	252,951	10.8	149,185	19.6
Rented cabin, condo, or vacation home	48,041	1.8	41,529	3.1	42,016	1.8	25,037	3.3
Owned cabin, condo, or vacation home	67,816	2.6	36,725	2.7	63,248	2.7	23,988	3.2
Camper, trailer, recreational vehicle, tent	60,815	2.3	35,118	2.6	59,519	2.5	29,924	3.9
Other type of lodging	99,902	3.8	73,314	5.4	83,930	3.6	38,356	5.0
Did not stay overnight	1,489,330	56.9	333,896	24.5	1,417,045	60.7	288,922	38.0
Not reported	1,271	0.05	559	0.04	731	0.03	208	0.03
Nights at destination								
Mean nights at destination	1.5	NA	NA	NA	1.1	NA	NA	NA
Friend's or relative's home	3.3	NA	NA	NA	2.7	NA	NA	NA
Hotel, motel, or resort	2.8	NA	NA	NA	2.3	NA	NA	NA

KEY: NA = not applicable.

^a Includes other leisure purposes not shown separately.

NOTE

Numbers may not add to totals due to roundings.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, National Household Travel Survey data, CD-ROM, February 2004.

Table 1-40: Long-Distance Travel in the United States by Selected Traveler Characteristics: 2001
(Roundtrips of 50 miles or more, one way)

	Persons (thousands)		Person trips (thousands)		Person-miles (millions)		Personal-use vehicle trips (thousands)		Personal-use vehicle-miles (millions)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
TOTAL	277,208	100.0	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
Under 5	19,281	7.0	113,329	4.3	56,136	4.1	107,012	4.6	37,220	4.9
5-17 years	52,450	18.9	337,984	12.9	169,303	12.4	297,520	12.7	101,565	13.4
18-24 years	23,918	8.6	209,171	8.0	97,575	7.2	192,499	8.2	60,386	7.9
25-29 years	18,432	6.6	192,382	7.4	109,392	8.0	172,075	7.4	56,290	7.4
30-39 years	43,114	15.6	505,463	19.3	260,673	19.2	447,666	19.2	136,738	18.0
40-49 years	40,924	14.8	483,005	18.5	257,444	18.9	428,672	18.3	134,938	17.7
50-59 years	30,498	11.0	391,161	14.9	204,614	15.0	351,977	15.1	110,109	14.5
60-64 years	11,250	4.1	123,103	4.7	67,517	5.0	111,692	4.8	39,101	5.1
65-74 years	18,345	6.6	155,190	5.9	81,500	6.0	140,226	6.0	53,741	7.1
75 years and over	18,997	6.9	106,337	4.1	56,659	4.2	86,755	3.7	30,237	4.0
Median (years)	33.5	NA	37.3	NA	NA	NA	37.4	NA	NA	NA
Sex, total	277,208	100.0	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
Male	135,291	48.8	1,499,967	57.3	757,454	55.7	1,347,123	57.7	429,259	56.5
Female	141,917	51.2	1,117,160	42.7	603,358	44.3	988,971	42.3	331,066	43.5
Race, total	277,208	100.0	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
White	193,338	69.7	2,033,914	77.7	1,058,412	77.8	1,821,143	78.0	595,944	78.4
Black	33,877	12.2	207,350	7.9	91,393	6.7	180,399	7.7	59,363	7.8
Asian or Pacific Islander	7,223	2.6	49,559	1.9	59,235	4.4	39,501	1.7	12,067	1.6
American Indian, Eskimo, or Aleutian	1,316	0.5	12,565	0.5	5,975	0.4	11,688	0.5	3,693	0.5
Other	39,472	14.2	294,628	11.3	136,480	10.0	266,200	11.4	84,115	11.1
Not reported	1,983	0.7	19,110	0.7	9,318	0.7	17,163	0.7	5,144	0.7
Ethnicity, total	277,208	100.0	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
Hispanic origin	35,043	12.6	253,100	9.7	118,516	8.7	227,266	9.7	71,465	9.4
Not of Hispanic origin	242,165	87.4	2,364,026	90.3	1,242,297	91.3	2,108,828	90.3	688,859	90.6
Household income	277,208	100.0	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
Less than \$25,000	58,935	21.3	327,852	12.5	133,903	9.8	302,354	12.9	95,773	12.6
\$25,000-\$39,999	54,404	19.6	454,543	17.4	188,296	13.8	422,556	18.1	138,312	18.2
\$40,000-\$49,999	29,471	10.6	297,383	11.4	135,256	9.9	278,871	11.9	86,849	11.4
\$50,000-\$59,999	26,622	9.6	285,398	10.9	147,926	10.9	260,465	11.1	85,859	11.3
\$60,000-\$74,999	25,557	9.2	305,461	11.7	134,024	9.8	281,037	12.0	83,941	11.0
\$75,000-\$99,999	32,264	11.6	380,371	14.5	221,657	16.3	332,095	14.2	107,055	14.1
\$100,000 or more	33,587	12.1	444,802	17.0	334,526	24.6	359,642	15.4	129,050	17.0
Not reported	16,369	5.9	121,316	4.6	65,224	4.8	99,074	4.2	33,486	4.4
Household type	277,208	100.0	2,617,126	100.0	1,360,813	100.0	2,336,094	100.0	760,325	100.0
One adult, no children	13,743	5.0	139,195	5.3	84,619	6.2	119,661	5.1	38,003	5.0
One adult, youngest child 0-5	5,736	2.1	25,736	1.0	15,239	1.1	21,777	0.9	6,528	0.9
One adult, youngest child 6-15	8,242	3.0	70,325	2.7	31,689	2.3	63,413	2.7	18,918	2.5
One adult, youngest child 16-21	2,614	0.9	22,080	0.8	7,677	0.6	18,741	0.8	4,967	0.7
One adult, retired, no children	8,750	3.2	42,932	1.6	23,648	1.7	36,142	1.5	11,325	1.5
Two or more adults, no children	50,160	18.1	620,148	23.7	355,433	26.1	542,463	23.2	175,694	23.1
Two or more adults, youngest child 0-5	69,688	25.1	593,106	22.7	291,117	21.4	536,070	22.9	172,395	22.7
Two or more adults, youngest child 6-15	64,237	23.2	590,787	22.6	292,422	21.5	530,746	22.7	167,498	22.0
Two or more adults, youngest child 16-21	18,741	6.8	205,093	7.8	101,686	7.5	182,859	7.8	57,110	7.5
Two or more adults, retired, no children	35,297	12.7	307,725	11.8	157,284	11.6	284,221	12.2	107,887	14.2
Educational attainment, total (Persons 16 years and over)	208,479	100.0	2,173,473	100.0	1,144,890	100.0	1,940,042	100.0	624,049	100.0
Less than high school graduate	30,601	14.7	183,801	8.5	84,797	7.4	162,768	8.4	49,856	8.0
High school graduate	63,428	30.4	585,117	26.9	225,637	19.7	554,002	28.6	168,467	27.0
Some college, no degree	43,377	20.8	458,953	21.1	211,462	18.5	423,517	21.8	137,884	22.1
Associate's degree	13,570	6.5	162,145	7.5	80,413	7.0	146,649	7.6	46,528	7.5
Bachelor's degree	33,063	15.9	437,767	20.1	285,168	24.9	369,402	19.0	126,532	20.3
Some grad school or grad degree	23,237	11.1	339,237	15.6	253,592	22.1	278,227	14.3	93,484	15.0
Not reported	1,202	0.6	6,453	0.3	3,822	0.3	5,477	0.3	1,299	0.2
Activity status, total (Persons 16 years and over)	208,479	100.0	2,173,473	100.0	1,144,890	100.0	1,940,042	100.0	624,049	100.0
Working full time	115,428	55.4	1,426,531	65.6	716,671	62.6	1,275,103	65.7	382,355	61.3
Retired	35,611	17.1	254,291	11.7	137,388	12.0	230,254	11.9	85,957	13.8
Other	57,098	27.4	491,046	22.6	289,717	25.3	433,191	22.3	155,015	24.8
Not reported	342	0.2	1,605	0.1	1,115	0.1	1,495	0.1	722	0.1

KEY: NA = not applicable.

NOTE

Numbers may not add to totals due to rounding.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, Federal Highway Administration, National Household Travel Survey data, CD-ROM, February 2004.

Table 1-41: Passengers Boarded at the Top 50 U.S. Airports^a

(Ranked By Passenger Enplanements in 2003)

Airport	Code	1993		2002		2003		Percent change 1993-2003	Percent change 2002-2003
		Rank	Total Enplaned Passengers	Rank	Total Enplaned Passengers	Rank	Total Enplaned Passengers		
Atlanta, GA (Hartsfield Intl.)	ATL	3	22,295,205	1	37,070,492	1	38,228,500	71.5	3.1
Chicago, IL (O'Hare Intl.)	ORD	1	28,459,367	2	28,356,224	2	30,797,513	8.2	8.6
Dallas / Ft. Worth, TX (Dallas / Ft. Worth Intl.)	DFW	2	24,653,530	3	24,072,162	3	24,502,273	-0.6	1.8
Los Angeles, CA (Los Angeles Intl.)	LAX	4	18,445,337	4	20,320,299	4	20,913,455	13.4	2.9
Denver, CO (Denver Intl.)	DEN	5	14,210,166	5	16,053,940	5	17,271,507	21.5	7.6
Phoenix, AZ (Phoenix Sky Harbor Intl.)	PHX	7	11,294,603	6	15,897,012	6	17,175,804	52.1	8.0
Las Vegas, NV (McCarran Intl.)	LAS	13	10,117,974	7	15,575,101	7	16,701,764	65.1	7.2
Houston, TX (George Bush Intercontinental)	IAH	18	8,696,901	8	15,223,638	8	15,495,455	78.2	1.8
Minneapolis, MN (Minneapolis-St. Paul Intl.)	MSP	10	10,377,457	9	15,045,630	9	15,362,399	48.0	2.1
Detroit, MI (Wayne County)	DTW	8	11,044,509	10	14,859,952	10	14,656,475	32.7	-1.4
Newark, NJ (Newark)	EWR	9	10,969,567	11	13,113,997	11	13,087,544	19.3	-0.2
Seattle, WA (Seattle-Tacoma Intl.)	SEA	16	9,010,385	12	12,577,597	12	12,787,620	41.9	1.7
San Francisco, CA (San Francisco Intl.)	SFO	6	14,003,556	13	12,250,289	13	12,227,636	-12.7	-0.2
Orlando, FL (Orlando Intl.)	MCO	17	8,724,950	14	12,127,425	14	12,049,112	38.1	-0.6
Miami, FL (Miami Intl.)	MIA	12	10,137,504	16	11,125,611	15	11,049,687	9.0	-0.7
New York, NY (John F. Kennedy Intl.)	JFK	21	8,257,682	19	9,930,102	16	10,745,946	30.1	8.2
Cincinnati, OH (Greater Cincinnati)	CVG	27	5,128,274	21	9,492,938	17	10,257,408	100.0	8.1
Philadelphia, PA (Philadelphia Intl.)	PHL	23	7,294,135	17	10,323,655	18	10,185,272	39.6	-1.3
New York, NY (La Guardia)	LGA	15	9,340,107	20	9,713,965	19	10,135,517	8.5	4.3
Charlotte, NC (Douglas Muni.)	CLT	22	7,805,221	18	10,154,889	20	9,572,721	22.6	-5.7
Boston, MA (Logan Intl.)	BOS	11	10,206,730	22	9,484,401	21	9,536,108	-6.6	0.5
Baltimore, MD (Baltimore-Washington Intl.)	BWI	34	3,952,301	23	8,962,712	22	9,408,706	138.1	5.0
St. Louis, MO (Lambert-St. Louis Muni.)	STL	14	9,902,321	15	11,765,453	23	9,302,358	-6.1	-20.9
Salt Lake City, UT (Salt Lake City Intl.)	SLC	25	7,147,123	29	7,254,485	24	8,874,157	24.2	22.3
Chicago, IL (Midway)	MDW	45	2,978,283	24	7,829,471	25	8,655,912	190.6	10.6
Miami / Ft. Lauderdale, FL (Ft. Lauderdale-Hollywood Intl.)	FLL	36	3,879,308	26	7,662,281	26	8,045,678	107.4	5.0
Honolulu, HI (Honolulu Intl.)	HNL	19	8,484,364	25	7,734,079	27	7,485,240	-11.8	-3.2
San Diego, CA (San Diego Intl.-Lindbergh)	SAN	26	5,699,382	30	7,082,934	28	7,428,369	30.3	4.9
Tampa, FL (Tampa Intl.)	TPA	28	4,576,551	28	7,260,166	29	7,327,728	60.1	0.9
Washington, DC (Dulles Intl.)	IAD	33	3,982,251	34	5,404,106	30	6,926,067	73.9	28.2
Oakland, CA (Oakland Metropolitan Intl.)	OAK	39	3,577,588	31	5,968,718	31	6,542,940	82.9	9.6
Washington, DC (Ronald Reagan National)	DCA	24	7,186,011	33	5,551,990	32	6,067,824	-15.6	9.3
Portland, OR (Portland Intl.)	PDX	30	4,187,972	32	5,784,838	33	5,950,495	42.1	2.9
Pittsburgh, PA (Greater Pittsburgh)	PIT	20	8,383,674	27	7,528,104	34	5,853,499	-30.2	-22.2
San Jose, CA (Norman Y. Mineta San Jose Intl.)	SJC	43	3,186,195	36	5,067,502	35	5,026,697	57.8	-0.8
Kansas City, MO (Kansas City Intl.)	MCI	38	3,778,822	35	5,073,709	36	4,805,884	27.2	-5.3
Cleveland, OH (Hopkins Intl.)	CLE	35	3,890,066	37	5,016,032	37	4,802,602	23.5	-4.3
New Orleans, LA (New Orleans Intl.)	MSY	40	3,281,874	38	4,545,152	38	4,553,564	38.7	0.2
San Juan, PR (Luis Munoz Marin Intl.)	SJU	31	4,150,438	40	4,472,230	39	4,543,833	9.5	1.6
Memphis, TN (Memphis Intl.)	MEM	41	3,238,706	39	4,537,659	40	4,504,679	39.1	-0.7
Sacramento, CA (Sacramento Intl.)	SMF	50	2,538,181	41	4,052,945	41	4,361,647	71.8	7.6
Santa Ana, CA (John Wayne Intl.)	SNA	46	2,854,297	42	3,889,774	42	4,220,145	47.9	8.5
Nashville, TN (Metropolitan)	BNA	37	3,815,882	45	3,753,291	43	3,768,227	-1.2	0.4
Raleigh-Durham, NC (Raleigh-Durham)	RDU	29	4,203,390	44	3,753,975	44	3,726,659	-11.3	-0.7
Houston, TX (William P. Hobby)	HOU	32	4,061,425	43	3,817,754	45	3,702,964	-8.8	-3.0
Indianapolis, IN (Indianapolis Intl.)	IND	48	2,712,888	46	3,206,486	46	3,412,072	25.8	6.4
Austin, TX (Robert Muller Muni.)	AUS	54	2,268,486	47	3,150,412	47	3,125,082	37.8	-0.8
San Antonio, TX (San Antonio Intl.)	SAT	47	2,753,008	48	3,100,390	48	3,055,642	11.0	-1.4
Ontario, CA (Ontario Intl.)	ONT	44	3,025,640	50	2,979,565	49	3,021,059	-0.2	1.4
Hartford / Springfield / Westfield CT (Bradley Intl.)	BDL	55	2,169,082	49	3,047,535	50	3,011,045	38.8	-1.2
Total top 50			386,338,669		482,023,067		494,250,490	27.9	2.5
All airports			466,677,495		574,858,880		593,974,008	27.3	3.3

^a Rank order by total enplaned passengers on large certificated U.S. air carriers (Majors, Nationals, Large Regionals, and Medium Regionals), scheduled and nonscheduled operations, at all airports served within the 50 states, the District of Columbia, and other U.S. areas designated by the Federal Aviation Administration. Prior to 1993, all scheduled and some nonscheduled enplanements for certificated air carriers were included; no enplanements were included for air carriers offering charter service only.

Large certificated air carriers hold Certificates of Public Convenience and Necessity issued by the U.S. Department of Transportation authorizing the performance of air transportation. Large certificated air carriers operate aircraft with seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds. Data for commuter, and foreign-flag air carriers are not included.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Schedule T-3 data, various years (Washington, DC 2003)

Table 1-42: Air Passenger Travel Arrivals in the United States (Thousands)

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL arriving passengers (excludes Canada)	12,646	20,262	24,156	36,414	35,464	38,927	41,558	43,818	46,910	49,853	54,315	56,181	57,785	62,217	56,700	53,865
United States (excludes Canada)	6,502	10,031	11,798	19,145	18,910	20,537	21,940	23,291	24,582	25,148	26,744	27,390	27,462	29,837	27,985	26,953
Foreign (excludes Canada)	6,144	10,231	12,357	17,269	16,554	18,390	19,618	20,527	22,328	24,704	27,571	28,791	30,324	32,380	28,715	26,912
Selected countries of embarkation^a																
Australia	106	227	277	495	561	598	591	551	581	622	618	613	670	812	739	724
Bahama Islands	758	1,123	1,503	1,679	1,436	1,341	1,370	1,424	1,433	1,487	1,530	1,396	1,337	1,471	1,458	1,430
Barbados	76	135	216	228	197	191	208	196	222	212	203	195	197	208	191	206
Belgium	144	242	281	417	366	357	408	377	379	407	589	715	730	778	598	330
Bermuda	398	497	434	487	430	405	436	447	426	363	425	407	384	374	334	312
Brazil	212	300	352	584	635	645	711	878	1,112	1,176	1,388	1,377	1,154	1,280	1,094	977
Canada ^b	N	N	N	6,870	6,263	6,546	6,843	6,812	7,417	8,501	8,895	9,613	^R 9,676	^R 10,236	^R 9,166	8,686
China/Taiwan	50	113	206	325	404	447	606	830	972	1,017	1,068	1,080	1,170	1,186	1,092	1,024
Colombia	173	315	279	286	305	343	389	443	481	499	586	606	649	674	683	590
Denmark	222	267	241	313	279	295	285	267	221	236	252	225	223	232	240	309
Dominican Republic	336	468	606	948	849	951	1,027	1,070	1,136	1,168	1,168	1,251	1,368	1,498	1,430	1,409
France	512	689	955	1,777	1,600	1,926	1,877	2,017	2,045	2,178	2,323	2,523	2,591	3,147	3,023	2,879
Germany	622	1,175	1,582	2,466	2,444	2,797	2,922	2,883	3,125	3,173	3,545	3,558	3,491	3,886	3,519	3,483
Grand Cayman	25	121	173	273	256	229	185	294	314	323	328	370	335	343	317	291
Greece	121	208	187	132	83	146	165	201	220	235	186	192	191	195	135	108
Haiti	91	133	192	233	217	154	200	137	314	303	289	293	327	303	317	338
Hong Kong	98	228	270	356	397	437	511	558	658	668	589	592	650	731	735	697
Ireland	220	220	274	448	418	569	582	660	642	721	716	775	950	1,064	992	848
Israel	84	189	294	204	202	231	293	332	412	483	482	502	547	577	400	343
Italy	431	537	662	792	716	885	903	953	1,007	1,047	1,097	1,078	1,171	1,511	1,269	1,082
Jamaica	457	429	707	975	907	888	982	1,040	1,124	1,136	1,162	1,219	1,209	1,248	1,226	1,238
Japan	1,095	1,624	2,435	4,528	4,510	4,972	4,999	5,149	5,676	6,349	6,736	6,630	6,991	6,974	5,876	5,666
Korea, Republic of	105	234	390	826	827	971	1,070	1,166	1,335	1,514	1,625	1,184	1,240	1,470	1,262	1,253
Mexico	1,626	2,886	2,719	4,313	4,467	4,625	4,778	5,107	4,884	5,591	6,124	6,318	6,576	6,999	6,591	6,349
Netherlands	312	427	583	837	892	1,039	1,297	1,427	1,580	1,774	2,074	2,213	2,318	2,401	2,132	2,104
Netherland Antilles	213	327	407	388	353	290	360	390	339	305	368	382	371	389	371	371
Panama Republic	97	150	180	153	175	177	201	221	225	229	227	267	308	359	343	339
Philippines	108	194	145	246	261	315	318	375	397	379	410	275	331	405	400	365
Spain	306	312	419	558	520	659	600	578	604	618	675	732	734	827	758	769
Switzerland	236	312	452	616	525	549	603	676	733	790	910	1,068	1,026	1,069	913	701
United Kingdom	1,549	2,973	3,460	5,166	4,793	5,651	6,006	6,087	6,648	7,131	7,935	8,640	8,780	9,382	8,435	8,217
Venezuela	205	533	248	458	510	576	653	702	786	659	709	810	794	718	730	556

KEY: N = data do not exist; R = revised.

^a Country where passenger boarded a direct flight to the United States.

^b Canadian figures come from a separate source and represents the number of revenue passengers on scheduled commercial and charter flights. Does not include foreign (non-Canadian, non-U.S.) scheduled carriers.

NOTES

Includes passengers on international commercial flights arriving at U.S. airports and travelers between U.S. airports in the 50 states, Puerto Rico, Guam, or the Virgin Islands, and other U.S. territories.

Data compiled from flight reports required by the U.S. Immigration and Naturalization Service, except for Canada.

SOURCES

Totals and all selected Countries, except for Canada:

1975-94: U.S. Department of Transportation, Research and Special Programs Administration, Volpe National Transportation Systems Center, *U.S. International Air Travel Statistics* (Cambridge, MA: Annual issues), table IIa.

1995: U.S. Department of Commerce, International Trade Administration, *U.S. International Air Passenger Statistics Report, Calendar Year 1995* (Washington, DC: 1996), table IIa.

1996-2002: Ibid., *U.S. International Air Travel Statistics Report* (Washington, DC: Annual issues), table IIa.

Canada:

Statistics Canada, *Air Carrier Traffic at Canadian Airports* (Canada: Annual issues) and personal communication, Oct. 22, 2003.

Table 1-43: Air Passenger Travel Departures from the United States (Thousands)

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL departing passengers (excludes Canada)	12,053	19,256	22,487	34,046	33,286	36,211	38,254	40,349	43,026	45,785	49,684	50,863	53,856	57,498	52,594	48,606
United States (excludes Canada)	5,912	9,369	10,696	17,628	17,530	18,858	20,232	21,355	22,231	22,901	24,302	24,513	25,457	27,431	25,483	23,610
Foreign (excludes Canada)	6,141	9,886	11,791	16,418	15,756	17,353	18,022	18,993	20,795	22,884	25,382	26,350	28,399	30,068	27,111	24,996
Selected countries of debarkation ^a																
Australia	103	245	232	540	581	609	588	522	560	614	606	607	686	806	713	686
Bahama Islands	704	1,006	1,151	1,279	1,128	1,005	1,046	963	1,024	994	983	955	1,027	1,137	1,007	935
Barbados	74	126	204	230	199	185	207	208	217	210	200	196	202	214	204	189
Belgium	134	231	249	395	318	355	372	334	340	380	513	622	713	740	586	265
Bermuda	372	467	389	277	237	217	247	242	199	196	215	207	206	189	150	165
Brazil	206	291	322	560	592	659	696	826	1,024	1,135	1,292	1,297	1,134	1,194	1,081	936
Canada ^b	N	N	N	6,870	6,263	6,546	6,798	6,764	7,405	8,477	8,890	9,647	^R 9,692	^R 10,246	^R 9,161	8,671
China/Taiwan	41	90	187	337	447	481	616	803	891	945	939	934	975	1,026	944	927
Colombia	171	299	294	277	294	324	353	415	461	467	567	588	585	622	649	587
Denmark	188	254	254	307	239	266	272	254	229	227	259	217	214	227	239	316
Dominican Republic	322	443	528	896	780	881	949	980	995	1,057	1,070	1,108	1,263	1,294	1,214	1,180
France	470	635	894	1,626	1,523	1,769	1,759	1,896	1,868	2,021	2,147	2,289	2,544	3,082	2,927	2,588
Germany	649	1,178	1,539	2,339	2,298	2,627	2,788	2,785	2,883	2,978	3,178	3,210	3,364	3,722	3,389	3,108
Grand Cayman	26	112	161	250	238	196	244	259	264	285	290	305	291	289	271	237
Greece	123	190	210	129	88	150	150	184	194	206	192	181	170	170	126	102
Haiti	81	124	169	201	178	139	180	118	292	288	284	295	315	296	300	315
Hong Kong	59	152	238	310	369	474	477	545	640	651	610	621	621	728	733	657
Ireland	163	212	233	311	263	316	324	380	409	449	488	554	743	809	797	631
Israel	105	186	255	259	249	294	317	367	426	492	499	488	515	480	374	338
Italy	409	495	660	731	694	873	878	918	955	1,006	1,055	1,041	1,101	1,366	1,182	955
Jamaica	416	382	607	888	821	796	887	909	987	988	1,018	1,018	1,086	1,095	1,084	1,067
Japan	1,183	1,602	2,255	4,471	4,431	4,795	4,757	4,954	5,452	6,187	6,796	6,487	6,709	6,985	5,993	5,665
Korea, Republic of	60	186	333	723	759	887	961	1,082	1,252	1,382	1,461	1,032	1,101	1,307	1,137	1,114
Mexico	1,525	2,886	2,671	4,136	4,230	4,307	4,371	4,632	4,568	5,133	5,613	5,771	6,217	6,510	6,025	5,643
Netherlands	304	409	562	777	881	965	1,150	1,319	1,444	1,636	1,920	1,933	2,009	2,107	1,854	1,722
Netherlands Antilles	184	282	395	377	341	309	347	368	295	288	319	340	335	337	344	330
Panama Republic	100	142	209	183	189	186	194	211	214	221	240	272	299	344	355	343
Philippines	81	160	165	195	194	241	249	228	281	275	306	218	272	348	309	332
Spain	260	273	397	540	513	637	576	553	573	577	615	669	708	782	732	688
Switzerland	224	306	434	600	527	543	593	657	712	760	811	906	983	1,038	905	671
United Kingdom	1,446	2,840	3,322	4,903	4,594	5,245	5,682	5,918	6,372	6,693	7,475	8,143	8,717	9,154	8,180	7,659
Venezuela	198	518	245	444	488	565	641	686	778	644	698	782	793	694	728	533

KEY: N = data do not exist; R = revised.

^a Country where passenger deboarded a direct flight from the United States.

^b Canadian figures come from a separate source and represents the number of revenue passengers on scheduled commercial and charter flights. Does not include foreign (non-Canadian, non-U.S.) scheduled carriers.

NOTE

Includes passengers on international commercial flights departing U.S. airports, and travelers between U.S. airports in the 50 states, Puerto Rico, Guam, or the Virgin Islands, and other U.S. territories. Data compiled from flight reports required by the U.S. Immigration and Naturalization Service, except for Canada data.

SOURCES

Totals and all selected Countries, except for Canada:

1975-94: U.S. Department of Transportation, Research and Special Programs Administration, Volpe National Transportation Systems Center, *U.S. International Air Travel Statistics* (Cambridge, MA: Annual issues), table IId.

1995: U.S. Department of Commerce, International Trade Administration, *U.S. International Air Passenger Statistics Report, Calendar Year 1995* (Washington, DC: 1996), table IId.

1996-2002: Ibid., *U.S. International Air Travel Statistics Report* (Washington, DC: Annual issues), table IId.

Canada:

Statistics Canada, *Air Carrier Traffic at Canadian Airports* (Canada: Annual issues) and personal communication, Oct. 22, 2003.

Table 1-44: U.S.-Canadian Border Land-Passenger Gateways: Entering the United States

All U.S.-Canadian land gateways	2001		2002		2003
All personal vehicle passengers	74,971,105	All personal vehicle passengers	70,007,912	All personal vehicle passengers	61,485,685
All personal vehicles	34,308,013	All personal vehicles	32,538,817	All personal vehicles	30,214,226
All bus passengers	4,456,436	All bus passengers	4,212,863	All bus passengers	3,779,788
All pedestrians	749,805	All pedestrians	1,081,682	All pedestrians	937,488
All train passengers	253,652	All train passengers	225,380	All train passengers	234,181
All buses	169,412	All buses	160,961	All buses	156,580
Personal vehicle passengers – top 5 gateways					
Buffalo-Niagara Falls, NY	16,571,352	Buffalo-Niagara Falls, NY	17,031,458	Buffalo-Niagara Falls, NY	13,216,214
Detroit, MI	15,156,971	Detroit, MI	12,318,806	Detroit, MI	10,965,872
Blaine, WA	6,926,914	Blaine, WA	4,794,088	Blaine, WA	4,491,959
Port Huron, MI	4,698,825	Port Huron, MI	4,188,972	Port Huron, MI	3,821,908
Champlain-Rouse Point, NY	2,902,006	Champlain-Rouse Point, NY	3,766,141	Champlain-Rouse Point, NY	3,521,091
Personal vehicles – top 5 gateways					
Detroit, MI	7,585,477	Buffalo-Niagara Falls, NY	7,569,643	Buffalo-Niagara Falls, NY	6,414,415
Buffalo-Niagara Falls, NY	7,396,036	Detroit, MI	6,857,332	Detroit, MI	6,315,590
Blaine, WA	2,892,208	Blaine, WA	2,385,389	Blaine, WA	2,299,636
Port Huron, MI	2,198,962	Port Huron, MI	2,187,210	Port Huron, MI	1,965,011
Calais, ME	1,232,755	Massena, NY	1,162,510	Massena, NY	1,133,727
Bus passengers – top 5 gateways					
Buffalo-Niagara Falls, NY	1,618,598	Buffalo-Niagara Falls, NY	1,556,924	Buffalo-Niagara Falls, NY	1,321,778
Detroit, MI	989,750	Detroit, MI	915,551	Detroit, MI	904,425
Blaine, WA	382,273	Blaine, WA	336,696	Blaine, WA	283,863
Champlain-Rouse Point, NY	291,421	Champlain-Rouse Point, NY	282,859	Champlain-Rouse Point, NY	234,620
Port Huron, MI	140,955	Port Huron, MI	147,309	Sault Ste. Marie, MI	192,760
Pedestrians – top 5 gateways					
Buffalo-Niagara Falls, NY	414,704	Buffalo-Niagara Falls, NY	818,913	Buffalo-Niagara Falls, NY	656,022
Sumas, WA	98,968	Sumas, WA	64,432	Sumas, WA	59,330
Calais, ME	49,148	Portland, ME ^a	39,293	Calais, ME	45,899
Portland, ME ^a	32,876	Calais, ME	35,154	Portland, ME ^a	38,129
International Falls-Rainer, MN	27,287	International Falls, MN	24,175	International Falls, MN	27,623
Train passengers – top 5 gateways					
Buffalo-Niagara Falls, NY	53,337	Blaine, WA	60,521	Skagway, AK	44,430
Blaine, WA	43,136	Buffalo-Niagara Falls, NY	47,315	Blaine, WA	43,515
Champlain-Rouse Point, NY	35,257	Champlain-Rouse Point, NY	33,738	Buffalo-Niagara Falls, NY	37,240
Skagway, AK	33,753	Skagway, AK	29,754	Champlain-Rouse Point, NY	28,325
Port Huron, MI	33,130	Port Huron, MI	26,815	Port Huron, MI	25,485
Buses – top 5 gateways					
Buffalo-Niagara Falls, NY	53,231	Buffalo-Niagara Falls, NY	50,582	Buffalo-Niagara Falls, NY	43,358
Detroit, MI	39,754	Detroit, MI	36,603	Detroit, MI	36,177
Blaine, WA	16,561	Blaine, WA	15,748	Sault Ste. Marie, MI	15,760
Champlain-Rouse Point, NY	10,374	Champlain-Rouse Point, NY	10,415	Blaine, WA	12,865
Sault Ste. Marie, MI	8,719	Sault Ste. Marie, MI	8,831	Champlain-Rouse Point, NY	11,290

^a Gateway is a pedestrian/ferry combination crossing.

NOTE

Data reflect all personal vehicles, buses, passengers and pedestrians entering the United States across the U.S.-Canadian border, regardless of nationality.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, special tabulation, June 2004. Based on the following primary data source: U.S. Department of Treasury, U.S. Customs Service, Office of Field Operations, Operations Management Database.

Table 1-45: U.S.-Mexican Border Land-Passenger Gateways: Entering the United States

All U.S.-Mexican land gateways		2001	2002	2003	
All personal vehicle passengers	209,105,846	All personal vehicle passengers	199,020,692	All personal vehicle passengers	193,697,482
All personal vehicles	89,526,957	All personal vehicles	89,849,415	All personal vehicles	88,068,391
All pedestrians	51,501,321	All pedestrians	50,278,281	All pedestrians	48,663,773
All bus passengers	3,366,795	All bus passengers	3,926,154	All bus passengers	3,747,337
All buses	288,285	All buses	309,360	All buses	319,087
All train passengers	18,895	All train passengers	15,108	All train passengers	12,101
Personal vehicle passengers — top 5 gateways					
El Paso, TX	39,200,481	San Ysidro, CA	36,171,884	San Ysidro, CA	39,180,519
San Ysidro, CA	33,003,554	El Paso, TX	26,363,164	El Paso, TX	26,317,018
Hidalgo, TX	17,713,609	Hidalgo, TX	17,613,527	Brownsville, TX	15,673,205
Laredo, TX	17,282,264	Laredo, TX	15,915,545	Hidalgo, TX	15,587,611
Brownsville, TX	16,951,901	Brownsville, TX	15,820,595	Laredo, TX	15,208,606
Personal vehicles — top 5 gateways					
El Paso, TX	16,697,439	El Paso, TX	16,135,835	San Ysidro, CA	17,408,481
San Ysidro, CA	14,106,704	San Ysidro, CA	15,001,616	El Paso, TX	13,699,206
Hidalgo, TX	8,779,691	Hidalgo, TX	7,549,907	Brownsville, TX	7,219,865
Brownsville, TX	7,877,255	Brownsville, TX	7,548,394	Hidalgo, TX	7,169,629
Laredo, TX	7,151,127	Laredo, TX	7,454,330	Laredo, TX	6,777,423
Pedestrians — top 5 gateways					
San Ysidro, CA	11,435,946	El Paso, TX	9,301,395	El Paso, TX	8,899,168
El Paso, TX	7,201,100	San Ysidro, CA	7,903,483	San Ysidro, CA	8,302,110
Calexico, CA	7,119,785	Calexico, CA	6,894,820	Calexico, CA	6,230,123
Laredo, TX	5,060,947	Nogales, AZ	5,911,866	Nogales, AZ	5,583,533
Nogales, AZ	4,874,738	Laredo, TX	4,648,046	Laredo, TX	4,577,725
Bus passengers — top 5 gateways					
San Ysidro, CA	897,047	San Ysidro, CA	1,199,630	San Ysidro, CA	1,244,973
Laredo, TX	720,559	Laredo, TX	757,459	Laredo, TX	748,644
Hidalgo, TX	659,450	Hidalgo, TX	632,923	Hidalgo, TX	655,430
Otay Mesa, CA	457,980	Otay Mesa, CA	546,493	El Paso, TX	392,718
El Paso, TX	195,399	El Paso, TX	351,335	Otay Mesa, CA	303,756
Buses — top 5 gateways					
San Ysidro, CA	102,627	San Ysidro, CA	97,042	San Ysidro, CA	110,820
Otay Mesa, CA	57,954	Otay Mesa, CA	65,474	Otay Mesa, CA	72,749
Laredo, TX	39,718	Laredo, TX	38,852	Laredo, TX	35,406
Hidalgo, TX	33,017	El Paso, TX	32,270	Hidalgo, TX	32,805
Brownsville, TX	14,026	Hidalgo, TX	31,952	El Paso, TX	30,031
Train passengers — top 5 gateways					
Eagle Pass, TX	6,704	Eagle Pass, TX	6,872	Eagle Pass, TX	6,496
Tecate, CA	5,018	Nogales, AZ	2,216	El Paso, TX	1,869
Nogales, AZ	2,648	Calexico East, CA	1,934	Nogales, AZ	1,664
El Paso, TX	2,337	El Paso, TX	1,866	Calexico East, CA	1,456
Calexico East, CA	1,722	Tecate, CA	1,760	Otay Mesa/San Ysidro, CA	460

NOTE

Data reflect all personal vehicles, buses, passengers and pedestrians entering the United States across the U.S.-Mexican border, regardless of nationality

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, special tabulation, June 2004. Based on the following primary data source: U.S. Department of Treasury, U.S. Customs Service, Office of Field Operations, Operations Management Database (Washington, DC: 2003).

Table 1-46: U.S. Ton-Miles of Freight (Millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL U.S. ton-miles of freight (millions)	U	1,854,034	2,206,713	2,284,706	2,988,522	2,949,410	3,195,677	3,232,634	3,337,086	3,363,542	3,526,823	3,648,036	3,724,723	3,682,437	3,710,237	3,780,225	3,778,042	3,757,546	U
Air carrier, domestic, all services ^a	553	1,353	2,709	3,470	4,528	5,156	9,064	8,860	9,820	10,675	11,803	12,520	12,861	13,601	13,840	14,202	14,983	13,288	13,882
Intercity truck ^b	285,000	359,000	412,000	454,000	555,000	610,000	735,000	758,000	815,000	861,000	908,000	921,000	972,000	996,000	1,027,000	1,059,000	1,074,000	(P) 1,051,000	U
Class I rail ^c	572,309	697,878	764,809	754,252	918,958	876,984	1,033,969	1,038,875	1,066,781	1,109,309	1,200,701	1,305,688	1,355,975	1,348,926	1,376,802	1,433,461	1,465,960	1,495,472	1,507,011
Domestic water transportation ^d	U	489,803	596,195	565,984	921,836	892,970	833,544	848,399	856,685	789,658	814,919	807,728	764,687	707,410	672,795	655,862	645,799	621,686	612,081
Coastwise	U	302,546	359,784	315,846	^e 631,149	610,977	479,134	502,133	502,311	448,404	457,601	440,345	408,086	349,843	314,864	292,730	283,872	274,559	263,668
Lakewise	U	75,918	79,416	68,517	61,747	48,184	60,930	55,339	55,785	56,438	58,263	59,704	58,335	62,166	61,654	57,045	57,879	50,854	53,653
Internal	U	109,701	155,816	180,399	227,343	232,708	292,393	289,959	297,639	283,894	297,762	306,329	296,791	294,023	294,896	304,724	302,558	294,861	293,410
Intraport	U	1,638	1,179	1,222	1,596	1,102	1,087	968	950	922	1,293	1,350	1,475	1,378	1,381	1,362	1,490	1,413	1,329
Oil pipeline ^b	229,000	306,000	431,000	507,000	588,200	564,300	584,100	578,500	588,800	592,900	591,400	601,100	619,200	616,500	619,800	617,700	577,300	576,100	586,200

KEY: P = preliminary; U = data are not available.

^a Includes freight, express, and mail revenue ton-miles as reported on U.S. DOT Form 41.

^b Intercity truck and oil pipeline estimates are reported in billions. The U.S. Department of Transportation, Bureau of Transportation Statistics converted these estimates to millions.

^c Revenue ton-miles.

^d Excludes intraterritorial traffic, for which ton-miles were not compiled.

^e Reflects startup between 1975 and 1980 of Alaska pipeline and consequent water transportation of crude petroleum from Alaskan ports to mainland United States for refining.

NOTE

Numbers may not add to totals due to roundings.

SOURCES

Air carrier, domestic, all services:

1960-65: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969* (Washington, DC: 1970).

1970-80: *Ibid.*, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues), p. 2, line 3.

1985-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues), p. 3, line 3.

Intercity truck:

1960-2001: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 42.

Class I rail:

1960-2002: Association of American Railroads, *Railroad Facts* (Washington, DC: 2002), p. 27.

Domestic water transportation:

1965-2002: U.S. Army Corps of Engineers, *Waterborne Commerce of the U.S.* (New Orleans, LA: Annual issues), part 5, section 1, table 1-4, and similar tables in earlier editions.

Oil pipeline:

1960-70: Eno Transportation Foundation, Inc., *Transportation in America, 1998* (Washington, DC: 1998), p. 44.

1975: Association of Oil Pipe Lines, *Shifts in Petroleum Transportation* (Washington, DC: Annual issues), table 4.

1980-2002: *Ibid.*, *Shifts in Petroleum Transportation* (Washington, DC: Annual issues), table 1.

Table 1-47: Top U.S. Foreign Trade Freight Gateways by Value of Shipments (Current \$ billions)

Gateway	Type	2002				2001			
		Rank	Exports	Imports	Total	Rank	Exports	Imports	Total
JFK International Airport, NY	Air	1	44.0	68.7	112.7	1	50.1	66.5	116.6
Port of Los Angeles, CA	Water	2	16.4	93.9	110.3	2	17.4	86.8	104.2
Port of Detroit, MI	Land	3	56.2	44.7	100.9	4	49.2	42.8	92.0
Port of New York, NY and NJ	Water	4	22.6	68.9	91.5	5	22.7	63.2	85.9
Port of Long Beach, CA	Water	5	15.1	73.7	88.8	3	16.7	78.0	94.7
Port of Laredo, TX	Land	6	32.3	46.9	79.3	6	34.7	44.9	79.6
Los Angeles International Airport, CA	Air	7	31.5	29.1	60.6	7	34.0	29.9	63.9
Port of Huron, MI	Land	8	19.1	38.3	57.4	10	17.3	38.4	55.6
Port of Buffalo-Niagara Falls, NY	Land	9	24.2	30.9	55.1	9	29.4	31.1	60.5
San Francisco International Airport, CA	Air	10	23.2	26.5	49.7	8	32.3	29.6	62.0
Chicago, IL	Air	11	18.6	29.2	47.8	11	19.9	25.0	44.9
Port of Houston, TX	Water	12	19.4	22.5	41.9	12	19.5	25.0	44.5
Port of El Paso, TX	Land	13	15.8	22.6	38.5	13	15.9	22.0	37.9
Port of Charleston, SC	Water	14	11.8	21.5	33.3	14	12.5	20.9	33.4
New Orleans, LA	Air	15	13.4	13.2	26.6	16	13.8	13.5	27.4
Port of Norfolk Harbor, VA	Water	16	10.8	15.2	26.0	18	11.3	13.6	24.9
Port of Seattle, WA	Water	17	5.3	18.5	23.8	15	5.3	23.3	28.6
Port of Baltimore, MD	Water	18	5.3	17.9	23.2	21	5.1	15.7	20.8
Port of Tacoma, WA	Water	19	4.4	18.4	22.9	25	4.3	14.4	18.7
Anchorage, AK	Air	20	4.8	18.0	22.7	20	5.1	16.8	21.9
Port of Oakland, CA	Water	21	7.5	15.3	22.7	17	7.7	17.2	25.0
Miami International Airport, FL	Air	22	13.3	7.8	21.1	19	15.4	7.2	22.6
Port of Otay Mesa Station, CA	Land	23	8.6	11.8	20.4	23	8.2	11.2	19.4
Dallas-Fort Worth, TX	Air	24	10.1	9.6	19.7	24	8.8	10.0	18.8
Port of Savannah, GA	Water	25	6.8	12.8	19.6	26	6.4	10.7	17.2
Port of New Orleans, LA	Water	26	10.0	8.8	18.8	27	8.1	8.8	17.0
Atlanta, GA	Air	27	7.7	9.8	17.5	30	7.6	8.3	15.8
Port of Miami, FL	Water	28	7.8	9.0	16.8	28	8.5	8.1	16.6
Cleveland, OH	Air	29	8.4	8.0	16.4	22	9.2	10.5	19.7
Port of Champlain-Rouses Pt., NY	Land	30	5.2	9.6	14.8	29	5.9	10.2	16.2
Port of Hidalgo, TX	Land	31	5.8	6.9	12.7	32	5.7	6.7	12.4
Port of Blaine, WA	Land	32	4.7	6.7	11.4	33	5.1	6.6	11.7
Port of Jacksonville, FL	Water	33	2.6	8.7	11.3	35	2.0	8.8	10.8
Port of Portland, OR	Water	34	2.6	8.6	11.2	36	2.7	8.0	10.7
Port of Nogales, AZ	Land	35	3.8	6.9	10.8	31	4.6	7.9	12.5
Port of Alexandria Bay, NY	Land	36	4.0	6.7	10.7	37	4.1	6.6	10.6
Port of Brownsville-Cameron, TX	Land	37	5.4	4.9	10.3	34	5.8	5.1	10.9
Port of Port Everglades, FL	Water	38	4.1	5.3	9.4	38	4.4	5.9	10.3
Port of Beaumont, TX	Water	39	0.8	8.3	9.1	51	0.8	6.8	7.7
Port of Philadelphia, PA	Water	40	0.6	8.3	8.8	40	0.6	9.4	10.0
San Juan International Airport, PR	Air	41	3.5	5.3	8.7	48	3.7	4.1	7.8
Philadelphia International Airport, PA	Air	42	4.4	4.3	8.7	45	4.9	3.9	8.8
Port of Pembina, ND	Land	43	4.4	4.3	8.7	43	4.4	4.5	8.9
Boston Logan Airport, MA	Air	44	5.1	3.3	8.5	42	5.7	3.6	9.2
Port of Calexico-East, CA	Land	45	3.6	4.8	8.4	52	3.2	4.1	7.3
Newark, NJ	Air	46	2.6	5.7	8.3	41	3.2	6.2	9.4
Port of Corpus Christi, TX	Water	47	1.6	6.0	7.5	50	1.2	6.5	7.7
Port of Sweetgrass, MT	Land	48	3.3	4.2	7.5	46	3.8	4.4	8.3
Port of Morgan City, LA	Water	49	0.2	7.2	7.4	47	0.1	7.7	7.8

Houston International Airport, TX	Air	50	4.5	2.9	7.4	49	4.8	2.9	7.7
Total top 50 gateways		NA	547.0	940.5	1,487.5	NA	^a 579.5	^a 920.8	^a 1,500.3

KEY: NA = not applicable.

^a Based on top 50 freight gateways in 2001.

NOTES

All data: Trade levels reflect the mode of transportation as a shipment enters or exits at a border port. Flows through individual ports are based on reported data collected from U.S. trade documents. Trade does not include low-value shipments. (In general, these are imports valued at less than \$1,250 and exports that are valued at less than \$2,500).

In 2001, Port of South Louisiana, LA (water) ranked 39th and Seattle-Tacoma International Airport, WA (air) ranked 44th.

Numbers may not add to totals due to roundings.

Air: Data for all air gateways include a low level (generally less than 2%-3% of the total value) of small user-fee airports located in the same region. Air gateways not identified by airport name (e.g., Chicago, IL, and others) include major airport(s) in that geographic area in addition to small regional airports. In addition, due to Bureau of Census confidentiality regulations, data for courier operations are included in the airport totals for JFK International Airport, New Orleans, Los Angeles, Cleveland, Chicago, Miami, and Anchorage.

SOURCES

Air: U.S. Department of Commerce, Bureau of the Census, Foreign Trade Division, special tabulation, August 2002 and August 2003.

Water: U.S. Department of Transportation, Maritime Administration, Office of Statistical and Economic Analysis, personal communications, Aug. 27, 2002 and Aug. 6, 2003.

Land: U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data, August 2002 and August 2003.

Table 1-48: U.S.-Canadian Border Land-Freight Gateways: Number of Truck or Railcar Crossings

Truck	2001	2002	2003
Total U.S.-Canadian border	6,776,909	6,915,973	6,727,292
Total top 5 gateways	4,448,865	4,567,704	4,478,405
Detroit, MI	1,642,042	1,670,565	1,634,319
Buffalo-Niagara, NY	1,123,971	1,208,095	1,162,961
Port Huron, MI	828,802	907,729	928,074
Blaine, WA	471,731	410,256	387,962
Champlain-Rouse Pt, NY	382,319	371,059	365,089
Rail			
Total U.S.-Canadian border	1,779,345	1,830,259	1,849,911
Total top 5 gateways	1,277,982	1,310,729	1,333,244
Port Huron, MI	449,299	429,918	458,551
Detroit, MI	304,591	293,300	254,688
International Falls, MN	205,430	238,515	252,699
Portal, ND	168,137	199,637	217,390
Buffalo-Niagara, NY	150,525	149,359	149,916

NOTES

Truck: Data represent the number of truck crossings, not the number of unique vehicles. Data are for both loaded and empty trucks.

Rail: Data includes both loaded and unloaded railcars.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, special tabulation, July 2004. Based on the following primary data source:
 U.S. Department of Treasury, U.S. Customs Service, Office of Field Operations, Operations Management Database, special tabulation (Washington, DC: 2003).

Table 1-49: U.S.-Mexican Border Land-Freight Gateways: Number of Truck or Railcar Crossings

Truck	2001		2002		2003
Total U.S.-Mexican border	4,304,959	Total U.S.-Mexican border	4,426,593	Total U.S.-Mexican border	4,238,045
Total top 5 gateways	3,398,053	Total top 5 gateways	3,544,815	Total top 5 gateways	3,378,199
Laredo, TX	1,403,914	Laredo, TX	1,441,653	Laredo, TX	1,354,229
Otay Mesa/San Ysidro, CA	708,446	Otay Mesa/San Ysidro, CA	731,291	Otay Mesa/San Ysidro, CA	697,152
El Paso, TX	660,583	El Paso, TX	705,199	El Paso, TX	659,614
Hidalgo, TX	368,395	Hidalgo, TX	390,282	Hidalgo, TX	406,064
Calexico East, CA	256,715	Calexico East, CA	276,390	Calexico East, CA	261,140
Rail					
Total U.S.-Mexican border	582,652	Total U.S.-Mexican border	602,322	Total U.S.-Mexican border	607,475
Total top 5 gateways	572,034	Total top 5 gateways	591,255	Total top 5 gateways	596,773
Laredo, TX	273,935	Laredo, TX	296,782	Laredo, TX	313,244
Brownsville, TX	101,787	Eagle Pass, TX	98,236	Brownsville, TX	98,622
Eagle Pass, TX	93,108	Brownsville, TX	96,591	Eagle Pass, TX	88,329
Nogales, AZ	58,667	Nogales, AZ	52,236	El Paso, TX	50,893
El Paso, TX	44,537	El Paso, TX	47,410	Nogales, AZ	45,685

NOTES

Truck: Data represent the number of truck crossings, not the number of unique vehicles. Data are for both loaded and empty trucks.

Rail: Data includes both loaded and unloaded railcars.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, special tabulation, July 2004. Based on the following primary data source: U.S. Department of Treasury, U.S. Customs Service, Office of Field Operations, Operations Management Database, special tabulation (Washington, DC: 2003).

Table 1-50: U.S. Waterborne Freight (Million short tons)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL freight	1,099.9	1,272.9	1,531.7	1,695.0	1,998.9	1,788.4	2,163.9	2,092.1	2,132.1	2,128.2	2,214.8	2,240.4	2,284.1	2,333.1	2,339.5	2,322.6	2,424.6	(R) 2,393.3	2,340.3
Foreign	339.3	443.7	581.0	748.7	921.4	774.3	1,041.6	1,013.6	1,037.5	1,060.0	1,115.7	1,147.4	1,183.4	1,220.6	1,245.4	1,260.8	1,354.8	(R) 1,350.8	1,319.3
Imports	211.3	269.8	339.3	476.6	517.5	412.7	600.0	555.4	586.7	648.8	719.5	672.7	732.6	788.3	840.7	860.8	939.7	(R) 951.8	934.9
Exports	128.0	173.9	241.6	272.1	403.9	361.6	441.6	458.2	450.8	411.3	396.2	474.7	450.8	432.3	404.7	400.0	415.0	399.0	384.3
Domestic	760.6	829.2	950.7	946.3	1,077.5	1,014.1	1,122.3	(R) 1,078.5	1,094.6	1,068.2	1,099.0	1,093.0	1,100.7	1,112.5	1,094.1	1,061.8	1,069.8	1,042.5	1,021.0
Inland	291.1	369.6	472.1	503.9	535.0	534.7	622.6	600.4	621.0	607.3	618.4	620.3	622.1	630.6	625.0	624.6	628.4	619.8	608.0
Coastal	209.2	201.5	238.4	231.9	329.6	309.8	298.6	294.5	285.1	271.7	277.0	266.6	267.4	263.1	249.6	228.8	226.9	223.6	216.4
Great Lakes	155.1	153.7	157.1	129.3	115.1	92.0	110.2	103.4	107.4	109.9	114.8	116.1	114.9	122.7	122.2	113.9	114.4	100.0	101.5
Intraport	104.2	102.9	81.5	78.3	94.2	74.3	86.4	75.6	76.8	74.4	82.9	83.1	89.0	89.8	90.1	(R) 88.6	94.6	93.2	90.0
Intraterritory	1.0	1.5	1.6	2.9	3.6	3.4	4.5	4.6	4.2	5.0	5.9	6.9	7.3	6.3	7.2	5.9	5.5	5.9	5.1

KEY: R = revised.

NOTES

Beginning in 1996, shipments of fish are excluded from domestic tonnage totals.
Numbers may not add to totals due to roundings.

SOURCE

1960-2002: U.S. Army Corps of Engineers, *Waterborne Commerce of the United States*
(New Orleans, LA: February 6, 2004), part 5, tables 1-1, 1-3, and 1-6.

Table 1-51: Tonnage of Top 50 U.S. Water Ports, Ranked by Total Tons^a

	1992		2001		2002		Percent change 2001-2002	Percent change 1992-2002
	Rank	Total tons (Millions)	Rank	Total tons (Millions)	Rank	Total tons (Millions)		
South Louisiana, LA	1	199.7	1	212.6	1	216.4	1.8%	8.4%
Houston, TX	2	137.7	2	185.1	2	177.6	-4.0%	29.0%
New York, NY and NJ	3	115.3	3	137.5	3	134.5	-2.2%	16.6%
Beaumont, TX	26	22.7	5	79.1	4	85.9	8.6%	278.4%
New Orleans, LA	6	66.4	4	85.6	5	85.0	-0.7%	27.9%
Huntington, WV-KY-OH	29	21.8	7	76.7	6	81.1	5.7%	271.3%
Corpus Christi, TX	7	60.9	6	77.6	7	72.0	-7.2%	18.3%
Long Beach, CA	10	52.0	8	67.6	8	67.9	0.3%	30.4%
Baton Rouge, LA	5	84.7	10	61.4	9	60.6	-1.4%	-28.5%
Plaquemines, LA	8	58.5	11	60.7	10	59.1	-2.6%	1.1%
Texas City, TX	13	43.1	9	62.3	11	55.2	-11.3%	28.1%
Los Angeles, CA	15	40.1	14	51.4	12	52.2	1.6%	30.2%
Pittsburgh, PA	19	34.3	12	53.0	13	52.1	-1.8%	51.7%
Valdez, AK	4	93.7	15	51.0	14	50.5	-0.9%	-46.1%
Tampa, FL	11	46.4	18	45.8	15	48.4	5.7%	4.2%
Lake Charles, LA	12	44.0	13	52.8	16	47.5	-10.1%	7.9%
Mobile, AL	14	40.5	16	48.1	17	46.0	-4.4%	13.7%
Duluth-Superior, MN-WI	17	39.3	20	39.8	18	44.2	10.9%	12.4%
Baltimore, MD	18	37.7	19	42.1	19	38.8	-7.7%	3.1%
Philadelphia, PA	16	39.7	17	46.4	20	34.1	-26.5%	-14.0%
St. Louis, MO-IL	21	31.9	22	34.4	21	32.6	-5.3%	2.0%
Pascagoula, MS	22	29.2	25	29.5	22	31.9	7.8%	8.9%
Norfolk Harbor, VA	9	53.5	21	37.3	23	27.9	-25.2%	-47.8%
Freeport, TX	38	15.0	24	30.1	24	27.2	-9.9%	81.7%
Portland, ME	47	12.5	26	28.5	25	27.1	-4.8%	116.9%
Portland, OR	23	28.2	23	31.3	26	26.6	-15.0%	-5.6%
Paulsboro, NJ	31	20.3	31	21.3	27	26.4	24.1%	30.3%
Marcus Hook, PA	24	26.6	37	19.1	28	25.2	31.8%	-5.1%
Charleston, SC	55	9.7	27	23.3	29	25.0	7.5%	159.0%
Port Arthur, TX	20	33.5	28	22.8	30	22.7	-0.6%	-32.4%
Richmond, CA	30	21.0	32	21.2	31	21.9	3.2%	4.1%
Port Everglades, FL	39	14.5	30	21.9	32	21.3	-2.9%	46.7%
Savannah, GA	41	14.0	36	19.4	33	20.7	6.6%	47.7%
Tacoma, WA	32	20.1	35	20.5	34	20.6	0.3%	2.3%
Chicago, IL	27	22.2	29	22.0	35	20.4	-7.2%	-7.9%
Boston, MA	33	19.2	33	20.6	36	20.4	-1.1%	6.0%
Seattle, WA	28	21.9	34	20.5	37	19.6	-4.7%	-10.5%
Jacksonville, FL	34	17.2	38	17.8	38	17.9	0.5%	4.1%
Detroit, MI	35	16.3	39	17.0	39	17.3	1.9%	6.1%
Honolulu, HI	51	11.5	42	16.6	40	16.6	0.4%	44.4%
Memphis, TN	44	13.3	40	16.9	41	16.4	-3.0%	23.5%
Anacortes, WA	37	15.3	41	16.8	42	15.4	-8.4%	0.7%
Two Harbors, MN	52	11.2	49	11.9	43	14.9	25.4%	33.5%
Indiana Harbor, IN	36	15.3	45	13.6	44	13.8	1.9%	-9.7%
Cincinnati, OH	49	11.9	43	14.1	45	13.0	-7.7%	9.7%
Oakland, CA	45	13.2	47	12.3	46	12.5	1.5%	-5.7%
San Juan, PR	40	14.3	46	12.8	47	12.4	-3.3%	-13.6%
Cleveland, OH	42	13.7	48	11.9	48	11.4	-4.4%	-16.4%
Newport News, VA	25	24.5	44	13.9	49	11.3	-18.5%	-53.8%
Toledo, OH	46	12.7	51	10.5	50	11.1	5.5%	-12.6%
Total top 50		1,862.1		2,146.4		2,110.4	-1.7%	13.3%
All ports		2,132.1		2,393.3		2,340.3	-2.2%	9.8%

^a Tonnage totals include both domestic and foreign waterborne trade.

NOTE

In 1992, Lorain, OH, ranked 43rd (13.3 million tons); Galveston, TX, ranked 48th (12.3 million tons); and New Castle, DE, ranked 50th (11.8 million tons).
In 2001, Ashtabula, OH, ranked 50th (10.9 million tons).

Numbers may not add to totals due to rounding.

SOURCES

1992: Ibid., *Waterborne Commerce of the United States, Calendar Year 1992, Part 5, National Summaries* (New Orleans, LA: 1994), table 1-1 and 5-2.

2001: Ibid., *Waterborne Commerce of the United States, Calendar Year 2001, Part 5, National Summaries* (New Orleans, LA: 2003), tables 1-1 and 5-2.

2002: Ibid., *A23, Calendar Year 2002, Part 5, National Summaries* (New Orleans, LA: 2004), tables 1-1 and 5-2.

Table 1-52: Freight Activity in the United States: 1993, 1997, and 2002^a

Mode of transportation	Value				Tons				Ton-miles ^c			
	1993 (billion \$)	1997 (billion \$)	2002 (billion \$)	Percent change (1993-2002)	1993 (millions)	1997 (millions)	2002 (millions)	Percent change (1993-2002)	1993 (billions)	1997 (billions)	2002 (billions)	Percent change (1993-2002)
TOTAL all modes	5,846.3	6,944.0	8,483.1	45.1	9,688.5	11,089.7	11,572.8	19.4	2,420.9	2,661.4	3,204.4	32.4
Single modes, total	4,941.5	5,719.6	7,052.9	42.7	8,922.3	10,436.5	10,878.1	21.9	2,136.9	2,383.5	2,913.0	36.3
Truck ^a	4,403.5	4,981.5	6,200.5	40.8	6,385.9	7,700.7	7,622.3	19.4	869.5	1,023.5	1,311.1	50.8
For-hire truck	2,625.1	2,901.3	3,838.5	46.2	2,808.3	3,402.6	3,666.0	30.5	629.0	741.1	1,001.5	59.2
Private truck	1,755.8	2,036.5	2,340.3	33.3	3,543.5	4,137.3	3,920.5	10.6	235.9	268.6	302.0	28.0
Rail	247.4	319.6	320.5	29.5	1,544.1	1,549.8	1,816.5	17.6	942.6	1,022.5	1,199.4	27.2
Water	61.6	75.8	90.9	47.5	505.4	563.4	713.9	41.2	272.0	261.7	323.1	18.8
Shallow draft	40.7	53.9	56.5	38.7	362.5	414.8	499.7	37.9	164.4	189.3	236.6	44.0
Great Lakes	S	1.5	0.8	S	33.0	38.4	39.5	19.5	12.4	13.4	19.5	57.7
Deep draft	19.7	20.4	33.6	70.3	109.9	110.2	174.7	58.9	95.2	59.0	66.9	-29.7
Air (includes truck and air)	139.1	229.1	279.5	100.9	3.1	4.5	3.9	24.0	4.0	6.2	5.6	38.7
Pipeline ^b	89.8	113.5	161.6	79.9	483.6	618.2	721.6	49.2	S	S	S	S
Multiple modes, total	662.6	945.9	1,111.0	67.7	225.7	216.7	198.5	-12.1	191.5	204.5	214.8	12.2
Parcel, U.S. Postal Service or courier	563.3	855.9	1022.0	81.4	18.9	23.7	26.4	40.0	13.2	18.0	20.5	56.2
Truck and rail	83.1	75.7	S	S	40.6	54.2	S	S	37.7	55.6	S	S
Truck and water	9.4	8.2	17.1	81.6	68.0	33.2	31.8	-53.2	40.6	34.8	59.1	45.6
Rail and water	3.6	1.8	S	S	79.2	79.3	S	S	70.2	77.6	S	S
Other multiple modes	3.2	4.3	5.5	71.9	18.9	26.2	28.0	48.1	S	18.6	19.6	S
Other / unknown modes, total	242.3	278.6	319.2	31.8	540.5	436.5	496.2	-8.2	92.6	73.4	76.6	-17.3

KEY: P = preliminary; S = data are not published because of high sampling variability or other reasons.

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

^b Excludes most shipments of crude oil.

^c Ton-miles estimates are based on estimated distances traveled along a modeled transportation network.

NOTE

Numbers may not add to totals due to rounding. Estimates for 2002 are preliminary and may be revised. Value-of-shipments estimates have not been adjusted for price changes. Coverage for the 2002 Commodity Flow Survey (CFS) differs from the previous surveys due to a change from the 1987 Standard Industrial Classification system to the 1997 North American Industry Classification System and other survey improvements. Therefore, data users are urged to use caution when comparing 2002 CFS estimates with estimates from prior years.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *2002 Commodity Flow Survey: United States (Preliminary)* (Washington, DC: December 2003), tables 1b and 1c.

Table 1-53: Value, Tons, and Ton-Miles of Freight Shipments within the United States by Domestic Establishments, 2002^P

SCTG	Value (\$billions)		Tons (millions)		Ton-miles ^b (billions)		Value per ton (\$)	Average miles per shipment
		Percent		Percent		Percent		
01 Live animals and live fish	7.2	0.1	6.5	0.1	2.0	0.1	1,099	534
02 Cereal grains	55.9	0.7	578.6	5.0	263.7	8.2	97	125
03 Other agricultural products	129.9	1.5	277.5	2.4	122.1	3.8	468	477
04 Animal feed and products of animal origin (NEC)	55.3	0.7	240.0	2.1	77.5	2.4	230	141
05 Meat, fish, seafood, and their preparations	204.9	2.4	85.0	0.7	41.8	1.3	2,410	192
06 Milled grain products, preparations, and bakery products	119.7	1.4	116.0	1.0	51.4	1.6	1,032	265
07 Other prepared foodstuffs and fats and oils	362.3	4.3	463.4	4.0	171.2	5.3	782	206
08 Alcoholic beverages	115.8	1.4	93.7	0.8	25.6	0.8	1,236	56
09 Tobacco products	77.2	0.9	5.8	0.1	1.3	0.0	13,320	414
10 Monumental or building stone	2.5	0.0	16.9	0.1	1.3	0.0	145	170
11 Natural sands	4.6	0.1	466.3	4.0	34.0	1.1	10	57
12 Gravel and crushed stone	12.6	0.1	1,775.2	15.3	104.6	3.3	7	33
13 Nonmetallic minerals (NEC)	12.7	0.1	186.3	1.6	57.0	1.8	68	214
14 Metallic ores and concentrates	15.7	0.2	116.1	1.0	59.4	1.9	136	465
15 Coal	24.1	0.3	1,255.1	10.8	562.5	17.6	19	112
17 Gasoline and aviation turbine fuel	233.6	2.8	840.4	7.3	130.2	4.1	278	103
18 Fuel oils	109.6	1.3	507.5	4.4	108.9	3.4	216	81
19 Coal and petroleum products (NEC)	74.7	0.9	431.3	3.7	96.0	3.0	173	125
20 Basic chemicals	152.1	1.8	497.0	4.3	173.9	5.4	306	516
21 Pharmaceutical products	426.8	5.0	22.8	0.2	12.1	0.4	18,697	722
22 Fertilizers	34.1	0.4	214.2	1.9	74.4	2.3	159	150
23 Chemical products and preparations (NEC)	234.4	2.8	109.8	0.9	54.8	1.7	2,134	409
24 Plastics and rubber	343.4	4.0	147.0	1.3	83.9	2.6	2,335	430
25 Logs and other wood in the rough	5.2	0.1	86.3	0.7	8.9	0.3	60	108
26 Wood products	140.0	1.7	321.1	2.8	114.0	3.6	436	250
27 Pulp, newsprint, paper, and paperboard	102.4	1.2	139.9	1.2	82.6	2.6	732	233
28 Paper or paperboard articles	105.9	1.2	72.5	0.6	25.5	0.8	1,460	282
29 Printed products	136.9	1.6	34.4	0.3	17.4	0.5	3,977	903
30 Textiles, leather, and articles of textiles or leather	507.0	6.0	53.3	0.5	34.6	1.1	9,511	967
31 Nonmetallic mineral products	143.1	1.7	910.3	7.9	120.3	3.8	157	388
32 Base metal in primary or semifinished forms and in finished basic shapes	253.7	3.0	326.0	2.8	121.6	3.8	778	275
33 Articles of base metal	234.9	2.8	115.7	1.0	44.4	1.4	2,031	396
34 Machinery	509.5	6.0	62.9	0.5	34.7	1.1	8,094	413
35 Electronic and other electrical equipment and components and office equipment	948.0	11.2	53.8	0.5	32.9	1.0	17,625	747
36 Motorized and other vehicles (including parts)	735.7	8.7	133.7	1.2	59.1	1.8	5,504	401
37 Transportation equipment (NEC)	163.0	1.9	10.3	0.1	6.2	0.2	15,871	1,003
38 Precision instruments and apparatus	222.0	2.6	15.2	0.1	3.4	0.1	14,600	986
Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	135.0	1.6	30.9	0.3	13.3	0.4	4,373	564
40 Miscellaneous manufactured products	404.7	4.8	90.6	0.8	37.1	1.2	4,467	1,003
41 Waste and scrap	49.3	0.6	305.6	2.6	71.1	2.2	161	163
43 Mixed freight	858.3	10.1	332.2	2.9	57.8	1.8	2,584	434
Commodity unknown	19.6	0.2	25.5	0.2	10.1	0.3	769	585
All commodities^a	8,483.1	100.0	11,572.8	100.0	3,204.4	100.0	733	589

KEY: NEC = not elsewhere classified; P = preliminary; SCTG = Standard Classification of Transportation Goods.

^a Estimates exclude shipments of crude petroleum (SCTG 16).

^b Ton-miles estimates are based on estimated distances traveled along a modeled transportation network.

NOTE

Estimates are preliminary and may be revised. Coverage for the 2002 Commodity Flow Survey (CFS) differs from previous surveys due to a change from the 1987 Standard Industrial Classification system to the 1997 North American Industry Classification System and other survey improvements. Therefore, data users are urged to use caution when comparing 2002 CFS estimates with estimates from prior years.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, U.S. Department of Commerce, Census Bureau, *2002 Commodity Flow Survey: United States (Preliminary)* (Washington, DC: December 2003), table 3a.

Table 1-54: Value of U.S. Land Exports to and Imports from Canada and Mexico by Mode (\$ millions)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Exports to Canada, total	124,701.2	129,884.1	139,109.7	133,970.3	137,745.4	146,374.1	154,847.4	145,661.6	146,435.3	154,870.8
Truck	89,151.1	97,423.4	102,743.0	111,173.8	114,806.1	123,140.0	129,825.3	117,694.5	118,259.1	124,235.0
Rail	13,593.9	15,271.9	15,678.7	13,255.6	12,279.6	11,754.6	12,946.5	12,972.7	13,974.1	14,776.5
Pipeline	133.8	121.3	162.2	180.6	93.4	113.9	161.6	221.3	174.3	759.6
Other ^a	21,753.2	17,010.5	20,467.5	9,336.1	10,559.5	11,360.0	11,913.4	14,772.0	14,026.7	15,099.2
Mail	69.3	57.0	58.3	24.1	6.8	5.6	0.6	1.1	1.2	0.4
Exports to Mexico, total	46,503.3	42,662.2	51,753.4	64,169.5	70,165.3	76,129.0	97,158.9	88,926.4	85,157.8	85,614.8
Truck	39,066.5	35,914.2	44,091.8	55,592.6	60,432.1	66,923.8	82,389.2	74,223.1	70,924.7	70,550.8
Rail	4,192.0	4,694.4	5,119.2	5,648.0	6,188.8	5,710.6	10,495.8	10,389.4	10,143.0	11,264.9
Pipeline	0.4	1.0	2.3	68.3	73.4	144.2	301.8	296.1	567.9	155.3
Other ^a	3,238.9	2,025.8	2,540.1	2,860.5	3,470.0	3,349.6	3,972.0	4,017.7	3,521.5	3,643.3
Mail ^b	5.5	26.8	-	0.1	1.0	0.7	-	0.1	0.6	0.4
Imports from Canada, total	123,504.9	143,669.5	156,206.6	155,682.6	162,105.7	183,723.5	210,270.5	200,853.4	194,820.7	207,448.4
Truck	79,456.4	88,964.9	98,400.8	99,814.8	108,856.7	118,901.4	127,816.3	117,129.9	117,985.3	116,714.1
Rail	30,322.8	39,996.9	39,811.0	38,293.0	37,374.1	46,255.4	49,699.2	47,197.9	46,966.8	49,980.9
Pipeline	9,728.6	10,606.6	12,796.2	13,879.5	11,120.1	12,055.5	23,117.1	25,908.5	21,832.3	31,451.3
Other ^a	3,991.6	3,888.2	4,968.4	3,572.5	4,575.1	6,386.9	9,571.0	10,523.8	7,992.7	9,236.6
Mail	5.5	5.2	6.9	0.4	1.7	13.1	4.1	7.2	0.4	0.3
FTZ ^c	U	207.6	223.4	122.4	177.9	111.2	62.8	86.1	43.3	65.3
Imports from Mexico, total	43,616.2	54,048.9	63,312.2	72,155.0	81,720.3	95,023.4	113,436.4	111,870.3	114,380.8	114,842.5
Truck	35,013.9	43,014.3	48,350.0	56,716.5	65,883.7	76,448.0	88,668.7	86,377.2	90,593.6	92,535.0
Rail	7,769.0	9,137.9	12,297.7	12,646.9	12,029.7	14,693.4	21,056.1	22,056.8	20,790.7	19,701.7
Pipeline	187.9	27.4	8.1	3.6	2.4	1.5	11.5	1.6	0.6	0.2
Other ^a	643.5	768.9	639.2	668.2	917.8	1,255.8	1,573.9	1,539.7	1,548.9	1,600.1
Mail	1.9	1.3	1.5	0.2	0.2	0.2	0.6	0.1	0.2	-
FTZ ^c	U	1,099.2	2,015.6	2,119.6	2,886.7	2,624.4	2,125.7	1,894.9	1,446.8	1,005.4

KEY: -- = value too small to report; U = data are not available.

^a 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.

^b Beginning in January 1996, new edit checks were added to the processing of the Transborder Surface Freight Data. Because of these checks, the number of mail export shipments from the United States to Mexico declined sharply between 1995 and 1996. The Census Bureau found that a number of rail shipments were misidentified as mail shipments in 1994 and 1995, although the exact proportion of these is unknown.

^c Foreign Trade Zones (FTZs) were added as a mode of transport for land import shipments beginning in April 1995. Although FTZs are being treated as a mode of transportation in the Transborder Surface 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.

NOTES

Shipments that neither originate nor terminate in the United States (i.e., in transit, in-bond shipments) are not included here, although they use the U.S. transportation system. These shipments are usually part of Mexico-Canada trade, and simply pass through the United States. Transshipments, however, are included between 1994, 1995, and 1996; these are shipments that entered or exited the United States by way of a Customs port on the northern or southern border, but whose origin or destination was a country other than Canada or Mexico. Starting in 1997, transshipments are excluded. Users should note these differences before comparing figures for 1994-96 with 1997 and subsequent year data. Data exclude export shipments valued at less than \$2,500 and import shipments valued at less than \$1,250.

Numbers may not add to totals due to roundings.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data, Internet site www.bts.gov/transborder as of July 27, 2004.

Table 1-55: Crude Oil and Petroleum Products Transported in the United States by Mode (billions)

	1975		1980		1985		1990		1995		1996		1997		1998		1999		2000		2001		2002	
	Ton-miles	Percent	Ton-miles	Percent	Ton-miles	Percent	Ton-miles	Percent	Ton-miles	Percent	Ton-miles	Percent	Ton-miles	Percent	Ton-miles	Percent	Ton-miles	Percent	Ton-miles	Percent	Ton-miles	Percent	Ton-miles	Percent
Crude oil, total	331.5	100.0	753.0	100.0	786.2	100.0	628.2	100.0	586.0	100.0	543.2	100.0	486.9	100.0	454.1	100.0	423.0	100.0	376.0	100.0	376.6	100.0	384.0	100.0
Pipelines ^a	288.0	86.9	362.6	48.2	334.4	42.5	334.8	53.3	335.9	57.3	338.3	62.3	337.4	69.3	334.1	73.6	321.1	75.9	283.4	75.4	277.0	73.6	286.6	74.7
Water carriers	40.6	12.2	(c) 387.4	51.4	449.2	57.2	291.2	46.4	247.7	42.3	202.4	37.3	147.3	30.3	117.9	26.0	100.0	23.6	91.0	24.2	98.1	26.0	95.7	24.9
Motor carriers ^b	1.4	0.4	2.5	0.3	1.8	0.2	1.5	0.2	1.7	0.3	1.7	0.3	1.7	0.3	1.6	0.3	1.4	0.3	1.2	0.3	1.1	0.3	1.2	0.3
Railroads	1.5	0.5	0.5	0.1	0.8	0.1	0.7	0.1	0.8	0.1	0.8	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.4	0.1	0.4	0.1	0.5	0.1
Refined petroleum products, total	515.2	100.0	492.3	100.0	409.3	100.0	448.6	100.0	458.9	100.0	479.0	100.0	469.6	100.0	475.7	100.0	489.9	100.0	497.3	100.0	493.2	100.0	480.6	100.0
Pipelines ^a	219.0	42.5	225.6	45.8	229.9	56.2	249.3	55.6	265.2	57.8	280.9	58.6	279.1	59.4	285.7	60.1	296.6	60.5	293.9	59.1	299.1	60.6	299.6	62.3
Water carriers	257.4	50.0	230.4	46.8	141.2	34.5	157.8	35.2	153.2	33.4	154.1	32.2	148.3	31.6	147.1	30.9	147.5	30.1	153.4	30.8	145.9	29.6	131.9	27.4
Motor carriers ^b	26.2	5.1	24.3	5.0	26.9	6.6	28.2	6.3	24.6	5.3	28.0	5.9	26.0	5.5	26.7	5.6	27.6	5.6	30.1	6.1	29.7	6.0	29.4	6.1
Railroads	12.6	2.4	12.0	2.4	11.3	2.7	13.3	2.9	15.9	3.5	16.0	3.3	16.2	3.5	16.2	3.4	18.2	3.7	19.9	4.0	18.5	3.8	19.7	4.1
Combined crude and petroleum products, total	846.7	100.0	1,245.3	100.0	1,195.5	100.0	1,076.8	100.0	1,044.9	100.0	1,022.2	100.0	956.5	100.0	929.8	100.0	912.9	100.0	873.3	100.0	869.8	100.0	864.6	100.0
Pipelines ^a	507.0	59.9	588.2	47.2	564.3	47.2	584.1	54.2	601.1	57.5	619.2	60.6	616.5	64.5	619.8	66.7	617.7	67.7	577.3	66.1	576.1	66.2	586.2	67.8
Water carriers	298.0	35.2	(c) 617.8	49.6	590.4	49.4	449.0	41.7	400.9	38.4	356.5	34.9	295.6	30.9	265.0	28.5	247.5	27.1	244.4	28.0	244.0	28.1	227.6	26.3
Motor carriers ^b	27.6	3.3	26.8	2.2	28.7	2.4	29.7	2.8	26.3	2.5	29.7	2.9	27.7	2.9	28.3	3.0	29.0	3.2	31.3	3.6	30.8	3.5	30.6	3.5
Railroads	14.1	1.7	12.5	1.0	12.1	1.0	14.0	1.3	16.6	1.6	16.8	1.6	16.7	1.8	16.7	1.8	18.7	2.1	20.3	2.3	18.9	2.2	20.2	2.3

^a The amount carried by pipeline is based on ton-miles of crude and petroleum products transported through federally regulated pipelines (84%), plus estimated ton-miles of crude and petroleum products transported through nonfederally regulated pipelines (16%).

^b The amount carried by motor carriers is estimated.

^c Reflects the entrance between 1975 and 1980 of the Alaska pipeline, moving crude petroleum for water transportation to U.S. refineries.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

1975: Association of Oil Pipe Lines, *Shifts in Petroleum Transportation* (Washington, DC), table 6.
 1980-2002: Ibid., (Annual issues), tables 1, 2, and 3.

Table 1-56: U.S. Hazardous Materials Shipments by Transportation Mode, 1997

Transportation mode	Value		Tons		Ton-miles	
	(\$ billion)	Percent	(millions)	Percent	(billions)	Percent
TOTAL all modes	466.4	100.0	1,565.2	100.0	263.8	100.0
Single modes, total	452.7	97.1	1,541.7	98.5	258.9	98.1
Truck ^a	298.2	63.9	869.8	55.6	74.9	28.4
For-hire	134.3	28.8	336.4	21.5	45.2	17.1
Private ^b	160.7	34.5	522.7	33.4	28.8	10.9
Rail	33.3	7.1	96.6	6.2	74.7	28.3
Water	27.0	5.8	143.2	9.1	68.2	25.9
Air	8.6	1.8	0.1	–	0.1	–
Pipeline ^c	85.7	18.4	432.1	27.6	S	S
Multiple modes, total	5.7	1.2	6.0	0.4	3.1	1.2
Parcel, U.S. Postal Service or Courier	2.9	0.6	0.1	–	0.1	–
Other	2.9	0.6	5.9	0.4	3.0	1.1
Unknown and other modes, total	7.9	1.7	17.5	1.1	1.8	0.7

KEY: – = less than 1 unit of measure or equal to zero; S = data are not published because of high sampling variability or other reasons.

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

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

^c Excludes most shipments of crude oil. See previous table for the estimated amount of crude oil and petroleum products transported in the United States.

NOTE

Numbers may not add to totals due to roundings.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, U.S. Department of Commerce, Census Bureau, *1997 Economic Census, Transportation, 1997 Commodity Flow Survey, Hazardous Materials* (Washington, DC: December 1999), table 1.

Table 1-57: U.S. Hazardous Materials Shipments by Hazard Class, 1997

Hazard class and description	Value (\$ billion)		Tons (millions)		Ton-miles (billions)		Average miles per shipment
		Percent		Percent		Percent	
Class 1. Explosives	4.3	0.9%	1.5	0.1%	S	S	549
Class 2. Gases	40.9	8.8%	115.0	7.3%	21.8	8.3%	66
Class 3. Flammable liquids	335.6	72.0%	1,264.3	80.8%	160.0	60.7%	73
Class 4. Flammable solids	3.9	0.8%	11.8	0.8%	9.6	3.6%	838
Class 5. Oxidizers and organic peroxides	4.5	1.0%	9.2	0.6%	4.5	1.7%	193
Class 6. Toxics (poison)	10.1	2.2%	6.4	0.4%	2.8	1.1%	402
Class 7. Radioactive materials	2.7	0.6%	0.9	0.1%	RZ	RZ	445
Class 8. Corrosive materials	40.4	8.7%	91.6	5.9%	41.2	15.6%	201
Class 9. Miscellaneous dangerous goods	23.9	5.1%	65.3	4.2%	22.7	8.6%	323
Total	466.4	100.0%	1,565.2	100.0%	263.8	100.0%	113

KEY: RZ = less than 1 unit of measure or rounds to zero; S = data were not published because of high sampling variability or other reasons.

NOTE

Numbers may not add to totals due to roundings.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics and U.S. Department of Commerce, Census Bureau, *1997 Economic Census, Transportation, 1997 Commodity Flow Survey, Hazardous Materials* (Washington, DC: December 1999), table 2.

Section E

Physical Performance

Table 1-58: Passengers Denied Boarding by the Largest U.S. Air Carriers^a (Thousands)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Boarded	420,696	429,190	445,271	449,184	457,286	460,277	480,555	502,960	514,170	523,081	543,344	^R 477,970	467,205	485,797
Denied boarding, ^b total	628	646	764	683	824	843	957	1,071	1,136	1,070	1,120	^R 900	837	769
Voluntary	561	599	718	632	771	794	899	1,018	1,091	1,024	1,062	^R 861	803	727
Involuntary	67	47	46	51	53	49	58	54	45	46	57	^R 39	34	42
Percent denied boarding	0.15%	0.15%	0.17%	0.15%	0.18%	0.18%	0.20%	0.21%	0.22%	0.20%	0.21%	0.19%	0.18%	0.16%

KEY: R = revised.

^a Data include nonstop scheduled service between points within the United States (including territories) by U.S. air carriers with at least 1% of the total domestic scheduled service passenger revenues and operate aircraft with a passenger capacity of more than 60 seats. In 2003, the air carriers were Alaska, America West, American, American Eagle, Continental, Delta, Northwest, Southwest, United, US Airways, AirTran, ATA (formerly American Trans Air), Atlantic Southeast, Hawaiian, and JetBlue. Before 1994, carriers included both majors and national airlines, i.e., airlines with over \$100 million in revenue.

^b Number of passengers who hold confirmed reservations and are denied boarding ("bumped") from a flight because it is oversold. These figures include only passengers whose oversold flight departs without them; they do not include passengers affected by canceled, delayed, or diverted flights.

SOURCE

U.S. Department of Transportation, Office of the Secretary, *Air Travel Consumer Report* (Washington, DC: Annual February issues).

Table 1-59: Mishandled-Baggage Reports Filed by Passengers with the Largest U.S. Air Carriers^a

	1990 ^b	1991 ^c	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total mishandled-baggage reports (millions)	2.66	2.20	2.45	2.28	2.32	2.28	2.46	2.28	2.48	2.54	2.74	^R 2.14	1.81	2.20
Enplaned passengers (domestic) (millions)	395.7	408.5	417.0	407.5	435.7	439.8	464.0	459.8	481.7	499.1	^R 517.5	^R 467.9	471.4	524.5
Reports per 1,000 passengers	6.73	5.38	5.87	5.60	5.33	5.18	5.30	4.96	5.16	5.08	5.29	^R 4.58	3.84	4.19

KEY: R = revised.

^a Data include nonstop scheduled service between points within the United States (including territories) by U.S. air carriers with at least 1% of the total domestic scheduled service passenger revenues and those carriers that report voluntarily. In 2003 the air carriers were Alaska, America West, American, American Eagle, Continental, Delta, Northwest, Southwest, United, US Airways, Airtran, ATA (formerly American Trans Air), Atlantic Coast, Atlantic Southeast, ExpressJet, JetBlue (voluntarily), and Skywest.

^b Includes Pan Am.

^c Includes Pan Am and Midway.

NOTES

Domestic system only.

Based on passenger reports of mishandled baggage, including those that did not subsequently result in claims for compensation.

SOURCE

U.S. Department of Transportation, Office of the Secretary, *Air Travel Consumer Report* (Washington, DC: Annual February issues).

Table 1-60: Flight Operations Arriving On Time by the Largest U.S. Air Carriers^a

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
On-time flight operations (percent)	79.4%	82.5%	82.3%	81.6%	81.5%	78.6%	74.5%	77.7%	77.2%	76.1%	72.6%	77.4%	82.1%	82.0%

^a Data include nonstop scheduled service between points within the United States (including territories) by U.S. air carriers with at least 1% of the total domestic scheduled service passenger revenues and other carriers that report voluntarily. In 2003 the air carriers were Alaska, America West, American, American Eagle, Continental, Delta, Northwest, Southwest, United, US Airways, Airtran, ATA (formerly American Trans Air), Atlantic Coast, Atlantic Southeast, ExpressJet, JetBlue (voluntarily), and Skywest. Reporting by Hawaiian Airlines (voluntary) became effective November 2003.

NOTE

A flight is considered on time if it arrived less than 15 minutes after the scheduled time shown in the carriers' Computerized Reservations Systems. Canceled and diverted operations are counted as late.

SOURCE

U.S. Department of Transportation, Office of the Secretary, *Air Travel Consumer Report* (Washington, DC: Annual February issues), table 1a, 12-month column.

Table 1-61: FAA-Cited Causes of Departure and En route Delays (After pushing back from the gate)

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	^b 2002
Operations delayed (thousands)	356	338	394	393	298	281	276	248	237	272	245	306	374	450	348	286
Cause (percent)																
Weather	67	70	57	56	65	65	72	75	72	74	68	74	69	69	72	72
Airport terminal volume	11	9	29	35	27	27	22	19	18	18	22	15	12	14	12	14
Air Route Traffic Control Center volume	13	12	8	2	a	a	a	a	a	a	a	a	a	a	a	a
Closed runways / taxiways	4	5	3	3	3	3	3	2	3	3	3	3	5	6	5	4
National Airspace System equipment	4	3	2	1	2	2	2	2	3	2	3	2	2	2	2	1
Other	1	1	1	4	3	3	2	2	4	2	4	6	13	9	10	9

KEY: ARTCC = Air Route Traffic Control Center; FAA = Federal Aviation Administration.

^a Delays due to ARTCC volume are included in delays due to terminal volume from 1991.

^b Data are preliminary and subject to change.

NOTE

Numbers may not add to totals due to roundings.

SOURCES

1987-97: U.S. Department of Transportation, Federal Aviation Administration, *Aviation Capacity Enhancement Plan* (Washington, DC: Annual issues).

1998-2000: U.S. Department of Transportation, Federal Aviation Administration, Internet site <http://www.faa.gov/apa/Delays/atDelays.htm> as of Aug. 8, 2002.

2001-02: Ibid., Internet site <http://www2.faa.gov/index.cfm/apa/1319> as of July 21, 2003.

Table 1-62: Major U.S. Air Carrier Delays, Cancellations, and Diversions

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total operations	5,202,096	5,041,200	5,270,893	5,076,925	5,092,157	5,070,501	5,180,048	5,327,435	5,351,983	5,411,843	5,384,721	5,527,884	5,683,047	5,967,780	(R) 5,271,359	6,488,539
Late departures ^a	730,712	883,167	753,182	621,509	617,148	661,056	729,960	(R) 827,934	(R) 973,948	(R) 846,870	(R) 870,395	(R) 937,273	(R) 1,131,663	(R) 953,808	(R) 717,368	834,238
Late arrivals ^b	1,042,452	1,208,470	1,087,774	890,068	902,567	931,437	960,254	(R) 1,039,250	(R) 1,220,045	(R) 1,083,834	(R) 1,070,071	(R) 1,152,725	(R) 1,356,040	(R) 1,104,439	(R) 868,225	1,057,504
Cancellations	50,163	74,165	52,458	43,505	52,836	59,845	66,740	91,905	128,536	97,763	144,509	154,311	187,490	231,198	(R) 65,143	101,448
Diversions	14,436	14,839	15,954	12,585	11,384	10,333	12,106	10,492	14,121	12,081	13,161	13,555	14,254	12,909	(R) 8,356	11,750

KEY: R = revised.

^a Prior to 1995, late departures comprises flights departing 15 minutes or more after the scheduled time and flights cancelled. Beginning in 1995, late departures is only flights departing 15 minutes or more after the scheduled departure time.

^b Prior to 1995, late arrivals comprises flights arriving 15 minutes or more after the scheduled arrival time, flights cancelled, and flights diverted. Beginning in 1995, late arrivals is only flights arriving 15 minutes or more after the scheduled arrival time.

NOTES

Late departures and arrivals are strongly seasonal and are affected by weather and heavy demand in winter and summer months. The term "late" is defined as 15 minutes after the scheduled departure or arrival time. Major air carriers are those with 1 percent or more of domestic scheduled-service passenger revenues. In 2003 there were 15 major air carriers. A canceled flight is one that was not operated, but was listed in a carrier's computer reservation system within seven calendar days of the scheduled departure. A diverted flight is one that left from the scheduled departure airport but flew to a destination point other than the scheduled destination point.

SOURCES

1988-94: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Airline Service Quality Performance data.

1995-2003: *Ibid.*, 2003 *Airline On-Time Performance* (Washington, DC: 2004), Internet site www.bts.gov/programs/airline_information/annual_airline_on_time_performance as of July 27, 2004.

Table 1-63: Annual Person-Hours of Highway Traffic Delay Per Person

Population group	Urban area	1982	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Percent change ^a			
																	Short-term 1997-2002		Long-term 1982-2002	
																	Percent	Rank	Percent	Rank
Medium	Akron, OH	1	1	3	3	4	3	5	4	6	8	9	9	8	8	6	-25	81	500	29
Medium	Albany-Schenectady-Troy, NY	3	1	4	3	(R) 4	4	4	4	4	4	5	6	6	6	6	50	11	100	79
Medium	Albuquerque, NM	2	(R) 4	8	8	10	11	(R) 14	(R) 18	(R) 20	23	25	(R) 27	19	18	15	-35	83	650	19
Small	Allentown-Bethlehem, PA-NJ	3	4	6	6	6	7	7	7	10	8	8	7	7	7	7	-13	74	133	76
Small	Anchorage, AK	2	3	3	3	2	2	2	2	2	2	2	2	2	(R) 2	3	50	11	50	83
Large	Atlanta, GA	6	10	11	(R) 11	12	17	23	26	30	31	33	29	(R) 31	(R) 28	32	3	61	433	40
Medium	Austin, TX	4	8	9	11	(R) 9	(R) 11	14	(R) 17	(R) 20	(R) 24	(R) 20	(R) 24	(R) 25	(R) 26	26	8	55	550	26
Small	Bakersfield, CA	1	1	2	2	3	2	2	3	3	3	3	3	4	4	4	33	26	300	53
Large	Baltimore, MD	4	6	15	15	13	14	16	17	18	19	18	18	(R) 19	(R) 21	26	37	24	550	26
Small	Beaumont, TX	2	3	3	3	3	4	3	3	3	4	6	6	6	6	8	100	2	300	53
Medium	Birmingham, AL	3	4	5	5	5	6	8	(R) 9	(R) 10	11	13	13	(R) 13	(R) 13	14	27	33	367	50
Very large	Boston, MA	9	12	18	18	19	21	23	23	23	25	25	27	(R) 26	(R) 27	27	8	56	200	67
Small	Boulder, CO	1	2	2	2	2	3	3	3	3	4	4	4	5	5	5	25	36	400	41
Medium	Bridgeport-Stamford, CT-NY	2	4	8	6	8	8	9	10	10	11	13	16	16	16	17	55	9	750	11
Small	Brownsville, TX	1	1	1	1	1	1	2	2	2	2	2	(R) 3	3	3	3	50	11	200	67
Large	Buffalo-Niagara Falls, NY	1	1	2	2	2	2	2	2	2	3	3	4	5	5	5	67	7	400	41
Small	Cape Coral, FL	1	2	3	4	4	5	5	6	6	7	7	7	7	7	8	14	49	700	14
Small	Charleston-North Charleston, SC	5	6	10	10	(R) 11	10	9	9	9	10	11	12	12	11	12	20	45	140	75
Medium	Charlotte, NC-SC	4	7	11	12	14	13	12	12	14	17	18	19	(R) 21	21	24	41	19	500	29
Very large	Chicago, IL-IN	6	11	17	18	18	(R) 18	17	20	26	24	26	26	(R) 25	(R) 26	29	21	44	383	48
Large	Cincinnati, OH-KY-IN	2	3	7	7	8	9	12	12	14	17	17	18	(R) 19	(R) 19	21	24	41	950	5
Large	Cleveland, OH	1	1	3	3	4	5	6	9	10	12	9	10	8	7	6	-50	85	500	29
Small	Colorado Springs, CO	1	2	2	2	3	4	4	6	6	8	10	12	(R) 12	13	12	50	11	1,100	4
Small	Columbia, SC	1	2	3	3	3	3	3	3	3	3	3	4	5	4	4	33	26	300	53
Large	Columbus, OH	2	2	8	8	10	11	14	15	17	19	19	20	17	(R) 16	15	-21	79	650	19
Small	Corpus Christi, TX	2	2	2	3	3	2	2	2	2	2	2	3	3	4	3	50	11	50	83
Very large	Dallas-Fort Worth-Arlington, TX	6	(R) 12	(R) 17	(R) 18	(R) 21	(R) 23	(R) 22	(R) 24	(R) 23	(R) 24	(R) 27	(R) 37	(R) 32	(R) 32	36	50	11	500	29
Medium	Dayton, OH	1	2	3	4	4	5	6	9	10	11	11	13	11	10	8	-27	82	700	14
Large	Denver-Aurora, CO	7	8	12	13	15	18	19	23	26	29	32	32	(R) 34	(R) 35	27	-7	72	286	58
Very large	Detroit, MI	7	7	20	21	28	34	28	26	26	27	27	26	(R) 24	(R) 26	27	0	63	286	58
Medium	El Paso, TX-NM	1	1	2	3	4	4	5	5	4	5	5	8	(R) 9	11	10	100	2	900	6
Small	Eugene, OR	1	1	2	2	2	3	2	(R) 2	3	3	4	5	(R) 6	5	5	67	7	400	41
Medium	Fresno, CA	3	3	(R) 7	7	7	5	5	5	6	7	8	10	(R) 10	(R) 8	8	14	49	167	72
Medium	Grand Rapids, MI	2	2	4	5	6	8	8	7	8	8	11	11	10	10	11	38	22	450	37
Medium	Hartford, CT	(R) 1	(R) 2	(R) 3	(R) 4	(R) 6	(R) 5	5	5	6	(R) 6	8	(R) 8	(R) 8	(R) 9	9	50	11	800	9

Medium	Honolulu, HI	4	(R) 6	13	13	14	13	13	14	13	12	12	13	10	(R) 11	10	-17	76	150	74
Very large	Houston, TX	19	33	(R) 23	17	(R) 17	(R) 21	24	25	(R) 26	(R) 32	(R) 29	(R) 35	(R) 31	(R) 32	33	3	62	74	81
Large	Indianapolis, IN	2	2	4	5	7	13	17	19	22	24	19	19	(R) 20	(R) 21	20	-17	76	900	6
Medium	Jacksonville, FL	3	4	(R) 10	10	13	13	14	18	17	18	15	15	(R) 14	15	17	-6	69	467	36
Large	Kansas City, MO-KS	1	2	3	3	4	6	8	6	8	9	9	11	9	9	8	-11	73	700	14
Small	Laredo, TX	1	1	1	1	1	1	1	2	2	3	3	4	3	4	4	33	26	300	53
Large	Las Vegas, NV	3	5	12	13	11	(R) 10	13	13	14	16	16	17	(R) 17	(R) 15	15	-6	71	400	41
Small	Little Rock, AR	1	1	2	2	2	3	3	3	3	4	5	6	5	6	5	25	36	400	41
Very large	Los Angeles-Long Beach-Santa Ana, CA	19	24	53	51	51	51	46	49	54	52	56	(R) 55	(R) 52	(R) 49	(R) 49	-6	70	158	73
Medium	Louisville, KY-IN	4	5	5	7	9	12	14	13	17	19	(R) 19	(R) 21	(R) 20	(R) 18	20	5	58	400	41
Medium	Memphis, TN-MS-AR	1	2	5	6	7	7	9	11	11	13	(R) 13	(R) 13	(R) 14	(R) 16	16	23	42	1,500	3
Very large	Miami, FL	(R) 5	(R) 6	(R) 13	(R) 14	(R) 18	(R) 18	(R) 19	(R) 19	(R) 21	(R) 22	(R) 22	(R) 24	(R) 26	(R) 27	29	32	32	480	35
Large	Milwaukee, WI	2	3	5	6	7	9	9	11	12	12	13	15	(R) 14	(R) 13	12	0	63	500	29
Large	Minneapolis-St. Paul, MN	1	4	8	9	11	14	15	(R) 17	17	23	23	26	(R) 21	(R) 23	22	-4	68	2,100	1
Medium	Nashville-Davidson, TN	6	7	9	8	7	10	12	14	15	18	16	20	(R) 20	(R) 20	22	22	43	267	62
Medium	New Haven, CT	2	2	4	4	5	5	5	5	4	6	9	11	(R) 12	(R) 15	11	83	5	450	37
Large	New Orleans, LA	4	5	6	8	7	7	12	11	11	11	11	11	10	10	9	-18	78	125	77
Very large	New York-Newark, NY-NJ-CT	6	7	18	13	13	14	16	18	18	20	21	23	(R) 21	(R) 22	23	15	48	283	60
Large	Oklahoma City, OK	1	2	2	3	3	3	3	4	5	6	6	(R) 8	6	6	7	17	46	600	22
Medium	Omaha, NE-IA	2	3	5	5	6	6	(R) 8	8	9	(R) 9	10	11	(R) 10	12	12	33	26	500	29
Large	Orlando, FL	5	9	11	16	17	19	19	19	21	24	27	26	(R) 31	(R) 32	27	13	52	440	39
Medium	Oxnard-Ventura, CA	2	5	8	7	7	7	10	11	12	10	12	12	15	17	17	70	6	750	11
Small	Pensacola, FL-AL	1	2	6	7	7	8	8	8	8	9	9	10	11	10	10	11	53	900	6
Very large	Philadelphia, PA-NJ-DE-MD	5	6	9	(R) 12	(R) 13	(R) 11	(R) 12	(R) 14	(R) 14	(R) 15	(R) 19	(R) 21	(R) 18	(R) 21	22	47	18	340	52
Large	Phoenix, AZ	7	8	15	17	19	19	19	16	21	23	20	25	(R) 24	(R) 25	24	4	60	243	63
Large	Pittsburgh, PA	4	5	7	7	(R) 7	6	6	(R) 7	7	8	8	9	7	7	(R) 7	-13	74	75	80
Large	Portland, OR-WA	3	3	8	9	11	14	14	(R) 16	(R) 18	19	20	21	(R) 20	(R) 20	20	5	58	567	25
Medium	Providence, RI-MA	2	(R) 3	(R) 6	(R) 6	7	(R) 8	(R) 8	(R) 9	(R) 10	(R) 15	(R) 10	(R) 13	(R) 11	(R) 12	17	13	51	750	11
Medium	Raleigh-Durham, NC	3	5	10	7	9	10	11	11	11	12	12	11	12	16	14	17	46	367	50
Medium	Richmond, VA	(R) 2	2	4	(R) 5	(R) 6	(R) 6	(R) 8	(R) 12	(R) 15	(R) 13	12	(R) 10	(R) 7	(R) 7	8	-38	84	300	53
Large	Riverside-San Bernardino, CA	4	7	20	23	25	24	20	22	24	25	29	28	(R) 27	(R) 29	31	24	40	675	18
Medium	Rochester, NY	0	1	2	1	2	2	2	3	3	3	3	4	3	3	3	0	63	NM	NM
Large	Sacramento, CA	5	7	14	14	13	13	16	14	17	15	15	16	(R) 17	(R) 17	19	27	34	280	61

Small	Salem, OR	1	1	3	4	4	(R) 4	5	(R) 4	(R) 5	6	(R) 6	6	(R) 6	(R) 6	8	33	26	700	14
Medium	Salt Lake City, UT	1	2	4	5	6	7	9	(R) 9	8	7	8	9	10	(R) 14	17	143	1	1,600	2
Large	San Antonio, TX	3	7	6	6	7	6	5	10	10	10	13	(R) 19	(R) 21	(R) 19	19	90	4	533	28
Large	San Diego, CA	3	6	16	14	14	(R) 13	14	14	14	17	16	20	(R) 20	(R) 21	26	53	10	767	10
Very large	San Francisco-Oakland, CA	12	24	(R) 36	28	26	28	24	(R) 31	31	28	32	34	(R) 35	(R) 36	37	32	31	208	66
Large	San Jose, CA	10	21	43	35	26	25	24	26	25	23	26	31	(R) 31	(R) 32	29	26	35	190	70
Medium	Sarasota-Bradenton, FL	5	5	5	6	6	7	7	6	8	8	8	10	9	9	11	38	22	120	78
Large	Seattle, WA	(R) 5	(R) 9	(R) 22	(R) 24	(R) 29	(R) 25	(R) 25	(R) 28	(R) 29	(R) 31	(R) 31	(R) 32	(R) 25	(R) 25	24	-23	80	380	49
Small	Spokane, WA	1	(R) 2	2	3	3	5	(R) 6	4	4	5	5	(R) 6	5	5	5	0	63	400	41
Medium	Springfield, MA-CT	3	3	4	3	4	4	3	4	4	4	4	4	5	4	5	25	36	67	82
Large	St. Louis, MO-IL	(R) 6	(R) 8	9	(R) 9	(R) 11	(R) 15	(R) 16	(R) 18	(R) 18	(R) 20	(R) 19	(R) 20	21	18	20	0	63	233	64
Large	Tampa-St. Petersburg, FL	8	9	14	17	18	20	23	23	22	21	21	22	(R) 20	(R) 23	23	10	54	188	71
Medium	Toledo, OH-MI	1	1	2	2	2	2	3	4	4	5	5	6	6	7	7	40	20	600	22
Medium	Tucson, AZ	2	2	5	6	6	7	8	8	8	11	12	12	(R) 11	(R) 13	15	36	25	650	19
Medium	Tulsa, OK	1	2	3	3	3	3	(R) 2	3	4	5	6	6	(R) 8	(R) 7	7	40	20	600	22
Large	Virginia Beach, VA	5	7	9	8	9	8	10	11	12	12	14	14	(R) 10	(R) 12	15	25	36	200	67
Very large	Washington, DC-VA-MD	10	14	21	22	24	26	26	28	31	31	35	37	33	(R) 33	33	6	57	230	65
NA	85 Area Average	7	(R) 9	(R) 17	(R) 16	(R) 17	(R) 18	(R) 18	(R) 20	(R) 21	(R) 22	(R) 23	25	(R) 45	(R) 45	24	9	NA	243	NA
NA	Very Large Area Average	(R) 9	(R) 13	(R) 25	(R) 23	24	(R) 25	(R) 24	(R) 26	(R) 28	(R) 28	31	(R) 32	(R) 60	(R) 60	32	14	NA	256	NA
NA	Large Area Average	4	6	12	12	13	14	(R) 15	(R) 16	(R) 17	19	(R) 19	21	(R) 38	(R) 38	20	5	NA	400	NA
NA	Medium Area Average	(R) 2	(R) 3	6	(R) 6	7	(R) 7	(R) 8	(R) 9	(R) 10	(R) 11	(R) 11	(R) 12	(R) 23	(R) 24	13	18	NA	550	NA
NA	Small Area Average	2	2	4	4	4	4	4	(R) 5	5	5	6	6	(R) 13	(R) 12	7	40	NA	289	NA

KEY: NA = not applicable; NM = not meaningful; R = revised.

Very large urban areas – over 3 million population.

Large urban areas – over 1 million and less than 3 million population.

Medium urban areas – over 500,000 and less than 1 million population.

Small urban areas – less than 500,000 population.

^a Percent change was calculated using the numbers in this table and were not obtained from the source mentioned below. Rank is based on the calculated percent change with the highest number corresponding to a rank of 1.

NOTE

The urban areas included are those containing over 500,000 people and several smaller places mostly chosen by previous sponsors of the Texas Transportation Institute study on mobility.

SOURCE

1982-2002: Texas Transportation Institute, *The 2004 Annual Urban Mobility Report* (College Station, TX: 2004), Internet site <http://mobility.tamu.edu> as of Sep. 13, 2004.

Table 1-64: Travel Time Index

Population group																	Points change					
		Urban area		1982	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Short-term 1997-2002		Long-term 1982-2002	
																			Points	Rank ^a	Points	Rank ^b
Medium	Akron, OH		1.02	1.02	1.04	1.05	1.05	1.07	1.07	1.06	1.09	1.11	1.11	1.11	1.10	1.10	1.09	-2	80	7	68	
Medium	Albany-Schenectady, NY		1.06	1.02	1.04	1.04	1.04	1.04	1.04	1.05	(R) 1.05	1.05	1.06	1.06	(R) 1.06	1.07	2	50	1	85		
Medium	Albuquerque, NM		1.04	1.06	1.10	(R) 1.11	1.13	1.14	1.18	1.21	1.23	1.24	1.26	1.26	(R) 1.23	(R) 1.22	1.19	-4	84	14	37	
Small	Allentown-Bethlehem, PA-NJ		1.06	1.08	1.11	1.12	1.11	1.12	1.13	1.13	1.14	1.15	1.15	1.13	1.14	1.14	1.15	0	65	8	62	
Small	Anchorage, AK		1.04	1.05	1.05	1.05	1.04	1.03	1.04	1.03	1.03	1.03	1.04	1.04	1.04	1.05	1.05	2	48	1	84	
Large	Atlanta, GA		1.08	1.11	1.14	1.13	1.14	1.18	1.24	1.26	1.29	1.31	1.34	1.32	(R) 1.35	(R) 1.37	1.42	8	8	31	3	
Medium	Austin, TX		1.08	(R) 1.10	1.12	1.13	1.12	(R) 1.14	1.17	1.20	1.23	1.26	1.24	1.26	(R) 1.26	(R) 1.30	1.31	4	25	21	24	
Small	Bakersfield, CA		1.01	1.01	1.03	1.04	1.04	1.04	1.04	1.04	1.05	1.05	1.06	1.05	1.06	1.06	1.06	1	60	5	71	
Large	Baltimore, MD		1.07	1.10	1.21	1.20	1.19	1.20	1.22	1.24	1.24	1.26	1.25	1.26	(R) 1.27	(R) 1.30	1.36	8	10	27	13	
Small	Beaumont, TX		1.03	1.03	1.03	1.04	1.04	1.04	1.03	1.04	1.04	1.04	1.05	1.06	1.05	1.06	1.07	3	34	4	78	
Medium	Birmingham, AL		1.05	1.05	1.06	1.06	1.07	1.08	1.10	1.11	(R) 1.12	1.13	1.15	(R) 1.15	(R) 1.15	(R) 1.15	1.16	3	38	10	51	
Very large	Boston, MA-NH-RI		1.14	1.18	1.27	1.27	1.29	1.34	(R) 1.36	1.37	1.37	1.39	1.41	1.43	(R) 1.43	(R) 1.45	1.45	4	23	27	11	
Small	Boulder, CO		1.02	1.03	1.03	1.03	1.04	1.05	1.05	(R) 1.06	1.06	1.07	1.08	1.08	1.09	(R) 1.09	1.09	2	51	7	68	
Medium	Bridgeport-Stamford, CT-NY		1.05	1.08	1.15	1.13	1.15	1.15	1.17	1.19	1.18	1.21	1.24	1.28	1.27	1.28	1.28	6	17	22	21	
Small	Brownsville, TX		1.02	1.03	1.04	1.04	1.04	1.04	1.05	1.05	1.05	1.06	1.07	1.07	1.08	1.08	1.07	1	61	5	73	
Large	Buffalo, NY		1.03	1.03	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.05	1.07	1.08	1.08	1.08	4	26	5	75	
Small	Cape Coral, FL		1.04	1.05	1.09	1.10	1.11	1.11	1.12	1.12	1.13	1.14	1.14	1.14	(R) 1.14	(R) 1.14	1.17	3	39	13	42	
Small	Charleston-North Charleston, SC		1.08	1.10	1.15	1.15	1.16	1.15	1.14	1.14	1.13	1.15	1.17	1.17	(R) 1.18	(R) 1.17	1.18	3	40	9	54	
Medium	Charlotte, NC-SC		(R) 1.07	1.12	1.16	1.18	1.19	1.17	1.16	1.17	(R) 1.19	1.23	1.23	1.24	(R) 1.26	(R) 1.26	1.31	7	15	22	20	
Very large	Chicago, IL-IN		(R) 1.18	1.27	1.36	1.35	1.35	1.34	1.33	1.38	1.44	1.43	1.47	1.47	(R) 1.44	(R) 1.47	1.54	8	11	31	6	
Large	Cincinnati, OH-KY-IN		1.04	1.06	1.12	1.12	1.15	1.15	1.18	1.18	1.20	1.22	1.22	1.23	(R) 1.25	(R) 1.25	1.25	2	45	20	26	
Large	Cleveland, OH		1.02	1.02	1.06	1.06	1.07	1.08	1.10	1.13	1.15	1.17	1.15	1.15	1.13	1.12	1.10	-6	85	8	63	
Small	Colorado Springs, CO		1.02	1.03	1.04	1.04	1.05	1.07	1.08	1.10	1.11	1.14	(R) 1.15	1.18	(R) 1.19	(R) 1.20	1.19	4	22	17	34	
Small	Columbia, SC		1.03	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.05	1.06	1.05	1.05	1.05	1	59	2	80	
Large	Columbus, OH		1.03	1.04	1.10	1.11	1.13	1.14	1.17	1.18	1.20	(R) 1.22	1.22	1.22	1.19	(R) 1.18	1.18	-3	82	15	36	
Small	Corpus Christi, TX		1.03	1.03	1.03	1.04	1.04	1.03	1.03	1.03	1.03	1.03	1.04	1.05	1.04	1.05	1.04	1	58	1	83	
Very large	Dallas-Fort Worth-Arlington, TX		1.07	1.12	1.18	1.19	1.20	1.20	1.20	1.21	1.22	1.23	(R) 1.26	(R) 1.31	(R) 1.31	(R) 1.31	1.34	9	5	25	16	
Medium	Dayton, OH		1.03	1.04	1.05	1.06	1.06	1.07	1.08	1.10	1.11	1.12	1.12	1.13	1.13	1.11	1.10	-2	79	7	70	
Large	Denver-Aurora, CO		1.10	1.13	1.17	1.19	1.21	1.24	1.24	1.30	1.33	1.37	1.39	1.38	1.42	(R) 1.46	1.40	2	47	27	10	
Very large	Detroit, MI		1.12	1.13	1.28	1.29	1.34	1.36	1.33	(R) 1.32	1.33	1.35	1.36	1.35	(R) 1.33	(R) 1.35	1.36	1	64	21	23	
Medium	El Paso, TX-NM		1.02	1.03	1.04	1.05	1.07	1.07	1.09	(R) 1.08	1.07	(R) 1.09	1.10	1.14	(R) 1.16	(R) 1.17	1.16	6	16	14	41	
Small	Eugene, OR		1.02	1.03	1.04	1.04	1.05	(R) 1.05	1.05	1.05	1.06	1.06	1.07	1.09	1.12	1.11	1.10	4	27	8	63	
Medium	Fresno, CA		1.05	1.05	1.13	1.13	1.13	1.12	1.11	1.13	1.13	1.16	1.18	1.20	(R) 1.19	(R) 1.16	1.15	-1	76	10	53	
Medium	Grand Rapids, MI		1.03	1.03	1.07	1.07	1.09	1.11	1.11	1.10	1.11	1.12	1.15	1.15	1.14	1.14	1.15	3	37	12	46	
Medium	Hartford, CT		(R) 1.04	(R) 1.04	(R) 1.05	(R) 1.06	(R) 1.08	1.07	1.07	(R) 1.08	1.07	(R) 1.10	(R) 1.11	(R) 1.11	(R) 1.11	1.12	1.12	2	53	8	65	
Medium	Honolulu, HI		1.10	1.12	1.21	1.20	1.22	1.21	1.22	1.23	1.23	1.20	1.21	1.21	(R) 1.19	1.19	1.18	-2	78	7	66	
Very large	Houston, TX		1.28	1.39	(R) 1.31	1.25	1.24	1.24	1.26	1.26	1.30	1.34	1.33	1.36	(R) 1.36	(R) 1.37	1.39	4	29	9	61	
Large	Indianapolis, IN		1.03	1.03	1.06	1.08	1.10	1.16	1.20	1.22	1.25	1.26	1.22	1.23	(R) 1.24	(R) 1.25	1.24	-2	77	20	25	
Medium	Jacksonville, FL		1.04	1.05	1.11	1.12	1.14	1.14	1.14	1.18	1.17	1.16	1.14	1.14	1.15	(R) 1.15	1.16	0	65	12	48	
Large	Kansas City, MO-KS		1.01	1.02	1.04	1.04	1.05	1.06	1.07	1.06	1.08	1.09	1.09	1.11	(R) 1.10	(R) 1.10	1.10	1	63	9	55	
Small	Laredo, TX		(R) 1.03	1.03	1.03	1.04	1.04	1.04	1.04	1.05	1.06	1.07	1.07	1.07	1.07	1.08	1.07	0	65	4	78	
Large	Las Vegas, NV		1.07	(R) 1.10	1.23	1.25	1.24	1.24	1.28	1.27	1.30	1.33	1.33	1.34	(R) 1.34	(R) 1.35	1.35	2	56	26	14	
Small	Little Rock, AK		1.02	1.02	1.02	1.03	1.03	1.03	1.03	1.03	1.04	1.04	1.05	1.06	1.05	1.07	1.06	2	49	4	77	
Very large	Los Angeles-Long Beach-Santa Ana, CA		1.30	1.35	1.80	1.79	1.76	1.73	1.64	1.72	1.78	1.77	1.83	1.80	(R) 1.76	(R) 1.77	1.77	0	65	36	1	
Medium	Louisville, KY-IN		1.09	1.09	1.08	1.10	1.13	1.15	1.16	1.16	1.19	1.21	(R) 1.22	1.24	1.24	1.22	1.24	2	44	14	39	
Medium	Memphis, TN-MS-AR		1.03	1.04	1.09	1.09	1.11	1.11	1.14	1.17	1.18	1.20	1.20	1.19	(R) 1.20	(R) 1.21	1.22	2	54	18	29	
Very Large	Miami, FL		(R) 1.09	(R) 1.11	(R) 1.20	(R) 1.21	(R) 1.26	(R) 1.26	(R) 1.26	(R) 1.28	(R) 1.29	(R) 1.30	(R) 1.31	(R) 1.34	(R) 1.35	(R) 1.37	1.40	8	12	28	8	
Large	Milwaukee, WI		1.05	1.07	1.12	1.12	1.15	1.17	1.16	1.19	1.20	1.20	1.22	1.25	(R) 1.25	(R) 1.24	1.24	3	31	18	31	

Large	Minneapolis-St. Paul, MN	1.03	1.06	1.12	1.12	1.14	1.16	1.20	1.22	1.23	1.30	1.32	1.35	(R) 1.32	(R) 1.34	1.34	3	32	30	7
Medium	Nashville-Davidson, TN	1.07	1.08	(R) 1.09	1.08	1.08	1.09	1.12	1.13	1.14	1.16	1.15	1.18	1.18	1.18	1.19	3	42	11	49
Medium	New Haven, CT	1.03	1.04	1.06	1.06	1.07	1.08	1.09	1.09	1.07	1.09	1.12	1.13	1.14	1.17	1.14	5	21	11	50
Large	New Orleans, LA	1.10	1.14	1.16	1.19	1.18	1.16	1.20	1.20	1.20	1.19	1.19	1.20	1.18	(R) 1.17	1.18	-1	75	7	66
Very large	New York-Newark, NY-NJ-CT	1.13	1.16	1.31	1.28	1.27	1.28	1.31	1.33	1.34	1.36	1.36	1.40	(R) 1.38	(R) 1.38	1.40	3	33	24	18
Large	Oklahoma City, OK	1.02	1.03	1.03	1.04	1.04	1.04	1.04	1.06	1.07	1.09	1.09	1.11	1.09	1.10	1.11	2	52	9	56
Medium	Omaha, NE-IA	1.04	1.06	1.09	1.10	1.11	1.10	1.12	1.12	1.14	(R) 1.13	1.14	1.15	1.15	(R) 1.16	1.17	4	30	13	42
Large	Orlando, FL	1.09	1.15	1.16	1.19	1.19	1.21	1.20	1.21	1.22	1.24	1.27	1.27	(R) 1.28	(R) 1.31	1.29	4	24	18	30
Medium	Oxnard-Ventura, CA	1.04	1.07	1.10	1.09	1.10	1.10	1.14	1.15	1.16	1.14	1.14	1.19	1.19	1.21	1.20	5	18	15	35
Small	Pensacola, FL-AL	1.03	1.04	1.08	1.09	1.09	1.11	(R) 1.10	1.11	1.10	1.12	1.12	1.12	1.14	1.12	1.12	0	65	9	60
Very large	Philadelphia, PA-NJ-DE-MD	(R) 1.13	1.14	(R) 1.19	1.20	(R) 1.22	1.20	1.21	(R) 1.23	(R) 1.26	(R) 1.26	(R) 1.33	(R) 1.32	(R) 1.30	(R) 1.35	1.35	7	13	19	27
Large	Phoenix, AZ	1.13	1.15	1.22	1.24	1.27	1.27	1.28	1.24	1.30	1.33	1.31	(R) 1.38	(R) 1.38	(R) 1.40	1.35	2	56	19	27
Large	Pittsburgh, PA	1.08	1.09	1.10	1.09	1.09	1.09	1.09	1.10	1.10	1.10	1.11	1.12	1.10	1.10	1.10	0	65	2	82
Large	Portland, OR-WA	1.05	1.07	1.16	1.17	1.20	1.24	1.25	(R) 1.28	1.31	1.35	1.34	1.37	(R) 1.37	(R) 1.39	1.38	2	46	31	4
Medium	Providence, RI-MA	(R) 1.05	(R) 1.06	(R) 1.10	(R) 1.10	1.10	1.11	(R) 1.11	(R) 1.12	(R) 1.14	(R) 1.21	(R) 1.13	(R) 1.14	(R) 1.15	(R) 1.16	1.20	-1	74	14	38
Medium	Raleigh-Durham, NC	1.05	1.07	1.12	1.09	1.12	1.12	1.13	1.14	1.13	1.15	1.15	1.15	1.16	1.19	1.18	3	40	12	44
Medium	Richmond, VA	(R) 1.03	1.03	1.05	(R) 1.06	(R) 1.06	1.07	1.08	(R) 1.11	(R) 1.11	1.10	(R) 1.09	(R) 1.09	(R) 1.07	(R) 1.07	1.08	-2	81	5	75
Large	Riverside-San Bernardino, CA	1.04	1.08	1.24	1.27	1.29	1.27	1.23	1.26	1.28	1.27	1.31	1.33	(R) 1.33	(R) 1.35	1.39	9	3	34	2
Medium	Rochester, NY	1.01	1.02	1.03	1.04	1.04	1.04	1.04	1.05	1.05	1.06	1.05	1.06	1.06	1.06	1.06	0	65	5	71
Large	Sacramento, CA	1.07	1.09	1.20	1.20	1.18	1.19	1.22	1.21	1.24	1.23	1.24	1.26	(R) 1.28	(R) 1.29	1.33	8	9	24	17
Small	Salem, OR	1.02	1.02	1.04	1.05	1.05	(R) 1.06	1.07	(R) 1.06	(R) 1.07	(R) 1.07	(R) 1.08	(R) 1.08	(R) 1.08	(R) 1.09	1.11	4	28	9	56
Medium	Salt Lake City, UT	1.03	1.05	1.08	1.10	(R) 1.13	1.13	1.15	1.17	1.17	1.15	1.16	1.17	1.18	(R) 1.24	1.27	10	2	23	19
Large	San Antonio, TX	1.05	1.08	(R) 1.07	1.07	1.08	1.07	1.08	1.12	1.12	1.13	1.16	(R) 1.22	(R) 1.24	(R) 1.22	1.23	9	6	17	33
Large	San Diego, CA	1.06	1.09	1.24	1.22	1.23	1.22	1.22	1.22	1.23	1.25	1.26	1.32	(R) 1.32	(R) 1.32	1.39	11	1	31	5
Very large	San Francisco-Oakland, CA	1.21	1.36	1.50	1.42	1.41	1.44	1.40	1.45	1.45	1.42	1.47	1.49	(R) 1.54	(R) 1.54	1.55	9	4	28	9
Large	San Jose, CA	1.18	1.30	1.44	1.41	1.34	1.34	1.33	1.34	1.33	1.30	1.34	1.39	1.42	1.43	1.39	7	14	18	32
Medium	Sarasota-Bradenton, FL	1.12	1.12	1.14	1.16	1.16	1.18	1.19	1.15	1.19	1.19	1.20	1.24	1.22	1.22	1.25	5	19	12	47
Large	Seattle, WA	(R) 1.07	(R) 1.13	(R) 1.29	(R) 1.33	(R) 1.38	(R) 1.35	(R) 1.34	(R) 1.36	(R) 1.36	(R) 1.40	(R) 1.39	(R) 1.41	(R) 1.35	(R) 1.35	1.35	-4	83	26	14
Small	Spokane, WA	1.02	1.03	(R) 1.04	1.04	(R) 1.05	(R) 1.08	(R) 1.08	1.06	1.06	1.07	(R) 1.08	1.08	1.08	1.07	1.07	0	65	5	73
Medium	Springfield, MA-CT	1.05	1.05	1.06	1.06	1.06	1.05	1.06	1.06	1.06	1.06	1.06	1.07	1.07	1.06	1.07	1	61	2	81
Large	St. Louis, MO-IL	(R) 1.09	(R) 1.12	(R) 1.12	(R) 1.12	(R) 1.14	(R) 1.18	(R) 1.19	(R) 1.21	(R) 1.21	(R) 1.24	(R) 1.23	(R) 1.24	(R) 1.25	(R) 1.22	1.24	0	65	14	39
Large	Tampa-St. Petersburg, FL	1.19	1.21	1.26	1.29	1.29	1.30	1.32	1.32	1.31	1.29	1.28	1.29	(R) 1.27	(R) 1.31	1.31	2	55	10	52
Medium	Toledo, OH-MI	1.02	1.02	1.03	1.03	1.03	1.04	1.05	1.06	1.06	1.08	1.08	1.09	1.10	1.11	1.11	3	35	9	56
Medium	Tucson, AZ	1.06	1.06	1.11	1.13	1.13	1.14	1.15	1.15	(R) 1.15	1.19	1.21	1.21	(R) 1.20	(R) 1.24	1.29	8	7	22	22
Medium	Tulsa, OK	1.02	1.03	1.05	1.05	1.05	1.05	1.05	1.06	1.07	1.08	1.09	(R) 1.09	1.12	(R) 1.12	1.11	3	35	9	56
Large	Virginia Beach, VA	1.08	1.11	(R) 1.14	1.14	1.14	1.13	1.15	1.16	1.18	1.18	1.19	1.19	(R) 1.16	(R) 1.18	1.21	3	43	12	45
Very large	Washington, DC-VA-MD	1.18	1.23	1.33	1.35	1.37	1.38	1.37	1.40	1.44	1.43	1.46	(R) 1.47	(R) 1.44	(R) 1.46	1.50	5	20	27	12
NA	85-Area Average	(R) 1.12	(R) 1.16	(R) 1.28	(R) 1.27	(R) 1.28	(R) 1.28	(R) 1.27	(R) 1.30	(R) 1.32	(R) 1.32	(R) 1.34	(R) 1.35	(R) 1.34	(R) 1.35	1.37	4	NA	22	NA
NA	Very Large Area Average	1.19	(R) 1.24	(R) 1.42	(R) 1.41	(R) 1.41	(R) 1.41	(R) 1.38	(R) 1.42	(R) 1.44	(R) 1.45	(R) 1.48	(R) 1.48	(R) 1.47	(R) 1.48	1.50	3	NA	26	NA
NA	Large Area Average	(R) 1.07	(R) 1.10	(R) 1.17	1.18	(R) 1.19	1.20	(R) 1.21	(R) 1.22	1.24	(R) 1.25	(R) 1.26	(R) 1.28	(R) 1.28	(R) 1.29	1.30	4	NA	21	NA
NA	Medium Area Average	1.05	1.06	1.09	(R) 1.09	(R) 1.10	1.11	(R) 1.12	(R) 1.13	(R) 1.14	(R) 1.15	(R) 1.15	(R) 1.16	(R) 1.16	(R) 1.17	1.18	3	NA	12	NA
NA	Small Area Average	(R) 1.04	1.04	1.06	1.06	1.07	1.07	1.07	(R) 1.07	1.08	(R) 1.08	(R) 1.09	1.10	(R) 1.10	(R) 1.10	1.10	2	NA	6	NA

KEY: NA = not applicable; R = revised.

Very large urban areas – over 3 million population.

Large urban areas – over 1 million and less than 3 million population.

Medium urban areas – over 500,000 and less than 1 million population.

Small urban areas – less than 500,000 population.

^a Rank is based on the calculated point change with the highest number corresponding to a rank of 1.

NOTE

The Travel Time Index (TTI) is the ratio of peak period travel time to free flow travel time. The TTI expresses the average amount of extra time it takes to travel in the peak relative to free-flow travel. A TTI of 1.3, for example, indicates a 20-minute free-flow trip will take 26 minutes during the peak travel time periods, a 6-minute (30 percent) travel time penalty.

SOURCE

1982-2002: Texas Transportation Institute, *The 2004 Annual Urban Mobility Report* (College Station, TX: 2004), Internet site <http://mobility.tamu.edu> as of Sep. 13, 2004.

Table 1-65: Annual Roadway Congestion Index

Population group		Urban area															Points change			
																	Short-term 1996-2001		Long-term 1982-2001	
																	Points	Rank ^a	Points	Rank ^a
Medium	Albany-Schenectady-Troy, NY	0.46	0.51	0.68	0.67	0.69	0.71	0.71	0.72	0.74	0.75	0.75	0.77	0.78	0.80	6	24	34	41	
Medium	Albuquerque, NM	0.62	0.69	0.85	0.84	0.87	0.91	0.97	1.00	1.05	1.06	1.08	1.08	^R 1.07	1.05	0	2	43	60	
Small	Anchorage, AK	0.58	0.63	0.62	0.62	0.60	0.59	0.61	0.60	0.59	0.59	0.62	0.61	0.62	0.65	6	24	7	2	
Large	Atlanta, GA	0.77	0.93	0.98	0.97	0.99	1.05	1.13	1.13	1.17	1.24	1.28	1.27	^R 1.33	1.33	16	66	56	71	
Medium	Austin, TX	0.73	0.81	0.90	0.90	0.88	0.88	0.90	0.94	0.97	1.01	1.03	1.07	^R 1.12	1.17	20	73	44	62	
Small	Bakersfield, CA	0.54	0.56	0.64	0.67	0.70	0.68	0.71	0.72	0.74	0.75	0.76	0.78	0.76	0.77	3	13	23	18	
Large	Baltimore, MD	0.75	0.80	0.95	0.95	0.97	0.97	1.00	1.03	1.03	1.05	1.06	1.07	1.10	1.14	11	52	39	54	
Small	Beaumont, TX	0.65	0.72	0.74	0.78	0.83	0.82	0.78	0.80	0.84	0.85	0.85	0.86	0.84	0.86	2	8	21	15	
Medium	Birmingham, AL	0.69	0.70	0.78	0.77	0.78	0.81	0.85	0.87	0.90	0.93	0.96	0.98	0.99	1.00	10	48	31	34	
Very large	Boston, MA	0.88	0.98	1.09	1.09	1.11	1.17	1.19	1.21	1.22	1.25	1.27	1.28	1.30	1.31	9	43	43	60	
Small	Boulder, CO	0.55	0.59	0.65	0.66	0.70	0.71	0.72	0.74	0.76	0.81	0.83	0.83	0.81	0.84	8	33	29	25	
Small	Brownsville, TX	0.54	0.54	0.62	0.62	0.64	0.68	0.69	0.70	0.71	0.73	0.76	0.75	0.78	0.79	8	33	25	19	
Large	Buffalo-Niagara Falls, NY	0.53	0.55	0.60	0.62	0.64	0.66	0.68	0.67	0.66	0.68	0.70	0.72	0.76	0.75	9	43	22	17	
Small	Charleston, SC	0.85	0.88	0.96	0.95	0.95	0.94	0.95	0.93	0.92	0.93	0.97	0.98	0.98	0.95	3	13	10	5	
Medium	Charlotte, NC	0.86	1.02	1.05	1.04	0.98	0.94	0.94	0.95	1.01	1.07	1.09	1.14	1.15	1.17	16	66	31	34	
Very large	Chicago, IL-Northwestern, IN	0.95	1.02	1.18	1.19	1.17	1.17	1.17	1.22	1.27	1.27	1.31	^R 1.32	^R 1.33	1.34	7	30	39	54	
Large	Cincinnati, OH-KY	0.70	0.78	0.92	0.90	0.91	0.95	1.00	1.00	1.04	1.09	1.11	1.12	1.13	1.12	8	33	42	58	
Large	Cleveland, OH	0.68	0.65	0.83	0.83	0.85	0.89	0.91	0.92	0.94	0.96	0.98	0.98	0.97	0.94	0	2	26	21	
Small	Colorado Springs, CO	0.50	0.60	0.62	0.61	0.64	0.66	0.68	0.73	0.76	0.81	0.83	0.85	0.86	0.87	11	52	37	49	
Large	Columbus, OH	0.63	0.68	0.85	0.87	0.90	0.92	0.94	0.97	1.00	1.02	1.04	1.04	1.02	1.08	8	33	45	63	
Small	Corpus Christi, TX	0.57	0.65	0.67	0.66	0.67	0.65	0.64	0.64	0.66	0.70	0.70	0.71	^R 0.71	0.71	5	21	14	9	
Very large	Dallas -Fort Worth, TX	0.73	0.86	0.96	0.96	0.95	0.95	0.96	0.96	0.98	^R 1.02	1.07	^R 1.08	^R 1.11	1.12	14	60	39	54	
Large	Denver, CO	0.82	0.86	0.92	0.93	0.97	0.99	1.02	1.07	1.12	1.14	1.18	1.20	1.23	1.28	16	66	46	64	
Very large	Detroit, MI	0.89	0.91	1.08	1.09	1.16	1.19	1.15	1.16	1.18	1.18	1.18	1.20	^R 1.23	1.24	6	24	35	44	
Medium	El Paso, TX-NM	0.62	0.70	0.73	0.78	0.82	0.83	0.85	0.85	0.84	0.86	0.91	0.94	0.98	0.99	15	63	37	49	
Small	Eugene-Springfield, OR	0.53	0.58	0.68	0.69	0.70	0.74	0.75	0.78	0.82	0.84	0.87	0.91	0.94	0.92	10	48	39	54	
Large	Fort Lauderdale-Hollywood-Pompano Beach, FL	0.69	0.75	0.90	0.95	1.03	1.05	1.03	1.05	1.07	1.12	1.12	1.17	1.23	1.28	21	74	59	73	
Small	Fort Myers - Cape Coral, FL	0.83	0.87	0.95	0.95	0.93	0.90	0.90	0.90	0.92	0.94	0.94	0.95	0.96	0.95	3	13	12	6	
Medium	Fresno, CA	0.67	0.65	0.86	0.88	0.87	0.85	0.85	0.87	0.89	0.92	0.96	0.98	^R 1.00	0.97	8	33	30	30	

Medium	Hartford-Middletown, CT	0.61	0.74	0.82	0.83	0.84	0.84	0.85	0.86	0.87	0.90	0.91	0.94	0.97	0.98	11	52	37	49
Medium	Honolulu, HI	0.79	0.84	1.03	1.03	1.04	1.05	1.07	1.08	1.07	1.06	1.06	1.06	1.04	1.04	-3	1	25	19
Very large	Houston, TX	1.03	1.11	1.04	1.00	1.01	1.01	1.00	1.00	1.02	^R 1.06	^R 1.10	^R 1.13	^R 1.17	1.19	17	69	16	12
Large	Indianapolis, IN	0.64	0.69	0.83	0.85	0.91	0.96	1.05	1.12	1.13	1.16	1.14	1.13	^R 1.16	1.19	6	24	55	70
Medium	Jacksonville, FL	0.75	0.81	0.94	0.96	0.98	1.00	1.02	1.04	1.02	1.01	1.01	1.00	1.02	1.02	0	2	27	22
Large	Kansas City, MO-KS	^R 0.53	^R 0.62	^R 0.66	^R 0.64	^R 0.65	^R 0.72	^R 0.72	^R 0.74	^R 0.77	^R 0.78	^R 0.79	^R 0.81	^R 0.83	0.84	7	30	31	34
Small	Laredo, TX	0.55	0.56	0.56	0.57	0.56	0.54	0.54	0.53	0.56	0.60	0.63	^R 0.63	^R 0.63	0.67	11	52	12	6
Large	Las Vegas, NV	0.69	0.78	1.06	1.09	1.10	1.15	1.13	1.12	1.12	1.11	1.13	1.18	1.23	1.20	8	33	51	66
Very large	Los Angeles, CA	1.29	1.31	1.59	1.58	1.56	1.54	1.50	1.52	1.56	1.54	1.58	1.58	1.59	1.56	0	2	27	22
Medium	Louisville, KY-IN	0.78	0.78	0.80	0.84	0.89	0.93	0.97	0.99	1.01	1.05	1.08	1.09	1.09	1.08	7	30	30	30
Medium	Memphis, TN-AR-MS	0.71	0.70	0.88	0.88	0.89	0.89	0.94	0.96	0.98	0.98	0.99	0.98	1.00	1.03	5	21	32	39
Large	Miami-Hialeah, FL	0.95	0.99	1.20	1.17	1.20	1.19	1.22	1.25	1.23	1.23	^R 1.24	^R 1.25	^R 1.31	1.29	6	24	34	41
Large	Milwaukee, WI	0.71	0.80	0.93	0.94	0.93	0.89	0.91	0.94	0.99	1.01	1.02	^R 1.07	^R 1.10	1.08	9	43	37	49
Large	Minneapolis-St. Paul, MN	0.66	0.76	0.89	0.91	0.93	0.98	1.04	1.06	1.08	1.13	1.18	1.20	1.22	1.25	17	69	59	73
Medium	Nashville, TN	0.83	0.82	0.85	0.84	0.85	0.85	0.90	0.93	0.93	0.96	0.97	0.98	0.98	1.03	10	48	20	14
Large	New Orleans, LA	0.92	0.97	0.94	0.96	0.95	0.94	0.99	0.99	0.96	0.97	1.00	0.99	0.97	0.97	1	6	5	1
Very large	New York, NY-Northeastern, NJ	0.77	0.86	0.99	0.99	0.99	1.01	1.02	1.04	^R 1.06	^R 1.09	^R 1.11	^R 1.14	^R 1.15	1.15	9	43	38	53
Large	Norfolk - Newport News-Virginia Beach, VA	0.84	0.89	0.91	0.89	0.88	0.89	0.91	0.91	0.94	0.95	0.96	0.97	^R 0.95	0.96	2	8	12	6
Large	Oklahoma City, OK	0.65	0.71	0.73	0.74	0.74	0.78	0.77	0.82	0.84	0.85	0.86	0.88	0.87	0.86	2	8	21	15
Medium	Omaha, NE-IA	0.62	0.70	0.75	0.76	0.79	0.80	0.80	0.81	0.84	0.85	0.87	0.90	0.90	0.92	8	33	30	30
Large	Orlando, FL	0.82	0.93	0.95	0.97	0.97	0.97	0.96	0.97	1.00	1.03	1.05	1.07	1.11	1.14	14	60	32	39
Small	Pensacola, FL	0.61	0.69	0.84	0.85	0.86	0.87	0.87	0.88	0.86	0.88	0.87	0.88	0.92	0.91	5	21	30	30
Very large	Philadelphia, PA-NJ	0.82	0.87	0.94	0.99	0.98	0.99	1.00	1.00	1.01	1.05	1.08	1.10	1.10	1.11	10	48	29	25
Large	Phoenix, AZ	0.95	0.98	1.01	1.03	1.06	1.05	1.04	1.08	1.14	1.12	1.16	1.21	1.27	1.29	15	63	34	41
Large	Pittsburgh, PA	0.70	0.73	0.75	0.75	0.74	0.74	0.74	0.76	0.76	0.76	0.78	0.78	0.77	0.78	2	8	8	3
Large	Portland-Vancouver, OR-WA	0.81	0.90	1.02	1.03	1.07	1.10	1.12	1.15	1.20	1.22	1.22	^R 1.25	1.27	1.28	8	33	47	65
Medium	Providence-Pawtucket, RI-MA	0.71	0.83	0.89	0.88	0.83	0.82	0.82	0.84	0.86	0.89	0.93	0.95	0.98	1.00	14	60	29	25
Medium	Richmond, VA	0.67	0.73	0.75	0.74	0.75	0.79	0.79	0.78	0.80	0.81	0.83	0.83	0.83	0.83	3	13	16	12
Medium	Rochester, NY	0.51	0.57	0.69	0.70	0.72	0.72	0.74	0.77	0.77	0.76	0.77	0.78	0.80	0.80	3	13	29	25
Large	Sacramento, CA	0.76	0.88	1.05	1.05	1.07	1.09	1.12	1.12	1.17	1.14	1.18	1.20	1.25	1.28	11	52	52	68
Small	Salem, OR	0.56	0.64	0.79	0.81	0.79	0.79	0.79	0.77	0.79	0.82	0.86	0.85	0.87	0.87	8	33	31	34
Medium	Salt Lake City, UT	0.66	0.71	0.84	0.89	0.91	0.94	1.00	1.04	1.04	1.01	1.01	1.00	^R 1.04	1.08	4	19	42	48
Large	San Antonio, TX	0.69	0.78	0.74	0.74	0.77	0.78	0.81	0.87	0.89	0.92	0.97	1.03	1.05	1.04	15	63	35	44
Large	San Bernardino-Riverside, CA	0.78	0.90	1.14	1.16	1.15	1.14	1.12	1.16	1.18	1.16	1.20	^R 1.25	1.26	1.30	12	57	52	68
Large	San Diego, CA	0.79	0.90	1.19	1.18	1.18	1.16	1.16	1.17	1.17	1.18	1.20	1.25	1.32	1.35	18	71	56	71

Very large	San Francisco-Oakland, CA	1.06	1.17	1.35	1.32	1.32	1.33	1.31	1.34	1.35	1.36	1.37	1.39	^R 1.41	1.41	6	24	35	44
Large	San Jose, CA	1.07	1.13	1.24	1.25	1.22	1.18	1.15	1.13	1.11	1.11	1.13	1.19	1.34	1.36	25	75	29	25
Large	Seattle-Everett, WA	^R 0.87	^R 0.94	^R 1.15	^R 1.18	^R 1.18	^R 1.18	^R 1.19	^R 1.18	^R 1.19	^R 1.21	^R 1.23	^R 1.25	1.23	1.23	4	19	36	48
Small	Spokane, WA	^R 0.53	^R 0.57	^R 0.62	^R 0.65	^R 0.69	0.73	0.77	0.76	0.78	0.80	0.81	0.83	0.82	0.81	3	13	28	24
Large	St. Louis, MO-IL	0.87	0.94	0.91	0.90	0.92	0.95	0.99	1.00	1.01	1.02	1.02	1.03	^R 1.04	1.02	1	6	15	10
Medium	Tacoma, WA	0.75	0.78	0.91	0.96	1.02	1.08	1.10	1.12	1.13	1.15	1.18	1.19	1.20	1.26	13	59	51	66
Large	Tampa-St. Petersburg-Clearwater, FL	1.07	1.12	1.10	1.13	1.14	1.17	1.16	1.16	1.14	1.11	1.11	1.12	1.13	1.16	2	8	9	4
Medium	Tucson, AZ	0.78	0.76	0.89	0.93	0.93	0.96	0.95	0.95	0.97	1.00	1.04	1.05	^R 1.07	1.09	12	57	31	34
Medium	Tulsa, OK	0.73	0.75	0.76	0.75	0.76	0.75	0.75	0.77	0.79	0.80	0.82	0.83	0.87	0.88	9	43	15	10
Large	West Palm Beach - Boca Raton-Delray Beach, FL	0.57	0.65	^R 0.85	^R 0.89	^R 0.96	^R 1.01	^R 1.05	^R 1.06	^R 1.07	^R 1.09	^R 1.13	^R 1.19	^R 1.24	1.25	18	71	68	75
Very large	Washington, DC-MD-VA	0.99	1.13	^R 1.16	^R 1.14	^R 1.17	^R 1.16	^R 1.22	^R 1.24	^R 1.26	^R 1.27	^R 1.29	^R 1.29	^R 1.30	1.34	8	33	35	44
	75-Area Average	^R 0.87	^R 0.94	^R 1.07	^R 1.07	^R 1.08	^R 1.08	^R 1.09	^R 1.11	^R 1.13	^R 1.14	^R 1.16	^R 1.18	^R 1.20	1.21	8		34	
	Very Large Area Average	^R 0.99	^R 1.06	^R 1.22	^R 1.21	^R 1.21	^R 1.21	^R 1.20	^R 1.22	^R 1.25	^R 1.25	^R 1.28	^R 1.30	^R 1.31	1.31	6		32	
	Large Area Average	^R 0.78	^R 0.86	^R 0.97	^R 0.98	^R 0.99	^R 1.01	^R 1.03	^R 1.04	^R 1.06	^R 1.08	^R 1.10	^R 1.12	^R 1.16	1.17	11		39	
	Medium Area Average	^R 0.70	^R 0.75	^R 0.84	^R 0.85	^R 0.86	^R 0.88	^R 0.90	^R 0.92	^R 0.94	^R 0.95	^R 0.97	^R 0.99	^R 1.00	1.02	8		32	
	Small Area Average	^R 0.62	^R 0.67	^R 0.74	^R 0.74	^R 0.76	^R 0.76	^R 0.77	^R 0.77	^R 0.78	^R 0.81	^R 0.82	^R 0.84	^R 0.84	0.84	6		22	

KEY: R = revised.

Very large urban areas – over 3 million population.

Large urban areas – over 1 million and less than 3 million population.

Medium urban areas – over 500,000 and less than 1 million population.

Small urban areas – less than 500,000 population.

^a Rank is based on the calculated point change with the lowest number corresponding to a rank of 1.

NOTE

The Roadway Congestion Index (RCI) is a measure of vehicle travel density on major roadways in an urban area. An RCI exceeding 1.0 indicates an undesirable congestion level, on an average, on the freeways and principal arterial street systems during the peak period. The cities shown represent the 50 largest metropolitan areas, as well as others chosen by the states sponsoring the Texas Transportation Institute's study on mobility.

SOURCE

1982 - 2001: Texas Transportation Institute, *The 2003 Annual Urban Mobility Study* (College Station, TX: 2003) from Internet site <http://mobility.tamu.edu> as of Oct. 27, 2003.

Table 1-66: Annual Highway Congestion Cost

Population group	Urban area	Annual congestion cost per capita (\$)										Annual congestion cost (\$ millions)									
		1998 Value	1999 Value	2000 Value	2001 Value	2002 Value	1998 Rank	1999 Rank	2000 Rank	2001 Rank	2002 Rank	1998 Value	1999 Value	2000 Value	2001 Value	2002 Value	1998 Rank	1999 Rank	2000 Rank	2001 Rank	2002 Rank
Medium	Akron, OH	141	144	139	133	116	57	61	61	61	69	76	78	76	73	64	58	64	66	66	67
Medium	Albany-Schenectady, NY	(R) 78	(R) 89	(R) 98	(R) 110	110	(R) 73	(R) 74	(R) 73	(R) 70	71	(R) 39	(R) 46	(R) 51	(R) 57	58	(R) 71	(R) 69	(R) 70	(R) 69	69
Medium	Albuquerque, NM	(R) 397	(R) 430	(R) 322	(R) 319	267	(R) 14	(R) 11	(R) 31	(R) 31	42	(R) 224	(R) 245	(R) 184	(R) 181	154	(R) 37	(R) 39	(R) 45	47	50
Small	Allentown-Bethlehem, PA-NJ	132	108	126	121	128	60	67	64	67	67	76	63	69	71	76	58	67	67	67	66
Small	Anchorage, AK	(R) 31	(R) 30	(R) 31	(R) 43	46	(R) 85	(R) 85	(R) 85	(R) 85	84	8	8	(R) 8	(R) 12	13	(R) 83	(R) 83	(R) 84	(R) 83	82
Large	Atlanta, GA	(R) 514	(R) 468	(R) 527	(R) 491	573	(R) 3	(R) 10	(R) 8	(R) 10	6	(R) 1,438	(R) 1,337	(R) 1,567	(R) 1,467	1,716	(R) 11	(R) 12	(R) 10	(R) 11	11
Medium	Austin, TX	(R) 316	(R) 391	(R) 434	(R) 465	461	(R) 21	(R) 19	(R) 14	13	17	(R) 231	(R) 291	(R) 334	(R) 374	387	(R) 36	(R) 33	(R) 30	29	29
Small	Bakersfield, CA	(R) 53	(R) 52	(R) 65	(R) 69	69	(R) 78	(R) 82	(R) 80	(R) 81	80	(R) 20	(R) 20	(R) 26	(R) 28	30	(R) 77	(R) 77	(R) 77	(R) 76	75
Large	Baltimore, MD	(R) 280	(R) 294	(R) 329	(R) 381	466	(R) 28	(R) 32	(R) 29	(R) 22	15	(R) 603	(R) 634	(R) 716	(R) 842	1,069	(R) 21	(R) 22	20	19	16
Small	Beaumont, TX	(R) 89	(R) 98	(R) 103	(R) 105	140	(R) 68	(R) 69	(R) 71	(R) 72	61	(R) 12	(R) 14	(R) 15	(R) 15	20	(R) 80	(R) 81	(R) 80	(R) 81	80
Medium	Birmingham, AL	(R) 198	(R) 211	(R) 225	(R) 236	248	(R) 42	(R) 42	(R) 41	(R) 43	44	(R) 131	(R) 140	(R) 151	(R) 158	168	48	(R) 47	(R) 48	(R) 50	49
Very large	Boston, MA-NH-RI	(R) 396	(R) 430	(R) 451	(R) 480	475	15	(R) 11	(R) 11	(R) 11	13	(R) 1,194	(R) 1,299	(R) 1,366	(R) 1,453	1,440	(R) 13	(R) 13	(R) 12	(R) 12	12
Small	Boulder, CO	(R) 68	(R) 69	(R) 77	(R) 89	88	(R) 75	(R) 77	(R) 79	(R) 75	73	(R) 7	8	9	(R) 10	9	(R) 84	(R) 83	(R) 83	(R) 84	84
Medium	Bridgeport-Stamford, CT-NY	212	261	275	303	301	37	36	36	35	36	165	205	220	248	256	45	42	40	37	41
Small	Brownsville, TX	(R) 35	(R) 40	(R) 49	(R) 52	45	(R) 84	(R) 84	(R) 83	(R) 84	85	5	6	(R) 8	(R) 9	8	(R) 85	(R) 85	(R) 84	(R) 85	85
Large	Buffalo, NY	(R) 45	(R) 62	(R) 79	(R) 83	85	(R) 81	(R) 78	(R) 77	(R) 77	76	(R) 49	(R) 68	(R) 87	(R) 93	95	(R) 67	(R) 66	(R) 64	(R) 61	62
Small	Cape Coral, FL	(R) 111	(R) 115	(R) 115	(R) 119	132	(R) 65	(R) 66	(R) 67	(R) 68	64	(R) 30	(R) 32	(R) 34	(R) 36	42	(R) 72	(R) 73	(R) 73	(R) 73	72
Small	Charleston-North Charleston, SC	(R) 169	(R) 185	(R) 203	(R) 193	205	(R) 50	49	45	51	50	(R) 74	(R) 81	(R) 93	(R) 89	95	(R) 60	(R) 62	(R) 62	(R) 63	62
Medium	Charlotte, NC-SC	(R) 276	(R) 303	(R) 361	(R) 363	420	29	(R) 30	(R) 21	26	20	(R) 170	(R) 189	(R) 233	(R) 241	303	(R) 43	(R) 45	(R) 37	(R) 38	34
Very large	Chicago, IL-IN	(R) 415	(R) 416	(R) 424	(R) 455	520	(R) 13	(R) 16	(R) 15	(R) 15	8	(R) 3,345	(R) 3,363	(R) 3,432	(R) 3,692	4,221	3	3	3	3	3
Large	Cincinnati, OH-KY-IN	(R) 273	(R) 290	(R) 326	(R) 339	378	(R) 30	(R) 33	(R) 30	(R) 28	26	(R) 348	(R) 371	(R) 419	(R) 437	500	(R) 25	(R) 27	27	(R) 26	26
Large	Cleveland, OH	(R) 149	(R) 156	(R) 141	(R) 124	110	(R) 54	(R) 57	(R) 60	(R) 65	71	(R) 277	(R) 289	(R) 263	(R) 233	206	31	34	(R) 35	41	43
Small	Colorado Springs, CO	(R) 162	(R) 186	(R) 206	(R) 228	215	(R) 52	(R) 48	44	46	48	(R) 69	(R) 82	(R) 96	(R) 107	102	(R) 63	(R) 60	(R) 61	(R) 57	59
Small	Columbia, SC	51	58	80	70	74	80	80	76	79	79	21	24	33	29	31	76	76	74	75	74
Large	Columbus, OH	(R) 302	(R) 331	(R) 294	(R) 279	276	(R) 25	(R) 26	(R) 35	(R) 37	39	(R) 311	(R) 343	(R) 306	(R) 293	291	(R) 28	(R) 28	(R) 32	(R) 33	36
Small	Corpus Christi, TX	(R) 37	(R) 50	(R) 43	(R) 65	59	(R) 83	(R) 83	(R) 84	(R) 82	82	(R) 12	(R) 16	(R) 14	(R) 21	19	(R) 80	(R) 80	(R) 81	(R) 79	81
Very Large	Dallas-Fort Worth-Arlington, TX	(R) 417	(R) 597	(R) 549	(R) 559	627	(R) 12	(R) 2	(R) 5	(R) 8	3	(R) 1,588	(R) 2,342	(R) 2,192	(R) 2,268	2,603	7	4	5	(R) 6	5
Medium	Dayton, OH	180	203	190	173	139	47	45	47	55	62	107	121	113	103	83	52	53	53	58	65
Large	Denver-Aurora, CO	(R) 499	(R) 512	(R) 582	(R) 635	470	(R) 5	8	(R) 3	(R) 3	14	(R) 914	(R) 952	(R) 1,113	(R) 1,287	954	14	16	15	14	18
Very large	Detroit, MI	(R) 429	(R) 420	(R) 413	(R) 457	481	(R) 9	14	(R) 16	(R) 14	12	(R) 1,726	(R) 1,690	(R) 1,661	(R) 1,844	1,939	6	(R) 9	(R) 9	(R) 9	9
Medium	El Paso, TX-NM	(R) 81	(R) 123	(R) 155	(R) 188	175	(R) 72	(R) 64	(R) 58	(R) 52	54	(R) 52	(R) 80	(R) 102	(R) 124	117	(R) 66	(R) 63	(R) 58	(R) 55	56
Small	Eugene, OR	(R) 58	(R) 80	(R) 111	(R) 91	86	(R) 77	(R) 75	(R) 68	(R) 74	75	(R) 13	(R) 18	(R) 24	(R) 21	21	(R) 79	(R) 78	(R) 78	(R) 79	79
Medium	Fresno, CA	(R) 135	(R) 164	(R) 177	(R) 149	143	(R) 59	55	(R) 52	(R) 60	60	(R) 74	(R) 90	(R) 98	(R) 83	84	(R) 60	(R) 59	(R) 59	(R) 65	64
Medium	Grand Rapids, MI	174	178	172	176	191	48	54	54	53	51	87	91	89	92	101	57	58	63	62	61
Medium	Hartford, CT	(R) 122	(R) 127	(R) 134	(R) 161	164	(R) 64	(R) 63	(R) 63	(R) 57	56	(R) 104	(R) 110	(R) 116	(R) 140	143	(R) 53	55	(R) 52	(R) 52	52
Medium	Honolulu, HI	(R) 207	(R) 218	(R) 181	(R) 197	175	(R) 41	(R) 40	(R) 50	(R) 50	54	(R) 145	(R) 152	(R) 126	(R) 138	123	(R) 46	(R) 46	(R) 50	(R) 53	54
Very large	Houston, TX	(R) 459	(R) 562	(R) 534	(R) 565	586	(R) 8	(R) 5	(R) 7	(R) 6	5	(R) 1,524	(R) 1,916	(R) 1,869	(R) 2,051	2,178	(R) 9	7	(R) 8	(R) 8	8
Large	Indianapolis, IN	(R) 300	(R) 299	(R) 342	(R) 371	357	(R) 27	(R) 31	(R) 26	(R) 23	28	(R) 305	(R) 305	(R) 348	(R) 381	369	(R) 29	(R) 32	(R) 29	28	31
Medium	Jacksonville, FL	(R) 232	(R) 239	(R) 248	(R) 267	296	(R) 35	(R) 37	(R) 38	(R) 40	37	(R) 195	(R) 203	(R) 214	(R) 237	269	(R) 40	(R) 43	(R) 42	(R) 39	40
Large	Kansas City, MO-KS	(R) 147	(R) 180	(R) 152	(R) 153	145	(R) 55	(R) 52	(R) 59	(R) 59	58	(R) 202	(R) 251	(R) 215	(R) 218	215	(R) 39	(R) 37	(R) 41	(R) 44	42
Small	Laredo, TX	(R) 53	(R) 58	(R) 54	(R) 70	66	(R) 78	(R) 80	(R) 82	(R) 79	81	(R) 9	(R) 10	(R) 10	(R) 14	13	(R) 82	(R) 82	(R) 82	(R) 82	82
Large	Las Vegas, NV	(R) 262	(R) 288	(R) 298	(R) 271	266	(R) 31	(R) 34	(R) 34	(R) 39	43	(R) 288	(R) 331	(R) 364	(R) 352	364	(R) 30	(R) 30	(R) 28	(R) 30	32
Small	Little Rock, AR	73	99	84	104	84	74	68	75	73	78	23	32	27	35	29	75	73	76	74	77
Very large	Los Angeles-Long Beach-Santa Ana, CA	(R) 899	(R) 922	(R) 896	(R) 883	879	1	1	1	1	1	(R) 11,066	(R) 11,364	(R) 11,060	(R) 10,915	11,231	1	1	1	1	1
Medium	Louisville, KY-IN	(R) 309	(R) 346	(R) 345	(R) 316	357	23	(R) 22	25	(R) 33	28	(R) 256	(R) 289	(R) 290	(R) 265	302	(R) 34	(R) 34	(R) 33	(R) 36	35
Medium	Memphis, TN-MS-AR	(R) 211	(R) 217	(R) 247	(R) 274	290	(R) 38	(R) 41	(R) 39	(R) 38	38	(R) 204	(R) 211	(R) 240	(R) 269	285	(R) 38	(R) 41	(R) 36	(R) 35	37
Very Large	Miami, FL	(R) 347	(R) 393	(R) 439	(R) 475	512	(R) 17	(R) 18	(R) 13	(R) 12	10	(R) 1,572	(R) 1,814	(R) 2,138	(R) 2,357	2,558	(R) 8	(R) 8	(R) 6	(R) 5	6
Large	Milwaukee, WI	(R) 208	(R) 237	(R) 242	(R) 232	220	(R) 40	(R) 38	(R) 40	(R) 44	46	(R) 270	(R) 315	(R) 331	(R) 325	318	(R) 32	(R) 31	31	(R) 32	33
Large	Minneapolis - St. Paul, MN	(R) 373	(R) 429	(R) 363	(R) 407	398	16	(R) 13	(R) 18	(R) 18	23	(R) 865	(R) 1,008	(R) 872	(R) 986	971	15	(R) 15	(R) 18	(R) 17	17
Medium	Nashville-Davidson, TN	(R) 259	(R) 324	(R) 341	(R) 348	390	(R) 33	(R) 28	(R) 27	27	24	(R) 170	(R) 214	(R) 229	(R) 236	273	(R) 43	(R) 40	(R) 39	(R) 40	39
Medium	New Haven, CT	141	187	210	265	207	57	47	42	41	49	73	97	110	142	113	62	57	56	51	57

Large	New Orleans, LA	(R) 173	(R) 182	(R) 172	(R) 174	161	(R) 49	(R) 50	54	54	57	(R) 188	(R) 199	(R) 187	(R) 191	177	(R) 41	(R) 44	(R) 44	(R) 46	47
Very large	New York-Newark, NY-NJ-CT	(R) 330	(R) 374	(R) 357	(R) 392	409	(R) 18	20	(R) 22	21	21	(R) 5,415	(R) 6,143	(R) 6,100	(R) 6,725	7,080	2	2	2	2	2
Large	Oklahoma City, OK	(R) 99	(R) 123	(R) 99	(R) 112	132	(R) 66	(R) 64	(R) 72	(R) 69	64	(R) 102	(R) 128	(R) 108	(R) 121	144	(R) 54	(R) 50	(R) 57	56	51
Medium	Omaha, NE-IA	(R) 165	(R) 179	(R) 179	(R) 204	217	51	(R) 53	(R) 51	(R) 49	47	(R) 97	(R) 109	(R) 111	(R) 128	138	(R) 56	(R) 56	54	(R) 54	53
Large	Orlando, FL	(R) 427	(R) 419	(R) 523	(R) 561	486	(R) 10	(R) 15	(R) 9	(R) 7	11	(R) 478	(R) 477	(R) 615	(R) 684	613	(R) 23	(R) 24	(R) 23	(R) 22	23
Medium	Oxnard-Ventura, CA	188	208	264	319	305	43	43	37	31	34	102	134	146	177	172	54	48	49	48	48
Small	Pensacola, FL-AL	(R) 146	(R) 154	(R) 190	(R) 171	176	(R) 56	(R) 59	(R) 47	56	53	(R) 43	(R) 46	(R) 58	(R) 52	55	(R) 68	(R) 69	(R) 68	(R) 70	70
Very large	Philadelphia, PA-NJ-DE-MD	(R) 306	(R) 337	(R) 308	(R) 369	389	(R) 24	(R) 25	(R) 32	(R) 24	25	(R) 1,448	(R) 1,601	(R) 1,470	(R) 1,772	1,871	(R) 10	(R) 10	(R) 11	(R) 10	10
Large	Phoenix, AZ	(R) 323	(R) 407	(R) 407	(R) 450	437	(R) 20	(R) 17	(R) 17	16	18	(R) 825	(R) 1,099	(R) 1,140	(R) 1,305	1,289	16	(R) 14	(R) 14	(R) 13	14
Large	Pittsburgh, PA	(R) 131	(R) 148	(R) 116	(R) 127	115	(R) 61	(R) 60	(R) 66	(R) 63	70	(R) 232	(R) 261	(R) 205	(R) 223	203	(R) 35	(R) 36	(R) 43	(R) 43	44
Large	Portland, OR-WA	(R) 316	(R) 345	(R) 352	(R) 368	367	(R) 21	(R) 23	(R) 23	(R) 25	27	(R) 465	(R) 521	(R) 539	(R) 585	589	(R) 24	23	(R) 24	24	24
Medium	Providence, RI-MA	(R) 158	(R) 206	(R) 192	(R) 223	311	(R) 53	(R) 44	(R) 46	(R) 47	33	(R) 187	(R) 247	(R) 232	(R) 273	384	42	(R) 38	(R) 38	(R) 34	30
Medium	Raleigh-Durham, NC	187	182	209	283	244	44	50	43	36	45	128	128	153	214	191	49	50	46	45	45
Medium	Richmond, VA	(R) 184	(R) 156	(R) 124	(R) 123	145	46	(R) 57	(R) 65	(R) 66	58	(R) 136	(R) 117	(R) 97	(R) 100	121	(R) 47	(R) 54	(R) 60	(R) 60	55
Large	Riverside-San Bernardino, CA	(R) 462	(R) 469	(R) 472	(R) 529	561	(R) 7	(R) 9	(R) 10	(R) 9	7	(R) 647	(R) 667	(R) 693	(R) 805	904	19	(R) 20	(R) 21	20	19
Medium	Rochester, NY	(R) 42	(R) 60	(R) 59	(R) 57	55	(R) 82	(R) 79	(R) 81	(R) 83	83	(R) 27	(R) 38	(R) 38	(R) 37	36	(R) 73	(R) 72	(R) 72	(R) 72	73
Large	Sacramento, CA	(R) 248	(R) 277	(R) 308	(R) 308	349	(R) 34	(R) 35	(R) 32	(R) 34	30	(R) 335	(R) 378	(R) 429	(R) 440	526	(R) 26	(R) 26	26	(R) 25	25
Small	Salem, OR	(R) 92	(R) 92	(R) 105	(R) 109	137	(R) 67	(R) 72	(R) 70	(R) 71	63	(R) 18	(R) 18	(R) 21	(R) 23	30	(R) 78	(R) 78	(R) 79	(R) 78	75
Medium	Salt Lake City, UT	(R) 127	(R) 144	(R) 169	(R) 249	304	(R) 62	(R) 61	(R) 56	(R) 42	35	(R) 113	(R) 129	(R) 152	(R) 227	277	51	(R) 49	(R) 47	(R) 42	38
Large	San Antonio, TX	(R) 211	(R) 308	(R) 363	(R) 328	344	(R) 38	(R) 29	(R) 18	(R) 29	32	(R) 260	(R) 382	(R) 454	(R) 414	434	(R) 33	(R) 25	(R) 25	(R) 27	27
Large	San Diego, CA	(R) 260	(R) 339	(R) 349	(R) 395	465	(R) 32	(R) 24	(R) 24	(R) 19	16	(R) 691	(R) 916	(R) 958	(R) 1,098	1,314	(R) 18	17	(R) 16	(R) 16	13
Very large	San Francisco-Oakland, CA	(R) 514	(R) 568	(R) 623	(R) 667	675	(R) 3	(R) 4	2	2	2	(R) 2,064	(R) 2,285	(R) 2,513	(R) 2,697	2,779	4	5	4	4	4
Large	San Jose, CA	(R) 425	(R) 516	(R) 548	(R) 578	518	11	7	6	(R) 5	9	(R) 702	(R) 861	(R) 919	(R) 970	871	(R) 17	18	(R) 17	18	20
Medium	Sarasota-Bradenton, FL	124	157	157	159	187	63	56	57	58	52	64	82	84	85	102	65	60	65	64	59
Large	Seattle, WA	(R) 486	(R) 540	(R) 440	(R) 442	435	(R) 6	(R) 6	(R) 12	(R) 17	19	(R) 1,251	(R) 1,401	(R) 1,146	(R) 1,184	1,175	(R) 12	(R) 11	(R) 13	(R) 15	15
Small	Spokane, WA	(R) 85	(R) 95	(R) 95	(R) 84	88	(R) 70	(R) 70	(R) 74	(R) 76	73	(R) 27	(R) 31	(R) 31	(R) 28	29	(R) 73	(R) 75	(R) 75	(R) 76	77
Medium	Springfield, MA-CT	68	71	78	76	85	75	76	78	78	76	41	43	48	47	55	70	71	71	71	70
Large	St. Louis, MO-IL	(R) 301	(R) 327	(R) 363	(R) 322	348	26	(R) 27	(R) 18	(R) 30	31	(R) 602	(R) 657	(R) 740	(R) 662	719	22	(R) 21	(R) 19	(R) 23	22
Large	Tampa-St Petersburg, FL	(R) 329	(R) 355	(R) 339	(R) 395	399	(R) 19	(R) 21	(R) 28	(R) 19	22	(R) 614	(R) 673	(R) 661	(R) 790	808	(R) 20	(R) 19	(R) 22	21	21
Medium	Toledo, OH-MI	85	95	108	125	124	70	70	69	64	68	42	47	54	63	62	69	68	69	68	68
Medium	Tucson, AZ	(R) 185	(R) 191	(R) 186	(R) 229	269	(R) 45	(R) 46	(R) 49	(R) 45	41	(R) 122	(R) 128	(R) 126	(R) 162	191	50	(R) 50	50	(R) 49	45
Medium	Tulsa, OK	(R) 87	(R) 91	(R) 139	(R) 128	131	(R) 69	(R) 73	(R) 61	(R) 62	66	(R) 66	(R) 70	(R) 111	(R) 103	106	(R) 64	(R) 65	(R) 54	(R) 58	58
Large	Virginia Beach, VA	(R) 219	(R) 229	(R) 177	(R) 218	270	(R) 36	(R) 39	(R) 52	(R) 48	40	(R) 317	(R) 336	(R) 265	(R) 331	412	(R) 27	(R) 29	(R) 34	(R) 31	28
Very large	Washington, DC-VA-MD	(R) 559	(R) 590	(R) 563	(R) 594	600	(R) 2	(R) 3	(R) 4	(R) 4	4	(R) 1,957	(R) 2,089	(R) 2,026	(R) 2,216	2,274	5	6	(R) 7	(R) 7	7
NA	85-Area Average	(R) 368	(R) 401	(R) 399	(R) 420	435	NA	NA	NA	NA	NA	(R) 595	(R) 655	(R) 663	(R) 707	743	NA	NA	NA	NA	NA
NA	Very Large Area Average	(R) 486	(R) 527	(R) 517	(R) 543	567	NA	NA	NA	NA	NA	(R) 2,991	(R) 3,264	(R) 3,257	(R) 3,454	3,652	NA	NA	NA	NA	NA
NA	Large Area Average	(R) 306	(R) 337	(R) 341	(R) 358	364	NA	NA	NA	NA	NA	(R) 503	(R) 561	(R) 580	(R) 619	639	NA	NA	NA	NA	NA
NA	Medium Area Average	(R) 178	(R) 200	(R) 208	(R) 226	238	NA	NA	NA	NA	NA	(R) 121	(R) 137	(R) 144	(R) 159	170	NA	NA	NA	NA	NA
NA	Small Area Average	(R) 94	(R) 100	(R) 112	(R) 114	116	NA	NA	NA	NA	NA	(R) 28	30	(R) 34	(R) 35	36	NA	NA	NA	NA	NA

KEY: NA = not applicable; R = revised.

Very large urban areas - over 3 million population.

Large urban areas - over 1 million and less than 3 million population.

Medium urban areas - over 500,000 and less than 1 million population.

Small urban areas - less than 500,000 population.

NOTES

The urban areas included are those containing over 500,000 people and several smaller places mostly chosen by previous sponsors of the Texas Transportation Institute study on mobility.

The cost of congestion is estimated with a value for each hour of travel time and each gallon of fuel. For a more detailed explanation of the formulas used, see the source document.

SOURCE

1998-2002: Texas Transportation Institute, *The 2004 Annual Urban Mobility Report* (College Station, TX: 2004), Internet site <http://mobility.tamu.edu> as of Sep. 13, 2004.

Table 1-67: Amtrak On-Time Performance Trends and Hours of Delay by Cause

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
On-time performance, total percent (weighted)	69%	81%	76%	77%	77%	72%	72%	76%	71%	74%	79%	79%	78%	75%	76%	74%
Short distance (<400 miles), percent	71%	82%	82%	82%	82%	79%	78%	81%	76%	79%	81%	80%	^R 82%	79%	80%	77%
Long distance (>=400 miles), percent	64%	78%	53%	59%	61%	47%	49%	57%	49%	53%	59%	55%	^R 55%	52%	52%	53%
Hours of delay by cause, total ^a	N	N	12,126	21,084	22,847	32,991	34,729	25,248	25,056	25,825	27,289	29,252	^R 70,396	83,837	85,932	88,413
Amtrak ^b	N	N	3,565	5,915	6,433	8,488	8,538	5,527	5,193	5,310	4,796	4,891	^R 23,337	27,822	26,575	25,711
Host railroad ^c	N	N	4,244	7,743	8,229	12,827	14,319	11,224	11,438	12,904	14,202	16,158	^R 43,881	52,273	55,090	57,346
Other ^d	N	N	4,316	7,426	8,185	11,675	11,871	8,497	8,425	7,611	8,291	8,203	^R 3,176	3,741	4,266	5,355

KEY: N = data do not exist; R = revised.

^a Amtrak changed its method for reporting delays in 2000. Therefore, the data for 2000 and following years are not comparable with prior years.

^b Includes all delays that occur when operating on Amtrak owned tracks and all delays for equipment or engine failure, passenger handling, holding for connections, train servicing, and mail/baggage handling when on tracks of a host railroad.

^c Includes all operating delays not attributable to Amtrak when operating on tracks of a host railroad, such as track and signal related delays, power failures, freight and commuter train interference, routing delays, etc.

^d Includes delays not attributable to Amtrak or other host railroads, such as customs and immigrations, law enforcement action, weather, or waiting for scheduled departure time.

NOTES

Host railroad is a freight or commuter railroad over which Amtrak trains operate for all or part of their trip.

Numbers may not add to totals due to roundings.

All percentages are based on Amtrak's fiscal year (October 1–September 30).

Amtrak trips are considered delayed based on the following chart:

<u>Trip length (miles)</u>	<u>Delayed departure time (minutes)</u>
0-250	10
251-350	15
351-450	20
451-550	25
≥551	30

SOURCES:

1980: Amtrak, *National Railroad Passenger Corporation Annual Report* (Washington, DC: 1981).

1985–99: *Ibid.*, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues).

2000–03: Amtrak, personal communication, October 2003.

Chapter 2
Transportation Safety

Section A
Multimodal

Table 2-1: Transportation Fatalities by Mode

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	
TOTAL fatalities	U	U	U	U	U	U	47,347	44,320	42,032	42,810	43,558	44,527	44,798	44,444	^R 43,910	^R 44,047	^R 44,333	44,933	U	
Air																				
U.S. air carrier ^a	499	261	146	124	1	526	39	^I 50	33	1	239	168	380	8	1	12	92	531	^P 0	
Commuter carrier ^b	N	N	N	28	37	37	6	^I 77	21	24	25	9	14	46	0	12	5	13	^P 0	
On-demand air taxi ^c	N	N	N	69	105	76	51	78	68	42	63	52	63	39	45	38	71	60	33	
General aviation ^d	787	1,029	1,310	1,252	1,239	956	767	799	867	744	730	735	636	631	624	619	^R 595	^R 562	^P 576	
Highway, total	36,399	47,089	52,627	44,525	51,091	43,825	44,599	41,508	39,250	40,150	40,716	41,817	^m 42,065	42,013	41,501	41,717	41,945	^R 42,196	42,815	
Passenger car occupants	N	N	N	25,929	27,449	23,212	24,092	22,385	21,387	21,566	21,997	22,423	22,505	22,199	21,194	20,862	20,699	^R 20,320	20,416	
Motorcyclists	790	1,650	2,280	3,189	5,144	4,564	3,244	2,806	2,395	2,449	2,320	2,227	2,161	2,116	2,294	2,483	2,897	^R 3,197	3,244	
Truck occupants ^e , light	N	N	N	4,856	7,486	6,689	8,601	8,391	8,098	8,511	8,904	9,568	9,932	10,249	10,705	11,265	11,526	^R 11,723	12,182	
Truck occupants ^e , large	N	N	N	961	1,262	977	705	661	585	605	670	648	621	723	742	759	754	^R 708	684	
Bus occupants	N	N	N	53	46	57	32	31	28	18	18	33	21	18	38	59	22	^R 34	45	
Pedestrians	7,210	7,990	8,950	7,516	8,070	6,808	6,482	5,801	5,549	5,649	5,489	5,584	5,449	5,321	5,228	4,939	4,763	^R 4,901	4,808	
Pedalcyclists	490	690	760	1,003	965	890	859	843	723	816	802	833	765	814	760	754	693	^R 732	662	
Other ^f	27,909	36,759	40,637	1,018	669	628	584	590	485	536	516	501	609	573	540	596	591	^R 581	774	
Railroad^g	2,345	2,533	2,225	1,492	1,417	1,036	1,297	1,194	1,170	1,279	1,226	1,146	1,039	1,063	1,008	932	937	971	951	
Highway-rail grade crossing	1,421	1,610	1,440	917	833	582	698	608	579	626	615	579	488	461	431	402	425	421	^P 355	
Railroad	924	923	785	575	584	454	599	586	591	653	611	567	551	602	577	530	512	^R 550	^P 596	
Transit ^h	N	N	N	N	N	N	339	300	273	281	320	274	264	275	286	299	295	267	U	
Waterborne, totalⁱ	N	N	2,016	2,039	1,847	1,377	1,051	1,010	1,006	1,009	963	975	856	959	982	888	838	820	U	
Vessel-related ^j	N	N	178	243	206	131	85	30	96	114	78	51	52	50	71	^R 61	^R 49	59	^P 28	
Not related to vessel casualties ^k	N	N	420	330	281	130	101	56	94	95	101	95	95	88	^R 96	^R 93	^R 88	80	^P 48	
Recreational boating ^k	739	1,360	1,418	1,466	1,360	1,116	865	924	816	800	784	829	709	821	815	734	701	681	U	
Pipeline, total	N	N	30	15	19	33	9	14	15	17	22	21	53	10	20	25	38	7	11	
Hazardous liquid pipeline	N	N	4	7	4	5	3	0	5	0	1	3	5	0	2	4	1	0	1	
Gas pipeline	N	N	26	8	15	28	6	14	10	17	21	18	48	10	18	21	37	7	10	

KEY: N = data do not exist; P = preliminary; R = revised; U = data are not available.

^a Carriers operating under 14 CFR 121, all scheduled and nonscheduled service. Since Mar. 20, 1997, 14 CFR 121 include aircraft with 10 or more seats that formerly operated under 14 CFR 135. This change makes it difficult to compare pre-1997 data for 14 CFR 121 and 14 CFR 135 with more recent data.

^b All scheduled service operating under 14 CFR 135 (commuter air carriers). Before Mar. 20, 1997, 14 CFR 135 applied to aircraft with 30 or fewer seats. Since Mar. 20, 1997, 14 CFR 135 includes only aircraft with fewer than 10 seats. This change makes it difficult to compare pre-1997 data for 14 CFR 121 and 14 CFR 135 with more recent data.

^c Nonscheduled service operating under 14 CFR 135 (on-demand air taxis).

^d All operations other than those operating under 14 CFR 121 and 14 CFR 135.

^e Large trucks are defined as trucks over 10,000 pounds gross vehicle weight rating, including single-unit trucks and truck tractors. Light trucks are defined as trucks of 10,000 pounds gross vehicle weight rating or less, including pickups, vans, truck-based station wagons, and utility vehicles.

^f Includes occupants of other vehicle types and other nonmotorists. For 1960-70, the U.S. Department of Transportation, National Highway Traffic Safety Administration did not break out fatality data to the same level of detail as in later years, so fatalities for those years also include occupants of passenger cars, trucks, and buses.

^g Includes Amtrak. Highway-rail grade crossing fatalities data for 1970 and before is not comparable with data after 1970 due to change in reporting system. Fatalities include those resulting from train accidents, train incidents, and nontrain incidents. Highway-rail grade crossing fatalities are also counted under highway, except train occupants.

^h Fatalities include those resulting from all reportable incidents, not just from accidents.

ⁱ 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.

^j 1992-2001 data come from the Marine Safety Management Information System and 2002 data come from the Marine Information for Safety and Law Enforcement System. Data for prior years come from other sources and may not be directly comparable.

^k Data are based on information provided by the States, the District of Columbia and the five U.S. Territories to the Coast Guard Boating Accident Report Database (BARD) system. Research on the level of underreporting of fatal accidents in the BARD, based on discrepancies between the BARD and the Coast Guard Search and Rescue Management Information System (SARMIS), found that approximately 6 percent of recreational boating fatalities are not captured by the BARD system. Adjusting the number of recreational boating fatalities included in the BARD in 2001 by 6 percent increases the total to 722.

^l U.S. air carrier figure does not include 12 persons killed aboard a commuter aircraft when it and a US Air airliner collided; commuter air carrier figure does not include 22 persons killed aboard a US Air airliner when it and a commuter aircraft collided.

^m Includes 2 fatalities that have not been assigned to a specific vehicle type.

NOTES

Numbers may not add to totals because some fatalities are counted in more than one mode. To avoid double counting, the following adjustments have been made: most (not all) highway-rail grade-crossing fatalities have not been added because most (not all) such fatalities involve motor vehicles and, thus, are already included in highway fatalities; for transit, all commuter rail fatalities and motor-bus, trolley-bus, demand-responsive, and van-pool fatalities arising from accidents have been subtracted because they are counted as railroad, highway, or highway-rail grade-crossing fatalities. The reader cannot reproduce the total fatalities in this table by simply leaving out the number of highway-rail grade-crossing fatalities in the sum and subtracting the above transit submodes, because in so doing, grade-crossing fatalities not involving motor vehicles would be left out (see table 2-35 on rail). An example of such a fatality is a bicyclist hit by a train at a grade crossing.

Caution must be exercised in comparing fatalities across modes because significantly different definitions are used. In particular, rail and transit fatalities include incident-related (as distinct from accident-related) fatalities, such as fatalities from falls in transit stations or railroad employee fatalities from a fire in a workshop. Equivalent fatalities for the air and highway modes (fatalities at airports not caused by moving aircraft or fatalities from accidents in automobile repair shops) are not counted toward the totals for these modes. Thus, fatalities not necessarily directly related to in service transportation are counted for the transit and rail modes, potentially overstating the risk for these modes.

SOURCES

Air:

1960: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1967* (Washington, DC: December 1968).
1965-70: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1975*, NTSB/ARC-77/1 (Washington, DC: January 1977).
1975: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1983*, NTSB/ARC-87/01 (Washington, DC: February 1987), table 18.
1980: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1981*, NTSB/ARC-85/01 (Washington, DC: February 1985), tables 2 and 16.
1985-2002: Ibid., Internet site www.ntsb.gov/aviation, table 5 as of May 5, 2003.

Commuter:

1975-80: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1980*, NTSB/ARC-83/01 (Washington, DC: January 1983), tables 26 and 40.
1985-2002: Ibid., Internet site www.ntsb.gov/aviation, table 8 as of May 5, 2003.

On-demand air taxi:

1975-80: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1981*, NTSB/ARC-85/01 (Washington, DC: February 1985), table 61.
1985-2002: Ibid., Internet site www.ntsb.gov/aviation, table 9 as of May 5, 2003.

General aviation:

1960-70: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. General Aviation, Calendar Year 1970*, NTSB/ARG-74/1 (Washington, DC: April 1974), table 117.
1975-80: Ibid., *Annual Review of Aircraft Accident Data: General Aviation, Calendar Year 1985*, NTSB/ARG-87/03 (Washington, DC: October 1987), table 21.
1985-2002: Ibid., Internet site www.ntsb.gov/aviation, table 10 as of May 5, 2003.

Highway:

1960-65: Estimated by U.S. Department of Transportation, National Highway Traffic Safety Administration from data supplied by U.S. Department of Health and Human Services, National Center for Health Statistics, and individual state accident reports (adjusted to 30 day deaths). Fatalities data prior to 1975 have been adjusted to reflect the Fatality Analysis Reporting System's definition of a fatal crash as one that involves a motor vehicle on a trafficway that results in the death of a vehicle occupant or a nonmotorist within 30 days of the crash.

1970-2000: Ibid., *Traffic Safety Facts 2001*, DOT HS 809 100 (Washington, DC: December 2002), table 4, available at Internet site www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSFAnn/TSF2001.pdf as of August 2003.

2001-02: Ibid., *Traffic Safety Facts 2002: Overview*, DOT HS 809 612 (Washington, DC: 2003), table 1, available at Internet site www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2002/2002ovrfacts.pdf as of August 2003.

Rail:

Highway-rail grade crossing:

1960-70: National Safety Council, *Accident Facts, 1974* (Washington, DC: 1974).
1975-80: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, personal communication.
1985-90: Ibid., *Rail-Highway Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: Annual issues), table S.
1991-2001: Ibid., *Railroad Safety Statistics Annual Report 2001* (Washington, DC: July 2003), tables 1-1 and 8-13, available at Internet site <http://safetydata.fra.dot.gov/OfficeofSafety>.
2002: Ibid., Preliminary data available at Internet site <http://safetydata.fra.dot.gov/Prelim/2002/r01.htm> as of June 24, 2003.

Railroad:

1960-65: National Safety Council, *Accident Facts, 1974* (Washington, DC: 1974).
1970-90: U.S. Department of Transportation, Federal Railroad Administration, *Highway-Rail Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: Annual issues), table 7.
1991-2001: Ibid., *Railroad Safety Statistics Annual Report 2001* (Washington, DC: July 2003), tables 1-1 and 8-13, available at Internet site <http://safetydata.fra.dot.gov/OfficeofSafety>.
2002: Ibid., Preliminary data available at Internet site <http://safetydata.fra.dot.gov/Prelim/2002/r01.htm> as of June 24, 2003.

Transit:

1990-99: U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics 1999* (Washington, DC: 2001), p. 41.
2000-01: U.S. Department of Transportation, Federal Transit Administration, personal communications, May 1, 2003.

Water:

Vessel- and nonvessel-related:

1970-91: U.S. Department of Transportation, U.S. Coast Guard, Office of Investigations and Analysis, Compliance Analysis Division, (G-MOA-2), personal communication, Apr. 13, 1999.
1992-2002: U.S. Department of Transportation, U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, May 28, 2003.

Recreational boating:

1960-2001: Ibid., Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual issues), also available at Internet site <http://www.uscgboating.org> as of July 25, 2003.

Hazardous liquid and gas pipeline:

1970-2002: U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, *Accident and Incident Summary Statistics by Year*, located at Internet site <http://ops.dot.gov> as of Nov. 18, 2003.

Table 2-2: Injured Persons by Transportation Mode

	1960	1965	1970	1975	1980	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL injured persons	U	U	U	U	U	U	U	U	U	3,127,134	3,202,029	3,325,081	3,517,767	3,532,287	3,397,512	3,241,660	3,284,450	3,240,424	U	U
Air^a																				
U.S. air carrier ^b	N	N	107	81	19	19	30	29	26	22	19	31	25	77	43	30	67	27	16	P 20
Commuter carrier ^c	N	N	N	N	14	14	14	11	31	7	2	6	17	2	1	2	2	7	4	P 0
On-demand air taxi ^d	N	N	N	N	43	43	44	36	26	19	24	32	14	22	23	10	14	12	23	P 13
General aviation ^e	N	N	715	769	681	681	501	409	432	408	385	415	396	365	350	327	322	310	322	P 312
Highway, total	N	N	N	N	N	N	N	3,230,666	3,096,870	3,069,603	3,149,164	3,265,928	3,465,279	3,483,319	3,347,614	3,192,035	3,236,238	3,188,750	3,032,672	2,925,758
Passenger car occupants	N	N	N	N	N	N	N	2,376,439	2,234,594	2,231,703	2,264,809	2,363,595	2,469,358	2,458,080	2,340,612	2,201,375	2,137,503	2,051,609	1,926,625	1,804,788
Motorcyclists	N	N	N	N	N	N	N	84,285	80,435	65,099	59,436	57,405	57,480	55,281	52,574	48,974	49,986	57,723	60,236	64,713
Truck occupants ^f , light	N	N	N	N	N	N	N	505,144	562,601	544,657	600,874	631,411	722,496	761,478	754,820	762,506	846,865	886,566	860,527	879,338
Truck occupants ^f , large	N	N	N	N	N	N	N	41,822	28,031	33,778	32,102	30,208	30,344	32,760	30,913	28,767	32,892	30,832	29,424	26,242
Bus occupants	N	N	N	N	N	N	N	32,691	20,959	20,144	17,056	15,767	19,214	20,291	16,887	15,559	21,958	17,769	15,427	18,819
Pedestrians	N	N	N	N	N	N	N	104,805	88,446	89,184	94,001	91,987	85,837	81,797	77,011	68,955	85,235	77,625	77,619	70,664
Pedalcyclists	N	N	N	N	N	N	N	74,903	67,088	62,691	67,916	62,489	66,572	58,158	57,802	53,379	51,290	51,160	45,277	48,011
Other ^g	N	N	N	N	N	N	N	10,578	14,716	22,348	12,969	13,065	13,977	15,473	16,995	12,519	10,509	15,466	17,536	13,182
Railroad^h																				
Highway-rail grade crossing	3,367	3,725	3,272	3,860	3,550	3,550	2,687	2,407	2,094	1,975	1,837	1,961	1,894	1,610	1,540	1,303	1,396	1,219	R 1,157	P 999
Railroad	16,113	21,930	17,934	50,138	58,696	58,696	31,617	22,736	21,374	19,408	17,284	14,851	12,546	10,948	10,227	10,156	10,304	10,424	R 9,828	P 10,067
Transitⁱ	N	N	N	N	N	N	N	54,556	52,125	55,089	52,668	58,193	57,196	55,288	56,132	55,990	55,325	56,697	U	U
Waterborne, total^j	N	N	U	U	U	U	U	U	U	5,334	5,173	5,976	6,119	5,992	5,713	5,288	4,954	5,052	4,980	P 4,738
Vessel-related ^k	N	N	105	97	180	180	172	175	110	162	166	174	145	223	121	135	131	R 130	181	P 157
Not related to vessel casualties ^k	N	N	U	U	U	U	U	U	U	1,489	1,448	1,718	1,833	1,327	1,037	R 541	R 508	R 567	525	P 519
Recreational boating	929	927	780	2,136	2,650	2,650	2,757	3,822	3,967	3,683	3,559	4,084	4,141	4,442	4,555	4,612	4,315	4,355	4,274	4,062
Pipeline, total	N	N	254	231	192	192	126	76	98	118	111	1,971	64	127	77	82	20	81	10	50
Hazardous liquid pipeline	N	N	21	17	15	15	18	7	9	38	10	1,858	11	13	5	6	20	4	10	0
Gas pipeline	N	N	233	214	177	177	108	69	89	80	101	113	53	114	72	76	R 88	77	R 51	50

KEY: N = data do not exist; P = preliminary; R = revised; U = data are not available.

^a Injuries classified as serious. See definitions of injuries in the glossary.

^b All scheduled and nonscheduled service operating under 14 CFR 121. Since March 20, 1997, 14 CFR 121 includes only aircraft with 10 or more seats formerly operated under 14 CFR 135. This change makes it difficult to compare pre-1997 data for 14 CFR 121 and 14 CFR 135 with more recent years' data.

^c All scheduled service operating under 14 CFR 135 (commuter air carriers). Before March 20, 1997, 14 CFR 135 applied to aircraft with 30 or fewer seats. Since March 20, 1997, 14 CFR 135 includes only aircraft with fewer than 10 seats. This change makes it difficult to compare pre-1997 data for 14 CFR 121 and 14 CFR 135 with more recent years' data.

^d Nonscheduled service operating under 14 CFR 135 (on-demand air taxis).

^e All operations other than those operating under 14 CFR 121 and 14 CFR 135.

^f Large trucks are defined as trucks over 10,000 pounds gross vehicle weight rating, including single-unit trucks and truck tractors. Light trucks are defined as trucks of 10,000 pounds gross vehicle weight rating or less, including pickups, vans, truck-based station wagons, and utility vehicles.

^g Includes occupants of other unknown vehicle types and other nonmotorists.

^h Includes Amtrak. Figures include those injuries resulting from train accidents, train incidents, and nontrain incidents. Injury figures also include occupational illness. Railroad injuries data for 1970 and before are not comparable with post-1970 data due to change in reporting system. Highway-rail grade crossing injuries are counted under highway, except train occupants.

ⁱ Includes motor bus, commuter rail, heavy rail, light rail, demand responsive, van pool, and automated guideway. Transit injuries include those resulting from all reportable incidents, not just from accidents.

^j 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.

^k 1992-2001 data come from the Marine Safety Management Information System and 2002 data come from the Marine Information for Safety and Law Enforcement System. Data for prior years come from other sources and may not be directly comparable.

NOTES

The motor vehicle injury data in this table come from the U.S. Department of Transportation, National Highway Traffic Safety Administration's General Estimates System (GES). The data from GES, which began operation in 1988, are obtained from a nationally representative probability sample selected from all police-reported crashes. The GES sample includes only crashes where a police accident report was completed and the crash resulted in property damage, injury, or death. The resulting figures do not take into account crashes that were not reported to the police or did not result in property damage. The 1993 *National Transportation Statistics (NTS) Historical Compendium* and earlier editions used injury figures estimated by the National Safety Council, which used a different set of methods to arrive at its figures. Thus, the injury figures in this edition of NTS may not be comparable with those found in the *Compendium* and earlier editions.

Numbers may not add to totals because some injuries are counted in more than one mode. To avoid double counting, the following adjustments have been made in the total injured row:

- most (not all) highway-rail grade crossing injuries have not been added because most (not all) such injuries involve motor vehicles and are already included in highway injuries;
- for transit, all commuter rail injuries and motor-bus, trolley-bus, demand-responsive, and van-pool injuries arising from accidents have been subtracted because they are counted as railroad, highway, or highway-rail grade crossing injuries.

The reader cannot reproduce the total injuries count in this table by simply leaving out the number of highway-rail grade crossing injuries in the sum and subtracting the above transit submodes, because in so doing, grade-crossing injuries not involving motor vehicles would be left out (see table 2-35 on rail). An example of such an injury is a bicyclist injured by a train at a grade crossing.

SOURCES

Air:

U.S. air carrier:

1970-94: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues).

1995-2002: Ibid., Analysis and Data Division, personal communications, Aug. 8, 1996, Mar. 10, 1999, March 23, 2000, May 7, 2002, Sept. 11, 2002, and May 5, 2003.

Commuter carrier, and on-demand air taxi:

1980-94: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues).

1995-2002: Ibid., Analysis and Data Division, personal communications, 1996, 1997, 1998, 2000, May 7, 2002, Sept. 11, 2002, and May 5, 2003.

General aviation:

1970-94: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: General Aviation* (Washington, DC: Annual issues).

1995-2002: Ibid., Analysis and Data Division, personal communications, 1996, 1997, 1998, 2000, May 7, 2002, Sept. 11, 2002, and May 5, 2003.

Highway:

1990-99: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 1999*, DOT HS 809 100 (Washington, DC: December 2000), table 4.

2000-02: Ibid., General Estimates System Database and personal communication, Dec. 9, 2003.

Rail:

Highway-rail grade crossings:

1960-70: National Safety Council, *Accident Facts, 1974* (Washington, DC: 1974).

1975: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, personal communication.

1980-91: Ibid., *Rail-Highway Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: Annual issues), table S.

1991-2001: Ibid., *Railroad Safety Statistics Annual Report 2001* (Washington, DC: July 2003), tables 1-1 and 8-13, available at Internet site

<http://safetydata.fra.dot.gov/OfficeofSafety>.

2002: Ibid., Preliminary data available at Internet site <http://safetydata.fra.dot.gov/Prelim/2002/r01.htm> as of Dec. 3, 2003.

Railroad:

1960-70: National Safety Council, *Accident Facts, 1974* (Washington, DC: 1974).

1970-91: U.S. Department of Transportation, Federal Railroad Administration, *Highway-Rail Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: Annual issues), table 7.

1992-2001: Ibid., *Railroad Safety Statistics Annual Report 2001* (Washington, DC: July 2003), tables 1-1 and 8-13, available at Internet site

<http://safetydata.fra.dot.gov/OfficeofSafety>.

2002: Ibid., Preliminary data available at Internet site <http://safetydata.fra.dot.gov/Prelim/2002/r01.htm> as of Dec. 3, 2003.

Transit:

1990-2000: U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics* (Washington, DC: Annual issues).

Water:

Vessel- and nonvessel-related:

1970-91: U.S. Department of Transportation, U.S. Coast Guard, Office of Investigations and Analysis, Compliance Analysis Division, (G-MOA-2), personal communication, Apr. 13, 1999.

1992-2002: Ibid., Data Administration Division (G-MRI-1), personal communications, Dec. 12, 2001 and May 28, 2003.

Recreational boating:

1960-2001: Ibid., Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual issues), also available at Internet site <http://www.uscgboating.org> as of July 25, 2003.

2002: Ibid., *Boating Statistics 2002 - Executive Summary*, available at Internet site <http://www.uscgboating.org> as of Dec. 10, 2003.

Hazardous liquid and gas pipeline:

1970-2002: U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, personal communication and Internet site

<http://ops.dot.gov> as of June 3, 2003.

Table 2-3: Transportation Accidents^a by Mode

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Air																			
U.S. air carrier ^b	90	83	55	37	19	21	24	26	18	23	23	36	37	49	50	51	56	45	41
Commuter carrier ^c	N	N	N	48	38	18	15	23	23	16	10	12	11	16	8	13	12	7	8
On-demand air taxi ^d	N	N	N	152	171	157	107	88	76	69	85	75	90	82	77	73	80	72	59
General aviation ^e	4,793	5,196	4,712	3,995	3,590	2,739	^R 2,242	2,197	2,111	^R 2,064	2,022	2,056	1,908	1,845	1,904	1,906	^R 1,837	^R 1,726	1,714
Highway, total crashes^a	N	N	N	N	N	N	6,471,000	6,117,000	6,000,000	6,106,000	6,496,000	6,699,000	6,770,000	6,624,000	6,335,000	6,279,000	6,394,000	6,323,000	6,570,000
Passenger car	N	N	N	N	N	N	5,561,000	5,178,000	5,042,000	5,040,000	5,401,000	5,594,000	5,599,000	5,423,000	5,146,000	4,916,000	4,926,000	4,832,000	6,606,000
Motorcycle	N	N	N	N	N	N	103,000	105,000	72,000	75,000	69,000	66,000	66,000	61,000	54,000	57,000	69,000	73,000	78,000
Truck ^f , light	N	N	N	N	N	N	2,152,000	2,200,000	2,191,000	2,407,000	2,574,000	2,750,000	2,881,000	2,901,000	2,867,000	3,080,000	3,208,000	3,254,000	3,988,000
Truck ^f , large	N	N	N	N	N	N	372,000	319,000	363,000	383,000	445,000	363,000	378,000	421,000	392,000	452,000	438,000	409,000	434,000
Bus	N	N	N	N	N	N	60,000	56,000	50,000	51,000	56,000	59,000	57,000	53,000	53,000	63,000	56,000	54,000	58,000
Rail																			
Highway-rail grade crossing ^{g,h}	3,195	3,820	3,559	12,076	10,612	6,919	5,715	5,388	4,910	4,892	4,979	4,633	4,257	3,865	3,508	3,489	3,502	^R 3,237	3,072
Railroad ^{g,i}	N	N	8,095	8,041	8,205	3,275	2,879	2,658	2,359	2,611	2,504	2,459	2,443	2,397	2,575	2,768	2,983	^R 3,023	2,701
Transit ^j	N	N	N	N	N	N	58,002	46,467	36,380	30,559	29,972	25,683	25,166	24,924	23,937	23,310	24,261	23,970	U
Waterborne																			
Vessel-related	N	N	2,582	3,310	4,624	3,439	3,613	2,222	3,238	3,412	3,970	4,298	4,264	^R 4,207	^R 4,397	^R 4,086	^R 3,887	3,937	4,110
Recreational boating	2,738	3,752	3,803	6,308	5,513	6,237	6,411	6,573	6,048	6,335	6,906	8,019	8,026	8,047	8,061	7,931	7,740	6,419	5,705
Pipeline																			
Hazardous liquid pipeline	N	N	351	254	246	183	180	216	212	229	245	188	194	171	153	168	147	129	140
Gas pipeline	N	N	1,077	1,338	1,524	334	198	233	177	216	222	161	187	175	236	^R 172	234	209	183

KEY: N = data do not exist; R = revised; U = data are not available.

^a The U.S. Department of Transportation, National Highway Traffic Safety Administration uses the term "crash" instead of accident in its highway safety data. Highway crashes often involve more than one motor vehicle, hence "total highway crashes" is smaller than the sum of the components. Estimates of highway crashes are rounded to the nearest thousand in the source document.

^b Carriers operating under 14 CFR 121, all scheduled and nonscheduled service. Since Mar. 20, 1997, 14 CFR 121 includes only aircraft with 10 or more seats formerly operated under 14 CFR 135. This change makes it difficult to compare pre-1997 data for 14 CFR 121 and 14 CFR 135 with more recent years' data.

^c All scheduled service operating under 14 CFR 135. Since Mar. 20, 1997, 14 CFR 121 includes only aircraft with 10 or more seats formerly operated under 14 CFR 135. This change makes it difficult to compare pre-1997 data for 14 CFR 121 and 14 CFR 135 with more recent years' data.

^d Nonscheduled service operating under 14 CFR 135.

^e All operations other than those operating under 14 CFR 121 and 14 CFR 135.

^f Large trucks are defined as trucks over 10,000 pounds gross vehicle weight rating, including single-unit trucks and truck tractors. Light trucks are defined as trucks of 10,000 pounds gross vehicle weight rating or less, including pickups, vans, truck-based station wagons, and utility vehicles.

^g Includes Amtrak.

^h Includes both accidents and incidents. Data not comparable after 1970 due to change in reporting system. Most highway-rail grade crossing accidents are counted under highway.

ⁱ Train accidents only.

^j Accident figures include collisions with vehicles, objects, and people, derailments / vehicles going off the road. Accident figures do not include fires and personal casualties.

NOTE

The motor vehicle crash data in this table come from the U.S. Department of Transportation, National Highway Traffic Safety Administrations' General Estimates System (GES), which began operation in 1988. GES data are obtained from a nationally representative probability sample selected from all police-reported crashes. The GES sample includes only crashes where a police accident report was completed and the crash resulted in property damage, injury, or death. The resulting figures do not take into account crashes that were not reported to the police or did not result in property damage. The 1993 National Transportation Statistics (NTS) Historical Compendium and earlier editions used crash figures estimated by the National Safety Council, which used a different set of methods to arrive at its figures. Thus, the crash figures in this edition of NTS may not be comparable with those found in the Compendium and earlier editions.

SOURCES

Air:

Air carrier:

1960: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1967* (Washington, DC: December 1968).

1965-70: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1975*, NTSB/ARC-77/1 (Washington, DC: January 1977).

1975: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1983*, NTSB/ARC-87/01 (Washington, DC: February 1987), table 18.

1980: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1981*, NTSB/ARC-85/01 (Washington, DC: February 1985), tables 2 and

1985-2002: Ibid., Internet site www.ntsb.gov/aviation as of June 27, 2003, table 5 and personal communication, July 3, 2003.

Commuter air carrier:

1975-80: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1980*, NTSB/ARC-83/01 (Washington, DC: January 1983), tables 26 and 40.

1985-2002: Ibid., Internet site www.ntsb.gov/aviation as of June 27, 2003, table 8 and personal communication, July 3, 2003.

On-demand air taxi:

1975-80: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1981*, NTSB/ARC-85/01 (Washington, DC: February 1985), table 61.

1985-2002: Ibid., Internet site www.ntsb.gov/aviation as of June 27, 2003, table 9 and personal communication, July 3, 2003.

General aviation:

1960-70: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: General Aviation, Calendar Year 1970*, NTSB/ARG-74/1 (Washington, DC: April 1974), table 117.

1975-80: Ibid., *Annual Review of Aircraft Accident Data: General Aviation, Calendar Year 1985*, NTSB/ARG-87/03 (Washington, DC: October 1987), table 21.

1985-2002: Ibid., Internet site www.ntsb.gov/aviation as of June 27, 2003, table 10 and personal communication, July 3, 2003.

Highway:

1990-2002: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2002, Early Edition* DOT HS 809 100 (Washington, DC: 2003), table 38, Nov. 10, 2003.

Rail:

Highway-rail grade crossings:

1960-70: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Rail-Highway Grade-Crossing Accidents* (Washington, DC: Annual issues).

1975-80: Ibid., Office of Policy and Program Development, personal communication.

1985-90: Ibid., *Rail-Highway Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: Annual issues), table S.

1991-2002: Ibid., *Interim Railroad Safety Statistics Annual Report 2002* (Washington, DC: August 2003) table 1-1.

Railroad:

1970-90: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Accident/Incident Bulletin* (Washington, DC: Annual issues), table 4.

1991-2002: Ibid., *Interim Railroad Safety Statistics Annual Report 2002* (Washington, DC: August 2003) table 1-1.

Transit:

1990-2001: U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics 2000* (Washington, DC: 2000), pp. 51-54 and personal communication, July 28, 2003.

Water:

Vessel-related:

1970-91: U.S. Department of Transportation, U.S. Coast Guard, Office of Investigations and Analysis, Compliance Analysis Division, personal communication, Apr. 13,

1992-2002: Ibid., Data Administration Division (G-MRI-1), personal communication, May 28, 2003.

Recreational boating:

1960-2001: Ibid., Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual issues).

2002: Ibid., *Boating Statistics Executive Summary*, available at <http://www.uscgboating.org/statistics> as of Nov. 20, 2003.

Hazardous liquid and gas pipeline:

1970-2002: U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, Internet site, <http://ops.dot.gov> as of June 27,

Table 2-4: Distribution of Transportation Fatalities by Mode

	1999		2000		2001	
	Number	Percent	Number	Percent	Number	Percent
TOTAL of all modes ^a	^R 44,044	100.0	^R 44,333	100.0	44,933	100.0
Passenger car occupants	20,862	47.4	20,699	46.7	20,320	45.2
Light-truck occupants	11,265	25.6	11,526	26.0	11,723	26.1
Pedestrians struck by motor vehicles	4,939	11.2	4,763	10.7	4,901	10.9
Motorcyclists	2,483	5.64	2,897	6.53	3,197	7.1
Pedalcyclists struck by motor vehicles	754	1.71	693	1.56	732	1.6
Large-truck occupants	759	1.72	754	1.70	708	1.6
Recreational boating	734	1.67	701	1.58	681	1.5
General aviation	619	1.41	^R 595	1.34	562	1.3
Air carriers	12	0.03	92	0.21	^R 531	1.2
Railroad trespassers ^b (excluding grade crossings)	479	1.09	463	1.04	511	1.1
Other and unknown motor vehicle occupants	447	1.01	450	1.02	458	1.0
Other nonoccupants struck by motor vehicles ^c	149	0.34	141	0.32	123	0.27
Waterborne transportation (nonvessel-related)	^R 93	0.21	^R 88	0.20	80	0.18
Grade crossings, not involving motor vehicles ^d	57	0.13	64	0.14	76	0.17
Air taxi	38	0.09	71	0.16	60	0.13
Heavy rail transit (subway)	84	0.19	80	0.18	59	0.13
Waterborne transportation (vessel-related)	^R 61	0.14	^R 49	0.11	59	0.13
Bus occupants (school, intercity, and transit)	59	0.13	22	0.05	34	0.08
Private grade crossings, with motor vehicles	36	0.08	55	0.12	30	0.07
Railroad employees, contractors, and volunteers on duty (excluding grade crossings)	^R 31	0.07	^R 22	0.05	23	0.05
Light rail transit	17	0.04	30	0.07	21	0.05
Railroad-related, not otherwise specified (excluding grade crossings)	^R 17	0.04	^R 23	0.05	13	0.03
Commuter air	12	0.03	5	0.01	13	0.03
Transit buses, fatalities not related to accidents ^e	12	0.03	8	0.02	6	0.01
Gas distribution pipelines	^R 16	0.04	22	0.05	5	0.01
Passengers on railroad trains (excluding grade crossings)	3	<0.01	4	<0.01	3	<0.01
Gas transmission pipelines	2	<0.01	15	0.03	2	<0.01
Demand response transit, fatalities not related to accidents ^e	0	-	0	-	2	<0.01
Hazardous liquid pipelines	4	<0.01	1	<0.01	0	-
Other counts, redundant with above^f						
Large-truck occupants and nonoccupants	5,380	NA	^R 5,282	NA	4,897	NA
Public grade crossings, with motor vehicles	309	NA	306	NA	315	NA
Transit buses, accident-related fatalities	90	NA	82	NA	89	NA
Commuter rail	95	NA	87	NA	87	NA
Outside planes in crashes ^g	5	NA	^R 14	NA	11	NA
Demand responsive transit, accident-related fatalities	1	NA	8	NA	3	NA

KEY: NA = not applicable; R = revised.

^a Unless otherwise specified, includes fatalities outside the vehicle

^b Includes fatalities outside trains, except at grade crossings.

^c Includes all nonoccupant fatalities, except pedalcyclists and pedestrians.

^d Public grade-crossing fatalities involving motor vehicles are included in counts for motor vehicles.

^e Fatalities not related to transit bus and demand responsive transit accidents are not included under highway submodes.

^f Fatalities at grade crossings with motor vehicles are included under relevant motor vehicle modes. Commuter rail fatalities are counted under railroad. For transit bus and demand responsive transit accidents, occupant fatalities are counted under "bus" and nonoccupant fatalities are counted under "pedestrians," "pedalcyclists," or other motor vehicle categories.

^g Includes nonoccupant fatalities resulting from aviation accidents.

^h Other than the persons aboard the aircraft who were killed, fatalities resulting from the September 11 terrorist acts are excluded.

SOURCES

Air data:

National Transportation Safety Board, Internet site www.nts.gov/aviation as of May 5, 2003.

Highway data:

U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 2002: Overview*, DOT HS 809 612 (Washington, DC: 2003), table 1, available at Internet site www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2002/2002ovrfacts.pdf as of August 2003.

Railroad data:

U.S. Federal Railroad Administration, *Railroad Safety Statistics, Annual Report 2001* (Washington, DC: July 2003), tables 1-3 and 7-7.

Transit data:

U.S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics* (Washington, DC: Annual issues) and personal communication, July 28, 2003.

Waterborne transportation:

U.S. Department of Transportation, U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, July 2, 2003.

Recreational boating:

Ibid., Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual issues).

Pipeline data:

U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, and Internet site <http://ops.dot.gov> as of Nov. 18, 2003.

Table 2-5: Highway-Rail Grade-Crossing Safety and Property Damage Data

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Fatalities	^a 1,440	917	833	582	698	608	579	626	615	579	488	461	431	402	425	421	(R) 357	324
Injured persons	3,272	3,860	(R) 3,890	2,687	2,407	2,094	1,975	1,837	1,961	1,894	1,610	1,540	1,303	1,396	1,219	1,157	(R) 999	998
Accidents	^a 3,559	(R) 12,126	(R) 10,796	(R) 7,073	5,715	5,388	4,910	4,892	4,979	4,633	4,257	3,865	3,508	3,489	3,502	3,237	(R) 3,077	2,928
Property damage, railroad vehicles and property (\$ millions)	N	(R) 6.9	6.5	8.7	13.1	13.3	8.1	10.3	11.8	10.1	8.8	15.0	14.4	23.0	14.8	8.3	(R) 9.6	15.7

KEY: N = data do not exist; R = revised.

^a 1970 data are not comparable to later years due to change in reporting system.

SOURCES

Fatalities, injuries, accidents:

1970: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Rail-Highway Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: Annual issues), tables S and 11.

1975, 1980, 1985, 1990-2003: Ibid. Internet site <http://safetydata.fra.dot.gov/OfficeofSafety/Query/Default.asp> as of June 25, 2004.

Property damage:

1970: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Accident/Incident Bulletin* (Washington, DC: Annual issues), table 5.

1975, 1980, 1985, 1990-2003: Ibid. Internet site <http://safetydata.fra.dot.gov/OfficeofSafety/Query/Default.asp> as of June 25, 2004.

Table 2-6: Hazardous Materials Fatalities, Injuries, Accidents, and Property Damage Data

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
TOTAL fatalities	27	19	8	8	10	16	15	11	7	120	12	13	9	16	(R) 11	(R) 9	8
Accident-related	21	14	7	7	10	15	14	11	6	7	10	8	7	11	(R) 7	(R) 8	7
Air fatalities	0	0	0	0	0	0	0	0	0	110	0	0	0	0	0	0	0
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Highway fatalities	27	17	8	8	10	16	15	11	7	8	12	13	9	16	(R) 11	(R) 8	8
Accident-related	21	12	7	7	10	15	14	11	6	5	10	8	7	11	(R) 7	(R) 7	7
Rail fatalities	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0
Accident-related	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0
Water^a fatalities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other^b fatalities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL injured persons	648	626	253	423	439	604	627	577	400	1,175	221	195	264	251	(R) 168	(R) 133	117
Accident-related	168	47	16	18	40	98	62	111	18	864	16	13	15	16	12	(R) 14	15
Air injured persons	5	8	4	39	31	23	50	57	33	33	24	20	12	5	13	4	1
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Highway injured persons	527	493	195	311	333	465	511	425	296	216	152	151	217	164	(R) 126	(R) 115	103
Accident-related	156	43	9	27	34	61	95	14	22	11	9	15	15	12	(R) 13	15	
Rail injured persons	99	121	53	73	75	116	66	95	71	926	45	22	35	82	29	(R) 14	13
Accident-related	12	4	7	9	13	64	1	16	4	842	5	4	0	1	0	1	0
Water^a injured persons	2	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other^b injured persons	15	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL incidents	10,951	15,719	6,019	8,879	9,110	9,393	12,838	16,105	(R) 14,853	(R) 14,077	(R) 14,070	(R) 15,497	(R) 17,616	(R) 17,556	(R) 17,830	(R) 15,447	15,191
Accident-related	440	486	364	297	303	283	266	296	303	335	318	(R) 316	371	390	(R) 411	(R) 355	318
Air incidents	147	223	114	297	299	414	622	931	817	925	(R) 1,031	1,386	(R) 1,582	(R) 1,419	(R) 1,084	(R) 734	753
Accident-related	0	0	0	0	0	1	0	0	0	0	1	2	0	1	2	1	0
Highway incidents	10,063	14,161	4,752	7,296	7,644	7,843	11,095	14,011	(R) 12,869	12,034	(R) 11,932	(R) 13,111	(R) 14,953	(R) 15,062	(R) 15,841	(R) 13,831	13,615
Accident-related	330	347	302	249	249	245	217	244	253	292	264	(R) 264	307	(R) 327	(R) 355	(R) 313	276
Rail incidents	694	1,271	842	1,279	1,155	1,128	1,113	1,157	1,155	1,112	(R) 1,102	989	(R) 1,073	(R) 1,058	(R) 899	(R) 872	813
Accident-related	109	134	61	48	54	36	49	52	50	43	53	(R) 50	64	(R) 62	54	(R) 41	42
Water^a incidents	28	34	7	7	12	8	8	6	12	6	5	(R) 11	8	17	(R) 6	(R) 10	10
Accident-related	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Other^b incidents	19	30	304	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accident-related	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL property damage (current \$ thousands) ^c	8,090	10,829	22,993	32,353	38,351	36,229	22,817	44,196	30,900	46,849	(R) 33,534	(R) 46,193	(R) 65,400	(R) 78,009	(R) 69,397	(R) 53,694	48,585
Accident-related	6,051	6,236	20,268	24,792	30,184	28,708	13,179	25,552	23,602	37,775	(R) 25,318	(R) 36,809	(R) 51,721	(R) 61,720	(R) 56,465	(R) 36,640	36,586
Air property damage	8.9	12.3	12.3	142	77	99	88	178	100	87	336	267	286	272	(R) 309	109	100
Accident-related	0	0	0	0	0	0	0	0	0	0	0	0	0	42	50	60	0
Highway property damage	5,584	7,324	12,690	20,190	29,650	24,130	19,866	25,253	22,141	29,257	(R) 24,741	(R) 28,669	(R) 34,359	(R) 50,907	(R) 47,692	(R) 43,631	44,099
Accident-related	3,694	3,782	10,175	14,132	23,953	18,350	11,263	13,539	16,342	22,315	(R) 17,871	21,489	(R) 23,065	(R) 37,700	(R) 36,322	(R) 29,095	33,412
Rail property damage	2,488	2,952	10,274	11,952	8,469	11,857	2,649	18,673	8,485	17,385	(R) 8,418	(R) 16,243	(R) 30,694	(R) 26,547	(R) 21,248	(R) 9,706	4,124
Accident-related	2,357	2,357	10,094	10,660	6,231	10,233	1,916	12,014	7,260	15,460	7,446	(R) 15,321	(R) 28,656	23,978	20,092	(R) 7,485	3,175
Water^a property damage	6.1	505	3.2	70	154	143	213	92	174	120	38	1,015	61	283	(R) 147	(R) 248	261
Accident-related	0	81	0	0	0	125	0	0	0	0	0	0	0	0	0	0	0
Other^b property damage	3.5	35	14.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accident-related	0.3	15.6	<0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

KEY: R = revised.

^a Water category only includes nonbulk marine. Bulk marine hazardous materials incidents are reported to the U.S. Coast Guard and are not included.

^b Other category includes freight forwarders and modes not otherwise specified.

^c Property damage under \$30,000 is reported to the nearest \$100. Property damage \$30,000 or greater is reported to the nearest \$1,000, therefore the total may not equal the sum.

NOTE

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.

SOURCES

1975-85: U.S. Department of Transportation, Research and Special Programs Administration, Office of Hazardous Materials Safety, Hazardous Materials Information System Database, 1999.

1990: Ibid. Internet site <http://hazmat.dot.gov/10yearfrm.htm>, as of May 2, 2000.

1991: Ibid. Internet site <http://hazmat.dot.gov/files/hazmat/10year/10yearfrm.htm> as of May 14, 2001.

1992: Ibid. Internet site <http://hazmat.dot.gov/files/hazmat/10year/10yearfrm.htm> as of August 21, 2002.

1993: Ibid. Internet site <http://hazmat.dot.gov/files/hazmat/10year/10yearfrm.htm> as of June 2, 2003.

1994-2003: Ibid. Internet site <http://hazmat.dot.gov/files/hazmat/10year/10yearfrm.htm> as of June 14, 2004.

Table 2-7: Transportation-Related Occupational Fatalities^a

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001 ^h	2002
TOTAL occupational fatalities	6,217	6,331	(R) 6,632	(R) 6,275	(R) 6,202	(R) 6,238	(R) 6,055	6,054	5,920	(R) 5,915	5,534
Transportation-related fatalities, total ^b	2,484	(R) 2,499	(R) 2,762	(R) 2,587	(R) 2,601	(R) 2,605	(R) 2,645	2,618	2,573	(R) 2,524	2,385
Highway ^c	1,158	(R) 1,242	(R) 1,343	(R) 1,346	(R) 1,346	(R) 1,393	(R) 1,442	1,496	1,365	(R) 1,409	1,373
Nonhighway ^d	436	392	(R) 409	(R) 387	(R) 374	377	(R) 388	352	399	(R) 326	323
Aircraft	353	282	(R) 426	(R) 283	(R) 324	261	(R) 224	228	280	247	194
Pedestrian struck by vehicle ^e	346	365	(R) 391	(R) 388	(R) 353	367	413	377	370	383	356
Water vehicle ^f	109	(R) 119	(R) 94	(R) 87	(R) 119	109	112	102	84	90	71
Railway ^g	(R) 66	86	81	82	(R) 74	93	60	56	71	62	64
Percent of total occupational fatalities											
Transportation-related fatalities, total ^b	40	(R) 39	42	41	42	42	44	43	43	43	43
Highway	19	20	20	21	22	22	24	25	23	24	25
Nonhighway	7	6	6	6	6	6	6	6	7	(R) 6	6
Aircraft	6	4	6	(R) 5	5	4	4	4	5	4	4
Pedestrian struck by vehicle	6	6	6	6	6	6	7	6	6	6	6
Water vehicle	2	2	1	1	2	2	2	2	1	2	1
Railway	1	1	1	1	1	1	1	1	1	1	1

KEY: R = revised.

^a Based on the 1992 Bureau of Labor Statistics, *Occupational Injury and Illness Classification Manual*.

^b Numbers may not add to totals because transportation categories may include subcategories not shown separately.

^c Includes collisions between vehicles/mobile equipment moving in the same or opposite directions, such as in an intersection; between moving and standing vehicles/mobile equipment at the side of a roadway; or a vehicle striking a stationary object. Also includes noncollisions, e.g., jack-knifed or overturned vehicle/mobile equipment—no collision; ran off highway—no collision; struck by shifting load; sudden start or stop; not elsewhere classified.

^d Refers to farms and industrial premises. Includes collisions between vehicles/mobile equipment; vehicles/mobile equipment striking a stationary object. Also includes noncollisions such as a fall from a moving vehicle/mobile equipment, fall from and struck by vehicle/mobile equipment, overturned vehicle/mobile equipment, and loss of control of vehicle/mobile equipment.

^e Includes worker struck by vehicle/mobile equipment in roadway, on side of road, in a parking lot, or nonroad area.

^f Includes collisions, explosions, fires, fall from or on ship/boat, and sinking/capsized water vehicles involved in transportation. Does not include fishing boats.

^g Includes collisions between railway vehicles, railway vehicle and other vehicle, railway vehicle and other object, and derailment.

^h Data do not include fatalities from the terrorist attacks of September 11 which totaled 2,886.

NOTES

Percentages may not add to totals due to rounding.

The above categories do not define the types of jobs people had, nor the industries in which they worked. The categories define the ways in which they died. For example, a representative traveling for business reasons who is killed in a rail accident would be listed under rail.

SOURCE

U.S. Department of Labor, Bureau of Labor Statistics, *Census of Fatal Occupational Injuries (CFOI)*, Internet site <http://www.bls.gov/iif/oshfoi1.htm#2002> as of June 17, 2004.

Table 2-8: Reporting Thresholds for Property Damage by U.S. Department of Transportation Modal Administrations

Modal administration	Reporting threshold
Federal Aviation Administration	More than \$25,000 damage to property other than the aircraft.
Federal Highway Administration	None; each state defines its own threshold and FHWA collects state reports.
Federal Railroad Administration	More than \$6,700 in damages to railroad on-track equipment, signals, track, track structures, and roadbed for accidents other than at grade-crossings. No threshold for grade-crossing accidents.
National Highway Traffic Safety Administration	None; property-damage-only crashes are recorded through the General Estimates System, a nationally representative sample of police-reported crashes of all severities.
Federal Transit Administration	More than \$7,500.
Research and Special Programs Administration	More than \$50,000 for gas pipelines. More than \$50,000 for hazardous liquid pipelines.
U. S. Coast Guard	More than \$25,000 for commercial vessels. More than \$2,000 or complete loss of vessel for recreational boats.

SOURCES

Federal Aviation Administration: 49 CFR 830.5 (as of Oct. 1, 2003).

Federal Highway Administration: U.S. Department of Transportation, Federal Highway Administration, personal communication, 1997.

Federal Railroad Administration: 49 CFR 225.19 (as of Oct. 1, 2003).

National Highway Traffic Safety Administration: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 2001*, DOT HS 809 337 (Washington, DC: 2001).

Federal Transit Administration: U.S. Department of Transportation, Federal Transit Administration, National Transit Database, *Safety and Security Reporting Manual* (Washington, DC: 2003), available at Internet site <http://www.ntdprogram.com/NTD/ntdhome.nsf/docs/sshome> as of Jan. 19, 2003.

Research and Special Programs Administration:

Gas pipeline: 49 CFR 191.3 (as of Oct. 1, 2003).

Hazardous liquid pipelines: 49 CFR 195.50 (as of Oct. 1, 2003).

U.S. Coast Guard:

Commercial shipping: 46 CFR 4.05-1 (as of Oct. 1, 2003).

Recreational boating: 33 CFR 173.55 (as of July 1, 2003).

Section B

Air

Table 2-9: U.S. Air Carrier^a Safety Data

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001 ^c	2002	^b 2003
TOTAL fatalities	499	261	146	124	1	526	39	^b 50	33	1	239	168	380	8	1	12	92	531	0	22
Total seriously injured persons	N	N	107	81	19	30	29	26	22	19	31	25	77	43	30	67	29	18	20	30
Total accidents	90	83	55	37	19	21	24	26	18	23	23	36	37	49	50	51	56	(R) 46	41	54
Fatal accidents	17	9	8	3	1	7	6	4	4	1	4	3	5	4	1	2	3	6	0	2
Aircraft-miles (millions)	1,130	1,536	2,685	2,478	2,924	3,631	4,948	4,825	5,039	5,249	5,478	5,654	5,873	6,697	6,737	7,101	7,524	(R) 7,294	(R) 7,056	7,037
Rates per 100 million aircraft-miles																				
Fatalities	44.159	16.992	5.438	5.004	0.034	14.486	0.788	1.036	0.655	0.019	4.363	2.971	6.470	0.119	0.015	0.169	1.223	(R) 7.280	0.000	0.313
Seriously injured persons	N	N	3.985	3.269	0.650	0.826	0.586	0.539	0.437	0.362	0.566	0.442	1.311	0.642	0.445	0.943	0.385	(R) 0.247	0.283	0.426
Total accidents	7.965	5.404	2.048	1.493	0.650	0.578	0.485	0.539	0.357	0.438	0.420	0.637	0.630	0.732	0.742	0.718	0.744	(R) 0.631	0.581	0.767
Total accidents, fatal	1.504	0.586	0.298	0.121	0.034	0.193	0.121	0.083	0.079	0.019	0.073	0.053	0.085	0.060	0.015	0.028	0.040	(R) 0.082	0.000	0.028
Aircraft departures (thousands)	N	N	N	N	5,479	6,307	8,092	7,815	7,881	8,073	8,238	8,457	8,229	10,318	10,980	11,309	11,458	(R) 10,956	(R) 10,138	10,002
Rates per 100,000 aircraft departures																				
Fatalities	N	N	N	N	0.018	8.340	0.482	0.640	0.419	0.012	2.901	1.987	4.618	0.078	0.009	0.106	0.803	(R) 4.847	0.000	0.220
Seriously injured persons	N	N	N	N	0.347	0.476	0.358	0.333	0.279	0.235	0.376	0.296	0.936	0.417	0.273	0.592	0.253	(R) 0.164	0.197	0.300
Total accidents	N	N	N	N	0.347	0.333	0.297	0.333	0.228	0.285	0.279	0.426	0.450	0.475	0.455	0.451	0.489	(R) 0.420	0.404	0.540
Total accidents, fatal	N	N	N	N	0.018	0.111	0.074	0.051	0.051	0.012	0.049	0.035	0.061	0.039	0.009	0.018	0.026	(R) 0.055	0.000	0.020
Flight hours (thousands)	N	4,691	6,470	5,607	7,067	8,710	12,150	11,781	12,360	12,706	13,124	13,505	13,746	15,838	16,817	17,555	18,299	(R) 17,814	(R) 16,986	17,121
Rates per 100,000 flight hours																				
Fatalities	N	5.564	2.257	2.212	0.014	6.039	0.321	0.424	0.267	0.008	1.821	1.244	2.764	0.051	0.006	0.068	0.503	(R) 2.981	0.000	0.128
Seriously injured persons	N	N	1.654	1.445	0.269	0.344	0.239	0.221	0.178	0.150	0.236	0.185	0.560	0.271	0.178	0.382	0.158	0.101	0.118	0.175
Total accidents	N	1.769	0.850	0.660	0.269	0.241	0.198	0.221	0.146	0.181	0.175	0.267	0.269	0.309	0.297	0.291	0.306	(R) 0.258	0.241	0.315
Total accidents, fatal	N	0.192	0.124	0.054	0.014	0.080	0.049	0.034	0.032	0.007	0.030	0.022	0.036	0.025	0.006	0.011	0.016	0.034	0.000	0.012

KEY: N = data do not exist; P = preliminary; R = revised.

^a Air carriers operating under 14 CFR 121, scheduled and nonscheduled service. Includes all scheduled and nonscheduled service accidents involving all-cargo carriers and commercial operators of large aircraft when those accidents occurred during 14 CFR 121 operations. Since Mar. 20, 1997, 14 CFR 121 includes aircraft with 10 or more seats formerly operated under 14 CFR 135. This change makes it difficult to compare pre-1997 data for 14 CFR 121 and 14 CFR 135 with more recent data.

^b Does not include the 12 persons killed aboard a SkyWest commuter aircraft when it and a U.S. Air aircraft collided.

^c Other than the persons aboard the aircraft who were killed, fatalities resulting from the September 11 terrorist acts are excluded.

NOTES

Miles, departures, and flight hours are compiled by the U.S. Department of Transportation, Federal Aviation Administration. Rates are computed by dividing the number of fatalities, serious injuries, total accidents, and fatal accidents by the number of miles, departures, or flight hours. These figures are based on information provided by airlines to the U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information.

SOURCES

Fatalities, accidents, miles, departures, and flight hours:

1960: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1967* (Washington, DC: December 1968).

1965-70: Ibid., *Calendar Year 1975, NTSB/ARC-77/1* (Washington, DC: January 1977).

1975 (all categories except miles): Ibid., *Calendar Year 1983, NTSB/ARC-87/01* (Washington, DC: February 1987), table 18.

1975 (miles): Ibid., *Calendar Year 1975, NTSB/ARC-77/1* (Washington, DC: January 1977).

1980: Ibid., *Calendar Year 1981, NTSB/ARC-85/01* (Washington, DC: February 1985), tables 2 and 16.

1985-2003: Ibid., National Transportation Safety Board, Internet site www.ntsb.gov/aviation/Table5.htm as of April 2004.

Serious injuries:

1970-85: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues).

1990-2003: Ibid., Analysis and Data Division, personal communication, Nov. 15, 2002, June 9, 2003, and Apr. 23, 2004.

Table 2-10: U.S. Commuter Air Carrier^a Safety Data

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	^f 2003
TOTAL fatalities	37	37	6	^d 77	21	24	25	9	14	46	0	12	5	13	0	2
Total seriously injured persons	14	14	11	31	7	2	6	17	2	1	2	2	7	4	0	1
Total accidents	38	18	15	23	^e 23	16	10	12	11	16	8	13	12	7	8	2
Total accidents, fatal	8	7	3	8	7	4	3	2	1	5	0	5	1	2	0	1
Aircraft-miles (millions)	192	301	450	434	508	555	594	550	591	246	51	52	45	43	(R) 36	41
Rates per 100 million aircraft-miles																
Fatalities ^b	19.27	12.29	1.33	17.74	4.13	4.32	4.21	1.64	2.37	18.70	0.00	22.90	11.12	30.16	0.00	4.86
Seriously injured persons	7.29	4.65	2.44	7.14	1.38	0.36	1.01	3.09	0.34	0.41	3.94	3.82	15.57	9.28	0.00	2.43
Total accidents ^{b,c}	19.79	5.98	3.33	5.30	4.33	2.88	1.68	2.18	1.86	6.50	15.76	24.81	26.70	16.24	21.92	4.86
Total accidents ^{b,c} , fatal	4.17	2.33	0.67	1.84	1.38	0.72	0.51	0.36	0.17	2.03	0.00	9.54	2.22	4.64	0.00	2.43
Aircraft departures (thousands)	1,777	2,561	3,160	2,820	3,115	3,602	3,581	3,220	3,515	1,394	707	672	611	559	(R) 479	540
Rates per 100 thousand aircraft departures																
Fatalities ^b	2.08	1.44	0.19	2.73	0.67	0.33	0.70	0.28	0.40	3.30	0.00	1.78	0.82	2.32	0.00	0.37
Seriously injured persons	0.79	0.55	0.35	1.10	0.22	0.06	0.17	0.53	0.06	0.07	0.28	0.30	1.15	0.72	0.00	0.19
Total accidents ^c	2.14	0.70	0.47	0.82	0.71	0.36	0.28	0.37	0.31	1.15	1.13	1.93	1.97	1.25	1.67	0.37
Total accidents ^c , fatal	0.45	0.27	0.09	0.28	0.22	0.14	0.08	0.06	0.03	0.36	0.00	0.74	0.16	0.36	0.00	0.19
Flight hours (thousands)	1,176	1,737	2,342	2,292	2,335	2,638	2,784	2,628	2,757	983	354	343	370	300	(R) 251	278
Rates per 100 thousand flight hours																
Fatalities	3.15	2.13	0.26	3.36	0.90	0.91	0.90	0.34	0.51	4.68	0.00	3.50	1.35	4.33	0.00	0.72
Seriously injured persons	1.19	0.81	0.47	1.35	0.30	0.08	0.22	0.65	0.07	0.10	0.57	0.58	1.89	1.33	0.00	0.36
Total accidents ^c	3.23	1.04	0.64	1.00	0.94	0.61	0.36	0.46	0.40	1.63	2.26	3.79	3.25	2.33	3.18	0.72
Total accidents ^c , fatal	0.68	0.40	0.13	0.35	0.30	0.15	0.11	0.08	0.04	0.51	0.00	1.46	0.27	0.67	0.00	0.36

KEY: P = preliminary; R = revised.

^a Air carriers operating under 14 CFR 135, scheduled service. Includes accidents involving all-cargo air carriers when those accidents occurred during scheduled 14 CFR 135 operations. Before Mar. 20, 1997, 14 CFR 135 applied to aircraft with 30 or fewer seats. Since Mar. 20, 1997, 14 CFR 135 includes only aircraft with fewer than 10 seats. This change makes it difficult to compare pre-1997 data with more recent years' data.

^b Data updated by rounding to two significant digits instead of one.

^c Rates are based on all accidents, including some that involve operators not reporting mileage or other traffic data to the U.S. Department of Transportation.

^d Total fatalities for 1991 do not include the 22 persons killed aboard an airliner when it and a commuter aircraft collided.

^e An attempted suicide case in 1992 is included in accidents but excluded in accident rates in this table.

NOTES

Miles, departures, and hours are compiled by the U.S. Department of Transportation, Federal Aviation Administration.

Rates are computed by dividing the number of fatalities, serious injuries, total accidents, and fatal accidents by the number of miles, departures, or flight hours. These figures are based on information provided by airlines to the U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information.

SOURCES

Fatalities, accidents, aircraft-miles, aircraft departures, and flight hours:

1980: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1980*, NTSB/ARC-83/01 (Washington, DC: January 1983), tables 26 and 40.

1985-2003: Ibid., Internet site www.ntsb.gov/aviation/Table 8.htm as of April 2004.

Serious injuries:

1980-85: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues).

1990-2003: Ibid., Analysis and Data Division, personal communications, Nov. 15, 2002, June 9, 2003, and Apr. 23, 2004.

Table 2-11: U.S. Air Carrier^a Fatal Accidents by First Phase of Operation^b

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	(P) 2003
TOTAL fatal accidents	6	4	4	1	4	3	5	4	1	2	3	6	0	2
Phase of operation														
Approach / descent / landing	1	2	1	0	2	(R) 0	0	0	0	1	0	0	0	0
Taxi/takeoff / climb	3	1	2	0	1	0	3	2	0	0	1	(R) 1	0	1
Cruise (in-flight)	1	0	0	0	0	0	1	1	0	0	1	0	0	0
Standing (static)	1	1	1	1	0	0	0	(R) 0	1	1	(R) 0	0	0	0
Maneuvering	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Other / not reported	0	0	0	0	0	(R) 3	1	(R) 1	0	0	(R) 1	(R) ^c 5	0	1

KEY: P = preliminary; R= revised.

^a 14 CFR 121. Before Mar. 20, 1997, 14 CFR 121 applied only to aircraft with more than 30 seats or a maximum payload capacity of more than 7,500 pounds. Since Mar. 20, 1997, 14 CFR 121 includes aircraft with 10 or more seats that formerly operated under 14 CFR 135. This change makes it difficult to compare pre-1997 data with more recent data.

^b First phase of operation is the phase of flight in which the first occurrence leading to the accident happened.

^c Other/not reported numbers for 2001 are unusually high because of the incidents occurring on September 11.

SOURCES

1990-95: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues), table 18.

1996-2003: *Ibid.*, personal communications, Aug. 21, 2002, Nov. 15, 2002, and June 9, 2003.

Table 2-12: U.S. Commuter Air Carrier^a Fatal Accidents by First Phase of Operation

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	(P) 2003
TOTAL fatal accidents	3	8	7	4	3	2	1	5	0	5	1	2	0	1
Phase of operation														
Approach / descent / landing	0	3	5	1	2	0	1	2	0	0	1	0	0	0
Taxi/takeoff / climb	0	0	1	1	0	1	0	1	0	2	0	2	0	0
Cruise (in-flight)	2	2	1	1	1	0	0	0	0	3	0	0	0	0
Standing (static)	0	1	0	1	0	0	0	0	0	0	0	0	0	0
Maneuvering ^b	1	1	0	0	0	1	0	2	0	0	0	0	0	0
Other / not reported	0	1	0	0	0	0	0	0	0	0	0	0	0	1

KEY: P = preliminary.

^a 14 CFR 135, scheduled operations. Before Mar. 20, 1997, 14 CFR applied to aircraft with 30 or fewer seats. Since Mar. 20, 1997, 14 CFR 135 includes only aircraft with fewer than 10 seats. This change makes it difficult to compare pre-1997 data with more recent years' data.

^b Includes instructional flights performing turns and agricultural flights for spraying and buzzing (repeated passes over a particular location).

SOURCES

1990-96: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues), table 36.

1997-2003: *Ibid.*, personal communications, Aug. 21, 2002, June 9, 2003, and June 9, 2004.

Table 2-13: U.S. On-Demand Air Taxi^a Safety Data

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	^P 2003
TOTAL fatalities	69	105	76	51	78	68	42	63	52	63	39	45	38	71	60	35	45
Total seriously injured persons	N	43	44	36	26	19	24	32	14	22	23	10	14	12	24	13	19
Total accidents	152	171	157	107	88	76	69	85	75	90	82	77	73	80	72	59	76
Total accidents, fatal	24	46	35	29	28	24	19	26	24	29	15	17	12	22	18	18	19
Flight hours (thousands)	2,526	3,618	2,570	2,249	2,241	2,844	2,324	2,465	2,486	3,220	3,098	3,802	(R) 3,204	(R) 3,930	(R) 2,997	(R) 2,911	2,955
Rates per 100,000 flight hours ^b																	
Fatalities	2.73	2.90	2.96	2.27	3.48	2.39	1.81	2.56	2.09	1.96	1.26	1.18	(R) 1.19	(R) 1.81	(R) 2.00	(R) 1.20	1.52
Seriously injured persons	N	1.19	1.71	1.60	1.16	0.67	1.03	1.30	0.56	0.68	0.74	0.26	(R) 0.44	(R) 0.31	(R) 0.80	(R) 0.45	0.64
Total accidents	6.02	4.73	6.11	4.76	3.93	2.67	2.97	3.45	3.02	2.80	2.65	2.03	(R) 2.28	2.25	(R) 2.40	(R) 2.03	2.57
Total accidents, fatal	0.95	1.27	1.36	1.29	1.25	0.84	0.82	1.05	0.97	0.90	0.48	0.45	(R) 0.37	(R) 0.56	(R) 0.60	(R) 0.62	0.64

KEY: N = data do not exist; P = preliminary; R = revised.

^a Air carriers operating under 14 CFR 135, nonscheduled service. Accidents on foreign soil and in foreign waters are excluded.

^b Rates are computed by dividing the number of fatalities, serious injuries, total accidents, and fatal accidents by the number of flight hours.

NOTE

Hours are estimated by the U.S. Department of Transportation, Federal Aviation Administration.

SOURCES

Fatalities and accidents:

1975-80: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1981*, NTSB/ARC-85/01 (Washington, DC: February 1985), table 61.

1985: Ibid., Internet site www.nts.gov/aviation/Table9.htm as of July 26, 2002.

1990-2001: Ibid., Analysis and Data Division, personal communications, July 29, 2002.

2002-03: Ibid., Internet site www.nts.gov/aviation/Table9.htm as of April 2004.

Flight hours:

1975-80: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1981*, NTSB/ARC-85/01 (Washington, DC: February 1985), table 61.

1985-2003: Ibid., Internet site www.nts.gov/aviation/Table9.htm as of April 2004.

Serious injuries:

1980-85: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues).

1990-2003: Ibid., Analysis and Data Division, personal communications, Nov. 15, 2002, June 9, 2003, and Apr. 23, 2004.

Table 2-14: U.S. General Aviation^a Safety Data

	1960 ^d	1965 ^d	1970 ^d	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	^P 2003
TOTAL fatalities	787	1,029	1,310	1,252	1,239	956	770	(R) 800	867	744	730	735	636	631	624	619	(R) 596	562	581	626
Total seriously injured persons	N	N	715	769	681	501	409	432	408	385	415	396	365	350	327	322	310	^R 322	312	322
Total accidents ^b	4,793	5,196	4,712	3,995	3,590	2,739	2,242	2,197	2,111	2,064	2,022	2,056	1,908	1,845	1,904	(R) 1,905	1,837	1,726	(R) 1,713	1,732
Total accidents ^b , fatal	429	538	641	633	618	498	444	(R) 439	451	401	404	413	361	350	364	340	(R) 345	325	(R) 345	351
Flight hours (thousands)	13,121	16,733	26,030	28,799	36,402	28,322	28,510	27,678	24,780	22,796	22,235	24,906	24,881	25,591	25,518	(R) 29,246	(R) 27,838	(R) 25,431	(R) 25,545	25,800
Rates per 100,000 flight hours ^c																				
Fatalities	6.00	6.15	5.03	4.35	3.40	3.38	2.70	2.89	3.50	3.26	3.28	2.95	2.56	2.47	2.45	(R) 2.12	(R) 2.14	(R) 2.21	(R) 2.27	2.43
Seriously injured persons	N	N	2.75	2.67	1.87	1.77	1.43	1.56	1.65	1.69	1.87	1.59	1.47	1.37	1.28	(R) 1.10	(R) 1.11	(R) 1.27	(R) 1.22	1.25
Total accidents	36.53	31.05	18.10	13.87	9.86	9.67	7.86	7.94	8.52	9.05	9.09	8.26	7.67	7.21	7.46	(R) 6.51	(R) 6.60	(R) 6.79	(R) 6.71	6.71
Total accidents, fatal	3.27	3.22	2.46	2.20	1.70	1.76	1.56	(R) 1.59	1.82	1.76	1.82	1.66	1.45	1.37	1.43	(R) 1.16	(R) 1.24	(R) 1.28	(R) 1.35	1.36

KEY: N = data do not exist; P = preliminary; R = revised.

^a U.S. registered civil aircraft not operated under 14 CFR 121 or 14 CFR 135. Accidents on foreign soil and in foreign waters are excluded. Suicide, sabotage, and stolen/unauthorized cases included in accidents and fatalities but excluded from accident rates in this table are: 1985 (12 accidents, 7 fatal accidents); 1990 (4,1); 1991 (8,5); 1992 (2,1); 1993 (5,4); 1994 (3,2); 1995 (10,6); 1996 (4,0); 1997 (5,2); 1998 (6,4); 1999 (3,1); 2000 (7,7); 2001 (3,1); 2002 (5,5).

^b Since April 1995, the National Transportation Safety Board has been required by law to investigate all public-use accidents, increasing the number of NTSB reported general aviation accidents by approximately 1.75%.

^c Rates are computed by dividing the number of fatalities, serious injuries, total accidents, and fatal accidents by the number of flight hours.

^d Data for 1960, 1965, and 1970 include air taxi.

NOTE

Flight hours are estimated by the U.S. Department of Transportation, Federal Aviation Administration.

SOURCES

Fatalities and accidents:

1960-70: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. General Aviation, Calendar Year 1970*, NTSB/ARG-74/1 (Washington, DC: April 1974), table 117.

1975-80: Ibid., *Annual Review of Aircraft Accident Data: General Aviation, Calendar Year 1985*, NTSB/ARG-87/03 (Washington, DC: October 1987), table 21.

1985: Ibid., Internet site www.nts.gov/aviation/Table10.htm as of July 29, 2002.

1990-2001: Ibid., Analysis and Data Division, personal communications, July 29, 2002 and Nov. 15, 2002.

2002-03: Ibid., Internet site www.nts.gov/aviation/Table10.htm as of April 2004.

Flight hours:

1960-70: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. General Aviation, Calendar Year 1970*, NTSB/ARG-74/1 (Washington, DC: April 1974), table 117.

1975-80: Ibid., *Annual Review of Aircraft Accident Data: General Aviation, Calendar Year 1985*, NTSB/ARG-87/03 (Washington, DC: October 1987), table 21.

1985-2003: Ibid., Internet site www.nts.gov/aviation/Table10.htm as of April 2004.

Serious injuries:

1970-85: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: General Aviation* (Washington, DC: Annual issues).

1990-2003: Ibid., Analysis and Data Division, personal communications, Nov. 15, 2002, June 9, 2003, and Apr. 23, 2004.

Table 2-15: Number of Pilot-Reported Near Midair Collisions (NMAC) by Degree of Hazard

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL, degree of hazard	568	758	454	348	311	254	275	238	194	238	211	257	239	211	180
Critical ^a	118	180	74	52	46	35	47	32	26	31	22	28	30	37	25
Potential ^b	319	423	266	197	195	158	139	139	101	105	100	110	130	^R 96	81
No hazard ^c	122	133	114	99	70	61	71	63	55	70	53	55	49	^R 51	39
Unclassified ^d	9	22	0	0	0	0	18	4	12	32	36	64	30	^R 27	^P 35
NMAC involving aircraft operating under 14 CFR 121 ^e	U	U	121	101	72	60	63	43	50	81	64	63	69	48	51

KEY: P = preliminary; R = revised; U = data are not available.

^a A situation where collision avoidance was due to chance, rather than an act on the part of the pilot. Less than 100 feet of aircraft separation would be considered critical.

^b An incident that would probably have resulted in a collision if no action had been taken by either pilot. Less than 500 feet would usually be required in this case.

^c When direction and altitude would have made a midair collision improbable, regardless of evasive action taken.

^d No determination could be made due to insufficient evidence or unusual circumstances, or because incident is still under investigation.

^e Before Mar. 20, 1997, 14 CFR 121 applied only to aircraft with more than 30 seats or a maximum payload capacity of more than 7,500 pounds. Since Mar. 20, 1997, 14 CFR 121 includes aircraft with 10 or more seats that formerly operated under 14 CFR 125. This change makes it difficult to compare pre-1997 data with more recent years' data.

NOTE

Includes air carriers, general aviation, military, and other aircraft involved in public-use operations.

SOURCES

1980-2000: U.S. Department of Transportation, Federal Aviation Administration, *Aviation Safety Statistical Handbook Annual Report* (Washington, DC: Annual issues) and personal communication, Aug. 6, 2002.

2001-2002: Ibid., Office of System Safety, National Aviation Safety Data Analysis Center, *NMAC database*, personal communication, July 2, 2003.

For NMAC involving 121 aircraft:

1980-2000: Ibid., Air Traffic Resource Management, personal communications, Aug. 6, 2002.

2001-2002: Ibid., Office of System Safety, National Aviation Safety Data Analysis Center, *NMAC database*, personal communication, July 2, 2003.

Table 2-16: Airline^a Passenger Screening Results by Type of Weapons Detected, Persons Arrested, and Bomb Threats Received

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Persons screened (millions)	585	993	1,145	1,015	1,111	1,150	1,261	1,263	1,497	1,660	1,667	1,767	1,812	U
TOTAL firearms detected	1,914	2,913	2,549	1,644	2,608	2,798	2,994	2,390	2,155	2,067	1,515	1,552	1,937	U
Firearms, handguns	1,878	2,823	2,490	1,597	2,503	2,707	2,860	2,230	1,999	1,905	1,401	1,421	1,643	U
Firearms, long guns	36	90	59	47	105	91	134	160	156	162	114	131	294	U
Other / other dangerous articles ^b	108	74	304	275	N	N	N	N	N	N	N	N	N	U
Explosive / incendiary devices	8	12	15	94	167	251	N	N	N	N	N	N	N	U
Persons arrested														
Carrying firearms / explosives	1,031	1,310	1,336	893	1,282	1,354	1,433	1,194	999	924	660	633	600	U
Giving false information	32	42	18	28	13	31	35	68	131	72	86	58	61	U
Bomb threats received														
Against airports	1,179	477	448	498	188	304	250	346	N	N	N	N	N	U
Against aircraft	268	153	338	388	215	248	218	327	N	N	N	N	N	U

KEY: N = data do not exist; U = unavailable.

^a Includes operators with a U.S. Department of Transportation, Federal Aviation Administration operating certificate engaged in scheduled passenger or public charter passenger operations and airports at which these operations are conducted.

^b In 1980 and 1985, the "other" category was included with firearms; in 1990, "other" became "other dangerous articles."

NOTES

Beginning in 1996, the Office of Civil Aviation Security Policy and Planning stopped keeping records of bomb threats received due to inconsistent reporting. The reporting of other / other dangerous articles was discontinued in 1992 and reporting of explosive / incendiary devices was discontinued in 1994 for the same reasons.

SOURCES

Persons screened, type of weapon detected, and persons arrested:

1980-85: U.S. Department of Transportation, Federal Aviation Administration, *Semiannual Report to Congress on the Effectiveness of the Civil Aviation Security Program, July 1-December 31, 1985* (Washington, DC: May 1986).

1990-2000: Ibid. Office of Civil Aviation Security Policy and Planning, *Annual Report to Congress on Civil Aviation Security* (Washington, DC: Annual issues), and personal communications, May 27, 1999, Mar. 29, 2000, and Aug. 7, 2001.

Bomb threats received:

U.S. Department of Transportation, Federal Aviation Administration, *Criminal Acts Against Civil Aviation* (Washington, DC: Annual issues).

Section C

Highway

Table 2-17: Motor Vehicle Safety Data

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Fatalities	36,399	47,089	52,627	44,525	51,091	43,825	44,599	41,508	39,250	40,150	40,716	41,817	42,065	42,013	41,501	41,717	41,945	(R) 42,196	42,815
Injured persons ^E	N	N	N	N	N	N	3,230,666	3,096,870	3,069,603	3,149,164	3,265,928	3,465,279	3,483,319	3,347,614	3,192,035	3,236,238	3,188,750	3,032,672	2,926,000
Crashes ^E	N	N	N	N	N	N	6,471,202	6,117,359	6,000,310	6,105,915	6,495,988	6,699,415	6,769,583	6,624,149	6,334,573	6,279,036	6,393,624	6,322,896	6,316,000
Vehicle-miles (millions)	718,763	887,811	1,109,724	1,327,664	1,527,295	1,774,827	2,144,362	2,172,050	2,247,151	2,296,378	2,357,588	2,422,696	2,485,848	2,561,695	2,631,522	2,691,056	2,746,925	(R) 2,797,000	2,856,000
Rates per 100 million vehicle-miles																			
Fatalities	5.1	5.3	4.7	3.4	3.3	2.5	2.1	1.9	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.5	(R) 1.5	1.5
Injured persons ^E	N	N	N	N	N	N	151	143	137	137	139	143	140	131	121	120	116	(R) 108	102
Crashes ^E	N	N	N	N	N	N	302	282	267	266	276	277	272	259	241	233	233	(R) 226	221

KEY: E = estimated; N = data do not exist; R = revised.

SOURCES

Fatalities:

1960-70: Estimated by U.S. Department of Transportation, National Highway Traffic Safety Administration from data supplied by U.S. Department of Health and Human Services, National Center for Health Statistics, and individual state accident reports (adjusted to 30-day deaths). Fatalities data prior to 1975 have been adjusted to reflect the Fatality Analysis Reporting System's definition of a fatal crash as one that involves a motor vehicle on a trafficway, which results in the death of a vehicle occupant or a nonmotorist within 30 days of the crash.

1975-2002: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2002*, DOT HS 809 620 (Washington, DC: January 2004), table 2.

Injured persons:

1990-2002: Ibid., *Traffic Safety Facts 2002*, DOT HS 809 620 (Washington, DC: January 2004), table 2.

Crashes:

1990-2002: Ibid., *Traffic Safety Facts 2002*, DOT HS 809 620 (Washington, DC: January 2004), table 1.

Vehicle-miles:

1960-65: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1975-2002: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2002*, DOT HS 809 620 (Washington, DC: January 2004), table 2.

Fatality and injury rates:

1960-65: Calculated by U.S. Department of Transportation, Bureau of Transportation Statistics.

1970-2002: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2002*, DOT HS 809 620 (Washington, DC: January 2004), table 2.

Crash rates:

Calculated by U.S. Department of Transportation, Bureau of Transportation Statistics.

Table 2-18: Motor Vehicle Fatalities, Vehicle-Miles, and Associated Rates by Highway Functional System

	1980	1985	1990	1995	1996	1997	1998	1999	2000	2001	2002
Fatalities											
Rural, total	29,545	24,492	25,786	23,978	24,510	24,889	24,751	25,185	23,640	23,396	25,693
Interstate	2,263	2,141	2,707	2,675	2,905	3,033	3,105	3,244	3,199	3,105	3,297
Other arterials ^a	12,268	9,940	9,893	9,947	9,458	9,821	9,594	9,573	8,913	8,692	9,358
Collector ^b	10,004	8,209	8,852	7,401	7,481	7,578	7,593	7,595	7,147	7,305	7,974
Local	5,010	4,202	4,334	3,955	4,666	4,457	4,459	4,773	4,381	4,294	5,064
Urban, total	21,546	19,333	18,813	17,839	17,555	17,078	16,143	15,970	15,695	15,219	16,759
Interstate	2,184	2,025	2,252	2,154	2,323	2,281	2,283	2,353	2,388	2,371	2,452
Other arterials ^a	12,752	12,521	11,742	10,916	10,756	10,243	9,902	9,628	9,442	8,838	9,702
Collector	2,226	1,696	1,427	1,441	1,290	1,399	1,037	1,031	987	1,007	1,136
Local	4,384	3,091	3,392	3,328	3,186	3,155	2,921	2,958	2,878	3,003	3,469
Vehicle-miles of travel (VMT) (millions)											
Rural, total	672,030	730,728	868,878	933,289	960,194	999,277	1,032,528	1,062,623	1,084,961	1,105,083	1,128,160
Interstate	135,084	154,357	200,173	223,382	232,565	240,255	251,520	260,166	268,960	274,024	279,962
Other arterials ^a	262,774	282,803	330,866	368,595	378,847	392,057	403,484	413,320	420,569	426,945	433,805
Collector ^b	189,468	206,669	240,460	236,148	241,030	254,100	257,868	264,453	267,521	270,962	275,007
Local	84,704	86,899	97,379	105,164	107,752	112,865	119,656	124,684	127,911	133,152	139,386
Urban, total	855,265	1,044,098	1,275,484	1,489,534	1,523,886	1,552,956	1,595,620	1,627,618	1,664,842	1,676,379	1,727,596
Interstate	161,242	216,188	278,901	341,528	351,579	361,433	374,622	383,259	393,580	399,890	408,618
Other arterials ^a	484,189	578,270	699,233	815,170	834,623	846,627	862,996	878,153	900,161	913,726	937,357
Collector	83,043	89,578	106,297	126,929	129,310	130,146	131,905	131,603	135,371	137,922	141,874
Local	126,791	160,062	191,053	205,907	208,374	214,750	226,097	234,603	235,730	224,841	239,747
Fatality rates per 100 million vehicle miles											
Rural, total	4.40	3.35	2.97	2.57	2.55	2.49	2.40	2.37	2.18	2.12	2.28
Interstate	1.68	1.39	1.35	1.20	1.25	1.26	1.23	1.25	1.19	1.13	1.18
Other arterials ^a	4.67	3.51	2.99	2.70	2.50	2.50	2.38	2.32	2.12	2.04	2.16
Collector ^b	5.28	3.97	3.68	3.13	3.10	2.98	2.94	2.87	2.67	2.70	2.90
Local	5.91	4.84	4.45	3.76	4.33	3.95	3.73	3.83	3.43	3.22	3.63
Urban, total	2.52	1.85	1.47	1.20	1.15	1.10	1.01	0.98	0.94	0.91	0.97
Interstate	1.35	0.94	0.81	0.63	0.66	0.63	0.61	0.61	0.61	0.59	0.60
Other arterials ^a	2.63	2.17	1.68	1.34	1.29	1.21	1.15	1.10	1.05	0.97	1.04
Collector	2.68	1.89	1.34	1.14	1.00	1.07	0.79	0.78	0.73	0.73	0.80
Local	3.46	1.93	1.78	1.62	1.53	1.47	1.29	1.26	1.22	1.34	1.45

^a For urban: the sum of other freeways and expressways, other principal arterials, and minor arterials.

For rural: the sum of other principal arterials and minor arterials.

^b Collector is the sum of major and minor collectors (rural only).

NOTES:

Includes the 50 states and the District of Columbia.

Fatality figures reflect original figures received by FHWA from NHTSA, and, when totaled, differ slightly from the revised NHTSA figures that appear in other tables in this volume.

SOURCES:

Fatalities:

1980-95: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site <http://www.fhwa.dot.gov/ohim/ohimstat.htm> as of Oct. 25, 2000.

1996-97: Ibid., *Highway Statistics*, Internet site <http://www.fhwa.dot.gov/ohim/ohimstat.htm> as of January 2003, table FI 1.

1998-2002: Ibid., *Highway Statistics*, Internet site <http://www.fhwa.dot.gov/ohim/hs01/fi20.htm> as of July 2004, table FI-20.

Vehicle miles:

1980-95: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-202.

1996-2002: Ibid., *Highway Statistics*, Internet site <http://www.fhwa.dot.gov/ohim/ohimstat.htm> as of July 2004, table VM-2.

Fatality rates:

Calculated by the U.S. Department of Transportation, Bureau of Transportation Statistics.

Table 2-19: Occupant Fatalities by Vehicle Type and Nonoccupant Fatalities

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL traffic fatalities	44,525	51,091	43,825	44,599	41,508	39,250	40,150	40,716	41,817	^d 42,065	42,013	41,501	41,717	41,945	^R 42,196	42,815
Occupant fatalities (by vehicle type)	35,925	41,927	36,043	37,134	34,740	32,880	33,574	34,318	35,291	35,695	35,725	35,382	35,875	36,348	^R 36,440	37,232
Passenger car, total	25,929	27,449	23,212	24,092	22,385	21,387	21,566	21,997	22,423	22,505	22,199	21,194	20,862	20,699	^R 20,320	20,416
Subcompact ^a	3,834	7,299	7,993	8,309	7,694	7,028	6,968	7,060	6,791	6,618	6,220	5,514	4,887	4,773	^R 4,458	4,226
Compact	614	927	2,635	5,310	5,338	5,354	5,707	6,322	6,899	7,288	7,195	6,804	6,942	7,022	^R 6,731	7,002
Intermediate	1,869	3,878	4,391	4,849	4,681	4,418	4,483	4,407	4,666	4,670	4,794	4,617	4,721	5,204	^R 5,402	5,473
Full ^b	10,800	11,580	6,586	4,635	4,040	3,796	3,675	3,560	3,413	3,417	3,481	3,106	2,887	3,184	^R 3,208	3,233
Unknown	8,812	3,765	1,607	989	632	791	733	648	654	512	509	1,153	1,425	516	^R 521	482
Truck ^c , total	5,817	8,748	7,666	9,306	9,052	8,683	9,116	9,574	10,216	10,553	10,972	11,447	12,024	12,280	12,431	12,866
Light	4,856	7,486	6,689	8,601	8,391	8,098	8,511	8,904	9,568	9,932	10,249	10,705	11,265	11,526	^R 11,723	12,182
Large	961	1,262	977	705	661	585	605	670	648	621	723	742	759	754	^R 708	684
Other vehicles, total	4,179	5,730	5,165	3,736	3,303	2,810	2,892	2,747	2,652	2,637	2,554	2,741	2,989	3,369	3,689	3,950
Motorcycle	3,189	5,144	4,564	3,244	2,806	2,395	2,449	2,320	2,227	2,161	2,116	2,294	2,483	2,897	^R 3,197	3,244
Bus	53	46	57	32	31	28	18	18	33	21	18	38	59	22	34	45
Other / unknown vehicle type	937	540	544	460	466	387	425	409	392	455	420	409	447	450	^R 458	661
Nonoccupant fatalities, total	8,600	9,164	7,782	7,465	6,768	6,370	6,576	6,398	6,526	6,368	6,288	6,119	5,842	5,597	5,756	5,583
Pedestrian	7,516	8,070	6,808	6,482	5,801	5,549	5,649	5,489	5,584	5,449	5,321	5,228	4,939	4,763	^R 4,901	4,808
Pedalcyclist	1,003	965	890	859	843	723	816	802	833	765	814	760	754	693	^R 732	662
Other	81	129	84	124	124	98	111	107	109	154	153	131	149	141	^R 123	113

KEY: R = revised.

^a Includes minicompact cars (wheelbase under 95 inches) and subcompact cars (wheelbase between 95 and 99 inches).

^b Includes cars with a wheelbase of 110 inches or greater.

^c See table 2-23 for definitions of light and large trucks.

^d Includes two fatalities that could not be assigned to a category above.

SOURCES

2002: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2002 Early Edition*, DOT HS 809 620 (Washington, DC: 2003), table 4.

Breakout of passenger car types:

U.S. Department of Transportation, National Center for Statistics and Analysis, personal communication, Dec. 18, 2003.

Table 2-20: Occupant and Nonmotorist Fatalities in Crashes by Number of Vehicles and Alcohol

	1985		1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		2000		2001		2002	
	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI	Fatal	AI
TOTAL fatalities	43,825	23,167	44,599	22,587	41,508	20,159	39,250	18,290	40,150	17,908	40,716	17,308	41,817	17,732	42,065	17,749	42,013	16,711	41,501	16,673	41,717	16,572	41,945	17,380	^R 42,196	^R 17,400	42,815	17,419
Percent of total fatalities	53%		51%		49%		47%		45%		43%		42%		42%		40%		40%		40%		41%		^R 41%		41%	
Motorist fatalities, total	36,043	19,271	37,134	18,953	34,740	16,917	32,880	15,301	33,574	14,857	34,318	14,437	35,291	14,796	35,695	14,830	35,725	14,051	35,382	13,896	35,875	13,958	36,348	14,834	^R 36,440	^R 14,708	37,232	14,862
Single-vehicle crashes	17,130	10,882	18,159	11,162	17,280	10,208	15,958	9,045	15,932	8,761	15,997	8,330	16,732	8,868	16,723	8,781	16,529	8,244	16,666	8,417	17,075	8,516	17,471	8,964	^R 17,753	^R 8,973	18,564	9,170
Two-vehicle crashes	16,467	7,296	16,262	6,676	15,025	5,821	14,449	5,341	15,161	5,205	15,664	5,219	15,744	5,017	15,935	5,084	16,218	4,904	15,742	4,638	15,726	4,562	15,758	4,854	^R 15,618	^R 4,739	15,541	4,716
More than two-vehicle crashes	2,446	1,093	2,713	1,115	2,435	888	2,473	916	2,481	891	2,657	888	2,815	911	3,037	965	2,978	904	2,974	841	3,074	880	3,119	1,016	^R 3,069	^R 996	3,127	976
Nonmotorist fatalities, total	7,782	3,897	7,465	3,636	6,768	3,241	6,370	2,989	6,576	3,051	6,398	2,871	6,526	2,936	6,368	2,919	6,288	2,660	6,119	2,777	5,842	2,613	5,597	2,546	^R 5,756	^R 2,693	5,583	2,559
Pedestrians fatalities, total	6,808	3,575	6,482	3,264	5,801	2,891	5,549	2,721	5,649	2,735	5,489	2,578	5,584	2,607	5,449	2,593	5,321	2,350	5,228	2,463	4,939	2,314	4,763	2,254	^R 4,901	^R 2,371	4,808	2,278
Pedestrians, single-vehicle crashes	6,342	3,278	5,990	2,966	5,302	2,588	5,099	2,454	5,180	2,464	5,027	2,308	5,110	2,364	5,024	2,358	4,876	2,112	4,801	2,228	4,516	2,074	4,340	2,015	^R 4,480	^R 2,123	4,404	2,054
Pedestrians, multiple-vehicle crashes	466	297	492	298	499	303	450	267	469	271	462	270	474	243	425	235	445	239	427	235	423	240	423	239	421	^R 248	404	224
Pedalcyclists fatalities, total	890	284	859	315	843	305	723	228	816	279	802	262	833	290	765	265	814	252	760	268	754	270	693	246	^R 732	^R 283	662	244
Pedalcyclists, single-vehicle crashes	864	271	832	301	815	296	690	211	792	264	781	252	807	279	739	253	788	244	736	259	718	253	668	236	^R 709	^R 271	625	230
Pedalcyclists, multiple-vehicle crashes	26	13	27	14	28	9	33	17	24	15	21	10	26	11	26	12	26	8	24	9	36	17	25	10	23	12	37	14
Others / unknown	84	38	124	57	124	45	98	39	111	37	107	31	109	39	154	61	153	58	131	47	149	29	141	46	^R 123	39	113	37

KEY: AI = Alcohol involvement; Fatal = fatalities; R = revised.

NOTES

Alcohol involvement pertains to any driver, pedestrian, or pedalcyclist involved in the accident. Alcohol results are determined from positive blood alcohol concentration tests and police-reported alcohol involvement and are adjusted by the U.S. Department of Transportation, National Highway Traffic Safety Administration.

In 2001, NHTSA adopted a new method to estimate missing blood alcohol concentration (BAC) test result data. This new method, multiple imputation, is being used by NHTSA's National Center for Statistics and Analysis (NCSA) to improve the scope of alcohol involvement statistics by the Fatality Analysis Reporting System (FARS). As a result of the methodology change, alcohol involvement fatalities have undergone a complete revision.

Total fatalities may not equal the sum of the categories in each column because NCSA generates a separate estimate for each category of fatalities, including total fatalities.

SOURCE

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Fatality Analysis Reporting System (FARS) Database, personal communication, Oct. 17, 2003.

Table 2-21: Passenger Car Occupant Safety Data

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Fatalities	25,929	27,449	23,212	24,092	22,385	21,387	21,566	21,997	22,423	22,505	22,199	21,194	20,862	^R 20,699	20,233
Injured persons^E	N	N	N	2,376,439	2,234,594	2,231,703	2,264,809	2,363,595	2,469,358	2,458,080	2,340,612	2,201,375	2,137,503	2,051,609	1,926,625
Crashes^E	N	N	N	5,560,592	5,178,450	5,042,203	5,040,116	5,401,164	5,593,685	5,598,699	5,423,286	5,146,124	4,915,734	4,926,243	4,831,727
Vehicle-miles (millions)	1,030,376	1,107,056	1,248,981	1,427,178	1,411,655	1,436,035	1,445,106	1,459,208	1,478,352	1,499,139	1,528,399	1,555,901	1,566,808	^R 1,580,493	1,584,612
Rates per 100 million vehicle-miles															
Fatalities	2.5	2.5	1.9	1.7	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.3	1.3	1.3
Injured persons ^E	N	N	N	^R 166	158	155	157	162	167	164	153	141	136	130	122
Crashes ^E	N	N	N	390	367	351	349	370	378	373	355	331	314	^R 312	305

KEY: E = estimated; N = data do not exist; R = revised.

NOTES

The injury and crash data in this table are from the U.S. Department of Transportation (USDOT), National Highway Traffic Safety Administration's (NHTSA) General Estimates System (GES). The data from GES, which began operation in 1988, are obtained from a nationally representative probability sample selected from all police-reported crashes. The GES sample includes only crashes where a police accident report was completed and the crash resulted in property damage, injury, or death. The resulting figures do not take into account crashes that were not reported to the police or that did not result in property damage. The 1993 *National Transportation Statistics (NTS) Historical Compendium* and earlier editions illustrated crashes and injury figures estimated by the National Safety Council, which used a different set of methods to arrive at its figures. Thus, the injury and crash figures in this edition of NTS may not be comparable with those found in the *Compendium* and earlier editions.

USDOT, Bureau of Transportation Statistics rounded vehicle-miles to the nearest billion.

Vehicle-miles in this table and in table 2-23 are taken from NHTSA revised data and are not based exclusively on USDOT, Federal Highway Administration (FHWA) data. The change was made to reflect the different vehicle classification schemes used by FHWA and NHTSA. Thus, vehicle-miles for passenger cars, and light and large trucks in this table and table 2-23 should not be compared with vehicle-miles in chapter 1, which are taken directly from FHWA.

SOURCES

Fatalities, injuries, vehicle miles, fatality and injury rates:

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2001*, DOT HS 809 484 (Washington, DC: December 2002), table 7 and personal communication, Sept. 10, 2002.

Crashes:

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Fatality Analysis Reporting System Database and General Estimates System Database, personal communication, Sept. 10, 2002.

Crash rates:

Calculated by U.S. Department of Transportation, Bureau of Transportation Statistics by dividing the number of crashes by the vehicle-miles traveled.

Table 2-22: Motorcycle Rider Safety Data

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Fatalities	3,189	5,144	4,564	3,244	2,806	2,395	2,449	2,320	2,227	2,161	2,116	2,294	2,483	^R 2,897	3,181
Injured persons ^E	N	N	N	84,285	80,435	65,099	59,436	57,405	57,480	55,281	52,574	48,974	49,986	57,723	60,236
Crashes ^E	N	N	N	103,114	105,030	72,177	74,565	68,752	66,354	66,224	61,451	54,477	57,322	68,783	73,326
Vehicle-miles (millions)	5,629	10,214	9,086	9,557	9,178	9,557	9,906	10,240	9,797	9,920	10,081	10,283	10,584	^R 10,469	9,529
Rates per 100 million vehicle-miles^a															
Fatalities	57	50	50	34	31	25	25	23	23	22	21	22	^R 23	^R 28	33
Injured persons ^E	N	N	N	882	876	681	600	561	587	557	522	476	472	^R 551	632
Crashes ^E	N	N	N	1,079	1,144	755	753	671	677	668	610	530	542	^R 657	770

KEY: E = estimated; N = data do not exist; R = revised.

^a U.S. Department of Transportation (USDOT), National Highway Traffic Safety Administration (NHTSA) rounds its injury and crash data to the nearest thousand before publishing them, but it calculates injury rates using the unrounded data. NHTSA also calculates fatality and injury rates using vehicle-miles expressed to a higher level of precision than shown here. USDOT, Bureau of Transportation Statistics rounded vehicle-miles to the nearest 100 million in this table.

NOTE

The injury and crash data in this table are from NHTSA's General Estimates System (GES). The data from the GES, which began operation in 1988, are obtained from a nationally representative probability sample selected from all police-reported crashes. The GES sample includes only crashes where a police accident report was completed and the crash resulted in property damage, injury, or death. The resulting figures do not take into account crashes that were not reported to the police or that did not result in property damage. The 1993 *National Transportation Statistics (NTS) Compendium* and earlier editions illustrated crashes and injury figures estimated by the National Safety Council, which used a different set of methods to arrive at its figures. Thus, the injury and crash figures in this edition of NTS may not be comparable with those found in the *Compendium* and earlier editions.

SOURCES

Fatalities, injuries, and vehicle-miles:

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2001*, DOT HS 809 484 (Washington, DC: December 2002), table 10 and personal communication, Sept. 10, 2002.

Crashes:

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, Fatality Analysis Reporting System Database and General Estimates System Database, personal communication, Sept. 10, 2002.

Table 2-23: Truck Occupant Safety Data

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Fatalities, total	5,817	8,748	7,666	9,306	9,052	8,683	9,116	9,574	10,216	10,553	10,972	11,447	12,024	^R 12,280	12,381
Light	4,856	7,486	6,689	8,601	8,391	8,098	8,511	8,904	9,568	9,932	10,249	10,705	11,265	^R 11,526	11,677
Large	961	1,262	977	705	661	585	605	670	648	621	723	742	759	^R 754	704
Injured persons^E, total	N	N	N	546,966	590,632	578,435	632,976	661,619	752,840	794,238	785,733	791,273	879,757	917,398	889,951
Light	N	N	N	505,144	562,601	544,657	600,874	631,411	722,496	761,478	754,820	762,506	846,865	886,566	860,527
Large	N	N	N	41,822	28,031	33,778	32,102	30,208	30,344	32,760	30,913	28,767	32,892	30,832	29,424
Crashes^E, total	N	N	N	2,459,908	2,460,561	2,488,936	2,722,506	2,937,998	3,039,159	3,175,497	3,225,320	3,167,967	3,425,409	3,539,797	3,560,956
Light	N	N	N	2,152,486	2,200,134	2,191,171	2,407,212	2,573,701	2,749,596	2,880,782	2,900,896	2,866,729	3,079,617	3,207,738	3,254,027
Large	N	N	N	371,801	318,637	362,807	383,220	444,697	362,883	378,335	421,377	391,807	452,444	437,861	409,352
Vehicle-miles (millions)															
Light	204,274	295,475	388,778	555,659	595,924	642,397	675,353	711,515	749,971	787,255	824,896	861,951	903,314	^R 942,853	972,649
Large	81,330	108,491	123,504	146,242	149,543	153,384	159,888	170,216	178,156	182,971	191,477	196,380	202,688	^R 205,520	207,686
Rates per 100 million vehicle-miles															
Fatalities															
Light	2.4	2.5	1.7	1.5	1.4	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2
Large	1.2	1.2	0.8	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3
Injured persons^E															
Light	N	N	N	91	94	85	89	89	96	97	92	88	94	94	88
Large	N	N	N	29	19	22	20	18	17	18	16	15	16	15	14
Crashes^E															
Light	N	N	N	387	369	341	356	362	367	366	352	333	341	340	335
Large	N	N	N	254	213	237	240	261	204	207	220	200	223	213	197

KEY: E = estimated; N = data do not exist; R = revised.

^aCrashes often involve more than one type of truck (light or large), hence "total truck crashes" is smaller than the sum of the components.

NOTES

Large trucks - trucks over 10,000 pounds gross vehicle weight rating, including single-unit trucks and truck tractors. Light trucks - trucks of 10,000 pounds gross vehicle weight rating or less, including pickups, vans, truck-based station wagons, and utility vehicles. The injury and crash data in this table are from the U.S. Department of Transportation (USDOT), National Highway Traffic Safety Administration's (NHTSA) General Estimates System (GES). The data from GES, which began operation in 1988, are obtained from a nationally representative probability sample selected from all police-reported crashes. The GES sample includes only crashes where a police accident report was completed and the crash resulted in property damage, injury, or death. The resulting figures do not take into account crashes that were not reported to the police or that did not result in property damage.

The 1993 *National Transportation Statistics (NTS) Historical Compendium* and earlier editions illustrated crashes and injury figures estimated by the National Safety Council, which used a different set of methods to arrive at its figures. Thus, the injury and crash figures in this edition of NTS may not be comparable with those found in the *Compendium* and earlier editions. USDOT, Bureau of Transportation Statistics rounded vehicle-miles to the nearest billion.

Vehicle-miles in this table and in table 2-19 are taken from NHTSA revised data and are not based exclusively on USDOT, Federal Highway Administration (FHWA) data, as they have been in earlier reports. The change was made to reflect the different vehicle classification schemes used by FHWA and NHTSA. Thus, vehicle-miles for passenger cars and light and large trucks in table 2-19 and this table should not be compared with vehicle-miles in Chapter 1, which are taken directly from FHWA.

SOURCES

Fatalities, injuries, vehicle-miles, fatality and injury rates:

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2001*, DOT HS 809 484 (Washington, DC: December 2002), tables 8, 9, and personal communication, Sept. 10, 2002.

Crashes:

Ibid., National Center for Statistics and Analysis, Fatality Analysis Reporting System Database and General Estimates System Database, personal communication, Sept. 10, 2002.

Crash rates:

Calculated by the U.S. Department of Transportation, Bureau of Transportation Statistics.

Table 2-24: Bus Occupant Safety Data^a

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Fatalities	53	46	57	32	31	28	18	18	33	21	18	38	59	22	34
Injured persons^E	N	N	N	32,691	20,959	20,144	17,056	15,767	19,214	20,291	16,887	15,559	21,958	17,769	15,427
Crashes^E	N	N	N	60,412	56,285	49,705	51,353	55,818	58,847	57,185	53,376	53,385	62,591	55,594	54,264
Vehicle-miles (millions)	6,055	6,059	4,478	5,726	5,750	5,778	6,125	6,409	6,420	6,563	6,842	7,007	7,662	^R 7,590	6,986
Rates per 100 million vehicle-miles^b															
Fatalities	0.9	0.8	1.3	0.6	0.5	0.5	0.3	0.3	0.5	0.3	0.3	0.5	0.8	0.3	0.5
Injured persons ^E	N	N	N	571	365	349	278	246	299	309	247	222	287	234	221
Crashes ^E	N	N	N	1,055	979	860	838	871	917	871	780	762	817	^R 732	777

KEY: E = estimated; N = data do not exist; R = revised.

^a Bus includes school, transit, and intercity buses.

^b The U.S. Department of Transportation (USDOT), National Highway Traffic Safety Administration (NHTSA) rounds its injury and crash data to the nearest thousand, but injury and crash rates are calculated using the unrounded data. NHTSA also calculates fatality, injury, and crash rates using vehicle-miles expressed to a higher level of precision than shown here. Thus, injury and crash rates shown in this table may differ slightly from the rates that would be calculated from the data in this table. USDOT, Bureau of Transportation Statistics has rounded vehicle-miles to the nearest 100 million in this table.

NOTE

The injury and crash data in this table are from the U.S. Department of Transportation (USDOT), National Highway Traffic Safety Administration's (NHTSA) General Estimates System (GES). The data from GES, which began operation in 1988, are obtained from a nationally representative probability sample selected from all police-reported crashes. The GES sample includes only crashes where a police accident report was completed and the crash resulted in property damage, injury, or death. The resulting figures do not take into account crashes that were not reported to the police or that did not result in property damage. The 1993 *National Transportation Statistics (NTS) Historical Compendium* and earlier editions illustrated crashes and injury figures estimated by the National Safety Council, which used a different set of methods to arrive at its figures. Thus, the injury and crash figures in this edition of NTS may not be comparable with those found in the *Compendium* and in earlier editions.

SOURCES

Fatalities and injuries:

1975-2001: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2001*, DOT HS 809 484 (Washington, DC: December 2002), tables 4, 51, and personal communication, Sept. 10, 2002.

Crashes:

1990-2001: Ibid., General Estimates System Database, personal communication, Sept 10, 2002.

Vehicle-miles:

1975-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995* (Washington, DC: July 1997), table VM-201A.

1995-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 2-25: Fatalities by Highest Blood Alcohol Concentration (BAC) in Highway Crashes

	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total fatalities	43,825	44,599	41,508	39,250	40,150	40,716	41,817	42,065	42,013	41,501	41,717	41,945	^R 42,196	42,815
Fatalities in alcohol-related crashes	23,167	22,587	20,159	18,290	17,908	17,308	17,732	17,749	16,711	16,673	16,572	17,380	^R 17,400	17,419
Percent	52.9	50.6	48.6	46.6	44.6	42.5	42.4	42.2	38.5	40.2	39.7	41.4	^R 41.2	40.7
BAC = 0.00														
Number	20,659	22,012	21,349	20,960	22,242	23,409	24,085	24,316	25,302	24,828	25,145	24,565	^R 24,796	25,396
Percent	47.1	49.4	51.4	53.4	55.4	57.5	57.6	57.8	61.5	59.8	60.3	58.6	^R 58.8	59.3
BAC = 0.01 - 0.07														
Number	3,081	2,980	2,560	2,443	2,361	2,322	2,490	2,486	2,290	2,465	2,321	2,511	^R 2,542	2,401
Percent	7.0	6.7	6.2	6.2	5.9	5.7	6.0	5.9	8.3	5.9	5.6	6.0	6.0	5.6
BAC = 0.08+														
Number	20,086	19,607	17,599	15,847	15,547	14,985	15,242	15,263	14,421	14,207	14,250	14,870	^R 14,858	15,019
Percent	45.8	44.0	42.4	40.4	38.7	36.8	36.4	36.3	30.3	34.2	29.6	35.5	^R 35.2	35.1

KEY: BAC = blood alcohol concentration; R = revised.

NOTES

BAC values have been assigned by U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA) when alcohol test results are unknown. Alcohol-related crashes pertain to the BAC of the driver and nonoccupants struck by motor vehicles. For some years, numbers may not add to totals due to rounding.

In 2001, NHTSA adopted a new method to estimate missing blood alcohol concentration (BAC) test result data. This new method, multiple imputation, is being used by NHTSA's National Center for Statistics and Analysis (NCSA) to improve the scope of alcohol involvement statistics by the Fatality Analysis Reporting System (FARS). As a result of the methodology change, BAC 0.08 breakouts, which coincide with many state laws, can now be determined. Thus, NHTSA's general reporting categories have been modified to reflect this and are now BAC 0.00, BAC 0.01-0.07, and BAC 0.08+.

SOURCES

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2002 Early Edition*, DOT HS 809 620 (Washington, DC: September 2003), table 13.

Table 2-26: Number of States with Different Types of Anti-DUI / DWI Legislation in Effect as of January 1 of the Listed Year

	1986	1990	1992	1994	1996	1997	1998	1999	2000	2001	2002
BAC = 0.08 per se laws ^a	2	4	5	10	13	13	15	16	^c 18	^c 20	^c 47
BAC level 0.02 or less for persons younger than 21 years	0	0	3	12	^c 28	^c 38	^c 51	^{c}51	^{c}51	^{c}51	^{c}51
Administrative license revocation (ALR) for DUI / DWI offenders ^b	^c 21	^c 27	^c 30	^c 33	^c 38	^c 40	^c 41	^{c}41	^{c}41	^{c}41	^{c}41

KEY: BAC = blood alcohol concentration; DUI = driving under the influence; DWI = driving while intoxicated.

^a Per se law makes it illegal in and of itself to drive with an alcohol concentration measured at or above a certain level.

^b States that impose additional thresholds for ALR beyond those imposed for DUI/DWI are not included in these figures.

^c Includes the District of Columbia.

NOTE

National Uniform Minimum Drinking Age Act, which standardized the minimum drinking age at 21, was enacted in 1984.

SOURCES

0.02 BAC and Administrative license revocation:

1986-98: U.S. Department of Transportation, National Highway Traffic Safety Administration, Traffic Safety Programs, Research and Evaluation Division, personal communications, Apr. 9, 1999 and Oct. 4, 1999.

1999-2000, 2002: Ibid., Impaired Driving Division, personal communications, May 22, 2000 and Feb. 5, 2004.

2001: Ibid., *Setting Limits, Saving Lives* (Washington, DC: April 2001), DOT HS 809-241.

0.08 BAC:

1986-2000: Ibid., *Presidential Initiative for Making 0.08 BAC the National Legal Limit, A Progress Report*, Internet site <http://www.nhtsa.dot.gov/people/injury/alcohol/limit.08/08progressreport/index.html> as of Aug. 13, 2001.

2001: Ibid., *Setting Limits, Saving Lives* (Washington, DC: April 2001), DOT HS 809-241.

2002: Ibid., Impaired Driving Division, personal communication, Feb. 5, 2004.

Table 2-27: Motor Vehicle Fatal Crashes by Day of Week, Time of Day, and Weather and Light Conditions (percent)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL fatal crashes	39,836	36,937	34,942	35,780	36,254	37,241	37,494	37,324	37,107	37,140	37,526	37,795	38,309
Day of week													
Sunday	16.1	16.2	15.9	15.8	15.9	15.7	15.2	15.8	15.5	15.7	16.1	16.0	15.9
Monday	11.7	11.5	11.6	12.1	12.4	12.4	12.7	12.1	12.4	12.6	12.3	12.6	12.2
Tuesday	11.5	11.5	11.5	11.8	11.7	11.8	12.4	11.9	12.4	11.9	12.0	12.1	12.3
Wednesday	11.5	11.9	12.3	12.0	12.3	11.9	12.2	13.0	12.4	12.5	12.2	12.2	12.6
Thursday	12.6	12.5	13.3	13.0	12.7	13.0	13.3	13.0	13.5	12.9	13.0	12.7	12.8
Friday	16.7	16.5	16.1	16.3	16.3	16.6	16.1	16.1	15.8	15.9	16.0	16.1	15.8
Saturday	20.0	19.9	19.3	19.0	18.6	18.5	18.2	18.0	18.0	18.5	18.5	18.2	18.3
Unknown	0.02	0.03	0.01	0.02	0.04	0.03	0.04	0.05	0.04	0.01	0.01	0.04	0.03
Time of day													
Midnight to 3 a.m.	15.7	15.3	14.3	13.8	13.1	12.8	12.6	12.2	12.3	12.2	12.5	12.5	13.1
3 a.m. to 6 a.m.	7.7	7.9	7.4	7.4	7.3	7.5	7.4	7.2	7.3	7.6	8.0	7.6	8.1
6 a.m. to 9 a.m.	8.6	8.6	8.5	8.9	9.3	9.2	9.5	9.9	9.7	10.1	9.9	9.8	9.7
9 a.m. to noon	8.5	8.6	8.8	9.7	9.6	9.4	9.7	9.9	10.2	10.1	9.9	10.0	9.7
Noon to 3 p.m.	11.6	11.7	12.4	12.5	13.1	12.9	12.7	13.3	13.4	13.2	13.1	13.2	13.1
3 p.m. to 6 p.m.	15.7	15.7	16.0	16.0	16.6	16.8	16.9	16.6	16.8	16.8	16.7	16.6	16.0
6 p.m. to 9 p.m.	15.6	15.6	16.5	16.2	15.7	15.9	15.7	15.9	15.6	15.4	15.3	15.4	15.4
9 p.m. to midnight	15.9	15.8	15.3	14.7	14.3	14.6	14.6	14.1	13.8	13.8	13.7	14.1	14.1
Unknown	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.9
Atmospheric condition													
Normal	86.7	86.7	85.7	87.0	87.3	86.7	86.3	86.4	87.2	89.0	88.0	88.1	87.7
Rain	9.3	9.0	10.0	8.7	8.3	8.6	8.4	8.8	8.8	7.3	7.1	7.5	7.8
Snow/sleet	1.6	1.9	2.0	2.2	1.8	2.4	2.7	2.5	1.7	1.6	2.3	1.8	1.9
Other/unknown	2.3	2.4	2.3	2.1	2.5	2.3	2.6	2.3	2.3	2.0	2.6	2.6	2.6
Light condition													
Daylight	45.0	45.4	46.0	47.7	49.5	48.7	49.3	50.3	50.5	50.7	50.5	50.7	49.3
Dark, but lighted	17.7	17.4	17.4	16.4	15.6	16.0	15.9	15.6	14.9	15.0	15.9	15.6	15.9
Dark	32.7	33.0	32.4	31.5	30.3	30.7	30.3	29.5	30.0	29.7	29.2	29.0	30.0
Dawn or dusk	4.2	3.9	3.9	4.2	4.2	4.2	4.2	4.2	4.3	4.3	4.1	4.1	4.1
Unknown	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.4	0.3	0.3	0.4	0.7	0.9

SOURCE

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2002 Early Edition*, DOT HS 809 620 (Washington, DC: September 2003), tables 24, 25.

Table 2-28: Motor Vehicle Fatal Crashes by Posted Speed Limit

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL fatal crashes	39,161	45,284	39,196	39,836	36,937	34,942	35,780	^R 36,799	^R 37,789	^R 38,041	^R 37,876	^R 37,631	37,140	37,526	^R 37,862	38,309
Under 55 mph, total	15,233	20,079	19,278	19,136	17,507	16,827	16,985	^R 17,361	^R 17,849	^R 17,765	^R 17,673	^R 17,424	16,963	17,054	^R 17,582	17,413
5, 10, 15, 20, 25 mph ^a	2,617	2,865	2,504	2,234	2,097	1,911	1,895	^R 1,947	^R 1,943	^R 1,964	^R 2,012	^R 1,913	1,863	1,827	^R 1,919	1,851
30, 35 mph	6,099	8,527	7,890	7,756	6,908	6,696	6,759	^R 6,738	^R 6,871	^R 6,614	^R 6,542	^R 6,200	5,946	6,079	^R 6,260	6,025
40, 45 mph	4,276	6,256	6,812	7,092	6,608	6,345	6,454	^R 6,792	^R 7,086	^R 7,260	^R 7,312	^R 7,519	7,245	7,315	^R 7,576	7,703
50 mph	2,241	2,431	2,072	2,054	1,894	1,875	1,877	^R 1,884	^R 1,949	^R 1,927	^R 1,807	^R 1,792	1,909	1,833	^R 1,827	1,834
55 mph and above, total	16,095	20,352	18,871	19,749	18,630	17,450	18,144	^R 18,830	^R 19,278	^R 19,587	19,388	^R 19,451	19,373	19,735	^R 19,416	19,778
55 mph	16,094	20,352	18,863	17,556	16,543	15,444	15,980	^R 16,644	^R 16,891	^R 14,224	13,034	12,640	12,184	12,143	^R 11,847	12,209
60 mph	0	0	2	18	9	4	9	13	16	523	935	1,073	1,069	1,163	^R 1,221	1,256
65 mph	1	0	2	2,175	2,078	2,002	2,155	2,173	2,323	3,214	3,311	3,421	3,537	3,686	^R 3,721	3,703
70 mph	0	0	3	0	0	0	0	0	38	1,282	1,633	1,835	2,079	2,230	^R 2,116	2,019
Over 70 mph	0	0	1	0	0	0	0	0	10	344	475	482	504	513	^R 511	591
Unknown, total	7,833	4,853	1,047	951	800	665	651	608	^R 649	^R 688	815	756	804	737	^R 864	939

KEY: mph = miles per hour; R = revised.

^a The "No Statutory Limit" speed limit designation is included in this category.

NOTES

In 1974, Congress enacted a national maximum speed limit of 55 miles per hour (mph). Amendments in 1987 and 1991 allowed states to increase speed limits to 65 mph on rural Interstates and similar highways.

The National Maximum Speed Limit was repealed in late 1995; speed limits are again set by the states, some of which have raised their maximum speed limits to 70 mph or above.

SOURCE

U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, *Traffic Safety Facts 2000*, DOT HS 809 337 (Washington, DC: December 2001), table 30, and the Fatality Analysis Reporting System (FARS) Web-based Encyclopedia available at <http://www-fars.nhtsa.dot.gov> as of Nov. 19, 2003.

Table 2-29: Safety Belt and Motorcycle Helmet Use (percent)^a

	1994	1996	1998	1999	2000	2001	2002
OVERALL Safety Belt Use	58	61	69	67	71	73	75
Drivers	59	62	70	67	72	74	76
Passengers	55	59	65	64	68	72	73
Passenger cars	63	64	71	70	74	76	77
Drivers	64	65	72	71	75	77	78
Passengers	59	62	68	66	70	74	74
Light trucks^b	50	56	66	62	68	69	73
Drivers	51	58	67	62	69	70	73
Passengers	49	53	61	60	65	69	72
Motorcycle Helmet Use^c	63	64	67	N	71	N	58
Operators	67	66	64	N	72	N	59
Riders	54	58	84	N	62	N	48

KEY: N = data do not exist.

^aSeat belt use is of Fall each year except in 1999 (December), 2001 (June), and 2002 (June). Motorcycle helmet use is of Fall each year except in 2002 (June).

^b Includes pickup trucks, vans, minivans, and sport utility vehicles.

^c In 1994, operators and riders were counted as helmeted if wearing any type of helmet. Since then, only those operators and riders wearing safety helmets that met U.S. Department of Transportation (DOT) standards were counted. Those safety helmets that do not meet DOT standards were treated as if the operator/rider were not wearing a helmet.

NOTE

Occupants of commercial and emergency vehicles are excluded.

SOURCES

Safety belt use:

1994-2002: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Safety Belt and Helmet Use in 2002 -- Overall Results*, DOT HS 809 500 (Washington, DC: 2002), table 1, Internet site <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/Rpts/2002/809-500.pdf> as of January 2003. Data are from the National Occupant Protection Use Survey (NOPUS).

Motorcycle helmet use:

1994-98: U.S. Department of Transportation, National Highway Traffic Safety Administration, Research Note, Observed Safety Belt Use in 1998 (Washington, DC: September 1999), Internet site <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/RNotes/1999/98obbelt.html> as of January 2003, table 3.

2000, 2002: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Safety Belt and Helmet Use in 2002 -- Overall Results*, DOT HS 809 500 (Washington, DC: 2002), table 6, Internet site <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/Rpts/2002/809-500.pdf> as of January 2003. Data are from the National Occupant Protection Use Survey (NOPUS).

Table 2-30: Estimated Number of Lives Saved by Use of Restraints

	1975	1980	1985	1990	1995	1996	1997	1998	1999	2000	2001	Total 1975-2001
Safety belts^a	978	575	2,435	6,592	9,790	10,414	10,750	11,018	11,197	11,889	12,144	147,246
Air bags	0	0	0	37	470	686	842	1,043	1,263	1,584	1,816	8,369
Motorcycle helmets	823	871	788	602	506	490	486	500	551	631	674	18,461
Age 21 minimum legal drinking age	412	595	701	1,033	851	846	846	861	901	922	927	20,970
Child restraints	36	49	153	222	279	365	312	299	307	^R316	269	5,085
Safety seats	33	39	135	193	232	313	266	244	277	282	235	4,353
Adult safety belts ^b	3	10	18	29	47	52	46	55	30	33	34	731

KEY: R = revised.

^a Represents all adults and children age 5 and older. Data are for passenger vehicles, which include cars, light trucks, vans, pickups, and utility vehicles. Excludes medium and heavy trucks.

^b Represents children age 4 and younger restrained only by adult safety belts.

NOTE

Total reflects lives saved for *all* years from 1975 to 2000.

SOURCES

Motorcycle helmets:

U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Fact Sheet 2001: Motorcycles* (Washington, DC: 2002) DOT HS 809 473, and personal communication, Apr. 5, 2000.

Minimum drinking age:

Ibid., *Traffic Safety Fact Sheet 2001: Alcohol* (Washington, DC: 2002) DOT HS 809 470, and personal communication, Apr. 5, 2000.

All other restraint use:

Ibid., *Traffic Safety Fact Sheet 2001: Occupant Protection* (Washington, DC: 2002) DOT HS 809 474, and personal communication, Apr. 5, 2000.

Section D

Transit

Table 2-31: Transit Safety and Property Damage Data

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fatalities^a	339	300	273	281	320	274	264	275	286	299	295
Injuries^a	54,556	52,125	55,089	52,668	58,193	57,196	55,288	56,132	55,990	55,325	56,697
Accidents^b	58,002	46,467	36,380	30,559	29,972	25,683	25,166	24,924	23,937	23,310	24,261
Incidents^{a,b} (includes accidents)	90,163	83,139	73,831	64,986	70,693	62,471	59,392	61,561	60,094	58,703	59,898
Vehicle-miles (millions)	2,490	2,478	2,510	2,535	2,581	2,620	2,605	2,702	2,833	2,927	3,002
Rates per 100 million vehicle-miles^c											
Fatalities (all reportable incidents)	13.6	12.1	10.9	11.1	12.4	10.5	10.1	10.2	10.1	10.2	9.8
Injuries (all reportable incidents)	2,191	2,103	2,195	2,077	2,254	2,183	2,122	2,078	1,976	1,890	1,889
Accidents	2,329	1,875	1,450	1,205	1,161	980	966	922	845	796	808
Property damage^d (current \$ million)	38.0	37.5	37.5	44.9	38.4	46.3	57.6	55.5	61.5	55.3	58.9

^a Totals do not include data for cable car, inclined plane, jitney, and ferry boat. These data appear in the footnotes for table 2-33

^b Accidents include collisions with other vehicles, objects, and people (except suicides), and derailments/buses going off the road. Incidents include accidents plus personal casualties (inside vehicles, inside stations, and boarding and alighting vehicle) and fires.

^c Fatality and injury rates are based on total incidents including accidents and were calculated by dividing the number of fatalities, injuries, and incidents in this table by the number of vehicle miles.

^d Total does not include property damage for cable car, inclined plane, jitney, and ferry boat, which were: 1990—\$335,000; 1991—\$410,000; 1992—\$288,000; 1993—\$221,000; 1994—\$322,000; 1995—\$3,263,000; 1996—\$157,000; 1997—\$67,000; 1998—\$24,000; 1999—\$104,000; 2000—\$77,000.

NOTES

Data are provided only for transit systems that furnished safety data for inclusion in the U.S. Department of Transportation, Federal Transit Administration, *Transit Safety and Security Statistics and Analysis*, annual reports.

Transit vehicle-miles in this table differ from those reported in Chapter 1. The American Public Transit Association, which is the source for the vehicle-miles table in Chapter 1, includes all transit systems, while *Safety Management Information Statistics (SAMIS)* covers only directly operated urban transit systems.

Prior to the 2000 edition, *Transit Safety and Security Statistics and Analysis Report* was entitled *Safety Management Information Statistics (SAMIS)* annual report.

SOURCE

U.S. Department of Transportation, Federal Transit Administration, *2000 Transit Safety and Security Statistics and Analysis Report* (Cambridge, MA: 2002).

Table 2-32: Transit Safety Data by Mode^a for All Reported Accidents^b

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fatalities, total	212	215	173	191	225	179	152	185	192	190	183
Motor bus ^c	92	80	91	79	90	69	82	100	90	91	82
Light rail	5	11	6	14	10	10	5	3	14	13	22
Heavy rail	51	59	33	37	41	43	32	28	18	21	19
Commuter rail	63	63	43	59	82	56	30	52	67	64	56
Demand responsive	0	2	0	2	2	1	3	2	2	1	4
Van pool	0	0	0	0	0	0	0	0	0	0	0
Automated guideway	1	0	0	0	0	0	0	0	1	0	0
Injured persons, total	20,023	20,594	21,653	22,081	20,939	22,159	22,950	21,452	^R 21,341	21,727	22,140
Motor bus ^c	18,876	19,016	20,556	20,862	19,663	20,879	21,222	20,145	^R 20,136	20,291	20,329
Light rail	465	474	468	361	327	355	680	320	332	427	415
Heavy rail	296	308	273	365	309	348	431	336	261	286	425
Commuter rail	84	560	110	210	216	159	213	99	66	54	53
Demand responsive	286	200	233	224	399	395	379	499	492	632	869
Van pool	16	36	13	58	24	23	25	52	53	37	49
Automated guideway	0	0	0	1	1	0	0	1	1	0	0
Accidents, total	58,002	46,468	36,380	30,559	29,972	25,683	25,166	^R 24,842	23,937	23,040	24,271
Motor bus ^c	55,289	44,467	34,282	28,596	27,754	23,819	23,425	^R 22,991	22,277	21,137	22,127
Light rail	699	671	600	449	512	309	341	363	328	300	357
Heavy rail	144	188	613	662	744	637	346	^R 278	293	396	364
Commuter rail	175	248	181	208	266	216	201	^R 162	193	215	268
Demand responsive	1,613	814	668	524	659	647	774	886	664	862	997
Van pool	81	79	35	119	36	54	78	160	179	130	157
Automated guideway	1	1	1	1	1	1	1	^R 2	3	0	1
Vehicle-miles (millions), total	2,490	2,478	2,510	2,535	2,581	2,620	2,605	2,702	2,833	2,927	3,002
Motor bus ^c	1,668	1,661	1,688	1,690	1,702	1,702	1,687	1,719	1,779	1,835	1,868
Light rail	24	27	28	27	34	34	37	41	43	48	52
Heavy rail	529	522	520	518	522	537	543	558	566	578	595
Commuter rail	187	188	188	206	210	217	203	216	242	249	253
Demand responsive	74	71	72	77	94	109	108	134	157	167	179
Van pool	8	8	13	16	18	19	25	33	44	49	52
Automated guideway	0.6	0.5	1.0	1.0	1.2	1.1	1.4	1.4	1.4	1.4	1.6
Rates per 100 million vehicle-miles^d	8.5	8.7	6.9	7.5	8.7	6.8	5.8	6.8	6.8	6.5	6.1
Fatalities, all modes	5.5	4.8	5.4	4.7	5.3	4.1	4.9	5.8	5.1	5.0	4.4
Motor bus ^c	5.5	4.8	5.4	4.7	5.3	4.1	4.9	5.8	5.1	5.0	4.4
Light rail	20.8	40.3	21.2	51.1	29.6	29.0	13.3	7.4	32.3	27.1	42.3
Heavy rail	9.6	11.3	6.3	7.1	7.9	8.0	5.9	5.0	3.2	3.6	3.2
Commuter rail	33.6	33.4	22.9	28.6	39.0	25.8	14.8	24.1	27.6	25.7	22.1
Demand responsive	0	2.8	0	2.6	2.1	0.9	2.8	1.5	1.3	0.6	2.2
Van pool	0	0	0	0	0	0	0	0	0	0	0
Automated guideway	162.0	0	0	0	0	0	0	0	69.0	0	0
Injured persons, all modes	804	831	863	871	811	846	881	794	753	742	738
Motor bus ^c	1,132	1,145	1,218	1,234	1,155	1,227	1,258	1,172	1,132	1,106	1,088
Light rail	1,933	1,735	1,654	1,318	968	1,030	1,815	785	767	889	798
Heavy rail	56	59	52	71	59	65	79	60	46	50	71
Commuter rail	45	297	59	102	103	73	105	46	27	22	21
Demand responsive	386	282	324	292	425	361	349	372	313	379	485
Van pool	208	430	103	363	132	123	101	158	121	75	94
Automated guideway	0	0	0	104	85	0	0	70	69	0	0
Accidents, all modes	2,329	1,875	1,450	1,205	1,161	980	966	^R 919	845	787	809
Motor bus ^c	3,315	2,678	2,031	1,692	1,631	1,400	1,389	1,338	1,252	1,152	1,184
Light rail	2,906	2,456	2,121	1,639	1,516	897	910	891	758	624	687
Heavy rail	27	36	118	128	142	119	64	^R 50	52	69	61
Commuter rail	93	132	96	101	127	100	99	^R 75	80	86	106
Demand response	2,177	1,147	928	682	702	591	714	661	423	516	557
Van pool	1,052	944	278	744	198	289	314	485	408	263	301
Automated guideway	162	204	102	104	85	87	69	^R 139	207	0	62

KEY: R = revised.

^a Accident statistics for cable car, inclined plane, jitney, and ferry boat are not available. The number of incidents, fatalities, and injuries for these modes appear in the footnotes for table 2-33.

^b Accidents include collisions with vehicles, objects, people (except suicides), and derailments/vehicles going off road.

^c Motor bus also includes trolley bus.

^d Rates are based on total incidents including accidents and were calculated by dividing the number of fatalities, injuries, and incidents in this table by the number of vehicle-miles.

NOTES

Data are provided only for transit systems that furnished safety data for inclusion in the U.S. Department of Transportation, Federal Transit Administration *Transit Safety and Security Statistics and Analysis* annual reports. Data covers only direct-operated urban transit systems. Vehicle-miles for all transit systems including nonurban and purchased can be found in the vehicle-miles table in chapter 1.

Prior to the 2000 edition, *Transit Safety and Security Statistics and Analysis Report* was entitled *Safety Management Information Statistics* (SAMIS) annual report.

SOURCE

U.S. Department of Transportation, Federal Transit Administration, *2000 Transit Safety and Security Statistics and Analysis Report* (Cambridge, MA: 2002).

Table 2-33: Transit Safety Data by Mode^a for All Reported Incidents^b

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fatalities, total	339	300	273	281	320	274	264	275	286	299	295
Motor bus ^c	110	88	99	83	108	82	101	109	109	102	90
Light rail	7	13	9	15	13	15	6	3	23	17	30
Heavy rail	117	103	91	83	85	79	74	77	54	84	80
Commuter rail	104	93	74	98	112	92	72	79	94	95	87
Demand responsive	0	3	0	2	2	6	11	7	4	1	8
Van pool	0	0	0	0	0	0	0	0	0	0	0
Automated guideway	1	0	0	0	0	0	0	0	2	0	0
Injured persons, total	54,556	52,125	55,089	52,668	58,193	57,196	55,288	56,132	55,990	55,325	56,697
Motor bus ^c	40,006	38,619	40,090	38,873	42,195	41,297	39,709	39,181	41,035	41,221	40,925
Light rail	1,244	1,251	1,268	982	1,181	1,319	1,604	1,087	1,076	1,271	1,338
Heavy rail	10,036	9,285	10,446	10,532	11,673	11,238	11,093	12,285	11,059	9,665	10,848
Commuter rail	2,438	2,308	2,546	1,560	2,374	2,374	1,953	2,388	1,677	1,761	1,783
Demand responsive	807	622	713	652	731	935	882	1,121	1,064	1,345	1,736
Van pool	21	40	19	59	29	25	27	54	67	41	52
Automated guideway	4	0	7	10	10	8	20	16	12	21	15
All incidents, total	90,163	83,139	73,831	64,986	70,693	62,471	59,392	61,561	60,094	58,703	59,898
Motor bus ^c	70,437	63,453	52,482	45,580	49,185	42,780	40,456	40,524	41,616	41,094	41,677
Light rail	1,465	1,543	1,492	1,136	1,413	1,276	1,350	1,173	1,121	1,182	1,319
Heavy rail	12,178	14,102	15,512	15,082	15,869	14,327	13,748	15,151	13,516	12,196	12,782
Commuter rail	3,031	2,716	3,160	2,111	3,115	2,847	2,449	3,078	2,410	2,499	2,072
Demand responsive	2,965	1,241	1,137	946	1,062	1,173	1,284	1,454	1,221	1,577	1,871
Van pool	84	83	40	121	39	58	80	162	194	135	160
Automated guideway	3	1	8	10	10	10	25	19	16	20	17
Unlinked passenger trips (millions)^d, total	7,646	7,380	7,318	7,059	7,335	7,172	7,211	7,615	7,774	8,149	8,337
Motor bus ^c	4,912	4,780	4,728	4,585	4,567	4,539	4,464	4,554	4,712	4,926	4,959
Light rail	174	184	187	187	274	249	259	259	273	289	316
Heavy rail	2,252	2,123	2,119	1,960	2,149	2,034	2,157	2,429	2,393	2,521	2,632
Commuter rail	286	274	262	303	318	322	302	311	360	374	388
Demand responsive	14	13	13	15	17	18	17	48	22	23	24
Van pool	2	2	3	4	5	5	6	8	9	10	10
Automated guideway	6	4	5	5	6	6	6	6	6	5	6
Rates per 100 million unlinked passenger trips (millions)^e											
Fatalities, all modes	4.4	4.1	3.7	4.0	4.4	3.8	3.7	3.6	3.7	3.7	3.5
Motor bus ^c	2.2	1.8	2.1	1.8	2.4	1.8	2.3	2.4	2.3	2.1	1.8
Light rail	4.0	7.1	4.8	8.0	4.7	6.0	2.3	1.2	8.4	5.9	9.5
Heavy rail	5.2	4.9	4.3	4.2	4.0	3.9	3.4	3.2	2.3	3.3	3.0
Commuter rail	36.4	33.9	28.3	32.4	35.2	28.6	23.8	25.4	26.1	25.4	22.4
Demand responsive	0	22.6	0	13.5	12.0	33.9	65.5	14.6	18.1	4.3	32.8
Van pool	0	0	0	0	0	0	0	0	0	0	0
Automated guideway	17.0	0	0	0	0	0	0	0	32.5	0	0
Injured persons, all modes	714	706	753	746	793	798	767	737	720	679	680
Motor bus ^c	815	808	848	848	924	910	890	860	871	837	825
Light rail	715	682	677	524	432	529	620	419	394	440	423
Heavy rail	446	437	493	537	543	553	514	506	462	383	412
Commuter rail	853	843	972	516	747	738	646	769	466	471	459
Demand responsive	5,835	4,678	5,393	4,401	4,390	5,286	5,251	2,336	4,821	5,846	7,113
Van pool	1,037	1,721	584	1,398	638	537	^R 461	701	773	411	524
Automated guideway	68	0	127	194	160	123	317	272	195	389	239
All incidents, all modes	1,179	1,126	1,009	921	964	871	824	808	773	720	718
Motor bus ^c	1,434	1,327	1,110	994	1,077	943	906	890	883	834	840
Light rail	842	841	796	606	516	512	522	452	411	410	417
Heavy rail	541	664	732	769	738	705	637	624	565	484	486
Commuter rail	1,060	991	1,207	698	980	885	810	991	670	668	533
Demand responsive	21,440	9,333	8,600	6,385	6,378	6,632	7,644	3,030	5,532	6,854	7,666
Van pool	4,147	3,570	1,229	2,867	858	1,245	^R 1,366	2,104	2,238	1,353	1,611
Automated guideway	51	28	145	194	160	154	396	323	260	371	271

KEY: R = revised.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fatalities:	2	1	0	1	0	0	1	0	0	0	0
Injuries:	378	327	399	383	616	598	354	357	379	1,091	762
Incidents:	186	411	400	411	650	536	301	353	253	1,078	745

^b Incidents include accidents (collisions with vehicles, objects, people (except suicides), derailments/vehicles going off road), plus personal casualties, fires, and property damage associated with transit agency revenue vehicles and all transit facilities.

^c Motor bus also includes trolley bus.

^d The number of unlinked passenger trips is equivalent to the number of passengers who board public transit vehicles. Passengers are counted each time they board a vehicle regardless of how many vehicles are necessary for a passenger to get to their destination.

^e Rates are based on total incidents including accidents and were calculated by dividing the number of fatalities, injuries, and incidents in this table by the number of unlinked passenger trips.

NOTES

Safety and Security Statistics and Analysis annual reports. Data covers only direct-operated urban transit systems. Vehicle-miles for all transit systems including

Prior to the 2000 edition, *Transit Safety and Security Statistics and Analysis Report* was entitled *Safety Management Information Statistics* (SAMIS) annual report.

SOURCE

U.S. Department of Transportation, Federal Transit Administration, *2000 Transit Safety and Security Statistics and Analysis Report* (Cambridge, MA: 2002).

Table 2-34: Reports of Violent Crime, Property Crime, and Arrests by Transit Mode

	1995	1996	1997	1998	1999	2000	2001
REPORTED OFFENSES, VIOLENT CRIME							
Homicide^a	19	20	19	51	21	12	16
Motor bus	8	9	6	40	7	7	8
Commuter rail	1	1	4	1	3	1	2
Demand responsive	0	0	0	0	0	0	0
Heavy rail	8	9	8	6	11	4	4
Light rail	2	1	1	4	0	0	2
Other ^b	0	0	0	0	0	0	0
Forcible rape^c	29	38	31	47	27	37	37
Motor bus	11	13	10	16	14	10	7
Commuter rail	5	4	7	1	3	3	5
Demand responsive	0	0	2	4	1	0	1
Heavy rail	13	19	8	24	8	20	9
Light rail	0	2	4	2	0	4	2
Other ^b	0	0	0	0	1	0	13
Robbery^d	2,811	4,563	4,760	3,684	3,789	3,480	3,308
Motor bus	909	871	870	605	764	916	953
Commuter rail	181	242	187	133	183	144	144
Demand responsive	1	3	0	1	3	4	4
Heavy rail	1,490	3,164	3,394	2,686	2,588	2,174	1,966
Light rail	181	238	222	220	200	213	217
Other ^b	49	45	87	39	51	29	24
Aggravated assault^e	2,701	3,084	3,105	2,314	2,448	2,217	2,286
Motor bus	1,941	1,677	1,294	1,186	1,268	1,070	1,146
Commuter rail	133	69	92	80	97	58	109
Demand responsive	6	13	13	13	14	16	8
Heavy rail	437	1,074	1,051	837	903	839	786
Light rail	157	199	143	170	135	208	187
Other ^b	27	52	512	28	31	26	50
REPORTED OFFENSES, PROPERTY CRIME							
Theft^f	10,596	13,238	14,486	11,830	12,896	13,393	13,636
Motor bus	2,738	3,408	2,920	2,327	2,487	2,548	2,826
Commuter rail	2,238	2,262	2,345	2,021	1,872	2,139	2,001
Demand responsive	2	8	40	15	4	19	5
Heavy rail	4,625	6,794	8,321	6,807	7,789	7,856	7,807
Light rail	451	609	479	496	530	724	706
Other ^b	542	157	381	164	214	107	291
Vehicle theft^g	2,182	2,261	2,276	2,225	1,876	2,112	1,909
Motor bus	263	306	198	208	198	169	213
Commuter rail	253	125	262	470	272	367	308
Demand responsive	0	1	3	9	28	6	6
Heavy rail	1,536	1,694	1,630	1,234	1,203	1,285	1,143
Light rail	128	135	179	273	156	279	226
Other ^b	2	0	4	31	19	6	13
Burglary^h	1,759	1,650	1,757	491	415	563	625
Motor bus	156	104	94	75	86	142	120
Commuter rail	178	177	260	217	170	191	188
Demand responsive	2	0	4	3	1	6	2
Heavy rail	1,367	1,278	1,343	110	91	82	119
Light rail	43	78	48	70	42	131	180
Other ^b	13	13	8	16	25	11	16
Arsonⁱ	63	96	75	60	53	50	44
Motor bus	29	67	33	21	15	24	12
Commuter rail	14	1	21	10	12	6	9
Demand responsive	0	0	0	0	0	0	0
Heavy rail	14	22	16	27	20	16	15
Light rail	6	6	5	2	6	4	8
Other ^b	0	0	0	0	0	0	0
REPORTED OFFENSES, ARRESTS							
Other assaults^j	2,991	3,088	2,697	2,787	2,641	2,799	2,441
Motor bus	1,896	1,571	1,439	1,400	1,217	1,159	1,024
Commuter rail	144	106	140	122	164	142	156
Demand responsive	4	0	16	3	4	3	6
Heavy rail	645	932	881	898	888	1,085	999
Light rail	181	330	195	282	269	354	204
Other ^b	121	149	26	82	99	56	52

Vandalism^k	17,228	8,627	9,539	6,571	6,895	7,312	2,971
Motor bus	13,343	6,167	5,262	3,656	4,178	4,579	1,410
Commuter rail	1,071	309	659	778	507	264	293
Demand responsive	12	17	8	10	16	7	9
Heavy rail	1,157	1,339	1,128	1,067	1,222	1,200	984
Light rail	1,505	609	2,084	947	892	1,215	246
Other ^b	140	186	398	113	80	47	29
Sex offenses^l	664	803	1,047	962	1,009	844	798
Motor bus	242	260	363	258	321	220	178
Commuter rail	100	41	82	91	85	84	80
Demand responsive	5	0	6	2	5	1	3
Heavy rail	249	430	517	541	515	477	474
Light rail	59	71	79	68	80	58	60
Other ^b	9	1	0	2	3	4	3
Drug abuse violations^m	2,578	3,944	4,355	3,792	4,131	4,083	4,339
Motor bus	1,037	2,122	1,970	1,414	1,705	1,443	1,179
Commuter rail	303	393	477	495	303	196	389
Demand responsive	1	0	15	21	8	1	2
Heavy rail	1,078	1,130	1,530	1,550	1,606	1,915	2,015
Light rail	151	298	336	271	501	520	739
Other ^b	8	1	27	41	8	8	15
Driving under the influenceⁿ	466	129	205	176	204	194	284
Motor bus	91	82	101	101	132	67	156
Commuter rail	26	21	22	21	12	44	26
Demand responsive	0	0	1	4	0	0	1
Heavy rail	52	8	22	21	42	39	57
Light rail	292	16	31	21	15	33	22
Other ^b	5	2	28	8	3	11	22
Drunkenness^o	10,479	6,921	8,632	12,643	11,487	6,087	8,033
Motor bus	6,457	3,936	5,346	3,046	3,609	3,337	4,693
Commuter rail	71	23	226	156	112	170	108
Demand responsive	2	2	46	34	2	1	4
Heavy rail	1,511	1,617	1,601	7,340	5,831	1,240	1,308
Light rail	2,255	1,305	1,258	1,844	1,913	1,316	1,598
Other ^b	183	38	155	223	20	23	322
Disorderly conduct^p	22,206	26,178	25,325	15,897	15,971	27,314	32,569
Motor bus	4,681	5,025	6,978	4,521	5,471	3,745	3,253
Commuter rail	810	1,085	1,399	1,525	797	706	607
Demand responsive	5	8	47	5	5	6	2
Heavy rail	15,258	19,183	15,309	8,227	7,856	21,087	27,626
Light rail	1,164	800	1,177	1,408	1,767	1,737	1,046
Other ^b	288	77	415	211	75	33	35
Trespassing^q	3,362	3,497	7,444	6,049	3,670	4,303	4,597
Motor bus	928	604	1,225	1,283	1,065	1,329	1,040
Commuter rail	845	674	4,150	2,850	1,080	709	1,034
Demand responsive	0	0	2	2	0	0	0
Heavy rail	1,155	1,208	1,398	1,254	1,044	1,267	1,228
Light rail	400	653	463	443	436	985	1,278
Other ^b	34	358	206	217	45	13	17
Fare evasion^r	33,903	47,873	53,406	58,856	55,194	53,863	47,258
Motor bus	3,172	2,372	1,819	1,694	2,388	591	847
Commuter rail	140	334	310	204	167	179	566
Demand responsive	1	1	2	5	1	3	5
Heavy rail	8,247	39,957	46,106	40,350	35,033	28,933	24,852
Light rail	22,212	1,185	912	12,798	17,320	24,124	20,945
Other ^b	131	4,024	4,257	3,805	285	33	43
Curfew and loitering laws^s	1,878	872	1,960	1,161	3,022	3,630	3,391
Motor bus	1,201	241	1,112	291	495	469	403
Commuter rail	19	27	223	72	172	329	330
Demand responsive	0	1	5	0	0	0	0
Heavy rail	462	493	530	680	1,789	2,324	2,396
Light rail	161	95	80	106	509	498	251
Other ^b	35	15	10	12	57	10	11

^a The killing of one or more human beings by another. This includes murder, non-negligent manslaughter, and manslaughter by negligence.

^b Other transit mode includes automated guideway, cable car, ferryboat, trolleybus, vanpool, monorail, inclined plane, and starting in 2001 the Alaska Railroad.

^c The carnal knowledge of a female forcibly and against her will. This includes assault to rape or attempt to rape.

^d The taking or attempting to take anything of value from the care, custody, or control of a person or persons by force or threat of force or violence and/or by putting the victim in fear. The use or threat of force includes firearms, knives or cutting instruments, other dangerous weapons (clubs, acid, explosives), and strong-arm techniques (hands, fists, feet).

^e An unlawful attack by one person upon another for the purpose of inflicting severe or aggravated bodily injury. This type of assault usually is accompanied by the use of a weapon or by means likely to produce death or great bodily harm.

^f The unlawful taking, carrying, leading, or riding away of property from the possession or constructive possession of another. This includes pocket-picking, purse-snatching, shoplifting, thefts from motor vehicles, thefts of motor vehicle parts and accessories, theft of bicycles, theft from buildings, theft from coin-operated devices or machines, and all other theft not specifically classified.

^g The theft or attempted theft of a motor vehicle. A motor vehicle is a self-propelled vehicle that runs on the surface of land and not on rails. Examples of motor vehicles are automobiles, trucks, buses, motor cycles, and motor scooters.

^h The unlawful entry of a structure to commit a felony or a theft. This includes offenses known locally as burglary (any degree), unlawful entry with intent to commit a larceny or felony, breaking and entering with intent to commit a larceny, housebreaking, safe-cracking, and all attempts at these offenses.

ⁱ To unlawfully and intentionally damage, or attempt to damage, any real or personal property by fire or incendiary device.

^j An unlawful attack or attempt by one person upon another where no weapon was used or which did not result in serious or aggravated injury to the victim. This includes simple assault, minor assault, assault and battery, injury by culpable negligence, intimidation, coercion, hazing, and all attempts to commit these offenses.

^k The willful or malicious destruction, injury, disfigurement, or defacement of any public or private property, real or personal, without consent of the owner or person having custody or control by cutting, tearing, breaking, marking, painting, drawing, covering with filth, or any other such means as may be specified by local law.

^l Any sexual acts except forcible rape, prostitution, and commercialized vice. This includes offenses against chastity, common decency, morals, and the like, such as: adultery and fornication, buggery, incest, indecent exposure, indecent liberties, seduction, sodomy or crime against nature, statutory rape (no force), and all attempts to commit any of the above.

^m Arrests requested based on the narcotics used. This includes all arrests for violations of state and local laws, specifically those relating to the unlawful possession, sale, use, growing, manufacturing, and making of narcotic drugs.

ⁿ The driving or operating of any vehicle or common carrier while drunk or under the influence of liquor or narcotics.

^o Arrests for all offenses of drunkenness, which is the consumption of alcoholic beverages to the extent that one's mental faculties and physical coordination are substantially impaired. This includes drunkenness, drunk and disorderly, common or habitual drunkard, and intoxication.

^p All charges of committing a breach of the peace. This includes, affray; unlawful assembly; disturbing the peace; disturbing meetings; disorderly conduct in state institutions, at court, at fairs, on trains or public conveyances, etc.; blasphemy, profanity, and obscene language; desecrating the flag; refusing to assist an officer; and all attempts to commit any of the above.

^q To unlawfully enter land, a dwelling, or other real property.

^r The unlawful use of transit facilities by riding without paying the applicable fare.

^s All arrests for violations of local curfew or loitering ordinances where such laws exist.

NOTES

Data are from transit agencies in urbanized areas over 200,000 population and include patrons, employees, and others.

The figures for violent and property crime follow the FBI Uniform Crime Reporting Handbook, (Washington, DC: 1984) and are based on records of calls for service, complaints, and/or investigations. These figures are for reported offenses and do not reflect the findings of a court, coroner, jury, or decision of a prosecutor.

Security data was first reported to the Federal Transit Administration in 1995 and were not compiled for earlier years.

SOURCE

1995-2001: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database*, Internet site <http://www.ntdprogram.com>, as of May 6, 2003, tables 25-27 and similar tables in earlier editions.

Section E

Railroad

Table 2-35: Railroad and Grade-Crossing Fatalities by Victim Class

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	(P) 2003
Passengers on trains	4	3	3	8	3	58	5	0	12	6	4	14	4	3	7	2
Railroad only	4	3	3	8	3	58	5	0	12	6	2	3	4	3	7	2
Grade crossing only	0	0	0	0	0	0	0	0	0	0	2	11	0	0	0	0
Employees on duty	97	46	40	35	34	47	31	34	33	37	27	31	24	22	20	19
Railroad only	97	44	35	34	32	44	30	32	32	37	23	29	22	21	19	18
Grade crossing only	0	2	5	1	2	3	1	2	1	0	4	2	2	1	1	1
Employees not on duty	4	2	0	1	1	4	0	2	0	0	2	0	1	0	1	0
Railroad only	3	2	0	1	1	4	0	2	0	0	2	0	1	0	1	0
Grade crossing only	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contractor employees	7	4	3	3	11	6	3	7	9	11	5	12	3	4	10	5
Railroad only	7	4	3	3	10	6	3	7	9	11	5	11	3	4	9	4
Grade crossing only	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1
Nontrespassers^a	739	507	551	484	475	489	505	443	365	363	326	305	335	269	(R) 267	196
Railroad only	16	10	15	16	12	18	44	32	27	15	9	8	19	11	(R) 18	7
Grade crossing only	723	497	536	468	463	471	461	411	338	348	317	297	316	258	(R) 249	189
Trespassers	566	474	700	663	646	675	682	660	620	646	644	570	570	673	646	634
Railroad only	457	391	543	524	533	523	529	494	471	533	536	479	463	511	540	501
Grade crossing only	109	83	157	139	113	152	153	166	149	113	108	91	107	162	106	133
Volunteer employees	N	N	N	N	N	N	N	N	N	N	0	0	0	0	0	0
Railroad only	N	N	N	N	N	N	N	N	N	0	0	0	0	0	0	0
Grade crossing only	N	N	N	N	N	N	N	N	N	0	0	0	0	0	0	0
Railroad and grade crossing only, total	1,417	1,036	1,297	1,194	1,170	1,279	1,226	1,146	1,039	1,063	1,008	932	937	971	951	856
Railroad only	584	454	599	586	591	653	611	567	551	602	577	530	512	550	594	532
Grade crossing only	833	582	698	608	579	626	615	579	488	461	431	402	425	421	357	324
Motor vehicles	748	521	614	535	506	554	542	508	415	419	369	345	361	345	(R) 310	263
Nonmotor vehicles	85	61	84	73	73	72	73	71	73	42	62	57	64	76	(R) 47	61

KEY: N = data do not exist; P = preliminary; R = revised.

^a Beginning in 1997, nontrespassers off railroad property are also included.

NOTE

"Railroad only" includes fatalities from train accidents, train incidents, and nontrain incidents (excludes highway-rail grade crossings). This table includes information for both freight and passenger railroad operations.

SOURCES

1980-94: U.S. Department of Transportation, Federal Railroad Administration, *Highway-Rail Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: Annual issues), and the *Accident/Incident Bulletin* (Washington DC: Annual issues).
 1995-2003: Ibid. Internet site <http://safetydata.fra.dot.gov/OfficeofSafety/Query/Default.asp> as of June 17, 2004.

Table 2-36: Railroad and Grade-Crossing Injured Persons by Victim Class

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	(P) 2003
Passengers on trains	593	657	473	382	411	559	497	573	513	601	535	481	658	746	(R) 877	639
Railroad only	569	646	462	360	329	515	413	543	489	558	516	438	648	726	(R) 851	580
Grade crossing only	24	11	11	22	82	44	84	30	24	43	19	43	10	20	26	59
Employees on duty	56,331	29,822	20,970	19,626	17,755	15,363	13,080	10,777	9,199	8,295	8,398	8,622	8,423	7,815	(R) 6,644	6,024
Railroad only	56,186	29,667	20,801	19,479	17,598	15,220	12,955	10,654	9,120	8,184	8,276	8,482	8,323	7,718	(R) 6,534	5,950
Grade crossing only	145	155	169	147	157	143	125	123	79	111	122	140	100	97	110	74
Employees not on duty	671	419	326	362	310	348	306	252	228	263	219	216	286	209	(R) 213	231
Railroad only	669	418	324	362	309	347	305	248	226	260	216	215	283	208	(R) 213	231
Grade crossing only	2	1	2	0	1	1	1	4	2	3	3	1	3	1	0	0
Contractor employees	74	110	242	219	226	262	252	269	208	334	380	384	368	383	(R) 375	363
Railroad only	74	109	240	216	224	261	251	268	208	333	379	384	367	380	(R) 374	361
Grade crossing only	0	1	2	3	2	1	1	0	1	1	1	0	1	3	1	2
Nontrespassers^a	3,849	2,562	2,339	2,110	1,909	1,856	1,913	1,869	1,660	1,540	1,236	1,342	1,294	1,201	(R) 2,380	989
Railroad only	384	285	349	423	408	432	475	372	431	370	243	335	381	388	(R) 1,732	353
Grade crossing only	3,465	2,277	1,990	1,687	1,501	1,424	1,438	1,497	1,229	1,170	993	1,007	913	813	(R) 648	636
Trespassers	728	734	793	769	772	733	764	700	750	728	677	650	606	627	(R) 609	621
Railroad only	474	492	560	534	540	509	452	461	474	516	513	445	414	404	(R) 395	395
Grade crossing only	254	242	233	235	232	224	312	239	276	212	164	205	192	223	(R) 214	226
Volunteer employees	N	N	N	N	N	N	N	N	N	6	14	5	8	4	5	5
Railroad only	N	N	N	N	N	N	N	N	N	6	13	5	8	4	5	5
Grade crossing only	N	N	N	N	N	N	N	N	N	0	1	0	0	0	0	0
Railroad and grade crossing only, total	62,246	34,304	25,143	23,468	21,383	19,121	16,812	14,440	12,558	11,767	11,459	11,700	11,643	10,985	(R) 11,103	8,872
Railroad only	58,356	31,617	22,736	21,374	19,408	17,284	14,851	12,546	10,948	10,227	10,156	10,304	10,424	9,828	(R) 10,104	7,875
Grade crossing only	3,890	2,687	2,407	2,094	1,975	1,837	1,961	1,894	1,610	1,540	1,303	1,396	1,219	1,157	(R) 999	^b 997
Motor vehicles	3,739	2,561	2,332	2,029	1,891	1,760	1,885	1,825	1,545	1,494	1,257	1,338	1,169	1,110	(R) 939	951
Nonmotor vehicles	151	126	75	65	84	77	76	69	65	46	46	58	50	47	60	47

KEY: N = data do not exist; P = preliminary; R = revised.

^a Beginning in 1997, nontrespassers off railroad property are also included.

^b This total does not add to the sum of its parts because of a discrepancy with the number of injuries resulting from one grade crossing incident. The Federal Railroad Administration is attempting to resolve this problem with the reporting railroad and will revise the data accordingly.

NOTE

"Railroad only" includes fatalities from train accidents, train incidents, and nontrain incidents (excludes highway-rail grade crossings). This table includes information for both freight and passenger railroad operations.

SOURCES

1980-94: U.S. Department of Transportation, Federal Railroad Administration, *Highway-Rail Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: Annual issues), and *Accident/Incident Bulletin* (Washington, DC: Annual Issues).

1995-2003: Ibid., Internet site <http://safetydata.fra.dot.gov/OfficeofSafety/Query/Default.asp> as of June 17, 2004.

Table 2-37: Train Fatalities, Injuries, and Accidents by Type of Accident^a

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	(P) 2003
Fatalities, total	29	8	10	19	6	67	12	14	25	18	4	9	10	6	15	4
Derailments	8	2	2	10	2	53	2	2	6	2	1	1	2	1	7	1
Collisions	20	6	8	5	1	14	8	7	16	10	1	7	1	4	4	0
Other	1	0	0	4	3	0	2	5	3	6	2	1	7	1	4	3
Injuries, total	665	476	451	326	171	308	262	294	281	185	129	129	275	310	(R) 1,884	224
Derailments	286	197	272	174	71	179	120	90	98	111	61	41	121	113	(R) 1,691	115
Collisions	341	223	139	103	59	87	118	151	146	55	32	62	89	145	(R) 151	56
Other	38	56	40	49	41	42	24	53	37	19	36	26	65	52	(R) 42	53
Accidents, total	8,205	3,275	2,879	2,658	2,359	2,611	2,504	2,459	2,443	2,397	2,575	2,768	2,983	3,023	(R) 2,738	2,950
Derailments	6,442	2,495	2,146	1,936	1,734	1,930	1,825	1,742	1,816	1,741	1,757	1,961	2,112	2,234	(R) 1,989	2,089
Collisions	1,201	366	315	261	207	205	240	235	205	202	168	205	238	220	(R) 192	202
Other	562	414	418	461	418	476	439	482	422	454	650	602	633	569	(R) 557	659

KEY: P = preliminary; R = revised.

^a Excludes highway-rail grade crossing accidents.

NOTE

Train accidents only. This table includes information for both freight and passenger railroad operations.

SOURCES

1980-96: U.S. Department of Transportation, Federal Railroad Administration, *Highway-Rail Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: Annual issues), tables 1-1, 1-3.

1997-98: Ibid., *Railroad Safety Statistics Annual Report 1998* (Washington, DC: September 1998), table 1-1, 1-3, 5-6.

1999-2003: Ibid., <http://safetydata.fra.dot.gov/officeofsafety/Query/Default.asp> as of June 17, 2004.

Table 2-38: Railroad Passenger Safety Data

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Passenger fatalities	3	8	3	58	5	0	12	6	4	14	4	3	7	2
Injured persons	473	382	411	559	497	573	513	601	535	481	658	746	(R) 877	639
Train-miles, passenger trains (millions)	72	74	74	75	75	76	77	78	78	82	84	88	90	90
Fatalities per 100 million passenger train-miles	4	11	4	77	7	0	16	8	5	17	5	3	8	2
Injuries per 100 million passenger train-miles	660	520	560	750	660	750	663	770	683	584	781	850	(R) 979	710

KEY: R = revised.

NOTE

A train-mile is the movement of a train (which can consist of many cars) the distance of 1 mile. A train-mile differs from a vehicle-mile, which is the movement of 1 car (vehicle) the distance of 1 mile. A 10-car (vehicle) train traveling 1 mile would be measured as 1 train-mile and 10 vehicle-miles. Caution should be used when comparing train-miles to vehicle miles.

SOURCES

Fatalities and injuries:

1990-2001: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Railroad Safety Statistics Annual Report 2001* (Washington, DC: August 2002), table 1-2.

2002-2003: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Railroad Safety Statistics Interim Report 2003* (Washington, DC: July 2004), table 1-2.

Train-miles, passenger trains:

1990-96: U.S. Department of Transportation, Bureau of Transportation Statistics calculations (sum of all commuter rail train-miles reported to USDOT, Federal Transit Administration, plus Amtrak train-miles).

1997-2001: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Railroad Safety Statistics Annual Report 2001* (Washington, DC: August 2002), table 2-4.

2002: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Railroad Safety Statistics Report 2002* (Washington, DC: March 2004), table 2-4.

2003: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Railroad Safety Statistics Interim Report 2003* (Washington, DC: July 2004), table 2-4.

Table 2-39: Railroad System Safety and Property Damage Data (Excludes highway-rail grade-crossing accidents)

	1970	1975	1980	1985	1990	1995	1996	1997	1998	1999	2000	2001	2002
Fatalities	785	575	584	454	599	567	551	602	577	530	512	^R 550	596
Injured persons	^d 17,934	50,138	58,696	31,617	22,736	12,546	10,948	10,227	10,156	10,304	10,424	^R 9,828	9,939
Accidents ^a	8,095	8,041	8,205	3,275	2,879	2,459	2,443	2,397	2,575	2,768	2,983	^R 3,023	2,678
Train-miles (millions) ^{b,c}	839	755	718	571	609	670	671	677	683	712	723	712	729
Rate per 100 million train-miles													
Fatalities	94	76	81	80	98	85	82	89	84	74	71	77	82
Injuries	N	6,640	8,180	5,540	3,740	1,870	1,630	1,511	1,487	1,446	1,442	^R 1,381	1,364
Accidents	965	1,065	1,143	574	473	367	364	354	377	389	413	^R 425	367
Property damage (current \$ millions)	121.6	177.4	267.4	179.3	198.7	189.2	212.3	210.7	233.9	245.1	263.2	^R 314.5	262.5

KEY: N = data do not exist; R = revised.

^a Train accidents only; excludes highway-rail grade-crossing accidents.

^b Train-miles in this table differ from train-miles in the vehicle-miles table in Chapter 1. Train-miles reported in Chapter 1 include only Class I rail (see glossary for definition), while this table includes Class I rail, Group II rail, and other rail. For example, in 1999 Group II rail accounted for 75 million train-miles, and other rail for 25 million train-miles. Moreover, the vehicle-miles table in Chapter 1 includes only train-miles between terminals and/or stations, thus excluding yard and switching miles. In 1999, Class I yard/switching train-miles totaled 70 million train-miles. Note that commuter rail safety data are reported in the rail mode and the transit mode. Commuter rail train-miles are included in Class I rail and Group II rail in this table.

^c A train-mile is the movement of a train (which can consist of many cars) the distance of 1 mile. A train-mile differs from a vehicle-mile, which is the movement of 1 car (vehicle) the distance of 1 mile. A 10-car (vehicle) train traveling 1 mile would be measured as 1 train-mile and 10 vehicle-miles. Caution should be used when comparing train-miles to vehicle-miles.

^d 1970 injuries not comparable to later years due to change in reporting system.

NOTE

This table includes information for both freight and passenger railroad operations.

SOURCES

Fatalities, injuries, accidents, and property damage:

1970-90: U.S. Department of Transportation, Federal Railroad Administration, Office of Policy and Program Development, *Accident/Incident Bulletin* (Washington, DC: annual issues), tables 14 and 15.

1995-2000: Ibid., *Railroad Safety Statistics Annual Report 2000* (Washington, DC: July 2001), tables 1-1 and 3-1.

2001-02: Ibid. Internet site <http://safetydata.fra.dot.gov/OfficeofSafety/Query/Default.asp> as of June 11, 2003.

Train-miles:

1970-90: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: annual issues), form 406.

1995-2000: U.S. Department of Transportation, Federal Railroad Administration, Internet site <http://safetydata.fra.dot.gov/OfficeofSafety/Forms/Default.asp> as of Aug. 22, 2002.

2001: Ibid., *Railroad Safety Statistics Annual Report 2001* (Washington, DC: August 2002), table 2-4.

2002: Ibid. Internet site <http://safetydata.fra.dot.gov/OfficeofSafety/Query/Default.asp> as of June 11, 2003.

Table 2-40: Fatalities and Injuries of On-Duty Railroad Employees

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL Employee fatalities accidents / incidents	40	35	34	47	31	34	33	37	27	31	24	22	20
Grade-crossing accidents and incidents	5	1	2	3	1	2	1	0	4	2	2	1	1
Train accidents and incidents only (grade-crossing excluded)	35	34	32	44	30	32	32	37	23	29	22	21	19
TOTAL Employees injured accidents / incidents	20,970	19,626	17,755	15,363	13,080	10,777	9,199	8,295	8,398	8,622	8,423	^R 7,815	6,543
Grade-crossing accidents and incidents	169	147	157	143	126	123	79	111	122	140	100	^R 97	110
Train accidents and incidents only (grade-crossing excluded)	20,801	19,479	17,598	15,220	12,954	10,654	9,120	8,184	8,276	8,482	8,323	^R 7,718	6,433
Employee hours (millions)	553.6	530.7	517.0	519.7	518.6	510.3	504.6	503.9	514.9	510.0	490.9	^R 475.1	453.9
Fatality rates per million employee hours													
All accidents / incidents	0.07	0.07	0.07	0.09	0.06	0.07	0.07	0.07	0.05	0.06	0.05	0.05	0.04
Grade-crossing accidents and incidents	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Train accidents and incidents only (grade-crossing excluded)	0.06	0.06	0.06	0.08	0.06	0.06	0.06	0.07	0.04	0.06	0.04	0.04	0.04
Injury rates per million employee hours													
All accidents / incidents	37.9	37.0	34.3	29.6	25.2	21.1	18.2	16.5	16.3	16.9	17.2	^R 16.4	14.4
Grade-crossing accidents and incidents	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	^R 0.2	0.2
Train accidents and incidents only (grade-crossing excluded)	37.6	36.7	34.0	29.3	25.0	20.9	18.1	16.2	16.1	16.6	17.0	^R 16.2	14.2
Train-miles (millions)^{a,b}	609	577	594	614	655	670	671	677	683	712	723	712	729
Fatality rates per million train-miles													
All accidents / incidents	0.07	0.06	0.06	0.08	0.05	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03
Grade-crossing accidents and incidents	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Train accidents and incidents only (grade-crossing excluded)	0.06	0.06	0.05	0.07	0.05	0.05	0.05	0.05	0.03	0.04	0.03	0.03	0.03
Injury rates per million train-miles													
All accidents/incidents	34.4	34.0	29.9	25.0	20.0	16.1	13.7	12.3	12.3	12.1	11.7	^R 11.0	9.0
Grade-crossing accidents and incidents	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2
Train accidents and incidents only (grade-crossing excluded)	34.2	33.8	29.6	24.8	19.8	15.9	13.6	12.1	12.1	11.9	11.5	10.8	8.8

KEY: R = revised.

^a Train-miles in this table differ from train-miles in the vehicle-miles table in Chapter 1. Train-miles reported in Chapter 1 include only Class I rail (see glossary for definition), while this table includes Class I rail, Group II rail, and other rail. In 2001, Group II rail accounted for 83 million train-miles, and other rail for 23 million train-miles. Moreover, the vehicle-miles table in Chapter 1 includes only train-miles between terminals and/or stations, thus excluding yard and switching miles. In 2001, Class I yard/switching train miles totaled 66 million train-miles. Note that commuter rail safety data are reported in the rail mode and in the transit mode. Commuter rail train-miles are included in Class I rail and Group II rail in this table.

^b A train-mile is the movement of a train (which can consist of many cars) the distance of 1 mile. A train-mile differs from a vehicle-mile, which is the movement of 1 car (vehicle) the distance of 1 mile. A 10-car (vehicle) train traveling 1 mile would be measured as 1 train-mile and 10 vehicle-miles. Caution should be used when comparing train-miles to vehicle miles.

NOTE

This table includes information for both freight and passenger railroad operations.

SOURCES1990-95: U.S. Department of Transportation, Federal Railroad Administration, *Highway-Rail Crossing Accident/Incident and Inventory Bulletin* (Washington, DC: annual issues).1996-2000: Ibid., *Railroad Safety Statistics Annual Report* (Washington, DC: annual issues), tables 1-3, 2-4, and 3-1.2001-02: Ibid. Internet site <http://safetydata.fra.dot.gov/OfficeofSafety/Query/Default.asp> as of June 9, 2002.

Section F

Water

Table 2-41: Waterborne Transportation Safety and Property Damage Data Related to Vessel Casualties

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	^R 2000	2001	2002
Fatalities ^a	178	243	206	131	85	30	96	114	78	51	52	50	71	^R 61	49	59	28
Injured persons	105	97	180	172	175	110	162	166	174	145	223	121	135	131	130	181	157
Accidents ^b	2,582	3,310	4,624	3,439	3,613	2,222	3,238	3,412	3,970	4,298	4,264	^R 4,207	^R 4,397	^R 4,086	3,887	3,937	4,110
Vessels ^c	4,063	5,685	7,694	5,694	5,494	3,514	4,789	5,137	6,204	6,724	6,694	^R 6,476	^R 6,433	^R 5,805	5,552	5,524	6,602
Property damage (current \$ millions)	U	U	U	U	U	U	199.5	173.6	263.3	157.8	190.1	^R 157.3	^R 234.7	^R 162.6	172.7	204.9	245.1

KEY: R = revised; U = data are not available.

^a Fatalities include the number of people who died or were declared missing subsequent to a marine accident.

^b Accidents in this table include the number of "marine casualty cases" reported to the U.S. Coast Guard in accordance with 46 U.S.C. 4.05.

^c More than one vessel may be involved in a marine accident.

NOTES

All deaths and injuries cited result from vessel casualties, such as groundings, collisions, fires, or explosions. The data are for all commercial vessels under U.S. jurisdiction, including U.S. flag vessels anywhere in the world and foreign flag vessels within the jurisdiction of the United States (within 12 miles, or having an interaction with a U.S. entity, such as a platform within 200 miles, or a collision with a U.S. ship). Includes commercial fishing vessels.

2002 data were derived from the Marine Information for Safety and Law Enforcement (MISLE) System. 1992-2001 data were derived from the Marine Safety Information System (MSIS). Data from prior years were derived from other sources and may not be directly comparable.

SOURCE

U.S. Department of Transportation, U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, May 28, 2003.

Table 2-42: Waterborne Transportation Safety Data not Related to Vessel Casualties

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Fatalities ^a	420	330	281	130	101	56	94	95	101	95	95	88	96	93	88	80	48	64
Injuries	U	U	U	U	U	U	1,489	1,448	1,718	1,833	1,327	1,037	541	508	567	525	519	515
Vessels ^b	U	321	274	128	98	51	1,592	1,549	1,823	1,941	1,434	1,135	649	608	662	470	U	U

KEY: U = data are not available.

^a Fatalities include people who were declared missing.

^b Figures represent the number of vessels involved in nonvessel casualties. These vessels were not part of the accident, but the accident may have occurred on the vessel (e.g., crewmembers swept overboard by a wave).

NOTE

Figures reflect the number of deaths and injuries to people on commercial vessels not resulting from a casualty to the vessel. These injuries and fatalities result from such incidents as slips, falls, or electrocutions. Deaths and injuries from disease, homicides, suicides, fights, and diving accidents have been excluded. The data reflect deaths and injuries to people on both U.S. and foreign flag vessels within the jurisdiction of the United States (within 12 miles of U.S. coast) and on U.S. flag vessels anywhere in the world.

2002 and 2003 data were derived from the Marine Information for Safety and Law Enforcement (MISLE) System. 1992-2001 data were derived from the Marine Safety Information System (MSIS). Data from prior years were derived from other sources and may not be directly comparable.

SOURCE

U.S. Department of Transportation, U.S. Coast Guard, Data Administration Division (G-MRI-1), personal communication, June 29, 2004.

Table 2-43: Recreational Boating Safety, Alcohol Involvement, and Property Damage Data

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Fatalities	739	1,360	1,418	1,466	1,360	1,116	865	924	816	800	784	829	709	821	815	734	^c 701	681	750	
Injuries	929	927	780	2,136	2,650	2,757	3,822	3,967	3,683	3,559	4,084	4,141	4,442	4,555	4,612	4,315	4,355	4,274	4,062	
Accidents	2,738	3,752	3,803	6,308	5,513	6,237	6,411	6,573	6,048	6,335	6,906	8,019	8,026	8,047	8,061	7,931	7,740	6,419	5,705	
Vessels involved	^a 3,562	^a 4,778	4,762	8,002	6,954	8,305	8,591	8,821	8,206	8,688	9,722	11,534	11,306	11,396	11,368	11,190	10,984	8,974	7,907	
Numbered boats (thousands)	^E 2,500	4,138	5,128	7,303	8,577	9,589	10,996	11,068	11,132	11,282	11,429	11,734	11,877	12,312	12,565	12,738	12,782	12,876	12,854	
Rates per 100,000 numbered boats																				
Fatalities	32.8	32.9	27.7	20.1	15.9	11.6	7.9	8.3	7.3	7.1	6.9	7.1	6.0	6.7	6.5	5.8	5.5	5.3	5.8	
Injuries	37.1	22.4	15.2	29.2	30.9	28.8	34.8	35.8	33.1	31.5	35.7	35.3	37.4	37.0	36.7	33.9	34.1	33.2	31.6	
Accidents	109.5	90.7	74.2	86.4	64.3	65.0	58.3	59.4	54.3	56.2	60.4	68.3	67.6	65.4	64.2	62.3	60.6	49.9	44.4	
Accident reports citing alcohol involvement	N	N	N	N	N	279	568	513	504	381	389	472	601	698	704	633	696	594	602	
Property damage (current \$ millions)	3.2	4.7	8.2	10.4	16.4	20.0	23.8	24.8	^b 34.8	20.2	^a 25.9	^a 21.5	23.2	29.0	31.0	28.9	34.7	31.3	39.2	

KEY: E = estimate; N = data do not exist

^a U.S. Department of Transportation, U.S. Coast Guard (CG), Office of Boating Safety, personal communication, May 15, 2002.

^b Includes \$11 million damage due to a boat fire.

^c The numbers for recreational boating safety fatalities are raw numbers--CG reports a 6% addition as instructed by the DOT Inspector General because it found a discrepancy in a review of the Search and Rescue Management Information System (SARMIS) and BARD data. (See the discussion found in the DOT FY2003 Performance Plan/Report on pg. 135 under data details of recreational boating fatalities).

NOTE

Only a small fraction of property damages and nonfatal accidents are reported to the U.S. Coast Guard.

SOURCE

U.S. Department of Transportation, U.S. Coast Guard, Office of Boating Safety, *Boating Statistics* (Washington, DC: Annual issues), Internet site http://www.uscgboating.org/statistics/accident_stats.htm as of June 2004.

Table 2-44: Personal Watercraft Safety Data

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Fatalities	5	20	20	28	26	34	35	56	68	57	84	78	66	68	50	71	U
Injured persons	156	254	402	532	708	730	915	1,338	1,617	1,837	1,812	1,743	1,614	1,580	1,424	1,362	U
Accidents ^a	376	650	844	1,162	1,513	1,650	2,236	3,002	3,986	4,099	4,070	3,607	3,374	3,268	2,562	2,225	U
Sales	29,000	48,000	64,000	72,000	68,000	79,000	107,000	142,000	200,000	191,000	176,000	130,000	106,000	92,000	80,900	79,300	80,600
Number in use	92,756	126,881	178,510	241,376	305,915	372,283	454,545	600,000	760,000	900,000	1,000,000	1,100,000	1,096,000	1,239,400	1,293,900	1,353,700	1,420,000

KEY: U = data are not available

^a Total vessels involved.

NOTES

Personal watercraft are less than 13 feet in length and are designed to be operated by a person or persons sitting, standing, or kneeling on the craft rather than within the confines of the hull.

Data on personal watercraft sales and number in use are estimates.

SOURCES

Fatalities, injuries, and accidents:

(Washington, DC: 2003), Internet site http://www.uscgboating.org/statistics/Boating_Statistics_2002.pdf as of June 3, 2004.

Sales:

1987-90: Personal Watercraft Industry Association, Internet site http://www.pwia.org/Abo_PWC.htm as of June 19, 2000.

1991-2003: Ibid., Internet site <http://www.nmma.org/facts/boatingstats/2003/files/market1.asp> as of June 3, 2004.

Use:

1987-96: National Marine Manufacturers Association, data compiled by the United States Coast Guard, personal communications.

1997-98: Ibid., Internet site <http://www.nmma.org/facts/boatingstats/statistic98.html> as of June 19, 2000.

1999-2003: Ibid., Internet site <http://www.nmma.org/facts/boatingstats/2003/files/populationstats3.asp> as of June 3, 2004.

Table 2-45: U.S. Coast Guard Search and Rescue Statistics, Fiscal Year

	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Cases	60,775	53,097	52,782	53,294	53,026	53,899	49,704	43,553	41,096	37,218	39,844	40,214	39,457	36,763	31,562
Responses ^a	70,237	64,971	66,409	69,856	69,784	70,337	63,679	55,710	52,141	46,602	50,622	48,226	49,502	46,643	U
Sorties ^a	88,449	84,033	84,872	88,388	88,147	108,758	110,267	98,423	91,722	83,307	89,635	57,697	59,015	54,609	36,471
Search and Rescue resource hours ^b	U	108,282	109,351	108,639	107,441	102,749	93,984	85,150	80,507	80,116	84,635	80,533	85,008	75,841	65,077
Lives saved	6,497	4,407	5,465	^f 17,543	5,826	^f 23,211	4,453	5,047	3,897	3,194	3,743	3,400	4,010	3,661	5,104
Lives lost, total	1,335	1,085	1,116	939	1,215	931	772	978	744	606	533	1,018	710	635	655
Lives lost before notification ^c	259	622	748	540	800	593	468	611	454	418	353	^g 779	413	399	409
Lives lost after notification ^d	1,076	463	368	399	415	338	304	367	290	188	180	239	297	236	246
Persons otherwise assisted	138,791	117,327	113,704	121,826	119,069	116,912	101,357	85,869	75,357	66,138	70,255	54,866	(R) 59,910	46,503	36,735
Value of property lost (\$ million) ^e	424.3	368.5	213.6	314.5	316.2	435.5	222.6	273.8	414.8	84.3	262.3	415.2	441.0	76.0	19.0
Value of property assisted (\$ million)	2,376.8	2,044.9	2,282.4	1,951.4	2,491.8	2,891.2	4,467.2	3,494.2	1,762.1	1,288.2	1,235.0	778.8	1,501.0	1,589.0	468.0
Property loss prevented (\$ million)	905.4	1,673.4	1,799.3	1,550.1	2,144.7	2,628.4	3,882.8	3,087.3	1,353.5	996.8	1,019.0	84.3	73.0	68.0	106.0

KEY: R = revised; U = data are not available.

^a Responses are the number of U.S. Coast Guard units involved. Sorties are the number of trips made by boat, aircraft, or cutter.

^b Search and Rescue resource hours represent the time that Coast Guard assets (i.e., aircraft, boats, and cutters) perform Search and Rescue operations.

^c Those persons whose lives were lost before the U.S. Coast Guard was notified of an incident.

^d Those persons whose lives were lost in an incident to which the U.S. Coast Guard was responding, but who were alive at the time the U.S. Coast Guard was notified of the incident.

^e Includes several out of the normal high cost incidents.

^f The Search and Rescue Management Information System's reporting policy has been revised and now requires complete reporting on all lives saved. This policy also includes reporting on "lives saved" in connection with Coast Guard Law Enforcement Activity (i.e., Alien Migrant Interdiction Operations (AMIO)). AMIO lives saved in fiscal year 1992 was determined to be approximately 12,000. AMIO lives saved in fiscal year 1994 was determined to be 15,179.

^g The Egypt Air (217 fatalities) and Alaska Air (88 fatalities) crashes account for the increase.

SOURCES

All data except Search and Rescue resource hours:

1985-1993: U.S. Department of Transportation, U.S. Coast Guard, Search and Rescue Management Information Systems (SARMIS II) Database, Internet site www.uscg.mil/hq/g-o/g-opr/92-01summary.htm as of Aug. 8, 2002.

1994-2003: U.S. Department of Transportation, U.S. Coast Guard, *ON SCENE The Journal of U.S. Coast Guard Search Rescue*, Internet site www.uscg.mil/hq/g-o/g-opr/On%20Scene/onscene.htm as of July 28, 2004.

Search and Rescue resource hours:

1990-2003: U.S. Department of Transportation, U.S. Coast Guard, Office of Command and Control Architecture, personal communications, Sept. 30, 2003 and July 28, 2004.

Section G

Pipeline

Table 2-46: Hazardous Liquid and Natural Gas Pipeline Safety and Property Damage Data Calculations

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
Fatalities																			
Total hazardous liquid		4	7	4	5	3	0	5	0	1	3	5	0	2	4	1	0	(R) 1	0
Total gas		26	8	15	28	6	14	10	17	21	18	48	10	(R) 19	(R) 18	37	7	10	12
Gas transmission		U	U	1	6	0	0	3	1	0	2	1	1	1	2	15	2	1	1
Gas distribution		U	U	14	22	6	14	7	16	21	16	47	9	(R) 18	(R) 16	22	5	9	11
Injured persons																			
Total hazardous liquid		21	17	15	18	7	9	38	10	(a) 1,858	11	13	5	6	20	4	10	0	5
Total gas		233	214	177	108	69	89	80	101	113	53	114	72	(R) 75	(R) 88	77	51	50	66
Gas transmission		U	U	13	12	17	12	15	17	22	10	5	5	11	8	18	5	5	8
Gas distribution		U	U	164	96	52	77	65	84	91	43	109	67	(R) 64	(R) 80	59	46	45	58
Incidents																			
Total hazardous liquid		351	254	246	183	180	216	212	229	245	188	194	171	153	168	147	(R) 130	(R) 144	126
Total gas		1,077	1,338	1,524	334	198	233	177	216	222	161	187	175	236	(R) 172	234	(R) 210	(R) 184	240
Gas transmission		U	U	389	129	89	71	74	95	81	64	77	73	99	54	80	86	(R) 82	97
Gas distribution		U	U	1,135	205	109	162	103	121	141	97	110	102	137	(R) 118	154	(R) 124	102	143
Property damage (current \$ millions)																			
Total hazardous liquid		1.2	2.2	5.7	5.1	15.7	37.8	39.1	28.9	62.2	32.5	85.1	(R) 55.2	62.9	87.1	(R) 182.7	25.3	(R) 34.8	37.7
Total gas		3.3	5.0	10.0	22.9	18.9	19.7	31.4	38.4	98.4	20.9	29.3	24.6	63.5	43.6	41.3	(R) 37.7	(R) 49.2	61.8
Gas transmission		U	U	8.8	13.4	11.3	11.9	24.6	23.0	45.2	10.0	13.1	12.1	44.5	17.7	17.9	23.6	(R) 25.5	39.5
Gas distribution		U	U	1.2	9.5	7.6	7.8	6.8	15.3	53.3	11.0	16.3	12.5	19.1	25.9	23.4	(R) 14.1	(R) 23.7	22.3

KEY: R = revised; U = data are not available.

^a Includes 1,851 injuries requiring medical treatment reported for accidents caused by severe flooding near Houston, TX, in October 1994.

NOTES

Beginning with 1985 data, pipeline incidents are credited to the year in which they occurred, not the year in which the report was received. Gas numbers represent sum of transmission and gathering and distribution operators.

Property damage includes, but is not limited to, damage to the operator's facilities and to the property of others; gas lost; restoration of service and relighting; facility repair and replacement; leak locating; right-of-way cleanup; and environmental cleanup and damage.

Numbers may not add to totals due to rounding.

SOURCES

1970-85: U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, personal communication, 1999.

1990-2003: Ibid., Internet site <http://ops.dot.gov/stats.htm> as of June 7, 2004.

Chapter 3

**Transportation and
the Economy**

Section A

Transportation and the
Total Economy

Table 3-1a: U.S. Gross Domestic Product (GDP) Attributed to For-Hire Transportation Services (Current \$ billions)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	^R 1999	^R 2000	2001
TOTAL U.S. GDP	5,803.2	5,986.2	6,318.9	6,642.3	7,054.3	7,400.5	7,813.2	8,318.4	8,781.5	9,274.3	9,824.6	10,082.2
For-hire transportation services GDP, total	177.4	186.1	193.4	206.0	223.2	233.4	243.4	261.8	288.7	301.9	313.7	306.1
Trucking and warehousing	69.4	70.9	74.5	79.2	86.4	89.0	92.1	99.4	114.1	121.4	123.3	126.0
Air	45.3	47.0	50.3	56.4	62.5	67.7	70.8	78.6	85.8	90.0	91.9	80.2
Railroad	19.8	22.0	21.6	22.0	23.3	23.6	23.4	23.0	24.3	23.1	24.8	25.8
Transportation services ^a	18.2	19.5	19.9	20.8	22.6	23.5	25.7	27.1	28.0	29.9	34.1	32.9
Local and interurban passenger transit	9.1	10.2	10.9	11.3	11.6	12.4	13.4	14.9	16.8	17.9	18.3	19.1
Water	10.0	11.1	10.7	10.7	11.5	11.6	12.2	13.1	13.6	13.4	15.0	15.7
Pipelines, except natural gas	5.5	5.5	5.5	5.6	5.5	5.5	5.7	5.8	6.1	6.2	6.3	6.5
Percent of U.S. GDP												
For-hire transportation services GDP, total	3.1%	3.1%	3.1%	3.1%	3.2%	3.2%	3.1%	3.1%	3.3%	3.3%	3.2%	3.0%
Trucking and warehousing	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.3%	1.3%	1.3%	1.2%
Air	0.8%	0.8%	0.8%	0.8%	0.9%	0.9%	0.9%	0.9%	1.0%	1.0%	0.9%	0.8%
Railroad	0.3%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.3%	0.3%
Transportation services ^a	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Local and interurban passenger transit	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Water transportation	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.2%	0.2%
Pipelines, except natural gas	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Percent of for-hire transportation services GDP												
Trucking and warehousing	39.1%	38.1%	38.5%	38.4%	38.7%	38.1%	37.8%	38.0%	39.5%	40.2%	39.3%	41.2%
Air	25.5%	25.3%	26.0%	27.4%	28.0%	29.0%	29.1%	30.0%	29.7%	29.8%	29.3%	26.2%
Railroad	11.2%	11.8%	11.2%	10.7%	10.4%	10.1%	9.6%	8.8%	8.4%	7.7%	7.9%	8.4%
Transportation services ^a	10.3%	10.5%	10.3%	10.1%	10.1%	10.1%	10.6%	10.4%	9.7%	9.9%	10.9%	10.7%
Local and interurban passenger transit	5.1%	5.5%	5.6%	5.5%	5.2%	5.3%	5.5%	5.7%	5.8%	5.9%	5.8%	6.2%
Water transportation	5.6%	6.0%	5.5%	5.2%	5.2%	5.0%	5.0%	5.0%	4.7%	4.4%	4.8%	5.1%
Pipelines, except natural gas	3.1%	3.0%	2.8%	2.7%	2.5%	2.4%	2.3%	2.2%	2.1%	2.1%	2.0%	2.1%

KEY: R = revised.

^a Defined as services incidental to transportation such as forwarding and packing and arranging passenger travel and freight transportation.

NOTES

Percentages based on the revised estimates have been recalculated but may appear unchanged due to the number of significant digits shown. Numbers may not add to totals due to rounding.

SOURCE

1990-1995: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (Washington, DC, June 2000), pp. 41-42.

1996: Ibid. (Washington, DC, December 2000), p. 29.

1997: Ibid. (Washington, DC, November 2001), p. 26.

1998-2001: Ibid. (Washington, DC, November 2002), p. 32.

Table 3-1b: U.S. Gross Domestic Product (GDP) Attributed to For-Hire Transportation Services (Chained 1996 \$ billions)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	^R 1999	^R 2000	2001
TOTAL U.S. GDP	6,707.9	6,676.4	6,880.0	7,062.6	7,347.7	7,543.8	7,813.2	8,159.5	8,508.9	8,858.9	9,191.4	9,214.5
For-hire transportation services GDP, total	180.6	185.9	193.6	201.2	218.6	225.1	243.4	248.9	257.9	268.6	282.5	270.3
Trucking and warehousing	68.1	71.6	75.7	79.1	85.3	86.6	92.1	90.5	95.5	100.2	103.4	99.3
Air	46.9	45.0	49.2	51.9	59.6	62.9	70.8	75.2	76.8	80.7	84.8	78.3
Railroad	18.1	20.9	20.8	21.0	22.1	22.7	23.4	22.8	22.8	22.4	25.0	25.0
Transportation services ^a	19.5	19.8	19.6	20.4	22.1	23.4	25.7	26.4	27.8	29.8	32.4	31.2
Local and interurban passenger transit	12.8	12.5	12.4	12.7	12.8	13.2	13.4	14.7	15.5	16.8	17.2	17.2
Water	10.2	10.5	10.3	10.5	11.3	11.3	12.2	13.2	13.2	12.0	13.4	13.3
Pipelines, except natural gas	5.7	6.2	5.9	6.0	5.5	5.0	5.7	6.2	6.4	6.6	6.4	6.0
Percent of U.S. GDP												
For-hire transportation services GDP, total	2.7%	2.8%	2.8%	2.8%	3.0%	3.0%	3.1%	3.1%	3.0%	3.0%	3.1%	2.9%
Trucking and warehousing	1.0%	1.1%	1.1%	1.1%	1.2%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%
Air	0.7%	0.7%	0.7%	0.7%	0.8%	0.8%	0.9%	0.9%	0.9%	0.9%	0.9%	0.8%
Railroad	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Transportation services ^a	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.4%	0.3%
Local and interurban passenger transit	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Water	0.2%	0.2%	0.1%	0.1%	0.2%	0.1%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%
Pipelines, except natural gas	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Percent of for-hire transportation services GDP												
Trucking and warehousing	37.7%	38.5%	39.1%	39.3%	39.0%	38.5%	37.8%	36.4%	37.0%	37.3%	36.6%	36.7%
Air	26.0%	24.2%	25.4%	25.8%	27.3%	27.9%	29.1%	30.2%	29.8%	30.0%	30.0%	29.0%
Railroad	10.0%	11.2%	10.7%	10.4%	10.1%	10.1%	9.6%	9.2%	8.8%	8.3%	8.8%	9.2%
Transportation services ^a	10.8%	10.7%	10.1%	10.1%	10.1%	10.4%	10.6%	10.6%	10.8%	11.1%	11.5%	11.5%
Local and interurban passenger transit	7.1%	6.7%	6.4%	6.3%	5.9%	5.9%	5.5%	5.9%	6.0%	6.3%	6.1%	6.4%
Water	5.6%	5.6%	5.3%	5.2%	5.2%	5.0%	5.0%	5.3%	5.1%	4.5%	4.7%	4.9%
Pipelines, except natural gas	3.2%	3.3%	3.0%	3.0%	2.5%	2.2%	2.3%	2.5%	2.5%	2.5%	2.3%	2.2%

KEY: R = revised.

^a Defined as services incidental to transportation such as forwarding and packing and arranging passenger travel and freight transportation.

NOTES

For-hire transportation numbers may not equal total due to the nature of the chained dollar calculations.

Percentages based on the revised estimates have been recalculated but may appear unchanged due to the number of significant digits shown.

Numbers may not add to totals due to rounding.

SOURCES

1990-95: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (Washington, DC, June 2000), p. 46.

1996: *Ibid.* (Washington, DC, December 2000), p. 31.

1997: *Ibid.* (Washington, DC, November 2001), p. 29.

Table 3-2a: U.S. Gross Domestic Product (GDP) Attributed to Transportation-Related Final Demand (Current \$ billions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Personal consumption of transportation, total	238.4	372.9	455.5	428.1	460.1	494.9	532.2	560.3	594.7	626.7	649.9	^R 707.8	^R 768.8	794.8
Motor vehicles and parts	87.0	175.7	206.4	182.8	200.2	222.1	242.3	249.3	256.3	264.2	288.8	^R 319.1	^R 336.6	361.3
Gasoline and oil	86.7	97.2	107.3	102.5	104.9	106.6	109.0	113.3	124.2	128.1	114.8	^R 129.3	^R 164.4	162.1
Transport services	64.7	100.0	141.8	142.8	155.0	166.2	180.9	197.7	214.2	234.4	246.3	^R 259.4	^R 267.8	271.4
Gross private domestic investment, total	52.1	74.0	78.7	82.7	89.8	102.2	122.1	130.5	144.3	157.3	175.2	^R 200.9	^R 195.0	170.8
Transportation structures	3.7	4.3	3.0	3.2	3.7	4.1	4.3	4.4	5.4	5.9	7.0	6.2	^R 5.3	5.0
Transportation equipment	48.4	69.7	75.7	79.5	86.1	98.1	117.8	126.1	138.9	151.4	168.2	^R 194.7	^R 189.7	165.8
Exports (+), total	45.7	57.5	106.0	115.1	122.8	123.7	130.1	132.9	142.3	163.3	171.6	^R 174.9	^R 179.4	174.3
Civilian aircraft, engines, and parts	14.1	13.5	32.2	36.6	37.7	32.7	31.5	26.1	30.8	41.4	53.5	52.9	48.1	52.6
Automotive vehicles, engines, and parts	17.4	24.9	36.5	40.0	47.0	52.5	57.8	61.8	65.0	74.0	72.4	^R 75.3	^R 80.4	75.4
Passenger fares	2.6	4.4	15.3	15.9	16.6	16.5	17.0	18.9	20.4	20.9	20.1	19.8	^R 20.8	18.0
Other transportation	11.6	14.7	22.0	22.6	21.5	22.0	23.8	26.1	26.1	27.0	25.6	26.9	^R 30.1	28.3
Imports (-), total	46.8	92.2	134.5	132.4	138.8	149.6	168.7	176.2	184.8	203.5	220.9	258.2	^R 288.2	282.4
Civilian aircraft, engines, and parts	3.1	5.3	10.5	11.7	12.6	11.3	11.3	10.7	12.7	16.6	21.8	23.8	26.4	31.4
Automotive vehicles, engines, and parts	28.3	64.9	88.5	85.7	91.8	102.4	118.3	123.8	128.9	139.8	148.7	179.0	195.9	189.8
Passenger fares	3.6	6.4	10.5	10.0	10.6	11.4	13.1	14.7	15.8	18.1	20.0	21.3	^R 24.3	22.4
Other transportation	11.8	15.6	25.0	25.0	23.8	24.5	26.0	27.0	27.4	29.0	30.4	34.1	^R 41.6	38.8
Net exports of transportation-related goods and services	-1.1	-34.7	-28.5	-17.3	-16.0	-25.9	-38.6	-43.3	-42.5	-40.2	-49.3	^R -83.3	^R -108.8	-108.1
Government transportation-related purchases, total	60.0	83.7	^R 111.8	123.4	122.3	125.9	131.9	134.5	141.2	149.5	156.6	^R 168.3	^R 176.8	189.4
Federal purchases ^b	7.0	10.0	12.9	14.5	15.3	15.9	17.1	16.3	17.2	17.6	18.3	^R 18.7	^R 19.4	20.9
State and local purchases ^b	48.8	67.5	90.1	93.2	95.6	100.7	106.6	109.8	115.2	123.6	130.0	140.7	^R 148.4	159.4
Defense-related purchases ^c	4.2	6.2	^R 8.8	15.7	11.4	9.3	8.2	8.4	8.8	8.3	8.3	8.9	^R 9.0	9.1
Gross Domestic Product	2,795.6	4,213.0	5,803.2	5,986.2	6,318.9	6,642.3	7,054.3	7,400.5	7,813.2	8,318.4	8,781.5	^R 9,274.3	^R 9,824.6	10,082.2
Total transportation-related final demand^d	349.4	495.9	^R 617.5	616.9	656.2	697.1	747.6	782.0	837.7	893.3	932.4	^R 993.7	^R 1,031.8	1,046.9
Total transportation in GDP (percent)	12.5%	11.8%	10.6%	10.3%	10.4%	10.5%	10.6%	10.6%	10.7%	10.7%	10.6%	^R 10.7%	^R 10.5%	10.4%

KEY: R = revised; U = data are not available.

^a Sum of exports and imports.^b Federal purchases and state and local purchases are the sum of consumption expenditures and gross investment.^c Defense-related purchases are the sum of transportation of material and travel.^d Sum of total personal consumption of transportation, total gross private domestic investment, net exports of transportation-related goods and services, and total government transportation-related purchases.**SOURCES****Federal, state, and local government transportation-related purchases:**1980-2001: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/> as of January, 2003, table 3.15.**GDP:**U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/> as of Aug. 12, 2002, table 1.1.**All other data:**U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/> as of Aug. 12, 2002, tables 2.2, 3.10, 4.3, 5.4, and 5.6.

Table 3-2b: U.S. Gross Domestic Product (GDP) Attributed to Transportation-Related Final Demand (Chained 1996 \$ billions)

	^e 1980	^e 1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Personal consumption of transportation, total	^R 362.3	494.3	532.6	485.9	509.3	534.2	561.5	574.6	594.7	619.3	658.5	^R 704.7	^R 727.1	751.8
Motor vehicles and parts	142.7	236.9	246.1	211.8	225.7	242.2	255.1	253.4	256.3	264.8	292.0	^R 322.1	^R 338.4	361.9
Gasoline and oil	^R 94.9	104.8	113.1	109.4	112.5	115.4	117.4	120.2	124.2	128.1	131.8	^R 136.4	^R 135.7	138.8
Transport services	124.7	152.6	173.4	164.7	171.1	176.6	189.0	201.0	214.2	226.4	234.7	^R 246.2	^R 253.0	251.1
Gross private domestic investment, total	^R 84.0	^R 99.6	91.1	91.5	96.8	107.9	125.0	132.8	144.3	156.2	174.9	^R 199.3	^R 191.7	168.6
Transportation structures	^R 6.4	^R 5.7	3.7	3.8	4.5	4.5	4.6	4.6	5.4	5.7	6.7	6.1	5.1	5.0
Transportation equipment	^R 77.6	93.9	87.4	87.7	92.3	103.4	120.4	128.2	138.9	150.5	168.2	^R 193.2	^R 186.6	163.6
Exports (+), total	76.2	76.0	123.7	127.4	133.0	131.3	135.8	135.4	142.3	161.9	170.3	^R 170.4	^R 169.5	161.8
Civilian aircraft, engines, and parts	26.9	19.5	40.9	42.9	42.9	36.2	33.9	27.2	30.8	40.0	51.1	49.4	^R 43.2	44.8
Automotive vehicles, engines, and parts	28.3	30.5	39.8	42.5	49.0	54.3	59.1	62.5	65.0	73.4	71.7	^R 74.1	^R 78.5	73.4
Passenger fares	4.5	7.1	19.1	18.0	18.3	17.9	18.0	18.9	20.4	21.6	21.1	19.3	^R 19.8	17.0
Other transportation	16.5	18.9	23.9	24.0	22.8	22.9	24.8	26.8	26.1	26.9	26.4	27.6	^R 28.0	26.6
Imports (-), total	^R 81.2	^R 132.1	155.0	146.0	150.9	160.4	176.4	178.5	184.8	202.2	219.1	^R 250.4	^R 272.7	265.3
Civilian aircraft, engines, and parts	6.0	7.7	13.5	13.6	14.3	12.4	12.1	11.2	12.7	16.0	20.7	22.1	23.9	27.3
Automotive vehicles, engines, and parts	52.5	^R 95.8	101.6	94.7	99.7	109.5	122.5	124.6	128.9	139.5	148.2	^R 177.1	192.5	186.7
Passenger fares	5.5	9.3	12.7	10.9	11.2	12.2	13.9	14.9	15.8	17.1	18.6	19.4	^R 20.9	17.7
Other transportation	^R 17.2	19.3	27.2	26.8	25.7	26.3	27.9	27.8	27.4	29.6	31.6	31.8	^R 35.4	33.6
Net exports of transportation-related goods and services	^R -5.0	^R -56.1	-31.3	-18.6	-17.9	-29.1	-40.6	-43.1	-42.5	-40.3	-48.8	^R -80.0	^R -103.2	-103.5
Government transportation-related purchases, total	96.4	105.5	^R 127.5	^R 137.1	135.7	134.6	135.8	138.5	141.2	146.0	150.2	^R 157.1	^R 162.2	167.2
Federal purchases ^b	13.3	13.9	16.1	16.4	17.5	17.5	17.3	17.2	17.2	17.9	18.1	^R 18.6	^R 19.3	20.1
State and local purchases ^b	77.3	83.5	101.1	103.4	105.5	107.0	109.8	112.6	115.2	119.8	123.9	^R 129.7	^R 134.2	138.4
Defense-related purchases ^c	5.8	8.1	10.3	17.3	12.7	10.1	8.7	8.7	8.8	8.3	8.2	8.8	^R 8.7	8.7
Gross Domestic Product	4,900.9	5,717.1	6,707.9	6,676.4	6,880.0	7,062.6	7,347.7	7,543.8	7,813.2	8,159.5	8,508.9	^R 8,859.0	^R 9,191.4	9,214.5
Total transportation-related final demand^d	^R 537.7	643.3	^R 719.9	^R 695.9	723.9	747.6	781.7	802.8	837.7	881.2	934.8	^R 981.1	^R 977.8	984.1
Total transportation in GDP (percent)	11.0%	11.3%	10.7%	10.4%	10.5%	10.6%	10.6%	10.6%	10.7%	10.8%	11.0%	^R 11.1%	^R 10.6%	10.7%

KEY: R = revised; U = data are not available.

^a Sum of exports and imports.^b Federal and state purchases are the sum of consumption expenditures and gross investment. Chained 1996 \$ value = (year n current dollar value/year n quantity index) x 100.^c Defense-related purchases are the sum of transportation of material and travel.^d Sum of total personal consumption of transportation, total gross private domestic investment, net exports of transportation-related goods and services and total government transportation-related purchases.^e Data are estimated using the appropriate chain-type quantity index.**NOTE**

Chained 1996 \$ value = (Quantity index for year n x 1996 current \$ value)/100.

SOURCES**Federal, state, and local government transportation-related purchases:**U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/bea/dn/nipaweb/> as of January 2003, table 3.15 and table 7.11 (chain-type quantity indices for federal nondefense and state and local).**GDP:**U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/bea/dn/nipaweb/> as of Aug. 12, 2002, table 1.2.**All other data:**U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/bea/dn/nipaweb/> as of Aug. 12, 2002, tables 2.3, 3.11, 4.4, 5.7, and 5.9.*Chain-Type Quantity Indices (for computing 1980-1985 values):*U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/bea/dn/nipaweb/> as of Aug. 12, 2002, tables 7.4, 7.7, 7.8, 7.10, and 7.12.

Table 3-3a: U.S. Gross Domestic Demand (GDD) Attributed to Transportation-Related Final Demand (Current \$ billions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Gross Domestic Demand	2,810.5	4,327.2	5,874.6	6,006.9	6,346.7	6,702.8	7,141.3	7,484.7	7,902.1	8,407.8	8,933.3	^R 9,524.2	^R 10,190.1	10,431.0
Total domestic transportation-related final demand	350.5	530.6	^R 642.4	634.2	672.2	723.0	786.2	825.3	880.2	933.5	981.7	^R 1,077.0	^R 1,140.6	1,155.0
Total transportation in GDD (percent)	12.5%	12.3%	^R 10.9%	10.6%	10.6%	10.8%	11.0%	11.0%	11.1%	11.1%	11.0%	^R 11.3%	^R 11.2%	11.1%
Personal consumption of transportation, total	238.4	372.9	455.5	428.1	460.1	494.9	532.2	560.3	594.7	626.7	649.9	^R 707.8	^R 768.8	794.8
Motor vehicles and parts	87.0	175.7	206.4	182.8	200.2	222.1	242.3	249.3	256.3	264.2	288.8	^R 319.1	^R 336.6	361.3
Gasoline and oil	86.7	97.2	107.3	102.5	104.9	106.6	109.0	113.3	124.2	128.1	114.8	^R 129.3	^R 164.4	162.1
Transportation services	64.7	100.0	141.8	142.8	155.0	166.2	180.9	197.7	214.2	234.4	246.3	^R 259.4	^R 267.8	271.4
Gross private domestic investment, total	52.1	74.0	78.7	82.7	89.8	102.2	122.1	130.5	144.3	157.3	175.2	^R 200.9	^R 195.0	170.8
Transportation structures	3.7	4.3	3.0	3.2	3.7	4.1	4.3	4.4	5.4	5.9	7.0	6.2	^R 5.3	5.0
Transportation equipment	48.4	69.7	75.7	79.5	86.1	98.1	117.8	126.1	138.9	151.4	168.2	^R 194.7	^R 189.7	165.8
Government transportation-related purchases, total	60.0	83.7	^R 108.2	123.4	122.3	125.9	131.9	134.5	141.2	149.5	156.6	^R 168.3	^R 176.8	189.4
Federal purchases ^a	7.0	10.0	12.9	14.5	15.3	15.9	17.1	16.3	17.2	17.6	18.3	^R 18.7	^R 19.4	20.9
State and local purchases ^a	48.8	67.5	90.1	93.2	95.6	100.7	106.6	109.8	115.2	123.6	130.0	140.7	^R 148.4	159.4
Defense-related purchases ^b	4.2	6.2	^R 5.2	15.7	11.4	9.3	8.2	8.4	8.8	8.3	8.3	8.9	^R 9.0	9.1

KEY: R = revised; U = data are not available.

^a Federal purchases and state and local purchases are the sum of consumption expenditures and gross investment.

^b Defense-related purchases are the sum of the transportation of material and travel.

^c Sum of total personal consumption of transportation, total gross private domestic investment, and total government related purchases.

SOURCES

Gross Domestic Demand:

U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/> as of January 2003, tables 1.1 and 4.3.

Federal, state, and local government purchases:

1980-2000: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/bea/dn/nipaweb/> as of January 2003, table 3.15.

All other data:

U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/> as of January 2003, tables 2.2, 3.10, 5.6, and 5.8.

Table 3-3b: U.S. Gross Domestic Demand (GDD) Attributed to Transportation-Related Final Demand (Chained 1996 \$ billions)

	^d 1980	^d 1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Personal consumption of transportation, total	^R 362.3	494.3	532.6	485.9	509.3	534.2	561.5	574.6	594.7	619.3	658.5	^R 704.7	^R 727.1	751.8
Motor vehicles and parts	142.7	236.9	246.1	211.8	225.7	242.2	255.1	253.4	256.3	264.8	292.0	^R 322.1	^R 338.4	361.9
Gasoline and oil	^R 94.9	104.8	113.1	109.4	112.5	115.4	117.4	120.2	124.2	128.1	131.8	^R 136.4	^R 135.7	138.8
Transportation services	124.7	152.6	173.4	164.7	171.1	176.6	189.0	201.0	214.2	226.4	234.7	^R 246.2	^R 253.0	251.1
Gross private domestic investment, total	^R 83.8	^R 99.6	91.1	91.5	96.8	107.9	125.0	132.8	144.3	156.2	174.9	^R 199.3	^R 191.7	168.6
Transportation structures	^R 6.4	^R 5.7	3.7	3.8	4.5	4.5	4.6	4.6	5.4	5.7	6.7	6.1	5.1	5.0
Transportation equipment	^R 77.6	93.9	87.4	87.7	92.3	103.4	120.4	128.2	138.9	150.5	168.2	^R 193.2	^R 186.6	163.6
Government transportation-related purchases, total	96.4	105.5	127.5	137.1	135.7	134.6	135.8	138.5	141.2	146.0	150.2	^R 157.1	^R 162.2	167.2
Federal purchases ^a	13.3	13.9	16.1	16.4	17.5	17.5	17.3	17.2	17.2	17.9	18.1	^R 18.6	^R 19.3	20.1
State and local purchases ^a	77.3	83.5	101.1	103.4	105.5	107.0	109.8	112.6	115.2	119.8	123.9	^R 129.7	^R 134.2	138.4
Defense-related purchases ^b	5.8	8.1	10.3	17.3	12.7	10.1	8.7	8.7	8.8	8.3	8.2	8.8	^R 8.7	8.7
Gross Domestic Demand	4,890.9	5,866.2	^R 6,764.9	^R 6,688.4	^R 6,896.4	^R 7,120.6	^R 7,434.2	^R 7,621.8	7,902.1	^R 8,271.7	^R 8,721.3	^R 9,160.2	^R 9,561.2	9,600.7
Total domestic transportation-related final demand^c	^R 542.5	^R 699.4	751.2	714.5	741.8	776.7	822.3	845.9	880.2	921.5	983.6	^R 1,061.1	^R 1,081.0	1,087.6
Total transportation in GDD (percent)	11.1%	11.9%	11.1%	10.7%	10.8%	10.9%	11.1%	11.1%	11.1%	11.1%	11.3%	^R 11.6%	11.3%	11.3%

KEY: R = revised; U = data are not available.

^a Federal purchases and state and local purchases are the sum of consumption expenditures and gross investments.^b Defense-related purchases are the sum of the transportation of material and travel.^c Sum of total personal consumption of transportation, total gross private domestic investment, and total government-related purchases.^d Data are estimated using the appropriate chain-type quantity index.**NOTE**

Chained 1996 \$ value = (Quantity index for year n x 1996 current \$ value)/100.

SOURCES**Federal, state, and local government transportation-related purchases:**1980-2001: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/bea/dn/nipaweb/> as of January 2003, tables 3.15 and 7.11 (chain-type quantity indices for federal nondefense and state and local).**All other data:**1980-2001: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/bea/dn/nipaweb/> as of January 2003, tables 1.2, 2.3, 3.11, 4.4, 5.7, and 5.9.**Chain-Type Quantity Indices (for computing 1980-1985 values):**U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Internet site <http://www.bea.doc.gov/bea/dn/nipaweb/> as of January 2003, tables 7.4, 7.7, 7.8, 7.10, and 7.12.

Table 3-4a: Contributions to Gross Domestic Product (GDP): Selected Industries (Current \$ billions)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	^R 1999	^R 2000	2001
GDP by industry, total	5,803	5,986	6,319	6,642	7,054	7,401	7,813	8,318	8,782	9,274	9,825	10,082
Services	1,072	1,124	1,219	1,288	1,365	1,462	1,564	1,692	1,830	1,977	2,116	2,227
Services, health care	314	345	378	395	414	433	459	472	491	515	549	590
Services, education	40	44	47	49	53	56	58	61	68	72	78	84
Finance, insurance, and real estat	1,010	1,072	1,141	1,205	1,255	1,347	1,437	1,570	1,709	1,799	1,977	2,077
Manufacturing	1,041	1,044	1,082	1,131	1,223	1,289	1,316	1,380	1,432	1,481	1,520	1,423
Manufacturing, durable goods	587	576	594	633	694	730	748	791	831	854	886	813
Manufacturing, nondurable goods	454	468	488	499	529	559	568	588	601	628	634	610
Government, total	807	857	894	925	958	990	1,020	1,065	1,103	1,151	1,218	1,281
Government, federal	300	322	334	336	340	342	347	355	360	370	390	396
Government, state and local	506	535	561	589	618	647	674	710	743	782	828	885
Retail trade	508	524	552	578	621	647	687	741	790	832	887	932
Wholesale trade	376	396	415	433	479	501	530	567	608	645	697	681
Construction	249	233	234	249	275	290	316	338	381	425	461	480
For-hire transportation	177	186	193	206	223	233	243	262	289	302	314	306
Electric, gas, and sanitary services	165	177	181	189	197	207	208	206	205	211	217	222
Communications	148	156	164	179	191	202	215	221	239	257	279	292
Agriculture, forestry, and fishing	108	103	112	108	119	110	130	130	128	128	134	141
Mining	112	97	88	88	90	96	113	119	100	104	133	139
Statistical discrepancy^a	31	20	44	64	59	27	33	30	-31	-39	-129	-117
Percent of GDP												
Services	18%	19%	19%	19%	19%	20%	20%	20%	21%	21%	22%	22%
Services, health care	5%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Services, education	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Finance, insurance, and real estat	17%	18%	18%	18%	18%	18%	18%	19%	19%	19%	20%	21%
Manufacturing	18%	17%	17%	17%	17%	17%	17%	17%	16%	16%	15%	14%
Manufacturing, durable goods	10%	10%	9%	10%	10%	10%	10%	10%	9%	9%	9%	8%
Manufacturing, nondurable goods	8%	8%	8%	8%	8%	8%	7%	7%	7%	7%	6%	6%
Government, total	14%	14%	14%	14%	14%	13%	13%	13%	13%	12%	12%	13%
Government, federal	5%	5%	5%	5%	5%	5%	4%	4%	4%	4%	4%	4%
Government, state and local	9%	9%	9%	9%	9%	9%	9%	9%	8%	8%	8%	9%
Retail trade	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Wholesale trade	6%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Construction	4%	4%	4%	4%	4%	4%	4%	4%	4%	5%	5%	5%
For-hire transportation	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Electric, gas, and sanitary services	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%
Communications	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Agriculture, forestry, and fishing	2%	2%	2%	2%	2%	1%	2%	2%	1%	1%	1%	1%
Mining	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%

KEY: R = revised.

^a Equals gross domestic product measured as the sum of expenditures less gross domestic income.**NOTES**

Data for 1997 and 1998 have been revised by the Bureau of Economic Analysis. Percentages based on the revised estimates have been recalculated but may appear unchanged due to the number of significant digits shown. Numbers may not add to totals due to roundings.

SOURCE

1990-97: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (Washington, DC: November 2001), p. 26.

Table 3-4b: Contributions to Gross Domestic Product (GDP): Selected Industries (Chained 1996 \$ billions)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	^R 1999	^R 2000	2001
GDP by industry	6,708	6,676	6,880	7,063	7,348	7,544	7,813	8,160	8,509	8,859	9,191	9,215
Services	1,362	1,352	1,391	1,418	1,458	1,510	1,564	1,632	1,699	1,768	1,826	1,843
Services, health care	423	433	443	437	438	444	459	460	461	471	488	501
Services, education	50	53	53	55	57	59	58	59	61	62	64	67
Finance, insurance, and real estate	1,251	1,271	1,297	1,329	1,348	1,393	1,437	1,521	1,622	1,688	1,794	1,844
Manufacturing	1,102	1,066	1,085	1,123	1,206	1,285	1,316	1,387	1,444	1,514	1,585	1,490
Manufacturing, durable goods	585	559	569	600	657	715	748	813	893	949	1,044	990
Manufacturing, nondurable goods	520	511	520	525	551	570	568	575	556	571	558	518
Government, total	1,008	1,012	1,015	1,013	1,016	1,017	1,020	1,036	1,047	1,061	1,089	1,108
Government, federal	385	385	382	373	367	354	347	347	348	347	355	351
Government, state and local	624	628	634	640	649	663	674	688	700	714	734	756
Retail trade	560	555	570	582	617	641	687	745	800	846	909	951
Wholesale trade	395	417	445	452	482	483	530	584	663	709	750	749
Construction	291	269	272	279	297	300	316	325	349	368	378	372
For-hire transportation	181	186	194	201	219	225	243	249	258	269	283	270
Electric, gas, and sanitary service	190	196	193	193	197	207	208	202	194	209	214	194
Communications	155	162	169	182	191	202	215	218	231	255	287	322
Agriculture, forestry, and fishing	119	121	131	123	136	123	130	144	146	155	167	164
Mining	106	101	96	101	108	113	113	117	120	115	102	107
Statistical discrepancy^a	35	22	47	68	61	27	33	29	-30	-37	-121	-108.3
Percent of GDP												
Services	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Services, health care	6%	6%	6%	6%	6%	6%	6%	6%	6%	5%	5%	5%
Services, education	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Finance, insurance, and real estate	19%	19%	19%	19%	18%	18%	18%	19%	19%	19%	20%	20%
Manufacturing	16%	16%	16%	16%	16%	17%	17%	17%	17%	17%	17%	16%
Manufacturing, durable goods	9%	8%	8%	8%	9%	9%	10%	10%	10%	11%	11%	11%
Manufacturing, nondurable goods	8%	8%	8%	7%	8%	8%	7%	7%	7%	6%	6%	6%
Government, total	15%	15%	15%	14%	14%	13%	13%	13%	12%	12%	12%	12%
Government, federal	6%	6%	6%	5%	5%	5%	4%	4%	4%	4%	4%	4%
Government, state and local	9%	9%	9%	9%	9%	9%	9%	8%	8%	8%	8%	8%
Retail trade	8%	8%	8%	8%	8%	9%	9%	9%	9%	10%	10%	10%
Wholesale trade	6%	6%	6%	6%	7%	6%	7%	7%	8%	8%	8%	8%
Construction	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
For-hire transportation	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Electric, gas, and sanitary service	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%
Communications	2%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Agriculture, forestry, and fishing	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Mining	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%

KEY: R = revised.

^a Equals the current dollar statistical discrepancy deflated by the implicit price deflator for gross domestic business product.

NOTES

Data for 1997 and 1998 have been revised by the Bureau of Economic Analysis.

Percentages based on the revised estimates have been recalculated but may appear unchanged due to the number of significant digits shown.

Numbers may not add to totals due to roundings.

SOURCES

1990-95: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, (Washington, DC, June 2000), p. 46.

1996: *Ibid.*, (Washington, DC, December 2000), p. 31.

1997: *Ibid.*, (Washington, DC, November 2001), p. 29.

1998-2001: *Ibid.*, (Washington, DC, November 2002), p. 35.

Table 3-5: Gross Domestic Product (GDP) by Major Social Function (Current \$ billions)

	1991	1992	1993	1994	1995	1996	1997	1998	^R 1999	^R 2000	2001
Total GDP	5,986	6,319	6,642	7,054	7,401	7,813	8,318	8,782	9,274	9,825	10,082
Housing	1,388	1,473	1,570	1,686	1,766	1,874	1,974	2,101	2,244	2,371	2,450
Percent of total	23.2	23.3	23.6	23.9	23.9	24.0	23.7	23.9	24.2	24.1	24.3
Healthcare	827	903	969	1,026	1,086	1,142	1,208	1,281	1,353	1,448	1,547
Percent of total	13.8	14.3	14.6	14.5	14.7	14.6	14.5	14.6	14.6	14.7	15.3
Food	798	828	850	903	926	985	1,011	1,058	1,125	1,195	1,231
Percent of total	13.3	13.1	12.8	12.8	12.5	12.6	12.2	12.1	12.1	12.2	12.2
Transportation^a	613	658	701	755	788	840	898	935	1,007	1,044	1,031
Percent of total	10.2	10.4	10.6	10.7	10.6	10.8	10.8	10.6	10.9	10.6	10.2
Education	413	432	452	478	511	541	578	615	659	712	755
Percent of total	6.9	6.8	6.8	6.8	6.9	6.9	6.9	7.0	7.1	7.2	7.5
Other	1,947	2,026	2,101	2,207	2,324	2,431	2,650	2,792	2,886	3,055	3,067
Percent of total	32.5	32.1	31.6	31.3	31.4	31.1	31.9	31.8	31.1	31.1	30.4

KEY: R = revised.

^a Transportation-related final demand.

NOTE

Numbers may not add to totals due to roundings.

SOURCE

U.S. Department of Transportation, Bureau of Transportation Statistics, calculated from data in the U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (Washington, DC: Various issues from 1991 to 2002).

Table 3-6: National Transportation and Economic Trends

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Passenger-miles (billions)	1,327	1,630	2,170	2,561	2,895	3,326	3,946	3,976	4,089	4,166	4,262	4,309	4,442	4,580	4,706	4,837	4,953	(R) 5,179	5,248	U
Index (1980 = 100)	46	56	75	88	100	115	136	137	141	144	147	149	153	158	163	167	171	(R) 179	181	U
Ton-miles (billions)	1,562	1,854	2,207	2,285	2,989	2,949	3,196	3,233	3,337	3,364	3,527	3,648	3,725	3,682	3,710	3,780	3,778	3,758	U	U
Index (1980 = 100)	52	62	74	76	100	99	107	108	112	113	118	122	125	123	124	126	126	126	U	U
Population ^a (millions)	181	194	205	216	228	238	250	253	257	260	263	267	268	273	276	279	282	(R) 285	(R) 288	291
Index (1980 = 100)	79	85	90	95	100	105	110	111	113	114	116	117	118	120	121	123	124	125	127	128
Industrial Production Index ^b (1992=100)	37	50	(R) 60	(R) 65	80	(R) 87	99	97	100	103	109	114	119	128	135	141	(R) 148	(R) 143	(R) 142	(P) 142
Gross Domestic Product																				
Current \$ (billions)	(R) 526	(R) 719	(R) 1,039	(R) 1,638	(R) 2,790	(R) 4,220	5,803	(R) 5,996	(R) 6,338	(R) 6,657	(R) 7,072	(R) 7,398	(R) 7,817	(R) 8,304	(R) 8,747	(R) 9,268	(R) 9,817	(R) 10,101	(R) 10,481	10,988
Index (1980 = 100)	19	26	37	(R) 59	100	151	208	(R) 215	(R) 227	(R) 239	(R) 254	265	(R) 280	298	314	332	(R) 352	(R) 362	(R) 376	394
Chained (2000) \$ (billions)	(R) 2,502	(R) 3,191	(R) 3,772	(R) 4,311	(R) 5,162	(R) 6,054	7,113	(R) 7,101	(R) 7,337	(R) 7,533	(R) 7,836	(R) 8,032	(R) 8,329	(R) 8,704	(R) 9,067	(R) 9,470	(R) 9,817	(R) 9,867	(R) 10,083	10,398

KEY: P = preliminary; R = revised; U = data are not available.

^a Annual estimates as of July 1. Includes Armed Forces abroad.

^b Industrial Production Index covers manufacturing, mining, and utilities.

SOURCES

Passenger-miles:

1960-2002: Summation of all modes from the passenger-miles table in chapter 1, less transit motor bus.

Ton-miles:

1960-2001: Summation of all modes from the ton-miles table in chapter 1.

Population:

1960-99: U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States, 2000* (Washington, DC: 2001), table 2.

2000-03: *Ibid.*, *Monthly National Population Estimates*, available at Internet site <http://www.census.gov> as of June 29, 2004.

Industrial Production Index:

1960-2003: Council of Economic Advisors, *Economic Report of the President*, available at www.gpoaccess.gov/eop/tables04.html as of June 29, 2004, table B-51.

Gross Domestic Product:

1960-97: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (Washington, DC: August 1998), table 1, pp. 147-148 and table 2A, pp. 151-152.

1998-2003: *Ibid.*, <http://www.bea.gov/bea/dn/gdplev.xls> as of June 29, 2004.

Section B

Transportation and Consumer Expenditures

Table 3-7: Passenger and Freight Transportation Expenditures (Current \$ millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997
TOTAL passenger and freight transportation expenditures	107,461	146,523	195,871	299,221	569,879	780,232	967,746	946,924	1,001,871	1,061,218	1,138,107	^R 1,190,009	1,267,010	1,341,7 ¹
PASSENGER transportation expenditures, total	59,694	81,592	111,893	183,382	356,143	506,620	616,796	591,715	626,791	664,883	717,787	^R 747,412	799,807	846,7 ¹
Highway, total	55,099	74,967	100,577	163,025	314,722	451,825	537,840	513,069	546,971	583,977	635,195	^R 657,410	709,738	745,7 ¹
Highway, auto purchases and ownership ^a	51,610	71,064	94,978	152,238	297,128	426,796	507,308	481,929	514,970	551,558	601,206	^R 619,433	672,416	706,0 ¹
Local, bus and transit ^b	1,337	1,454	1,841	4,697	9,297	13,548	16,721	17,356	18,012	18,794	20,082	21,647	21,318	21,9 ¹
Local, taxi	1,107	1,113	1,740	2,900	2,755	3,770	4,030	4,030	4,030	4,340	4,650	4,960	5,425	5,7 ¹
Local, school bus	486	707	1,219	2,174	3,833	5,722	8,031	7,879	8,060	7,618	7,847	9,889	9,082	10,3 ¹
Intercity, bus	559	629	799	1,016	1,709	1,989	1,750	1,875	1,899	1,667	1,410	1,481	1,497	1,6 ¹
Air total ^c	3,555	5,682	10,565	18,851	38,135	50,319	73,045	72,841	73,780	74,123	76,146	81,155	82,331	93,2 ¹
Rail total ^d	759	598	464	1,212	2,976	3,875	4,521	4,414	4,571	5,278	4,882	6,693	5,895	5,7 ¹
Water total (includes international)	281	345	287	294	310	601	1,391	1,391	1,469	1,505	1,564	^R 2,155	1,843	1,9 ¹
FREIGHT transportation expenditures, total	47,767	64,931	83,978	115,839	213,736	273,612	350,950	355,209	375,080	396,335	420,320	^R 442,597	467,203	495,0 ¹
Highway, total	32,289	47,477	62,494	84,843	155,331	205,645	270,776	274,381	292,930	311,878	330,716	348,109	368,545	396,6 ¹
Local, truck	14,289	23,779	28,819	37,287	60,545	82,200	108,350	109,650	116,000	122,050	125,712	128,352	132,973	138,7 ¹
Intercity bus	42	70	122	156	235	245	126	131	130	128	128	130	132	1 ¹
Intercity truck	17,958	23,628	33,553	47,400	94,551	123,200	162,300	164,600	176,800	189,700	204,876	219,627	235,440	257,8 ¹
Air (domestic and international) total	354	708	1,171	1,838	4,013	6,817	13,706	14,353	14,950	15,805	17,249	18,755	20,448	22,8 ¹
Rail total	9,028	9,923	11,869	16,509	27,858	29,150	30,067	30,003	30,473	30,775	33,121	^R 34,605	35,059	35,3 ¹
Water total	3,487	3,903	5,257	8,221	15,498	18,448	20,121	20,306	19,895	20,768	21,150	22,709	24,564	21,0 ¹
Oil pipeline total	895	1,051	1,396	2,220	7,548	8,910	8,506	8,095	8,548	8,470	8,676	9,077	8,637	8,6 ¹
Other total ^e	1,714	1,869	1,791	2,208	3,488	4,642	7,774	8,071	8,284	8,639	9,408	^R 9,342	9,950	10,5 ¹

KEY: R = revised.

^a Includes business expenditures for passenger cars.^b Includes federal / state operating subsidies, and federal capital grants. Beginning in 1994, includes taxes levied directly by transit agencies and local subsidies such as bridge and tunnel tolls, and nontransit parking lot funds.^c Air includes aircraft and operating costs, plus domestic and international air passenger federal excise taxes.^d Data from 1980 include federal / state / local operating subsidies and capital grants.

Figures also include federal operating subsidies and capital grants for Amtrak and the Northeast Corridor.

^e Domestic freight forwarder's revenues after payment to live-haul carriers plus other shipper costs such as loading and unloading freight cars.**NOTE**

Previously published data are revised only for the selected years included in the most recent source publication.

SOURCE**Passenger and freight:**1960-2001: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), pp. 38-41, and similar tables in earlier editions.

Table 3-8: Sales Price of Transportation Fuel to End-Users (Current ¢ / gallon)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Aviation fuel (excluding taxes)																
Aviation gasoline ^a	108.4	120.1	112.0	104.7	102.7	99.0	95.7	100.5	111.6	112.8	97.5	105.9	130.6	132.3 (R)	128.8	149.3
Jet fuel kerosene ^a	86.8	79.6	76.6	65.2	61.0	58.0	53.4	54.0	65.1	61.3	45.2	54.3	89.9	77.5 (R)	72.1	87.3
Highway fuel (including taxes)																
Gasoline, premium ^b	N	134.0	134.9	132.1	131.6	130.2	130.5	133.6	141.3	141.6	125.0	135.7	169.3	165.7 (R)	155.6	177.7
Gasoline, regular ^b	124.5	120.2	116.4	114.0	112.7	110.8	111.2	114.7	123.1	123.4	105.9	116.5	151.0	146.1	135.8	159.1
Gasoline, all types	122.1	119.6	121.7	119.6	119.0	117.3	117.4	120.5	128.8	129.1	111.5	122.1	156.3	153.1	144.1	163.8
Diesel no. 2 (excluding taxes) ^a	81.8	78.9	72.5	64.8	61.9	60.2	55.4	56.0	68.1	64.2	49.4	58.4	93.5	84.2	76.2	94.3
Railroad fuel																
Diesel	82.6	77.8	69.2	67.2	63.3	63.1	59.9	60.0	67.7	67.8	57.0	55.5	87.5	85.5 (R)	73.3	U

KEY: R = revised; U = data are not available.

^a Sales to end-users (those sales made directly to the ultimate consumer, including bulk customers in agriculture, industry, and utility).

^b Average retail price.

SOURCES

All data except railroad fuel:

U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* (Washington, DC: May 2004), tables 9.4 and 9.7 and Internet site <http://www.eia.doe.gov/emeu/mer/prices.html> as of June 2004.

Railroad fuel:

Association of American Railroads, *Railroad Facts* (Washington, DC: Annual issues), p. 61.

Table 3-9: Price Trends of Gasoline v. Other Consumer Goods and Services

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Retail price of motor gasoline, all types (constant 2002 dollars per gallon)																				
Total service station price	1.90	1.78	1.66	1.90	2.67	2.01	1.68	1.59	1.53	1.47	1.43	1.43	1.48	1.45	1.23	1.32	1.64	1.56	1.48 ^b	
Service station price excluding taxes	1.28	1.19	1.14	1.49	2.37	1.64	1.31	1.15	1.10	1.02	0.95	0.95	1.01	0.99	0.78	0.87	1.20	1.13	1.06 ^b	
Average motor fuel taxes ^a	0.62	0.60	0.52	0.42	0.30	0.37	0.37	0.43	0.43	0.44	0.48	0.48	0.47	0.46	0.45	0.45	0.44	0.43	0.42 ^b	
Retail price of motor gasoline, all types (current dollars per gallon)																				
Total service station price	0.31	0.31	0.36	0.57	1.22	1.20	1.22	1.20	1.19	1.17	1.17	1.21	1.29	1.29	1.12	1.22	1.56	1.53	1.48 ^b	
Consumer price indices (1982-84 = 100)																				
All items	30	32	39	54	82	108	131	136	140	145	148	152	157	161	163	167	172	177	180	
Food	30	32	39	60	87	106	132	136	138	141	144	148	153	157	161	164	168	173	176	
Shelter	25	27	36	49	81	110	140	146	151	156	161	166	171	176	182	187	193	201	208	
Apparel	46	48	59	73	91	105	124	129	132	134	133	132	132	133	133	131	130	127	124	
Motor fuel	24	25	28	45	97	99	101	99	99	98	99	100	106	106	92	101	129	125	117	
Medical care	22	25	34	48	75	114	163	177	190	201	211	221	228	235	242	251	261	273	286	

^a State and federal taxes are weighted averages computed by the American Petroleum Institute, based on gasoline sold in the 50 states. Local taxes are excluded, but additional state sales taxes levied on motor fuel are included.

^b Includes data from January to October.

SOURCES

All data except consumer price indices:

1960-2002: American Petroleum Institute, *How Much We Pay for Gasoline* (October 2002), tables 1 and 4.

Consumer price indices:

1960-2002: Council of Economic Advisors, *Economic Report of the President* (Washington, DC: February 2003), tables B-60 and B-61. Also available at Internet site <http://w3.access.gpo.gov/eop/>.

Table 3-10: Producer Price Indices for Transportation Services (Base date = 100)

	Base date	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Railroads, line-haul operating (SIC 4011)	12/84	107.5	109.3	109.9	110.9	111.8	111.7	111.5	112.1	113.4	113.0	114.5	116.6	118.9	121.4
Motor freight transportation and warehousing (SIC 42)	06/93	U	U	U	99.9	101.9	104.5	106.3	108.9	111.6	114.8	119.4	123.1	124.5	127.9
Water transportation (SIC 44)	12/92	U	U	100.0	99.7	100.0	103.0	103.7	104.2	105.6	113.0	122.6	129.8	134.6	147.1
Air transportation (SIC 45)	12/92	U	U	100.0	105.6	108.5	113.7	121.1	125.3	124.5	130.8	147.7	157.2	157.8	162.1
Pipelines, except natural gas (SIC 46)	12/86	95.8	96.1	96.4	96.6	102.6	110.8	104.6	98.8	99.2	98.3	102.3	110.3	111.9	111.7
Travel agencies (SIC 4724)	12/89	107.3	113.6	113.4	115.3	115.3	111.3	109.9	114.5	112.1	112.0	121.8	123.3	114.0	112.5
Freight transportation arrangement (SIC 4731)	12/94	U	U	U	U	100.0	99.8	101.5	101.4	99.7	99.2	100.3	100.3	99.5	99.9

KEY: SIC = Standard Industrial Classification; U = data are not available.

NOTE

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.

SOURCE

U.S. Department of Labor, Bureau of Labor Statistics, Producer Price Index Industry Data, Internet site www.bls.gov/data/sa.htm as of June 21, 2004.

Table 3-11a: Producer Price Indices for Transportation Equipment (Base date = 100)

	Base date	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Transportation equipment (SIC 37)	12/84	115.6	119.8	123.0	126.3	130.1	132.2	134.2	134.1	133.6	134.5	136.8	137.9	137.3	138.4
Motor vehicles and motor vehicle equipment (SIC 371)	12/84	113.0	117.4	120.5	123.8	127.5	129.1	130.4	129.0	127.7	128.3	129.2	128.5	126.7	126.6
Motor vehicles and passenger car bodies (SIC 3711)	06/82	119.9	125.3	129.1	133.2	138.0	139.1	140.4	138.7	136.8	137.6	138.7	137.6	134.9	135.1
Truck and bus bodies (SIC 3713)	12/82	125.4	128.1	131.1	132.8	136.8	145.5	149.9	153.5	155.3	157.0	160.3	163.3	165.6	167.5
Motor vehicle parts and accessories (SIC 3714)	12/82	108.9	110.3	111.0	111.7	112.0	113.5	114.0	113.1	112.6	112.0	111.6	111.5	111.1	110.0
Truck trailers (SIC 3715)	12/79	125.6	128.1	131.2	134.2	138.6	148.6	147.8	147.7	152.2	153.6	156.6	156.1	155.6	157.0
Motor homes built on purchased chassis (SIC 3716)	06/84	125.8	128.7	131.8	133.9	134.5	137.8	141.6	143.1	145.0	147.6	149.4	151.8	154.8	157.8
Aircraft (SIC 3721)	12/85	116.0	120.4	124.3	128.6	132.9	137.3	140.5	142.3	142.7	144.1	150.5	155.7	158.8	164.2
Aircraft engines and engine parts (SIC 3724)	12/85	112.6	117.9	123.6	125.7	129.0	130.9	133.4	134.8	135.8	136.8	139.7	144.0	145.7	152.9
Aircraft parts and auxiliary equipment, NEC (SIC 3728)	06/85	116.3	120.3	124.9	128.0	130.7	131.7	136.3	139.0	140.8	142.2	143.3	146.6	148.1	147.6
Shipbuilding and repairing (SIC 3731)	12/85	114.0	116.2	118.3	123.3	126.8	127.6	130.1	133.3	134.8	135.4	137.6	140.1	144.1	151.7
Boatbuilding and repairing (SIC 3732)	12/81	136.0	140.1	144.9	147.7	150.2	154.6	159.6	165.0	168.6	172.7	179.4	186.3	190.5	194.2
Railroad equipment (SIC 3743)	06/84	114.2	117.3	118.7	119.8	122.6	127.6	129.6	127.4	127.5	128.1	128.6	128.2	127.7	128.9
Motorcycles, bicycles, and parts (SIC 3751)	12/84	109.9	111.8	114.4	116.9	119.0	122.2	123.3	123.3	124.2	125.5	127.7	127.9	128.6	128.6
Travel trailers and campers (SIC 3792)	06/84	118.1	120.1	122.2	123.2	124.7	127.2	129.0	129.6	130.3	132.0	133.2	134.2	136.6	139.5
Transportation equipment, NEC (SIC 3799)	06/85	112.5	114.9	116.1	117.2	119.1	123.3	126.6	128.7	131.3	132.2	135.5	138.1	138.7	139.7

KEY: NEC = not elsewhere classified; SIC = Standard Industrial Classification.

NOTE

Bureau of Labor Statistics 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.

SOURCE

U.S. Department of Labor, Bureau of Labor Statistics, Producer Price Index Revision-Current Series, Internet site www.bls.gov/data/sa.htm as of June 22, 2004.

Table 3-11b: Producer Price Indices for Transportation Equipment, NAICS Basis (Base date = 100)

	Base date	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Transportation Equipment Manufacturing (NAICS 336)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	U
Motor Vehicle Manufacturing (NAICS 3361)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	U
Automobile and Light Duty Motor Vehicle Manufacturing (NAICS 33611)	06/82	119.9	125.3	129.1	133.2	138.0	139.1	140.4	138.7	136.8	137.6	138.7	137.6	13
Automobile Manufacturing ((NAICS 336111)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Light Truck and Utility Vehicle Manufacturing (NAICS 336112)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Heavy Duty Truck Manufacturing (NAICS 33612)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Heavy Duty Truck Manufacturing (NAICS 336120)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Body and Trailer Manufacturing (NAICS 3362)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Body and Trailer Manufacturing (NAICS 33621)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Body Manufacturing (NAICS 336211)	12/82	125.4	128.1	131.1	132.8	136.8	145.5	149.9	153.5	155.3	157.0	160.3	163.3	16
Truck Trailer Manufacturing (NAICS 336212)	12/79	125.6	128.1	131.2	134.2	138.6	148.6	147.8	147.7	152.2	153.6	156.6	156.1	15
Motor Home Manufacturing (NAICS 336213)	06/84	125.8	128.7	131.8	133.9	134.5	137.8	141.6	143.1	145.0	147.6	149.4	151.8	15
Travel Trailer and Camper Manufacturing (NAICS 336214)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Parts Manufacturing (NAICS 3363)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Gasoline Engine and Engine Parts Manufacturing (NAICS 33631)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Carburetor, Piston, Piston Ring, and Valve Manufacturing (NAICS 336311)	12/82	118.6	119.7	120.7	121.9	122.7	124.8	126.4	127.1	127.0	126.5	127.8	128.5	12
Gasoline Engine and Engine Parts Manufacturing (NAICS 336312)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Electrical and Electronic Equipment Manufacturing (NAICS 33632)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Vehicular Lighting Equipment Manufacturing (NAICS 336321)	12/83	112.8	121.8	122.7	123.2	123.2	124.1	124.3	123.7	124.7	124.7	122.7	122.5	12
Other Motor Vehicle Electrical and Electronic Equipment Manufacturing (NAICS 336322)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing (NAICS 33633)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing (NAICS 336330)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Brake System Manufacturing (NAICS 33634)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Brake System Manufacturing (NAICS 336340)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Transmission and Power Train Parts Manufacturing (NAICS 33635)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Transmission and Power Train Parts Manufacturing (NAICS 336350)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Seating and Interior Trim Manufacturing (NAICS 33636)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Seating and Interior Trim Manufacturing (NAICS 336360)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Metal Stamping (NAICS 33637)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Metal Stamping (NAICS 336370)	12/82	112.6	111.7	111.5	111.4	111.9	111.7	112.5	112.8	111.9	110.4	110.6	110.1	11
Other Motor Vehicle Parts Manufacturing (NAICS 33639)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Motor Vehicle Air-Conditioning Manufacturing (NAICS 336391)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
All Other Motor Vehicle Parts Manufacturing (NAICS 336399)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Aerospace Product and Parts Manufacturing (NAICS 3364)	06/85	117.7	122.3	126.6	130.1	134.0	137.3	140.8	142.7	143.4	144.8	149.9	154.7	15
Aerospace Product and Parts Manufacturing (NAICS 33641)	06/85	117.7	122.3	126.6	130.1	134.0	137.3	140.8	142.7	143.4	144.8	149.9	154.7	15
Aircraft Manufacturing (NAICS 336411)	12/85	116.0	120.4	124.3	128.6	132.9	137.3	140.5	142.3	142.7	144.1	150.5	155.7	15
Aircraft Engine and Engine Parts Manufacturing (NAICS 336412)	12/85	112.6	117.9	123.6	125.7	129.0	130.9	133.4	134.8	135.8	136.8	139.7	144.0	14
Other Aircraft Parts and Auxiliary Equipment Manufacturing (NAICS 336413)	06/85	116.3	120.3	124.9	128.0	130.7	131.7	136.3	139.0	140.8	142.2	143.3	146.6	14
Guided Missile and Space Vehicle Manufacturing (NAICS 336414)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing (NAICS 336415)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing (NAICS 336419)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Railroad Rolling Stock Manufacturing (NAICS 3365)	06/84	114.2	117.3	118.7	119.8	122.6	127.6	129.7	127.4	127.6	128.2	128.6	128.3	12
Railroad Rolling Stock Manufacturing (NAICS 336510)	06/84	114.2	117.3	118.7	119.8	122.6	127.6	129.6	127.4	127.5	128.1	128.6	128.2	12
Ship and Boat Building (NAICS 3366)	12/84	120.1	122.7	125.7	129.9	133.0	135.0	138.2	142.0	144.1	145.6	149.0	152.6	15
Ship and Boat Building (NAICS 33661)	12/84	120.1	122.7	125.7	129.9	133.0	135.0	138.2	142.0	144.1	145.6	149.0	152.6	15
Ship Building and Repairing (NAICS 336611)	12/85	114.0	116.2	118.3	123.3	126.8	127.6	130.1	133.3	134.8	135.4	137.6	140.1	14
Boat Building (NAICS 336612)	12/81	136.0	140.1	144.9	147.7	150.2	154.6	159.6	165.0	168.6	172.7	179.4	186.3	19
Other Transportation Equipment Manufacturing (NAICS 3369)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	
Other Transportation Equipment Manufacturing (NAICS 33699)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
Motorcycle, Bicycle, and Parts Manufacturing (NAICS 336991)	12/84	109.9	111.8	114.4	116.9	119.0	122.2	123.3	123.3	124.2	125.5	127.7	127.9	12
Military Armored Vehicle, Tank, and Tank Component Manufacturing (NAICS 336992)	NA	U	U	U	U	U	U	U	U	U	U	U	U	
All Other Transportation Equipment Manufacturing (NAICS 336999)	12/03	U	U	U	U	U	U	U	U	U	U	U	U	

KEY: NA = not applicable; NAICS = North American Industry Classification System; U = data are not available.

NOTE

Bureau of Labor Statistics 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.

SOURCE

U.S. Department of Labor, Bureau of Labor Statistics, Producer Price Index Revision-Current Series, Internet site www.bls.gov/data/sa.htm as of Sept. 1, 2004.

Table 3-12: Personal Expenditures by Category (Current \$ millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total expenditures	331,700	443,800	648,500	1,034,400	1,757,100	2,720,300	3,839,900	3,986,100	4,235,300	4,477,900	4,743,300	4,975,800	5,256,800	5,547,400	5,879,500	6,282,500	6,739,400	7,045,400	7,385,300
Transportation	42,800	59,400	81,500	132,400	238,900	377,700	471,700	447,300	483,200	520,800	567,300	594,600	641,800	685,200	718,000	785,000	853,400	874,000	876,700
Transportation as a percent of total expenditures	12.9%	13.4%	12.6%	12.8%	13.6%	13.9%	12.3%	11.2%	11.4%	11.6%	12.0%	11.9%	12.2%	12.4%	12.2%	12.5%	12.7%	12.4%	11.9%
Food and tobacco	89,200	108,800	154,600	238,300	376,800	498,400	677,800	699,900	717,300	740,600	767,900	790,100	820,100	850,000	888,700	994,800	1,003,700	1,047,800	1,094,800
Clothing, accessories, and jewelry	32,700	41,400	57,600	85,600	132,300	188,300	261,500	263,500	280,900	293,400	306,300	314,500	327,200	337,400	356,300	379,600	397,000	396,800	405,500
Personal care	5,600	8,100	11,500	16,100	25,500	38,800	56,900	58,500	62,000	64,400	68,100	72,800	77,000	82,900	86,200	89,500	93,400	94,300	97,200
Housing	48,200	65,400	94,100	147,700	256,200	412,700	597,900	631,100	658,500	683,900	726,100	764,400	800,100	842,600	894,600	948,400	1,006,500	1,073,700	1,144,600
Household operation	46,700	62,100	84,800	135,700	233,300	343,600	433,300	444,300	466,000	497,500	529,600	553,500	586,600	616,200	641,800	675,200	719,300	738,400	748,300
Medical care	22,200	34,700	61,300	109,900	209,600	376,400	635,100	692,900	761,100	809,000	853,300	905,000	950,700	1,002,800	1,069,400	1,130,800	1,218,300	1,322,800	1,436,600
Personal business	14,100	20,100	31,800	54,900	95,200	177,500	250,900	279,700	306,700	330,000	336,100	349,600	376,000	412,900	446,100	491,600	539,100	539,000	564,000
Recreation	18,500	26,900	43,100	70,500	117,500	189,700	290,200	302,000	321,300	351,000	383,400	418,100	448,400	474,500	505,800	546,100	585,700	603,400	633,900
Education and research	4,400	7,000	12,700	20,600	33,500	53,900	83,700	89,300	96,000	101,500	107,300	114,300	122,600	129,700	140,000	150,500	163,800	176,300	187,900
Religious and welfare activities	5,200	7,100	11,000	18,300	34,800	55,700	88,700	92,900	102,300	106,500	115,300	120,400	130,500	134,200	146,000	154,500	172,300	186,100	202,000
Foreign travel and other, net	2,100	2,900	4,500	4,400	3,500	7,700	-7,700	-15,200	-20,000	-20,600	-17,400	-21,400	-24,200	-21,100	-13,300	-13,500	-13,000	-7,200	-6,300
Disposable Personal Income (DPI)	366,200	498,900	736,500	1,181,400	2,019,800	3,086,500	4,293,600	4,474,800	4,754,600	4,935,300	5,165,400	5,422,600	5,677,700	5,968,200	6,355,600	6,627,400	7,120,200	7,393,200	7,815,500
Transportation as a percent of DPI	11.7%	11.9%	11.1%	11.2%	11.8%	12.2%	11.0%	10.0%	10.2%	10.6%	11.0%	11.0%	11.3%	11.5%	11.3%	11.8%	12.0%	11.8%	11.2%

NOTE

Data in this table have been revised by the Bureau of Economic Analysis as part of the 2003 comprehensive revision of the National Income and Product Accounts.

SOURCES

DPI: 1960-2002: U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables*, table 2.9, Internet site <http://www.bea.doc.gov>, as of Apr. 24, 2003.

All but DPI: 1960-2002: *Ibid.*, *National Income and Product Accounts Tables*, table 2.5.5, Internet site <http://www.bea.doc.gov> as of Dec. 18, 2003.

Table 3-13: Personal Consumption Expenditures on Transportation by Subcategory (Current \$ millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL transportation	42,800	59,400	81,500	132,400	238,900	377,700	471,700	447,300	483,200	520,800	567,300	594,600	641,800	685,200	718,000	785,000	853,400	874,000	876,700
User-operated transportation, total	39,500	55,300	74,500	121,100	218,800	349,800	434,700	410,800	445,900	481,100	525,400	550,500	594,800	634,600	664,400	729,300	793,800	819,000	823,000
New cars and net purchases of used cars	16,600	25,200	26,700	36,700	57,200	110,700	119,000	103,700	112,400	120,400	133,200	132,600	136,000	139,400	147,300	158,400	164,300	162,600	157,200
New and used trucks and RVs	600	1,300	2,700	7,700	11,800	41,000	63,900	60,300	70,100	80,800	91,200	96,200	108,600	123,800	144,900	165,400	173,200	195,300	211,100
Tires, tubes, accessories, and parts	2,500	3,500	6,100	10,300	17,900	24,300	29,900	29,500	30,500	32,800	36,000	37,800	40,300	41,900	43,900	47,000	49,000	49,100	49,700
Repair and rental ¹	5,500	7,600	12,300	19,800	34,000	60,500	84,900	81,900	90,300	99,500	112,500	125,500	138,700	152,900	161,100	172,600	183,500	189,100	187,100
Gasoline and oil	12,000	14,800	21,900	39,700	86,700	97,200	111,200	108,500	112,400	114,100	116,200	120,200	130,400	134,400	122,400	137,900	175,700	173,100	165,800
Tolls	300	500	700	800	1,100	1,500	2,300	2,500	2,800	3,100	3,400	3,700	4,000	4,400	4,400	4,800	5,100	5,300	5,600
Insurance premiums, less claims paid	2,000	2,600	4,100	5,900	10,000	14,700	23,500	24,400	27,300	30,400	32,800	34,500	36,700	37,800	40,400	43,200	43,000	44,600	46,500
Purchased intercity transportation, total	1,300	2,000	4,000	7,300	15,400	21,000	28,600	27,700	28,200	30,300	32,100	33,900	36,200	39,500	41,800	43,900	47,400	42,300	40,800
Railroad	300	300	200	300	300	400	600	600	500	500	400	400	400	400	400	500	500	600	600
Intercity bus	300	400	500	700	1,400	1,300	1,300	1,600	1,600	1,700	1,700	1,800	1,900	2,200	2,200	2,200	2,400	2,400	2,300
Airline	700	1,300	3,100	5,900	12,800	17,600	22,700	21,400	21,300	22,900	24,000	25,300	26,900	29,800	31,800	33,300	36,700	32,100	30,500
Other	0	100	200	400	900	1,700	4,000	4,200	4,800	5,300	5,900	6,400	7,000	7,000	7,300	7,800	7,800	7,300	7,400
Purchased local transportation, total	2,000	2,100	3,000	4,000	4,800	6,800	8,400	8,800	9,000	9,400	9,900	10,100	10,900	11,100	11,800	11,900	12,200	12,700	12,900
Mass transit system	1,400	1,400	1,800	2,100	2,900	4,200	5,800	6,100	6,500	6,700	7,100	7,100	7,700	7,800	8,300	8,600	9,100	9,500	9,600
Taxi	600	600	1,200	2,000	1,900	2,600	2,600	2,600	2,600	2,700	2,800	3,000	3,200	3,300	3,500	3,300	3,100	3,200	3,300

KEY: RVs = recreational vehicles.

¹ Also includes greasing, washing, parking, storage, and leasing.

NOTES

Numbers may not add to totals due to rounding.

Data in this table have been revised by the Bureau of Economic Analysis as part of the 2003 comprehensive revision of the National Income and Product Accounts.

SOURCE

1960-2002: U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables*, table 2.5.5, Internet site <http://www.bea.doc.gov> as of Dec. 18, 2003.

Table 3-14: Average Cost of Owning and Operating an Automobile^a (Assuming 15,000 Vehicle-Miles per Year)

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Average total cost per mile (current ¢)	14.4	21.2	23.2	33.0	37.3	38.8	38.7	39.4	41.2	42.6	44.8	46.1	47.0	49.1	51.0	50.2	51.7
Gas and oil	4.8	5.9	5.6	5.4	6.6	5.9	5.9	5.6	5.8	5.6	6.6	6.2	5.6	6.9	7.9	5.9	7.2
Gas and oil as a percent of total cost	33.4	27.9	24.0	16.4	17.7	15.2	15.2	14.2	14.1	13.1	14.7	13.4	11.9	14.1	15.5	11.8	13.9
Maintenance	1.0	1.1	1.2	2.1	2.2	2.2	2.4	2.5	2.6	2.8	2.8	3.1	3.3	3.6	3.9	4.1	4.1
Tires	0.7	0.6	0.7	0.9	0.9	0.9	0.9	1.0	1.2	1.2	1.4	1.4	1.7	1.7	1.8	1.8	1.8
Average total cost per 15,000 miles (current \$)	2,154	3,176	3,484	4,954	5,601	5,824	5,804	5,916	6,185	6,389	6,723	6,908	7,050	7,363	7,654	7,533	7,754
Variable cost	968	1,143	1,113	1,260	1,455	1,350	1,380	1,365	1,440	1,440	1,620	1,605	1,590	1,829	2,040	1,770	1,965
Fixed cost ^b	1,186	2,033	2,371	3,694	4,146	4,474	4,424	4,551	4,745	4,949	5,103	5,303	5,460	5,534	5,614	5,764	5,789

^a All figures reflect the average cost of operating a vehicle 15,000 miles per year in stop and go conditions.

^b Fixed costs (ownership costs) include insurance, license, registration, taxes, depreciation, and finance charges.

NOTES

Changes in the way costs were calculated make it difficult to compare pre-1985 data with more recent years.

Prior to 1985, the cost figures are for a mid-sized, current model, American car equipped with a variety of standard and optional accessories. After 1985, the cost figures represent a composite of three current model American cars. The 2003 fuel costs are based on a fourth quarter average price of \$1.461 per gallon of regular unleaded gasoline, weighted 20 percent full-serve and 80 percent self-serve. Insurance figures are based on personal use of vehicles driven less than 10 miles to or from work, with no young drivers. Normal depreciation costs are based on the vehicle's trade-in value at the end of 4 years or 60,000 miles. American Automobile Association analysis covers vehicles equipped with standard and optional accessories including automatic transmission, air conditioning, power steering, power disc brakes, AM/FM stereo, driver- and passenger-side air bags, anti-lock brakes, cruise control, tilt steering wheel, tinted glass, emissions equipment, and rear-window defogger.

SOURCE

American Automobile Association, *Your Driving Costs* (Heathrow, FL: Annual issues).

Table 3-15a: Average Passenger Fares (Current \$)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Air carrier, domestic, scheduled service	33.01	34.13	40.65	53.64	84.60	92.53	107.86	106.78	103.60	109.80	103.21	106.66	110.37	114.10	114.34	114.98	121.27	112.17
Class I bus, intercity ^a	2.46	2.73	3.81	5.46	10.57	11.98	20.22	21.86	21.15	21.32	19.77	20.10	22.85	^R 20.83	^R 23.14	^R 26.16	29.46	30.27
Transit, all modes ^b (unlinked)	0.14	0.16	0.22	0.27	0.30	0.53	0.67	0.70	0.72	0.77	0.85	0.88	0.93	0.90	0.91	0.90	0.93	0.92
Commuter rail	0.64	0.71	0.84	1.04	1.41	2.85	2.90	3.01	3.09	3.09	3.19	3.13	3.25	3.30	3.29	3.30	^R 3.32	3.44
Intercity / Amtrak ^c	4.22	3.92	3.19	12.96	17.72	26.15	^R 39.59	^R 41.19	^R 40.78	^R 40.11	^R 39.10	^R 39.92	^R 43.31	^R 45.26	^R 44.75	^R 46.85	49.61	51.58

KEY: R = revised

^a Regular route intercity service.

^b Prior to 1984, excludes commuter railroad, automated guideway, urban ferryboat, demand responsive, and most rural and smaller systems.

^c Amtrak began operations in 1971.

SOURCES

Air carrier, domestic, scheduled service:

1960: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969* (Washington, DC: February 1970), part III, table 2 (enplanements); part IV, table 2 (passenger revenue).

1965-70: Ibid. *Handbook of Airline Statistics, 1973* (Washington, DC: March 1974), part III, table 2 (enplanements); part IV, table 2 (passenger revenue).

1975-80: Ibid. *Air Carrier Financial Statistics* (Washington, DC: Annual December issues), p. 1, line 3; and *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), p. 2, line 16 (passenger revenue / revenue passenger enplanements).

1985-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Financial Statistics* (Washington, DC: Annual December issues), p. 1, line 3; and *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), p. 2, line 16 (passenger revenue / revenue passenger enplanements).

Class I bus, intercity:

1960-93: Interstate Commerce Commission, *Transport Statistics in the United States, Motor Carriers* (Washington, DC: Annual issues), part 2.

1994-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, *Selected Earnings Data, Class I Motor Carriers of Passengers* (Washington, DC: Annual issues) (operating revenue / revenue passengers).

Transit and commuter rail:

1960-2001: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: Annual issues) (passenger fares / passenger trips).

Intercity / Amtrak:

1960-70: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual issues).

1975-80: Amtrak, State and Local Affairs Department and Public Affairs Department, personal communication.

1985: Amtrak, Amtrak Annual Report, Statistical Appendix (Washington, DC: Annual issues) (transportation revenues / Amtrak system passenger trips).

1990-2001: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues) (ticket revenue per passenger mile x average trip length of passengers).

Table 3-15b: Average Passenger Fares (Chained 2000 \$)^a

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Air carrier, domestic, scheduled service	138.96	138.27	138.65	135.45	123.18	112.42	117.94	119.18	114.14	113.74	112.60	114.73	124.53	121.38	119.86	120.39	121.27	122.81
Class I bus, intercity ^b	17.71	18.57	20.46	18.70	22.63	16.36	23.31	24.08	22.93	23.87	22.16	23.22	25.91	23.51	24.79	27.36	29.46	29.31
Transit, all modes ^c (unlinked)	1.02	1.01	0.92	0.97	0.75	0.84	0.86	0.87	0.85	0.88	0.96	0.97	0.94	0.89	0.91	0.91	0.93	0.89
Commuter rail	4.60	5.02	5.04	4.84	3.97	5.11	3.81	3.85	3.89	3.83	3.92	3.65	3.56	3.62	3.52	3.40	3.32	3.28
Intercity / Amtrak ^d	30.30	27.73	19.15	60.29	49.86	46.85	51.99	52.65	51.39	49.78	48.04	46.56	47.39	49.59	47.87	48.32	49.61	49.18

^a All data in this table have been revised using newly available chain-type indexes for transportation services from the Bureau of Economic Analysis.

^b Regular route intercity service.

^c Prior to 1984, excludes commuter railroad, automated guideway, urban ferryboat, demand responsive, and most rural and smaller systems.

^d Amtrak began operations in 1971.

SOURCES

Air carrier, domestic, scheduled service:

1960: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969* (Washington, DC: February 1970), part III, table 2 (enplanements); part IV, table 2 (passenger revenue).

1965-70: Ibid., *Handbook of Airline Statistics, 1973* (Washington, DC: March 1974), part III, table 2 (enplanements); part IV, table 2 (passenger revenue).

1975-80: Ibid., *Air Carrier Financial Statistics* (Washington, DC: Annual December issues), p. 1, line 3; and *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), p. 2, line 16 (passenger revenue / revenue passenger enplanements).

1985-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Financial Statistics* (Washington, DC: Annual December issues), p. 1, line 3 (passenger revenues); *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), p. 2, line 16 (passenger revenue / revenue passenger enplanements).

Class I bus, intercity:

1960-93: Interstate Commerce Commission, *Transport Statistics in the United States, Motor Carriers* (Washington, DC: Annual issues), part 2.

1994-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, *Selected Earnings Data, Class I Motor Carriers of Passengers* (Washington, DC: Annual issues).

Transit and commuter rail:

1960-2001: American Public Transit Association, *Transit Fact Book* (Washington, DC: Annual issues) (passenger fares / passenger trips).

Intercity / Amtrak:

1960-70: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual issues).

1975-80: Amtrak, State and Local Affairs Department and Public Affairs Department, personal communication.

1985: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues) (transportation revenues / Amtrak system passenger trips).

1990-2001: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues) (ticket revenue per passenger mile x average trip length of passengers).

Section C
**Transportation Revenues,
Employment, and
Productivity**

Table 3-16: Average Passenger Revenue per Passenger-Mile (Current ¢)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Air carrier, domestic, scheduled service	6.1	6.1	6.0	7.7	11.5	12.2	13.4	13.2	12.9	13.7	13.1	13.5	13.8	14.0	14.1	14.0	14.6	13.2	12.0
Index (1980 = 100)	53	53	52	67	100	106	117	115	112	119	114	117	120	121	122	121	127	115	104
Class I bus, intercity ^a	2.7	2.9	3.6	4.9	7.3	9.9	11.6	12.0	11.8	12.0	11.6	12.2	12.3	12.6	12.8	12.8	12.8	12.9	U
Index (1990 = 100)	23	25	31	42	63	86	100	104	102	104	101	106	106	109	110	110	111	112	U
Commuter rail	2.9	3.3	3.8	4.6	6.7	12.1	13.5	13.0	13.3	14.3	13.6	13.1	13.7	14.7	14.7	15.0	15.1	15.4	U
Index (1990 = 100)	22	25	28	34	50	90	100	97	99	107	101	97	102	109	109	111	112	114	U
Intercity / Amtrak ^b	3.0	3.1	4.0	5.7	8.2	11.3	14.1	14.1	14.1	14.0	13.7	14.6	16.6	17.3	17.5	18.4	23.2	24.9	26.8
Index (1990 = 100)	21	22	28	40	58	80	100	100	100	99	97	103	118	123	124	130	165	176	190
Consumer Price Index (1982-84 = 100)	30	32	39	54	82	108	131	136	140	145	148	152	157	161	^c 163	^d 167	172	177	180

KEY: U = data are unavailable.

^a Regular route intercity service.

^b Amtrak began operations in 1971.

^c Beginning in 1998, data reflect changes in series composition and renaming.

^d Beginning in 1999, data reflect changes in the formula used for calculating the basic components of the Consumer Price Index.

SOURCES

Air carrier, domestic, scheduled service:

1960: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969* (Washington, DC: February 1970), part III, table 2 (passenger-miles); part IV, table 2 (passenger revenues).

1965-70: Ibid., *Handbook of Airline Statistics, 1973* (Washington, DC: March 1974), part III, table 2 (passenger-miles); part IV, table 2 (passenger revenues).

1975-80: Ibid., *Air Carrier Financial Statistics* (Washington, DC: Annual December issues), p. 2, line 3.

Ibid., *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), p. 4, line 9.

1985-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Financial Statistics* (Washington, DC: Annual December issues), p. 1, line 9 and similar pages in previous editions; and *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), p. 3, line 9 and similar pages in previous editions (total passenger operating revenues / total revenue passenger-miles).

Intercity class I bus and commuter rail:

1960-2001: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 48.

Intercity / Amtrak:

1960-70: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual issues).

1975-80: Eno Transportation Foundation, Inc., *Transportation in America, 1994* (Lansdowne, VA: 1994), p. 50.

1985-2002: Amtrak, *Amtrak Annual Report, Statistical Appendix* (Washington, DC: Annual issues) (transportation revenues / passenger-miles).

Consumer Price Index:

1960-2002: Council of Economic Advisors, *Economic Report of the President, 2003* (Washington, DC: 2003), table B-60.

Table 3-17: Average Freight Revenue Per Ton-mile (Current ¢)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Air carrier, domestic, scheduled service	22.8	20.5	21.9	28.2	46.3	48.8	64.6	64.8	64.1	71.4	72.2	76.5	81.5	79.8	^R 82.7	80.9	78.0	78.0
Index (1980 = 100)	49	44	47	61	100	105	140	140	138	154	156	165	176	172	^R 179	175	168	168
Truck ^a	6.3	6.5	8.5	11.6	18.0	22.9	24.4	24.8	23.1	25.0	25.0	25.1	26.0	26.1	26.2	26.2	27.0	26.6
Index (1990 = 100)	26	26	35	48	74	94	100	102	95	102	103	103	107	107	107	107	111	109
Class I rail	1.40	1.27	1.43	2.04	2.87	3.04	2.66	2.59	2.58	2.52	2.49	2.40	2.35	2.40	2.34	2.28	2.26	2.24
Index (1990 = 100)	53	48	54	77	108	114	100	97	97	95	94	90	88	90	88	86	85	84
Barge	N	0.35	0.30	0.52	0.77	0.80	0.76	0.78	0.76	0.76	0.74	0.73	0.73	0.74	0.74	0.74	0.73	0.72
Index (1990 = 100)	N	46	40	68	102	106	100	103	100	100	97	97	96	97	98	98	97	95
Oil pipeline	0.32	0.28	0.27	0.37	^c 1.33	1.57	1.46	1.40	1.45	1.43	1.47	1.51	1.40	1.40	1.38	1.46	1.45	1.47
Index (1990 = 100)	22	19	19	25	91	107	100	96	100	98	101	104	96	96	95	100	100	101
Producer Price Index (1982 = 100) ^b	33	34	39	58	88	105	119	122	123	125	126	128	131	132	131	133	138	141

KEY: N = data do not exist; R = revised; U = data are unavailable.

^a General freight common carriers, most of which are LTL (less-than-truckload) carriers.

^b Total finished goods.

^c Reflects entrance of Alaska pipeline moving crude petroleum to U.S. refineries between 1975 and 1980.

SOURCES

Air carrier, domestic, scheduled service:

1960: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969* (Washington, DC: 1970), part III, tables 2 and 13.

1965-70: Ibid., *Handbook of Airline Statistics, 1973* (Washington, DC: 1974), part III, tables 2 and 13.

1975-80: Ibid., *Air Carrier Traffic Statistics* (Washington, DC: 1976, 1981), pp. 4 and 14 (December 1976) and pp. 2 and 3 (December 1981).

1985-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Financial Statistics* (Washington, DC: Annual December issues), p. 1, line 4.

Ibid., *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), p. 2, line 18 (freight operating revenues/freight revenue ton-miles).

Truck, barge, and oil pipeline:

1960-2001: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 47.

Class I rail:

1960-2000: Association of American Railroads, *Railroad Facts* (Washington, DC: 2001), p. 30.

Producer Price Index:

1960-2001: Council of Economic Advisors, *Economic Report of the President, 2000* (Washington, DC: August 2002), table B-65.

Table 3-18: Total Operating Revenues (Current \$ millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Air carrier, domestic, all services	2,178	3,691	7,180	12,020	26,440	37,629	57,961	56,165	57,654	63,233	65,949	70,885	76,891	82,250	86,494	90,931	98,896	86,200
Trucking ^a	N	N	N	N	N	N	127,314	126,772	135,437	142,547	155,713	161,806	174,743	183,153	195,706	209,438	224,464	221,100
Class I bus, intercity	463	607	722	955	1,397	1,233	943	981	938	928	870	917	912	996	999	^R 1,014	1,088	1,000
Transit ^b	1,407	1,444	1,707	3,451	6,510	12,195	16,053	16,533	16,915	17,276	17,968	18,241	19,151	19,515	21,062	22,220	24,243	^P 25,200
Class I rail	9,514	10,208	11,992	16,402	28,258	27,586	28,370	27,845	28,349	28,825	30,809	32,279	32,693	33,118	33,151	33,521	34,102	34,500
Intercity / Amtrak ^c	N	N	N	253	454	832	1,308	1,347	1,320	1,400	1,409	1,490	1,550	1,669	2,244	2,011	2,111	2,100
Water transportation (domestic) ^d	1,722	1,822	2,070	3,293	7,219	7,704	7,940	7,964	7,935	8,028	7,745	7,712	7,283	6,940	6,824	6,795	^R 6,930	6,200
Oil pipeline ^e	895	1,051	1,396	2,220	7,548	8,910	8,506	8,095	8,548	8,470	8,676	9,077	8,637	8,632	8,579	9,067	^R 8,958	9,000
Gas pipeline (investor-owned) ^f	8,700	11,500	16,400	30,551	85,918	103,945	66,027	63,922	66,405	69,965	63,430	58,435	72,025	U	57,548	59,142	^R 72,348	78,500
Transmission companies	3,190	4,088	5,928	11,898	41,604	45,738	21,756	19,818	20,193	19,873	13,841	12,092	12,050	10,339	9,450	9,555	^R 10,404	10,200
Distribution companies	N	N	N	5,938	14,013	21,510	18,750	17,812	19,854	20,307	20,911	19,421	30,407	30,864	28,182	28,135	^R 34,696	41,200
Integrated companies	N	N	N	6,962	17,300	17,396	10,117	11,047	10,279	12,506	11,827	10,899	11,941	12,125	2,974	3,086	^R 3,755	4,100
Combination companies	N	N	N	5,753	13,001	19,301	15,404	15,245	16,079	17,279	16,851	16,023	17,627	U	16,942	18,366	^R 23,220	22,800

KEY: N = data do not exist; P = preliminary; R = revised; U = data are not available.

^a Data from 1990 through 1997 include local trucking (4212), trucking, except local (4213), local trucking, without storage (4214), and courier services, except air (4215) based on SIC (Standard Industrial Classification). For 1998 and later, data includes truck transportation (484) and couriers and messengers (492) based on NAICS (North American Industry Classification System). Therefore, data from 1998 onward are not directly comparable with data prior to 1998.

^b Excludes commuter rail, automated guideway, urban boat, demand responsive, and most rural and smaller systems prior to 1984. Includes operating assistance.

^c Amtrak began operations in 1971.

^d Includes foreign traffic moving on domestic inland waterways.

^e Oil pipeline revenues are much smaller than gas pipeline revenues because oil pipeline companies are common carriers that include transportation costs only.

^f Data are not directly comparable from year to year due to acquisition and mergers. Prior to 1975, pipeline companies are not categorized by distribution, integrated, or combination. Total numbers for these companies are 1960 = 5,505; 1965 = 7,437; 1970 = 10,542. In 1997, the American Gas Association revised the database that identifies companies by type (distribution, integrated, or transmission). This reclassification of companies has resulted in numerous additions to the distribution company sample, in particular from the integrated company sample.

NOTE

In January 2000, the American Public Transit Association changed its name to the American Public Transportation Association (APTA). The *APTA Transit Fact Book* is now referred to as the *Public Transportation Fact Book*.

SOURCES

Air carrier, domestic, all services:

1960-70: Civil Aeronautics Board, *Handbook of Airline Statistics, 1973* (Washington, DC: March 1974).

1975-80: Ibid., *Air Carrier Financial Statistics* (Washington, DC: Annual issues), p. 1.

1985-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Financial Statistics* (Washington, DC: Annual December issues), p. 1.

Trucking:

1990-97: U.S. Department of Commerce, Bureau of the Census, *Transportation Annual Survey, 1998* (Washington, DC: January 2000), table 1.

1998-2001: Ibid., *Service Annual Survey, 2001* (Washington, DC: February, 2003), table 2.2.

Intercity Class I bus:

1960-93: Interstate Commerce Commission, *Annual Report of the Interstate Commerce Commission* (Washington, DC: Annual issues).

1994-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, *Selected Earnings Data, Class 1 Motor Carriers of Passengers* (Washington, DC: Annual issues).

Transit:

1960-2001: American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: Annual Issues), table 63, and similar tables in earlier editions of the *APTA Transit Fact Book*.

Class I rail:

1960-2001: Association of American Railroads, *Railroad Facts* (Washington, DC: 2002), p. 12.

Intercity/Amtrak:

1975-80: Amtrak, State and Local Affairs Department and Public Affairs Department, personal communication.

1985-2001: Ibid., *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues).

Water transportation:

1960-2001: Eno Transportation Foundation, Inc., *Transportation in America* (Washington, DC: 2002), p. 38-40.

Oil pipeline:

1960-2001: Eno Transportation Foundation, Inc., *Transportation in America* (Washington, DC: 2002), p. 38-40.

Gas pipeline:

1960-2001: American Gas Association, *Gas Facts* (Arlington, VA: Annual issues), tables 12-1, 12-2, 12-3, and 12-4.

Table 3-19: Employment in For-Hire Transportation and Selected Transportation-Related Industries^a (Thousands)

SIC	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL U.S. labor force ^b	54,189	60,763	70,880	76,945	90,406	97,387	109,403	108,249	108,601	110,713	114,163	117,191	119,608	122,690	125,865	128,916	131,720	131,922	130,791
Transportation-related labor force, total	^R 5,160	^R 5,737	^R 6,128	^R 7,834	^R 8,488	^R 9,211	^R 10,093	^R 9,836	^R 9,713	^R 9,858	^R 10,189	^R 10,501	^R 10,215	^R 11,002	^R 11,262	^R 11,523	^R 11,664	^R 11,585	U
For-hire transportation industry, total	^R 2,395	^R 2,683	^R 2,855	^R 2,796	^R 3,128	^R 3,172	^R 3,675	^R 3,661	^R 3,659	^R 3,759	^R 3,920	^R 4,057	^R 4,166	^R 4,264	^R 4,410	^R 4,545	^R 4,645	^R 4,622	4,438
45 Air	191	229	352	363	453	522	968	962	964	988	1,023	1,068	1,107	1,134	1,181	1,227	1,280	1,266	1,161
42 Trucking and warehousing	856	964	1,083	1,108	1,280	1,361	1,395	1,378	1,385	1,444	1,526	1,587	1,637	1,677	1,744	1,810	1,847	1,848	1,826
41 Local and interurban passenger transit	284	269	281	270	265	277	338	354	361	379	404	419	437	452	469	478	476	479	472
413 Intercity and rural bus	41	42	43	40	38	35	26	24	23	22	24	24	24	22	24	24	25	25	23
411 Local and suburban	U	U	U	69	79	92	141	155	162	176	194	203	218	229	236	238	233	236	235
415 School bus ^c	N	N	N	65	80	91	111	115	118	122	126	131	132	137	141	146	147	148	149
412 Taxi	121	110	106	85	53	38	32	32	30	30	31	31	31	31	31	32	32	32	31
Other local and interurban ^d	123	118	131	11	16	22	28	28	28	29	30	31	33	34	36	38	40	38	35
40 Railroad	885	735	634	548	532	359	279	262	254	248	241	238	231	227	231	235	237	234	229
44 Water	N	228	212	194	211	185	177	184	173	168	172	175	174	179	181	186	194	192	190
46 Liquid pipeline	23	20	18	18	21	19	19	19	19	18	17	15	15	14	14	13	14	15	15
492 Gas production and distribution	155	154	161	162	168	175	165	166	163	161	159	154	147	141	137	134	128	126	121
47 Transportation services ^e	N	85	115	134	198	275	336	336	338	352	378	401	418	441	454	463	470	463	423
Equipment manufacturing (SIC 37 and SIC 301), total	1,773	1,955	1,949	1,824	1,995	2,054	2,073	1,971	1,911	1,838	1,840	1,870	1,864	1,923	1,973	1,967	1,931	1,835	1,739
372 Aircraft and parts	605	601	644	499	633	616	712	669	612	542	482	451	458	501	525	496	464	461	410
371 Motor vehicles and equipment	724	843	799	792	789	883	812	789	813	837	909	971	967	986	995	1,018	1,017	947	912
374 Railroad equipment	43	56	51	57	71	33	33	30	29	31	35	38	36	34	37	38	36	30	27
373 Ship and boat building and repairing	141	160	172	194	221	187	188	177	170	159	158	160	159	158	167	167	168	161	158
301 Tires and inner tubes	105	102	116	124	115	94	84	81	81	82	79	80	80	78	80	79	79	75	72
Other ^f	155	193	167	157	167	241	244	225	207	188	177	172	165	167	168	168	168	161	161
Related industries, total	461	522	613	2,498	2,694	3,336	3,672	3,532	3,508	3,612	3,782	3,930	4,086	4,186	4,251	4,368	4,442	4,473	4,479
553 Automotive and home supply stores	U	U	U	212	261	304	337	332	332	340	357	369	380	392	397	404	408	410	406
75 Automotive repair, services, and parking	U	U	U	439	571	730	914	882	881	925	968	1,020	1,080	1,120	1,145	1,196	1,234	1,257	1,263
554 Gasoline service stations	461	522	613	622	561	588	647	626	616	617	634	649	669	676	680	660	652	648	641
161 Highway and street construction	U	U	U	U	U	264	239	218	215	222	226	228	236	243	257	280	281	289	286
501 Motor vehicles, parts, and supplies	U	U	U	382	434	454	456	448	446	451	471	492	503	513	517	524	517	502	498
551 New and used car dealers	U	U	U	731	745	856	924	879	875	908	963	996	1,031	1,046	1,047	1,080	1,112	1,121	1,130
Other automotive retail ^g	N	N	N	112	122	140	155	146	143	148	163	176	187	197	208	223	239	246	256
Government employment ^h , total	532	577	711	716	671	649	673	672	635	650	647	644	99	629	629	643	646	654	U
U.S. DOT ⁱ	N	N	104	112	112	100	104	108	110	109	103	101	99	98	99	100	100	102	141
State and local highway ^j	532	577	607	604	559	549	569	564	525	541	544	543	^k N	531	530	543	546	552	U

KEY: N = data do not exist; R = revised; SIC = Standard Industrial Classification; U = data are not available.

^a Annual averages.

^b Excludes farm employment.

^c Does not include drivers employed by school districts.

^d Difference between the total of SIC 41 and the sum of 411, 412, 413, and 415.

^e Transportation services are defined as services incidental to transportation, such as forwarding and packing; motor vehicle inspections; and freight broker, tour operator, and travel agency services, etc.

^f The difference between the total of SIC 37 and the sum of 371, 372, 373, and 374.

^g The difference between the total of SIC 55 and the sum of 551, 553, and 554.

^h Not all government agencies are included (e.g., the National Transportation Safety Board).

ⁱ U.S. Department of Transportation was created in 1966. Data are for fiscal year and include permanent civilians as well as temporary employees and military.

^j Full-time equivalent employment. Data prior to 1986 are not directly comparable to data from later years due to a change in the way full-time equivalent was calculated. Full-time equivalent was not calculated for 1985.

^k Due to a change in the reference period, from October to March, the October 1996 Annual Survey of Government Employment and Payroll was not conducted.

NOTE

The employment totals in tables 3-19 and 3-20 differ. Table 3-19 shows employment in transportation and selected transportation-related industries. Table 3-20 shows employment by transportation occupation. Some employees of transportation industries have nontransportation jobs (e.g., a bookkeeper in a trucking firm), and some people with transportation occupations do not work in the transportation industry (e.g., a truck driver for a construction firm). Beginning in January 1999, data are not strictly comparable with data for 1998 and earlier years because of revisions in the population controls used in the household survey.

SOURCES**All data, except as noted:**

1960-85: U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours and Earnings, United States, 1909-1994* (Washington, DC: September 1994).

1990-2002: Ibid., Internet site www.bls.gov/, database query for individual series as of June 11, 2003.

Government employment:*USDOT:*

1970-75: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States, 1976* (Washington, DC: 1976), table 409, and U.S. Department of Transportation, U.S. Coast Guard, G-WPM, Office of Military Personnel, personal communication.

1980-85: U.S. Department of Transportation, Office of the Secretary of Transportation, *DOT Employment Facts, A Report to Management* (Washington, DC: Annual issues).

1990-2002: Ibid., *DOT Workforce Demographics* (Washington, DC: Annual issues).

State and local highway:

1960-91: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States, 1993* (Washington, DC: 1993), table 500 and similar tables in earlier editions.

1992-2001: Ibid., Internet site <http://www.census.gov/pub/govs/www/apesstl.html> as of July 24, 2002.

Table 3-20a: Employment in Transportation Occupations (Thousands)

	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total workers, 16 years and over	107,150	118,793	117,718	118,492	120,259	123,060	124,900	126,708	129,558	131,463	133,488	135,208	135,073
Total workers in transportation occupatic	3,681	4,039	4,101	4,098	4,250	4,287	4,308	4,451	4,534	4,499	4,643	4,684	4,824
Transportation occupation as percent of total workers, 16 years and over	3.4%	3.4%	3.5%	3.5%	3.5%	3.5%	3.4%	3.5%	3.5%	3.4%	3.5%	3.5%	3.6%
Motor vehicle operators, total	3,298	3,618	3,704	3,726	3,850	3,879	3,900	4,024	4,090	4,069	4,202	4,222	4,356
Supervisors	51	76	80	87	84	94	87	85	95	88	86	77	88
Truck drivers	2,412	2,627	2,684	2,712	2,804	2,815	2,860	3,018	3,075	3,012	3,116	3,088	3,156
Drivers-sales workers	214	201	215	184	178	164	158	156	150	159	160	167	166
Bus drivers	394	443	469	477	506	511	526	512	472	471	490	539	571
Taxicab drivers and chauffeurs	180	213	197	217	230	238	211	203	248	273	271	280	305
Parking lot attendants	45	53	53	44	41	49	50	46	46	62	68	60	61
Motor transportation occupations, NEC	2	5	6	5	7	8	8	4	4	3	11	11	9
Rail transportation, total	148	118	115	108	108	108	104	116	121	104	106	127	112
Railroad conductors and yardmasters	36	36	38	39	38	38	33	45	48	50	45	48	42
Locomotive operating occupations	59	46	44	44	45	47	51	49	53	41	45	63	61
Railroad brake, signal, and switch operators	46	28	27	20	21	19	17	15	14	7	9	11	7
Rail vehicle operators, NEC	7	8	6	5	4	4	3	7	6	6	7	5	2
Water transportation, total	59	53	61	54	61	68	66	70	52	63	57	56	59
Ship captains and mates, except fishing boa	32	27	32	26	26	30	33	32	24	22	31	38	34
Sailors and deckhands	18	18	18	16	24	27	26	25	21	30	16	14	20
Marine engineers	1	2	4	5	3	6	3	8	2	3	5	2	4
Bridge, lock, and lighthouse tenders	8	6	7	7	8	5	4	5	5	8	5	3	1
Air transportation, total	111	150	134	119	126	128	144	146	156	139	167	152	164
Airplane pilots and navigators	77	114	100	96	101	104	114	114	120	113	143	129	136
Air traffic controllers	34	36	34	23	25	24	30	32	36	26	24	23	28
Public transportation attendants	65	100	86	91	105	104	94	95	115	124	111	127	133

KEY: NEC = not elsewhere classified.

NOTES

Beginning in January 2000, data are not comparable with data for earlier years due to new composite estimation procedures and revised controls used in the household survey for population. See source for additional information.

The employment totals in tables 3-19 and 3-20 differ. Table 3-19 shows employment in transportation and related industries; table 3-20 shows employment by transportation occupation. Some employees of transportation industries have nontransportation jobs (e.g., a bookkeeper in a trucking firm), and some people in transportation occupations do not work in the transportation industry (e.g., a truck driver for a construction firm).

SOURCES

All data except total workers, 16 years and over:

1985, 1990-99: U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings* (Washington, DC: Annual January issues), table 11 of the Household Data Annual Averages Tables, Internet site <http://stats.bls.gov/pdf/cpsaatab.htm> as of May 31, 2000.

2000: Ibid., personal communication, Aug. 6, 2001.

2001: Ibid., personal communication, Aug. 23, 2002.

Total workers, 16 years and over:

1985, 1990-2000: U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings* (Washington, DC: January 2001), revised totals, table 1, Internet site <http://stats.bls.gov/pdf/cpsaat1.pdf> as of Aug. 3, 2001.

2001: Ibid., personal communication, Aug. 23, 2002.

Table 3-20b: Employment in Transportation and Transportation-Related Occupations

SOC code	Occupation	1999	2000	2001	2002
Vehicle operators, pipeline operators, and primary support					
53-2011	Airline pilots, copilots, and flight engineers	88,040	94,820	88,800	78,810
53-2012	Commercial pilots	18,780	18,040	18,380	19,570
53-2022	Airfield operations specialists	4,510	4,580	5,390	5,910
53-2021	Air traffic controllers	22,620	23,350	22,990	23,410
53-3011	Ambulance drivers and attendants, except emergency medical technicians	13,520	15,700	17,620	17,280
53-3021	Bus drivers, transit and intercity	160,210	175,470	190,530	197,090
53-3022	Bus drivers, school	463,860	457,050	469,100	468,790
53-3031	Driver/sales workers	385,210	373,660	378,220	368,730
53-3032	Truck drivers, heavy and tractor-trailer	1,558,400	1,577,070	1,548,480	1,520,880
53-3033	Truck drivers, light or delivery services	1,085,050	1,033,220	996,000	977,920
53-3041	Taxi drivers and chauffeurs	119,630	130,200	125,860	125,720
53-4011	Locomotive engineers	19,940	29,390	30,730	28,250
53-4012	Locomotive firers	890	1,040	730	710
53-4013	Rail yard engineers, dinkey operators, and hostlers	5,070	4,020	4,840	4,600
53-4021	Railroad brake, signal, and switch operators	14,500	16,830	17,070	15,030
53-4031	Railroad conductors and yardmasters	36,680	40,380	40,910	38,070
53-4041	Subway and street car operators	U	3,190	U	7,250
53-5011	Sailors and marine oilers	27,200	30,090	28,650	25,360
53-5021	Captains, mates, and pilots of water vessels	20,660	21,080	22,180	22,530
53-5022	Motorboat operators	4,000	3,540	3,410	3,600
53-5031	Ship engineers	6,800	7,370	7,470	8,020
53-6011	Bridge and lock tenders	6,970	4,790	4,500	3,900
53-7071	Gas compressor and gas pumping station operators	6,940	6,510	6,070	6,920
53-7072	Pump operators, except wellhead pumpers	13,480	13,730	12,920	12,360
Transportation equipment manufacturing and maintenance occupations					
17-2011	Aerospace engineers	71,790	71,550	74,380	74,210
17-2121	Marine engineers and naval architects	4,450	4,680	4,860	4,810
17-3021	Aerospace engineering and operations technicians	17,270	19,850	15,570	14,700
49-2091	Avionics technicians	15,560	15,360	16,340	21,710
49-2093	Electrical and electronics installers and repairers, transportation equipment	14,700	15,930	16,650	17,320

SOC code	Occupation	1999	2000	2001	2002
49-2096	Electronic equipment installers and repairers, motor vehicles	14,250	12,480	13,210	15,200
49-3011	Aircraft mechanics and service technicians	125,970	135,730	135,250	125,850
49-3021	Automotive body and related repairers	179,960	168,170	168,630	175,370
49-3022	Automotive glass installers and repairers	20,520	21,240	21,550	19,710
49-3023	Automotive service technicians and mechanics	587,320	692,570	701,150	687,380
49-3031	Bus and truck mechanics and diesel engine specialists	273,320	258,800	254,420	254,470
49-3043	Rail car repairers	7,230	10,620	11,860	13,520
49-3051	Motorboat mechanics	18,450	19,040	18,370	18,550
49-3052	Motorcycle mechanics	11,390	11,720	13,290	13,030
49-3091	Bicycle repairers	8,080	7,940	7,730	7,000
49-3092	Recreational vehicle service technicians	13,100	12,200	11,830	12,490
49-3093	Tire repairers and changers	99,880	88,530	86,200	81,560
51-2011	Aircraft structure, surfaces, rigging, and systems assemblers	18,070	32,680	33,620	25,690
51-9122	Painters, transportation equipment	45,920	43,270	44,090	45,670
51-9197	Tire builders	16,680	15,790	13,410	13,020
53-6031	Service station attendants	109,050	106,010	107,650	102,550
53-7061	Cleaners of vehicles and equipment	302,380	301,330	304,500	311,070
Transportation Infrastructure construction and maintenance occupations					
47-2071	Paving, surfacing, and tamping equipment operators	58,410	56,330	57,880	58,760
47-4051	Highway maintenance workers	139,540	145,790	148,390	146,290
47-4061	Rail-track laying and maintenance equipment operators	8,620	9,940	11,680	10,450
49-9097	Signal and track switch repairers	3,720	5,540	8,550	7,990
53-7031	Dredge operators	1,910	3,100	2,920	2,850
Secondary Support Service Occupations					
13-1032	Insurance appraisers, auto damage	19,310	12,320	12,110	13,270
33-3041	Parking enforcement workers	7,660	8,040	9,160	10,180
33-3052	Transit and railroad police	4,590	5,760	6,750	6,010
33-9091	Crossing guards	68,310	72,830	69,990	73,020
39-6022	Travel guides	4,180	5,200	5,480	4,960
39-6031	Flight attendants	123,310	126,380	115,750	104,360
39-6032	Transportation attendants, except flight attendants and baggage porters	22,780	23,550	25,910	26,580

SOC code	Occupation	1999	2000	2001	2002
41-3041	Travel agents	111,130	124,030	111,310	104,550
43-4181	Reservation and transportation ticket agents and travel clerks	222,340	199,700	183,280	174,170
43-5021	Couriers and messengers	134,370	130,210	121,670	120,900
43-5032	Dispatchers, except police, fire, and ambulance	171,560	167,180	170,050	168,380
43-5052	Postal service mail carriers	352,550	354,980	355,120	347,420
43-5071	Shipping, receiving, and traffic clerks	886,230	864,530	802,600	792,470
53-6021	Parking lot attendants	109,340	116,930	109,930	108,460
53-6041	Traffic technicians	5,000	4,590	5,090	5,370
53-6051	Transportation inspectors	22,440	26,520	27,670	28,340
53-7081	Refuse and recyclable material collectors	135,320	118,910	125,600	132,290
53-7121	Tank car, truck, and ship loaders	20,830	17,480	19,430	16,960
Other					
11-3071	Transportation, storage, and distribution managers	123,450	116,680	108,590	107,400
53-1011	Aircraft cargo handling supervisors	8,090	9,960	9,070	8,920
53-1021	First-line supervisors/managers of helpers, laborers, and material movers, hand	138,210	146,790	147,490	147,180
53-1031	First-line supervisors/managers of transportation and material-moving machine and vehicle operators	175,260	186,710	197,430	207,280

KEY: SOC = Standard Occupational Classification; U = data are not available.

NOTES

Occupational Employment Statistics (OES) uses a mail survey to measure employment levels and wage rates for all full- and part-time wage and salary workers in nonfarm establishments. The survey does not include self-employed owners and partners in unincorporated firms, household workers, or unpaid family workers. In 1999 OES began using the Standard Occupational Classification (SOC) system to organize occupational data. Consequently estimates from 1999 and subsequent years are not directly comparable to previous occupational estimates. The SOC is being adopted by all federal agencies and consists of 821 detailed occupations, grouped into 449 broad occupations, 96 minor groups, and 23 major groups.

A broad definition of transportation and transportation-related occupations is used in this table based on Sen, B. and M. Rossetti, "A Complete Count of the U.S. Transportation Workforce," *Transportation Research Record 1719* : 2000, pp 259-266. Some occupational categories may include workers not engaged in transportation or transportation-related activities. For example, the category "first-line supervisors/managers" (53-1021 and 53-1031) may include workers in material moving occupations along with transportation occupations. Moreover, some workers engaged in transportation and transportation-related activities may be excluded. For example, "baggage porters and bellhops" is not included in this table because it is believed that a large share of workers in this category work in hotels or similar establishments.

SOURCES

U.S. Department of Labor, Bureau of Labor Statistics, Occupational Employment Statistics, *Occupational Employment and Wages, 2002* (Washington, DC: November 2003), Internet site <http://www.bls.gov/oes>.

Table 3-21a: Average Wage^a and Salary Accruals per Full-Time Equivalent Employee by Transportation Industry (Standard Industrial Classification [SIC] basis)^b (Current \$)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
All industries	4,822	5,808	7,744	10,810	15,793	21,297	26,262	27,326	28,672	29,444	30,177	31,034	32,087	33,490	35,201	36,754	38,846
Transportation, total	5,835	6,989	9,396	13,550	20,818	25,246	29,000	30,018	31,575	31,392	31,946	32,283	33,074	34,407	35,907	37,178	38,484
Air	6,929	8,495	12,027	17,035	25,649	32,131	32,867	34,487	36,058	35,852	36,257	36,419	36,989	38,691	40,441	42,523	43,820
Trucking and warehousing	5,396	6,623	8,672	12,765	19,204	22,383	26,297	26,921	28,336	28,293	29,112	29,605	30,342	31,754	32,949	34,007	35,024
Local and interurban passenger transit	4,877	5,553	6,996	9,462	13,530	14,878	17,554	18,064	18,950	18,955	19,504	19,980	20,648	21,219	22,008	22,792	23,745
Railroad	6,241	7,460	10,110	14,987	25,049	36,608	43,602	45,893	50,267	50,440	51,719	50,465	55,299	57,235	60,632	60,623	62,673
Water	6,212	7,402	10,302	14,136	22,746	28,531	33,855	34,703	36,311	36,833	37,357	37,769	38,857	40,329	42,317	43,436	44,980
Pipelines, except natural gas	6,957	8,053	10,765	16,765	26,227	37,316	46,167	47,000	51,526	50,421	54,647	58,186	54,782	58,881	64,991	65,379	66,540
Transportation services ^c	5,380	6,239	8,232	11,430	16,005	20,530	26,057	27,169	28,534	28,792	29,588	30,801	31,511	32,794	34,603	36,204	38,602

^a Wages do not include supplements to wages and salaries such as pension, profit-sharing, and other retirement

^b The data in this table have been revised as a result of the Bureau of Economic Analysis' comprehensive revision of

^c Establishments furnishing services incidental to transportation, such as forwarding and packing services and the

NOTES

Use care in comparing the data in this table with those in table 3-22. This table includes weighted part-time employees' salaries. Table 3-22 covers only full-time employees. 1960-85 data are based on the 1972 SIC codes; 1990-2000 data are based on the 1987 SIC codes.

The Bureau of Economic Analysis provides these data on a SIC basis ending in 2000 and on a North American Industry Classification System (NAICS) basis beginning in 1998 (see table 3-21b for data based on NAICS).

Wage and salary accruals consist of the monetary remuneration of employees, including compensation of corporate officers; commissions, tips and bonuses; voluntary employee contributions to certain deferred compensation plans, such as 401(k) plans; and receipts in kind that represent income. In other words, accruals are wage and salary earned, not wage and salary paid. For example, wage and salary earned in 1999 but not paid until 2000 are included in accruals for 1999. However, the difference between wage and salary earned and wage and salary paid is usually very small.

SOURCE

1960-2000: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Products Accounts, tables 6.6b and 6.6c, Internet site <http://www.bea.doc.gov/bea/dn1.htm> available as of Feb. 17, 2004.

Table 3-21b: Average Wage^a and Salary Accruals per Full-Time Equivalent Employee by Transportation Industry (North American Industry Classification System [NAICS] basis) (Current \$)

	1998	1999	2000	2001	2002
All industries	35,201	36,754	38,846	39,660	40,318
Transportation and warehousing, total	36,297	37,612	39,463	39,439	40,138
Air	46,790	48,466	50,969	55,338	57,410
Rail	60,530	60,538	62,728	63,979	65,314
Water	47,422	51,803	51,361	54,847	55,341
Truck	34,533	35,341	36,736	36,203	36,945
Transit and ground passenger transportation	21,988	22,880	23,795	23,120	23,502
Pipeline	71,496	77,984	96,703	99,715	81,375
Other transportation and support activities ^b	33,444	35,299	36,806	35,846	37,275
Warehousing and storage	30,120	31,663	34,269	33,851	34,773

a Wages do not include supplements to wages and salaries such as pension, profit-sharing, and other retirement plans, and health, life, and unemployment insurance compensation.

b Comprises business establishments involved in scenic and sightseeing transportation, support activities for transportation, postal service, and couriers and messengers.

NOTES

Use care in comparing the data in this table with those in table 3-22. This table includes weighted part-time employees' salaries. Table 3-22 covers only full-time employees. 1998-2002 data are based on the 1997 NAICS codes.

The Bureau of Economic Analysis provides these data on a Standard Industrial Classification (SIC) basis ending in 2000 and on a NAICS basis beginning in 1998 (see table 3-21a for data based on SIC).

Wage and salary accruals consist of the monetary remuneration of employees, including compensation of corporate officers; commissions, tips and bonuses; voluntary employee contributions to certain deferred compensation plans, such as 401(k) plans; and receipts in kind that represent income. In other words, accruals are wage and salary earned, not wage and salary paid. For example, wage and salary earned in 1999 but not paid until 2000 are included in accruals for 1999. However, the difference between wage and salary earned and wage and salary paid is usually very small.

SOURCE

1998-2002: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Products Accounts, table 6.6d Internet site <http://www.bea.doc.gov/bea/dn1.htm> as of Feb. 24, 2004.

Table 3-22: Median Weekly Earnings of Full-Time Wage and Salary Workers in Transportation by Detailed Occupation (Current \$)

	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
16 years and over, all ^a	343	412	426	440	459	467	479	490	503	523	549	576	597	609
Airplane pilots and navigators	738	910	931	884	1,076	1,013	956	1,138	1,079	1,383	1,048	1,283	1,150	1,245
Public transportation attendants	N	635	N	N	733	452	450	417	521	524	604	568	552	611
Motor vehicle operators	343	400	405	415	434	452	475	473	496	503	514	543	575	582
Supervisors, motor vehicle operators	N	520	500	494	583	512	549	583	589	595	585	688	609	688
Truck drivers	N	N	N	417	442	467	481	481	506	516	527	564	593	600
Drivers-sales workers	399	439	458	484	478	461	517	506	524	526	534	558	630	600
Bus drivers	344	355	378	400	403	392	419	396	405	428	428	460	457	493
Taxicab drivers and chauffeurs	262	307	342	312	312	374	352	374	405	379	427	468	487	476
Nonmotor vehicle operators	559	687	716	700	714	631	711	691	761	834	761	816	911	884
Rail transportation operators	599	717	774	717	722	701	741	740	814	849	816	863	947	866
Water transportation	463	547	576	610	667	582	624	586	641	812	604	778	794	934

^a Earnings for all full-time workers, not just transportation related.

NOTES

Use care in comparing the figures in this table with those in table 3-21. This table does not include part-time employees. Table 3-21 includes weighted part-time employees' salaries.

SOURCES

Water transportation:

1985-2000: U.S. Department of Labor, Bureau of Labor Statistics, unpublished data, Mar. 1, 1999, Mar. 11, 1999, and Apr. 25, 2000.

2001-02: Ibid., personal communication, Aug. 23, 2002 and Nov. 20, 2003.

Other Data:

1985-2002: U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings (Washington, DC: Annual January issues), table 39 of the Household Data Annual Averages Tables, available at <http://www.bls.gov/cps/cpsaat39.pdf> as of Nov. 20, 2003.

2001: Ibid., personal communication, Aug. 23, 2002.

Table 3-23a: Total Wage^a and Salary Accruals by Transportation Industry (Standard Industrial Classification [SIC] basis)^b (Current \$ millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
All industries	272,855	363,757	551,560	814,838	1,377,641	1,995,472	2,754,015	2,822,984	2,964,529	3,089,159	3,249,764	3,435,670	3,623,205	3,874,685	4,182,719	4,471,400	4,829,240
Transportation, total	14,629	17,276	24,505	34,512	59,247	72,556	95,323	97,978	102,840	106,514	113,248	118,964	125,351	133,638	144,919	154,811	163,555
Air	1,268	1,852	4,029	5,894	11,029	15,744	29,515	30,659	31,983	33,020	34,553	36,237	38,616	41,090	45,132	49,284	52,890
Trucking and warehousing	4,592	6,265	9,123	13,786	23,755	29,725	34,475	34,890	36,780	38,790	42,155	44,556	46,787	50,362	54,365	58,323	61,326
Local and interurban passenger transit	1,307	1,427	1,868	2,375	3,423	4,047	5,635	5,943	6,329	6,748	7,373	7,892	8,569	9,188	9,903	10,575	10,899
Railroad	5,498	5,446	6,268	8,108	12,850	11,861	10,726	10,877	11,511	11,147	11,171	11,203	11,502	11,733	12,611	12,610	12,409
Water	1,379	1,584	2,112	2,601	4,572	5,050	5,620	5,969	5,955	6,004	6,239	6,345	6,450	6,896	7,321	7,601	8,141
Pipeline, except natural gas	160	153	183	285	577	709	831	893	979	958	929	873	822	824	845	850	865
Transportation services ^c	425	549	922	1,463	3,041	5,420	8,521	8,748	9,302	9,847	10,829	11,858	12,604	13,544	14,741	15,568	17,024

^a Wages do not include supplements to wages and salaries such as pension, profit-sharing, and other retirement plans, and health, life, and unemployment insurance compensation.

^b The data in this table have been revised as a result of the Bureau of Economic Analysis' comprehensive revision of the National Income and Product Accounts (NIPA).

^c Establishments furnishing services incidental to transportation, such as forwarding and packing services and the arrangement of passenger and freight transportation.

NOTE

The Bureau of Economic Analysis provides these data on a SIC basis *ending* in 2000 and on a North American Industry Classification System (NAICS) basis *beginning* in 1998 (see table 3-23b for data based on NAICS).

SOURCE

1960-2000: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Products Accounts, tables 6.3b and 6.3c, Internet site <http://www.bea.doc.gov/bea/dn1.htm> as of Feb. 17, 2004.

Table 3-23b: Total Wage^a and Salary Accruals by Transportation Industry (North American Industry Classification System [NAICS] basis) (Current \$ millions)

	1998	1999	2000	2001	2002
All industries	4,182,719	4,471,400	4,829,240	4,942,873	4,974,557
Transportation and warehousing, total	142,175	151,999	162,753	165,118	162,226
Air	25,512	27,447	30,046	32,314	30,581
Rail	12,611	12,610	12,409	12,103	11,823
Water	2,396	2,652	2,710	2,790	2,823
Truck	43,059	45,818	48,594	48,553	47,953
Transit and ground passenger transportation	7,672	8,249	8,497	8,814	9,023
Pipeline	3,178	3,473	4,282	4,238	3,281
Other transportation and support activities ^b	34,105	37,040	39,974	39,879	39,866
Warehousing and storage	13,641	14,709	16,240	16,248	16,876

^a Wages do not include supplements to wages and salaries such as pension, profit-sharing, and other retirement plans, and health, life, and unemployment insurance compensation.

^b Comprises business establishments involved in scenic and sightseeing transportation, support activities for transportation, postal service, and couriers and messengers.

SOURCE

1998-2002: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Products Accounts, Annual edition, table 6.3d, Internet site <http://www.bea.doc.gov/bea/dn1.htm> as of Feb. 17, 2004.

^a Wages do not include supplements to wages and salaries such as pension, profit-sharing, and other retirement plans, and health, life, and unemployment insurance compensation.

^b Comprises business establishments involved in scenic and sightseeing transportation, support activities for transportation, postal service, and couriers and messengers.

^a Wages do not include supplements to wages and salaries such as pension, profit-sharing, and other retirement plan

^b Comprises business establishments involved in scenic and sightseeing transportation, support activities for transpor

Table 3-24a: Labor Productivity Indices for Selected Transportation Industries (SIC)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Output per hour^a worked																	
Air ^b	N	N	N	N	N	N	93	93	97	100	106	109	111	112	108	109	111
Bus, Class I ^c	106	128	118	107	111	96	96	104	105	109	99	110	106	125	105	135	112
Railroad	22	32	36	43	55	82	119	128	140	145	150	156	167	170	173	183	196
Trucking, except local ^b	N	N	N	N	N	N	111	117	123	127	130	125	131	132	130	132	131
Petroleum pipelines ^c	31	49	76	91	89	100	103	99	100	104	108	116	131	134	137	145	141
Output per employee^d																	
Air	22	35	45	56	71	92	93	93	97	100	106	109	111	112	108	109	111
Bus, Class I ^c	108	129	119	103	99	93	96	102	103	107	96	105	103	121	104	133	110
Railroad	25	36	42	46	55	79	120	125	134	142	153	162	172	177	176	182	195
Trucking, except local	48	56	60	64	78	94	111	117	123	127	130	125	131	132	130	132	131
Petroleum pipelines ^c	30	48	75	89	89	98	102	98	99	104	112	121	139	141	146	150	141

KEY: N = data do not exist.

^a Based on the number of paid hours.

^b The average weekly hours were assumed to be constant for these industries; therefore, the output per hour worked and the output per employee measures are identical in the years for which data are given for both measures.

^c Data did not meet the publication standards for the Bureau of Labor Statistics and are considered less reliable than the published series.

^d Full-time and part-time employees are counted equally. Hence, these data do not reflect output per full-time equivalent employee.

NOTE

Index, 1987 = 100.

SOURCES

U.S. Department of Labor, Bureau of Labor Statistics, Industry Productivity, Internet site <http://www.bls.gov/lpc/iprdata1.htm> as of Aug. 12, 2002.

Ibid., personal communication, Aug. 19, 2002 (unpublished data).

Table 3-24b: Labor Productivity Indices for Selected Transportation Industries (NAICS)

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Output per hour^a worked															
Air transportation ^b	81	82	79	78	78	81	85	91	95	99	100	98	98	98	92
Line-haul railroads	59	64	68	70	75	82	86	89	92	98	100	102	108	115	123
General freight trucking, long-distance	79	84	84	89	93	98	96	98	95	96	100	99	102	105	103
Postal Service	92	92	92	96	96	97	99	99	98	97	100	101	102	105	106
Output per employee^c															
Air transportation ^b	81	82	79	78	78	81	85	91	95	99	100	98	98	98	92
Line-haul railroads	57	62	64	68	71	76	80	86	91	97	100	99	103	110	113
General freight trucking, long-distance	75	80	81	85	88	93	93	98	94	96	100	99	103	106	103
Postal Service	88	88	88	93	94	96	99	99	97	96	100	101	102	105	105

^a Based on the number of paid hours.

^b The average weekly hours were assumed to be constant for the air transportation industries; therefore, the output per hour worked and the output per employee measures are identical.

^c Full-time and part-time employees are counted equally. Hence, these data do not reflect output per full-time equivalent employee.

NOTES

Index, 1997 = 100.

selected mining, transportation, communications and services industries. Indexes for petroleum pipelines and bus (class I) systems were created under the Standard Industrial Classification (SIC) system but have not yet been developed under NAICS. Productivity measures for all industries using NAICS start in 1987.

SOURCE

U.S. Department of Labor, Bureau of Labor Statistics, Industry Productivity, Internet site <http://www.bls.gov/lpc/iprdata1.htm> as of Nov. 19, 2003.

Section D

Government Finance

Table 3-25a: Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (Current \$ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total government revenues	32,977	52,140	69,753	77,392	80,326	85,197	87,632	93,659	96,419	100,516	111,234	126,895	125,882	U	U
Federal	10,312	18,404	21,384	25,976	25,867	27,373	27,206	30,166	30,742	31,440	38,934	51,996	46,791	42,654	43,408
State and local	22,665	33,735	48,369	51,417	54,458	57,823	60,427	63,493	65,677	69,076	72,300	74,898	79,091	U	U
Total government expenditures ^a	56,329	^R 77,239	^R 100,695	^R 108,350	^R 114,652	^R 116,528	^R 125,947	^R 130,579	^R 133,450	^R 138,444	^R 145,748	^R 154,802	167,455	U	U
State and local expenditures less federal grants ^b	31,592	48,939	69,770	75,334	79,321	79,190	86,214	^R 89,739	92,585	96,596	104,355	^R 110,968	117,921	U	U
Federal grants	14,581	18,146	19,689	20,488	21,349	23,037	23,278	^R 24,983	25,061	26,073	25,125	^R 27,861	32,976	36,781	U
Federal expenditures, less grants ^a	10,156	^R 10,153	^R 11,236	^R 12,527	^R 13,982	^R 14,300	^R 16,455	^R 15,856	^R 15,804	^R 15,776	^R 16,268	^R 15,973	^R 16,558	19,790	U

KEY: R = revised; U = data are not available.

^a data for 1985 and 1990 -2000 have been revised due to the Office of Management and Budget (OMB)'s revision to the source data on federal expenditure.

^b Based on data from the U.S. Department of Commerce, Census Bureau, which uses different definitions and accounting methods than those used by some modal administrations of the U.S. Department of Transportation. For example, highway expenditures in this table do not include traffic control activities by police or public safety activities; while the highway expenditure statistics published by the U.S. Department of Transportation, Federal Highway Administration do include these items.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

1980: U.S. Department of Transportation, Bureau of Transportation Statistics, unpublished data.

1985–2002: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: 2002* (Washington, DC: forthcoming), tables 3-A, 13-A, and 14-A.

Table 3-25b: Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (Chained 1996 \$ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total government revenues	60,135	72,568	82,229	88,189	89,810	92,341	92,354	95,754	96,419	98,144	106,994	118,888	113,569	U	U
Federal	18,410	25,758	26,091	30,183	29,488	29,890	28,774	30,813	30,742	30,805	37,661	48,928	42,610	38,189	37,581
State and local	41,725	46,809	56,138	58,006	60,322	62,451	63,580	64,941	65,677	67,339	69,333	69,959	70,959	U	U
Total government expenditures ^a	102,324	R107,512	R118,709	R123,352	R128,138	R126,298	R132,736	R133,501	R133,445	R135,165	R140,107	R144,891	150,932	U	U
State and local expenditures less federal grants ^b	58,159	R67,905	R80,978	R84,989	R87,861	R85,528	R90,713	R91,786	92,585	R94,166	R100,072	R103,650	105,796	U	U
Federal grants	26,033	25,397	24,022	23,807	24,338	25,155	24,620	R25,519	25,061	25,547	24,304	R26,217	30,052	32,946	U
Federal expenditures, less grants ^a	18,133	K14,210	K13,709	K14,556	K15,939	K15,615	K17,403	K16,197	K15,799	K15,452	K15,731	K15,024	K15,084	15,635	U

KEY: R = revised; U = data are not available.

^a data for 1985 and 1990 -2000 have been revised due to the Office of Management and Budget (OMB)'s revision to the source data on federal expenditure.

^b Figures for state and local expenditures less federal grants were determined by adding the total number of federal grants and federal expenditures, less grants and subtracting the sum from the total government expenditures.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

1980: U.S. Department of Transportation, Bureau of Transportation Statistics, unpublished data.

1985–2002: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: 2002* (Washington, DC: forthcoming), 3-b, 13-b, and 14-b.

Constant dollar deflator: U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts*, Washington, DC, table 7.1, "Chain-Type Price Index."

Table 3-26: Summary of Transportation Revenues and Expenditures from Own Funds and User Coverage, Fiscal Year (Current and chained 1996 \$ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Federal revenues															
Current	10,312	18,404	21,384	25,976	25,867	27,373	27,206	30,166	30,742	31,440	38,934	51,996	^R 46,791	42,654	43,408
Chained	18,410	25,758	26,091	30,183	29,488	29,890	28,774	30,813	30,742	30,805	37,661	48,928	42,610	38,189	37,581
Federal expenditures^a															
Current	24,737	^R 28,300	^R 30,924	^R 33,015	^R 35,331	^R 37,337	^R 39,733	^R 40,839	^R 40,865	^R 41,849	^R 41,393	^R 43,834	^R 49,534	56,570	U
Chained	44,165	^R 39,608	^R 37,731	^R 38,363	^R 40,277	^R 40,770	^R 42,023	^R 41,715	^R 40,860	^R 40,999	^R 40,035	^R 41,241	^R 45,136	48,581	U
Federal user coverage (percent)	42%	65%	69%	79%	73%	73%	68%	74%	75%	75%	94%	119%	97%	97%	U
State and local revenues															
Current	22,665	33,735	48,369	51,417	54,458	57,823	60,427	63,493	65,677	69,076	72,300	74,898	79,091	U	U
Chained	41,725	46,809	56,138	58,006	60,322	62,451	63,580	64,941	65,677	67,339	69,333	69,959	70,959	U	U
State and local expenditures															
Current	31,592	48,939	69,770	75,334	79,321	79,190	86,214	^R 89,739	92,585	96,596	104,355	^R 110,968	117,921	U	U
Chained	58,966	67,905	80,978	84,989	87,861	85,528	90,713	^R 91,786	92,585	94,166	100,072	^R 103,650	105,796	U	U
State and local user coverage (percent)	72%	69%	69%	68%	69%	73%	70%	71%	71%	72%	69%	67%	67%	U	U

KEY: R = revised; U = data are not available.

^a data for 1985 and 1990 -2000 have been revised due to the Office of Management and Budget (OMB)'s revision to the source data on federal expenditure.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

1980: U.S. Department of Transportation, Bureau of Transportation Statistics, unpublished data.

1985–2002: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: 2002* (Washington, DC: forthcoming), tables 2-a, 2-b, 4-a, and 4-b.

Constant dollar deflator: U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts*, Washington, DC, table 7.1, "Chain-Type Price Index."

Table 3-27a: Transportation Revenues by Mode and Level of Government, Fiscal Year (Current \$ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL, all modes	32,977	52,140	69,753	77,392	80,326	85,197	87,632	93,659	96,419	100,516	111,234	126,895	125,882	U	U
Federal	10,312	18,404	21,384	25,976	25,867	27,373	27,206	30,166	30,742	31,440	38,934	51,996	46,791	42,654	43,408
State	17,088	24,442	34,629	36,585	39,085	41,429	42,861	44,846	45,966	47,729	50,009	51,584	54,142	U	U
Local	5,577	9,294	13,740	14,832	15,373	16,394	17,566	18,647	19,711	21,348	22,291	23,315	24,949	U	U
Highway, total	25,268	38,166	49,945	53,838	57,780	60,465	62,316	66,743	71,179	71,814	77,299	88,668	87,800	U	U
Federal: Highway Trust Fund-Highway Account ^a	7,647	12,906	13,453	15,303	16,572	16,864	17,005	19,377	22,692	21,314	24,307	33,823	30,347	26,917	27,982
State	16,287	22,960	32,644	34,462	36,916	39,149	40,557	42,415	43,353	45,034	47,214	48,784	51,073	U	U
Local	1,334	2,300	3,848	4,073	4,292	4,453	4,754	4,952	5,133	5,466	5,779	6,061	6,380	U	U
Air, total	4,100	6,711	10,119	11,924	11,872	12,744	13,101	13,954	11,298	13,544	18,176	21,079	21,627	U	U
Federal: Airport and Airways Trust Fund ^b	2,274	3,593	4,945	6,206	5,918	6,096	6,027	6,291	3,128	4,488	8,654	11,089	10,544	10,073	9,807
State	190	299	556	618	650	726	652	695	705	765	768	744	852	U	U
Local	1,636	2,818	4,617	5,101	5,304	5,922	6,422	6,968	7,465	8,291	8,754	9,246	10,231	U	U
Transit, total	2,397	5,636	7,193	8,778	7,482	8,570	8,948	9,352	10,171	11,417	11,872	13,186	12,674	U	U
Federal: Highway Trust Fund- Mass Transit Account	RZ	1,420	1,977	3,149	1,816	2,735	2,691	2,813	3,282	3,996	4,326	5,478	4,625	4,553	4,621
State	362	847	1,074	1,123	1,126	1,145	1,218	1,257	1,308	1,339	1,384	1,404	1,524	U	U
Local	2,035	3,369	4,142	4,506	4,540	4,690	5,039	5,283	5,581	6,082	6,162	6,304	6,525	U	U
Water, total	1,211	1,626	2,487	2,840	3,174	3,393	3,242	3,567	3,733	3,704	3,850	3,923	3,717	U	U
Federal: Water Receipts ^c	391	485	999	1,306	1,544	1,655	1,457	1,644	1,602	1,605	1,611	1,568	1,210	1,049	916
State	249	335	355	382	393	409	434	479	600	590	643	651	693	U	U
Local	572	807	1,133	1,152	1,237	1,329	1,351	1,444	1,531	1,509	1,597	1,704	1,813	U	U
Pipeline, total	RZ	RZ	10	11	14	15	19	35	31	30	29	30	40	44	57
Federal: Pipeline Safety Fund	RZ	RZ	10	11	14	15	19	35	31	30	29	30	40	44	57
General support, total	RZ	RZ	RZ	RZ	3	10	7	7	7	7	8	8	25	18	25
Federal: Emergency Preparedness Fund	RZ	RZ	RZ	RZ	3	10	7	7	7	7	8	8	25	18	25

KEY: RZ = no activity or a value of zero; U = data are not available.

^a Beginning in 1983, a portion of the fuel tax credited to the Highway Trust Fund is earmarked for transit.

^b The tax requirement that allows for the 10% passenger ticket tax and certain other taxes paid by airport and airway users to be transferred to the Airport and Airway Trust Fund expired on Dec. 31, 1995; it was reenacted in August 1996; but expired again in December 1996.

^c Water receipts include the Harbor Maintenance Trust Fund, St. Lawrence Seaway tolls, the Inland Waterway Trust Fund, Panama Canal receipts, Oil Spill Liability Trust Fund, Offshore Oil Pollution Fund, Deep Water Port Liability Fund, and excise taxes of the Boat Safety Program.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

1980: U.S. Department of Transportation, Bureau of Transportation Statistics, unpublished data.

1985-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics:2002* (Washington, DC: forthcoming), table 2-a.

Table 3-27b: Transportation Revenues by Mode and Level of Government, Fiscal Year (Chained 1996 \$ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL, all modes	60,135	72,568	82,229	88,189	89,810	92,341	92,354	95,754	96,419	98,144	106,994	118,888	113,569	U	U
Federal	18,410	25,758	26,091	30,183	29,488	29,890	28,774	30,813	30,742	30,805	37,661	48,928	42,610	38,189	37,581
State	31,458	33,914	40,192	41,274	43,293	44,745	45,098	45,868	45,966	46,528	47,956	48,182	48,576	U	U
Local	10,266	12,895	15,947	16,732	17,028	17,706	18,482	19,072	19,711	20,811	21,376	21,777	22,384	U	U
Highway, total	46,093	53,112	58,768	61,256	64,537	65,505	65,661	68,239	71,179	70,114	74,329	83,056	79,202	U	U
Federal: Highway Trust Fund-Highway Account ^a	13,653	18,064	16,414	17,782	18,892	18,414	17,985	19,792	22,692	20,884	23,512	31,828	27,656	24,110	24,235
State	29,984	31,858	37,888	38,879	40,890	42,282	42,674	43,382	43,353	43,902	45,276	45,567	45,822	U	U
Local	2,455	3,191	4,466	4,595	4,754	4,809	5,002	5,065	5,133	5,328	5,542	5,661	5,724	U	U
Air, total	7,421	9,355	12,038	13,663	13,342	13,837	13,817	14,264	11,298	13,225	17,502	19,766	19,552	U	U
Federal: Airport and Airways Trust Fund ^b	4,060	5,029	6,034	7,212	6,747	6,657	6,374	6,426	3,128	4,397	8,371	10,435	9,609	9,023	8,494
State	349	416	646	697	720	784	686	711	705	745	737	695	765	U	U
Local	3,012	3,910	5,359	5,754	5,875	6,396	6,758	7,127	7,465	8,083	8,395	8,636	9,179	U	U
Transit, total	4,413	7,838	8,466	10,010	8,346	9,288	9,429	9,562	10,171	11,150	11,421	12,354	11,436	U	U
Federal: Highway Trust Fund- Mass Transit Account	RZ	1,987	2,412	3,659	2,070	2,986	2,846	2,873	3,282	3,915	4,185	5,155	4,215	4,078	4,002
State	667	1,176	1,247	1,267	1,247	1,237	1,281	1,285	1,308	1,306	1,327	1,312	1,367	U	U
Local	3,746	4,675	4,807	5,083	5,029	5,065	5,302	5,403	5,581	5,929	5,909	5,888	5,854	U	U
Water, total	2,209	2,263	2,946	3,249	3,566	3,684	3,419	3,646	3,733	3,619	3,706	3,675	3,320	U	U
Federal: Water Receipts ^c	697	678	1,219	1,517	1,760	1,807	1,541	1,679	1,602	1,573	1,558	1,475	1,071	923	779
State	458	465	412	431	436	442	457	490	600	576	616	608	622	U	U
Local	1,053	1,119	1,315	1,300	1,370	1,436	1,421	1,477	1,531	1,471	1,531	1,592	1,627	U	U
Pipeline, total	RZ	RZ	12	13	16	16	20	36	31	29	28	28	36	39	49
Federal: Pipeline Safety Fund	RZ	RZ	12	13	16	16	20	36	31	29	28	28	36	39	49
General support, total	RZ	RZ	RZ	RZ	3	10	7	7	7	7	8	8	23	16	22
Federal: Emergency Preparedness Fund	RZ	RZ	RZ	RZ	3	10	7	7	7	7	8	8	23	16	22

KEY: RZ = no activity or a value of zero; U = data are not available.

^a Beginning in 1983, a portion of the fuel tax credited to the Highway Trust Fund is earmarked for transit.

^b The tax requirement that allows for the 10% passenger ticket tax and certain other taxes paid by airport and airway users to be transferred to the Airport and Airway Trust Fund expired on Dec. 31, 1995; it was reenacted in August 1996; but expired again in December 1996.

^c Water receipts include the Harbor Maintenance Trust Fund, St. Lawrence Seaway tolls, the Inland Waterway Trust Fund, Panama Canal receipts, Oil Spill Liability Trust Fund, Offshore Oil Pollution Fund, Deep Water Port Liability Fund, and excise taxes of the Boat Safety Program.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

1980: U.S. Department of Transportation, Bureau of Transportation Statistics, unpublished data.

1985–2002: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics: 2002* (Washington, DC: forthcoming), table 2-b.

Constant dollar deflator: U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts*, Washington, DC, table 7.1, "Chain-Type Price Index."

Table 3-28: Cash Balances of the Transportation-Related Federal Trust Funds, Fiscal Year (\$ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
TOTAL, all funds																
Current \$	16,441	20,483	31,795	35,697	37,475	36,499	31,916	32,345	31,139	31,306	30,637	^R 44,323	48,175	^R 45,550	44,250	38,385
Chained 2000 \$	30,847	29,272	41,216	44,492	45,368	43,047	36,659	36,138	33,853	33,471	32,416	45,749	48,175	44,628	42,200	35,704
Airport / Airway Trust Fund																
Current \$	5,442	7,426	14,355	15,263	15,204	12,850	12,386	11,365	7,692	6,358	9,411	12,446	13,934	14,485	12,642	12,397
Chained 2000 \$	10,210	10,613	18,609	19,024	18,406	15,155	14,227	12,698	8,363	6,798	9,958	12,846	13,934	14,192	12,056	11,531
Highway Trust Fund, highway account																
Current \$	10,999	10,361	9,629	10,246	11,300	11,523	7,927	9,421	11,658	12,575	8,519	^R 19,206	22,553	20,372	22,233	17,815
Chained 2000 \$	20,636	14,807	12,482	12,770	13,680	13,590	9,105	10,526	12,674	13,444	9,014	19,824	22,553	19,960	21,203	16,571
Highway Trust Fund, transit account																
Current \$	N	2,524	7,155	9,250	9,798	10,617	9,945	9,579	9,525	9,857	10,051	9,753	8,547	7,368	6,096	4,823
Chained 2000 \$	N	3,607	9,275	11,529	11,862	12,522	11,423	10,702	10,355	10,539	10,635	10,067	8,547	7,219	5,814	4,486
Harbor Maintenance Trust Fund																
Current \$	N	N	30	74	121	305	451	621	865	1,106	1,246	^R 1,556	1,621	1,777	1,850	2,001
Chained 2000 \$	N	N	39	92	146	360	518	694	940	1,182	1,318	1,606	1,621	1,741	1,764	1,861
Inland Waterway Trust Fund																
Current \$	N	172	281	217	186	180	214	238	275	300	327	^R 345	364	^R 404	392	383
Chained 2000 \$	N	246	364	270	225	212	246	266	299	321	346	356	364	396	374	356
Oil Spill Liability Trust Fund																
Current \$	N	N	345	647	866	1,024	993	1,121	1,124	1,110	1,083	1,017	1,156	^R 1,144	1,037	966
Chained 2000 \$	N	N	447	806	1,048	1,208	1,141	1,252	1,222	1,187	1,146	1,050	1,156	1,121	989	899

KEY: N = data do not exist; R = revised.

SOURCES

1980-94: U.S. Department of Transportation, Bureau of Transportation Statistics, *Transportation Receipts and Outlays in the Federal Budget*, Fiscal Years 1977-94 (Washington, DC: April 1997), table 1-3.

1995-2003: U.S. Executive Office of the President, Office of Management and Budget, *Budget of the United States Government, Appendix* (Washington, DC: Annual issues).

Constant dollar deflator

1980-2003: U.S. Department of Commerce, Bureau of Economic Analysis, *Interactive Access to National Income and Product Accounts Tables*, table 3.9.4, "Price Indexes for Government Consumption Expenditures and Gross Investment," Internet site <http://www.bea.doc.gov/bea/dn/nipaweb> as of February 2004.

Table 3-29a: Transportation Expenditures by Mode and Level of Government from Own Funds, Fiscal Year (Current \$ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
TOTAL, all modes^a	56,329	77,239	100,695	108,350	114,652	116,528	125,947	130,579	133,450	138,444	145,748	154,802	167,455	U
Federal ^a	24,737	28,300	30,924	33,015	35,331	37,337	39,733	40,839	40,865	41,849	41,393	43,834	49,534	56,570
State and local	31,592	48,939	69,770	75,334	79,321	79,190	86,214	^R 89,739	92,585	96,596	104,355	^R 110,968	117,921	U
Highways, total^a	34,553	46,613	62,629	66,588	69,018	70,054	74,591	79,375	81,623	84,290	89,527	95,556	103,952	U
Federal ^a	11,706	15,039	15,517	15,921	16,837	18,144	20,113	20,144	20,695	21,425	20,725	23,553	27,759	29,950
State and local	22,847	31,574	47,112	50,667	52,182	51,910	54,478	59,232	60,927	62,865	68,802	^R 72,003	76,192	U
Air, total^a	5,673	7,903	12,568	13,978	15,920	17,412	17,945	16,931	17,273	18,777	19,593	21,787	22,107	U
Federal ^a	3,762	4,947	7,305	8,285	9,317	10,053	10,150	10,393	10,135	10,138	10,622	10,720	10,571	13,984
State and local	1,911	2,955	5,263	5,692	6,604	7,359	7,795	^R 6,538	7,138	8,639	8,971	11,067	11,536	U
Transit, total	8,949	16,333	19,261	20,857	22,322	21,279	25,088	26,162	26,346	26,875	28,108	29,027	32,387	U
Federal	3,307	3,427	3,832	3,917	3,675	3,517	3,770	4,474	4,375	4,583	4,302	4,265	^R 5,337	7,048
State and local	5,642	12,906	15,429	16,939	18,647	17,763	21,318	21,688	21,971	22,292	23,806	24,762	27,053	U
Water, total	4,477	5,124	5,480	5,847	6,167	6,593	7,046	6,628	6,775	6,996	^R7,144	^R7,684	7,946	U
Federal	3,308	3,642	3,537	3,833	4,304	4,462	4,457	4,380	^R 4,237	4,212	^R 4,391	^R 4,567	^R 4,814	4,472
State and local	1,168	1,481	1,943	2,014	1,863	2,131	2,589	2,247	2,538	2,783	2,753	3,117	3,132	U
Rail, total	2,419	1,072	541	783	906	819	845	1,043	1,017	^R1,155	^R1,102	^R447	768	U
Federal	2,395	1,057	534	779	900	811	833	1,034	^R 1,006	^R 1,138	^R 1,079	^R 428	1	722
State and local	23	15	7	3	6	8	12	9	11	17	23	19	8	U
Pipeline, total^{b a}	RZ	8	26	28	32	34	38	45	U	U	U	U	U	U
Federal ^a	RZ	RZ	9	9	12	14	16	21	33	31	34	34	36	29
State and local	RZ	8	17	19	20	20	22	24	U	U	U	U	U	U
General support, total^{c a}	259	187	191	270	286	337	394	394	384	322	241	267	260	366
Federal / general support ^a	259	187	191	270	286	337	394	394	384	322	241	267	260	366

KEY: R = revised; RZ = no activity or a value of zero; U = data are not available.

^a data for 1985 and 1990 -2000 have been revised due to the Office of Management and Budget (OMB)'s revision to the source data on federal expenditure.

^b Includes gas and liquid pipeline.

^c General support represents administrative and operating expenditures of the U.S. Department of Transportation, the Interstate Commerce Commission (terminated at the end of 1995), and the National Transportation Safety Board.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

1980: U.S. Department of Transportation, Bureau of Transportation Statistics, unpublished data.

1985–2001: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002* (Washington, DC: forthcoming).

Table 3-29b: Transportation Expenditures by Mode and Level of Government from Own Funds, Fiscal Year (Chained 1996 \$ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
TOTAL, all modes^a	102,324	107,512	118,709	123,352	128,138	126,298	132,736	133,501	133,445	135,165	140,107	144,891	150,932	U
Federal ^a	44,165	39,608	37,731	38,363	40,277	40,770	42,023	41,715	40,860	40,999	40,035	41,241	45,136	48,581
State and local	58,159	67,905	80,978	84,989	87,861	85,528	90,713	^R 91,786	92,585	94,166	100,072	^R 103,650	105,796	U
Highways, total^a	62,960	64,858	73,612	75,660	76,993	75,877	78,593	81,158	81,623	82,276	86,025	89,418	93,656	U
Federal ^a	20,899	21,048	18,932	18,500	19,193	19,813	21,273	20,576	20,695	20,992	20,047	22,163	25,298	26,827
State and local	42,060	43,810	54,680	57,160	57,800	56,064	57,321	60,583	60,927	61,284	65,978	^R 67,255	68,358	U
Air, total^a	10,234	11,025	15,021	16,049	17,936	18,925	18,937	17,303	17,273	18,355	18,878	20,425	19,983	U
Federal ^a	6,717	6,924	8,912	9,627	10,621	10,977	10,735	10,616	10,135	9,933	10,275	10,088	9,634	10,441
State and local	3,517	4,100	6,109	6,422	7,314	7,948	8,201	^R 6,688	7,138	8,422	8,603	10,337	10,350	U
Transit, total	16,291	22,704	22,583	23,662	24,844	23,024	26,418	26,753	26,346	26,221	26,990	27,143	29,132	U
Federal	5,903	4,796	4,675	4,552	4,189	3,840	3,987	4,570	4,375	4,490	4,161	4,013	^R 4,861	6,313
State and local	10,387	17,908	17,908	19,110	20,655	19,184	22,431	22,183	21,971	21,731	22,829	23,129	24,271	U
Water, total	8,058	7,153	6,570	6,726	6,970	7,174	7,438	6,773	6,775	6,841	^R6,887	^R7,209	7,197	U
Federal	5,907	5,098	4,316	4,454	4,907	4,872	4,714	4,474	^R 4,238	4,127	^R 4,247	^R 4,298	^R 4,387	4,006
State and local	2,151	2,055	2,255	2,272	2,063	2,302	2,724	2,299	2,538	2,713	2,640	2,911	2,810	U
Rail, total	4,320	1,501	659	909	1,033	895	893	1,066	^R1,017	^R1,131	^R1,066	^R420	700	647
Federal	4,277	1,480	652	906	1,026	886	881	1,056	^R 1,006	^R 1,115	^R 1,044	^R 403	693	647
State and local	43	21	8	4	7	9	13	10	11	16	22	18	7	U
Pipeline, total^{b,a}	RZ	11	31	32	36	36	40	46	U	U	U	U	U	U
Federal ^a	RZ	RZ	11	11	14	15	17	21	33	30	33	32	33	26
State and local	RZ	11	19	21	22	22	24	25	U	U	U	U	U	U
General support, total^{c,a}	462	261	233	314	326	367	417	402	379	310	228	245	230	321
Federal / general support ^a	462	261	233	314	326	367	417	402	379	310	228	245	230	321

KEY: R = revised; RZ = no activity or a value of zero; U = data are not available.

^a data for 1985 and 1990 -2000 have been revised due to the Office of Management and Budget (OMB)'s revision to the source data on federal expenditure.

^b Includes gas and liquid pipeline.

^c General support represents administrative and operating expenditures of the U.S. Department of Transportation, the Interstate Commerce Commission (terminated at the end 1995), and the National Transportation Safety Board.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

1980: U.S. Department of Transportation, Bureau of Transportation Statistics, unpublished data.

1985–2001: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002* (Washington, DC: forthcoming).

Constant dollar deflator: U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts*, Washington, DC, table 7.1, "Chain-Type Price Index."

Table 3-30a: Federal Transportation Grants to State and Local Governments by Mode, Fiscal Year (Current \$ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total, all modes	14,581	18,146	19,689	20,488	21,349	23,037	23,278	^R 24,983	25,061	26,073	25,125	^R 27,861	^R 32,976	36,781
Highway	10,807	14,007	14,695	15,083	16,044	17,158	18,319	18,677	19,039	20,008	19,294	^R 22,029	^R 26,049	27,749
Air	590	789	1,220	1,541	1,672	1,931	1,620	^R 1,895	1,655	1,489	1,511	1,565	^R 1,624	2,017
Transit	3,129	3,304	3,728	3,817	3,577	3,885	3,267	4,353	4,291	4,499	4,221	4,188	^R 5,262	6,963
Water ^b	RZ	12	26	35	36	37	39	62	40	26	32	21	9	1
Rail	54	35	16	8	14	19	28	22	25	39	54	44	^R 19	37
Pipeline	RZ	RZ	4	5	6	7	5	10	11	12	13	14	13	14

KEY: R = revised; RZ = no activity or a value of zero.

^b Includes only federal grants for Boat Safety Program.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

1980: U.S. Department of Transportation, Bureau of Transportation Statistics, unpublished data.

1985-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002* (Washington, DC: forthcoming).

Table 3-30b: Federal Transportation Grants to State and Local Governments by Mode, Fiscal Year (Chained 1996 \$ millions)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total, all modes	26,033	25,397	24,022	23,807	24,338	25,155	24,620	^R 25,519	25,061	25,547	24,304	^R 26,217	^R 30,052	32,946
Highway	19,295	19,604	17,929	17,527	18,290	18,735	19,375	19,077	19,039	19,604	18,664	^R 23,739	^R 24,855	24,855
Air	1,054	1,104	1,489	1,790	1,906	2,109	1,713	^R 1,899	1,655	1,459	1,462	1,473	^R 1,480	1,807
Transit	5,586	4,624	4,549	4,435	4,078	4,243	3,455	4,446	4,291	4,408	4,083	3,941	^R 4,795	6,237
Water ^b	RZ	17	31	41	41	41	42	63	40	25	31	20	8	1
Rail	97	49	19	9	16	20	30	22	25	38	52	41	^R 17	33
Pipeline	RZ	RZ	5	5	7	7	6	10	11	12	13	13	12	13

KEY: R = revised; RZ = no activity or a value of zero.

^b Includes only federal grants for Boat Safety Program.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

1980: U.S. Department of Transportation, Bureau of Transportation Statistics, unpublished data.

1985–2001: U.S. Department of Transportation, Bureau of Transportation Statistics, *Government Transportation Financial Statistics 2002* (Washington, DC: forthcoming).

Constant dollar deflator: U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts*, Washington, DC, table 7.1, "Chain-Type Price Index."

Chapter 4

Transportation, Energy, and the Environment

Section A

U.S. and Transportation Section Energy Consumption

Table 4-1: Overview of U.S. Petroleum Production, Imports, Exports, and Consumption (Million barrels per day)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Domestic production, total ^a	7.96	9.01	11.30	10.05	10.21	10.64	8.99	9.17	9.00	8.84	8.65	8.63	8.61	8.61	8.39	8.11	8.11	8.05	(R) 8.04	7.88
Crude oil ^b	7.04	7.80	9.64	8.38	8.60	8.97	7.36	7.42	7.17	6.85	6.66	6.56	6.47	6.45	6.25	5.88	5.82	5.80	(R) 5.75	5.74
Natural gas plant liquids	0.93	1.21	1.66	1.63	1.57	1.61	1.56	1.66	1.70	1.74	1.73	1.76	1.83	1.82	1.76	1.85	1.91	1.87	1.88	1.72
Gross imports, total	1.81	2.47	3.42	6.06	6.91	5.07	8.02	7.63	7.89	8.62	9.00	8.84	9.48	10.16	10.71	10.85	11.46	11.87	(R) 11.53	12.25
Crude oil ^c	1.02	1.24	1.32	4.11	5.26	3.20	5.89	5.78	6.08	6.79	7.06	7.23	7.51	8.23	8.71	8.73	9.07	9.33	(R) 9.14	9.65
Petroleum products ^d	0.80	1.23	2.10	1.95	1.65	1.87	2.12	1.84	1.81	1.83	1.93	1.61	1.97	1.94	2.00	2.12	2.39	2.54	(R) 2.39	2.61
Exports	0.20	0.19	0.26	0.21	0.54	0.78	0.86	1.00	0.95	1.00	0.94	0.95	0.98	1.00	0.95	0.94	1.04	0.97	0.98	1.02
U.S. net imports ^e	1.61	2.28	3.16	5.85	6.37	4.29	7.16	6.63	6.94	7.62	8.05	7.89	8.50	9.16	9.76	9.91	10.42	10.90	(R) 10.55	11.24
U.S. petroleum consumption	9.80	11.51	14.70	16.32	17.06	15.73	16.99	16.71	17.03	17.24	17.72	17.72	18.31	18.62	18.92	19.52	19.70	19.65	19.76	(P) 20.04
By the transportation sector	5.14	6.04	7.78	8.95	9.55	(R) 9.84	(R) 10.89	(R) 10.76	(R) 10.88	(R) 11.12	(R) 11.42	(R) 11.67	(R) 11.92	(R) 12.10	(R) 12.42	(R) 12.77	(R) 13.01	(R) 12.94	(E) 13.12	(E) 13.24
Transportation petroleum use a percent of domestic petroleum production	64.5	67.0	68.8	89.1	93.5	(R) 92.5	(R) 121.1	(R) 117.4	(R) 121.0	(R) 125.9	(R) 132.0	(R) 135.3	(R) 138.5	(R) 140.5	(R) 148.0	(R) 157.5	(R) 160.4	(R) 160.6	163.1	168.2
Transportation petroleum use a percent of domestic petroleum consumption	52.4	52.4	52.9	54.8	56.0	(R) 62.6	(R) 64.1	(R) 64.4	(R) 63.9	(R) 64.5	(R) 64.4	(R) 65.8	(R) 65.1	(R) 65.0	(R) 65.7	(R) 65.4	(R) 66.0	(R) 65.8	66.4	66.1
World petroleum consumption	21.34	31.14	46.81	56.20	(R) 63.11	60.09	(R) 66.53	(R) 67.10	(R) 67.24	(R) 67.40	(R) 68.71	(R) 70.00	(R) 71.50	(R) 73.20	(R) 73.88	(R) 75.73	(R) 76.83	(R) 78.00	(R) 78.21	U
U.S. petroleum consumption as percent of world petroleum consumption	45.9	37.0	31.4	29.0	27.0	26.2	(R) 25.5	(R) 24.9	(R) 25.3	(R) 25.6	(R) 25.8	25.3	25.6	(R) 25.4	25.6	25.8	25.6	(R) 25.2	(R) 25.3	U

KEY: E = estimate; R = revised; U = data are not available.

^a Includes crude oil, natural gas plant liquids, and other liquids.

^b Includes lease condensate.

^c Includes imports for the Strategic Petroleum Reserve, which began in 1977.

^d Beginning in 1985, motor gasoline blending components and aviation gasoline blending components are included.

^e Net imports = imports minus exports.

NOTE

Numbers may not add to totals due to rounding.

SOURCES

Domestic production, imports, exports, and U.S. petroleum consumption:

1960-1970: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2000*, DOE/EIA-0384(2000) (Washington, DC: August 2001), table 5.1.

1975-2003: Ibid., *Monthly Energy Review* (Washington, DC: March 2003), tables 3.1a and 3.1b, Internet site <http://www.eia.doe.gov> as of Apr. 14, 2004.

World petroleum consumption:

1960-1970: Ibid., *Annual Energy Review 2000*, DOE/EIA-0384(2000) (Washington, DC: August 2001), table 11.9.

1975-2003: Ibid., *Annual Energy Review 2002*, DOE/EIA-0384(2003) (Washington, DC: September 2004), table 11.10, Internet site <http://www.eia.doe.gov> as of Sep. 16, 2004.

U.S. petroleum consumption by transportation sector:

1960-2001: Ibid., *Annual Energy Review 2001*, DOE/EIA-0384(2001) (Washington, DC: November 2002), table 5.12c.

2002-2003: Ibid., *Annual Energy Review 2002*, DOE/EIA-0384(2003) (Washington, DC: September 2004), table 5.13c, Internet site <http://www.eia.doe.gov> as of Sep. 16, 2004.

Table 4-2: U.S. Consumption of Energy from Primary Sources by Sector (Quadrillion Btu)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Energy consumption, total	43.80	52.68	66.43	72.00	78.29	76.42	84.61	84.52	85.87	(R) 87.58	89.25	91.22	94.22	94.73	95.15	96.77	(R) 98.91	96.32	(R) 98.24	98.25
Transportation	10.56	12.40	16.06	18.21	19.66	20.02	22.47	22.07	22.41	22.83	23.45	23.91	24.46	24.75	(R) 25.30	(R) 26.05	(R) 26.65	(R) 26.21	(R) 26.63	26.82
Transportation as percent of total energy consumption	24.1	23.5	24.2	25.3	25.1	(R) 26.2	(R) 26.6	(R) 26.1	(R) 26.1	(R) 26.1	26.3	(R) 26.2	26.0	26.1	(R) 26.6	(R) 26.9	(R) 26.9	(R) 27.2	(R) 27.1	27.3
Industrial	16.26	19.24	21.92	21.45	22.67	19.54	21.24	20.90	21.81	(R) 21.74	22.38	22.64	23.36	23.61	23.07	(R) 22.83	(R) 22.74	(R) 21.82	(R) 22.06	21.68
Industrial as percent of total energy consumption	37.1	36.5	33.0	(R) 29.8	(R) 29.0	(R) 25.6	(R) 25.1	(R) 24.7	25.4	(R) 24.8	(R) 25.1	(R) 24.8	(R) 24.8	(R) 24.9	(R) 24.2	(R) 23.6	(R) 23.0	(R) 22.7	(R) 22.5	22.1
Residential and commercial	8.75	10.00	12.14	12.03	11.60	10.70	(R) 10.27	(R) 10.55	(R) 10.78	(R) 11.01	10.88	11.05	11.77	11.34	(R) 10.42	(R) 10.79	(R) 11.34	(R) 10.98	(R) 11.10	11.42
Residential and commercial as percent of total energy consumption	20.0	19.0	18.3	16.7	14.8	(R) 14.0	12.1	12.5	12.6	12.6	12.2	12.1	12.5	12.0	(R) 10.9	(R) 11.2	11.5	(R) 11.4	(R) 11.3	11.6
Energy input at electric utilities	8.19	11.01	16.27	20.31	24.36	26.16	30.65	31.00	30.87	32.01	32.55	33.62	34.63	35.02	36.36	37.10	(R) 38.18	(R) 37.32	(R) 38.44	38.33
Energy input at electric utilities as percent of total energy consumption	18.7	20.9	24.5	(R) 28.2	(R) 31.1	(R) 34.2	36.2	36.7	(R) 36.0	(R) 36.5	(R) 36.5	(R) 36.9	(R) 36.7	(R) 37.0	(R) 38.2	(R) 38.3	38.6	(R) 38.7	(R) 39.1	39.0
Percentage of primary demand met by petroleum																				
Transportation	96.0	95.7	95.3	96.7	96.7	97.4	97.0	97.2	97.3	97.2	97.0	97.0	97.0	(R) 96.8	97.4	97.4	97.5	(R) 97.5	(R) 97.4	97.5
Industrial	35.4	35.3	35.5	38.0	(R) 42.0	(R) 39.9	(R) 39.1	(R) 38.5	(R) 39.5	(R) 38.6	(R) 39.3	(R) 37.8	(R) 38.5	(R) 39.0	(R) 39.1	(R) 40.7	(R) 39.8	(R) 42.3	(R) 41.9	43.4
Residential and commercial	39.8	38.6	35.4	31.6	26.2	23.6	21.2	(R) 20.4	(R) 19.7	(R) 19.4	(R) 19.1	(R) 18.7	(R) 19.0	(R) 19.0	(R) 19.0	(R) 19.4	(R) 19.7	(R) 20.8	(R) 20.3	20.2
Electric utilities	6.7	6.7	13.0	(R) 15.6	(R) 10.8	(R) 4.2	(R) 4.2	(R) 3.9	(R) 3.2	(R) 3.5	(R) 3.3	(R) 2.2	(R) 2.4	(R) 2.6	(R) 3.6	(R) 3.3	(R) 3.0	(R) 3.4	(R) 2.5	3.1

KEY: Btu = British thermal unit; R = revised.

NOTES

The data for residential, commercial, and industrial sectors include only fossil fuels consumed directly. Most renewable fuels are not included. The data for the transportation sector includes only fossil and renewable fuels consumed directly. The data for electric utilities includes all fuels (fossil, nuclear, geothermal, hydro, and other renewables) used by electric utilities. Due to a lack of consistent monthly historical data, some renewable energy resources are not included in this table. The totals in table 4-4 are the best numbers for total U.S. energy consumption from all sources.

The April 2003 *Monthly Energy Review* included extensive revisions to historical data. These revisions are most noticeable in the electricity, natural gas, coal, renewable energy, and total energy consumption data.

Numbers may not add to totals due to rounding.

SOURCES

1960-70: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1990*, DOE/EIA-0394(90) (Washington, DC: May 1991), table 4.

1975-2003: Ibid., *Monthly Energy Review*, DOE/EIA-0035(2004/05) (Washington, DC: June 2004), tables 2.1, 2.2, 2.3, 2.4, 2.5, and 2.6.

Section B

Transportation Energy Consumption by Mode

Table 4-3: Domestic Demand for Refined Petroleum Products by Sector (Quadrillion Btu)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
TOTAL petroleum demand	19.92	23.26	29.53	32.73	34.20	30.92	(R) 33.55	32.85	33.53	33.84	34.67	34.55	35.76	36.27	36.93	37.96	38.40	38.33	(R) 38.40	39.07
Transportation	10.13	11.87	15.31	17.61	19.01	19.50	(R) 21.79	(R) 21.45	(R) 21.80	(R) 22.19	(R) 22.74	(R) 23.18	(R) 23.72	(R) 23.97	(R) 24.64	(R) 25.38	(R) 25.97	(R) 25.56	(R) 25.93	26.15
Industrial	5.75	6.79	7.79	8.15	9.53	7.81	(R) 8.31	(R) 8.05	(R) 8.62	(R) 8.40	(R) 8.79	(R) 8.55	(R) 8.99	(R) 9.21	(R) 9.02	(R) 9.28	(R) 9.06	(R) 9.22	(R) 9.25	9.42
Residential and commercial	3.49	3.87	4.31	3.81	3.04	2.52	(R) 2.18	2.15	(R) 2.12	2.14	(R) 2.08	(R) 2.07	(R) 2.23	(R) 2.15	(R) 1.98	(R) 2.09	(R) 2.23	(R) 2.28	(R) 2.26	2.30
Electric utilities	0.55	0.73	2.12	3.17	2.63	1.09	(R) 1.29	(R) 1.20	(R) 0.99	(R) 1.12	(R) 1.06	(R) 0.76	(R) 0.82	(R) 0.93	(R) 1.31	(R) 1.21	(R) 1.14	(R) 1.28	(R) 0.96	1.21
Transportation as percent of total petroleum demand	50.9	51.0	51.8	53.8	55.6	63.1	64.9	65.3	65.0	65.6	65.6	67.1	66.3	66.1	66.7	66.8	67.6	66.7	67.5	66.9

KEY: Btu = British thermal unit; R = revised.

NOTE

Transportation's share of U.S. petroleum demand in this table differs slightly from table 4-1 because this table takes into account differences within sectors in the use of various grades of petroleum-based fuel that have different Btu content per unit volume. The April 2003 *Monthly Energy Review* includes extensive revisions to historical data.

SOURCES

1960-70: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1997*, DOE/EIA-0384(97) (Washington, DC: July 1998), tables 2.1, 5.12b, and A3.
 1975-2003: *Ibid.*, *Monthly Energy Review*, DOE/EIA-0035(2004/05) (Washington, DC: June 2004), tables 1.3, 2.2, 2.3, 2.4, 2.5, 2.6, and similar tables in earlier editions.

Table 4-4: U.S. Energy Consumption by the Transportation Sector (Quadrillion Btu)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Energy consumption (all sectors)	45.12	54.02	67.86	(R) 72.00	(R) 78.29	(R) 76.42	(R) 84.60	(R) 84.52	(R) 85.87	(R) 87.58	(R) 89.25	(R) 91.22	(R) 94.22	(R) 94.73	(R) 95.15	96.77	(R) 98.90	(R) 96.32	(R) 98.24	98.24
Total transportation consumption ^a	10.60	12.43	16.10	18.24	19.70	20.07	(R) 22.53	(R) 22.12	(R) 22.46	(R) 22.88	(R) 23.50	(R) 23.96	(R) 24.51	(R) 24.81	(R) 25.36	(R) 26.11	(R) 26.70	(R) 26.27	(R) 26.69	26.87
Transportation as percent of total energy consumption	23.5	23.0	23.7	25.3	25.2	26.3	(R) 26.6	(R) 26.2	(R) 26.2	(R) 26.1	(R) 26.3	(R) 26.3	(R) 26.0	(R) 26.2	(R) 26.7	(R) 27.0	(R) 27.0	(R) 27.3	(R) 27.2	27.4
Total primary consumption ^b	10.56	12.40	16.06	18.21	19.66	20.02	(R) 22.47	(R) 22.07	(R) 22.41	(R) 22.83	(R) 23.45	(R) 23.90	(R) 24.46	(R) 24.75	(R) 25.30	(R) 26.05	(R) 26.64	(R) 26.21	(R) 26.63	26.82
Coal	0.074	0.017	0.007	0.001	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f
Million short tons	3.0	0.7	0.3	<0.05	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f
Natural gas ^c	0.36	0.52	0.75	(R) 0.59	0.65	0.52	0.68	0.62	0.61	0.64	0.71	0.72	(R) 0.74	0.78	(R) 0.67	(R) 0.68	0.67	(R) 0.66	(R) 0.70	0.67
Trillion cubic feet	0.35	0.50	0.72	0.58	(R) 0.63	0.50	0.66	0.60	0.59	0.63	0.69	0.70	(R) 0.72	0.76	0.64	(R) 0.66	0.65	(R) 0.64	(R) 0.68	0.65
Petroleum products ^d	10.13	11.87	15.31	17.61	19.01	19.50	(R) 21.79	(R) 21.45	(R) 21.80	(R) 22.18	(R) 22.74	(R) 23.18	(R) 23.72	(R) 23.97	(R) 24.64	(R) 25.37	(R) 25.97	(R) 25.56	(R) 25.93	26.15
Million barrels	1,879	2,203	2,839	3,267	3,494	3,597	4,003	3,942	4,004	4,080	4,191	4,278	4,376	4,426	4,549	4,683	4,789	(E) 4,804	U	U
Electricity	0.010	0.010	0.011	0.010	0.011	0.014	0.016	0.016	0.016	0.016	0.017	0.017	0.017	0.017	0.017	0.017	0.018	(R) 0.019	0.018	0.018
Electrical system energy losses ^e	0.026	0.024	0.026	(R) 0.024	0.027	0.033	0.037	0.037	(R) 0.037	(R) 0.037	0.038	(R) 0.039	(R) 0.038	(R) 0.038	(R) 0.038	(R) 0.040	(R) 0.042	(R) 0.042	(R) 0.040	0.040

KEY: Btu = British thermal unit; E = estimated; R = revised; U = data are not available.

^a Sum of primary consumption, electricity, and electrical system energy losses categories.

^b Sum of coal, natural gas, and petroleum categories.

^c Consumed in the operation of pipelines, primarily in compressors, and small amounts consumed as vehicle fuel.

^d Includes most nonutility use of fossil fuels to produce electricity and small amounts (about 0.1 quadrillion Btu per year since 1990) of renewable energy in the form of ethanol blended into motor gasoline.

^e Incurred in the generation, transmission, and distribution of electricity plus plant use and unaccounted for electrical system energy losses.

^f From 1980, small amounts of coal consumed for transportation are included in industrial sector consumption.

NOTES

Energy consumption (all sectors) differs from totals in table 4-2 for 1990 and subsequent years.

Table 4-2 includes primary energy consumption only.

SOURCES

Energy consumption (all sectors), total transportation consumption and total primary consumption:

1960-70: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2000*, DOE/EIA-0384 (2000) (Washington DC: August 2001) table 2.1a.

1975-2003: Ibid., *Monthly Energy Review* (Washington DC: May 2004), table 2.1.

Coal:

Btu:

1960-70: Ibid., *Annual Energy Review 2000*, DOE/EIA-0384 (2000) (Washington DC: August 2001) table 2.1e.

1975-2003: Ibid., *Monthly Energy Review* (Washington DC: May 2004), table 2.5.

Short tons:

1960-70: Ibid., *Annual Energy Review 2000*, DOE/EIA-0384 (2000) (Washington DC: August 2001) table 7.3.

1975-2003: Ibid., *Monthly Energy Review* (Washington DC: May 2004), table 6.2.

Natural gas:

Btu:

1960-70: Ibid., *Annual Energy Review 2000*, DOE/EIA-0384 (2000) (Washington DC: August 2001) table 2.1e.

1975-2003: Ibid., *Monthly Energy Review* (Washington DC: May 2004), table 2.5.

Cubic feet:

1960-70: Ibid., *Annual Energy Review 2000*, DOE/EIA-0384 (2000) (Washington DC: August 2001) table 6.5.

1975-2003: Ibid., *Monthly Energy Review* (Washington DC: May 2004), table 4.4.

Petroleum products:

Btu:

1960-70: Ibid., *Annual Energy Review 2000*, DOE/EIA-0384 (2000) (Washington DC: August 2001) table 2.1e.

1975-2003: Ibid., *Monthly Energy Review* (Washington DC: May 2004), table 2.5.

Barrels:

1960-2001: Ibid., *Annual Energy Review 2001*, DOE/EIA-0384 (2001) (Washington DC: November 2002) table 5.12c.

(barrels/day x 365 or 366 for leap years).

Electricity and electrical system energy losses:

1960-70: Ibid., *Annual Energy Review 2000*, DOE/EIA-0384 (2000) (Washington DC: August 2001) table 2.1e.

1975-2003: Ibid., *Monthly Energy Review* (Washington DC: May 2004), table 2.5.

Table 4-5: Fuel Consumption by Mode of Transportation

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Air																			
Certificated carriers ^a																			
Jet fuel (million gallons)	1,954	3,889	7,857	7,558	8,519	10,115	(R) 12,323	11,506	11,763	11,959	(R) 12,384	(R) 12,672	(R) 13,217	(R) 13,563	(R) 13,335	14,402	14,845	14,017	12,848
General aviation ^b																			
Aviation gasoline (million gallons)	242	292	551	412	520	421	353	354	314	268	266	287	289	292	311	345	(R) 333	(R) 275	278
Jet fuel (million gallons)	N	56	208	453	766	691	663	577	494	454	464	560	608	642	815	967	(R) 972	(R) 953	984
Highway																			
Gasoline, diesel and other fuels (million gallons)																			
Passenger car and motorcycle	41,171	49,723	67,879	74,253	70,186	71,700	69,759	64,501	65,627	67,246	68,079	68,268	69,419	70,094	71,901	73,495	73,275	(R) 73,752	75,140
Other 2-axle 4-tire vehicle	N	e	12,313	19,081	23,796	27,363	35,611	38,217	40,929	42,851	44,112	45,605	47,354	49,388	50,462	52,859	52,939	(R) 53,522	54,841
Single-unit 2-axle 6-tire or more truck	N	13,848	3,968	5,420	6,923	7,399	8,357	8,172	8,237	8,488	9,032	9,216	9,409	9,576	6,817	9,372	9,563	(R) 9,667	10,305
Combination truck	N	6,658	7,348	9,177	13,037	14,005	16,133	16,809	17,216	17,748	18,653	19,777	20,193	20,302	25,158	24,537	25,666	(R) 25,512	26,451
Bus	827	875	820	1,053	1,018	834	895	864	878	929	964	968	990	1,027	1,040	1,148	1,112	(R) 1,026	993
Transit^c																			
Electricity (million kWh)	2,908	2,584	2,561	2,646	2,446	4,216	4,837	4,853	4,716	4,865	5,081	5,068	5,007	4,988	5,073	5,237	5,510	5,610	(P) 5,649
Motor fuel (million gallons)																			
Diesel	208	248	271	365	431	609	651	665	685	679	678	678	693	717	740	763	786	745	(P) 725
Gasoline and other nondiesel fuels ^d	192	124	68	8	11	46	34	34	37	46	60	61	61	59	53	49	48	46	(P) 57
Compressed natural gas	N	N	N	N	N	N	N	N	1	2	5	11	15	24	37	44	55	66	(P) 81
Rail, Class I (in freight service)																			
Distillate / diesel fuel (million gallons)	3,463	3,592	3,545	3,657	3,904	3,110	3,115	2,906	3,005	3,088	3,334	3,480	3,579	3,575	3,583	3,715	3,700	3,710	3,730
Amtrak																			
Electricity (million kWh)	N	N	N	180	254	295	330	303	300	301	309	304	293	282	275	283	350	377	U
Distillate / diesel fuel (million gallons)	N	N	N	63	64	65	82	82	82	83	75	66	71	75	75	74	76	75	U
Water																			
Residual fuel oil (million gallons)	3,952	3,093	3,774	4,060	8,952	4,590	6,326	6,773	6,563	5,282	5,386	5,886	5,701	5,010	5,620	5,838	6,410	5,409	4,848
Distillate / diesel fuel oil (million gallons)	787	652	819	1,098	1,478	1,699	2,065	2,046	2,219	2,155	2,189	2,339	2,491	2,574	2,595	2,419	2,261	2,044	2,079
Gasoline (million gallons)	N	N	598	730	1,052	1,053	1,300	1,710	1,316	874	876	1,060	994	987	956	1,098	1,124	994	1,081
Pipeline																			
Natural gas (million cubic feet)	347,075	500,524	722,166	582,963	634,622	503,766	659,816	601,305	587,710	624,308	685,362	700,335	711,446	751,470	635,477	645,319	642,210	(R) 624,964	667,027

KEY: kWh = kilowatt-hour; N = data do not exist; P = preliminary; R = revised; U = data are unavailable.

^a Domestic operations only.

^b Includes fuel used in air taxi operations, but not commuter operations. Data for 1996 are estimated using new information on nonrespondents and are therefore not comparable to earlier years. See the accuracy statement in the appendix for more detailed information.

^c Prior to 1984, excludes commuter rail, automated guideway, ferryboat, demand responsive vehicles, and most rural and small systems.

^d Gasoline and all other nondiesel fuels such as liquefied natural gas, methanol, and propane, except compressed natural gas.

^e Included in single-unit 2-axle 6-tire or more truck category.

SOURCES

Air:

Certificated air carriers:

1960-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Internet site <http://www.bts.gov/oai/fuel/fueyearly.html> as of June 23, 2004.

General aviation:

1960-70: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation - 1972 edition* (Washington, DC: 1973), table 9.12.

1975-93: *Ibid.*, *General Aviation and Air Taxi Activity Survey* (Washington, DC: Annual issues), table 5.1, and similar tables in earlier editions.

1994-2002: *Ibid.*, *FAA Aerospace Forecasts Fiscal Years 2004-2015* (Washington, DC: March 2004), table 34 and similar tables in earlier editions.

Highway:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A. (Revised data obtained from Internet site <http://www.fhwa.dot.gov/ohim/ohimstat.htm> as of August 2001).

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Transit:

Electricity / motor fuel / compressed natural gas:

1960-2002: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: February 2003), tables 33, 34, 35, and similar tables in earlier editions.

Rail:

1960-2002: Association of American Railroads, *Railroad Facts* (Washington, DC: October 2003), p. 40.

Amtrak:

1975-2001: Amtrak, Energy Management Department, personal communication.

Water:

Residual and distillate / diesel fuel oil:

1960-80: American Petroleum Institute, *Basic Petroleum Data Book* (Washington, DC: Annual issues), tables 10, 10a, 12, and 12a.

1985-2002: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual issues), tables 2, 4, and similar tables in earlier editions.

Gasoline:

1970-2002: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table MF-24 and similar tables in earlier editions.

Pipeline:

1960-2002: U.S. Department of Energy, *Natural Gas Annual 2002*, DOE/EIA-0131(02) (Washington, DC: January 2004), table 15 and similar tables in earlier editions.

Table 4-6: Energy Consumption by Mode of Transportation (Trillion Btu)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Air																			
Certificated carriers ^a																			
Jet fuel	264	525	1,061	1,020	1,150	1,366	(R) 1,664	1,553	1,588	1,614	(R) 1,672	(R) 1,711	(R) 1,784	(R) 1,831	(R) 1,800	1,944	2,004	1,892	1,735
General aviation ^b																			
Aviation gasoline	29	35	66	50	63	51	42	43	38	32	32	35	35	35	37	42	(R) 40	(R) 33	33
Jet fuel	N	8	28	61	103	93	90	78	67	61	63	76	82	87	110	131	(R) 131	(R) 129	133
Highway																			
Gasoline, diesel and other fuels																			
Passenger car and motorcycle	5,146	6,215	8,485	9,282	8,773	8,963	8,720	8,063	8,203	8,406	8,510	8,534	8,677	8,762	8,988	9,187	9,159	(R) 9,219	9,392
Other 2-axle 4-tire vehicle	N	e	1,539	2,385	2,975	3,420	4,451	4,777	5,116	5,356	5,514	5,701	5,919	6,173	6,308	6,607	6,617	(R) 6,690	6,855
Single-unit 2-axle 6-tire or more truck	N	1,921	550	752	960	1,026	1,159	1,133	1,142	1,177	1,253	1,278	1,305	1,328	946	1,300	1,326	(R) 1,341	1,429
Combination truck	N	923	1,019	1,273	1,808	1,942	2,238	2,331	2,388	2,462	2,587	2,743	2,801	2,816	3,489	3,403	3,560	(R) 3,538	3,669
Bus	115	121	114	146	141	116	124	120	122	129	134	134	137	142	144	159	154	(R) 142	138
Transit^c																			
Electricity	10	9	9	9	8	14	17	17	16	17	17	17	17	17	17	18	19	19	(P) 19
Motor fuel																			
Diesel	29	34	38	51	60	84	90	92	95	94	94	94	96	99	103	106	109	103	(P) 100
Gasoline and other nondiesel fuels ^d	24	16	9	1	1	6	4	4	5	6	8	8	8	7	7	6	6	6	(P) 7
Compressed natural gas	N	N	N	N	N	N	N	N	<1	<1	1	1	2	3	5	6	8	9	(P) 11
Rail, Class I (in freight service)																			
Distillate / diesel fuel	480	498	492	507	541	431	432	403	417	428	462	483	496	496	497	515	513	515	517
Amtrak																			
Electricity	N	N	N	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	U
Distillate / diesel fuel	N	N	N	9	9	9	11	11	11	12	10	9	10	10	10	10	11	10	U
Water																			
Residual fuel oil	592	463	565	608	1,340	687	947	1,014	983	791	806	881	853	750	841	874	960	810	726
Distillate / diesel fuel oil	109	90	114	152	205	236	286	284	308	299	304	324	345	357	360	336	314	284	288
Gasoline	N	N	75	91	132	132	163	214	165	109	109	133	124	123	120	137	141	124	135
Pipeline																			
Natural gas	358	516	745	601	654	519	680	620	606	644	707	722	734	775	655	665	662	(R) 644	688

KEY: Btu = British thermal unit; N = data do not exist; P = preliminary; R = revised; U = data are unavailable.

^a Domestic operations only.

^b Includes fuel used in air taxi operations, but not commuter operations.

^c Prior to 1984, excludes commuter rail, automated guideway, ferryboat, demand responsive vehicles, and most rural and smaller

^d Gasoline and all other nondiesel fuels such as liquefied natural gas, methanol, and propane, except compressed natural gas.

^e Included in other single-unit 2-axle 6-tire or more truck category.

NOTES

The following conversion rates were used:

Jet fuel = 135,000 Btu/gallon	Compressed natural gas = 138,700 Btu/gallon
Aviation gasoline = 120,200 Btu/gallon	Distillate fuel = 138,700 Btu/gallon
Automotive gasoline = 125,000 Btu/gallon	Residual fuel = 149,700 Btu/gallon
Diesel motor fuel = 138,700 Btu/gallon	Natural gas = 1,031 Btu/ft ³

Electricity 1kWh = 3,412 Btu, negating electrical system losses. To include approximate electrical system losses, multiply this conversion factor by 3.

SOURCES

Air:

Certificated air carriers:

1960-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Internet site <http://www.bts.gov/oai/fuel/fuelyearly.html> as of June 23, 2004.

General aviation:

1960-70: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation*: - 1972 edition (Washington, DC: 1973), table 9.12.

1975-93: *Ibid.*, *General Aviation and Air Taxi Activity Survey* (Washington, DC: Annual issues), table 5.1, and similar tables in earlier editions.

1994-2002: *Ibid.*, *FAA Aerospace Forecasts Fiscal Years 2004-2015* (Washington, DC: March 2004), table 34 and similar tables in earlier editions.

Highway:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A. (Revised data obtained from Internet site <http://www.fhwa.dot.gov/ohim/ohimstat.htm> as of August 2001).

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Transit:

Electricity / motor fuel / compressed natural gas:

1960-2002: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: February 2003), tables 33, 34, 35, and similar tables in earlier editions.

Rail:

1960-2002: Association of American Railroads, *Railroad Facts* (Washington, DC: October 2003), p. 40.

Amtrak:

1975-2001: Amtrak, Energy Management Department, personal communication.

Water:

Residual and distillate / diesel fuel oil:

1960-80: American Petroleum Institute, *Basic Petroleum Data Book* (Washington, DC: Annual issues), tables 10, 10a, 12, and 12a.

1985-2002: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual issues), tables 2, 4, and similar tables in earlier editions.

Gasoline:

1970-2002: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table MF-24 and similar tables in earlier editions.

Pipeline:

1960-2002: U.S. Department of Energy, *Natural Gas Annual 2002*, DOE/EIA-0131(02) (Washington, DC: January 2004), table 15 and similar tables in earlier editions.

Table 4-7: Domestic Demand for Gasoline (Million gallons) by Mode

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL demand	60,761	71,187	89,601	102,996	104,838	107,550	113,606	112,222	114,883	116,579	118,717	120,253	122,595	124,235	127,978	131,781	131,891	133,740	137,260
Highway	55,429	66,979	85,598	99,354	101,183	103,545	109,529	107,913	110,974	113,668	115,682	117,061	119,515	120,938	124,694	128,743	128,884	129,682	132,955
Nonhighway, total	5,332	4,208	4,003	3,642	3,655	4,005	4,076	4,309	3,908	2,911	3,035	3,192	3,081	3,297	3,284	3,038	3,007	4,058	4,305
Agriculture	2,292	1,963	1,932	1,565	1,059	1,081	681	779	806	846	912	927	918	984	907	703	652	802	832
Aviation ^a	1,324	501	393	410	413	382	361	339	344	340	364	367	344	335	351	322	296	356	342
Marine	61	96	598	730	1,052	1,053	1,300	1,710	1,319	874	897	1,060	994	987	956	1,098	1,124	994	1,081
Other ^b	1,656	1,647	1,080	938	1,131	1,490	1,733	1,482	1,439	850	862	838	825	990	1,070	915	934	1,907	2,051

^a Does not include aviation jet fuel.

^b Includes state, county, and municipal use, industrial and commercial use, construction use, and miscellaneous.

NOTES

All nonhighway uses of gasoline were estimated by the U.S. Department of Transportation, Federal Highway Administration.

These estimates may not be comparable to data for prior years due to revised estimation procedures.

Numbers may not add to totals due to rounding.

SOURCES

Highway:

1960-95: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995* (Washington, DC: 1996), table MF-221.

1996-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table MF-21.

Nonhighway:

1960-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table MF-24, and unpublished revisions.

Table 4-8: Certificated Air Carrier Fuel Consumption and Travel^a

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Number of aircraft	2,135	2,125	2,679	2,495	3,808	4,678	6,083	6,054	7,320	7,297	7,370	7,411	7,478	7,616	8,111	8,228	8,055	8,497	8,194	U
Average miles flown per aircraft (thousands)	487	667	949	932	768	740	776	770	669	701	727	759	783	791	768	797	862	802	835	U
Aircraft-miles (millions)																				
Domestic operations	858	1,134	2,068	1,948	2,523	3,046	3,963	3,854	3,995	4,157	4,380	4,629	4,811	4,911	5,035	5,332	5,664	5,548	(R) 5,616	6,085
International operations	182	284	475	377	401	415	760	807	904	961	980	998	1,043	1,114	1,192	1,225	1,282	1,266	1,225	1,246
Fuel consumption (million gallons)																				
Domestic operations	1,954	3,889	7,857	7,558	8,519	10,115	12,429	11,506	11,763	11,959	12,476	12,812	13,187	13,660	13,877	14,402	14,845	14,017	12,848	12,959
International operations	566	1,280	2,243	1,949	1,747	2,488	3,963	3,940	4,120	4,113	4,311	4,511	4,658	4,964	5,186	5,250	5,475	5,237	4,991	4,836
Aircraft-miles flown per gallon																				
Domestic operations	0.44	0.29	0.26	0.26	0.30	0.30	0.32	0.33	0.34	0.35	0.35	0.36	0.36	0.36	0.36	0.37	0.38	0.40	0.44	0.47
International operations	0.32	0.22	0.21	0.19	0.23	0.17	0.19	0.20	0.22	0.23	0.23	0.22	0.22	0.22	0.23	0.23	0.23	0.24	0.25	0.26

KEY: R = revised; U = data are unavailable.

^a Aircraft operating under 14 CFR 121 and 14 CFR 135.

SOURCES

Number of aircraft:

1960-65: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, 1970 edition* (Washington, DC: 1970), table 5.3.

1970-75: Ibid., *FAA Statistical Handbook of Aviation, Calendar Year 1979* (Washington, DC: 1979), table 5.1.

1980-85: Ibid., *FAA Statistical Handbook of Aviation, Calendar Year 1986* (Washington, DC: 1986), table 5.1.

1990-97: Ibid., *FAA Statistical Handbook of Aviation, Calendar Year 1997* (Washington, DC: unpublished), personal communication, Mar. 19, 1999.

1998-2002: Aerospace Industries Association, *Aerospace Facts and Figures* (Washington DC: Annual Issues), "Active U.S. Air Carrier Fleet."

Aircraft-miles flown:

1960: Civil Aeronautics Board, *Handbook of Airline Statistics 1969* (Washington, DC: 1970), part III, tables 2 and 13.

1965-70: Ibid., *Handbook of Airline Statistics 1973* (Washington, DC: 1974), part III, tables 2 and 13.

1975-80: Ibid., *Air Carrier Traffic Statistics* (Washington, DC: December 1976), pp. 4 and 14; and (December 1981), pp. 2 and 3.

1985-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues, December), pp. 2 and 3, line 27 plus line 50.

2002-2003: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues, December), pp. 3 and 4, line 25 plus line 46.

Fuel consumption:

1960-2003: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Internet site <http://www.bts.gov/programs/oai/fuel/fuelyearly.html> as of June 25, 2004.

Table 4-9: Motor Vehicle Fuel Consumption and Travel

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Vehicles registered (thousands) ^a	73,858	90,358	111,242	137,913	161,490	177,133	193,057	192,314	194,427	198,041	201,802	205,427	210,441	211,580	215,496	220,461	225,821	235,331	234,624
Vehicle-miles traveled (millions)	718,762	887,812	1,109,724	1,327,664	1,527,295	1,774,826	2,144,362	2,172,050	2,247,151	2,296,378	2,357,588	2,422,696	2,485,848	2,561,695	2,631,522	2,691,056	2,746,925	(R) 2,797,287	2,855,756
Fuel consumed (million gallons)	57,880	71,104	92,329	108,984	114,960	121,301	130,755	128,563	132,888	137,262	140,839	143,834	147,365	150,386	155,379	161,411	162,554	(R) 163,478	167,730
Average miles traveled per vehicle (thousands)	9.7	9.8	10.0	9.6	9.5	10.0	11.1	11.3	11.6	11.6	11.7	11.8	11.8	12.1	12.2	12.2	12.2	(R) 11.9	12.2
Average miles traveled per gallon	12.4	12.5	12.0	12.2	13.3	14.6	16.4	16.9	16.9	16.7	16.7	16.8	16.9	17.0	16.9	16.7	16.9	17.1	17.0
Average fuel consumed per vehicle (gallons)	784	787	830	790	712	685	677	669	683	693	698	700	700	711	721	732	720	(R) 695	715

KEY: R = revised.

^a Includes personal passenger vehicles, buses, and trucks.

NOTE

See tables 4-11, 4-12, 4-13, 4-14, and 4-15 for individual highway vehicles.

SOURCES

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-10: Estimated Consumption of Alternative and Replacement Fuels for Highway Vehicles (Thousand gasoline-equivalent gallons)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	^{PP} 2003	^{PP} 2004
TOTAL fuel consumption ^a	134,230,631	135,912,964	140,718,522	144,774,683	148,180,046	151,597,859	^R 156,838,150	^R 161,210,087	^R 163,032,677	^R 165,201,691	169,983,219	173,303,895	177,561,958
Alternative fuels, total	229,631	293,334	281,152	276,643	295,616	312,589	^R 323,790	^R 302,287	^R 322,307	^R 348,421	378,589	412,725	447,198
Liquefied petroleum gases	208,142	264,655	248,467	232,701	239,158	238,356	^R 241,386	^R 209,817	^R 212,576	^R 215,876	223,143	230,486	242,368
Compressed natural gas	16,823	21,603	24,160	35,162	46,923	65,192	^R 72,412	^R 79,620	^R 86,475	^R 104,496	120,670	141,726	159,464
Liquefied natural gas	585	1,901	2,345	2,759	3,247	3,714	5,343	^R 5,828	^R 7,259	^R 8,921	9,382	10,514	10,868
Methanol, 85% ^b	1,069	1,593	2,340	2,023	1,775	1,554	1,212	1,073	^R 585	^R 439	337	274	257
Methanol, neat	2,547	3,166	3,190	2,150	347	347	449	447	^R 0	^R 0	0	0	0
Ethanol, 85% ^b	21	48	80	190	694	1,280	1,727	^R 3,916	^R 12,071	^R 14,623	17,783	20,092	22,405
Ethanol, 95% ^b	85	80	140	995	2,699	1,136	59	^R 62	^R 13	^R 0	0	0	0
Electricity ^c	359	288	430	663	773	1,010	1,202	^R 1,524	^R 3,058	^R 4,066	7,274	9,633	11,836
Biodiesel	N	N	N	N	N	N	N	N	6,816	7,076	16,917	26,758	36,599
Oxygenates													
Methyl-tertiary-butyl-ether ^d	1,175,000	2,069,200	2,018,800	2,691,200	2,749,700	3,104,200	^R 2,903,400	^R 3,402,600	^R 3,296,100	^R 3,352,200	2,383,000	U	U
Ethanol in gasohol	701,000	760,000	845,900	910,700	660,200	830,700	^R 889,500	^R 950,300	^R 1,085,800	^R 1,143,300	1,413,600	1,792,900	2,052,000
Traditional fuels, total	134,001,000	135,619,630	140,437,370	144,498,040	147,884,430	151,285,270	156,514,360	160,907,800	^R 162,710,370	^R 164,853,270	169,604,630	172,891,170	177,114,760
Gasoline ^e	110,135,000	111,323,000	113,144,000	115,943,000	117,783,000	119,336,000	122,849,000	125,111,000	^R 125,720,000	^R 127,768,000	131,299,000	132,961,000	136,374,000
Diesel	23,866,000	24,296,630	27,293,370	28,555,040	30,101,430	31,949,270	33,665,360	35,796,800	^R 36,990,370	^R 37,085,270	38,305,630	39,930,170	40,740,760

KEY: N = data do not exist; PP = based on plans or projections; R = revised; U = data are not available.

^a Total fuel consumption is the sum of alternative fuels, gasoline, and diesel. Oxygenate consumption is included in gasoline consumption.

^b The remaining portion of 85% methanol, 85% ethanol, and 95% ethanol fuels is gasoline. Consumption data include the gasoline portion of the fuel.

^c Excludes gasoline-electric hybrids.

^d Includes a very small amount of other ethers, primarily tertiary-amyl-methyl-ether and ethyl-tertiary-butyl-ether.

^e Gasoline consumption includes ethanol in gasohol and methyl-tertiary-butyl-ether.

NOTE

Numbers may not add to totals due to rounding.

SOURCE

U.S. Department of Energy, Energy Information Administration, *Alternatives to Traditional Transportation Fuels 2003*, Table 10 available at <http://www.eia.doe.gov/fuel/alternate.html> as of Feb. 27, 2004.

Table 4-11: Passenger Car and Motorcycle Fuel Consumption and Travel

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Vehicles registered (thousands)																			
Passenger cars	61,671	75,258	89,244	106,706	121,601	127,885	133,700	128,300	126,581	127,327	127,883	128,387	129,728	129,749	131,839	132,432	133,621	137,633	135,921
Motorcycles	574	1,382	2,824	4,964	5,694	5,444	4,259	4,177	4,065	3,978	3,757	3,897	3,872	3,826	3,879	4,152	4,346	4,903	5,004
Vehicle-miles traveled (millions)																			
Passenger cars	587,000	723,000	917,000	1,034,000	1,112,000	1,247,000	1,408,000	1,358,000	1,372,000	1,375,000	1,406,000	1,438,000	1,469,854	1,502,556	1,549,577	1,569,100	1,600,287	^R 1,628,332	1,658,640
Motorcycles	^a	^a	3,000	5,600	10,200	9,100	9,600	9,200	9,600	9,900	10,200	9,800	9,920	10,081	10,283	10,584	10,469	^R 9,639	9,553
Fuel consumed (million gallons)																			
Passenger cars	41,171	49,723	67,819	74,140	69,982	71,518	69,568	64,317	65,436	67,048	67,874	68,072	69,221	69,892	71,695	73,283	73,065	^R 73,559	74,949
Motorcycles	^a	^a	60	113	204	182	191	184	191	198	205	196	198	202	206	212	209	^R 193	191
Average miles traveled per vehicle (thousands)																			
Passenger cars	9.5	9.6	10.3	9.7	9.1	9.8	10.5	10.6	10.8	10.8	11.0	11.2	11.3	11.6	11.8	11.8	12.0	^R 11.8	12.2
Motorcycles	^a	^a	1.1	1.1	1.8	1.7	2.3	2.2	2.4	2.5	2.7	2.5	2.6	2.6	2.7	2.5	2.4	^R 2.0	1.9
Average miles traveled per gallon																			
Passenger cars	14.3	14.5	13.5	13.9	15.9	17.4	20.2	21.1	21.0	20.5	20.7	21.1	21.2	21.5	21.6	21.4	21.9	22.1	22.1
Motorcycles	^a	^a	50.0	49.6	50.0	50.0	50.3	50.0	50.3	50.0	49.8	50.0	50.0	50.0	50.0	50.0	50.0	49.9	50.0
Average fuel consumed per vehicle (gallons)																			
Passenger cars	668	661	760	695	576	559	520	501	517	527	531	530	534	539	544	553	547	^R 534	551
Motorcycles	^a	^a	21	23	36	33	45	44	47	50	55	50	51	53	53	51	48	^R 39	38

KEY: R = revised.

^a Included in passenger car.

NOTE

See table 4-12 for other 2-axle 4-tire vehicles.

SOURCES

Passenger car:

Number registered:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table MV-201.

1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

All other categories:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A. For 1970-94, the unrevised motorcycle vehicle-miles and fuel consumed are subtracted from the combined passenger car and motorcycle vehicle-miles and fuel consumed from VM-201A.

1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Motorcycle:

Number registered:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table MV-201.

1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

All other categories:

1970-85: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1985*, table VM-201A.

1990-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Average miles traveled per vehicle, average miles traveled per gallon, average fuel consumed per vehicle: derived by calculation.

Table 4-12: Other 2-Axle 4-Tire Vehicle Fuel Consumption and Travel

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number registered (thousands)	14,211	20,418	27,876	37,214	48,275	53,033	57,091	59,994	62,904	65,738	69,134	70,224	71,330	75,356	79,085	84,188	85,011
Vehicle-miles traveled (millions)	123,000	201,000	291,000	391,000	575,000	649,000	707,000	746,000	765,000	790,000	816,540	850,739	868,275	901,022	923,059	^R 943,207	966,184
Fuel consumed (million gallons)	12,313	19,081	23,796	27,363	35,611	38,217	40,929	42,851	44,112	45,605	47,354	49,388	50,462	52,859	52,939	^R 53,522	54,841
Average miles traveled per vehicle (thousands)	8.7	9.8	10.4	10.5	11.9	12.2	12.4	12.4	12.2	12.0	11.8	12.1	12.2	12.0	11.7	^R 11.2	11.4
Average miles traveled per gallon	10.0	10.5	12.2	14.3	16.1	17.0	17.3	17.4	17.3	17.3	17.2	17.2	17.2	17.0	17.4	17.6	17.6
Average fuel consumed per vehicle (gallons)	866	935	854	735	738	721	717	714	701	694	685	703	707	701	669	^R 636	645

KEY: R = revised.

NOTES: Nearly all vehicles in this category are light trucks, which include vans, pickup trucks, and sport utility vehicles. In 1995, the U.S. Department of Transportation, Federal Highway Administration revised its vehicle categories beginning with 1993 data. They are passenger car, other 2-axle 4-tire vehicle, single-unit 2-axle 6-tire or more truck, and combination truck. Prior to 1993, some minivans and sport utility vehicles were included under the passenger car category.

SOURCES: 1970-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.
1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-13: Single-Unit 2-Axle 6-Tire or More Truck Fuel Consumption and Travel^a

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number registered (thousands)	3,681	4,232	4,374	4,593	4,487	4,481	4,370	4,408	4,906	5,024	5,266	5,293	5,735	5,763	5,926	5,704	5,651
Vehicle-miles (millions)	27,100	34,600	39,800	45,400	51,900	52,900	53,900	56,800	61,300	62,705	64,072	66,893	68,021	70,304	70,500	^R 72,448	75,887
Fuel consumed (million gallons)	3,968	5,420	6,923	7,399	8,357	8,172	8,237	8,488	9,032	9,216	9,409	9,576	6,817	9,372	9,563	^R 9,667	10,305
Average miles traveled per vehicle (thousands)	7.4	8.2	9.1	9.9	11.6	11.8	12.3	12.9	12.5	12.5	12.2	12.6	11.9	12.2	11.9	12.7	13.4
Average miles traveled per gallon	6.8	6.4	5.7	6.1	6.2	6.5	6.5	6.7	6.8	6.8	6.8	7.0	10.0	7.5	7.4	^R 7.5	7.4
Average fuel consumed per vehicle (gallons)	1,078	1,281	1,583	1,611	1,862	1,824	1,885	1,926	1,841	1,835	1,787	1,809	1,189	1,626	1,614	^R 1,695	1,824

KEY: R = revised.

^aBeginning in 1998, the Federal Highway Administration (FHWA) used the Census Bureau's 1997 *Vehicle Inventory and Use Survey* (VIUS) for its baseline estimate of single-unit 2-axle 6-tire or more trucks. Prior to 1998, the FHWA used the Census Bureau's 1992 *Transportation Inventory and Use Survey* (TIUS) for its baseline estimates. Therefore, post-1997 data may not be comparable to 1997 and earlier years.

NOTES: In 1995, the U.S. Department of Transportation, Federal Highway Administration revised its vehicle categories beginning with 1993 data to include passenger cars, other 2-axle 4-tire vehicles, single-unit 2-axle 6-tire or more trucks, and combination trucks. Single-unit 2-axle 6-tire or more trucks are on a single frame with at least 2 axles and 6 tires. Pre-1993 data have been reassigned to the most appropriate category.

SOURCES: 1970-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.
1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-14: Combination Truck Fuel Consumption and Travel^a

	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number registered (thousands)	787	905	1,131	1,417	1,403	1,709	1,691	1,675	1,680	1,682	1,696	1,747	1,790	1,997	2,029	2,097	2,154	2,277
Vehicle-miles traveled (millions)	31,700	35,100	46,700	68,700	78,100	94,300	96,600	99,500	103,100	108,900	115,500	118,899	124,584	128,359	132,384	135,020	^R 136,584	138,643
Fuel consumed (million gallons)	6,658	7,348	9,177	13,037	14,005	16,133	16,809	17,216	17,748	18,653	19,777	20,193	20,302	25,158	24,537	25,666	^R 25,512	26,451
Average miles traveled per vehicle (thousands)	40.3	38.8	41.3	48.5	55.7	55.2	57.1	59.4	61.4	64.8	68.1	68.1	69.6	64.3	65.3	64.4	^R 63.4	60.9
Average miles traveled per gallon	4.8	4.8	5.1	5.3	5.6	5.8	5.7	5.8	5.8	5.8	5.8	5.9	6.1	5.1	5.4	5.3	^R 5.4	5.2
Average fuel consumed per vehicle (gallons)	8,465	8,119	8,116	9,201	9,980	9,441	9,938	10,276	10,562	11,093	11,663	11,561	11,342	12,596	12,096	12,241	^R 11,843	11,618

KEY: R = revised.

^a Beginning in 1998, the Federal Highway Administration (FHWA) used the Census Bureau's *1997 Vehicle Inventory and Use Survey* (VIUS) for its baseline estimate of combination trucks. Prior to 1998, the FHWA used the Census Bureau's *1992 Transportation Inventory and Use Survey* (TIUS) for its baseline estimates. Therefore, post-1997 data may not be comparable to 1997 and earlier years.

SOURCES: 1965-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.
1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-15: Bus Fuel Consumption and Travel

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number registered (thousands)	272	314	378	462	529	593	627	631	645	654	670	686	695	698	716	729	746	750	761
Vehicle-miles traveled (millions)	4,300	4,700	4,500	6,100	6,100	4,500	5,700	5,800	5,800	6,100	6,400	6,400	6,563	6,842	7,007	7,662	7,590	^R 7,077	6,849
Fuel consumed (million gallons)	827	875	820	1,053	1,018	834	895	864	878	929	964	968	990	1,027	1,040	1,148	1,112	^R 1,026	993
Average miles traveled per vehicle (thousands)	15.8	15.0	11.9	13.2	11.5	7.6	9.1	9.2	9.0	9.3	9.5	9.3	9.4	9.8	9.8	10.5	10.2	^R 9.4	9.0
Average miles traveled per gallon	5.2	5.4	5.5	5.8	6.0	5.4	6.4	6.7	6.6	6.6	6.6	6.6	6.6	6.7	6.7	6.7	6.8	6.9	6.9
Average fuel consumed per vehicle (gallons)	3,039	2,784	2,172	2,278	1,925	1,405	1,427	1,369	1,362	1,420	1,438	1,412	1,425	1,472	1,454	1,576	1,490	^R 1,369	1,306

KEY: R = revised.

NOTE: Includes both publicly and privately owned school, transit, and other commercial buses.

SOURCES: 1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.
 1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-16: Transit Industry Electric Power and Primary Energy Consumption^a and Travel

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	(P) 2002
Number of vehicles (thousands)	65	62	61	62	75	94	93	96	102	107	116	116	122	126	124	129	131	134	135
Vehicle-miles traveled (millions)	2,143	2,008	1,883	2,176	2,287	2,791	3,242	3,306	3,355	3,435	3,468	3,550	3,650	3,746	3,794	3,972	4,081	4,196	4,277
Electric power consumed (million kWh)	2,908	2,584	2,561	2,646	2,446	4,216	4,837	4,853	4,716	4,865	5,081	5,068	5,007	4,988	5,073	5,237	5,510	5,610	5,649
Primary energy consumed (thousand gallons)																			
Diesel	208,100	248,400	270,600	365,060	431,400	608,738	651,030	665,158	684,944	678,511	678,226	678,286	692,714	716,952	739,621	763,369	786,025	744,663	724,535
Gasoline and other nondiesel fuels ^b	191,900	124,200	68,200	7,576	11,400	45,704	33,906	34,467	37,179	45,672	60,003	60,730	61,213	59,463	52,615	48,694	48,284	45,873	57,124
Compressed natural gas	N	N	N	N	N	N	N	N	1,009	1,579	4,835	10,740	15,092	23,906	37,268	44,398	54,794	66,215	81,051

KEY: kWh = kilowatt hour; N = data do not exist; P = preliminary.

^a Prior to 1985, excludes commuter rail, automated guideway, urban ferryboat, demand responsive vehicles, and most rural and smaller systems.

^b Data for 1992-2002, includes propane, liquid petroleum gas, liquefied natural gas, kerosene, and all other nondiesel fuels except compressed natural gas. 1960 to 1991 data include propane. Series not continuous between 1991 and 1992.

SOURCE

American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: March 2004), tables 18, 24, 33, 34, 35, and similar tables in earlier editions.

Table 4-17: Class I Rail Freight Fuel Consumption and Travel

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number in use																			
Locomotives ^a	29,031	27,780	27,077	27,846	28,094	22,548	18,835	18,344	18,004	18,161	18,505	18,812	19,269	19,684	20,261	20,256	20,028	19,745	20,506
Cars ^b	1,965,486	1,800,662	1,784,181	1,723,605	1,710,827	1,421,686	1,212,261	1,189,660	1,173,136	1,173,132	1,192,412	1,218,927	1,240,573	1,270,419	1,315,667	1,368,836	1,380,796	1,314,136	1,299,670
Miles traveled (millions)																			
Freight train-miles ^c	404	421	427	403	428	347	380	375	390	405	441	458	469	475	475	490	504	500	500
Locomotive unit-miles	N	N	N	1,479	1,531	1,228	1,280	1,238	1,278	1,320	1,405	1,445	1,465	1,423	1,440	1,504	1,503	(R) 1,478	1,444
Car-miles	28,170	29,336	29,890	27,656	29,277	24,920	26,159	25,628	26,128	26,883	28,485	30,383	31,715	31,660	32,657	33,851	34,590	34,243	34,680
Average miles traveled per vehicle (thousands)																			
Locomotives	N	N	N	53.1	54.5	54.5	68.0	67.5	71.0	72.7	75.9	76.8	76.0	72.3	71.1	74.2	75.0	(R) 74.9	70.4
Cars	14.3	16.3	16.8	16.0	17.1	17.5	21.6	21.5	22.3	22.9	23.9	24.9	25.6	24.9	24.8	24.7	25.1	26.1	26.7
Average miles traveled per gallon																			
Trains	0.12	0.12	0.12	0.11	0.11	0.11	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.14	0.13	0.13
Cars	8.13	8.17	8.43	7.56	7.50	8.01	8.40	8.82	8.69	8.71	8.54	8.73	8.86	8.86	9.11	9.11	9.35	9.23	9.30
Fuel consumed (million gallons)	3,463	3,592	3,545	3,657	3,904	3,110	3,115	2,906	3,005	3,088	3,334	3,480	3,579	3,575	3,583	3,715	3,700	3,710	3,730
Average fuel consumed per locomotive^a (thousand gallons)	119.3	129.3	130.9	131.3	139.0	137.9	165.4	158.4	166.9	170.0	180.2	185.0	185.7	181.6	176.8	183.4	184.7	187.9	181.9

KEY: N = data do not exist; R = revised; U = data are not available.

^a For 1960-80, the total includes a small number of steam and electric units, which are not included in the per locomotive fuel consumption figure.

^b Includes cars owned by Class I railroads, other railroads, car companies, and shippers.

^c Based on the distance run between terminals and / or stations; does not include yard or passenger train-miles.

SOURCES

All data except for locomotive unit-miles:

Association of American Railroads, *Railroad Facts* (Washington, DC: November 2003), pp. 33, 34, 40, 49, and 51.

Locomotive unit-miles:

1975-92, 2002: Ibid., *Railroad Ten-Year Trends* (Washington, DC: Annual issues).

1993-2001: Ibid., *Analysis of Class I Railroads* (Washington, DC: Annual issues)

Table 4-18: Amtrak Fuel Consumption and Travel

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number in use															
Locomotives	355	419	291	318	316	336	360	338	313	299	332	345	329	378	401
Cars	1,913	2,128	1,854	1,863	1,786	1,796	1,853	1,852	1,722	1,730	1,728	1,962	1,992	1,894	2,084
Miles traveled (millions)															
Train-miles	30	30	30	33	34	34	35	34	32	30	32	33	34	35	36
Car-miles	253	235	251	301	313	307	303	304	292	276	288	312	342	368	378
Locomotive fuel consumed															
Electric (million of kWh hours)	180	254	295	330	303	300	301	309	304	293	282	275	283	350	U
Diesel (million gallons)	63	64	65	82	82	82	83	75	66	71	75	75	74	76	U
Average miles traveled per car	132,000	110,000	135,000	162,000	175,000	171,000	164,000	164,000	170,000	160,000	167,000	159,000	172,000	194,000	181,000

KEY: Btu = British thermal unit; kWh = kilowatt hour; U = data are not available.

NOTE

The heat equivalent factors used in Btu conversions are: diesel = 138,700 Btu/gallon; electric = 3,412 Btu/kWh, negating electrical system losses (to include electrical system losses, multiply this conversion factor by approximately three).

SOURCES**Number of locomotives and cars:**

1975–80: Amtrak, State and Local Affairs Department, personal communication.

1985–2000: Ibid., *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues).

2001: Association of American Railroads, *Railroad Facts* (Washington, DC: 2002), p. 77.

Miles traveled:*Train-miles:*

1975–2001: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues).

Car-miles:

1975: Association of American Railroads, *Yearbook of Railroad Facts 1975* (Washington, DC: 1976), p. 40.

1980–85: Amtrak, State and Local Affairs Department and Public Affairs Department, personal communication.

1990–2000: Ibid., Amtrak Corporate Reporting, Route Profitability System, personal communication, Aug. 22,

2001: Association of American Railroads, *Railroad Facts* (Washington, DC: 2002), p. 77.

Locomotive fuel consumed:

1975–2000: Amtrak, State and Local Affairs Department, personal communication.

Table 4-19: U.S. Government Energy Consumption by Agency and Source (Trillion Btu)

	Petroleum					Electricity	Natural gas	Coal and other ^d	Total
	Motor gasoline	Distillate and residual fuel oil	Jet fuel and aviation gas	Other ^c	Total				
FY 1992, total	35.6	200.6	629.2	11.4	876.8	192.5	151.2	74.2	1,294.7
Agriculture	4.6	0.5	0.1	0.2	5.4	2.0	1.6	0.1	9.1
Defense	12.2	183.2	620.5	5.4	821.3	115.9	106.6	60.2	1,104.0
Energy	1.1	2.5	0.4	0.3	4.4	18.8	12.3	8.9	44.3
GSA	0.1	0.4	0.0	0.0	0.5	9.1	2.6	1.6	13.8
Health and Human Services	0.0	2.0	0.0	0.1	2.1	2.5	2.1	0.1	6.8
Interior	1.8	1.0	0.2	1.8	4.7	1.5	0.6	0.1	7.0
Justice	2.9	0.4	0.7	0.0	4.1	2.2	0.9	0.4	7.5
NASA	0.3	1.1	1.5	0.0	2.9	7.0	2.4	0.3	12.6
Postal Service	9.3	3.9	0.0	0.2	13.4	12.7	5.1	0.5	31.7
Transportation	0.7	1.5	4.7	3.4	10.3	5.7	1.0	0.1	17.0
Veterans Affairs	0.5	1.6	0.0	0.0	2.1	8.2	13.6	1.3	25.3
Other ^a	2.0	2.3	1.3	0.0	5.6	6.7	2.5	0.8	15.6
FY 2001, total	42.5	177.0	414.3	7.9	641.8	188.9	133.9	37.5	1,002.2
Agriculture	2.3	0.3	0.0	0.1	2.8	1.9	2.5	0.2	7.4
Defense	13.6	153.6	407.7	4.1	579.0	102.2	78.0	28.0	787.2
Energy	0.9	2.3	0.0	0.2	3.5	16.4	6.9	4.1	31.1
GSA	0.1	0.5	0.0	0.0	0.6	9.7	6.5	1.7	18.4
Health and Human Services	0.6	0.8	0.0	0.2	1.6	3.0	3.6	0.4	8.5
Interior	2.4	1.4	0.1	2.2	6.1	2.0	1.3	0.0	9.5
Justice	6.6	0.9	1.7	0.0	9.3	4.3	5.8	0.4	19.7
NASA	0.2	0.5	0.0	0.0	0.7	5.7	3.1	0.2	9.9
Postal Service	11.7	5.2	0.0	0.7	17.6	17.3	8.5	0.0	43.4
Transportation	0.7	5.6	3.6	0.1	10.0	5.9	1.8	0.1	17.8
Veterans Affairs	0.6	3.3	0.0	0.0	4.0	10.0	12.2	1.5	27.7
Other ^b	2.8	2.5	1.1	0.1	6.5	10.5	3.9	0.8	21.7
FY 2002^P, total	42.5	177.4	414.3	7.6	641.9	188.6	130.8	37.5	998.8
Agriculture	2.3	0.3	0.0	0.2	2.9	1.8	1.9	0.6	7.1
Defense	13.6	153.6	407.7	4.1	579.0	102.2	78.0	28.0	787.2
Energy	0.9	1.7	0.0	0.2	3.0	16.7	7.6	3.4	30.7
GSA	0.1	0.1	0.0	0.0	0.2	9.8	6.1	1.4	17.5
Health and Human Services	0.6	0.6	0.0	0.2	1.4	3.1	3.7	0.4	8.5
Interior	2.4	1.3	0.1	2.4	6.2	1.9	1.5	0.1	9.7
Justice	6.6	1.0	1.7	0.0	9.3	4.3	5.2	0.6	19.4
NASA	0.2	0.5	0.0	0.0	0.8	5.6	3.0	0.2	9.7
Postal Service	11.7	5.0	0.0	0.2	16.9	17.7	7.0	0.4	42.0
Transportation	0.7	5.6	3.6	0.1	9.9	5.0	1.0	0.2	16.1
Veterans Affairs	0.6	3.3	0.0	0.0	4.0	10.0	12.2	1.5	27.7
Other ^b	2.8	4.3	1.1	0.1	8.3	10.4	3.7	0.7	23.2

KEY: Btu = British thermal unit; FY = fiscal year; GSA = General Services Administration; NASA = National Aeronautics and Space Administration; P = preliminary.

^a Includes U.S. Department of Commerce, Panama Canal Commission, Tennessee Valley Authority, U.S. Department of Labor, U.S. Information Agency, U.S. Department of Housing and Urban Development, Federal Communications Commission, Office of Personnel Management, U.S. Department of State, Federal Emergency Management Agency, U.S. Department of the Treasury, National Archives and Records Administration, Nuclear Regulatory Commission, Railroad Retirement Board, Federal Trade Commission, Commodity Futures Trading Commission, Equal Employment Opportunity Commission, and Environmental Protection Agency.

^b Includes National Archives and Records Administration, U.S. Department of Commerce, U.S. Department of Labor, U.S. Department of State, Environmental Protection Agency, Federal Communications Commission, Federal Trade Commission, Social Security Administration, International Broadcasting Bureau, Equal Employment Opportunity Commission, Nuclear Regulatory Commission, Office of Personnel Management, U.S. Department of Housing and Urban Development, U.S. Department of the Treasury, Railroad Retirement Board, Tennessee Valley Authority, Federal Emergency Management Agency, Central Intelligence Agency, and National Science Foundation.

^c Includes liquefied petroleum gases.

^d Includes purchased steam, chilled water from district heating and cooling systems, and any other energy type, such as renewable energy.

NOTES

Numbers may not add to totals due to rounding.

These data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. government energy use for electricity generation and uranium enrichment is excluded. Other energy used by U.S. agencies that produce electricity or enriched uranium is included. The U.S. government's fiscal year runs from October 1 through September 30.

This table uses a conversion factor for electricity of 3,412 Btu per kilowatt-hour, and a conversion factor for purchased steam of 1,000 Btu per pound.

SOURCE

U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2002*, table 1.13. Internet site <http://www.eia.doe.gov/emeu/aer/as> of October 2003.

Section C

Transportation Energy Intensity and Fuel Efficiency

Table 4-20: Energy Intensity of Passenger Modes (Btu per passenger-mile)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	
Air, certificated carrier																			
Domestic operations	8,633	10,118	10,185	7,746	5,727	5,047	4,932	4,671	4,564	4,558	4,444	4,382	4,183	4,166	4,123	4,049	3,942	3,940	
International operations	9,199	10,292	10,986	8,465	4,339	5,103	4,546	4,609	4,258	4,099	4,145	4,173	4,108	4,168	4,278	4,123	4,009	4,126	
Highway^a																			
Passenger car	4,495	4,455	4,841	4,743	4,348	4,267	3,812	3,654	3,703	3,785	3,771	3,721	3,688	3,657	3,637	3,672	^R 3,589	3,557	
Other 2-axle 4-tire vehicle	N	N	6,810	6,571	5,709	4,971	4,451	4,277	4,256	4,275	4,345	4,538	4,541	4,564	4,569	4,612	^R 4,509	4,467	
Motorcycle	b	b	2,500	2,354	2,125	1,896	1,990	1,917	1,990	2,063	2,135	2,274	2,271	2,273	2,273	2,273	^R 2,273	2,273	
Transit motor bus	N	N	N	N	2,742	3,396	3,723	3,767	4,038	3,944	4,162	4,155	4,196	4,228	4,133	4,044	4,147	^P 3,698	
Amtrak	N	N	N	2,383	2,164	2,094	2,064	1,978	2,035	2,023	1,935	1,838	2,148	2,200	2,138	2,107	2,134	U	

KEY: Btu = British thermal unit; N = data do not exist; P = preliminary; R = revised; U = data are not available.

^a For 1995 and subsequent years, highway passenger-miles were taken directly from *Highway Statistics* rather than derived from vehicle-miles and average occupancy, as is the case for 1960-1994.

^b Included in passenger car.

NOTE

To calculate total Btu, multiply fuel consumed (see tables 4-21, 4-22, 4-24, 4-25) by 135,000 Btu/gallon for air carrier; 125,000 Btu/gallon for passenger car, other 2-axle 4-tire vehicle, and motorcycle; 138,700 Btu/gallon for transit motor bus and Amtrak diesel consumption; and 3,412 Btu/KwH for Amtrak electric consumption.

SOURCES

Air:

Certificated air carriers:

Passenger-miles:

Air Transport Association, Internet site <http://www.air-transport.org/public/industry> as of Aug. 30, 2002.

Fuel consumed:

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Internet site <http://www.bts.gov/oai/fuel/fueyearly.html> as of Aug. 30, 2002.

Highway:

Passenger car:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Other 2-axle 4-tire vehicle:

1970-94: Ibid., *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Motorcycle:

1970-85: Ibid., *Highway Statistics Summary to 1985*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1990-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Transit motor bus:

American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: February 2003), tables 6 and 33.

Amtrak:

Amtrak, State and Local Affairs Department, personal communication.

Table 4-21: Energy Intensity of Certificated Air Carriers, All Services^a

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Aircraft-miles (millions)																				
Domestic operations	858	1,134	2,068	1,948	2,523	3,046	3,963	3,854	3,995	4,157	4,380	4,629	4,811	4,911	5,035	5,332	5,664	5,548	(R) 5,616	6,085
International operations	182	284	475	377	401	415	760	807	904	961	980	998	1,043	1,114	1,192	1,225	1,282	1,266	1,225	1,246
Available seat-miles (millions)																				
Domestic operations	52,220	94,787	213,160	241,282	346,028	445,826	563,065	543,638	557,989	571,489	585,438	603,917	626,389	651,918	662,313	699,330	727,033	695,200	(R) 676,949	689,170
International operations	13,347	29,533	51,960	61,724	86,507	101,963	170,310	171,561	194,784	200,151	198,893	203,160	208,682	228,689	237,538	242,981	254,048	235,311	215,606	204,732
Passenger-miles (millions)																				
Domestic operations	30,557	51,887	104,147	131,728	200,289	270,584	340,231	332,566	347,931	354,177	378,990	394,708	425,596	450,612	463,262	488,357	516,129	486,506	(R) 482,310	503,339
International operations	8,306	16,789	27,563	31,082	54,363	65,819	117,695	115,389	130,622	135,508	140,391	145,948	153,067	169,356	172,255	180,269	192,798	178,343	(R) 171,860	167,662
Fuel consumed (million gallons)																				
Domestic operations	1,954	3,889	7,857	7,558	8,519	10,115	12,429	11,506	11,763	11,959	12,476	12,812	13,187	13,660	13,877	14,402	14,845	14,017	12,848	12,959
International operations	566	1,280	2,243	1,949	1,747	2,488	3,963	3,940	4,120	4,113	4,311	4,511	4,658	4,964	5,186	5,250	5,475	5,237	4,991	4,836
Seats per aircraft																				
Domestic operations	60.9	83.6	103.1	123.9	137.1	146.4	142.1	141.1	139.7	137.4	133.7	130.5	130.2	132.7	131.5	131.1	128.4	125.3	(R) 120.5	113.3
International operations	73.3	104.0	109.4	163.7	215.7	245.7	224.1	212.6	215.5	208.7	203.0	203.6	200.1	205.3	199.2	198.3	198.2	185.9	(R) 176.1	164.3
Seat-miles per gallon																				
Domestic operations	27	24	27	32	41	44	45	47	47	48	47	47	48	48	48	49	49	50	53	53
International operations	24	23	23	32	50	41	43	44	47	49	46	45	45	46	46	46	46	45	43	42
Energy intensity (Btu/passenger-mile)^b																				
Domestic operations	8,633	10,118	10,185	7,746	5,742	5,047	4,932	4,671	4,564	4,558	4,444	4,382	4,183	4,092	4,044	3,981	3,883	3,890	(R) 3,596	3,476
International operations	9,199	10,292	10,986	8,465	4,339	5,103	4,546	4,610	4,258	4,098	4,145	4,173	4,108	3,957	4,064	3,932	3,833	3,965	(R) 3,920	3,894
Load factor (percent)																				
Domestic operations	58.5	54.7	48.9	54.6	58.0	60.7	60.4	61.2	62.4	62.0	64.7	65.4	67.9	69.1	69.9	69.8	71.0	69.1	70.3	72.4
International operations	62.2	56.8	53.0	50.4	62.8	64.6	69.1	67.3	67.1	67.6	70.6	71.8	73.3	74.1	72.5	74.2	75.9	72.8	76.6	76.5

KEY: Btu = British thermal unit; R = revised.

^a U.S. owned carriers only. Operation of foreign-owned carriers in or out of the United States not included.

^b Calculation based on unrounded figures not shown here.

NOTES

Aircraft-miles includes all four air-carrier groups (majors, nationals, large regionals, and medium regionals), scheduled and charter, passenger, and all-cargo. Fuel consumed includes majors, nationals, and large regionals, scheduled and charter, passenger, and all-cargo.

Passenger-miles includes all four air-carrier groups, scheduled and charter, passenger service only.

International operations include operations outside the United States, including those between the United States and foreign countries and the United States and its territories or possessions.

Heat equivalent factor used for Btu conversion is 135,000 Btu/gallon.

SOURCES

Aircraft-miles, available seat-miles, passenger-miles, and load factor:

1960-80: Air Transport Association, Internet site <http://www.air-transport.org/public/industry>, as of July 31, 2002.

1985-2003: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington DC: Annual December issues).

Fuel consumed:

1960-2003: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Internet site <http://www.bts.gov/oai/fuel/fueyearly.html> as of July 21, 2004.

Seats per aircraft, seat-miles per gallon, and energy intensiveness:

Derived by calculation.

Table 4-22: Energy Intensity of Passenger Cars, Other 2-Axle 4-Tire Vehicles, and Motorcycles

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Vehicle-miles (millions)																				
Passenger car	587,000	723,000	917,000	1,034,000	1,112,000	1,247,000	1,408,000	1,358,000	1,372,000	1,375,000	1,406,000	1,438,000	1,470,000	1,503,000	1,550,000	1,569,000	1,600,287	(R) 1,628,332	1,658,640	
Other 2-axle 4-tire vehicle	N	N	123,000	201,000	291,000	391,000	575,000	649,000	707,000	746,000	765,000	790,000	817,000	851,000	868,000	901,000	923,059	(R) 943,207	966,184	
Motorcycle	^b	^b	3,000	5,600	10,200	9,100	9,600	9,200	9,600	9,900	10,200	9,800	9,900	10,100	10,300	10,600	10,469	(R) 9,639	9,553	
Passenger-miles (millions)^a																				
Passenger car	1,145,000	1,395,000	1,751,000	1,954,000	2,012,000	2,094,000	2,282,000	2,200,000	2,208,000	2,213,000	2,250,000	2,287,000	2,337,000	2,389,000	2,464,000	2,495,000	2,544,457	(R) 2,556,481	2,604,065	
Other 2-axle 4-tire vehicle	N	N	226,000	363,000	521,000	688,000	1,000,000	1,117,000	1,202,000	1,253,000	1,269,000	1,256,000	1,298,000	1,353,000	1,381,000	1,433,000	1,467,664	(R) 1,678,853	1,719,750	
Motorcycle	^b	^b	3,000	6,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	11,000	11,000	11,000	11,000	12,000	11,516	(R) 11,760	11,655	
Fuel consumed (million gallons)																				
Passenger car	41,171	49,723	67,819	74,140	69,982	71,518	69,568	64,317	65,436	67,048	67,874	68,072	69,221	69,892	71,695	73,283	73,065	(R) 73,559	74,949	
Other 2-axle 4-tire vehicle	N	N	12,313	19,081	23,796	27,363	35,611	38,217	40,929	42,851	44,112	45,605	47,354	49,388	50,462	52,859	52,939	(R) 53,522	54,841	
Motorcycle	^b	^b	60	113	204	182	191	184	191	198	205	196	198	202	206	212	209	(R) 193	191	
Energy intensity (Btu/passenger-mile)^c																				
Passenger car	4,495	4,455	4,841	4,743	4,348	4,269	3,811	3,654	3,704	3,787	3,771	3,721	3,702	3,657	3,637	3,671	3,589	(R) 3,597	3,598	
Other 2-axle 4-tire vehicle	N	N	6,810	6,571	5,709	4,971	4,451	4,277	4,256	4,275	4,345	4,539	4,560	4,563	4,568	4,611	4,509	(R) 3,985	3,986	
Motorcycle	^a	^a	2,500	2,354	2,125	1,896	1,990	1,917	1,990	2,063	2,135	2,227	2,250	2,295	2,341	2,205	2,273	(R) 2,049	2,049	

KEY: Btu = British thermal unit; N = data do not exist; R = revised.

^a Passenger-miles are derived by multiplying vehicle-miles by an average occupancy rate for that vehicle type based on data provided by the Federal Highway Administration, Nationwide Personal Transportation Survey (1977, 1983, 1995) and Federal Highway Administration and Bureau of Transportation Statistics, National Household Travel Survey (2001). Average vehicle occupancy rates are as follows: passenger car (1960-2002): 1.95, 1.93, 1.91, 1.89, 1.81, 1.68, 1.62, 1.62, 1.61, 1.61, 1.60, 1.59, 1.59, 1.59, 1.59, 1.59, 1.57, 1.57; other 2-axle 4-tire vehicle (1970-2002): 1.84, 1.81, 1.79, 1.76, 1.74, 1.72, 1.70, 1.68, 1.66, 1.59, 1.59, 1.59, 1.59, 1.59, 1.78, 1.78; motorcycle (1970-2002): 1.00, 1.07, 1.18, 1.32, 1.25, 1.30, 1.25, 1.21, 1.18, 1.12, 1.11, 1.09, 1.07, 1.13, 1.10, 1.22, 1.22.

^b Included in passenger car.

^c Energy Intensity (Btu/passenger-mile) is calculated by converting the fuel consumption in gallons to the energy equivalent Btu units and dividing by the passenger-miles. The heat equivalent factor used for Btu conversion is 125,000 Btus/gallon.

NOTES:

In 1995, the U.S. Department of Transportation, Federal Highway Administration revised its vehicle type categories for 1993 and later data.

These new categories include passenger car, other 2-axle 4-tire vehicle, single-unit 2-axle 6-tire or more truck, and combination truck.

Other 2-axle 4-tire vehicle includes vans, pickup trucks, and sport utility vehicles. In previous years, some minivans and sport utility vehicles were included in the passenger car category. Single-unit 2-axle 6-tire or more trucks are on a single frame with at least 2 axles and 6 tires. Pre-1993 data have been reassigned to the closest available category.

Vehicle-miles and passenger-miles data for 1960 through 1999 have been rounded to the nearest billion miles.

SOURCES:

Vehicle-miles:

Passenger car:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Other 2-axle 4-tire vehicle:

1960-94: *Ibid.*, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Motorcycle:

1970-94: *Ibid.*, *Highway Statistics, Summary to 1985* (Washington, DC: 1986), table VM-201A.

For 1970-94, the unrevised motorcycle vehicle-miles are subtracted from the combined passenger car and motorcycle vehicle-miles from VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Passenger-miles:

1960-97: Vehicle-miles multiplied by vehicle occupancy rates.

1998-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Fuel consumed:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

For 1970-94, the unrevised motorcycle fuel consumed is subtracted from the combined passenger car and motorcycle fuel consumed from VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-23: Average Fuel Efficiency of U.S. Passenger Cars and Light Trucks

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Average U.S. passenger car fuel efficiency (mpg) (calendar year)														
Passenger car ^a	16.0	17.5	20.3	21.2	21.0	20.6	20.8	21.1	21.2	21.5	21.6	21.4	^R 21.9	22.1
Other 2-axle 4-tire vehicle	12.2	14.3	16.1	17.0	17.3	17.4	17.3	17.3	17.2	17.2	17.2	17.0	^R 17.4	17.6
New vehicle fuel efficiency (mpg)^b (model year)														
Light-duty vehicle														
Passenger car	24.3	27.6	28.0	28.4	27.9	28.4	28.3	28.6	28.5	28.7	28.8	28.3	28.5	28.6
Domestic	22.6	26.3	26.9	27.3	27.0	27.8	27.5	27.7	28.1	27.8	28.6	28.0	^R 28.7	28.8
Imported	29.6	31.5	29.9	30.1	29.2	29.6	29.7	30.3	29.6	30.1	29.2	29.0	28.3	28.4
Light truck (<8,500 lbs GVWR) ^c	18.5	20.7	20.8	21.3	20.8	21.0	20.8	20.5	20.8	20.6	21.1	20.9	^R 21.3	20.9
CAFE standards (mpg)^b (model year)														
Passenger car	20.0	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5
Light truck	^d 16.0/14.0	19.5	20.0	20.2	20.2	20.4	20.5	20.6	20.7	20.7	20.7	20.7	20.7	20.7

KEY: CAFE = Corporate Average Fuel Economy; GVWR = gross vehicle weight rating; mpg = miles per gallon; N = data do not exist; R = revised; U = data are not available.

^a From 1980 to 1994, passenger car fuel efficiency includes motorcycles.

^b Assumes 55% city and 45% highway-miles. The source calculated average miles per gallon for light-duty vehicles by taking the reciprocal of the sales-weighted average of gallons per mile. This is called the

^c Beginning with FY 1999, the total light truck fleet ceased to be categorized by either domestic or import

^d 2 Wheel Drive/4 Wheel Drive. No combined figure available for this year.

NOTE

The fuel efficiency figures for light duty vehicles represent the sales-weighted harmonic average of the combined passenger car and light truck fuel economies.

SOURCES

Average U.S. passenger car fuel efficiency:

1980-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A (Revised data obtained from Internet site <http://www.fhwa.dot.gov/ohim/ohimstat.htm> as of Aug. 2, 2001).

1995-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

New vehicle fuel efficiency (based on model year production):

1980-2001: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Automotive Fuel Economy Program, Annual Update Calendar Year 2001*, table II-6, Internet site www.nhtsa.dot.gov/cars/problems/studies/fuelecon/index.html as of January 2003.

CAFE standards:

1980-2001: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Automotive Fuel Economy Program, Annual Update Calendar Year 2001*, table I-1, Internet site www.nhtsa.dot.gov/cars/problems/studies/fuelecon/index.html as of January 2003.

Table 4-24: Energy Intensity of Transit Motor Buses

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	(P) 2002
Vehicle-miles (millions)	1,576	1,528	1,409	1,526	1,677	1,863	2,130	2,167	2,178	2,210	2,162	2,184	2,221	2,245	2,175	2,276	2,315	2,377	2,411
Passenger-miles (millions)	N	N	N	N	21,800	21,200	20,981	21,090	20,336	20,247	18,832	18,818	19,096	19,604	20,360	21,205	21,241	22,022	21,842
Fuel consumed (million gallons diesel)	208	248	271	365	431	518	563	573	592	576	565	564	578	598	607	618	635	587	559
Energy intensity (Btu / passenger-mile)	N	N	N	N	2,742	3,389	3,723	3,767	4,038	3,944	4,162	4,155	4,196	4,228	4,133	4,044	4,147	3,697	4,415

KEY: Btu = British thermal unit; N = data do not exist; P = preliminary.

NOTES

Heat equivalent factor used for Btu conversion is 138,700 Btu/gallon.

SOURCE

American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: February 2004), tables 38 and 70, and similar tables.

Table 4-25: Energy Intensity of Class I Railroad^a Freight Service

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Revenue freight ton-miles (millions)	572,309	697,878	764,809	754,252	918,958	876,984	1,033,969	1,038,875	1,066,781	1,109,309	1,200,701	1,305,688	1,355,975	1,348,926	1,376,802	1,433,461	1,465,960	1,495,472	1,507,011
Car-miles (millions)	28,170	29,336	29,890	27,656	29,277	24,920	26,159	25,628	26,128	26,883	28,485	30,383	31,715	31,660	32,657	33,851	34,590	34,243	34,680
Tons per car load	44	49	55	61	67	68	67	66	66	64	63	65	67	63	64	63	63	64	63
Fuel consumed (million gallons)	3,463	3,592	3,545	3,657	3,904	3,110	3,115	2,906	3,005	3,088	3,334	3,480	3,579	3,575	3,583	3,715	3,700	3,710	3,730
Energy intensity (Btu/revenue freight ton-mile)	839	714	643	672	589	492	418	388	391	386	385	370	366	368	361	359	350	344	343
Energy intensity (Btu/car-mile)	17,051	16,983	16,450	18,341	18,495	17,310	16,516	15,727	15,952	15,932	16,234	15,886	15,652	15,662	15,218	15,222	14,836	15,027	14,918

KEY: Btu = British thermal unit.

^a Class I railroads are those that have operating revenues of \$272 million or more.

NOTE

The heat equivalent factor used for Btu conversion is 138,700 Btu/gallon.

SOURCE

Association of American Railroads, *Railroad Facts* (Washington, DC: November 2003), pp. 34, 37, and 40.

Table 4-26: Energy Intensity of Amtrak Services

	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Revenue passenger-miles (millions)	3,931	4,503	4,785	6,057	6,273	6,091	6,199	5,921	5,545	5,050	5,166	5,304	5,330	5,498	5,559	5,468
Locomotive fuel consumed																
Total fuel consumed (billion Btu) ^a	9,367	9,673	9,995	12,512	12,406	12,328	12,511	11,457	10,191	10,875	11,365	11,341	11,229	11,735	11,674	U
Electric (millions of kWh) ^a	180	254	295	330	303	300	301	309	304	293	282	275	283	350	377	U
Diesel (million gallons)	63	64	65	82	82	82	83	75	66	71	75	75	74	76	75	U
Energy intensity (Btu/revenue passenger-mile)^a	2,383	2,148	2,089	2,066	1,978	2,024	2,018	1,935	1,838	2,153	2,200	2,138	2,107	2,134	2,100	U

KEY: Btu = British thermal unit; kWh = kilowatt hour; U = data are not available.

^a Does not include electric power generation and distribution losses, which, if included, would triple the electric conversion factor given below and increase the numbers in this row by about 20 percent.

NOTE

The heat equivalent factors used in Btu conversion are: diesel = 138,700 Btu/gallon; electric = 3,412 Btu/kWh.

SOURCES

Revenue passenger-miles:

Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues).

Locomotive fuel consumed:

1975-2001: Ibid., State and Local Affairs Department, personal communication.

Table 4-27: Annual Wasted Fuel Due to Congestion^a

Population group		Gallons wasted (millions)														Percent change			
																Short-term 1996-2001		Long term 1982-2001	
		Urban area	1982	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Percent	Rank	Percent	Rank
Medium	Albany-Schenectady-Troy, NY	0	0	2	2	2	3	3	4	4	4	4	5	5	6	50	24	NM	NM
Medium	Albuquerque, NM	2	4	6	6	7	9	12	14	17	20	21	23	R17	17	0	59	750	23
Small	Anchorage, AK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NM	NM	NM	NM
Large	Atlanta, GA	16	28	42	41	48	67	97	111	125	138	156	144	R167	174	39	36	988	19
Medium	Austin, TX	3	7	8	10	10	12	15	17	22	29	25	30	35	38	73	13	1,167	12
Small	Bakersfield, CA	0	0	0	0	0	0	0	1	2	2	2	2	3	3	50	24	NM	NM
Large	Baltimore, MD	11	18	49	49	45	50	57	61	65	69	64	67	75	85	31	43	673	26
Small	Beaumont, TX	0	0	0	0	0	0	0	0	0	0	1	1	1	1	NM	NM	NM	NM
Medium	Birmingham, AL	2	3	5	5	6	7	10	10	12	13	15	15	17	17	42	34	750	23
Very large	Boston, MA	40	54	90	88	95	102	111	111	115	122	123	130	136	139	21	46	248	51
Small	Boulder, CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NM	NM	NM	NM
Small	Brownsville, TX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NM	NM	NM	NM
Large	Buffalo-Niagara Falls, NY	2	2	5	4	4	5	5	5	5	5	5	7	9	9	80	8	350	37
Small	Charleston, SC	2	4	6	6	6	6	6	6	6	6	7	8	9	9	50	24	350	37
Medium	Charlotte, NC	2	5	7	10	11	11	11	12	13	17	18	20	24	24	85	7	1,100	14
Very large	Chicago, IL-Northwestern, IN	R73	R125	R208	R212	R220	R225	R213	R244	R318	R299	R327	R325	R328	340	7	54	366	36
Large	Cincinnati, OH-KY	3	6	15	15	18	19	27	26	31	38	39	40	44	46	48	29	1,433	8
Large	Cleveland, OH	2	2	9	10	12	16	19	27	R32	38	30	31	29	24	-25	68	1,100	14
Small	Colorado Springs, CO	0	0	0	0	1	2	3	4	5	5	7	8	9	9	80	8	NM	NM
Large	Columbus, OH	2	4	13	13	16	19	23	26	28	33	33	36	31	30	7	53	1,400	9
Small	Corpus Christi, TX	0	0	0	0	1	0	0	0	0	1	1	1	1	2	NM	NM	NM	NM
Very large	Dallas-Fort Worth, TX	24	59	93	100	117	129	124	137	R140	R149	175	R246	R229	230	64	17	858	22
Large	Denver, CO	16	20	31	32	38	48	51	64	74	84	92	96	105	114	54	21	613	29
Very large	Detroit, MI	40	46	127	134	177	215	176	168	168	174	176	171	166	175	4	58	338	41
Medium	El Paso, TX-NM	0	0	2	2	4	4	5	5	4	5	6	7	10	13	225	1	NM	NM
Small	Eugene-Springfield, OR	0	0	0	0	0	0	0	0	0	0	0	2	2	2	NM	NM	NM	NM
Large	Fort Lauderdale-Hollywood-Pompano Beach, FL	6	R6	R17	R19	R23	R27	R25	R29	R34	R40	R41	R49	R62	70	106	3	1,067	18
Small	Fort Myers-Cape Coral, FL	0	0	0	0	1	2	2	2	2	3	3	4	4	4	100	4	NM	NM
Medium	Fresno, CA	2	2	6	6	5	4	4	5	5	6	7	8	10	8	60	18	300	46
Medium	Hartford-Middletown, CT	3	7	7	8	9	7	6	6	7	8	9	11	12	12	71	15	300	46
Medium	Honolulu, HI	R4	6	R14	R14	R15	R15	R15	R15	R15	R14	R15	R15	R12	12	-20	67	200	53
Very large	Houston, TX	78	132	R112	R86	R87	R108	R118	R125	R136	R168	R161	R197	R197	206	51	23	164	55
Large	Indianapolis, IN	2	3	6	R9	12	21	28	32	38	41	33	32	35	40	5	56	1,900	4
Medium	Jacksonville, FL	4	5	11	13	17	17	19	24	24	25	21	21	R22	23	-4	64	475	33
Large	Kansas City, MO-KS	1	3	7	6	8	R14	17	15	R20	R21	R23	R27	R24	24	20	47	2,300	2
Small	Laredo, TX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NM	NM	NM	NM
Large	Las Vegas, NV	2	4	13	15	14	14	18	19	23	26	29	31	34	32	39	37	1,500	6

Very large	Los Angeles, CA	R ³⁰⁹	R ⁴¹³	R ⁹¹³	R ⁹⁰⁶	R ⁹¹⁰	R ⁹¹⁸	R ⁸⁴⁶	R ⁹⁰²	R ⁹⁹⁷	R ⁹⁷¹	R ^{1,036}	R ^{1,023}	R ^{1,040}	996	0	63	222	52
Medium	Louisville, KY-IN	5	6	7	10	13	16	21	17	24	26	27	31	31	26	8	52	420	34
Medium	Memphis, TN-AR-MS	2	2	7	8	10	11	14	17	17	21	21	22	25	27	59	19	1,250	11
Large	Miami-Hialeah, FL	24	31	62	64	85	83	88	86	88	95	92	95	R ¹¹⁶	115	31	44	379	35
Large	Milwaukee, WI	5	7	12	13	15	19	19	24	25	26	29	32	R ³⁵	33	32	42	560	30
Large	Minneapolis-St. Paul, MN	5	10	29	31	39	51	56	63	65	90	94	104	108	116	78	10	2,220	3
Medium	Nashville, TN	R ⁶	6	9	7	7	10	13	15	17	19	18	22	24	24	41	35	300	46
Large	New Orleans, LA	7	9	12	13	13	13	22	20	20	20	20	20	19	19	-5	65	171	54
Very large	New York, NY-Northeastern, NJ	157	180	472	355	348	362	431	484	R ⁴⁸⁷	R ⁵²⁸	R ⁵⁶³	R ⁶²⁵	R ⁶⁵⁰	696	43	33	343	39
Large	Norfolk-Newport News-Virginia Beach, VA	9	14	20	18	20	20	25	27	31	31	35	R ³⁵	R ²⁷	33	6	55	267	50
Large	Oklahoma City, OK	1	2	3	4	5	5	5	7	8	10	12	14	11	12	50	24	1,100	14
Medium	Omaha, NE-IA	1	2	5	5	6	6	6	6	8	8	10	11	11	12	50	24	1,100	14
Large	Orlando, FL	6	11	16	23	25	29	31	32	36	40	47	47	58	62	72	14	933	20
Small	Pensacola, FL	0	0	2	R ²	3	4	4	4	4	4	4	4	5	4	0	59	NM	NM
Very large	Philadelphia, PA-NJ	31	40	61	76	78	75	82	91	94	98	112	116	115	126	34	40	306	44
Large	Phoenix, AZ	17	R ²²	R ⁴⁵	R ⁵²	R ⁵⁹	R ⁶¹	R ⁶⁴	R ⁶⁰	R ⁷⁶	R ⁸⁷	R ⁸²	105	115	127	67	16	647	28
Large	Pittsburgh, PA	11	R ¹³	18	18	18	17	17	21	21	21	22	24	20	22	5	57	100	56
Large	Portland-Vancouver, OR-WA	5	6	17	18	25	31	32	36	43	48	49	53	57	62	44	31	1,140	13
Medium	Providence-Pawtucket, RI-MA	2	6	12	10	10	13	15	16	20	17	22	26	29	31	55	20	1,450	7
Medium	Richmond, VA	0	2	5	4	4	6	7	10	11	11	12	12	11	12	9	51	NM	NM
Medium	Rochester, NY	0	0	1	1	2	2	2	3	4	4	3	4	4	4	0	59	NM	NM
Large	Sacramento, CA	6	10	27	29	26	28	33	30	37	34	36	38	46	46	24	45	667	27
Small	Salem, OR	0	0	0	0	0	0	1	0	1	2	2	2	2	2	100	4	NM	NM
Medium	Salt Lake City, UT	1	2	6	7	8	9	12	13	13	12	12	13	R ¹⁶	19	46	30	1,800	5
Large	San Antonio, TX	6	12	12	12	13	12	12	20	20	22	28	38	42	38	90	6	533	32
Large	San Bernardino-Riverside, CA	6	12	R ⁴⁰	R ⁵⁰	R ⁵³	R ⁵³	R ⁴⁵	R ⁵⁰	R ⁵⁴	R ⁵⁷	R ⁶⁶	R ⁶⁵	R ⁷³	82	52	22	1,267	10
Large	San Diego, CA	12	R ²²	R ⁶⁵	R ⁶⁰	R ⁶³	R ⁶¹	R ⁶²	R ⁶³	R ⁶⁶	R ⁷⁸	R ⁷⁵	R ⁹²	R ¹⁰⁷	116	76	12	867	21
Very large	San Francisco-Oakland, CA	67	130	220	175	170	179	158	198	201	186	213	223	R ²⁶²	271	35	38	304	45
Large	San Jose, CA	22	45	93	82	65	61	61	67	67	R ⁶²	72	83	89	90	34	39	309	43
Large	Seattle-Everett, WA	R ¹⁷	R ³¹	R ⁷⁵	R ⁹⁶	R ¹¹²	R ¹⁰²	R ¹⁰⁵	R ¹⁰⁹	R ¹²⁰	R ¹²⁸	R ¹²⁵	R ¹³¹	R ¹⁰⁵	110	-8	66	547	31
Small	Spokane, WA	0	0	0	R ⁰	R ⁰	2	2	2	2	2	3	3	3	2	0	59	NM	NM
Large	St. Louis, MO-IL	17	25	29	27	32	43	50	R ⁵⁵	56	61	63	66	R ⁷³	64	14	50	276	49
Medium	Tacoma, WA	2	2	8	8	R ⁸	11	12	12	12	12	12	16	14	16	33	41	700	25
Large	Tampa-St Petersburg-Clearwater, FL	17	21	37	44	46	53	62	61	61	59	58	63	62	72	18	48	324	42
Medium	Tucson, AZ	0	2	4	6	6	6	6	7	9	11	12	12	16	16	78	11	NM	NM
Medium	Tulsa, OK	0	2	4	3	3	3	3	5	5	6	7	8	11	11	120	2	NM	NM
Large	West Palm Beach-Boca Raton-DeLray Beach, FL	1	3	R ⁹	12	R ¹⁴	R ¹⁴	20	20	23	22	R ²⁵	R ²⁹	R ³¹	33	43	32	3,200	1
Very large	Washington, DC-MD-VA	46	67	R ¹¹⁰	R ¹¹⁹	R ¹³¹	R ¹⁴¹	R ¹⁴⁷	R ¹⁵⁸	R ¹⁷³	R ¹⁷²	R ¹⁹⁷	R ²⁰⁶	R ¹⁹³	203	17	49	341	40
	75-Area Average	16	R ²³	R ⁴⁵	R ⁴⁴	R ⁴⁶	R ⁴⁹	R ⁵¹	R ⁵⁵	R ⁶⁰	R ⁶³	R ⁶⁶	R ⁷¹	R ⁷⁴	76	27		375	
	Very Large Area Average	R ⁸⁷	R ¹²⁵	R ²⁴¹	R ²²⁵	R ²³³	R ²⁴⁵	R ²⁴¹	R ²⁶²	R ²⁸³	R ²⁸⁷	R ³⁰⁸	R ³²⁶	R ³³²	338	19		289	
	Large Area Average	9	R ¹³	28	29	32	35	39	42	46	R ⁵¹	R ⁵³	56	R ⁶⁰	63	37		600	

Medium Area Average	2	3	R ₆	7	8	9	10	11	13	14	14	16	17	18	38	800
Small Area Average	0	0	1	1	1	1	1	1	2	2	2	3	3	3	91	2,000

KEY: NM = not meaningful; R = revised.

Very large urban areas - over 3 million population.

Large urban areas - over 1 million and less than 3 million population.

Medium urban areas - over 500,000 and less than 1 million population.

Small urban areas - less than 500,000 population.

NOTES

"Wasted" fuel is the difference between the fuel consumed under estimated existing conditions and the fuel consumed if all traffic was moving at free-flow conditions. Calculations are made for peak period speeds and for free-flow speeds on both the freeway and principal arterial systems.

For a more detailed description of the formulas used, see the source document.

The cities shown represent the 50 largest metropolitan areas, as well as others chosen by the states sponsoring the study.

Percent changes for area averages were calculated before rounding.

SOURCE

1982-2001: Texas Transportation Institute, *The 2003 Annual Urban Mobility Study Report* (College Station, TX: 2003) from Internet site <http://mobility.tamu.edu> as of Oct. 31, 2003.

Table 4-28: Annual Wasted Fuel Per Person

Population group		Gallons wasted														Percent change			
																Short-term 1996-2001		Long term 1982-2001	
		1982	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Percent	Rank	Percent	Rank
Medium	Albany-Schenectady-Troy, NY	R4	0	4	4	4	6	6	8	8	8	8	10	10	12	50	15	200	49
Medium	Albuquerque, NM	5	9	12	12	13	17	22	25	30	35	36	39	R29	29	-3	60	480	23
Small	Anchorage, AK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NM	NM	NM	NM
Large	Atlanta, GA	10	17	20	19	21	29	40	45	51	53	56	50	56	58	14	45	480	23
Medium	Austin, TX	7	15	15	18	18	21	25	28	35	43	36	43	48	50	43	21	614	16
Small	Bakersfield, CA	0	0	0	0	0	0	0	3	5	5	5	5	7	7	NM	24	NM	NM
Large	Baltimore, MD	6	10	25	24	22	24	27	29	30	32	30	31	R34	38	27	38	533	17
Small	Beaumont, TX	0	0	0	0	0	0	0	0	0	0	7	7	7	7	NM	NM	NM	NM
Medium	Birmingham, AL	3	5	8	8	9	11	16	15	18	20	23	23	25	25	39	26	733	13
Very large	Boston, MA	14	20	30	30	32	34	37	37	38	40	41	43	45	46	21	40	229	45
Small	Boulder, CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NM	NM	NM	NM
Small	Brownsville, TX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NM	NM	NM	NM
Large	Buffalo-Niagara Falls, NY	2	2	5	4	4	5	5	5	5	5	5	6	8	8	60	11	300	36
Small	Charleston, SC	6	11	15	15	15	14	14	14	14	16	18	20	20	20	43	21	233	44
Medium	Charlotte, NC	6	14	16	22	22	21	21	22	23	29	29	32	37	36	57	12	500	20
Very large	Chicago, IL-Northwestern, IN	R10	R17	R28	R28	R29	R30	R28	R32	R40	R38	R41	R40	R41	42	5	53	320	34
Large	Cincinnati, OH-KY	3	5	13	13	15	15	22	21	25	30	31	31	34	36	44	20	1,100	9
Large	Cleveland, OH	1	1	5	6	7	9	10	15	R17	20	16	R17	R16	13	-24	68	1,200	8
Small	Colorado Springs, CO	R0	0	0	0	3	6	8	10	13	12	16	18	19	19	46	19	NM	NM
Large	Columbus, OH	2	5	15	14	17	19	23	26	27	32	32	35	30	29	7	51	1,350	7
Small	Corpus Christi, TX	0	0	0	0	4	0	0	0	0	3	3	3	3	6	NM	NM	NM	NM
Very large	Dallas-Fort Worth, TX	10	21	30	31	37	40	38	42	R40	R42	48	R66	60	60	50	15	500	20
Large	Denver, CO	12	13	20	20	24	30	30	37	42	47	50	52	55	56	33	33	367	31
Very large	Detroit, MI	10	12	32	34	44	54	44	42	42	R43	44	43	41	43	2	55	330	33
Medium	El Paso, TX-NM	0	0	4	4	7	7	9	8	7	8	9	11	15	20	186	1	NM	NM
Small	Eugene-Springfield, OR	0	0	0	0	0	0	0	0	0	0	0	9	9	9	NM	NM	NM	NM
Large	Fort Lauderdale-Hollywood-Pompano Beach, FL	6	R5	R13	R15	R18	R21	R19	R21	R24	R27	R28	R32	R39	43	79	4	617	15
Small	Fort Myers-Cape Coral, FL	0	0	0	0	4	8	8	8	8	11	11	15	14	13	63	10	NM	NM
Medium	Fresno, CA	6	5	13	13	10	8	8	10	9	11	13	15	18	14	56	13	133	55
Medium	Hartford-Middletown, CT	5	12	11	13	15	11	10	10	11	13	14	17	19	19	73	5	280	37
Medium	Honolulu, HI	R7	10	R21	R21	R22	R22	R22	R21	R21	R20	R21	R22	R17	17	-19	67	143	53
Very large	Houston, TX	33	55	R39	R30	R30	R37	R40	R42	R44	R54	R50	R60	R58	59	34	32	79	57
Large	Indianapolis, IN	2	3	6	R9	13	22	29	32	38	40	33	31	34	39	3	54	1,850	2
Medium	Jacksonville, FL	7	8	15	17	22	22	24	30	29	30	25	25	R25	26	-10	65	271	38
Large	Kansas City, MO-KS	1	3	6	5	7	R11	13	11	R15	R15	17	19	R17	17	13	46	1,600	3
Small	Laredo, TX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NM	NM	NM	NM
Large	Las Vegas, NV	4	8	19	20	18	16	20	20	23	25	R26	27	28	25	9	49	525	18
Very large	Los Angeles, CA	R31	R39	R80	R77	R77	R77	R71	R75	R82	R79	R83	R81	R82	78	-5	61	152	52
Medium	Louisville, KY-IN	6	8	9	12	16	20	25	21	29	31	33	37	37	31	7	52	417	27
Medium	Memphis, TN-AR-MS	3	3	8	9	11	12	15	18	18	22	22	23	26	28	56	13	833	12
Large	Miami-Hialeah, FL	14	17	34	34	44	43	45	43	43	46	44	45	R52	51	19	43	264	40
Large	Milwaukee, WI	4	6	10	11	12	15	15	19	20	20	22	24	R26	24	20	41	500	20
Large	Minneapolis-St. Paul, MN	3	6	14	15	18	24	26	28	29	39	41	R44	R45	48	66	7	1,500	5
Medium	Nashville, TN	R11	11	16	12	12	17	21	24	26	29	27	R33	R36	36	38	27	227	46
Large	New Orleans, LA	7	9	11	12	12	12	20	18	18	18	18	18	17	17	-6	62	143	53

Very large	New York, NY-Northeastern, NJ	10	12	30	22	22	22	27	30	R30	R32	R34	38	R38	41	37	30	310	35
Large	Norfolk-Newport News-Virginia Beach, VA	8	12	15	13	15	14	18	19	22	22	24	R24	R18	22	NM	56	175	51
Large	Oklahoma City, OK	2	3	4	5	6	6	6	8	8	10	12	13	10	11	38	28	450	25
Medium	Omaha, NE-IA	2	4	9	9	11	11	11	11	14	14	17	18	18	19	36	31	850	11
Large	Orlando, FL	10	16	19	25	27	30	31	31	34	36	42	41	R49	51	50	15	410	28
Small	Pensacola, FL	0	0	8	R8	11	15	15	14	14	14	14	13	R17	13	-7	64	NM	NM
Very large	Philadelphia, PA-NJ	8	10	14	17	17	17	18	20	21	22	25	25	25	27	29	36	238	42
Large	Phoenix, AZ	12	R13	R24	R27	R29	29	R30	R27	32	R36	32	R39	R41	44	38	28	267	39
Large	Pittsburgh, PA	6	7	10	10	10	10	10	12	12	12	12	13	11	12	NM	56	100	56
Large	Portland-Vancouver, OR-WA	4	5	14	15	20	24	25	27	32	33	33	R35	R37	39	22	39	875	10
Medium	Providence-Pawtucket, RI-MA	2	7	14	12	11	15	17	18	22	19	24	29	32	33	50	15	1,550	4
Medium	Richmond, VA	0	4	9	7	7	10	12	16	18	18	19	19	17	17	-6	62	NM	NM
Medium	Rochester, NY	0	0	2	2	3	3	3	5	6	6	5	6	6	6	NM	56	NM	NM
Large	Sacramento, CA	7	11	25	25	22	23	27	24	29	26	27	28	33	33	14	44	371	30
Small	Salem, OR	0	0	0	0	0	0	6	0	6	11	11	R10	10	10	67	6	NM	NM
Medium	Salt Lake City, UT	1	3	8	9	10	11	15	16	15	14	13	15	R18	21	40	24	2,000	1
Large	San Antonio, TX	6	12	10	10	11	10	10	16	16	18	23	31	34	30	88	3	400	29
Large	San Bernardino-Riverside, CA	7	13	R33	38	R40	R40	R34	R37	R40	R42	R47	R46	R52	57	43	23	714	14
Large	San Diego, CA	7	12	R28	25	R25	R24	R24	25	R26	R30	R28	R34	R40	43	65	8	514	19
Very large	San Francisco-Oakland, CA	20	39	60	47	45	47	41	51	52	47	53	55	R65	67	29	35	235	43
Large	San Jose, CA	17	34	66	55	43	40	40	43	42	R38	44	R50	53	54	29	36	218	47
Large	Seattle-Everett, WA	R12	R20	R43	R53	R61	R54	R55	R56	R62	R65	R63	R66	R53	53	-15	66	342	32
Small	Spokane, WA	0	0	0	R0	R0	7	6	6	6	6	9	9	9	6	NM	56	NM	NM
Large	St. Louis, MO-IL	9	13	15	14	R16	22	25	28	28	31	32	33	R36	31	11	47	244	41
Medium	Tacoma, WA	5	4	15	15	R15	20	21	21	20	20	20	27	23	26	30	34	420	26
Large	Tampa-St Petersburg-Clearwater, FL	12	14	22	26	27	30	35	33	33	32	31	33	32	36	9	48	200	49
Medium	Tucson, AZ	0	4	8	11	11	10	10	11	14	17	18	18	18	23	64	9	NM	NM
Medium	Tulsa, OK	0	4	6	4	4	R4	4	7	7	8	9	10	14	14	100	2	NM	NM
Large	West Palm Beach-Boca Raton-Delray Beach, FL	2	4	R11	15	R17	R17	23	23	26	24	R26	R29	R30	31	19	42	1,450	6
Very large	Washington, DC-MD-VA	17	23	R35	R36	R40	R41	R43	R46	R50	R49	R56	R58	R54	54	8	50	218	47
	75-Area Average	R11	R16	R29	R28	R29	R30	R31	R33	R36	R37	R39	R41	R41	42	17		282	
	Very Large Area Average	R16	R23	R41	R38	39	R41	40	43	46	R46	R49	R52	R52	52	13		206	
	Large Area Average	7	R11	R20	R20	R22	R24	R26	R28	R30	R32	R33	R35	R36	37	23		429	
	Medium Area Average	4	6	11	11	12	13	15	17	R19	20	20	23	24	24	26		500	
	Small Area Average	R1	1	R3	R3	R4	R5	R5	R5	R6	R7	R8	R9	R10	10	67		900	

KEY: NM = not meaningful; R = revised.

Very large urban areas - over 3 million population.

Large urban areas - over 1 million and less than 3 million population.

Medium urban areas - over 500,000 and less than 1 million population.

Small urban areas - less than 500,000 population.

NOTES

"Wasted" fuel is the difference between the fuel consumed under estimated existing conditions and the fuel consumed if all traffic was moving at free-flow conditions.

Calculations are made for peak period speeds and for free-flow speeds on both the freeway and principal arterial system.

For a more detailed description of the formulas used, see the source document.

The cities shown represent the 50 largest metropolitan areas, as well as others chosen by the states sponsoring the study.

SOURCE

1982-2001: Texas Transportation Institute, *The 2003 Annual Urban Mobility Study* (College Station, TX: 2003) from Internet site <http://mobility.tamu.edu> as of Oct. 31, 2003.

Section D

Air Pollution

Table 4-29: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Vehicles^{a,b} (Grams per mile)

Engine type and pollutant	Prior to control ^d	1968-1969	1970-1971	1972	1973-1974	1975-1976	1977-1979	1980	1981	1982-1986	1987-1993	Tier 1 ⁱ 1994-2003 ^b	Interim Tier 2 ⁱ 2004-2006	Tier 2 ⁱ 2007+
Gasoline														
HC (total)	11	^g	2.2	3.4		1.5		0.41				0.41 ^(h)	^h	
NMHC	^e	^h										0.25 (0.31)	^h	
NMOG	^e	^h											0.125 (0.156)	0.100 (0.125)
CO	80	^g	23	39		15		7.0	3.4			3.4 (4.2)		
Cold-temp. CO ^c	^e	^h										10 ^(h)		
NO _x	4	^h			3.0	3.1	2.0		1.0			0.4 (0.6)		0.14 (0.20)
Particulates	^e	^h										0.08 (0.10)	0.08 (0.08)	0.02 (0.02)
Formaldehyde	^e	^h											0.015 (0.018)	
Diesel														
HC (total)	11	^h				1.5		0.41				0.41 ^(h)	^h	
NMHC	^e	^h										0.25 (0.31)	^h	
NMOG	^e	^h											^h (0.156)	0.100 (0.125)
CO	80	^h				15		7.0	3.4			3.4 (4.2)	^h (4.2)	3.4 (4.2)
NO _x	4	^h				3.1	2.0		1.0			1.0 (1.25)	^h (0.6)	0.14 (0.20)
Particulates	^e	^h								0.60	0.20	0.08 (0.10)	^h (0.10)	0.02 (0.02)
Formaldehyde	^e	^h											^h (0.018)	0.015 (0.018)
Test procedure		7-mode		CVS-72		CVS-75								
Useful life, intermediate^{b,h}													5 years/50,000 miles	
Useful life, full													10 years/100,000 miles	10 years/120,000 miles

KEY: CO = carbon monoxide; CVS = constant volume sampler; HC = hydrocarbons; NMHC = non-methane hydrocarbons; NMOG = nonmethane organic gases; NOx = nitrogen oxides.

^a The test procedure for measuring exhaust emissions has changed several times over the course of vehicle emissions regulations. The 7-mode procedure was used through model year 1971 and was replaced by the CVS-72 procedure beginning in model year 1972. The CVS-75 procedure became the test procedure as of model year 1975. While it may appear that the total HC and CO standards were relaxed in 1972-74, these standards were actually more stringent due to the more stringent nature of the CVS-72 test procedure. Additional standards for CO and composite standards for NMHC and NOx tested under the new Supplemental Federal Test Procedure will be phased-in beginning with model year 2000; these standards are not shown in this table.

^b All emissions standards must be met for a useful life of 5 years/50,000 miles. Beginning with model year 1994, a second set of emissions standards must also be met for a full useful life of 10 years/100,000 miles; these standards are shown in parentheses. Tier 1 exhaust standards were phased-in during 1994-96 at a rate of 40%, 80%, and 100%, respectively.

^c The cold CO emissions standard is measured at 20 °F (rather than 75 °F) and is applicable for a 5-year/50,000-mile useful life.

^d The "Prior to control" column reports emissions estimates of a typical newly manufactured car in the years before exhaust emissions certification standards were implemented.

^e No estimate available.

^f Manufacturers can opt to certify vehicles for a full useful life of 15 years/150,000 miles and have either 1) intermediate useful life standards waived or 2) receive additional NOx credits.

^g In 1968-69, exhaust emissions standards were issued in parts per million rather than grams per mile and are, therefore, incompatible with this table.

^h No standard has been set.

ⁱ The term "tier" refers to a level of standards and is associated with specific years. Interim Tier 2 refers to an intermediate level of standards that move manufacturers toward compliance with Tier 2 standards. Interim Tier 2 and Tier 2 standards are established as "bins." Each bin is a set of standards for NOx, CO, NMOG, formaldehyde, and particulate matter; HC and NMHC standards are dropped for Tier 2 and Interim Tier 2. Manufacturers may certify any given vehicle family to any of the bins available for that vehicle class as long as the resulting sales-weight corporate average NOx standard is met for the full useful life of the vehicle. The Tier 2 corporate average NOx standard is 0.07 grams/mile. Interim corporate-based average NOx standards are based on vehicle type. The interim sales-weighted average for light-duty vehicles (LDVs) is 9.3 grams/mile. For LDVs, Tier 2 standards will be phased in at a rate of 25% in 2004, 50% in 2005, 75% in 2006, and 100% in 2007. During this period, all LDVs not meeting the Tier 2 standards must meet Interim Tier 2 standards.

SOURCES

40 CFR 86, Subpart A (July 1, 2000).

Federal Register, Vol. 65, No. 28, pp. 6851-6858.

Table 4-30a: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Trucks (Category LDT1)^{a,b,c} (Grams per mile)

Engine type and pollutant	Prior to control ^g	1968-1969	1970-1971	1972	1973-1974	1975	1976-1978	1979-1981	1982-1983	1984	1985-1986	1987	1988-1993	Tier 1 ^k 1994	1995-2003	Interim Tier 2 ^k 2004-2006	Tier 2 ^k 2007+	
Gasoline																		
HC (total)	11		2.2	3.4		2.0		1.7		0.80				^j R(0.80)				
NMHC	^h													0.25 (0.31)				
NMOG	^h															0.125 (0.156)	0.100 (0.125)	
CO	80		23	39		20		18		10				3.4 (4.2)				
Cold-temp. CO ^d	^e													10 ^j				
NO _x	4				3.0	3.1		2.3					1.2	0.4 (0.6)			0.14 (0.20)	
Particulates	^h														0.08 (0.10)	0.08 (0.08)	0.02 (0.02)	
Formaldehyde	^h															0.015 (0.018)		
Diesel																		
HC (total)	11						2.0	1.7		0.80							^j (0.80)	
NMHC	^h																0.25 (0.31)	
NMOG	^h																^j (0.156) 0.100 (0.125)	
CO	80						20	18		10				3.4 (4.2)		^j (4.2)	3.4 (4.2)	
NO _x	4						3.1	2.3					1.2	1.0 (1.25)		^j (0.6)	0.14 (0.20)	
Particulates	^h								0.60			0.26			0.08 (0.10)	^j (0.10)	0.02 (0.02)	
Formaldehyde	^h															^j (0.018)	0.015 (0.018)	
LDT1 weight criteria ^e	GVWR up through 6,000 pounds					GVWR up through 8,500 pounds					GVWR up through 6,000 lbs; LVW up through 3,750 pounds							
Test procedure ^b	7-mode			CVS-72			CVS-75											
Useful life, intermediate ^{c,f}	^j												5 years/50,000 miles		5 years/50,000miles			
Useful life, full	5 years/50,000 miles									11 years/120,000 miles			10 years/100,000 miles			10 years/ 20,000 miles		

KEY: CO=carbon monoxide; CVS = constant volume sampler; GVWR=gross vehicle weight rating; HC=hydrocarbons; LVW=loaded vehicle weight; NMHC=nonmethane hydrocarbons; NMOG= nonmethane organic gases; NOx=nitrogen oxides.

^a Light-duty truck categories LDT1-LDT4 were not created until 1994. From 1968 to 1978, all trucks with a GVWR up to 6,000 pounds were classified as light-duty trucks and were required to meet the same standards. As of 1979, the maximum weight was raised to 8,500 pounds GVWR. During 1988-93, light duty trucks were divided into two subcategories that coincide with the current LDT1-LDT4 categories. The standards for LDT2, LDT3, and LDT4 are shown in tables 4-30b through 4-30d.

^b The test procedure for measuring exhaust emissions has changed several times over the course of vehicle emissions regulation. The 7-mode procedure was used through model year 1971 and was replaced by the CVS-72 procedure beginning in model year 1972. The CVS-75 procedure became the test procedure as of model year 1975. While it may appear that total HC and CO standards were relaxed in 1972-74, these standards were actually more stringent due to the more stringent nature of the CVS-72 test procedure. Additional standards for CO and composite standards for NMHC and NOx tested over the new Supplemental Federal Test Procedure will be phased-in beginning with model year 2000. These standards are not shown in this table.

^c The useful life of a vehicle is defined as the number of years or miles that a vehicle is expected to be used. For model years 1985-93, several useful life options were available for 1984). Beginning in model year 1994, emissions standards were established for an intermediate useful life of 5 years/50,000 miles as well as a full useful life (full useful life standards are shown in parentheses). HC standards, however, were established only for full useful life. Tier 1 exhaust standards, except particulates standards, were phased in during 1994-96 at a rate of 40%, 80%, and 100%, respectively. Particulate matter standards were phased-in at a rate of 40%, 80%, and 100% during 1995-97.

^d The cold CO emissions standard is measured at 20 °F (rather than 75 °F) and is applicable for a 5-year/50,000-mile useful life.

^e GVWR is the maximum design loaded weight. LVW is the curb weight (nominal vehicle weight) plus 300 pounds.

^f Manufacturers can opt to certify vehicles for a full useful life of 15 years/150,000 miles and either have (1) intermediate useful life standards waived or (2) receive additional NOx credits.

^g The "Prior to controls" column reports emissions estimates of a typical newly manufactured car in the years before exhaust emissions certification standard were implemented.

^h No estimate available.

ⁱ In 1968-69, exhaust emissions standards were issued in parts per million rather than grams per mile and are, therefore, incompatible with this

^j No standard has been set.

^k The term "tier" refers to a level of standards for specific years. Interim Tier 2 refers to an intermediate level of standards that move manufacturers toward compliance with Tier 2 standards. Interim Tier 2 and Tier 2 standards are established as "bins." Each bin is a set of standards for NOx, CO, NMOG, formaldehyde, and particulates (HC and NMHC standards are dropped for Tier 2 and Interim Tier 2). Manufacturers may certify any given vehicle family to any of the bins available for that vehicle class as long as the resulting sales-weighted corporate average NOx standard is met for the full useful life. The Tier 2 corporate average NOx standard is 0.07 grams/mile. Interim corporate-based average NOx standards are based on vehicle type. The interim corporate sales-weighted average for LDT1 vehicles is 0.3 grams/mile. Tier 2 standards will be phased in at a rate of 25% in 2004, 50% in 2005, 75% in 2006, and 100% in 2007. During this period, all LDT1 vehicles not meeting the Tier 2 standards must meet Interim Tier 2 standards.

SOURCES

40 CFR 86, Subpart A (July 1, 2000).

Federal Register, Vol. 65, No. 28, pp. 6851-6858.

Table 4-30b: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Trucks (Category LDT2)^{a,b,c} (Grams per mile)

Engine type and pollutant	Prior to control ^g	1968-1969	1970-1971	1972	1973-1974	1975	6-197	9-198	1982-1983	1984	1985-1986	1987	8-199	1991-1993	Tier 1k 1994	Tier 1k 1995-2003	Interim Tier 2 ^k 2004-2006	Tier 2 ^k 2007+	
Gasoline																			
HC (total)	11	^e	2.2	3.4		2.0		1.7		0.80					j (0.80)				
NMHC	^h	j													j (0.40)				
NMOG	^h	j															0.125 (0.156)	0.100 (0.125)	
CO	80	ⁱ	23	39		20		18		10					4.4 (5.5)		3.4 (4.2)		
Cold-temp. CO ^{dh}		j													13 ⁽ⁱ⁾				
NO _x	4	j			3.0	3.1		2.3					1.7		0.7 (0.97)		0.4 (0.6)	0.14 (0.20)	
Particulates	^h	j														0.1 (0.10)	0.08 (0.08)	0.02 (0.02)	
Formaldehyde	^h	j															0.015 (0.018)		
Diesel																			
HC (total)	11	j				2.0	1.7		0.80						j (0.80)				
NMHC	^h	j													0.3 (0.40)				
NMOG	^h	j															j (0.156)	0.100 (0.125)	
CO	80	j				20	18		10						4.4 (5.5)		j (4.2)	3.4 (4.2)	
NO _x	4	j				3.1	2.3						1.7		j (0.97)		j (0.6)	0.14 (0.20)	
Particulates	^h	j						0.60		0.50	0.5	0.13			0.1 (0.10)		j (0.10)	0.02 (0.02)	
Formaldehyde	^h	j															j (0.018)	0.015 (0.018)	
LDT2 weight criteria^e	GVWR up through 6,000 pounds					GVWR up through 8,500 pounds					GVWR up through 6,000 pounds; LVW over 3,750 pounds								
Test procedure^b	7-mode		CVS-72		CVS-75														
Useful life, intermediate^{c, f}															5 years/50,000 miles		5 years/50,000miles		
Useful life, full	5 years/50,000 miles									11 years/120,000 miles			10 years/100,000 miles				10 years/120,000 miles		

KEY: CO=carbon monoxide; GVWR=gross vehicle weight rating; HC=hydrocarbons; LVW=loaded vehicle weight; NMHC=non-methane hydrocarbons; NMHC=nonmethane hydrocarbons; NMOG=nonmethane organic gases; NOx=nitrogen oxides.

^a Light-duty truck categories LDT1-LDT4 were not created until 1994. From 1968 to 1978 all trucks with a GVWR up to 6,000 pounds were classified as light-duty trucks and were required to meet the same standards. As of 1979, the maximum weight was raised to 8,500 pounds GVWR. During 1988-93, light-duty trucks were divided into two subcategories that coincide with the current LDT1-LDT4 categories. The standards for LDT1, LDT3, and LDT4 are shown in tables 4-30a, 4-40c, and 4-30d.

^b The test procedure for measuring exhaust emissions has changed several times over the course of vehicle emissions regulation. The 7-mode procedure was used through model year 1971 and was replaced by the CVS-72 procedure beginning in model year 1972. The CVS-75 procedure became the test procedure as of model year 1975. While it may appear that the total HC and CO standards were relaxed in 1972-74, these standards were actually more stringent due to the more stringent nature of the CVS-72 test procedure. Additional standards for CO and composite standards for NMHC and NOx tested over the new Supplemental Federal Test Procedure will be phased-in beginning with model year 2000. These standards are not shown in this table.

^c Emissions standards had to be met for a useful life of 5 years/50,000 miles through model year 1983, and a full useful life of 11 years/120,000 miles was defined for 1985-93 (several useful life options were available for 1984). Beginning in model year 1994, emissions standards were established for an intermediate useful life of 5 years/50,000 miles as well as a full useful life (full useful life standards are shown in parentheses). HC standards, however, were established only for full useful life. Tier 1 exhaust standards, except particulates standards were phased-in during 1994-96 at a rate of 40%, 80%, and 100%, respectively. Particulates standards were phased-in at a rate of 40%, 80%, and 100% during 1995-97.

^d The cold CO emissions standard is measured at 20 °F (rather than 75 °F) and is applicable for a 5-year/50,000-mile useful life.

^e GVWR is the maximum design loaded weight. LVW is the curb weight (nominal vehicle weight) plus 300 pounds.

^f Manufacturers can opt to certify vehicles for a full useful life of 15 years/150,000 miles and either have (1) intermediate useful life standards waived or (2) receive additional NOx credits.

^g The "Prior to controls" reports emissions estimates of a typical newly manufactured car in the years before exhaust emissions certification standards were implemented

^h No estimate available.

ⁱ In 1968-69, exhaust emissions standards were issued in parts per million rather than grams per mile and are, therefore, incompatible with this table

^j No standard has been set.

^k The term "tier" refers to a level of standards for specific years. Interim 2 refers to an intermediate level of standards that move manufacturers toward compliance with Tier 2 standards. Interim Tier 2 and Tier 2 standards are established as "bins." Each bin is a set of standards for NO_x, CO, NMOG, formaldehyde, and particulates (HC and NMHC standards are dropped for Tier 2 and Interim Tier 2). Manufacturers may certify any given vehicle family to any of the bins available for that vehicle class as long as the resulting sales-weighted corporate average NO_x standard is met for the full useful life. The Tier 2 corporate average NO_x standard is 0.07 grams/mile. Interim corporate-based average NO_x standards are based on vehicle type. The interim corporate sales-weighted average for LDT2 vehicles is 0.3 grams/mile. Tier 2 standards will be phased in at a rate of 25% in 2004, 50% in 2005, 75% in 2006, and 100% in 2007. During this period all LDT2 vehicles not meeting the Tier 2 standards must meet Interim Tier 2 standards.

SOURCES

40 CFR 86, Subpart A (July 1, 2000).

Federal Register, Vol. 65, No. 28, pp. 6851-6858.

Table 4-30c: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Trucks (Category LDT3)^{a,b,c} (Grams per mile)

Engine type and pollutant	Prior to control ^g	1968-1969	1970-1971	1970-1972	1973-1974	1973-1975	1976-1978	1979-1981	1982-1983	1982-1984	1985-1986	1985-1987	1988-1989	1988-1990	1991-1995	Tier 1 ^k 1996-2007	Interim Tier 2 ^k 2008	Tier 2 ^k 2009+	
Gasoline																			
HC (total)	11		2.2	3.4		2.0		1.7		0.80						j (0.80)			
NMHC	h															0.32 (0.46)			
NMOG	h																0.160 (0.230)	0.125 (0.156)	
CO	80		23	39		20		18		10						4.4 (6.4)		3.4 4.2	
Cold-temp. CO ^d	h															12.5 ⁽ⁱ⁾			
NO _x	4				3.0	3.1		2.3				2.3	1.7			0.7 (0.98)	0.4 (0.6)	0.14 (0.20)	
Particulates	h															j (0.10)	0.08 (0.08)	0.02 (0.02)	
Formaldehyde	h																0.018 (0.027)	0.015 (0.018)	
Diesel																			
HC (total)	11					2.0		1.7		0.80						j (0.80)			
NMHC	h															0.32 (0.46)			
NMOG	h																(0.230)	0.125 (0.156)	
CO	80					20		18		10						4.4 (6.4)		3.4 4.2	
NO _x	4					3.1		2.3				2.3	1.7			j (0.98)	(0.6)	0.14 (0.20)	
Particulates	h								0.60		0.50	0.45		0.13		j (0.10)	(0.08)	0.02 (0.02)	
Formaldehyde	h																(0.027)	0.015 (0.018)	
LDT3 weight criteria^e	GVWR up through 6,000 pounds					GVWR up through 8,500 pounds					Any ALVW		ALVW up through 5,750 pounds						
	GVWR 6,001-8,500 pounds																		
Test procedure^b	7-mode		CVS-72			CVS-75													
Useful life, intermediate^f																5 years/50,000 miles			
Useful life, full	5 years/50,000 miles										11 years/120,000 miles								

KEY: ALVW=adjusted loaded vehicle weight; CO = carbon monoxide; GVWR=gross vehicle weight rating; HC = hydrocarbons; NMHC=nonmethane hydrocarbon; NMOG=nonmethane organic gases; NOx=nitrogen oxides.

^a Light-duty truck categories LDT1-LDT4 were not created until 1994. From 1968 to 1978 all trucks with a GVWR up to 6,000 pounds were classified as light-duty trucks and were required to meet the same standards. As of 1979, the maximum weight was raised to 8,500 pounds GVWR. During 1988-93, light-duty trucks were divided into two subcategories that coincide with the current LDT1-LDT4 categories. The standards for LDT1, LDT2, and LDT4 are given in tables 4-30a, 4-40b, and 4-30d.

^b The test procedure for measuring exhaust emissions has changed several times over the course of vehicle emissions regulation. The 7-mode procedure was used through model year 1971 and was replaced by the CVS-72 procedure beginning in model year 1972. The CVS-75 procedure became the test procedure as of model year 1975. While it may appear that the total HC and CO standards were relaxed in 1972-74, these standards were actually more stringent due to the more stringent nature of the CVS-72 test procedure. Additional standards for CO and composite standards for NMHC and NO_x tested over the new Supplemental Federal Test Procedure will be phased-in beginning with model year 2002. These standards are not shown in this table.

^c Emissions standards had to be met for a full useful life of 5 years/50,000 miles through model year 1983, and a full useful life of 11 years/120,000 miles was defined for 1985-93 (several useful life options were available for 1984). Beginning in model year 1996, emissions standards were established for an intermediate useful life of 5 years/50,000 miles as well as a full useful life of 11 years/120,000 miles (intermediate and full useful life standards are shown in parentheses). This applied to all pollutants except HC and particulates for all LDT3 vehicles and NO_x for diesel-powered LDT3 vehicles, which were only required to meet full useful life standards. Tier 1 exhaust standards were phased-in during 1996-97 at a rate of 50% and 100%, respectively.

^d The cold CO emissions standard is measured at 20 °F (rather than 75 °F) and is applicable for a 5-year/50,000-mile useful life.

^e GVWR is the maximum design loaded weight. ALVW is the numerical average of the GVWR and the curb weight.

^f Manufacturers can opt to certify vehicles for a full useful life of 15 years/150,000 miles and either have (1) intermediate useful life standards waived or (2) receive additional NO_x credits.

^g The "Prior to controls" column reports emissions estimates of a typical newly manufactured car in the years before exhaust emissions certification standards were implemented.

^h No estimate available.

ⁱ In 1968-69, exhaust emissions standards were issued in parts per million rather than grams per mile and are, therefore, incompatible with this table.

^j No standard has been set.

^k The term "tier" refers to a level of standards for specific years. Interim 2 refers to an intermediate level of standards that moves manufacturers toward compliance with Tier 2 standards. Interim Tier 2 and Tier 2 standards are established as "bins." Each bin is a set of standards for NO_x, CO, NMOG, formaldehyde, and particulates (HC and NMHC standards are dropped for Tier 2 and Interim Tier 2). Manufacturers may certify any given vehicle family to any of the bins available for that vehicle class as long as the resulting sales-weighted corporate average NO_x standard is met for full useful life. The Tier 2 corporate average NO_x standard is 0.07 grams/mile. Interim corporate-based average NO_x standards are based on vehicle type. The interim corporate sales-weighted average for LDT3 vehicles is 0.6 grams/mile. Tier 2 LDT3 standards will be phased in during 2008 and 2009. In 2008, 50% of LDT3 vehicles must meet Tier 2 standards; the others must meet Interim Tier 2 standards. Beginning in 2009, all LDT3 vehicles must meet Tier 2 standards.

SOURCES

40 CFR 86, Subpart A (July 1, 2000).

Federal Register, Vol. 65, No. 28, pp. 6851-6858.

Table 4-30d: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light-Duty Trucks (Category LDT4)^{a,b,c} (Grams per mile)

Engine type and pollutant	Prior to control ^g	1970-1972				1973-1978				1979-1987				1988-1995		Tier 1 ^k 1996-2007	Interim Tier 2 ^k 2008		Tier 2k 2009+				
		1968-1969	1970	1971	1972	1973-1974	1975	1976-1977	1978	1979-1980	1981	1982-1983	1984	1985-1986	1987		1988-1989	1990		1991-1995			
Gasoline																							
HC (total)	11		2.2	3.4		2.0		1.7		0.80						j	(0.80)	j					
NMHC	h																0.4	(0.56)	j				
NMOG	h																			0.160 (0.230)	0.125 (0.156)		
CO	80	i	23	39		20		18		10							5.0	(7.3)	4.4	(6.4)	3.4	(4.2)	
Cold-temp. CO ^d	h																13	(i)					
NO _x	4	j				3.0	3.1		2.3				2.3	1.7			1.1	(1.53)	0.4	(0.6)	0.14	(0.20)	
Particulates	h																j	(0.12)	0.08	(0.08)	0.02	(0.02)	
Formaldehyde	h																			0.018	(0.027)	0.015	(0.018)
Diesel																							
HC (total)	11	j				2.0		1.7		0.80							j	(0.80)	j				
NMHC	h																	0.4	(0.56)	j			
NMOG	h																				(0.230)	0.125 (0.156)	
CO	80	j				20		18		10								5.0	(7.3)	j	(6.4)	3.4	(4.2)
NO _x	4	j				3.1	2.3					2.3	1.7					j	(1.53)	j	(0.6)	0.14	(0.20)
Particulates	h								0.60		0.50	0.5		0.1				j	(0.12)	j	(0.08)	0.02	(0.02)
Formaldehyde	h																			j	(0.027)	0.015	(0.018)
LDT4 weight criteria^e	GVWR up through 6,000 pounds					GVWR up through 8,500 pounds					Any ALVW		ALVW over 5,750 pounds										
											GVWR 6,001-8,500 pounds												
Test procedure^b	7-mode	CVS-72	CVS-75																				
Useful life, intermediate^j																5 years/50,000 miles							
Useful life, full	5 years/50,000 miles									11 years/120,000 miles													

KEY: ALVW=adjusted loaded vehicle weight; CO = carbon monoxide; GVWR=gross vehicle weight rating; HC = hydrocarbons; NMHC=nonmethane hydrocarbon; NMOG=nonmethane organic gases; NOx=nitrogen oxides.

^a Light-duty truck categories LDT1-LDT4 were not created until 1994. From 1968 to 1978 all trucks with a GVWR up to 6,000 pounds were classified as light-duty trucks and were required to meet the same standards. As of 1979, the maximum weight was raised to 8,500 pounds GVWR. During 1988-93, light-duty trucks were divided into two subcategories that coincide with the current LDT1-LDT4 categories. The standards for LDT1, LDT2, and LDT3 are given in tables 4-30a, 4-40b, and 4-30c.

^b The test procedure for measuring exhaust emissions has changed several times over the course of vehicle emissions regulation. The 7-mode procedure was used through model year 1971 and was replaced by the CVS-72 procedure beginning in model year 1972. The CVS-75 procedure became the test procedure as of model year 1975. While it may appear that the total HC and CO standards were relaxed in 1972-74, these standards were actually more stringent due to the more stringent nature of the CVS-72 test procedure.

Additional standards for CO and composite standards for NMHC and NOx tested over the new Supplemental Federal Test Procedure will be phased-in beginning with model year 2002. These standards are not shown in this table.

^c Emissions standards had to be met for a full useful life of 5 years/50,000 miles through model year 1983, and a full useful life of 11 years/120,000 miles was defined for 1985-93 (several useful life options were available for 1984). Beginning in model year 1996, emissions standards were established for an intermediate useful life of 5 years/50,000 miles as well as a full useful life of 11 years/120,000 miles (intermediate and full useful life standards are shown in parentheses). This applied to all pollutants except HC and particulates for all LDT4 vehicles and NOx for diesel-powered LDT4 vehicles, which were only required to meet full useful life standards. Tier 1 exhaust standards were phased-in during 1996-97 at a rate of 50% and 100%, respectively.

^d The cold CO emissions standard is measured at 20 °F (rather than 75 °F) and is applicable for a 5-year/50,000-mile useful life.

^e GVWR is the maximum design loaded weight. ALVW is the numerical average of the GVWR and the curb weight.

^f Manufacturers can opt to certify vehicles for a full useful life of 15 years/150,000 miles and either have (1) intermediate useful life standards waived or (2) receive additional NOx credits.

^g The "Prior to control" column reports emissions estimates of a typical newly manufactured car in the years before exhaust emissions certification standards were implemented.

^h No estimate available.

ⁱ In 1968-69, exhaust emissions standards were issued in parts per million rather than grams per mile and are, therefore, incompatible with this table.

^j No standard has been set.

^k The term "tier" refers to a level of standards for specific years. Interim 2 refers to an intermediate level of standards that moves manufacturers toward compliance with Tier 2 standards. Interim Tier 2 and Tier 2 standards are established as "bins." Each bin is a set of standards for NOx, CO, NMOG, formaldehyde, and particulate matter (HC and non-methane HC standards are dropped for Tier 2 and interim Tier 2). Manufacturers may certify any given vehicle family to any of the bins available for that vehicle class as long as the resulting sales-weighted corporate average NOx standard is met for full useful life. The Tier 2 corporate average NOx standard is 0.07 grams/mile. Interim corporate-based average NOx standards are based on vehicle type. The interim corporate sales-weighted average for LDT4 vehicles is 0.6 grams/mile. Tier 2 standards will be phased in during 2008 and 2009. In 2008, 50% of LDT4 vehicles must meet Tier 2 standards; the others must meet Interim Tier 2 standards. Beginning in 2009, all LDT4 vehicles must meet Tier 2 standards.

SOURCES

40 CFR 86, Subpart A (July 1, 2000).

Federal Register, Vol. 65, No. 28, pp. 6851-6858.

Table 4-31: Federal Exhaust Emission Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Medium-Duty Passenger Vehicles (MDPV)^{a,b}
(Grams per mile)

Engine type and pollutant	Interim Tier 2 ^f		Tier 2 ^f	
	2004	2008	2009+	
Gasoline				
NMOG	0.195 (0.280)		0.125 (0.156)	
CO	5.0 (7.3)		3.4 (4.2)	
Cold-temp. CO ^c	12.5			
NO _x	0.6 (0.9)		0.14 (0.20)	
Particulates	0.12 (0.12)		0.02 (0.02)	
Formaldehyde	0.022 (0.032)		0.015 (0.018)	
Diesel				
HC	1.3 g/bhp-hr			
NMHC + NO _x	2.4 g/bhp-hr			
NMOG		^g (0.280)	0.125 (0.156)	
CO	15.5 g/bhp-hr	^g (7.3)	3.4 (4.2)	
NO _x	4.0 g/bhp-hr	^g (0.9)	0.14 (0.20)	
Particulates	0.10 g/bhp-hr	^g (0.12)	0.02 (0.02)	
Formaldehyde		^g (0.032)	0.015 (0.018)	
Smoke opacity (acceleration / lugging / peak) ^d	20/15/50			
Weight Criteria	Greater than 8,500 pounds GVWR; less than 10,000 pounds GVWR			
Test procedure, gasoline	CVS-75			
Test procedure, diesel	EPA Transient	CVS-75		
Useful life-gasoline, intermediate^{b,e}	5 years/50,000 miles			
Useful life-gasoline, full	11 years/120,000 miles			
Useful life-diesel, intermediate^{b,e}	^g		5 years/50,000 miles	
Useful life-diesel, full	8 years/110,000 miles	11 years/120,000 miles		

KEY: CO = carbon monoxide; g/bhp-hr = grams per brake horsepower/hour; GVWR = gross vehicle weight rating; HC = hydrocarbons; NMHC=nonmethane hydrocarbon; NMOG = nonmethane organic gases; NO_x = nitrogen oxides.

^a The MDPV category was created for the Interim Tier 2 and Tier 2 vehicle emissions standards. This category was specifically designed to help bring passenger vehicles (such as large sport utility vehicles and passenger vans) over 8,500 pounds GVWR into the Tier 2 program. MDPVs are defined as any complete heavy-duty vehicle less than 10,000 pounds GVWR designed primarily for transportation of persons, including conversion vans (i.e., vans which are intended to be converted to vans used primarily for transporting people). This does not include vehicles that have 1) a capacity of more than 12 persons total, or 2) are designed to accommodate more than 9 persons seated rearward of the driver's seat, or 3) have a cargo box (i.e., a pickup-bed or box) of six feet or more in interior length. Prior to Tier 2 standards, these vehicles would have been regulated as light heavy-duty trucks.

^b Diesel MDPVs can continue to use light heavy-duty truck standards for new vehicle certification until 2008. Note that these standards are measured in grams per brake horsepower-hour (g/bhp-hr). Beginning in 2008, MDPVs must use the same on-chassis testing procedure as heavy light-duty trucks (categories LDT3 and LDT4) and must meet standards for MDPVs. Beginning in 2009, MDPVs must meet the same standards as light heavy-duty trucks, except MDPVs are not required to meet Supplemental Federal Test Procedure standards.

^c The cold CO emissions standard is measured at 20^oF (rather than 75^oF) and is applicable for a full useful life of 5-years/50,000-miles.

^d Smoke opacity is expressed as a percentage for acceleration, lugging, and peak operation modes. Lugging occurs when a vehicle is carrying a load.

^e Manufacturers can opt to certify vehicles for a useful life of 15 years/150,000 miles and have either 1) intermediate useful life standards waived or 2) receive additional NO_x credits.

^f The term "tier" refers to a level of standards for specific years. Interim 2 refers to an intermediate level of standards that moves manufacturers toward compliance with Tier 2 standards. Tier 2 and interim Tier 2 standards are established as "bins." Each bin is a set of standards for NO_x, CO, NMOG, formaldehyde, and particulates (HC and NMHC standards are dropped for Tier 2 and Interim Tier 2). Manufacturers may certify any given vehicle family to any of the bins available for that vehicle class as long as the resulting sales-weighted corporate average NO_x standard is met for full useful life. The Tier 2 corporate average NO_x standard is 0.07 grams/mile. Interim corporate-based average NO_x standards are based on vehicle type. The interim corporate sales-weighted average for MDPVs is 0.6 grams/mile. Tier 2 MDPV standards will be phased in during 2008 and 2009. In 2008, 50% of MDPVs must meet Tier 2 standards; the other 50% of MDPVs must meet interim Tier 2 standards. Beginning in 2009, all MDPVs must meet Tier 2 standards.

^g Diesel MDPVs are not required to meet intermediate life standards during this time period.

SOURCE

40 CFR 86, Subpart A (July 1, 2000) Federal Register, Vol. 65, No. 28, pp. 6851-6858.

Table 4-32a: Federal Exhaust Emissions Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Light Heavy-Duty Trucks (Grams per brake horsepower-hour)

Engine type and pollutant	1970-73	1974-78	1979-83	1984	1985-86	1987	1988-89	1990	1991-93	1994-97	1998-2003	2004	2005-06	2007	2008+	
<i>Gasoline</i>																
HC + NO _x	j	16	10		j											
NO _x + NMHC	j												1.0		j	
NMHC	j														0.14	
HC	k	j	1.5		1.9	1.1									j	
NO _x	j				10.6			6.0	5.0		4.0				j	
CO	k	40	25		37.1	14.4										
Particulates	j														0.01	
<i>Diesel</i>																
HC + NO _x	j	16	10		j											
HC	k	j	1.5	1.3											j	
NO _x	j			10.7				6.0	5.0		4.0				0.20	
NO _x + NMHC	j											2.4 ¹			j	
NMHC	j														0.14	
CO	k	40	25	15.5												
Particulates	j							0.60	0.25	0.10					0.01	
Smoke opacity (acceleration / lugging / peak) ^a	40/20 ^j	20/15/50														
Weight criteria for light heavy-duty trucks^b	GVWR over 6,000 lbs		GVWR over 8,500 lbs		GVWR 8,501 through 14,000 lbs											
Test procedure, gasoline^c	9-mode steady-state				MVMA transient											
Test procedure, diesel^c	13-mode steady-state			EPA transient												
Useful life (gasoline)^d	5 years/50,000 miles				8 years/110,000 miles							10 years/110,000 miles				

Complete Vehicles - (Grams per mile)^{e,f}

Weight range and pollutant	2005-06	2007	2008+
GVWR 8,500 through 10,000 lbs			
NMOG ^g	0.28		e
NMHC ^h	e		0.195
CO	7.3		
NO _x	0.9		0.2
Particulates	e		0.02
HCHO	e		0.032
GVWR 10,001 lbs through 14,000 lbs			
NMOG ⁱ	0.33		e
NMHC ^j	e		0.230
CO	8.1		
NO _x	1.0		0.4
Particulates	e		0.02
HCHO	e		0.040
Test procedure^k	EPA HD-UDDS		

KEY: CO = carbon monoxide; HC = hydrocarbon; NO_x = nitrogen oxides; NMHC = nonmethane hydrocarbons; NMOG = nonmethane organic gas; HCHO = formaldehyde.

^a Smoke opacity is expressed in percentage for acceleration, lugging, and peak modes (acceleration/lugging/peak). Lugging is when a vehicle is carrying a load.

^b Gross vehicle weight rating (GVWR) is the maximum design loaded weight.

^c Several testing procedures have been used during the course of exhaust emissions control. A steady-state 9-mode test procedure (13-mode for diesel) was used for 1970-83 standards. For 1984, either the steady-state tests or the U.S. Environmental Protection Agency (EPA) transient test procedure could be used. For diesels, the EPA transient test was required from 1985 to the present. For gasoline-powered vehicles, either the EPA or the Motor Vehicle Manufacturers Association (MVMA) transient test procedure could be used during 1985-86, and the MVMA procedure was required thereafter.

^d Emissions standards apply to the useful life of the vehicle. Useful life was 5 years/50,000 miles through 1983 and became 8 years/110,000 miles beginning in model year 1985. 1984 was a transitional year in which vehicles could meet the older standard (and test procedure) or the newer one. Useful life requirement for gasoline-powered trucks meeting NO_x standards for 1998 and after is 10 years/110,000 miles. Starting in 2004, the useful life will be 10 years/110,000 miles. The useful life requirements for heavy-duty diesel truck standards are more complex and vary by vehicle weight, pollutant, test procedure, and year. Consult the U.S. Code of Federal Regulations for further information.

^e No standard set.

^f Although emissions standards for HC and CO were in effect for these years, they were not measured in grams per brake horsepower-hour and are, therefore, incompatible with the engine certification section of this table.

^g Vehicles can meet a NMHC + NO_x standard of 2.5 g/bhp-h, given they meet a NMHC standard of no more than 0.5 g/bhp-h.

^h Starting in 2005, complete gasoline heavy-duty vehicles of 14,000 lbs GVWR or below will have to be chassis certified.

ⁱ The manufacturer has the option of satisfying this standard by measurement of nonmethane hydrocarbons or total hydrocarbons.

^j The manufacturer has the option of satisfying this standard by measurement of nonmethane organic gas or total hydrocarbons.

^k This test procedure currently exists to test complete vehicles that have been optionally chassis certified. However, chassis certification is not required until 2005.

^l Required for complete gasoline heavy-duty vehicles only.

NOTE

Tables 4-32a and 4-32b are identical for heavy-duty diesel engines.

SOURCES

40 CFR 86, Electronic Code of Federal Regulations, Internet site at http://www.access.gpo.gov/nara/cfr/cfrhtml_00/Title_40/40cfr86_00.html as of Oct. 9, 2001.

U.S. Environmental Protection Agency, Office of Transportation and Air Quality, personal communication, October 2001.

Table 4-32b: Federal Exhaust Emissions Certification Standards for Newly Manufactured Gasoline- and Diesel-Powered Heavy-Duty Trucks
(Grams per brake horsepower-hour)

Engine type and pollutant	1970-73	1974-78	1979-83	1984	1985-86	1987	1988-89	1990	1991-93	1994-97	1998-2003	2004	2005-2006	2007	2008+	
<i>Gasoline</i>																
HC + NO _x	e	16	10	e												
NO _x + NMHC	e												1.0	e		
NMHC	e															
HC	f	e	1.5	1.9			e									
NO _x	e			10.6			6.0	5.0	4.0			e		0.20		
CO	f	40	25	37.1												
Particulates	e															
<i>Diesel</i>																
HC + NO _x	e	16	10	e												
HC	f	e	1.5	1.3			e									
NO _x	e			10.7			6.0	5.0	4.0			e		0.20		
NO _x + NMHC	e												2.4 ⁹	e		
NMHC	e															
CO	f	40	25	15.5												
Particulates	e						0.60		0.25	0.10			0.01			
Smoke opacity (acceleration / lugging / peak) ^a	40/20 ^e		20/15/50													
weight criteria for heavy heavy-duty trucks^b	GVWR over 6,000 lbs		GVWR over 8,500 lbs			GVWR over 14,000 lbs										
Test procedure, gasoline^c	13-mode steady-state			MVMA transient												
Test procedure, diesel^c	13-mode steady-state			EPA transient												
Useful life (gasoline)^d	5 years/50,000 miles			8 years/110,000 miles									10 years/110,000 miles			

KEY: CO = carbon monoxide; HC = hydrocarbon; NO_x = nitrogen oxides; NMHC = nonmethane hydrocarbons.

^a Smoke opacity is expressed in percentage for acceleration, lugging, and peak modes (acceleration/lugging/peak). Lugging is when a vehicle is carrying a load.

^b Gross vehicle weight rating (GVWR) is the maximum design loaded weight.

^c Several testing procedures have been used during the course of exhaust emissions control. A steady-state 9-mode test procedure (13-mode for diesel) was used for 1970-83 standards. For 1984, either the steady-state tests or the U.S. Environmental Protection Agency (EPA) transient test procedure could be used. For diesels, the EPA transient test was required from 1985 to the present. For gasoline-powered vehicles, either the EPA or the Motor Vehicle Manufacturers Association (MVMA) transient test procedure could be used during 1985-86, and the MVMA procedure was required thereafter.

^d Emissions standards apply to the useful life of the vehicle. Useful life was 5 years/50,000 miles through 1983 and became 8 years/110,000 miles beginning in model year 1985. 1984 was a transitional year in which vehicles could meet the older standard (and test procedure) or the newer one. Useful life requirement for gasoline-powered trucks meeting NO_x standards for 1998 and after is 10 years/110,000 miles. Starting in 2004, the useful life will be 10 years/110,000 miles. The useful life requirements for heavy-duty diesel truck standards are more complex and vary by vehicle weight, pollutant, test procedure, and year. Consult the U.S. Code of Federal Regulations for further information.

^e No standard set.

^f Although emissions standards for HC and CO were in effect for these years, they were not measured in grams per brake horsepower-hour and are, therefore, incompatible with this table.

⁹ Vehicles can meet a NMHC + NO_x standard of 2.5 g/bhp-h, given they meet a NMHC standard of no more than 0.5 g/bhp-h.

NOTE

Tables 4-32a and 4-32b are identical for heavy-duty diesel engines.

SOURCES

40 CFR 86, Electronic Code of Federal Regulations, internet site at http://www.access.gpo.gov/nara/cfr/cfrhtml_00/Title_40/40cfr86_00.html as of Oct. 9, 2001.
U.S. Environmental Protection Agency, Office of Transportation and Air Quality, personal communication, Oct. 2001.

Table 4-33: Federal Exhaust Emissions Standards for Newly Manufactured Motorcycles^a (g/km)^b

Pollutant	Engine displacement	Emissions prior to controls ^c	1978-79	1980-89	1990-96	1997+
<i>Gasoline-powered</i>						
HC	50-169 cc	1.0-13.8	5			
	170-749 cc		$5 + 0.0155(D-170)^d$	5.0		
	750 cc and greater		14	5.0		
CO	50 cc and greater	11.0-31.0	17	12		
<i>Methanol-powered</i>						
Total HC equivalent	50 cc and greater				5.0	
CO	50 cc and greater				12	
<i>Natural gas and LPG-powered</i>						
HC	50 cc and greater					5.0
CO	50 cc and greater					12
Useful life	(Class I) 50-169 cc		5 years or 12,000 km (7,456 mi), whichever comes first			
	(Class II) 170-279 cc		5 years or 18,000 km (11,185 mi), whichever comes first			
	(Class III) 280 cc and greater		5 years or 30,000 km (18,641 mi), whichever comes first			

KEY: cc = cubic centimeters; D = engine displacement; g = gram; HC = hydrocarbon; h = hour; kg = kilogram; km = kilometer; lb = pound; LPG = liquefied petroleum gas; mi = miles; mph = miles per hour.

^a A motorcycle is any motor vehicle with a headlight, taillight, and stoplight, and having two or three wheels and a curb mass less than or equal to 793 kg (1,749 lb). (The limit was 680 kg, or 1,499 lb prior to the 1998 model year.) A motorcycle is excluded from the standards if it has a displacement of less than 50 cc (3.1 cubic inches) or if with a 80 kg (176 lb) driver it cannot start from a dead stop using only the engine or exceed a speed of 40 km/h (25 mph) on a level, paved surface.

^b Readers who wish to compare motorcycle regulations with passenger car and truck regulations should note that 5.0 g/km = 8.0 g/mi and 12 g/km = 19 g/mi. The formula for 1978-79 HC emissions by motorcycles 170-749 cc becomes, in g/mi., approximately $8.0 + 0.025(D-170)$.

^c Estimates of emissions rates prior to controls are ranges of emissions for all engine displacements. Not available for motorcycles powered by fuels other than gasoline.

^d D = engine displacement in cubic centimeters (cc). For example, the standard for a 300 cc engine would be $5.0 + 0.0155(300-170) = 7.0$ g/km.

SOURCE:

40 CFR 86 Subpart E (July 1, 2000). U.S. Environmental Protection Agency, Office of Air and Radiation, personal communication, Aug. 28, 2001.

Table 4-34: Federal Exhaust Emissions Standards for Newly Manufactured and In-Use Aircraft Engines^{a,b}

Engine type ^c	Pollutant	Year of engine manufacture						
		1974-75	1976-77	1978-82	1983	1984-96	1997-99	2000+
Turboprop								
	Smoke				^g 187(rO) ^{-0.168}			
Class T3 turbojet								
	CO (g/kN) ^d						118	
	HC (g/kN) ^d						19.6	
	NO _x (g/kN) ^d						^e 40 + 2(rPR)	^f 32 + 1.6(rPR)
	Smoke	25		^h 83.6(rO) ^{-0.274}				
Class T8 turbojet								
	CO (g/kN) ^d						118	
	HC (g/kN) ^d						19.6	
	NO _x (g/kN) ^d						^e 40 + 2(rPR)	^f 32 + 1.6(rPR)
	Smoke	30	^h 83.6(rO) ^{-0.274}					
Turbofan and turbojet engines other than Classes T3, T8, and TSS								
	CO (g/kN) ^d						118	
	HC (g/kN) ^d						19.6	
	NO _x (g/kN) ^d						^e 40 + 2(rPR)	^f 32 + 1.6(rPR)
	Smoke		ⁱ 83.6(rO) ^{-0.274}	^j 83.6(rO) ^{-0.274}	^h 83.6(rO) ^{-0.274}			
TSS engines (supersonic aircraft engines)								
	HC (g/kN)						140(0.92) ^{rPR}	
	Smoke						^h 83.6(rO) ^{-0.274}	

KEY: CO = carbon monoxide; g = gram; g/kN = grams of pollutant per kilonewtons of thrust; HC = hydrocarbon, kN = kilonewtons; kW = kilowatt; NO_x = nitrogen oxides; rO = rated output, which is the maximum power or thrust available for takeoff; rPR = rated pressure ratio.

^a Federal standards apply to all planes operating in the United States, regardless of where they were manufactured. This table primarily displays exhaust emissions standards for newly manufactured aircraft engines. Only two standards (smoke standards) have been set for in-use aircraft engines (see footnotes i and k). Therefore, unless otherwise noted, emissions in this table apply to new aircraft engines only.

^b HC, CO, and NO_x are measured using the International Civil Aviation Organization (ICAO) Gaseous Emissions Test Procedure. Smoke is measured using the ICAO Smoke Emission Test Procedure. There is no useful life or warranty period for purposes of compliance with emissions standards.

^c Examples of commercial aircraft that use each engine type include the following:

Class T3 turbojet—Boeing 707-320s (Class T3 engines are currently out of production, though some are still in use).

Class T8 turbojet—Boeing 727s and 737-200s, and McDonnell-Douglas MD-80s and DC-9s.

Turbofans and turbojets other than T3, T8, and TSS—Boeing 747-400s, 757s, 767-200s and 777s, and McDonnell-Douglas MD-11s; Canadair Regional Jets.

Turboprops—Used mostly in regional airliners such as ATR 72, Dornier 328, and Saab SF 340.

TSS—British Aircraft Corp./Aerospatiale Concorde (the only supersonic aircraft currently used in commercial civil aviation).

^d Applies to engines with $rO > 26.7$ kN.

^e Effective as of July 7, 1997. This standard applies only to those engines of a type or model for which the date of manufacture of the first individual production model was on or before Dec. 31, 1995 and for which the date of manufacture of the individual engine was on or before Dec. 31, 1999.

^f Effective as of July 7, 1997. This standard also applies to engines of a type or model for which the date of manufacture of the first individual production model was after Dec. 31, 1995 and for which the date of manufacture of the individual engine was after Dec. 31, 1999.

^g Engines with $rO \geq 1,000$ kW.

^h Engines manufactured on or after Jan. 1, 1984 and with $rO \geq 26.7$ kN. Smoke number may not exceed 50.

ⁱ Engines with rated output $rO \geq 129$ kN. This is also the in-use standard for all such aircraft engines.

^j Engines with $rO < 26.7$ kN. Smoke number may not exceed 50.

^k Class T8 turbojet engines shall not exceed a smoke number of 30 beginning Feb. 1, 1974.

SOURCE:

40 CFR 87, Subparts A-D (July 1, 2000), and U.S. Environmental Protection Agency, Office of Air and Radiation, personal communication, Aug. 28, 2001.

Table 4-35: Federal Exhaust Emissions Standards for Locomotives^a
(g/bhph except where noted)

Pollutant	Duty-cycle^f	Tier 0 1973- 2001^h	Tier 1 2002-2004	Tier 2 2005+
Total HC ^b	Line-haul	1.00	0.55	0.30
	Switch	2.10	1.20	0.60
Nonmethane HC ^c	Line-haul	1.00	0.55	0.30
	Switch	2.10	1.20	0.60
Total HC equivalent ^d	Line-haul	1.00	0.55	0.30
	Switch	2.10	1.20	0.60
CO	Line-haul	5.0	2.2	1.5
	Switch	8.0	2.5	2.4
	Line-haul (optional standard)	10.0	10.0	10.0
	Switch (optional standard) ^g	12.0	12.0	12.0
NO _x	Line-haul	9.5	7.4	5.5
	Switch	14.0	11.0	8.1
Particulates	Line-haul	0.60	0.45	0.20
	Switch	0.72	0.54	0.24
	Line-haul (optional standard)	0.30	0.22	0.10
	Switch (optional standard) ^g	0.36	0.27	0.12
Smoke opacity (% opacity-normalized) ^h	Steady-state	30%	25%	20%
	30-second peak	40%	40%	40%
	3-second peak	50%	50%	50%
Useful life		7.5 MWh per hp or 10 years ^{i,j}		

KEY: bhp = brake horsepower; bhph = brake horsepower hour; CO = carbon monoxide; g = gram; h = hour; MW = megawatt; MWh = megawatt hour; NO_x = nitrogen oxides; PM = particulate matter.

^a Locomotive standards apply to both new and remanufactured locomotives, except as noted.

^b The line-haul duty-cycle is weighted toward operation in the higher power notches and is typical of line-haul applications. The switch duty-cycle is typical of switch operations, with more emphasis on idle and low power notch emissions. Locomotives generally are required to meet the standards for both duty-cycles. However, Tier 0 dedicated switch locomotives rated at 2,300 hp or less are only required to meet the switch duty-cycle standard.

^c Tier 0 standards apply to all new production locomotives in the 2001 model year, as well as for any 1994 through 2001 model year freight locomotives remanufactured on or after Jan. 1, 2001. They also apply to all other 1973 through 2001 model year locomotives remanufactured on or after Jan. 1, 2002. Other phase-in options are also available for manufacturers (see 40 CFR 92 for more detail on phase-in options).

^d Total HC standards apply to locomotives powered by any fuel except alcohol or natural gas or fuels primarily composed of alcohol or natural gas.

^e Nonmethane HC standards apply to locomotives powered by natural gas or fuels that are primarily composed of natural gas.

^f Total HC equivalent standards apply to locomotives powered by alcohol or fuels that are primarily composed of alcohol.

^g Manufacturers and remanufacturers can elect to comply with the alternate CO and PM standards. However, a manufacturer or remanufacturer using the alternate standards must meet both the CO and the PM standards. This allows locomotives to have higher CO emissions in exchange for meeting more stringent PM standards.

^h Smoke opacity values are normalized to be equivalent to a 1 meter path length.

ⁱ For Tier 0 locomotives not equipped with MW/h meters, the minimum useful life is 750,000 miles or 10 years, whichever comes first.

^j This is a minimum standard. The certifying manufacturer or remanufacturer must specify a longer useful life if the locomotive or locomotive engine is designed to last longer than the applicable minimum useful life.

SOURCE: 40 CFR 92, Jul. 1, 2000, and U.S. Environmental Protection Agency, Office of Air and Radiation, personal communication, Aug. 28, 2001.

Table 4-36: Federal Exhaust Emissions Standards for Newly Manufactured Marine Spark-Ignition Outboard, Personal Watercraft^e, and Jet-Boat Engines^a (g/kWh)

Year	HC + NOx (g/kWh)		Warranty period	Useful life ^d
	Rated power < 4.3 kW	Rated power ≥ 4.3 kW ^{c,d}		
1998 ^b	278.00	$(0.917 \times (151 + 557/P^{0.9})) + 2.44$	yr for all emissions-related component	Outboard engines: 350 hr/10 yr; Personal watercraft: 350 hr/5 yr
1999	253.00	$(0.833 \times (151 + 557/P^{0.9})) + 2.89$		
2000	228.00	$(0.750 \times (151 + 557/P^{0.9})) + 3.33$		
2001	204.00	$(0.667 \times (151 + 557/P^{0.9})) + 3.78$	1 yr for all emission-related components; 3 yr/200 hr for specified major emissions control components	
2002	179.00	$(0.583 \times (151 + 557/P^{0.9})) + 4.22$	2 yr/200 hr for all emissions-related components; 3 yr/200 hr for specified major emissions control components	
2003	155.00	$(0.500 \times (151 + 557/P^{0.9})) + 4.67$		
2004	130.00	$(0.417 \times (151 + 557/P^{0.9})) + 5.11$		
2005	105.00	$(0.333 \times (151 + 557/P^{0.9})) + 5.56$		
2006+	81.00	$(0.250 \times (151 + 557/P^{0.9})) + 6.00$		

KEY: g = gram; hr = hour; HC = hydrocarbon; hp = horsepower; kW = kilowatt; kWh = kilowatt hour; NOx = nitrogen oxide; yr = year.

^a The standards apply to marine spark-ignition outboard, personal watercraft, and jet-boat engines only. There are currently no federal standards for marine spark-ignition sterndrive/inboard engines (previously proposed standards have not been finalized). Marine compression-ignition engines under 50 hp are covered under the proposed nonroad compression-ignition engine standards. Federal standards are in development for marine compression-ignition engines over 50 hp.

^b P = the average power of the engine family in kilowatts (sales-weighted).

^c As an example, the standards for an outboard engine of 125 hp (just over 93 kW) would be 149.53 g/kWh in 1998, 123.63 g/kWh in 2000, 97.74 g/kWh in 2002, 72.00 g/kWh in 2004, and 46.10 g/kWh in 2006.

^d All emissions standards must be met for the useful life of the engine.

^e The standards for personal watercraft did not go into effect until 1999, although the standard went into effect for outboard engines in 1998.

SOURCE

40 CFR 91 July 1, 2000 edition, pp. 301-302, 398, and U.S. Environmental Protection Agency, Office of Air and Radiation, personal communication, Aug. 28, 2001.

Table 4-37: Tier 2 Federal Exhaust Emissions Standards for Newly Manufactured Commercial Marine Compression-Ignition Engines^{a,b}

Engine category ^c	Displacement (liters/cylinder)	Rated power (kW)	Year	NOx + THC (g/kW-hr)	PM (g/kW-hr)	CO (g/kW-hr)	Useful Life ^d	Warranty Period
1	< 0.9	37 kW and above	2005	7.5	0.40	5.0	10 yrs or 10,000 hrs operation	5 yrs or 5,000 hrs operation
	0.9 to < 1.2		2004	7.2	0.30			
	1.2 to < 2.5		2004	7.2	0.20			
	2.5 to < 5.0		2007	7.2	0.20			
2	5.0 to < 15.0	37 kW and above	2007	7.8	0.27	5.0	10 yrs or 20,000 hrs operation	5 yrs or 10,000 hrs operation
	15.0 to < 20.0			8.7	0.50			
	15.0 to < 20.0	37 kW to < 3,300 kW		9.8	0.50			
	20.0 to < 25.0	3,300 kW and above		9.8	0.50			
3	25.0 to < 30.0	37 kW and above		11.0	0.50			
	30 and above	37 kW and above	No Tier 2 emissions standards have been set for Category 3 commercial marine vessels					

KEY: CO=carbon monoxide; disp=displacement; g/kW-hr=gram per kilowatt-hour; hrs=hours;kW=kilowatt; NOx=nitrogen oxides; PM=particulate matter; THC=total hydrocarbons; yrs=years.

^a Tier 2 emissions standards established by Congress apply to commercial compression-ignition (diesel) engines with a power rating of at least 37 kW. Both propulsion and auxiliary engines are covered under these standards, but land-based engines used in portable auxiliary equipment must meet standards for land-based engines. Smaller compression-ignition engines are covered under a separate rule. The U.S. Environmental Protection Agency (EPA) also intends to regulate recreational marine diesel engine emissions under a separate rule and is establishing provisions to allow exemptions for category 1 and 2 engines used as auxiliary engines in U.S.-flagged vessels engaged in foreign trade or overseas operations at least 75 percent of the time (i.e., operation will occur more than 320 nautical kilometers outside the United States, not including trips between U.S. ports in Alaska, Hawaii, the continental United States, or its territories).

^b MARPOL Annex VI nitrogen oxide (NOx) standards (international standards adopted by the International Maritime Convention on the Prevention of Pollution from Ships) are referred to as Tier 1 emissions standards. These standards apply to any diesel engine over 130 kW installed on a vessel constructed on or after Jan. 1, 2000 and to any engine that undergoes major conversion after that date. MARPOL standards are currently voluntary for ships engaged in domestic travel but will be required for ships engaged in foreign trade with countries that ratify MARPOL standards. Although they have not yet been ratified by the United States, the EPA encourages engine manufacturers to make compliant engines and encourages owners to purchase them. If ratified by the United States, MARPOL Annex VI NOx standards will be retroactively effective Jan. 1, 2000.

^c Emissions standards are based on displacement/cylinder and rated power. The three standards categories are as follows:

Category 1 (< 5 liters displacement/cylinder and rated power >=37 kW): These engines are typically used as propulsion engines on relatively small commercial vessels (fishing vessels, tugboats, crewboats, etc.). They are also used as auxiliary engines on vessels of all sizes and applications.

Category 2 (>= 5 liters displacement/cylinder to < 30 liters displacement/cylinder and rated power >=37 kW): The largest engines that are widely used as propulsion engines in harbor and coastal vessels in U.S. waters. These engines also provide auxiliary power on very large vessels. Many of these engines are of similar size and configuration as locomotive engines or use comparable emissions control technologies.

Category 3 (>= 30 liters displacement/cylinder and rated power >=37kW): These are very large high-power engines that are used almost exclusively for propulsion on vessels engaged in international trade.

^d Manufacturers must demonstrate that the engine or engine family will meet all standards for its useful life. Certification for useful life is accomplished by testing a sample of engines. The warranty period applies to each engine manufactured. The manufacturer of each engine must provide a warranty to the ultimate purchaser or owner (and each subsequent purchaser or owner) that the engine is designed, built, and equipped so as to conform at the time of sale with Tier 2 standards and is free from defects in materials and workmanship that would cause the engine to fail to conform to these standards for the warranty period. Furthermore, this warranty cannot be shorter than any mechanical warranty on the engine and must be at least one half of the useful life period.

SOURCE:

Federal Register, Vol. 64, No. 249, Dec. 29, 1999, pp 73,299 to 73,373, and U.S. Environmental Protection Agency, Office of Air and Radiation, personal communication, Aug. 28, 2001.

Table 4-38: Estimated National Average Vehicle Emissions Rates by Vehicle Type and Fuel (Grams per mile)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
GASOLINE (assuming zero RFG)														
Light-duty vehicles														
Exhaust HC	2.79	2.50	2.23	1.98	1.77	1.57	1.39	1.25	1.14	1.05	0.97	0.89	0.81	0.74
Nonexhaust HC	1.21	1.16	1.12	1.09	1.07	1.05	1.03	1.01	0.98	0.95	0.92	0.88	0.84	0.81
Total HC	3.99	3.66	3.35	3.07	2.84	2.62	2.41	2.26	2.12	2.00	1.89	1.77	1.65	1.54
Exhaust CO	42.89	39.15	35.54	32.23	29.32	26.60	24.18	22.38	20.86	19.54	18.53	18.03	17.58	17.13
Exhaust NO _x	2.70	2.47	2.27	2.09	1.94	1.78	1.64	1.55	1.46	1.35	1.29	1.25	1.20	1.14
Light-duty trucks														
Exhaust HC	3.68	3.33	3.00	2.71	2.45	2.21	1.96	1.80	1.65	1.54	1.45	1.35	1.24	1.13
Nonexhaust HC	1.36	1.29	1.20	1.16	1.12	1.10	1.07	1.04	1.02	0.99	0.97	0.94	0.89	0.84
Total HC	5.04	4.62	4.20	3.87	3.58	3.31	3.03	2.85	2.67	2.53	2.42	2.29	2.13	1.98
Exhaust CO	56.23	51.99	47.93	44.34	40.77	37.51	34.47	32.20	30.23	28.28	26.81	25.61	24.32	22.30
Exhaust NO _x	2.62	2.42	2.26	2.11	1.98	1.84	1.73	1.65	1.59	1.55	1.54	1.53	1.50	1.45
Heavy-duty vehicles														
Exhaust HC	3.66	3.34	3.03	2.76	2.39	2.16	1.94	1.73	1.51	1.35	1.22	1.09	0.98	0.82
Nonexhaust HC	2.74	2.60	2.34	2.25	2.16	2.07	1.97	1.87	1.79	1.69	1.62	1.54	1.48	1.41
Total HC	6.40	5.94	5.37	5.00	4.55	4.24	3.91	3.60	3.29	3.04	2.84	2.63	2.46	2.24
Exhaust CO	85.61	78.64	72.12	65.92	60.01	54.16	48.52	43.26	38.82	34.54	31.08	27.59	24.73	20.60
Exhaust NO _x	7.19	6.96	6.72	6.52	6.35	6.11	5.89	5.73	5.56	5.40	5.26	5.13	5.01	4.91
Motorcycles														
Exhaust HC	2.01	1.88	1.82	1.75	1.72	1.69	1.63	1.63	1.62	1.61	1.61	1.61	1.61	1.61
Nonexhaust HC	0.74	0.73	0.72	0.72	0.71	0.71	0.70	0.69	0.70	0.70	0.70	0.70	0.70	0.70
Total HC	2.74	2.60	2.54	2.46	2.43	2.40	2.34	2.32	2.32	2.31	2.31	2.31	2.31	2.31
Exhaust CO	15.15	14.78	14.77	14.76	14.76	14.67	14.59	14.59	14.59	14.59	14.59	14.59	14.59	14.59
Exhaust NO _x	1.26	1.28	1.28	1.28	1.28	1.26	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
DIESEL														
Light-duty vehicles														
Exhaust HC	0.68	0.69	0.71	0.73	0.75	0.77	0.79	0.81	0.81	0.82	0.80	0.76	0.73	0.73
Exhaust CO	1.49	1.52	1.56	1.60	1.64	1.69	1.73	1.76	1.78	1.79	1.78	1.75	1.73	1.74
Exhaust NO _x	1.83	1.85	1.86	1.87	1.89	1.89	1.89	1.88	1.86	1.85	1.81	1.72	1.62	1.54
Light-duty trucks														
Exhaust HC	1.59	1.60	1.64	1.64	1.68	1.67	1.69	1.63	1.51	1.42	1.02	0.88	0.96	0.97
Exhaust CO	2.67	2.70	2.76	2.77	2.85	2.85	2.89	2.79	2.60	2.44	1.77	1.54	1.66	1.68
Exhaust NO _x	2.71	2.66	2.62	2.56	2.53	2.46	2.42	2.31	2.17	2.07	1.76	1.64	1.67	1.66
Heavy-duty vehicles														
Exhaust HC	2.21	1.97	1.74	1.55	1.38	1.23	1.10	1.00	0.92	0.85	0.79	0.74	0.69	0.61
Exhaust CO	10.06	9.22	8.43	7.71	7.00	6.32	5.73	5.23	4.80	4.43	4.10	3.82	3.58	3.37
Exhaust NO _x	23.34	22.14	21.47	21.10	20.75	20.49	20.24	20.04	19.84	19.14	18.05	16.68	15.52	13.92
AVERAGE OF ALL VEHICLES, GASOLINE AND DIESEL														
Exhaust HC	2.98	2.70	2.42	2.18	1.96	1.76	1.56	1.43	1.32	1.23	1.15	1.08	0.99	0.91
Nonexhaust HC	1.21	1.15	1.09	1.06	1.03	1.01	0.99	0.96	0.94	0.91	0.88	0.85	0.81	0.77
Total HC	4.19	3.85	3.52	3.24	2.99	2.77	2.55	2.40	2.25	2.14	2.04	1.93	1.80	1.68
Exhaust CO	45.07	41.43	37.93	34.76	31.84	29.12	26.65	24.90	23.40	22.00	20.94	20.20	19.42	18.27
Exhaust NO _x	4.15	3.92	3.75	3.61	3.49	3.36	3.24	3.18	3.12	3.02	2.91	2.78	2.65	2.48

KEY: CO = carbon monoxide; HC = hydrocarbon; NO_x = nitrogen oxide; RFG = reformulated gasoline.

NOTES

As of July 1 of each year. Vehicles types are defined as follows: light-duty vehicles (passenger cars up to 6,000 lb GVWR); light-duty trucks (pickups and minivans up to 8,500 lb GVWR); heavy-duty vehicles (8,501 lbs or more GVWR); motorcycle (highway only). This table is based on MOBILE6, the U.S. Environmental Protection Agency's (EPA) latest highway vehicle emissions factor model. Interested readers can learn more about the MOBILE6 model at the following USEPA Internet site <http://www.epa.gov/otaq/m6.htm>.

Emissions factors are national averages based on the following assumptions: ambient temperature 75 °F, daily temperature range 60-84 °F, average traffic speed 27.6 mph (representative of overall traffic in urban areas), standard operating mode (cold-start, hot-start, stabilized), vehicle-miles traveled fractions, no inspection/maintenance or antitampering programs, and gasoline volatility 9.0 per square inch RVP (Reid vapor pressure).

See Table 4-39 for emissions from vehicles operating on reformulated gasoline.
Data for nonexhaust HC is negligible for diesel light-duty vehicles, light-duty trucks, and heavy-duty vehicles.

SOURCE

U.S. Environmental Protection Agency, National Vehicle and Fuel Emissions Laboratory, personal communications, July 31, 2002 and Nov. 26, 2003.

Table 4-39: Estimated National Average Vehicle Emissions Rates by Vehicle Type Using Reformulated Gasoline (Grams per mile)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Light-duty vehicles									
Exhaust HC	1.45	1.28	1.15	1.04	0.97	0.84	0.76	0.68	0.62
Nonexhaust HC	0.89	0.87	0.86	0.84	0.82	0.65	0.63	0.61	0.59
Total HC	2.34	2.15	2.01	1.88	1.78	1.48	1.39	1.29	1.21
Exhaust CO	22.78	20.84	19.43	18.25	17.21	15.36	14.85	14.31	13.88
Exhaust NO _x	1.78	1.64	1.55	1.46	1.35	1.24	1.19	1.12	1.06
Light-duty trucks									
Exhaust HC	2.09	1.85	1.69	1.55	1.44	1.28	1.18	1.07	0.97
Nonexhaust HC	0.92	0.90	0.88	0.86	0.84	0.67	0.66	0.63	0.62
Total HC	3.01	2.74	2.58	2.41	2.28	1.95	1.84	1.71	1.59
Exhaust CO	31.86	29.46	27.70	26.19	24.63	22.25	21.23	20.08	18.39
Exhaust NO _x	1.84	1.73	1.65	1.59	1.55	1.47	1.45	1.41	1.36
Heavy-duty vehicles									
Exhaust HC	2.14	1.91	1.70	1.48	1.32	1.16	1.03	0.92	0.77
Nonexhaust HC	1.72	1.64	1.56	1.50	1.43	1.12	1.07	1.03	1.01
Total HC	3.86	3.55	3.26	2.98	2.75	2.28	2.10	1.96	1.78
Exhaust CO	46.02	41.15	36.62	32.80	29.12	25.87	22.88	20.41	16.87
Exhaust NO _x	6.13	5.90	5.74	5.57	5.41	5.18	5.01	4.86	4.75
Motorcycles									
Exhaust HC	1.69	1.63	1.63	1.62	1.61	1.61	1.61	1.61	1.61
Nonexhaust HC	0.55	0.54	0.53	0.53	0.53	0.43	0.43	0.43	0.44
Total HC	2.24	2.17	2.16	2.16	2.14	2.04	2.04	2.04	2.05
Exhaust CO	12.64	12.56	12.56	12.56	12.56	12.56	12.56	12.56	12.56
Exhaust NO _x	1.26	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Average of all RFG and diesel vehicles									
Exhaust HC	1.65	1.46	1.34	1.23	1.15	1.02	0.94	0.86	0.78
Nonexhaust HC	0.85	0.84	0.82	0.80	0.78	0.62	0.60	0.58	0.57
Total HC	2.50	2.30	2.16	2.03	1.93	1.64	1.54	1.44	1.35
Exhaust CO	24.92	22.93	21.56	20.38	19.27	17.44	16.76	15.99	15.01
Exhaust NO _x	3.36	3.24	3.18	3.12	3.02	2.85	2.71	2.58	2.40

KEY: CO = carbon monoxide; HC = hydrocarbon; NO_x = nitrogen oxide; RFG = reformulated gasoline.

NOTES

As of July 1 of each year. Vehicle types are defined as follows: light-duty vehicles (passenger cars up to 6,000 lb gross vehicle weight rating GVWR) ; light-duty trucks (pickups and minivans up to 8,500 lb GVWR); heavy-duty vehicles (8,501 lb or more GVWR); motorcycle (on-highway only). The data in this table are based on MOBILE6, and reflect the introduction of RFG starting in 1995. Emissions factors are national averages based on the following assumptions: ambient temperature 75 °F, daily temperature range 60 -84 °F, average traffic speed 27.6 mph (representative of overall traffic in urban areas), standard operating mode (cold-start, hot-start, stabilized), vehicle-miles traveled fractions and no inspection/maintenance or antitampering programs. Emissions estimates in this table assume 100% RFG.

SOURCE

U.S. Environmental Protection Agency, National Vehicle and Fuel Emissions Laboratory, personal communications, July 31, 2002 and Nov. 26, 2003.

Table 4-40: Estimated National Emissions of Carbon Monoxide^R (Million short tons)

	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
TOTAL all sources	204.04	188.40	185.41	176.84	173.67	172.97	174.42	160.52	154.19	147.13	140.90	135.90	133.56	126.78	128.86	117.91	115.38	117.23	123.57	120.76
Transportation, total	166.29	157.34	147.70	138.13	136.22	134.30	127.66	121.00	114.34	109.11	103.89	98.67	93.44	88.22	82.99	80.22	77.64	73.18	72.49	79.34
On-road vehicles	163.23	153.55	143.83	134.19	132.26	130.33	123.64	116.95	110.26	104.98	99.71	94.43	89.16	83.88	78.61	75.85	73.24	68.17	68.06	74.83
Off-road	3.06	3.78	3.87	3.94	3.96	3.96	4.02	4.05	4.08	4.13	4.18	4.23	4.29	4.34	4.39	4.37	4.40	5.01	4.43	4.51
Aircraft	0.17	0.18	0.21	0.22	0.22	0.22	0.23	0.23	0.24	0.24	0.24	0.24	0.25	0.25	0.25	0.28	0.30	0.34	0.27	0.26
Railroads	0.11	0.11	0.12	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.12	0.10	0.10
Marine vessels	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.13	0.13	0.12	0.13	0.13
Other off-road ^a	2.65	3.36	3.42	3.49	3.52	3.52	3.57	3.59	3.62	3.66	3.71	3.76	3.80	3.85	3.89	3.87	3.88	4.44	3.93	4.02
Nontransportation, total	37.75	31.06	37.71	38.72	37.45	38.67	46.76	39.52	39.85	38.01	37.01	37.24	40.12	38.56	45.87	37.69	37.74	44.05	51.08	41.42
Fuel combustion	4.63	4.48	7.30	8.49	7.55	6.96	7.37	7.44	5.51	5.86	6.15	5.59	5.52	5.93	4.34	4.33	4.33	5.44	4.59	4.59
Industrial processes ^b	9.84	7.54	6.95	5.27	5.15	5.00	5.23	5.27	4.77	4.62	4.55	4.65	4.61	4.60	3.64	3.80	3.81	2.54	2.62	2.74
Waste disposal and recycling	7.06	3.23	2.30	1.94	1.92	1.85	1.81	1.75	1.08	1.12	1.14	1.25	1.22	1.19	2.90	2.95	3.12	3.14	3.23	3.23
Miscellaneous ^c	16.22	15.81	21.15	23.02	22.83	24.86	32.35	25.06	28.49	26.42	25.17	25.75	28.76	26.84	34.99	26.61	26.48	32.93	40.65	30.86

KEY: R = revised.

^a Other off-road comprises nonroad gasoline- and diesel-powered recreational, airport service and railway maintenance vehicles, and recreational marine vessels.

^b Industrial processes comprises chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes; and solvent utilization, storage, and transport.

^c Miscellaneous comprises nonroad gasoline- and diesel-powered construction, industrial, lawn and garden, farm, light-commercial, logging vehicles and other nonroad sources; agriculture and forestry, health services, cooling towers, fugitive dust; and other combustion sources that could not be accurately allocated to specific source categories.

NOTES

The methodologies used to estimate emissions constantly evolve and undergo major changes. These improved methods are often used to revise estimates for previous years and, therefore, some estimates in this table may not match estimates produced in previous reports. The most recent revision of these estimates is based on Version 2 of the 1999 National Emissions Inventory (NEI) and provides a generally consistent time trend of the estimates. However, state-submitted data on mobile sources is only reflected in the estimates for 1999 and the EPA plans to correct this inconsistency in future publications.

Numbers may not add to totals due to rounding.

SOURCE

1970-2001: U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), *Current Emission Trends Summaries*, available at Internet website <http://www.epa.gov/ttn/chief/trends/> as of Aug. 14, 2003.

Table 4-41: Estimated National Emissions of Nitrogen Oxides^R (Million short tons)

	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
TOTAL all sources	26.88	26.38	27.08	25.76	25.42	25.58	26.07	25.38	25.53	25.18	25.26	25.36	25.35	24.96	24.79	24.71	24.35	23.67	23.20	22.35
Transportation	14.83	14.26	13.74	13.06	12.92	12.79	12.42	12.05	11.68	11.56	11.45	11.33	11.22	11.10	10.99	11.02	10.82	10.54	10.57	10.42
On-road vehicles	12.62	12.06	11.49	10.93	10.82	10.71	10.34	9.96	9.59	9.45	9.31	9.16	9.02	8.88	8.73	8.79	8.62	8.35	8.39	8.25
Off-road, total	2.20	2.20	2.25	2.13	2.10	2.08	2.08	2.08	2.08	2.11	2.14	2.17	2.20	2.23	2.26	2.23	2.20	2.19	2.18	2.17
Aircraft	0.05	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.09	0.10	0.09	0.08
Railroads	1.14	1.11	1.18	0.96	0.91	0.87	0.89	0.92	0.94	0.96	0.98	1.00	1.01	1.03	1.05	1.06	1.07	1.09	1.00	1.00
Marine vessels	0.98	0.99	0.95	1.04	1.06	1.08	1.05	1.03	1.00	1.01	1.02	1.03	1.04	1.05	1.06	1.01	0.96	0.91	1.01	1.01
Other off-road	0.04	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.10	0.08	0.08
Nontransportation	12.06	12.12	13.34	12.70	12.50	12.80	13.66	13.33	13.86	13.62	13.81	14.03	14.13	13.85	13.80	13.69	13.53	13.13	12.63	11.93
Fuel combustion	10.06	10.49	11.32	10.05	9.87	10.01	10.47	10.54	10.89	10.78	10.93	11.11	11.01	10.83	10.52	10.56	10.38	9.58	9.04	8.60
Industrial processes	0.77	0.54	0.56	0.80	0.79	0.76	0.77	0.77	0.80	0.72	0.76	0.74	0.76	0.77	0.80	0.84	0.85	0.80	0.83	0.86
Waste disposal	0.44	0.16	0.11	0.09	0.09	0.09	0.09	0.08	0.09	0.09	0.10	0.12	0.11	0.10	0.15	0.16	0.16	0.16	0.17	0.17
Miscellaneous	0.78	0.94	1.35	1.76	1.76	1.94	2.33	1.94	2.07	2.02	2.03	2.05	2.24	2.15	2.34	2.14	2.14	2.60	2.60	2.30

KEY: R = revised.

^a Other off-road comprises nonroad gasoline- and diesel-powered recreational, airport service and railway maintenance vehicles, and recreational marine vessels.

^b Industrial processes comprises chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes; and solvent utilization, storage,

^c Miscellaneous comprises nonroad gasoline- and diesel-powered construction, industrial, lawn and garden, farm, light-commercial, logging vehicles, and other nonroad sources; agriculture and forestry, health services, cooling towers, fugitive dust; and other combustion sources that could not

NOTES

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Numbers may not add to totals due to rounding.

SOURCE

1970-2001: U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), *Current Emission Trends Summaries*, available at Internet website <http://www.epa.gov/ttn/chief/trends/> as of Aug. 14, 2003.

Table 4-42: Estimated National Emissions of Volatile Organic Compounds^R (Million short tons)

	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total all sources	34.66	30.76	31.11	27.40	26.79	26.74	26.97	25.56	24.12	23.58	23.07	22.73	22.57	22.04	20.87	19.53	18.78	19.38	19.70	17.96
Transportation, total	17.81	16.39	14.94	13.47	13.17	12.87	12.10	11.32	10.54	10.05	9.55	9.05	8.55	8.05	7.55	7.33	7.21	7.07	6.68	6.22
On-road vehicles	16.91	15.39	13.87	12.35	12.05	11.75	10.96	10.17	9.39	8.86	8.33	7.80	7.28	6.75	6.22	5.99	5.86	5.61	5.33	4.87
Off-road	0.90	1.00	1.07	1.11	1.12	1.12	1.13	1.15	1.16	1.19	1.22	1.24	1.27	1.30	1.33	1.34	1.35	1.46	1.35	1.35
Aircraft	0.06	0.05	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.03	0.02
Railroads	0.04	0.04	0.05	0.04	0.04	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Marine vessels	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Other off-road ^a	0.77	0.88	0.94	1.01	1.02	1.02	1.04	1.05	1.06	1.09	1.11	1.14	1.17	1.20	1.23	1.24	1.25	1.34	1.26	1.26
Nontransportation, total	16.85	14.37	16.16	13.94	13.63	13.88	14.88	14.24	13.57	13.53	13.52	13.68	14.02	13.99	13.32	12.21	11.57	12.31	13.02	11.74
Fuel combustion	0.72	0.66	1.05	1.57	1.40	1.28	1.36	1.37	1.00	1.07	1.11	0.99	0.99	1.07	1.12	1.12	1.12	1.43	1.18	1.18
Industrial processes ^b	12.33	11.10	12.10	9.50	9.35	9.59	9.89	9.81	9.01	9.18	9.37	9.53	9.69	9.71	8.14	8.34	7.88	7.48	7.28	7.45
Waste disposal and recycling	1.98	0.98	0.76	0.98	0.97	0.95	0.96	0.94	0.99	1.00	1.01	1.05	1.05	1.07	0.51	0.52	0.54	0.53	0.54	0.54
Miscellaneous ^c	1.82	1.63	2.25	1.89	1.91	2.06	2.66	2.11	2.57	2.28	2.02	2.11	2.29	2.14	3.54	2.23	2.04	2.87	4.02	2.56

KEY: R = revised.

^a Other off-road comprises nonroad gasoline- and diesel-powered recreational, airport service and railway maintenance vehicles, and recreational marine vessels.

^b Industrial processes comprises chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes; and solvent utilization, storage, and transport.

^c Miscellaneous comprises nonroad gasoline- and diesel-powered construction, industrial, lawn and garden, farm, light-commercial, logging vehicles, and other nonroad sources; geogenic sources, catastrophic and accidental releases, health services, cooling towers, nontransportation-related fugitive dust, agriculture and forestry, structural fires, agriculture fires, slash/prescribed burning, forest wildfires, and other combustion sources that could not be accurately allocated to specific source categories.

NOTES

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Numbers may not add to totals due to rounding.

SOURCE

1970-2001: U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), *Current Emission Trends Summaries*, available at Internet website <http://www.epa.gov/ttn/chief/trends/> as of Aug. 14, 2003.

Table 4-43: Estimated National Emissions of Particulate Matter (PM-10)^{a,R} (Million short tons)

	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total all sources	13.02	7.56	7.01	41.32	40.53	40.79	42.83	40.83	27.76	27.34	27.10	27.36	28.61	25.82	22.86	22.91	22.90	21.63	24.70	24.10
Transportation, total	N	N	N	17.24	17.44	17.14	18.78	18.07	13.98	14.09	13.81	14.34	14.34	13.19	11.88	12.45	12.37	10.17	11.92	12.26
Transportation-fuel-related, total	0.58	0.56	0.54	0.51	0.51	0.50	0.50	0.50	0.49	0.48	0.47	0.45	0.44	0.42	0.41	0.39	0.38	0.36	0.35	0.34
On-road vehicles	0.48	0.46	0.43	0.41	0.40	0.40	0.39	0.39	0.39	0.37	0.35	0.34	0.32	0.30	0.29	0.27	0.26	0.24	0.23	0.22
Off-road, total	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Aircraft	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Railroads	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
Marine vessels	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.04	0.04	0.04	0.04
Other off-road ^b	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
Transportation-related fugitive dust, total	N	N	N	16.72	16.94	16.64	18.28	17.57	13.48	13.61	13.34	13.89	13.91	12.77	11.47	12.05	11.99	9.80	11.57	11.92
Unpaved highways	N	N	N	11.64	11.67	11.11	12.38	11.80	11.23	11.21	10.92	11.43	11.37	10.36	9.07	9.46	9.33	7.29	8.75	9.04
Paved highways	N	N	N	5.08	5.26	5.53	5.90	5.77	2.25	2.40	2.42	2.46	2.54	2.41	2.40	2.60	2.66	2.51	2.82	2.88
Nontransportation, total	12.44	7.00	6.48	24.09	23.09	23.65	24.05	22.77	13.78	13.26	13.29	13.02	14.27	12.62	10.99	10.47	10.53	11.47	12.78	11.85
Fuel combustion	2.87	2.25	2.45	1.54	1.42	1.33	1.38	1.38	1.20	1.15	1.18	1.12	1.11	1.18	0.91	0.91	0.84	1.15	1.53	1.50
Industrial processes ^c	7.67	3.70	2.75	1.06	1.05	1.02	1.04	1.03	1.03	0.99	0.99	0.91	0.91	0.94	0.65	0.67	0.67	0.70	0.73	0.76
Waste disposal and recycling	1.00	0.37	0.27	0.28	0.27	0.27	0.26	0.25	0.27	0.28	0.28	0.33	0.31	0.29	0.45	0.47	0.49	0.48	0.50	0.50
Miscellaneous ^d	0.90	0.68	1.01	21.21	20.34	21.03	21.38	20.11	11.28	10.85	10.84	10.66	11.93	10.21	8.97	8.42	8.54	9.13	10.02	9.08

KEY: N = data do not exist; R = revised.

^a Fine particulate matter less than 10 microns.

^b Other off-road comprises nonroad gasoline- and diesel-powered recreational, airport service and railway maintenance vehicles, and recreational marine vessels.

^c Industrial processes comprises chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes; solvent utilization; and storage and transport.

^d Miscellaneous comprises nonroad gasoline- and diesel-powered construction, industrial, lawn and garden, farm, light-commercial, logging vehicles and other non-road sources; geogenic sources; agriculture and forestry, cooling towers, nontransportation-related fugitive dust, wildfires, managed burning, and other combustion sources that could not be accurately allocated to specific source categories.

NOTES

The methodologies used to estimate emissions constantly evolve and undergo major changes. These improved methods are often used to revise estimates for previous years and, therefore, some estimates in this table may not match estimates produced in previous reports. The most recent revision of these estimates is based on Version 2 of the 1999 National Emissions Inventory (NEI) and provides a generally consistent time trend of the estimates. However, state-submitted data on mobile sources is only reflected in the estimates for 1999 and the EPA plans to correct this inconsistency in future publications.

Except for residential wood combustion, included in the fuel combustion category, combustion source emissions for 1999-2001 include both the condensable and filterable PM fractions. Emissions prior to 1999 include only the filterable PM fraction. Residential wood combustion emissions include both the condensable and filterable PM fractions for all years.

Numbers may not add to totals due to rounding.

SOURCE

1970-2001: U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), *Current Emission Trends Summaries*, available at Internet website <http://www.epa.gov/ttn/chieftrends/> as of Aug. 14, 2003.

Table 4-44: Estimated National Emissions of Particulate Matter (PM-2.5)^{a,R} (Million short tons)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total all sources	7.56	7.32	7.20	7.15	7.54	6.93	6.73	6.26	6.26	6.81	8.18	7.38
Transportation, total	2.67	2.69	2.64	2.71	2.71	2.50	2.30	2.40	2.38	2.02	2.31	2.35
On-road vehicles	0.32	0.31	0.29	0.28	0.26	0.24	0.23	0.22	0.20	0.18	0.17	0.16
Aircraft	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Railroads	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Marine vessels	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Other off-road ^b	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Transportation-related fugitive dust												
Unpaved roads	1.69	1.68	1.64	1.72	1.71	1.56	1.37	1.43	1.41	1.10	1.32	1.36
Paved roads	0.56	0.60	0.61	0.62	0.63	0.58	0.60	0.65	0.67	0.63	0.71	0.72
Nontransportation, total	4.89	4.63	4.56	4.44	4.83	4.43	4.42	3.86	3.88	4.79	5.87	5.03
Fuel combustion	0.91	0.89	0.93	0.85	0.84	0.90	0.67	0.67	0.63	0.96	1.34	1.32
Industrial processes ^c	0.56	0.57	0.58	0.50	0.50	0.50	0.37	0.38	0.39	0.49	0.50	0.52
Waste disposal and recycling	0.23	0.24	0.24	0.29	0.27	0.25	0.43	0.44	0.46	0.45	0.47	0.48
Miscellaneous ^d	3.19	2.92	2.81	2.80	3.22	2.79	2.96	2.37	2.41	2.90	3.55	2.71

KEY: R = revised.

^a Particulate matter less than 2.5 microns in size.

^b Other off-road comprises nonroad gasoline- and diesel-powered recreational, airport service and railway maintenance vehicles, and recreational marine vessels.

^c Industrial processes comprises chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes; solvent utilization; and storage and transportation.

^d Miscellaneous comprises nonroad gasoline- and diesel-powered construction, industrial, lawn and garden, farm, light-commercial, logging vehicles and other non-road sources; geogenic sources, agriculture and forestry, cooling towers, nontransportation-related fugitive dust, wildfires, managed burning, and other fugitive dust and combustion that could not accurately be allocated to specific source categories.

NOTES

The emissions estimates shown here are those that are directly emitted, which represent only a portion of the total PM-2.5 emissions found in the air. Secondary formation of fine particulates resulting from emissions of nitrogen oxide, sulfur dioxide, volatile organic compounds, and other substances, is also a significant source of PM-2.5.

Numbers may not add to totals due to rounding.

The methodologies used to estimate emissions constantly evolve and undergo major changes. These improved methods are often used to revise estimates for previous years and, therefore, some estimates in this table may not match estimates produced in previous reports. The most recent revision of these estimates is based on Version 2 of the 1999 National Emissions Inventory (NEI) and provides a generally consistent time trend of the estimates. However, state-submitted data on mobile sources is only reflected in the estimates for 1999 and the EPA plans to correct this inconsistency in future publications.

Except for residential wood combustion, included in the fuel combustion category, combustion source emissions for 1999-2001 include both the condensible and filterable PM fractions. Emissions prior to 1999 include only the filterable PM fraction. Residential wood combustion emissions include both the condensible and filterable PM fractions for all years.

SOURCE

1990-2001: U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), *Current Emission Trends Summaries*, available at Internet website <http://www.epa.gov/ttn/chief/trends/> as of Aug. 14, 2003.

Table 4-45: Estimated National Emissions of Sulfur Dioxide^R (Million short tons)

	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
TOTAL all sources	31.22	28.04	25.93	23.31	22.52	22.26	22.69	22.81	23.08	22.38	22.08	21.77	21.35	18.62	18.39	18.84	18.95	17.65	16.32	15.79
Transportation, total	0.51	0.57	0.63	0.69	0.71	0.72	0.72	0.73	0.73	0.70	0.66	0.63	0.60	0.56	0.53	0.53	0.53	0.54	0.49	0.49
On-road vehicles	0.27	0.33	0.39	0.45	0.47	0.48	0.49	0.50	0.50	0.47	0.44	0.40	0.37	0.34	0.30	0.30	0.30	0.30	0.26	0.26
Off-road, total	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.23	0.22
Aircraft	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Railroads	0.07	0.07	0.07	0.06	0.06	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Marine vessels	0.16	0.16	0.16	0.17	0.18	0.18	0.18	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.17	0.18	0.16	0.16
Nontransportation, total	30.70	27.47	25.30	22.61	21.81	21.54	21.97	22.08	22.34	21.68	21.42	21.14	20.75	18.06	17.86	18.31	18.41	17.11	15.83	15.30
Fuel combustion	23.46	22.66	21.39	20.02	19.43	19.43	19.76	19.92	20.29	19.80	19.49	19.24	18.89	16.23	16.25	16.65	16.75	15.51	14.20	13.63
Industrial processes ^a	7.09	4.68	3.77	2.43	2.22	1.94	2.02	1.97	1.86	1.68	1.71	1.65	1.62	1.59	1.37	1.43	1.43	1.32	1.36	1.41
Waste disposal and recycling	<0.01	0.05	0.03	0.03	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.07	0.06	0.05	0.03	0.03	0.03	0.03	0.03	0.04
Miscellaneous ^b	0.15	0.08	0.10	0.13	0.13	0.14	0.16	0.15	0.15	0.16	0.17	0.17	0.19	0.19	0.20	0.20	0.20	0.24	0.23	0.23

KEY: R = revised.

^a Industrial processes comprises chemical and allied product manufacturing, metals processing, petroleum and related industries, and other industrial processes; solvent utilization; and storage and transport.

^b Miscellaneous comprises nontransportation-related fugitive dust, agriculture and forestry, nonroad gasoline, nonroad diesel, other nonroad sources and other miscellaneous combustion that could not be accurately allocated to specific source categories.

NOTES

The methodologies used to estimate emissions constantly evolve and undergo major changes. These improved methods are often used to revise estimates for previous years and, therefore, some estimates in this table may not match estimates produced in previous reports. The most recent revision of these estimates is based on Version 2 of the 1999 National Emissions Inventory (NEI) and provides a generally consistent time trend of the estimates. However, state-submitted data on mobile sources is only reflected in the estimates for 1999 and the EPA plans to correct this inconsistency in future publications.

Numbers may not add to totals due to rounding.

SOURCE

1970-2001: U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), *Current Emission Trends Summaries*, available at Internet website <http://www.epa.gov/ttn/chief/trends/> as of Aug. 14, 2003.

Table 4-46: Estimated National Emissions of Lead (Thousand short tons)

	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
TOTAL all sources	220.88	159.67	74.16	22.89	14.77	7.68	7.05	5.49	4.98	4.17	3.81	3.92	4.05	3.93	4.08	4.14	4.06	4.20	4.23
Transportation, total	173.36	131.33	61.39	18.74	11.06	3.95	3.24	1.64	1.04	0.59	0.59	0.55	0.55	0.56	0.52	0.52	0.52	0.54	0.56
Highway vehicles	171.96	130.21	60.50	18.05	10.25	3.32	2.57	0.98	0.42	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Aircraft	1.40	1.12	0.89	0.69	0.81	0.63	0.67	0.66	0.62	0.57	0.57	0.53	0.53	0.54	0.51	0.50	0.50	0.52	0.55
Nontransportation, total	47.52	28.34	12.77	4.15	3.71	3.73	3.81	3.85	3.94	3.58	3.22	3.37	3.50	3.37	3.55	3.61	3.54	3.66	3.66
Fuel combustion	10.62	10.35	4.30	0.52	0.52	0.51	0.51	0.51	0.50	0.50	0.49	0.50	0.50	0.49	0.49	0.49	0.49	0.50	0.50
Industrial processes ^a	26.36	11.38	3.94	2.53	2.13	2.16	2.27	2.40	2.48	2.27	1.92	2.05	2.18	2.27	2.27	2.32	2.24	2.35	2.35
Waste disposal and recycling	2.20	1.60	1.21	0.87	0.84	0.84	0.82	0.77	0.80	0.81	0.81	0.83	0.83	0.60	0.79	0.80	0.81	0.81	0.81
Miscellaneous ^b	8.34	5.01	3.32	0.23	0.22	0.22	0.21	0.17	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

^a Industrial processes comprise chemical and allied product manufacturing, metals processing, and other industrial processes.

^b Miscellaneous comprises other nonroad gasoline, engines and vehicles that could not be accurately allocated to specific source categories.

NOTES

Total lead emissions decreased sharply from 1970 to 1995 as a result of regulatory actions. The lead content of leaded gasoline was reduced dramatically in 1985. In addition, unleaded gasoline was introduced in 1975 for use in automobiles equipped with catalytic control devices. By 1995, unleaded gasoline sales accounted for 99% of the gasoline market.

The EPA now treats lead as a hazardous air pollutant (HAP) and the HAPs emission inventory report is published every three years.

The methodologies used to estimate emissions constantly evolve and undergo major changes. Improved methods are often used to revise estimates for previous years. Therefore, some estimates in this table may not match estimates produced in previous reports, and some trends may not be consistent across years in which major changes in methodology have occurred.

Numbers may not add to totals due to rounding.

SOURCES

1970, 1975: U.S. Environmental Protection Agency, *National Air Quality and Emissions Trends Report: 1999* (EPA-454/R-01-004) (Research Triangle Park, NC: March 2001), table A-2; available at Internet website <http://www.epa.gov/oar/aqtrnd99/toc.html> as of Sept. 5, 2001.

1980, 1985 and 1989-2000: Ibid, Current Emission Trends Summaries, available at internet website <http://www.epa.gov/ttn/chief/trends/trends00/trends2000.pdf> as of Oct. 17, 2002.

1986-87: Ibid, National Emission Trends source reports database; available at Internet website www.epa.gov/air/data/nettier.html as of Sept. 5, 2001.

1988: Ibid, *National Air Pollutant Emission Trends: 1900-1998* (EPA-454/R-00-002) (Research Triangle Park, NC: March 2000), table A-2; available at Internet website <http://www.epa.gov/ttn/chief/trends/trends98/browse.html> as of Sept. 5, 2001.

**Table 4-47: Air Pollution Trends in Selected Metropolitan Statistical Areas
(Number of days with AQI values greater than 100 at trend sites and all monitorin**

	All sites		Trend sites										
	Total number of sites ^R	AQI days > 100 (2003)	Number of trend sites ^R	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Akron, OH	2	4	2	8	12	11	6	14	20	4	12	22	4
Albany-Schenectady-Troy, NY	4	5	3	6	3	4	3	3	6	1	11	8	5
Albuquerque, NM	11	3	8	1	0	(R) 1	0	0	(R) 2	0	1	(R) 0	2
Allentown-Bethlehem-Easton, PA	3	4	1	3	7	6	12	18	19	5	9	18	4
Ann Arbor, MI	2	6	1	3	5	5	1	4	1	2	5	11	5
Atlanta, GA	11	13	6	15	36	(R) 30	(R) 35	(R) 59	(R) 66	(R) 30	(R) 14	(R) 30	11
Austin-San Marcos, TX	4	4	1	4	10	0	0	5	8	6	0	5	3
Bakersfield, CA	8	116	8	105	(R) 106	110	58	(R) 76	(R) 93	(R) 82	(R) 85	(R) 91	116
Baltimore, MD	8	10	7	40	36	28	30	51	40	(R) 16	(R) 26	(R) 39	10
Baton Rouge, LA	7	16	7	10	22	12	16	21	26	(R) 30	5	6	16
Birmingham, AL	10	4	6	6	32	15	8	23	(R) 30	(R) 21	(R) 11	(R) 13	3
Boston, MA-NH	6	5	2	6	7	4	7	8	(R) 8	1	12	(R) 13	3
Buffalo-Niagara Falls, NY	2	7	2	4	6	3	1	13	8	5	13	21	7
Charleston-North Charleston, SC	3	0	3	2	1	3	3	3	5	4	0	1	0
Charlotte-Gastonia-Rock Hill, NC-SC	8	9	6	15	18	21	29	50	42	(R) 24	(R) 26	(R) 36	9
Chicago, IL	19	4	20	(R) 7	24	7	10	12	(R) 14	(R) 1	(R) 16	(R) 20	4
Cincinnati, OH-KY-IN	9	11	5	16	(R) 23	(R) 11	(R) 13	(R) 15	(R) 26	(R) 9	(R) 6	(R) 26	7
Cleveland-Lorain-Elyria, OH	9	9	7	(R) 23	(R) 24	(R) 18	(R) 12	(R) 21	(R) 20	(R) 4	(R) 17	(R) 29	6
Columbia, SC	3	2	2	3	2	3	7	16	12	8	7	3	1
Columbus, OH	7	7	3	(R) 11	18	(R) 17	(R) 12	(R) 20	(R) 21	(R) 6	(R) 7	(R) 19	5
Dallas, TX	11	20	3	24	29	10	27	33	25	22	16	15	12
Dayton-Springfield, OH	5	7	4	14	11	18	10	19	(R) 19	(R) 6	(R) 4	28	6
Denver, CO	8	17	8	(R) 2	(R) 3	2	0	9	(R) 3	(R) 2	(R) 2	(R) 7	17
Detroit, MI	7	7	7	11	(R) 12	(R) 12	11	17	(R) 14	(R) 3	(R) 16	(R) 21	7
El Paso, TX	6	1	2	(R) 2	3	(R) 1	(R) 0	6	(R) 0	(R) 3	(R) 1	(R) 4	0
Fort Lauderdale, FL	3	0	2	1	1	1	0	1	(R) 1	(R) 1	(R) 2	(R) 1	0
Fort Wayne, IN	3	4	2	14	12	10	7	8	12	4	2	15	4
Fort Worth-Arlington, TX	8	28	2	31	28	14	14	17	19	16	17	23	22
Fresno, CA	8	97	5	55	61	70	75	67	(R) 81	(R) 78	(R) 92	(R) 91	96
Gary, IN	6	5	3	6	18	12	(R) 11	9	(R) 10	(R) 5	(R) 10	20	3
Grand Rapids-Muskegon-Holland, MI	5	8	4	14	18	9	10	19	(R) 21	(R) 3	(R) 11	(R) 20	7
Greensboro-Winston-Salem-High Pt., NC	7	6	6	7	13	(R) 8	(R) 17	(R) 30	(R) 29	(R) 20	(R) 18	(R) 30	6
Greenville-Spartanburg-Anderson, SC	4	4	4	5	7	7	9	28	19	11	13	28	4
Harrisburg-Lebanon-Carlisle, PA	3	3	3	12	13	3	9	22	(R) 17	(R) 5	(R) 17	(R) 17	3
Hartford, CT	3	7	3	18	(R) 13	5	16	10	18	7	16	21	7
Houston, TX	18	38	9	41	66	(R) 29	(R) 46	(R) 39	(R) 51	(R) 43	(R) 28	23	30
Indianapolis, IN	12	13	7	22	21	16	12	19	24	(R) 4	(R) 8	(R) 23	11
Jacksonville, FL	2	0	1	0	0	0	0	3	2	0	0	(R) 0	0
Jersey City, NJ	1	2	1	12	16	5	9	7	(R) 17	(R) 3	(R) 6	(R) 6	2
Kansas City, MO-KS	8	14	4	10	21	(R) 6	16	14	(R) 3	(R) 10	4	7	10
Knoxville, TN	7	14	7	16	26	21	37	54	(R) 62	(R) 36	(R) 17	45	14
Las Vegas, NV-AZ	15	11	4	3	(R) 0	(R) 4	(R) 0	(R) 3	(R) 0	(R) 0	1	(R) 2	2
Little Rock-North Little Rock, AR	3	1	2	2	7	1	1	(R) 2	5	16	4	9	1
Los Angeles-Long Beach, CA	14	86	14	(R) 117	(R) 97	(R) 74	(R) 45	(R) 46	(R) 19	(R) 45	(R) 37	(R) 35	61
Louisville, KY-IN	7	7	7	28	26	17	18	29	(R) 44	(R) 10	(R) 10	(R) 26	7
McAllen-Edinburg-Mission, TX	2	1	2	0	0	0	0	0	0	0	1	1	1
Memphis, TN-AR-MS	4	9	4	10	21	(R) 18	17	27	35	24	13	16	9
Miami, FL	4	1	4	1	2	1	3	8	(R) 5	(R) 0	1	0	1
Middlesex-Somerset-Hunterdon, NJ	2	7	2	9	20	15	19	22	26	11	21	29	7
Milwaukee-Waukesha, WI	10	8	8	12	14	5	5	12	(R) 17	(R) 4	(R) 12	12	8
Minneapolis-St. Paul, MN-WI	7	1	4	(R) 0	(R) 3	0	0	1	(R) 0	(R) 0	2	1	1
Mobile, AL	3	3	1	0	1	3	3	8	4	6	1	0	1
Monmouth-Ocean, NJ	2	12	2	13	20	17	21	31	27	11	21	31	12
Nashville, TN	7	6	6	21	26	(R) 22	20	30	(R) 33	(R) 16	7	16	6
Nassau-Suffolk, NY	3	6	2	15	10	8	12	11	18	5	3	13	6
New Haven-Meriden, CT	2	11	1	13	14	8	19	9	(R) 16	(R) 6	(R) 11	(R) 20	9
New Orleans, LA	6	8	6	8	20	8	7	7	18	17	5	2	8
New York, NY	7	7	4	16	(R) 20	14	23	18	25	(R) 11	(R) 16	(R) 30	7
Newark, NJ	2	4	1	(R) 11	20	11	13	22	(R) 21	(R) 6	(R) 13	(R) 27	4

Norfolk-VA Beach-Newport News, VA-NC	3	4	3	6	6	4	17	15	(R) 16	5	(R) 6	15	4
Oakland, CA	11	4	7	(R) 2	(R) 8	(R) 5	0	(R) 8	(R) 7	(R) 1	(R) 3	(R) 5	2
Oklahoma City, OK	6	2	3	5	13	2	4	7	4	6	2	2	2
Omaha, NE-IA	3	0	3	(R) 0	(R) 0	(R) 0	(R) 0	(R) 0	(R) 2	(R) 0	(R) 0	0	0
Orange County, CA	4	10	2	(R) 14	(R) 8	(R) 6	3	(R) 5	(R) 1	(R) 3	(R) 2	(R) 0	3
Orlando, FL	5	1	4	3	1	1	5	14	4	3	(R) 3	1	0
Philadelphia, PA-NJ	12	14	10	(R) 25	(R) 30	(R) 22	(R) 32	37	32	(R) 17	(R) 27	33	13
Phoenix-Mesa, AZ	26	12	7	(R) 7	(R) 19	15	(R) 10	14	10	(R) 9	(R) 6	(R) 6	7
Pittsburgh, PA	12	8	11	(R) 20	(R) 25	12	(R) 20	39	(R) 23	(R) 4	(R) 19	(R) 28	7
Portland-Vancouver, OR-WA	5	0	3	(R) 1	2	6	0	3	(R) 0	(R) 0	(R) 0	(R) 1	0
Providence-Fall River-Warwick, RI-MA	2	10	1	5	7	2	3	2	(R) 2	(R) 2	10	9	4
Raleigh-Durham-Chapel Hill, NC	8	8	8	(R) 16	(R) 16	(R) 18	(R) 29	(R) 52	(R) 32	(R) 18	(R) 9	29	8
Richmond-Petersburg, VA	4	5	3	9	14	5	19	22	21	(R) 5	(R) 12	(R) 21	3
Riverside-San Bernardino, CA	19	103	15	(R) 149	(R) 119	(R) 115	(R) 104	(R) 95	(R) 96	(R) 98	(R) 92	(R) 96	102
Rochester, NY	2	3	2	1	6	0	6	4	9	1	5	13	3
Sacramento, CA	16	43	11	37	41	44	(R) 18	(R) 32	(R) 40	(R) 31	(R) 35	(R) 39	36
St. Louis, MO-IL	17	11	14	(R) 31	(R) 36	23	(R) 14	24	(R) 29	(R) 16	(R) 14	(R) 32	11
Salt Lake City-Ogden, UT	9	6	6	(R) 9	5	(R) 12	2	19	(R) 4	(R) 7	(R) 4	(R) 7	3
San Antonio, TX	3	7	1	3	17	2	3	6	9	0	0	17	4
San Diego, CA	9	6	9	46	48	31	14	33	(R) 16	(R) 14	(R) 17	(R) 13	6
San Francisco, CA	3	0	3	0	2	0	0	0	(R) 0	(R) 0	(R) 0	(R) 0	0
San Jose, CA	6	6	5	2	14	8	0	8	(R) 3	(R) 1	(R) 3	(R) 6	6
Sarasota-Bradenton, FL	6	3	2	2	1	1	2	9	4	5	4	0	2
Scranton-Wilkes Barre-Hazleton, PA	4	3	4	7	12	4	11	7	12	(R) 1	(R) 10	(R) 16	3
Seattle-Bellevue-Everett, WA	4	2	1	(R) 1	(R) 0	(R) 0	(R) 0	3	(R) 0	(R) 0	(R) 0	(R) 0	0
Springfield, MA	3	3	4	12	9	(R) 4	10	7	(R) 10	(R) 2	13	12	3
Stockton-Lodi, CA	2	2	3	6	9	14	3	7	10	3	2	3	2
Syracuse, NY	3	5	2	1	5	0	2	3	4	1	4	9	2
Tacoma, WA	3	1	2	2	0	1	0	4	(R) 0	(R) 0	(R) 0	0	0
Tampa-St. Petersburg-Clearwater, FL	10	6	7	3	2	3	4	11	(R) 9	(R) 6	4	0	4
Toledo, OH	5	6	2	8	9	11	4	5	4	2	9	13	6
Tucson, AZ	9	1	5	0	3	0	1	0	(R) 1	0	0	(R) 1	1
Tulsa, OK	6	9	2	(R) 11	(R) 19	(R) 12	(R) 5	(R) 7	(R) 13	10	(R) 4	5	7
Vallejo-Fairfield-Napa, CA	3	0	4	0	5	4	0	8	8	0	0	0	0
Ventura, CA	6	31	6	63	66	(R) 65	(R) 46	(R) 30	(R) 23	(R) 30	(R) 23	(R) 15	31
Washington, DC-MD-VA-WV	20	8	15	22	32	18	30	47	39	11	22	34	8
West Palm Beach-Boca Raton, FL	2	0	1	0	0	0	0	2	1	0	1	0	0
Wichita, KS	2	1	2	0	1	2	3	3	2	1	3	2	1
Wilmington-Newark, DE-MD	5	7	4	24	27	13	22	28	21	18	19	21	7
Worcester, MA	1	1	1	11	7	0	5	6	8	1	6	8	1
Youngstown-Warren, OH	3	5	2	5	11	8	10	20	(R) 12	(R) 2	(R) 12	(R) 16	4

KEY: AQI = Air Quality Index; R = revised.

NOTES

The Air Quality Index (AQI) integrates information on 5 major pollutants (particulate matter less than 10 microns in diameter, sulfur dioxide, carbon monoxide, ozone, and nitrogen dioxide and for 2000-2003 particulate matter less than 2.5 microns in diameter is also included as a sixth major pollutant) across an entire monitoring network into a single number that represents the worst daily air quality experienced in an urban area. An AQI greater than 100 indicates that at least 1 criteria pollutant exceeded air quality standards on a given day; therefore, air quality would be in the unhealthy range on that day. Air quality monitoring sites are selected as "trend sites" if they have complete data for at least 8 of the 10 last years.

SOURCE

U.S. Environmental Protection Agency, Office of Air and Radiation, Air Trends, *Factbook and Related Information*, available at <http://www.epa.gov/airtrends/aqi10year.pdf> as of Aug. 25, 2004.

**Table 4-48: Areas in Nonattainment of National Ambient Air Quality Standards for Criteria Pollutants
(Condensed nonattainment area list as of September 2002)**

Ref. no.	States	Consolidated nonattainment area name ^a	Number of areas in nonattainment ^d					Area population, in 1,000s ^h					
			O ₃ ^e	CO	SO ₂	PM-10	Pb	NO ₂	O ₃	CO	SO ₂	PM-10	Pb	Total exposed
1	AK	Anchorage	.	1	.	1	.	.	255	.	195	.	255
2	AK	Fairbanks	.	1	.	.	.	.	39	.	.	.	39
3	AK	Juneau	.	.	.	1	.	.	.	.	13	.	13
4	AL	Birmingham	1	.	.	.	.	.	805	.	.	.	805
5	AZ	Ajo	.	.	1	1	.	.	.	7	7	.	7
6	AZ	Douglas	.	.	1	1	.	.	.	15	15	.	15
7	AZ	Miami-Hayden	.	.	2	1	.	.	.	4	4	.	4
8	AZ	Morenci	.	.	1	.	.	.	.	8	.	.	8
9	AZ	Nogales	.	.	.	1	.	.	.	.	24	.	24
10	AZ	Paul Spur	.	.	.	1	.	.	.	.	1	.	1
11	AZ	Phoenix	1	1	.	1	.	.	3,028	3,028	3,111	.	3,111
12	AZ	Rillito	.	.	.	1	.	.	.	.	0	.	0
13	AZ	San Manuel	.	.	1	.	.	.	.	7	.	.	7
14	AZ	Yuma	.	.	.	1	.	.	.	.	82	.	82
15	CA	Imperial Valley	.	.	.	1	.	.	.	.	119	.	119
16	CA	Los Angeles-South Coast Air Basin	1	1	.	1	.	.	14,550	14,550	14,550	.	14,550
17	CA	Mono Basin (in Mono Co.)	.	.	.	1	.	.	.	.	0	.	0
18	CA	Owens Valley	.	.	.	1	.	.	.	.	7	.	7
19	CA	Sacramento Metro	1	.	.	1	.	.	1,978	.	1,223	.	1,978
20	CA	San Diego	1	.	.	.	.	.	2,813	.	.	.	2,813
21	CA	San Francisco-Oakland-San Jose	1	.	.	.	.	.	6,541	.	.	.	6,541
22	CA	San Joaquin Valley	2	.	.	1	.	.	3,302	.	3,080	.	3,302
23	CA	Santa Barbara-Santa Maria-Lompoc	1	.	.	.	.	.	399	.	.	.	399
24	CA	Searles Valley	.	.	.	3	.	.	.	.	22	.	22
25	CA	Southeast Desert Modified AQMA	1	.	.	2	.	.	1,024	.	424	.	1,024
26	CA	Ventura Co.	1	.	.	.	.	.	753	.	.	.	753
27	CO	Aspen	.	.	.	1	.	.	.	.	5	.	5
28	CO	Denver-Boulder	.	.	.	1	.	.	.	.	2,389	.	2,389
29	CO	Fort Collins	.	1	.	.	.	.	143	.	.	.	143
30	CO	Lamar	.	.	.	1	.	.	.	.	8	.	8
31	CO	Steamboat Springs	.	.	.	1	.	.	.	.	9	.	9
32	CT	Greater Connecticut	1	.	.	1	.	.	2,532	.	123	.	2,532
33	DC-MD-VA	Washington	1	.	.	.	.	.	4,544	.	.	.	4,544
34	DE	Sussex County	1	.	.	.	.	.	156	.	.	.	156
35	GA	Atlanta	1	.	.	.	.	.	3,698	.	.	.	3,698
36	GU ^b	Piti Power Plant	.	.	1	.	.	.	.	.	1	.	1
37	GU ^b	Tanguisson Power Plant	.	.	1	.	.	.	.	.	1	.	1
38	ID	Boise	.	1	.	.	.	.	197	.	.	.	197
39	ID	Bonner Co. (Sandpoint)	.	.	.	1	.	.	.	.	36	.	36
40	ID	Pocatello Area	.	.	.	2	.	.	.	.	66	.	66
41	ID	Shoshone Co.	.	.	.	2	.	.	.	.	12	.	12
42	IL-IN	Chicago-Gary-Lake County	1	.	1	3	.	.	8,757	484	322	.	8,757
43	KY-WV	Ashland-Huntington	.	.	1	.	.	.	.	.	49	.	49
44	LA	Baton Rouge	1	.	.	.	.	.	636	.	.	.	636
45	MA	Boston-Lawrence	1	.	.	.	.	.	5,883	.	.	.	5,883
46	MA	Springfield (W. Mass)	1	.	.	.	.	.	814	.	.	.	814
47	MD	Baltimore	1	.	.	.	.	.	2,512	.	.	.	2,512
48	MD	Kent and Queen Anne Cos.	1	.	.	.	.	.	59	.	.	.	59
49	ME	Knox/Lincoln County	1	.	.	.	.	.	73	.	.	.	73
50	ME	Lewiston-Auburn	1	.	.	.	.	.	220	.	.	.	220
51	ME	Portland	1	.	.	.	.	.	487	.	.	.	487
52	MO	Liberty-Arcadia	.	.	.	.	1	.	.	.	.	6	6
53	MO-IL	St. Louis	1	.	.	.	91	.	2,482	.	.	2	2,482
54	MT	Billings/Laurel (Yellowstone Co.)	.	.	1	.	.	.	.	6	.	.	6
55	MT	Butte	.	.	.	1	.	.	.	.	34	.	34
56	MT	Columbia Falls	.	.	.	.	.	.	.	.	3	.	3
57	MT	East Helena (Lewis & Clark Co.)	.	.	1	.	1	.	.	2	.	2	2
58	MT	Kalispell	.	.	.	1	.	.	.	.	15	.	15
59	MT	Lame Deer	.	.	.	.	1	.	.	.	0	.	0
60	MT	Libby	.	.	.	1	.	.	.	.	3	.	3
61	MT	Missoula	.	1	.	1	.	.	52	.	52	.	52
62	MT	Polson	.	.	.	1	.	.	.	.	3	.	3
63	MT	Ronan	.	.	.	1	.	.	.	.	2	.	2
64	MT	Thompson Falls	.	.	.	1	.	.	.	.	1	.	1
65	MT	Whitefish	.	.	.	1	.	.	.	.	5	.	5
66	NH	Manchester	1	.	.	.	.	.	364	.	.	.	364
67	NH	Portsmouth-Dover-Rochester	1	.	.	.	.	.	192	.	.	.	192
68	NJ	Atlantic City	1	.	.	.	.	.	354	.	.	.	354
69	NM	Anthony	.	.	.	1	.	.	.	.	2	.	2
70	NM	Grant Co.	.	.	1	.	.	.	.	31	.	.	31
71	NM	Sunland Park	1	.	.	.	.	.	10	.	.	.	10

72	NV	Lake Tahoe	.	1	.	.	.	.	.	29	.	.	.	29
73	NV	Las Vegas	.	1	.	1	.	.	.	478	1,375	.	.	1,375	
74	NV	Reno	1	1	.	1	.	.	.	339	178	339	.	339	
75	NY	Albany-Schenectady	1	.	.	.	.	.	.	892	.	.	.	892
76	NY	Buffalo-Niagara Falls	1	.	.	.	.	.	.	1,170	.	.	.	1,170
77	NY	Essex City, Whiteface	1	.	.	.	.	.	.	0	.	.	.	0
78	NY	Jefferson Co.	1	.	.	.	.	.	.	111	.	.	.	111
79	NY	Poughkeepsie	1	.	.	.	.	.	.	600	.	.	.	600
80	NY-NJ-CT	New York-N. New Jersey-Long Island	1	.	.	1	.	.	.	19,171	1,537	.	.	19,171	
81	OH	Cleveland-Akron-Lorain	.	.	1	.	.	.	.	.	1,095	.	.	1,095
82	OH	Lucas Co. (Toledo)	.	.	1	.	.	.	.	.	455	.	.	455
83	OH-KY	Cincinnati-Hamilton	1	.	.	.	.	.	.	1,514	.	.	.	1,514
84	OH-PA	Youngstown-Warren	1	.	.	.	.	.	.	120	.	.	.	120
85	OR	Grants Pass	.	.	.	1	.	.	.	.	.	20	.	20
86	OR	Klamath Falls	.	.	.	1	.	.	.	.	.	19	.	19
87	OR	LaGrande	.	.	.	1	.	.	.	.	.	12	.	12
88	OR	Lakeview	.	.	.	1	.	.	.	.	.	3	.	3
89	OR	Medford	.	.	.	1	.	.	.	.	.	78	.	78
90	OR	Oakridge	.	.	.	1	.	.	.	.	.	3	.	3
91	OR	Springfield-Eugene	.	.	.	1	.	.	.	.	.	179	.	179
92	OR	Salem	.	1	.	.	.	.	.	135	.	.	.	135
93	PA	Altoona	1	.	.	.	.	.	.	129	.	.	.	129
94	PA	Erie	1	.	.	.	.	.	.	280	.	.	.	280
95	PA	Harrisburg-Lebanon	1	.	.	.	.	.	.	629	.	.	.	629
96	PA	Johnstown	1	.	.	.	.	.	.	232	.	.	.	232
97	PA	Lancaster	1	.	.	.	.	.	.	470	.	.	.	470
98	PA	Pittsburgh-Beaver Valley	.	1	2	1	.	.	.	335	410	21	.	410	
99	PA	Scranton-Wilkes-Barre	1	.	.	.	.	.	.	763	.	.	.	763
100	PA	Warren Co	.	.	2	.	.	.	.	.	.	20	.	20
101	PA	York	1	.	.	.	.	.	.	473	.	.	.	473
102	PA-DE-NJ-MD	Philadelphia-Wilmington-Trenton	1	.	.	.	.	.	.	6,311	.	.	.	6,311
103	PA-NJ	Allentown-Bethlehem	1	.	1	.	.	.	.	740	102	.	.	740
104	PR	Guaynabo Co.	.	.	.	1	.	.	.	.	.	92	.	92
105	RI	Providence (all of RI)	1	.	.	.	.	.	.	1,048	.	.	.	1,048
106	TX	Beaumont-Port Arthur	1	.	.	.	.	.	.	385	.	.	.	385
107	TX	Dallas-Fort Worth	1	.	.	.	.	.	.	4,589	.	.	.	4,589
108	TX	El Paso	1	1	.	1	.	.	.	679	62	563	.	679	
109	TX	Houston-Galveston-Brazoria	1	.	.	.	.	.	.	4,669	.	.	.	4,669
110	UT	Ogden	.	.	.	1	.	.	.	.	.	77	.	77
111	UT	Salt Lake City	.	.	1	1	.	.	.	.	898	898	.	898
112	UT	Tooele Co.	.	.	1	.	.	.	.	.	40	.	.	40
113	UT	Utah Co. (Provo)	.	1	.	1	.	.	.	118	.	368	.	368	
114	VA	Smyth Co., White Top	1	.	.	.	.	.	.	0	.	.	.	0
115	WA	Spokane	.	1	.	1	.	.	.	322	204	.	.	322	
116	WA	Walla Walla	.	.	.	1	.	.	.	.	0	.	.	0
117	WA	Yakima	.	1	.	1	.	.	.	.	63	.	.	63
118	WI	Door Co.	1	.	.	.	.	.	.	27	.	.	.	27
119	WI	Manitowoc Co.	1	.	.	.	.	.	.	82	.	.	.	82
120	WI	Milwaukee-Racine	1	.	.	.	.	.	.	1,839	.	.	.	1,839
121	WV	Follansbee	.	.	.	1	.	.	.	.	.	2	.	2
122	WV	New Manchester Gr. (in Hancock Co)	.	.	1	.	.	.	.	.	9	.	.	9
123	WV	Wier.-Butler-Clay (in Hancock Co)	.	.	1	1	.	.	.	.	16	15	.	16
124	WY	Sheridan	.	.	.	1	.	.	.	.	.	15	.	15
National totals (124 areas) ^c			56	16	24	67	3	0	0	116,228	19,921	3,660	31,850	10	125,730

KEY: CO = carbon monoxide; NO₂ = nitrogen dioxide; O₃ = ozone; Pb = lead; PM-10 = particulate matter smaller than 10 microns; SO₂ = sulfur dioxide; . = all areas in attainment for a particle or pollutant.

^a This is a simplified listing of classified nonattainment areas. Unclassified and Section 185a (transitional) nonattainment areas are not included. Names of nonattainment areas are listed alphabetically within each state. Note that several smaller nonattainment areas may be inside one larger nonattainment area. In these cases, the smaller nonattainment areas are listed on the same line as the larger one, and the number of nonattainment areas are indicated under each pollutant.

^b Guam (U.S. territory)

^c National total includes Guam (U.S. territory).

^d The number of nonattainment areas for each of the criteria pollutants is listed. A dot (.) indicates that all areas are in attainment for that pollutant.

^e 1-hour ozone standard.

^f Ozone nonattainment area is a portion of Dona Ana County, New Mexico.

^g Lead nonattainment area is Herculaneum, Missouri in Jefferson County.

^h Population figures were obtained from the 2000 census data. For nonattainment areas defined as only partial counties, population figures for just the nonattainment area were used when these were available. Otherwise, whole county population figures were used. When a larger nonattainment area encompasses a smaller one, double counting the population in the "Total exposed" column is avoided by only counting the population of the larger nonattainment area.

The "Total exposed" values represent estimated population living in areas that are in nonattainment for at least one pollutant.

NOTE

Reference numbers 1-124 do not indicate ranking.

SOURCE

U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Quality and Emissions Trends Report, 2002* (Research Triangle Park, NC: 2002), table A-19. Internet website <http://www.epa.gov/airtrends/> as of Oct. 2, 2003.

Table 4-49: U.S. Carbon Dioxide Emissions from Energy Use by Sector (Million metric tons of carbon)

Sector	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	(P) 2002
Total U.S. CO ₂ Emissions from energy use by sector	(R) 1,360.4	(R) 1,347.4	(R) 1,375.2	(R) 1,398.6	(R) 1,419.3	(R) 1,433.3	(R) 1,484.5	(R) 1,502.8	(R) 1,514.2	(R) 1,535.5	(R) 1,581.3	(R) 1,552.1	1,562.4
Transportation	(R) 428.0	(R) 422.5	(R) 428.3	(R) 433.8	(R) 445.0	(R) 453.1	(R) 465.0	(R) 469.8	(R) 479.4	(R) 492.5	(R) 504.3	(R) 498.3	504.4
Natural gas	9.8	8.9	8.8	9.3	10.2	10.4	10.6	11.2	9.6	9.7	9.7	9.2	9.6
Electricity	0.7	0.7	0.7	0.7	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	0.9
Petroleum	(R) 417.5	(R) 412.9	(R) 418.8	(R) 423.8	(R) 433.9	(R) 441.8	(R) 453.6	(R) 457.7	(R) 468.9	(R) 481.9	(R) 493.6	(R) 488.1	493.9
Motor gasoline	260.5	259.2	263.0	268.9	(R) 272.1	(R) 276.9	(R) 282.0	(R) 284.3	(R) 292.6	(R) 299.9	(R) 301.6	(R) 303.0	310.5
Liquid petroleum gas	0.4	0.3	0.3	0.3	(R) 0.5	0.3	(R) 0.2	0.2	0.3	0.2	0.2	0.2	0.2
Jet fuel	60.1	58.1	57.6	58.1	60.4	60.0	62.7	63.3	64.2	(R) 66.2	68.5	65.6	63.9
Distillate fuel	(R) 72.3	(R) 71.1	(R) 72.8	(R) 75.0	(R) 79.6	(R) 82.8	(R) 88.3	(R) 92.3	(R) 95.0	(R) 98.8	(R) 102.0	(R) 104.5	103.4
Residual fuel	21.6	21.8	22.8	19.2	18.8	19.4	18.1	15.1	14.3	14.2	18.9	(R) 12.5	13.6
Lubricants	1.8	1.6	1.6	1.6	1.7	1.7	1.6	1.7	1.8	1.8	1.8	1.6	1.6
Aviation gas	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6
Industrial	(R) 460.5	(R) 448.3	(R) 470.0	(R) 465.0	(R) 472.7	(R) 472.3	(R) 486.8	(R) 491.0	(R) 484.3	(R) 481.9	(R) 483.8	(R) 459.6	456.4
Residential	(R) 259.3	(R) 263.6	(R) 263.9	(R) 280.0	(R) 278.2	(R) 279.7	(R) 296.0	(R) 293.6	(R) 298.9	(R) 306.5	(R) 318.9	(R) 316.6	325.3
Commercial	212.6	(R) 213.0	(R) 213.0	(R) 219.9	(R) 223.5	(R) 228.2	(R) 236.7	(R) 248.5	(R) 251.5	(R) 254.6	(R) 274.3	(R) 277.7	276.2
Total U.S. CO ₂ Emissions (Incl. adj. and other sources) ^a	(R) 1,365.2	(R) 1,352.3	(R) 1,383.3	(R) 1,412.6	(R) 1,435.1	(R) 1,450.4	(R) 1,502.3	(R) 1,519.6	(R) 1,527.8	(R) 1,550.6	(R) 1,596.4	(R) 1,567.6	1,580.5

KEY: CO₂ = carbon dioxide; P = preliminary; R = revised.

^a "Adjustments" comprise the addition of U.S. territories and the subtraction of military bunker fuels and international bunker fuels. "Other sources" comprise the addition of gas flaring, CO₂ in natural gas, cement production, other industrial, and waste combustion.

NOTES

Electric utility emissions are distributed across end-use sectors.

Numbers may not add to totals due to rounding.

Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon equals 3.667 tons of carbon dioxide gas.

SOURCE

U.S. Department of Energy, Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2002*, Washington, DC: 2003, available at Internet website http://www.eia.doe.gov/oiaf/1605/ggrpt/cdemissions_tbls.html as of June 14, 2004.

Section E

Water Pollution, Noise, and Solid Waste

Table 4-50: Petroleum Oil Spills Impacting Navigable U.S. Waterways

Source	1985		1990		1995		1996		1997		1998		1999		2000		2001	
	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled
TOTAL all spills	6,169	8,436,248	8,177	7,915,007	9,038	2,638,229	9,335	3,117,831	8,624	942,574	8,315	885,303	8,539	1,172,449	8,354	1,431,370	7,559	854,520
Vessel sources, total	1,662	4,862,911	2,485	6,387,158	5,478	1,624,153	5,586	1,681,020	5,347	380,879	5,172	621,235	5,680	576,475	5,560	1,033,643	5,021	569,856
Tankship	164	732,397	249	4,977,251	148	125,491	122	219,311	124	22,429	104	56,673	92	8,414	111	608,176	95	125,217
Tank barge	385	3,683,548	457	992,025	353	1,101,938	313	1,163,258	252	165,649	220	248,089	227	158,977	229	133,540	246	212,298
Other vessels ^a	1,113	446,966	1,779	417,882	4,977	396,724	5,151	298,451	4,971	192,801	4,848	316,473	5,361	409,084	5,220	291,927	4,680	232,341
Nonvessel sources, total	2,802	3,250,229	2,584	1,408,472	1,116	958,222	1,078	1,408,303	1,356	501,265	1,553	246,716	1,615	551,381	1,645	373,761	1,465	270,523
Offshore pipelines	23	17,977	73	46,228	7	1,143	4	386	13	810	10	843	5	35,707	4	17	13	1,241
Onshore pipelines	362	759,040	76	270,700	23	10,751	13	978,006	19	223,312	35	47,020	20	433	21	17,004	21	12,336
Other ^b	2,417	2,473,212	2,435	1,091,544	1,086	946,328	1,061	429,911	1,324	277,143	1,508	198,853	1,590	515,241	1,620	356,740	1,431	256,946
Mystery ^c	1,705	323,108	3,108	119,377	2,444	55,854	2,671	28,508	1,921	60,430	1,590	17,352	1,244	44,593	1,149	23,966	1,073	14,141

^a Other vessels include commercial vessels, fishing boats, freight barges, freight ships, industrial vessels, oil recovery vessels, passenger vessels, unclassified public vessels, recreational boats, research vessels, school ships, tow and tug boats, mobile offshore drilling units, offshore supply vessels, publicly owned tank and freight ships, as well as vessels not fitting any particular class (unclassified).

^b Other nonvessel sources include designated waterfront facilities, nonmarine land facilities, fixed offshore and inshore platforms, mobile facility, municipal facility, aircraft, land vehicles, railroad equipment, bridges, factories, fleeting areas, industrial facilities, intakes, locks, marinas, MARPOL reception facilities, nonvessel common carrier facilities, outfalls, sewers, drains, permanently moored facilities, shipyards, ship repair facilities.

^c Mystery spills are spills from unknown or unidentified sources. U.S. Coast Guard investigators are unable to identify the vessel or facility that spilled the oil into U.S. navigable waters.

SOURCE

U.S. Coast Guard, Oil Spill Compendium 2001, available at <http://www.uscg.mil/hq/g-m/nmc/response/stats/aa.htm> as of Dec. 12, 2003.

Table 4-51: Leaking Underground Storage Tank Releases and Cleanups

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total confirmed releases	87,528	126,816	184,457	237,022	270,567	303,635	317,488	341,773	371,387	397,821	412,392	418,918	427,307	439,385
Cleanups initiated	51,770	79,506	129,074	171,082	209,797	238,671	252,615	292,446	314,965	346,300	367,603	379,243	384,029	403,558
Cleanups not initiated	35,758	47,310	55,383	65,940	60,770	64,964	64,873	49,327	56,422	51,521	44,789	39,675	43,278	35,827
Cleanups completed	16,905	58,258	99,496	87,065	107,448	131,272	152,683	178,297	203,247	228,925	249,759	268,833	284,602	303,120
Releases not cleaned up	70,623	68,558	84,961	149,957	163,119	172,363	164,805	163,476	168,140	168,896	162,633	150,085	142,705	136,265

NOTES

All numbers are cumulative.

Data represent fiscal year, October 1 through September 30.

SOURCES

1990: U.S. Environmental Protection Agency, Office of Underground Storage Tanks, personal communications, Nov. 17 and 18, 1998.

1991-2003: Ibid., Internet site <http://www.epa.gov/swerust1/cat/camarchv.htm> as of June 10, 2004.

Table 4-52: Highway Noise Barrier Construction (Miles)

	Unknown	1963-80	1981-89	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Total 1963-2001
TOTAL length	6	224	531	^R 64	^R 99	142	^R 88	89	^R 129	^R 54	^R 88	^R 129	51	76	69	1,831
Type I barriers ^a	^d 6	144	380	44	78	^R 114	^R 63	^R 47	^R 90	^R 37	^R 55	^R 105	30	62	40	1,293
Type II barriers ^b	0	78	120	19	18	18	^R 21	16	32	15	31	^R 23	17	10	10	429
All other types ^c	N	2	31	^R 1	^R 3	^R 10	^R 4	^R 26	^R 7	^R 2	^R 2	1	4	4	19	108
Cost (2001 \$ millions)	N	187	716	101	165	213	135	127	181	75	140	205	97	124	98	2,564

KEY: N = data do not exist; R = revised.

^a A Type I barrier is built on a new highway project or a physically altered existing highway.

^b A Type II barrier is built to abate noise along an existing highway (often referred to as retrofit abatement) and is not mandatory.

^c All other types of barriers are nonfederally funded.

^d Have not been assigned a year of construction or a cost.

NOTES

Twenty-eight miles of barriers, while assigned a year of construction, cannot be assigned a cost. Data are produced on a 3-year cycle.

California and Arizona did not provide data for the years 1999, 2000, and 2001 and therefore these years may not be comparable with previous years.

SOURCE

U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, *Highway Traffic Noise Barrier Construction Trends* (Washington, DC: 2003), tables 1 and 3.

**Table 4-53: Number of People Residing in High Noise Areas Around U.S. Airports^{a,b,c}
(Within 65 dB DNL noise-level contours)**

Year	Exposure		
	People (thousands)	Percent of U.S. resident population	U.S. resident population (millions)
1975	7,000	3.25	215.5
1980	5,200	2.29	227.2
1985	3,400	1.43	237.9
1990	2,700	1.08	^R 249.6
1995	1,700	^R 0.64	^R 266.3
1996	1,500	^R 0.56	^R 269.4
1997	1,300	^R 0.48	^R 272.6
1998	1,100	^R 0.40	^R 275.9
1999	680	^R 0.24	^R 279.0
2000	440	0.16	282.2
2001	^R 411	^R 0.14	285.1
2002	294	0.10	288.0

KEY: dB = decibels; DNL = day-night sound level; R = revised.

^a Noise-level contours are graphical representations of noise levels on a map, similar to elevation contours on a topographic map. Noise-level contours are lines that join points of equal sound levels. Areas between given noise-level contour lines would have a noise level between the two contour values. The U.S. Department of Transportation, Federal Aviation Administration (FAA) has identified DNL 65 dB as the highest threshold of airport noise exposure that is normally compatible with indoor and outdoor activity associated with a variety of land uses, including residential, recreational, schools, and hospitals.

^b Estimates are for areas surrounding airport property of 250 of the largest civil airports with jet operations in the United States. They exclude exposure to aircraft noise within an airport boundary.

^c 1975 exposure estimates were made by the U.S. Environmental Protection Agency. 1980–2002 estimates were made by FAA. See the source and accuracy statement for more details on how exposure estimates are made.

SOURCES

Exposure:

1975-2002: U.S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy (AEE-12), personal communications, Sept. 19, 2002 and Jan. 18, 2004.

Population:

1975-1999: U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States 2002* (Washington, DC: 2002), table 2.

2000-2002: Ibid., *Monthly Population Estimates for the United States*, available at <http://eire.census.gov/popest/data/national/tables/NA-EST2003-01.php> as of Jan. 21, 2004.

Table 4-54: Motor Vehicles Scrapped^a (Thousands)

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
TOTAL motor vehicles	8,298	6,576	10,137	9,829	11,073	10,850	12,781	8,413	12,369	10,332	10,811	12,509	11,665	11,664	14,299	14,122	13,296	12,085
Passenger cars	7,461	5,669	8,405	7,729	8,897	8,565	11,194	7,366	7,824	7,414	7,527	8,244	6,819	7,216	8,085	7,650	U	U
Trucks	837	908	1,732	2,100	2,177	2,284	1,587	1,048	4,545	2,918	3,284	4,265	4,846	4,447	6,214	6,472	U	U

KEY: U = data are not available.

^a Data are for the period July 1 to June 30 of the given year.

NOTES

Figures represent vehicles that are not re-registered.

Numbers may not add to totals due to rounding.

SOURCE

1970-2001: The Polk Co., personal communication, July 31, 2002.

2002-03: National Automobile Dealers Association, "NADA Data: Vehicles in Operation and Scrappage," *AutoExec*, May 2004, p. 58, Internet site http://www.nada.org/Content/NavigationMenu/Newsroom/NADADData/NADA_Data.htm as of July 2004.

Modal Profiles

Air Carrier Profile

Financial	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Operating revenues (thousand dollars) ¹														
Domestic total ^a	2,178,339	7,180,161	26,440,297	57,960,508	65,948,993	70,885,050	76,890,526	82,249,568	86,493,789	90,931,479	98,895,837	86,511,248	(R) 79,220,149	88,179,380
Majors, all services	1,942,635	6,272,775	23,012,073	53,333,552	59,846,676	64,317,169	70,036,709	74,942,391	77,650,810	82,615,015	89,290,585	78,599,844	71,837,353	75,953,691
Nationals, all services	146,481	736,831	3,182,418	4,167,552	5,465,021	5,935,773	5,990,391	6,163,458	8,113,690	7,789,636	9,104,701	7,485,642	(R) 6,738,116	11,161,453
Large regionals, all services	N	N	245,806	459,404	637,296	632,108	863,426	1,143,719	729,289	526,828	500,551	425,762	(R) 644,680	1,064,236
International total	705,938	2,109,497	6,442,144	17,990,355	22,364,429	23,433,483	25,046,820	27,318,034	26,971,289	28,106,973	31,403,421	28,715,591	(R) 27,482,292	27,567,329
Majors, all services	705,938	2,109,497	5,976,221	16,761,376	19,222,842	19,892,111	21,524,274	23,608,853	23,356,233	24,671,152	28,100,884	25,883,361	(R) 24,549,966	24,896,068
Nationals, all services	N	N	465,923	901,352	2,697,137	3,282,606	3,326,467	3,376,014	3,161,212	3,142,217	2,909,590	2,512,290	(R) 2,583,498	2,090,717
Large regionals, all services	N	N	N	327,627	444,450	258,766	196,079	333,166	453,844	293,604	392,947	319,940	(R) 348,828	580,544
Total certificated ^a	2,884,877	9,289,658	32,882,441	75,950,863	88,313,422	94,318,533	101,937,346	109,567,602	113,465,078	119,038,452	130,299,258	115,226,839	(R) 106,702,441	115,746,709
Operating expenses (thousand dollars) ¹														
Domestic total ^a	2,052,094	7,001,668	26,465,999	58,953,086	63,757,937	66,119,699	71,573,073	75,731,215	78,388,515	84,328,320	93,578,562	94,891,737	(R) 86,696,559	90,827,606
Majors, all services	1,907,785	6,256,039	23,150,527	54,209,401	57,824,115	59,721,080	64,793,763	68,307,270	70,114,852	76,506,077	84,208,514	86,611,140	(R) 79,299,562	79,659,763
Nationals, all services	144,309	745,629	3,058,289	4,297,823	5,285,783	5,750,372	5,847,797	6,163,923	7,500,451	7,299,934	8,824,795	7,809,449	(R) 6,725,692	10,166,967
Large regionals, all services	N	N	257,183	445,862	648,039	648,039	931,513	1,260,021	773,212	522,309	545,253	471,148	(R) 671,305	1,000,876
International total	665,660	2,065,605	6,642,095	18,914,480	21,842,021	22,335,257	24,155,203	25,249,593	25,748,752	26,307,097	29,735,718	30,658,472	(R) 28,563,067	27,103,118
Majors, all services	665,660	2,065,605	6,171,366	17,746,006	18,875,302	19,061,258	20,807,517	21,688,642	22,321,441	23,218,938	26,645,342	27,664,641	(R) 25,703,233	24,624,881
Nationals, all services	N	N	470,729	853,361	2,503,462	3,025,707	3,166,097	3,253,249	3,014,282	2,815,341	2,659,021	2,672,662	(R) 2,539,233	1,945,654
Large regionals, all services	N	N	N	315,113	463,257	248,292	181,589	307,702	413,029	272,819	431,355	321,169	(R) 320,601	532,583
Total certificated ^a	2,717,754	9,067,273	33,108,094	77,867,566	85,599,958	88,454,956	95,728,276	100,980,807	104,137,267	110,635,417	123,314,280	125,550,209	(R) 115,259,626	117,930,724
Inventory ^b														
Number of carriers ^{c2}														
Total domestic and international	55	39	66	59	80	89	90	82	80	82	76	69	72	65
Majors	N	N	14	12	11	11	12	13	13	13	14	15	13	14
Nationals	N	N	18	15	23	27	31	31	27	31	33	27	30	26
Regionals	N	N	34	32	46	51	47	38	40	38	29	27	29	25
Number of aircraft available for service ³														
Total domestic and international	2,135	2,690	2,818	4,727	5,221	5,567	5,961	5,770	6,144	6,254	6,522	6,081	5,819	6,675
Majors	N	N	2,071	3,854	4,085	4,039	4,422	4,352	4,605	4,711	5,118	4,996	4,530	4,948
Nationals	N	N	432	650	819	1,143	1,167	967	1,113	1,319	1,182	952	1,079	1,299
Regionals	N	N	315	223	317	385	372	451	426	224	222	133	210	428
Number of employees ^{c2}														
Total domestic and international	169,872	304,690	354,264	588,926	585,427	610,363	634,866	656,243	696,408	728,495	732,049	653,488	642,797	609,401
Majors	118,189	214,021	318,973	549,100	526,379	533,313	564,631	597,953	623,389	650,267	672,294	607,857	585,890	534,902
Nationals	12,470	24,913	29,922	32,077	46,670	59,444	56,586	47,662	59,620	68,138	56,056	41,865	52,470	69,350
Regionals	N	N	5,369	7,749	12,378	17,606	13,649	10,628	13,399	10,090	3,699	3,766	4,437	5,149

continued

Air Carrier Profile *continued*

Performance	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Aircraft revenue-miles (thousands)														
Domestic ⁴														
Certificated, all services	858,451	2,067,598	2,523,375	3,963,263	4,379,830	4,629,394	4,811,453	4,910,948	5,034,691	5,332,483	5,664,281	5,548,323	(R) 5,616,309	6,084,854
Major, all services	716,961	1,778,065	2,113,669	3,547,339	3,760,064	3,953,287	4,083,664	4,191,113	4,260,052	4,598,092	4,784,663	4,680,536	4,418,671	4,266,950
Nationals, all services	94,794	247,055	330,528	351,946	519,312	569,641	614,519	594,241	702,913	668,646	813,061	809,367	(R) 939,355	1,249,346
Large regionals, all services	N	N	56,995	60,542	78,573	85,363	96,573	112,682	51,199	47,438	52,941	40,936	(R) 44,128	73,786
International total ⁵														
Certificated, all services	181,605	474,666	400,971	760,338	979,765	997,658	1,043,313	1,113,816	1,192,489	1,225,218	1,281,706	1,265,939	(R) 1,224,662	1,246,109
Major, all services	N	N	330,391	666,231	809,242	822,283	859,483	917,109	1,003,726	1,053,219	1,117,712	1,119,387	1,048,152	1,028,244
Nationals, all services	N	N	66,499	48,812	119,839	141,870	150,147	145,821	145,494	138,135	132,497	124,764	(R) 147,046	173,486
Large regionals, all services	N	N	2,948	60,542	41,067	27,761	22,519	47,138	40,398	29,474	27,890	17,516	(R) 24,698	37,493
Medium regionals, all services, domestic and international	N	N	23,204	9,017	31,500	28,847	27,861	16,660	21,024	22,697	17,223	15,976	(R) 25,164	25,734
Total certificated	1,040,056	2,542,264	2,924,346	4,723,601	5,359,595	5,627,052	5,854,766	6,024,764	6,227,180	6,557,701	7,056,534	6,814,264	(R) 6,840,971	7,330,964
Aircraft revenue-hours														
Domestic ⁴														
Certificated, all services	3,672,900	5,133,161	6,247,795	9,717,375	10,721,374	11,378,134	11,871,886	12,060,253	12,445,483	13,091,273	13,905,472	13,507,906	(R) 13,727,415	15,239,998
Major, all services	2,802,317	4,066,480	4,941,327	8,524,236	8,864,840	9,257,260	9,584,525	9,828,418	9,957,390	10,863,178	11,308,820	10,908,397	(R) 10,297,655	9,869,212
Nationals, all services	606,146	908,935	919,187	1,016,491	1,579,771	1,839,835	1,981,219	1,882,975	2,299,916	2,053,335	2,419,285	2,302,845	(R) 2,469,537	3,331,365
Large regionals, all services	N	N	267,522	167,826	223,951	223,007	260,985	315,506	143,197	126,602	142,900	112,813	(R) 113,446	180,813
International ⁵														
Certificated, all services	608,736	977,325	819,518	1,556,760	1,978,381	2,021,060	2,113,467	2,235,441	2,394,095	2,456,726	2,595,893	2,569,314	(R) 2,495,108	2,560,748
Major, all services	N	N	668,199	1,351,349	1,607,155	1,634,465	1,712,416	1,819,583	1,992,776	2,090,817	2,229,167	2,239,473	(R) 2,099,919	2,066,899
Nationals, all services	N	N	140,329	101,533	251,902	314,066	329,311	309,948	311,540	290,582	299,259	282,776	(R) 330,647	391,875
Large regionals, all services	N	N	7,583	88,641	97,967	59,572	48,619	97,304	83,437	62,658	60,381	37,451	(R) 54,486	84,990
Medium regionals, all services, domestic and international	N	N	123,411	24,059	74,169	70,989	68,278	41,960	51,322	60,827	41,553	50,396	(R) 77,373	78,925
Total certificated	4,281,636	6,110,486	7,190,724	11,298,194	12,699,755	13,399,194	13,985,353	14,295,694	14,839,578	15,547,999	16,501,365	16,077,220	(R) 16,222,523	17,800,746
Revenue passenger-miles (thousands)														
Domestic ⁴														
Certificated, all services	31,098,944	108,441,978	204,367,599	345,872,950	388,398,689	403,887,802	434,651,687	450,612,482	463,262,198	488,356,869	516,128,630	486,506,043	(R) 482,309,630	503,338,954
Majors, all services	29,430,428	99,903,229	182,984,795	327,112,620	352,063,855	368,701,100	395,099,254	410,906,050	421,217,665	451,399,646	472,284,794	440,413,336	425,605,781	424,148,216
Nationals, all services	1,170,779	7,642,071	20,466,712	16,756,818	31,339,182	29,255,179	33,000,546	33,241,082	37,699,063	33,267,469	40,549,113	43,541,665	(R) 49,906,626	65,988,860
Large regionals, all services	N	N	711,868	1,752,615	3,757,414	4,381,267	5,443,071	5,778,338	3,124,802	2,627,816	2,527,254	1,999,953	(R) 2,048,656	3,534,870

continued

Air Carrier Profile *continued*

Performance (continued)	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
International ⁵														
Certificated, all services	8,950,672	39,695,392	63,354,387	126,362,697	149,107,689	154,869,249	161,512,010	169,356,100	172,255,197	180,269,038	192,797,653	178,343,137	(R) 171,859,992	167,662,425
Majors, all services	N	N	54,318,160	118,268,507	133,299,897	137,986,520	145,330,811	153,564,956	157,398,986	168,175,060	181,585,899	169,335,413	163,432,281	156,266,051
Nationals, all services	N	N	8,659,592	6,794,533	13,459,194	16,128,695	14,681,127	13,616,245	13,471,798	9,649,710	8,447,916	7,710,903	(R) 6,803,106	8,589,662
Large regionals, all services	N	N	330,288	1,219,706	1,964,944	676,925	505,337	2,148,486	1,097,330	2,145,931	2,675,654	1,219,133	(R) 1,356,128	2,686,664
Medium regionals, all services, domestic and international	N	N	250,571	330,848	1,621,892	1,627,365	2,103,551	713,425	1,507,751	1,360,275	855,653	628,777	(R) 1,627,448	931,648
Total certificated	40,049,616	148,137,370	267,972,557	472,566,495	537,506,378	558,757,051	596,163,697	619,968,582	635,517,395	668,625,907	708,926,283	664,849,180	(R) 654,169,622	671,001,379
Average passenger revenue / passenger-mile ⁶														
(Domestic, scheduled service)	6.09	6.00	11.49	13.43	13.12	13.48	13.76	13.97	14.08	13.72	14.56	13.25	(R) 12.00	12.22
Average passenger fare ⁶														
(Domestic, scheduled service)	30.01	40.65	84.60	107.86	103.21	106.66	110.37	114.10	114.08	114.99	121.27	111.60	(R) 101.94	102.90
Revenue passenger enplanements (thousands)														
Domestic ⁴														
Certificated, all services	56,352	153,662	275,182	428,767	489,351	506,789	538,394	548,735	566,951	589,170	616,778	574,881	(R) 564,400	596,674
Major, all services	48,678	122,866	223,237	393,927	428,328	441,650	466,743	478,253	486,903	519,760	537,379	496,453	(R) 468,052	453,175
Nationals, all services	5,949	26,726	47,145	32,015	53,361	55,656	62,183	61,316	74,281	65,072	76,092	75,599	(R) 83,035	111,584
Large regionals, all services	N	N	3,748	2,566	6,138	7,136	7,887	8,203	4,352	3,152	2,226	1,688	(R) 1,590	3,527
International ⁵														
Certificated, all services	5,904	16,620	26,514	46,126	51,330	52,864	54,515	56,767	57,759	57,702	60,828	56,650	(R) 56,864	58,327
Major, all services	N	N	23,949	42,207	42,702	44,155	46,302	48,614	49,610	50,604	53,157	50,077	(R) 50,599	49,984
Nationals, all services	N	N	2,343	2,632	6,608	8,114	7,401	6,896	7,038	5,446	5,788	5,662	5,325	6,598
Large regionals, all services	N	N	149	1,246	1,741	556	405	1,231	940	1,404	1,810	833	(R) 669	1,582
Medium regionals, all services, domestic and international	N	N	1,125	300	1,803	2,386	1,988	989	1,586	1,434	1,154	1,211	1,884	1,879
Total certificated	62,256	169,922	302,821	475,193	540,681	559,653	592,909	605,502	624,710	646,872	677,606	631,531	(R) 612,266	655,002
Revenue passenger														
Load factor (%) (scheduled service)														
Domestic ⁴														
Certificated	58.5	48.9	58.0	60.4	64.7	65.4	67.9	69.1	70.0	69.8	71.2	69.1	70.3	72.4
Majors	59.5	49.3	58.1	60.6	65.0	65.7	68.5	69.7	70.4	70.3	71.6	69.3	70.6	72.9
Nationals	41.9	43.6	58.4	56.6	62.6	61.9	61.5	63.2	65.1	64.7	66.5	67.0	68.7	71.3
Large regionals	N	N	47.7	48.7	60.0	56.0	60.4	60.7	58.8	42.4	59.2	54.6	(R) 60.8	71.3
International ⁵														
Certificated	62.2	53.0	62.8	69.1	70.6	71.8	73.3	74.1	72.8	74.4	76.0	72.8	76.6	76.5
Majors	N	N	62.8	69.1	70.8	72.1	73.7	74.4	72.9	74.5	76.1	72.9	76.8	76.8
Nationals	N	N	65.5	73.4	68.2	67.7	67.8	69.6	70.9	73.7	73.4	70.0	67.9	64.7
Large regionals	N	N	73.9	66.5	46.8	44.5	0.0	64.9	46.0	U	58.0	67.0	62.3	70.2
Medium regionals, all services, domestic and international	N	N	46.7	0.0	53.8	59.3	66.7	49.7	58.2	58.3	35.5	60.4	57.8	64.5

continued

Air Carrier Profile *continued*

Performance (continued)	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
U.S. international passenger travel ^{d,7}														
Total passenger-arrivals (thousands)														
Flag of carrier														
United States	1,332	5,531	10,031	19,145	23,291	24,582	25,148	26,744	27,390	27,462	29,837	27,985	26,953	26,557
Foreign	1,234	4,343	10,231	17,269	20,527	22,328	24,704	27,571	28,791	30,324	32,380	28,715	26,912	27,395
Total passenger-departures (thousands)														
Flag of carrier														
United States	1,200	4,949	9,369	17,628	21,355	22,231	22,901	24,302	24,513	25,457	27,431	25,483	23,610	24,070
Foreign	1,136	4,147	9,886	16,418	18,993	20,795	22,884	25,382	26,350	28,399	30,068	27,111	24,996	25,897
Total revenue ton-miles (thousands) ^e														
Domestic ⁴														
Certificated, all services	3,732,949	13,876,802	24,964,907	43,651,162	50,631,589	52,910,081	56,326,750	58,658,887	60,199,459	63,032,722	66,595,204	61,731,557	(R) 62,051,854	65,258,164
Majors, all services	3,332,483	12,589,057	21,427,534	39,107,033	44,952,734	47,015,642	50,096,661	52,254,323	53,424,349	56,696,427	59,095,406	54,798,905	54,168,780	54,135,774
Nationals, all services	121,157	850,477	3,336,057	3,561,283	4,510,285	4,996,345	231,398	5,317,576	6,012,665	5,705,158	6,799,198	6,192,307	(R) 6,297,409	7,861,350
Large regionals, all services	N	N	180,042	945,929	1,002,552	718,659	863,449	971,942	508,172	507,053	588,975	623,649	(R) 812,852	1,525,565
International ⁵														
Certificated, all services	1,291,336	6,308,701	9,689,067	19,975,915	24,879,791	26,295,684	28,177,721	30,944,299	31,481,513	32,810,136	35,161,431	32,736,774	(R) 33,883,040	34,287,888
Majors, all services	N	N	7,377,733	17,803,825	20,681,991	21,517,789	22,880,295	24,971,379	25,794,344	27,949,876	30,683,564	28,394,238	27,861,326	26,999,503
Nationals, all services	N	N	2,261,534	1,229,849	3,201,089	4,116,380	4,603,920	4,657,365	4,376,654	4,257,520	3,815,162	3,868,702	(R) 5,344,254	6,385,151
Large regionals, all services	N	N	44,438	835,701	862,184	513,476	396,142	1,240,303	1,269,602	566,689	565,198	433,174	(R) 618,332	751,452
Medium regionals, all services, domestic and international	N	N	28,178	143,457	300,545	327,474	432,606	190,298	265,186	160,135	209,132	151,434	(R) 297,252	284,407
Total certificated	5,024,285	20,185,503	34,682,153	63,770,534	75,511,380	79,205,765	84,504,471	89,603,186	91,650,972	95,842,858	101,756,635	94,468,332	(R) 95,934,895	99,546,053
Revenue ton-miles of freight (thousands)														
Domestic ⁴														
Certificated, all services	552,756	2,708,900	4,528,316	9,063,864	11,802,778	12,520,057	12,860,845	13,601,412	13,839,605	14,201,933	14,982,615	13,069,461	(R) 13,881,707	14,924,269
Majors, all services	321,176	U	3,129,087	6,395,767	9,746,354	10,145,537	10,586,741	11,163,518	11,302,583	11,556,463	11,866,926	10,750,087	11,608,200	11,720,953
Nationals, all services	3,850	U	1,289,510	1,885,600	1,387,322	2,070,570	1,931,201	1,993,498	2,239,140	2,378,206	2,744,086	1,837,861	(R) 1,306,920	1,262,464
Large regionals, all services	N	N	108,864	770,670	626,842	280,512	318,542	398,153	195,791	249,706	337,068	423,739	(R) 608,325	1,172,078
International ⁵														
Certificated, all services	268,156	1,566,105	3,353,371	7,339,660	9,970,189	10,854,620	12,031,634	14,008,685	14,262,373	14,782,231	15,880,424	14,902,664	(R) 16,697,508	17,521,647
Majors, all services	N	N	1,945,660	5,976,973	7,351,998	7,719,138	8,347,214	9,614,881	10,054,448	11,132,370	12,524,977	11,460,695	11,518,098	11,372,899
Nationals, all services	N	N	1,395,575	550,409	1,855,167	2,549,371	3,140,921	3,295,738	3,035,853	3,291,549	2,970,370	3,097,665	(R) 4,663,944	5,526,186
Large regionals, all services	N	N	11,409	713,733	666,863	445,783	345,609	1,025,455	1,159,869	352,095	296,387	311,412	(R) 483,186	482,786
Medium regionals, all services, domestic and international	N	N	3,124	110,372	138,421	163,766	222,251	118,854	114,294	23,775	123,225	84,745	(R) 194,815	191,243
Total certificated	820,907	3,755,436	7,884,811	16,513,896	21,772,967	23,374,677	24,892,479	27,610,097	28,101,978	28,984,164	30,863,039	27,972,125	(R) 30,579,215	32,445,917

continued

Air Carrier Profile *continued*

Safety ^a	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Air carrier fatalities														
Operating under 14 CFR 121 (airlines)														
Scheduled services	N	N	0	39	239	166	342	3	1	12	92	531	0	22
Nonscheduled services	N	N	1	0	0	2	38	5	0	0	0	0	0	0
Operating under 14 CFR 135														
Scheduled services (commuters)	N	N	37	6	25	9	14	46	0	12	5	13	0	2
Nonscheduled services (on-demand air taxis)	N	N	105	51	63	52	63	39	45	38	71	60	(R) 35	45
Total	499	146	143	96	327	229	457	93	46	62	168	604	(R) 35	69
Air carrier accidents														
Operating under 14 CFR 121 (airlines)														
Scheduled services	N	N	15	22	19	34	32	44	43	46	50	(R) 42	34	52
Nonscheduled services	N	N	4	2	4	2	5	5	7	5	6	4	7	2
Operating under 14 CFR 135														
Scheduled services (commuters)	N	N	38	15	10	12	11	16	8	13	12	7	8	2
Nonscheduled services (on-demand air taxis)	N	N	171	107	85	75	90	82	77	73	80	72	(R) 59	77
Total	90	55	228	146	118	123	138	147	135	137	148	125	(R) 108	133
Fatal air carrier accidents														
Operating under 14 CFR 121 (airlines)														
Scheduled services	N	N	0	6	4	2	3	3	1	2	3	6	0	2
Nonscheduled services	N	N	1	0	0	1	2	1	0	0	0	0	0	0
Operating under 14 CFR 135														
Scheduled services (commuters)	N	N	8	3	3	2	1	5	0	5	1	2	0	1
Nonscheduled services (on-demand air taxis)	N	N	46	29	26	24	29	15	17	12	22	18	(R) 18	19
Total	17	8	55	38	33	29	35	24	18	19	26	26	(R) 18	22

KEY: N = data do not exist; R = revised; U = data are not available.

^a Some totals include data not in the table; thus totals may not equal sum of table data.

^b Includes scheduled and nonscheduled (charter) operators. By Sec. 2 of the Airline Deregulation Act of 1978 "charter air carrier" and "charter air transportation" replaced supplemental air carriers and supplemental air transportation, which were formerly Sec. 101(36) and (37) of the Act. The 24 pre-deregulation supplemental carriers now have scheduled service authority.

^c Total includes only those carriers who have reported employment statistics to BTS' Office of Airline Information.

^d Passenger travel totals do not include Canada because the source does not record departures and arrivals to and from Canada.

^e Total Revenue Ton-Miles includes passenger, freight, express, and mail.

NOTES

Domestic encompasses operations within and between the 50 states of the United States, the District of Columbia, Puerto Rico, and the Virgin Islands. It also encompasses Canadian and Mexican transborder operations (U.S. airlines only). All other operations are considered international.

SOURCES

Unless otherwise noted, refer to chapter tables for sources.

¹ 1960-1970: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969 and 1973* (Washington, DC), pp. 69 and 71. 1980: Civil Aeronautics Board, *Air Carrier Financial Statistics*, December 1981 (Washington, DC), pp. 3/28, 42, and 44. 1990-2003: U.S. Department of Transportation, Bureau of Transportation Statistics (pre-1995, U.S. Department of Transportation, Research and Special Programs Administration), *Air Carrier Financial Statistics* (Washington, DC: Annual December issue), pp. 3, 35, 36, 71, and 72 and similar pages in earlier editions.

² 1960: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, <http://www.bts.gov/oa/employees/employcov.html> as of Oct. 14, 2003. 1970-2003: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, http://www.bts.gov/programs/airline_information/number_of_employees/certificated_carriers/ as of Aug. 20, 2004.

³ *Ibid.*, personal communication, Oct. 17, 2003 and Sept. 10, 2004.

⁴ 1960-1970: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969 and 1973* (Washington, DC), Part III, tables 2, 4, 7, and 13. 1980: Civil Aeronautics Board, *Air Carrier Financial Statistics*, December 1981 (Washington, DC), pp. 2, 5, 46, and 86. 1990-2003: U.S. Department of Transportation, Bureau of Transportation Statistics (pre-1995, U.S. Department of Transportation, Research and Special Programs Administration), *Air Carrier Traffic Statistics* (Washington, DC: Annual December issue), pp. 2, 3, 10, 16, 23, and similar pages in earlier editions.

⁵ 1960-1970: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969 and 1973* (Washington, DC), Part III, tables 2, 4, 7, and 13. 1980: Civil Aeronautics Board, *Air Carrier Financial Statistics*, December 1981 (Washington, DC), pp. 3, 6, 85, and 115. 1990-2003: U.S. Department of Transportation, Bureau of Transportation Statistics (pre-1995, U.S. Department of Transportation, Research and Special Programs Administration), *Air Carrier Traffic Statistics* (Washington, DC: Annual December issue), pp. 2, 4, 11, 17, 24, 27, and similar pages in earlier editions.

⁶ Passenger Revenue: 1960-1970: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969 and 1973* (Washington, DC). 1980: Civil Aeronautics Board, *Air Carrier Financial Statistics*, December 1981 (Washington, DC). 1990-2003: U.S. Department of Transportation, Bureau of Transportation Statistics (pre-1995, U.S. Department of Transportation, Research and Special Programs Administration), *Air Carrier Financial Statistics* (Washington, DC: Annual December issue), p. 1 and similar pages in earlier editions. Revenue Passenger Miles / Revenue Passenger Enplanements: 1960-1970: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969 and 1973* (Washington, DC), Part III. 1980: Civil Aeronautics Board, *Air Carrier Financial Statistics*, December 1981 (Washington, DC). 1990-2003: U.S. Department of Transportation, Bureau of Transportation Statistics (pre-1995, U.S. Department of Transportation, Research and Special Programs Administration), *Air Carrier Traffic Statistics* (Washington, DC: Annual December issue), p. 3 and similar pages in earlier editions.

⁷ 1960-70: U.S. Department of Justice, Immigration and Naturalization Service, *Report of Passenger Travel Between the U.S. and Foreign Countries*, 1960, 1970 (Washington, DC). 1980-2003: U.S. Department of Transportation, Research and Special Programs Administration, *U.S. International Air Travel Statistics* (Washington, DC: Annual issues), tables 1Ia and 1Id.

⁸ National Transportation Safety Board, Internet site <http://www.ntsb.gov/aviation/stats.htm> as of June 2004 and personal communication.

General Aviation Profile

FINANCIAL ¹	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002
Expenditures, total (\$ millions)	895	2,035	8,053	9,907	9,332	10,379	11,605	13,797	16,372	17,553	21,909	26,499	U
Aircraft	202	339	2,853	3,398	3,910	4,260	5,298	7,174	9,573	11,262	14,291	18,524	U
Operating costs	693	1,696	5,200	6,509	5,422	6,119	6,307	6,623	6,799	6,291	7,618	7,975	U
INVENTORY²													
Number of active aircraft by primary use, total	76,549	131,743	211,045	196,800	172,400	188,100	(R) 187,312	(R) 192,414	(R) 204,710	219,464	217,533	211,446	211,244
Corporate	N	6,835	14,860	10,100	9,400	9,800	(R) 9,286	10,411	11,250	10,804	11,003	10,544	10,810
Business	N	26,900	49,391	33,100	26,500	26,200	(R) 28,236	27,716	32,611	24,543	25,169	25,525	24,153
Instructional	N	10,727	14,862	18,600	15,000	14,800	(R) 14,261	14,663	11,375	16,081	14,883	14,254	13,203
Personal	N	65,398	96,222	112,600	102,500	109,300	(R) 109,619	115,630	124,347	147,085	148,192	144,031	145,996
Aerial application	N	5,455	7,294	6,200	4,300	5,100	(R) 5,361	4,858	4,550	4,254	4,294	3,779	3,971
Aerial observation	N	N	N	4,900	5,100	4,700	(R) 3,225	3,311	3,242	3,240	5,093	5,039	4,535
External load	N	N	N	N	100	200	(R) 424	186	313	190	234	202	151
Other work ^a	N	2,054	2,813	1,400	1,200	1,100	(R) 1,118	(R) 679	1,116	2,363	1,787	1,528	1,733
Air taxi / air tours ^b	N	N	N	5,800	3,800	4,100	(R) 3,963	4,948	5,190	4,569	4,019	4,004	4,157
Sightseeing ^c	N	N	N	N	1,300	900	(R) 889	677	679	832	881	918	641
Other ^d	N	8,249	17,045	4,100	4,200	6,300	(R) 6,718	5,250	6,010	1,200	1,952	1,573	1,895
Public use	N	N	N	N	N	N	(R) 4,206	4,130	4,029	4,138	^j N	^j N	^j N
PERFORMANCE													
Number of flight hours by actual use, total ² (thousands)	13,121	26,030	36,430	30,763	24,092	(R) 26,612	(R) 26,909	27,713	28,100	(R) 31,231	(R) 29,960	(R) 27,017	27,040
Corporate	N	N	5,332	2,913	2,486	(R) 3,069	(R) 2,898	2,878	3,213	(R) 3,535	(R) 3,341	(R) 2,657	3,275
Business	5,699	7,204	8,434	4,417	3,012	(R) 3,335	(R) 3,259	3,006	3,523	(R) 3,602	(R) 3,588	(R) 3,579	3,287
Instructional	1,828	6,791	5,748	7,244	4,156	(R) 4,410	(R) 4,759	4,956	3,961	(R) 5,795	(R) 5,050	(R) 4,307	4,182
Personal	3,172	6,896	8,894	9,276	8,248	(R) 9,659	(R) 9,037	9,644	9,781	(R) 11,072	(R) 11,477	(R) 11,266	11,025
Aerial application	N	N	2,044	1,872	1,364	(R) 1,526	(R) 1,713	1,562	1,306	(R) 1,408	(R) 1,318	(R) 1,038	1,182
Aerial observation	N	N	N	1,745	1,746	(R) 1,391	(R) 1,057	1,261	812	(R) 1,244	(R) 1,545	(R) 1,442	1,366
External load	N	N	N	N	135	(R) 128	(R) 191	112	153	(R) 123	(R) 161	(R) 131	97
Other work ^a	N	N	1,053	572	241	(R) 280	(R) 265	139	286	(R) 605	(R) 496	(R) 256	369
Air taxi / air tours ^b	N	N	N	2,249	1,545	1,527	(R) 1,834	(R) 2,122	2,583	(R) 1,985	(R) 2,122	(R) 1,587	1,495
Sightseeing ^c	N	N	N	N	309	(R) 179	(R) 195	127	169	(R) 218	(R) 197	(R) 183	134
Other ^d	2,422	5,139	4,925	475	622	(R) 1,107	(R) 656	819	940	(R) 535	(R) 665	(R) 664	628
Public use ^e	N	N	N	N	N	N	(R) 1,047	1,096	1,373	(R) 1,109	^j N	^j N	^j N
Vehicle-miles(millions) ^{f,4}	1,769	3,207	5,204	4,548	3,358	3,795	3,524	3,877	U	U	U	U	U
Passenger-miles (millions) ^{f,1}	2,300	9,100	14,700	13,000	9,800	10,800	12,000	12,500	13,100	14,100	15,200	15,900	U

Fuel consumed, total (million gallons) ^{f, 5}	242	759	1,286	1,016	731	847	896	934	1,126	1,313	(R) 1,305	(R) 1,228	1,262
Aviation gasoline	242	551	520	353	266	287	289	292	311	345	(R) 333	(R) 275	278
Jet fuel	N	208	766	663	464	560	608	642	815	967	(R) 972	(R) 953	984
SAFETY													
Fatalities, total ^{g, 6}	787	1,310	1,239	767	730	735	636	631	624	619	593	565	581
Corporate	N	28	66	21	6	15	20	3	0	30	13	12	0
Business	N	148	126	80	64	73	44	45	42	55	43	50	40
Instructional	N	93	73	62	47	44	40	38	38	38	64	40	42
Personal	N	726	808	492	472	488	413	432	432	383	386	376	407
Aerial application	N	41	32	17	17	15	10	17	6	14	19	14	14
Other	N	174	134	95	138	112	119	106	112	105	87	73	81
Accidents, total ⁷	4,793	4,712	3,590	2,241	2,022	2,056	1,908	1,845	1,904	1,906	1,837	1,726	1,713
Fatal	429	641	618	443	403	413	361	350	364	340	344	325	345
Accident rate (per 100,000 flight hours) ^{h, i}	36.5	18.1	9.9	7.3	8.4	(R) 7.7	(R) 7.1	6.7	6.8	(R) 6.1	(R) 6.1	(R) 6.4	6.3
Fatal	3.3	2.5	1.7	1.4	1.7	1.6	(R) 1.3	1.3	1.3	1.1	1.1	(R) 1.2	1.3

KEY: N = data do not exist; R = revised; U = data are not available.

^a In 1960, 1970, 1980, classified as "Industrial."

^b Includes air tours done under 14 CFR 135: air taxi operators and commercial operators.

^c Includes sightseeing done under 14 CFR 91: general operating and flight rules.

^d Significant decrease in "Other" can be attributed to a redefining of the category to only include "Aerial Other" and "Medical Use."

^e Federal, state or local government-owned or leased aircraft used for the purpose of fulfilling a government position.

^f Includes air taxi operations. Nautical miles in source multiplied by 1.151 to convert from nautical miles.

^g Sum of fatalities does not necessarily equal total. Differences are due to methodology used to count collisions involving aircraft in different categories.

^h Suicide/sabotage cases are included in accidents and fatalities data but are excluded from accident rates.

ⁱ Accident rates are calculated by BTS using the formula: Accident Rates (per 100,000 flight hours) = Accidents or Fatalities/Flight Hours (thousands)*100.

^j Beginning in 2000, "Public Use" was included in "Other Work".

NOTES

Numbers may not add to totals due to rounding.

Total fatalities in this profile may not match those in table 2-14, due to when the total fatalities data were received and the data breakdown by type of flying. NTSB constantly updates and reclassifies accident and fatality data.

1994-95 data for active aircraft by use, and flight hours, have been revised to reflect changes in adjustment for nonresponse bias with 1996 telephone survey factors. 1996 vehicle-miles and fuel consumption data are estimated using new information on nonrespondents and are not comparable to earlier years.

SOURCES

Unless otherwise noted, refer to chapter tables for sources.

¹ Eno Transportation Foundation, Inc., *Transportation in America*, Annual Issues (Washington, DC), pp. 40 and 45, and similar tables in earlier editions.

² U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Air Taxi Activity and Avionics Survey* (Washington, DC: 1990-2002 issues), table 1.1.

³ *Ibid.*, table 1.6 and similar tables in earlier editions.

⁴ *Ibid.*, table 3.3 and similar tables in earlier editions.

⁵ 1960-1990: U.S. Department of Transportation, Federal Aviation Administration, *General Aviation and Air Taxi Activity and Avionics Survey* (Washington, DC: 1990-2000 issues), table 5.1. 1994-2002: Ibid., *FAA Aerospace Forecasts, Fiscal Years 2004-2015* (Washington, DC: March 2004), table 32 and similar tables in earlier editions.

⁶ 1960-1970: National Transportation Safety Board, RE-50, personal communication. 1980-2002: Ibid., *Annual Review of Aircraft Accident Data, U.S. General Aviation, Calendar Year 1998* (Washington, DC: July 2000), charts 27, 39, 40, 41, 42 and 43, and personal communications on Sept. 10, 2002, Dec. 22, 2003, and April 30, 2004.

⁷ National Transportation Safety Board, RE-50, personal communication. *Annual Review of Aircraft Accident Data, U.S. General Aviation, Calendar Year 1998* (Washington, DC: July 2000), available at Internet site <http://www.ntsb.gov/aviation/> as of July 22, 2004, table 10.

Highway Profile

FINANCIAL	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002
Government receipts, total (\$ millions)¹	11,193	21,763	39,834	75,444	91,312	96,347	102,771	107,421	111,581	121,650	131,115	132,324	134,765
Federal, total	2,771	6,160	9,949	14,576	17,854	19,851	23,196	21,648	24,509	26,008	30,819	27,670	28,527
Highway trust fund ^d	2,531	5,464	7,615	13,380	16,582	18,835	22,036	20,500	23,396	25,085	29,445	26,365	26,808
Other	240	696	2,334	1,196	1,272	1,016	1,160	1,148	1,113	923	1,374	1,305	1,719
State and local, total	8,422	15,603	29,885	60,868	73,458	76,496	79,575	85,773	87,072	95,642	100,296	104,654	106,238
State and D.C.	6,055	11,737	19,666	40,026	47,699	50,064	52,808	58,087	58,806	63,274	66,434	68,873	68,430
Local	2,367	3,866	10,219	20,842	25,759	26,432	26,767	27,686	28,266	32,368	33,862	35,781	37,808
Government expenditures, total (\$ millions)¹	10,757	20,829	41,763	75,408	90,192	93,478	98,082	101,953	107,975	116,011	122,697	129,900	135,919
Federal, total	197	425	874	664	1,306	1,402	1,598	1,315	1,375	1,428	1,680	1,913	1,761
Highway trust fund ^d	27	83	315	358	965	1,092	1,384	1,103	1,170	1,249	1,304	1,463	1,261
Other ^b	170	342	559	306	341	310	214	212	205	179	376	450	500
State and local, total	10,560	20,404	40,889	74,744	88,886	92,076	96,484	100,638	106,600	114,583	121,017	127,987	134,158
State and D.C.	7,125	14,100	25,936	45,609	55,569	56,981	59,709	61,534	65,507	71,415	76,997	81,803	85,653
Local	3,435	6,304	14,953	29,135	33,317	35,095	36,775	39,104	41,093	43,168	44,020	46,184	48,505
State highway user tax revenues^c, total (\$ millions)	5,323	10,284	17,177	35,944	46,437	47,424	49,756	51,381	54,507	56,269	56,454	58,508	58,299
Motor fuel tax ²	3,374	6,433	9,485	19,658	25,860	26,881	27,555	28,477	29,803	30,753	31,981	32,519	33,046
Other motor fuel receipts ^{4, 2}	22	44	92	220	101	108	63	55	58	134	179	298	297
Motor vehicle registration fees ³	1,514	2,873	5,173	10,257	12,388	11,942	13,234	13,631	14,552	14,882	13,704	14,437	13,316
Other motor vehicle fees ^{e, 3}	235	577	1,490	3,353	4,505	4,416	4,689	4,704	5,068	5,350	5,696	5,764	6,077
Motor carrier taxes ³	110	176	323	695	875	770	726	729	861	740	784	753	703
Miscellaneous fees ³	68	181	615	1,761	2,708	3,307	3,489	3,785	4,165	4,410	4,800	4,737	4,860
INVENTORY													
Rural / urban mileage by ownership, total^f	3,545,693	3,730,082	3,859,837	3,866,926	3,906,595	3,912,226	3,919,652	3,944,601	3,906,304	3,917,245	3,936,241	3,948,335	3,966,494
Rural mileage, total	3,116,125	3,169,412	3,230,936	3,122,282	3,092,810	3,092,520	3,092,887	3,108,493	3,064,650	3,071,181	3,084,000	3,071,332	3,071,768
Under state control	658,896	707,002	750,479	702,486	690,372	690,924	691,156	692,767	660,834	660,682	661,798	663,134	662,855
Under federal control ^f	111,912	187,696	246,130	178,188	173,650	170,568	168,938	167,369	118,369	116,846	116,698	119,270	117,751
Under local control	2,345,317	2,274,714	2,234,327	2,241,608	2,228,788	2,231,029	2,232,793	2,248,357	2,285,447	2,293,653	2,305,504	2,288,928	2,291,162
County roads	1,742,404	1,732,981	1,542,984	1,616,634	1,624,982	1,626,927	1,627,639	1,642,468	1,647,025	1,649,291	1,656,906	1,637,616	1,628,510
Town, township and municipal roads ^h	538,651	510,174	458,231	437,460	423,908	424,529	426,170	426,433	426,340	590,206	592,623	595,197	606,398
Other local roads ^h	64,262	31,559	233,112	187,514	179,898	179,573	178,984	179,456	212,082	54,156	55,975	56,115	56,254
Urban mileage, total	429,568	560,670	628,901	744,644	813,785	819,706	826,765	836,108	841,654	846,064	852,241	877,003	894,726
Under state control	50,158	74,103	97,287	95,778	109,947	111,766	111,924	112,226	110,017	109,956	110,195	109,136	110,434
Under federal control ^f	N	N	1,495	1,024	1,484	1,509	1,470	1,464	1,485	1,503	1,484	2,234	2,819
Under local control	N	N	530,119	647,842	702,354	706,431	713,371	722,418	730,152	734,605	740,562	765,633	781,473
County roads	N	N	71,357	95,929	115,388	117,518	117,181	117,487	117,016	117,105	116,918	144,065	144,615
Town and township roads ^h	N	N	37,583	42,752	74,630	60,561	60,926	74,402	75,195	605,255	611,473	608,859	624,163
Other local roads ^h	379,410	486,567	421,179	509,161	512,336	528,352	535,264	530,529	537,941	12,245	12,171	12,709	12,695
Rural / urban mileage by functional system, total^f	3,545,693	3,730,082	3,859,837	3,866,926	3,906,595	3,912,226	3,919,652	3,945,872	3,906,290	3,917,240	3,936,229	3,948,335	3,966,485
Rural mileage, total	3,116,125	3,169,412	3,230,936	3,122,282	3,092,810	3,092,520	3,092,887	3,109,132	3,064,648	3,071,181	3,083,988	3,071,331	3,071,761
Interstate	N	N	31,905	33,547	32,457	32,580	32,820	32,817	32,813	32,974	33,048	33,061	32,992
Other principal arterial	N	N	82,569	83,802	97,175	97,948	98,131	98,257	98,852	98,856	98,911	99,185	98,853
Minor arterial	N	N	149,057	144,774	138,120	137,151	137,359	137,497	137,308	137,463	137,574	137,587	137,568
Major collector	N	N	439,000	436,352	431,115	431,712	432,117	432,714	432,408	432,954	433,121	433,284	430,946
Minor collector	N	N	299,613	293,922	282,011	274,081	273,198	272,362	272,140	271,690	271,815	271,377	270,700
Local	N	N	2,228,792	2,129,885	2,111,932	2,119,048	2,119,262	2,135,485	2,091,127	2,097,244	2,109,519	2,096,837	2,100,702
Urban mileage, total	429,568	560,670	628,901	744,644	813,785	819,706	826,765	836,740	841,642	846,059	852,241	877,004	894,724
Interstate	N	N	9,215	11,527	13,126	13,164	13,217	13,247	13,312	13,343	13,379	13,406	13,491
Other freeways and expressways	N	N	6,774	7,668	8,994	8,970	9,027	9,063	9,127	9,125	9,140	9,126	9,323
Other principal arterial	N	N	44,155	51,968	53,110	52,796	52,983	53,223	53,132	53,206	53,312	53,056	53,439
Minor arterial	N	N	66,377	74,659	87,857	88,510	89,020	89,185	89,496	89,399	89,789	89,962	90,411
Collector	N	N	68,387	78,254	86,089	87,331	87,790	88,049	88,071	88,008	88,200	88,713	89,247
Local	N	N	433,993	520,568	564,609	568,935	574,728	583,973	588,504	592,978	598,421	622,741	638,813

U.S. roads and streets by surface⁶

Paved mileage, total	1,230,469	1,658,421	2,072,692	2,254,822	2,342,179	2,378,268	2,380,650	2,409,935	2,420,344	2,451,426	2,504,494	2,523,468	2,577,693
Rural	919,082	1,188,080	1,490,050	1,550,283	1,561,649	1,591,334	1,582,166	1,605,804	1,612,251	1,641,877	1,684,922	1,678,782	1,714,714
Urban	311,387	470,341	582,642	704,539	780,530	786,934	798,484	804,131	808,093	809,549	819,572	844,686	862,979
Percent paved	34.7%	44.5%	53.7%	58.3%	60.0%	60.8%	60.5%	60.9%	61.3%	62.4%	63.4%	63.7%	64.8%
Unpaved mileage, total	2,315,224	2,071,661	1,787,145	1,612,104	1,564,416	1,533,958	1,553,537	1,548,349	1,528,549	1,478,977	1,445,548	1,438,727	1,402,995
Rural	2,197,043	1,981,332	1,740,886	1,571,999	1,531,161	1,501,186	1,518,310	1,510,330	1,490,488	1,436,969	1,406,508	1,400,134	1,364,900
Urban	118,181	90,329	46,259	40,105	33,255	32,772	35,227	38,019	38,061	42,008	39,040	38,593	38,095
Percent unpaved	65.3%	55.5%	46.3%	41.7%	40.0%	39.2%	39.5%	39.1%	38.7%	37.6%	36.6%	36.3%	35.2%
Number of employees													
State and local govt. streets and highways ⁵	532,000	607,000	559,000	569,000	544,000	543,000	U	531,000	530,000	543,000	546,000	552,000	545,000
Highway, street and bridge construction ⁸	U	U	U	U	(R) 274,000	(R) 278,000	(R) 288,000	(R) 294,000	(R) 308,000	(R) 336,000	(R) 340,000	(R) 346,000	346,000

PERFORMANCE

Vehicle-miles of travel by functional system (millions),

total^{1,9}	718,762	1,109,724	1,527,295	2,144,362	2,357,588	2,422,696	2,484,080	2,552,233	2,628,148	2,690,241	(R) 2,746,925	2,781,462	2,855,756
Rural mileage, total	400,463	539,472	672,030	868,878	908,341	933,289	960,194	999,277	1,032,528	1,062,623	(R) 1,083,152	1,105,083	1,278,160
Interstate	10,514	79,516	135,084	200,173	215,568	223,382	232,565	240,255	251,520	260,166	(R) 268,180	274,024	279,962
Other principal arterial	N	N	132,958	175,133	207,569	215,567	221,403	228,716	237,704	244,045	(R) 248,725	253,056	257,587
Minor arterial	N	N	129,816	155,733	149,760	153,028	157,444	163,341	165,780	169,275	(R) 171,874	173,889	176,218
Major collector	N	N	150,186	190,512	182,000	186,212	190,923	201,790	203,580	206,831	(R) 209,659	211,312	213,503
Minor collector	N	N	39,282	49,948	48,529	49,936	50,107	52,310	54,288	57,622	(R) 57,572	59,650	61,504
Local	N	N	84,704	97,379	104,915	105,164	107,752	112,865	119,656	124,684	(R) 127,142	133,152	139,386
Urban mileage, total	318,299	570,252	855,265	1,275,484	1,449,247	1,489,407	1,523,886	1,552,956	1,595,620	1,627,618	(R) 1,663,773	1,676,379	1,727,596
Interstate	13,365	81,532	161,242	278,901	330,577	341,515	351,579	361,433	374,622	383,259	(R) 393,465	399,890	408,618
Other freeways and expressways	N	N	79,690	127,465	147,534	151,509	157,502	159,572	165,632	171,515	(R) 177,222	182,758	189,634
Other principal arterial	N	N	229,469	335,543	364,200	370,365	377,776	385,123	388,071	392,688	(R) 398,772	401,037	408,336
Minor arterial	N	N	175,030	236,225	286,165	293,228	299,345	301,932	309,293	313,950	(R) 324,398	329,931	339,387
Collector	N	N	83,043	106,297	120,088	126,883	129,310	130,146	131,905	131,603	(R) 135,372	137,922	141,874
Local	N	N	126,791	191,053	200,683	205,907	208,374	214,750	226,097	234,603	(R) 234,544	224,841	239,747
Highway demand for petroleum, total (thousand barrels)	1,488,095	2,361,310	2,882,143	3,289,554	3,530,071	3,602,159	3,669,491	3,765,003	3,889,758	4,042,708	4,062,573	4,071,470	4,180,428
Motor fuel ¹⁰	1,378,095	2,198,310	2,737,143	3,113,214	3,353,320	3,424,616	3,492,285	3,580,620	3,699,500	3,843,128	3,870,337	3,882,069	3,993,576
Asphalt and road oil ¹¹	110,000	163,000	145,000	176,340	176,751	177,543	177,206	184,383	190,258	199,580	192,236	189,401	186,852

SAFETY¹²

Fatalities	36,399	52,627	51,091	44,599	40,716	41,817	42,065	42,013	41,501	41,717	41,945	(R) 42,196	42,815
Injured persons	N	N	N	3,231,000	3,266,000	3,465,000	3,483,000	3,348,000	3,192,000	3,236,000	3,189,000	3,033,000	2,926,000
Crashes	N	N	N	6,471,000	6,496,000	6,699,000	6,770,000	6,624,000	6,335,000	6,279,000	6,394,000	6,323,000	6,316,000

KEY: N = data do not exist; R = revised; U = data are not available.

⁸ The Federal Highway Trust Fund was created with the enactment of the Highway Revenue Act of 1956. The total receipts shown for 1995 are overstated by approximately \$1.59 billion due to a fiscal year (FY) 1994 error by the Treasury Department in reconciling estimated deposits to the actual tax revenue. The correction was made after the close of FY1994 and is shown in FY1995 receipts.

⁹ Figures obtained by addition/subtraction and may not appear directly in data source.

¹⁰ Gross amounts collected by state governments from highway users. Does not include tolls. Not all revenues allocated to highway expenditures.

^d Includes distributors and dealers licenses, inspection fees, fines and penalties, and miscellaneous receipts.

^e Includes drivers licenses, title fees, special title taxes, fines and penalties; estimated service charges and local collections.

^f Includes carrier gross receipt taxes; mileage, ton-mile and passenger-mile taxes; special license fees and franchise taxes; and certificate or permit fees.

^g Mileage in federal parks, forests, and reservations that are not a part of the state and local highway system.

^h Prior to 1999, mileage for municipal roads was included with the "other local roads" jurisdiction. Mileage for municipal roads was included in "Town, Township and Municipal Road" jurisdiction after 1999.

ⁱ Data for 1994-2002, is based on the North American Industry Classification System (NAICS). Prior to 1994, data is based on the Standard Industrial Classification System (SIC).

^j Highway category classifications changed several times before 1980. Actual 1960 data categories were: Main Rural Roads, Local Rural Roads and Urban Streets; 1970 data categories were: Rural Interstate, Rural Other Arterial, Other Rural, Urban Interstate and Other Urban.

NOTES

Motor vehicle injury and crash data in this profile come from the National Highway Traffic Safety Administration's General Estimates System (GES). The data from GES, which began operation in 1988, are obtained from a nationally representative probability sample selected from all police-reported crashes, and the GES sample includes only crashes where a police accident report was completed and the crash resulted in property damage, injury, or death. The resulting figures do not take into account crashes which were not reported to the police or which did not result in at least property damage. Earlier editions of NTS, particularly the 1993 Historical Compendium, used crash and injury figures estimated by the National Safety Council, which employed a different set of methods to arrive at its figures. Thus, the injury and crash figures in this edition of NTS may not be comparable with those found in earlier editions.

In 1998, FHWA instituted a new method of creating mileage based tables derived from the Highway Performance Monitoring System (HPMS). See Chapter 1 accuracy profiles for more information about the HPMS.

SOURCES

Unless otherwise noted, please refer to chapter tables for sources.

¹ 1960-94: U.S. Department of Transportation, Federal Highway Administration *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table HF-210.

1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), tables HF-10A and HF-10.

² 1960-95: Ibid., *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table MF-201.

1996-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table MF-1.

³ 1960-95: Ibid., *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table MV-202.

1996-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table MV-2.

⁴ 1960-70: *Highway Statistics, Summary to 1985* (Washington, DC: July 1997), table M-203.

1980-1995: Ibid., *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table HM-210.

1996-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-10.

⁵ 1960-95: Ibid., *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), tables HM-212 and HM-220.

1996-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-20.

⁶ 1960-95: Ibid., *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table HM-212.

1996-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-12.

⁷ U.S. Department of Commerce, *Statistical Abstract of the United States*, various years, State and Local Government Section.

⁸ U.S. Department of Labor, Bureau of Labor Statistics, Internet site <http://www.bls.gov/data/sa.htm> as of April 19, 2004.

⁹ 1960-70: U.S. Department of Transportation, Federal Highway Administration *Highway Statistics, Summary to 1985*, FHWA-PL-97-009 (Washington, DC: April 1987), table VM-201.

1980-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), tables VM-2 and VM-2A.

¹⁰ 1960-90: Ibid., *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A (total fuel consumed in thousands of gallons divided by 42).

1994-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1 (total fuel consumed in thousands of gallons divided by 42).

¹¹ 1960-80: U.S. Department of Energy, Energy Information Administration *State Energy Data Report* (Washington, DC), p. 13.

1990-2002: U.S. Department of Energy, Energy Information Administration, *Petroleum Supply Annual: Volume 1* (Washington, DC: Annual issues), table 2.

¹² 1960-80: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, NRD-30, personal communication.

1990-99, 2002: Ibid., *Traffic Safety Facts 2002* (Washington, DC: Annual issues) tables 1 and 4.

2000-01: Ibid., Fatality Analysis Reporting System (FARS) Query, Jan. 6, 2003.

Automobile Profile

FINANCIAL	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002
Personal auto expenditures, total^a (\$ millions)	39,886	73,390	209,563	(R) 380,092	(R) 445,146	(R) 465,166	(R) 497,891	(R) 523,128	(R) 532,547	(R) 576,729	(R) 632,052	(R) 636,127	623,569
New and used cars ^{a,1}	16,600	26,700	57,200	119,000	(R) 133,200	(R) 132,600	(R) 136,000	(R) 139,400	(R) 147,300	(R) 158,400	(R) 164,300	(R) 162,600	157,200
Tires, tubes, accessories, and parts ¹	2,500	6,100	17,900	29,900	(R) 36,000	(R) 37,800	(R) 40,300	(R) 41,900	(R) 43,900	(R) 47,000	(R) 49,000	(R) 49,100	49,700
Gasoline and oil ¹	12,000	21,900	86,700	(R) 111,200	(R) 116,200	(R) 120,200	(R) 130,400	(R) 134,400	(R) 122,400	(R) 137,900	(R) 175,700	(R) 173,100	165,800
Tolls ¹	300	700	1,100	2,300	(R) 3,400	(R) 3,700	(R) 4,000	(R) 4,400	(R) 4,400	(R) 4,800	(R) 5,100	(R) 5,300	5,600
Insurance premiums less claims paid ^d	2,000	3,800	9,400	(R) 23,500	(R) 32,800	(R) 34,500	(R) 36,700	(R) 37,800	(R) 40,400	(R) 43,200	(R) 43,000	(R) 44,600	46,500
Repair, greasing, washing, parking, storage, rental, and leasing ¹	5,500	12,300	34,000	84,900	(R) 112,500	(R) 125,500	(R) 138,700	(R) 152,900	(R) 161,100	(R) 172,600	(R) 183,500	(R) 189,100	187,100
Auto registration fees ²	867	1,668	2,893	6,054	7,423	7,043	7,698	8,163	8,630	8,625	7,607	8,278	7,415
Driver's license fees ²	119	222	370	638	823	823	893	865	917	904	745	849	954
Taxi expenditures (\$ millions)¹	600	1,200	1,900	2,600	(R) 2,800	(R) 3,000	(R) 3,200	(R) 3,300	(R) 3,500	(R) 3,300	(R) 3,100	(R) 3,200	3,300
INVENTORY													
Number of vehicle registrations													
Passenger car and motorcycle ³	62,245,422	92,067,655	127,294,783	137,959,958	131,640,024	132,283,966	133,599,578	133,575,077	135,717,988	136,584,477	137,967,488	142,536,523	140,924,833
Other 2-axle 4-tire vehicle ³	e	14,210,591	27,875,934	48,274,555	62,903,589	65,738,322	68,933,798	70,224,082	71,330,205	75,356,376	79,084,979	84,187,636	85,011,305
Motorcycle ⁴	574,032	2,824,098	5,693,940	4,259,462	3,756,555	3,897,191	3,871,237	3,826,373	3,879,450	4,152,433	4,346,068	4,903,056	5,004,156
Motor vehicle licensed drivers⁵	87,252,563	111,542,787	145,295,036	167,015,250	175,403,465	176,628,482	179,539,340	182,709,204	184,860,969	187,170,420	190,625,023	191,275,719	194,295,633
Number of employees⁶													
Taxicabs	120,700	106,400	52,500	32,400	30,800	30,700	30,500	30,600	31,200	31,600	31,900	31,800	30,800
Automotive dealers and service stations	1,267,200	1,617,400	1,688,500	2,063,100	2,116,200	2,189,600	2,266,700	2,310,800	2,332,300	2,368,100	2,409,600	2,424,800	2,432,200
Motor vehicles, parts, and supplies	N	N	434,300	456,000	471,400	492,100	502,800	513,000	516,600	523,700	516,800	502,100	498,000
Auto repair, services, and parking	N	N	570,900	913,700	968,300	1,020,100	1,080,000	1,119,600	1,145,200	1,196,400	1,234,200	1,257,200	1,263,200
PERFORMANCE													
Vehicle-miles (millions)⁷													
Passenger car and motorcycle, total ^a	587,012	919,679	1,121,810	1,417,823	1,416,329	1,448,091	1,478,767	1,512,637	1,559,860	1,579,684	1,610,756	(R) 1,637,971	1,668,193
Rural highway, total	313,623	424,088	450,659	547,910	518,421	527,932	540,021	555,227	579,258	589,213	597,898	(R) 609,060	613,861
Rural interstate	N	62,342	89,488	117,519	114,002	115,991	120,324	121,095	128,447	131,956	135,630	(R) 137,087	139,707
Rural other arterial	233,452	182,213	180,857	211,066	207,540	212,063	217,574	221,732	230,435	232,779	236,423	(R) 237,986	239,562
Other rural roads	80,171	179,533	180,314	219,325	196,879	199,878	202,122	212,400	220,376	224,478	225,845	(R) 233,987	234,592
Urban highway, total ^b	273,389	495,591	671,151	869,912	897,909	920,159	938,746	957,410	980,602	990,471	1,012,858	(R) 1,028,911	1,054,332
Urban interstate	N	69,369	124,480	184,783	199,588	205,489	211,818	215,525	222,066	225,822	232,202	(R) 238,529	244,837
Other urban	N	426,222	546,671	685,129	698,321	714,670	726,928	741,885	758,536	764,649	780,656	(R) 790,382	809,495
Other 2-axle 4-tire vehicle, total	e	123,286	290,935	574,571	764,634	790,029	815,936	850,739	868,275	901,022	923,059	(R) 943,207	966,184
Rural highway, total	e	73,591	149,560	227,831	285,325	295,472	306,891	327,316	334,806	351,658	360,355	(R) 374,736	384,498
Rural interstate	e	6,766	19,952	46,298	60,849	63,329	65,779	69,030	72,343	76,190	79,088	(R) 82,356	84,936
Rural other arterial	e	29,808	56,137	87,474	113,595	118,305	122,211	129,890	132,043	138,475	141,257	(R) 146,525	150,715
Other rural roads	e	37,017	73,471	94,059	110,881	113,838	118,901	128,396	130,420	136,993	140,010	(R) 145,855	148,847
Urban highway, total ^f	e	49,695	141,375	346,739	479,308	494,557	509,045	523,423	533,469	549,364	562,704	(R) 568,471	581,686
Urban interstate	e	6,252	23,067	71,500	105,317	109,807	112,908	116,680	121,700	124,399	128,291	(R) 127,989	129,986
Other urban	e	43,443	118,308	275,239	373,991	384,750	396,136	406,743	411,769	424,965	434,413	(R) 440,482	451,700
Vehicle-miles, total (millions)³	587,012	1,042,965	1,412,745	1,992,394	2,180,963	2,238,120	2,294,703	2,363,376	2,428,135	2,480,706	2,533,815	(R) 2,581,178	2,634,377
Passenger cars ^f	(f) 587,012	(f) 919,679	(f) 1,121,810	(f) 1,417,823	(f) 1,416,329	1,438,294	1,468,854	1,502,556	1,549,577	1,569,100	1,600,287	(R) 1,628,332	1,658,640
Other 2-axle 4-tire vehicle	e	123,286	290,935	574,571	764,634	790,029	815,936	850,739	868,275	901,022	923,059	(R) 943,207	966,184
Motorcycle	g	g	g	g	(E) 10,240	9,797	9,913	10,081	10,283	10,584	10,469	(R) 9,639	9,553
Passenger-miles, total (millions)^{c,3}	1,145,000	1,979,787	2,545,020	3,037,244	3,612,100	3,553,810	3,643,719	3,752,829	3,855,696	3,939,137	4,023,637	(R) 4,247,094	4,335,470
Passenger cars	(a,f) 1,145,000	(a,f) 1,754,174	(a,f) 2,024,246	(f) 2,140,913	(f) 2,600,050	2,286,887	2,335,478	2,389,065	2,463,828	2,494,870	2,544,457	(R) 2,556,481	2,604,065
Other 2-axle 4-tire vehicle	e	225,613	520,774	896,331	1,012,050	1,256,146	1,297,337	1,352,675	1,380,557	1,432,625	1,467,664	(R) 1,678,853	1,719,750

Motorcycle	g	g	g	g	(E) 11,264	10,777	10,904	11,089	11,311	11,642	11,516	(R) 11,760	11,655
Average miles traveled per vehicle³													
Passenger car	(f) 9,518	(f) 9,989	(f) 8,813	(f) 10,277	(f) 10,759	11,203	11,323	11,581	11,754	11,848	11,976	(R) 11,831	12,203
Other 2-axle 4-tire vehicle	e	8,676	10,437	11,902	12,156	12,018	11,837	12,115	12,173	11,957	11,672	(R) 11,204	11,365
Motorcycle	g	g	g	g	(E) 2,726	2,514	2,561	2,635	2,651	2,549	2,409	(R) 1,966	1,909
Fuel consumed (million gallons)³													
Passenger cars	(f) 41,171	(f) 67,879	(f) 70,186	(f) 69,759	(f) 68,079	68,072	68,897	69,892	71,695	73,283	73,065	(R) 73,559	74,949
Other 2-axle 4-tire vehicle	e	12,313	23,796	35,611	44,112	45,605	47,133	49,388	50,462	52,859	52,939	(R) 53,522	54,841
Motorcycle	g	g	g	g	(E) 205	196	198	202	206	212	209	(R) 193	191
Average fuel consumption per vehicle (gallons)³													
Passenger cars	(f) 668	(f) 737	(f) 551	(f) 506	(f) 517	530	531	539	544	553	547	(R) 534	551
Other 2-axle 4-tire vehicle	e	866	854	738	701	694	684	703	707	701	669	(R) 636	645
Motorcycle	g	g	g	g	55	50	51	53	53	51	48	(R) 39	38
Average miles traveled per gallon of fuel consumed³													
Passenger cars	(f) 14	(f) 14	(f) 16.0	(f) 20.3	(f) 21	21.1	21.3	21.5	21.6	21.4	21.9	22.1	22.1
Other 2-axle 4-tire vehicle	e	10.0	12.2	16.1	17.3	17.3	17.3	17.2	17.2	17.0	17.4	17.6	17.6
Motorcycle	g	g	g	g	(E) 50	50	50	50	50	50	50	50	50

SAFETY⁸

Number of occupants and nonoccupant fatalities

Passenger car	N	N	27,449	24,092	21,997	22,423	22,505	22,199	21,194	20,862	20,699	(R) 20,320	20,416
Motorcycle	790	2,280	5,144	3,244	2,320	2,227	2,161	2,116	2,294	2,483	2,897	(R) 3,197	3,244
Bicycle ^d	490	760	965	859	802	833	765	814	760	754	693	(R) 732	662
Pedestrian ^d	7,210	8,950	8,070	6,482	5,489	5,584	5,449	5,321	5,228	4,939	4,763	(R) 4,901	4,808

Occupant fatality rates

Per 100 million vehicle-miles

Passenger car	4.7	3.8	2.5	1.7	1.5	1.5	1.5	1.5	1.4	1.3	1.3	1.3	1.3
Motorcycle	N	76.5	50.4	33.9	22.7	22.7	21.8	21.0	22.3	23.5	27.7	(R) 33.2	34.0

Per 10,000 registered vehicles

Passenger car	5.1	3.9	2.6	2.0	1.8	1.8	1.8	1.8	1.7	1.6	1.6	1.6	1.6
Motorcycle	13.8	8.1	9.0	7.6	6.2	5.7	5.6	5.5	5.9	6.0	6.7	6.5	6.5

Vehicle involvement rate (fatal crashes)

Per 100 million vehicle-miles

Passenger car	N	5.6	3.5	2.4	2.1	2.1	2.0	2.0	1.9	1.8	1.8	1.7	1.7
Motorcycle	N	22.9	50.9	34.3	22.8	23.1	21.9	21.4	22.7	23.9	28.4	(R) 33.9	35.0

Per 10,000 registered vehicles

Passenger car	N	5.6	3.7	2.8	2.5	2.5	2.5	2.4	2.3	2.2	2.2	2.1	2.1
Motorcycle	N	8.2	9.1	7.7	6.2	5.8	5.6	5.6	6.0	6.1	6.8	(R) 6.7	6.7

KEY: E = estimate; N = data do not exist; R = revised; U = data are not available.

NOTES

^a Figures obtained by addition / subtraction and may not appear directly in data source.

^b Urban consists of travel on all roads and streets in urban places of 5,000 or greater population.

^c In July 1997, the USDOT, Federal Highway Administration published revised passenger-miles data for the highway modes for many years. The major change reflected the reassignment of some vehicles from the passenger car category to the other 2-axle 4-tire vehicle category.

^d Involvement only with motor vehicle.

^e Included in single-unit 2-axle 6-tire or more truck category.

^f Includes motorcycle data.

^g Included in passenger cars.

SOURCES

Unless otherwise noted, refer to chapter tables for sources.

¹ U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts Tables*, table 2.5.5 available at <http://www.bea.doc.gov/bea/dn/nipaweb/AllTables.asp> as of April 2004.

² 1960-95: U.S. Department of Transportation, Federal Highway Administration (FHWA), *Highway Statistics Summary to 1995*, FHWA-97-009 (Washington, DC: July 1997), table MV-202.

1996-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table MV-2 (revised tables used when applicable).

³ 1960-94: Ibid., *Highway Statistics Summary to 1995*, FHWA-97-009 (Washington, DC: July 1997), table VM-201A, table revised in June 1999.

1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1 (revised tables used when applicable).

⁴ 1960-94: Ibid., *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table MV-201.

1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1 (revised tables used when applicable).

⁵ 1960-95: Ibid., *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table DL-201.

1996-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table DL-22 (revised tables used when applicable).

⁶ 1960-2002: U.S. Department of Labor, Bureau of Labor Statistics, *BLS Database*, Internet site <http://www.bls.gov/data/sa.htm> as of April 2004; codes "414120 Taxicabs," "605500 Automotive Dealers and Service Stations," "525010 Motor Vehicle Parts, and Supplies" and "807500 Auto Repair, Services, and Parking."

⁷ 1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201.

1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1 (revised tables used when applicable).

⁸ 1960-2002: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA), *Traffic Safety Facts 2002*, DOT HS 809 484, (Washington, DC: January 2004), tables 3, 4, 7, and 10.

Truck Profile

FINANCIAL	1960	1970	1980
Operating revenues, total ^{a,1} (based on SIC) (\$ millions)	N	N	N
Local trucking	N	N	N
Trucking, except local	N	N	N
Local trucking with storage	N	N	N
Courier services, except by air	N	N	N
Operating expenses, total ^{a,1} (based on SIC) (\$ millions)	N	N	N
Local trucking	N	N	N
Trucking, except local	N	N	N
Local trucking with storage	N	N	N
Courier services, except by air	N	N	N
Operating revenues, total ^{b,2} (based on NAICS) (\$ millions)	N	N	N
Truck transportation	N	N	N
Couriers messengers	N	N	N
Truck highway-user taxes, total ^{c,3} (\$ millions)	2,830	5,632	9,888
State	1,709	3,429	6,731
Federal	1,121	2,203	3,157
INVENTORY			
Number of truck registrations, total ⁴	11,914,249	4,586,487	5,790,653
Single-unit truck	N	3,681,405	4,373,784
Combination truck	N	905,082	1,416,869
Number of employees			
Trucking and courier services, except air	N	998,500	1,182,000
Truck drivers and sales workers ^{d,6}	1,477,000	1,565,000	1,931,000
Number of trucking and courier establishments ^{a,7}	N	64,756	69,796
PERFORMANCE			
Vehicle-miles, total rural and urban ⁸ (millions)	127,404	62,215	108,491
Rural highway, total	84,508	39,244	68,776
Rural interstate	N	10,069	25,111
Rural other arterial	N	17,625	24,789
Other rural roads	N	11,550	18,876
Urban highway, total ^f	42,896	22,971	39,715
Urban interstate	N	5,634	13,135
Other urban streets	N	17,337	26,580
Passenger-miles, total ^f (millions)	127,405	62,215	108,491
Single-unit truck ^g	98,551	27,081	39,813
Combination truck	28,854	35,134	68,678
Ton-miles, intercity ⁹ (millions)	285,000	412,000	555,000
Fuel consumed, all trucks ¹⁰ (million gallons)	15,882	11,316	19,960
Single-unit truck	N	3,968	6,923
Combination truck	N	7,348	13,037
Average fuel consumption per vehicle, all trucks ¹⁰ (gallons)	1,333	2,467	3,447
Single-unit truck	N	1,078	1,583
Combination truck	N	8,119	9,201
Average miles traveled per gallon of fuel consumed, all trucks ¹⁰	8.0	5.5	5.4
Single-unit truck	N	6.8	5.8
Combination truck	N	4.8	5.3
Average miles traveled per vehicle, all trucks ¹⁰	10,693	13,565	18,736
Single-unit truck	N	7,356	9,103
Combination truck	N	38,819	48,472
Average length of haul (domestic freight) ¹¹ (miles)	272	263	363
SAFETY¹²			
Occupant fatalities, all trucks	N	N	8,748
Light truck	N	N	7,486
Large truck	N	N	1,262
Occupant fatality rate			
Per 100 million vehicle-miles, all trucks	N	N	2.2

Light truck	N	N	2.5
Large truck	N	N	1.2
Per 10,000 registered vehicles, all trucks	N	N	2.4
Light truck	N	N	2.5
Large truck	N	N	2.2
Vehicle involvement rate (fatal crashes)			
Per 100 million vehicle-miles, all trucks	N	N	4.5
Light truck	N	N	4.3
Large truck	N	N	5.0
Per 10,000 registered vehicles, all trucks	N	N	5.0
Light truck	N	N	4.2
Large truck	N	N	9.3

KEY: N = data do not exist; R = revised; U = data are not available.

^a **Local trucking (SIC 4212)** - Establishments primarily engaged in furnishing trucking or transfer services without storage for freight generally weighing more than 100 pounds.

Trucking, except local (SIC 4213) - Establishments primarily engaged in furnishing "over-the-road" trucking services or trucking services and storage services, including household goods either as common carriers or under special or individual contracts or agreements, for freight generally weighing more than 100 pounds.

Local trucking, without storage (SIC 4214) - Establishments primarily engaged in furnishing both trucking and storage services, including household goods.

Courier services, except by air (SIC 4215) - Establishments primarily engaged in the delivery of individually addressed letters, parcels, and packages (generally under 100 pounds).

^b **Truck transportation (NAICS 484)** - Industries primarily engaged in over-the-road transportation of cargo using motor vehicles, truck-tractors, and trailers.

Couriers and messengers (NAICS 492) - Establishments primarily engaged in providing air, surface, or combined courier delivery services of parcels or primarily engaged in furnishing local messenger and delivery services of small items within a single metropolitan area or urban center.

^c Numbers may not equal totals due to rounding.

^d In 1999, the Occupational Employment Statistics survey began using the Standard Occupational Classification (SOC) system to organize occupational data. Therefore, estimates from 1999 and subsequent years are not directly comparable to previous occupational data.

^e Urban consists of travel on all roads and streets in urban places of 5,000 or greater population.

^f Highway passenger-miles are calculated by multiplying vehicle-miles of travel as cited by the Federal Highway Administration (FHWA) by the average number of occupants for each vehicle type as estimated by the FHWA using the Nationwide Personal Transportation Survey.

^g Includes other 2-axle 4-tire vehicle in 1960.

NOTE

In 1995, FHWA revised its vehicle type categories. These new categories include passenger car, other 2-axle 4-tire vehicle, single-unit 2-axle 6-tire or more truck, and combination truck. Other 2-axle 4-tire vehicles include vans, pickup trucks, and sport/utility vehicles. In previous years, some minivans and sport/utility vehicles were included in the passenger car category. Single-unit 2-axle 6-tire or more trucks are on a single frame with at least 2 axles and 6 tires.

SOURCES

Unless otherwise noted, refer to chapter tables for sources.

¹ U.S. Census Bureau, *Transportation Annual Survey* (Washington, DC: December 1998), table 1.

² Ibid., *Service Annual Survey, 2002* (Washington, DC: February 2004), table 2.2.

³ American Trucking Association, *American Trucking Trends* (Washington, DC: Annual issues).

⁴ 1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2002: Ibid., Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

⁵ 1960-90: U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours and Earnings, United States, 1909-1994* (Washington, DC: September 1994), SIC 421.

1994-2002: Ibid., Internet site www.bls.gov as of Apr. 21, 2004, SIC 421.

⁶ Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p. 35.

2002: U.S. Department of Labor, Bureau of Labor Statistics, Occupational Employment Statistics, *Occupational Employment and Wages, 2002* (Washington, DC: November 2003), Internet site <http://www.bls.gov/oes> as of June 15, 2004.

⁷ U.S. Bureau of the Census, *County Business Patterns* (Washington, DC: Annual issues), table 2 (NAICS 484 and 492/SIC 421), and similar tables in earlier editions.

⁸ 1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201.

1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

⁹ Eno Transportation Foundation, Inc., *Transportation in America, 2000* (Washington, DC: 2001), p. 12.

¹⁰ 1960: Ibid., *Transportation in America, 2000* (Washington, DC: 2001), p. 35.

1970-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997) table VM-201A.

1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

¹¹ Eno Transportation Foundation, Inc., *Transportation in America, 2001* (Washington, DC: 2001), p.65.

¹² U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 2002*, DOT HS 809 484 (Washington, DC: Annual issues), tables 3, 8 and 9, and Fatality Analysis Reporting System (FARS) Query, Apr. 21, 2004.

Bus Profile

FINANCIAL	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002
Expenditures (\$ thousands)													
School bus ¹	486,000	1,219,000	3,833,000	8,031,000	7,847,000	9,889,000	9,082,000	10,353,000	10,326,000	10,340,000	12,104,000	12,624,000	U
Operating revenues (\$ thousands)													
Intercity bus, Class I ²	463,100	721,700	1,397,378	943,268	1,161,479	1,189,235	985,537	1,080,083	1,074,582	1,326,909	1,133,822	1,117,526	1,070,204
Operating expenses (\$ thousands)													
Intercity bus, Class I ²	405,400	639,000	1,318,372	1,026,213	1,289,834	1,253,537	941,014	1,022,680	1,016,208	1,313,900	1,078,386	1,080,186	1,045,515
INVENTORY													
Number of operating companies													
Intercity bus, Class I ²	143	71	61	31	26	24	20	22	20	18	15	15	12
Number of vehicles, all buses³													
Intercity bus	272,129	377,562	528,789	626,987	670,423	685,503	694,781	697,548	715,540	728,777	746,125	749,548	760,717
Number of employees⁴													
Intercity and rural bus	40,500	43,400	37,900	26,100	23,600	23,800	23,800	22,200	24,400	23,800	24,700	25,100	22,890
School bus	N	N	79,900	111,200	125,900	131,100	132,200	136,500	141,000	146,100	146,700	147,700	174,440
PERFORMANCE													
Vehicle-miles, all buses (millions)⁵													
Rural highway, total	4,346	4,544	6,059	5,726	6,409	6,420	6,538	6,842	7,007	7,662	7,590	(R) 7,077	6,849
Interstate rural	N	339	533	567	683	711	742	794	834	971	978	(R) 951	941
Other arterial rural	N	944	991	995	1,154	1,171	1,186	1,243	1,282	1,375	1,270	(R) 1,133	1,104
Other rural	N	1,266	1,511	1,882	1,893	1,972	2,005	2,072	2,135	2,321	2,241	(R) 2,081	1,901
Urban highway ⁶ , total	2,014	1,995	3,024	2,283	2,679	2,566	2,605	2,733	2,756	2,995	3,101	(R) 2,912	2,903
Interstate urban	N	277	560	455	627	580	598	647	663	752	791	(R) 775	802
Other urban	N	1,718	2,464	1,828	2,052	1,986	2,007	2,086	2,093	2,243	2,310	(R) 2,137	2,101
Passenger-miles (millions), all buses⁵													
Intercity bus, total ¹	366,000	401,000	370,000	334,000	343,200	366,500	347,900	350,600	357,600	358,900	364,600	356,900	U
Average miles traveled per vehicle, all buses⁵													
Intercity bus, total ¹	15,970	12,035	11,458	9,133	9,560	9,365	9,386	9,809	9,793	10,515	10,173	(R) 9,442	9,003
Fuel consumed (million gallons), all buses⁵													
Intercity bus, total ¹	827	820	1,018	895	964	968	985	1,027	1,040	1,148	1,112	(R) 1,026	993
Average fuel consumption per vehicle (gallons), all buses⁵													
Intercity bus, total ¹	3,039	2,172	1,925	1,427	1,438	1,412	1,414	1,472	1,454	1,576	1,490	(R) 1,369	1,306
Average miles traveled per gallon of fuel consumed, all buses⁵													
Intercity bus, total ¹	5.3	5.5	6.0	6.4	6.6	6.6	6.6	6.7	6.7	6.7	6.8	6.9	6.9
Average revenue per passenger-mile (cents) (intercity)¹													
Intercity bus, total ¹	2.71	3.60	7.26	11.55	11.61	12.19	12.30	12.56	12.75	12.76	12.79	12.91	U
SAFETY													
Number of fatalities⁶													
School bus-related	N	N	150	115	(R) 107	123	136	131	128	167	147	141	127
School bus occupants	N	N	9	11	(R) 4	13	10	(R) 10	6	10	(R) 21	18	3
Other vehicle													
Occupants	N	N	88	64	64	72	101	(R) 97	91	127	(R) 99	95	98
Nonoccupants	N	N	53	40	(R) 39	38	25	24	31	30	(R) 27	(R) 28	26
Occupant fatalities, all buses⁶													
School buses	N	N	46	32	21	33	21	18	38	59	22	34	45
Cross country buses	N	N	14	13	2	12	10	8	6	8	16	16	2
Transit buses	N	N	23	2	7	6	3	5	13	32	3	3	20
Other and unknown	N	N	6	3	6	1	5	3	2	6	1	4	6
Fatalities in vehicular accidents⁶, all buses⁷													
School buses	N	N	3	14	6	14	3	2	17	13	2	11	17
Fatalities in vehicular accidents⁶, all buses⁷													
School buses	N	N	390	340	286	311	367	339	329	374	355	330	343
Occupant fatality rate													
Per 90 million vehicle-miles, all buses ⁶	N	N	0.8	0.6	0.3	0.5	0.3	0.3	0.5	0.8	0.3	0.5	0.7
Per 9,000 registered vehicles, all buses ⁶	N	N	0.9	0.5	0.3	0.5	0.3	0.3	0.5	0.8	0.3	0.5	0.6
Vehicle involvement rate (fatal crashes)													
Per 90 million vehicle-miles, all buses ⁷	N	N	6.4	5.9	4.5	4.8	5.6	5.0	4.7	(R) 4.9	(R) 4.7	(R) 4.7	5.0
Per 9,000 registered vehicles, all buses ⁷	N	N	7.4	5.4	4.3	4.5	5.3	4.9	4.6	(R) 5.1	(R) 4.8	(R) 4.4	4.5

KEY: N = data do not exist; R = revised; U = data are not available.

¹ Urban consists of travel on all roads and streets in urban places of 5,000 or greater population.

² Includes all fatalities that occurred in an accident in which a bus was involved.

NOTE

See transit profile for transit bus data.

SOURCES

Unless otherwise noted, refer to chapter tables for sources.

¹ Eno Transportation Foundation, Inc., *Transportation in America, 19th edition* (Washington, DC: 2002), p. 40, 46, and 48.

² 1960-95: Interstate Commerce Commission, *Annual Report of the ICC* (Washington, DC: Annual issues), Appendix F, tables 1 and 6. 1996-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, *Selected Earnings Data, Class I Motor Carriers of Passengers* (Washington, DC: Annual issues).

³ U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table MV-10.

⁴ 1960-99: U.S. Department of Labor, Bureau of Labor Statistics, *National Employment, Hours and Earnings*, SIC codes 413 and 415, Internet site www.bls.gov as of June 17, 2004. 2000-02: Ibid., NAICS codes 485200 and 485400, Internet site www.bls.gov as of June 17, 2004.

⁵ 1960-95: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A. 1996-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

⁶ 1980-98: Ibid., National Highway Traffic Safety Administration, *Traffic Safety Facts 1998*, DOT HS 808 983 (Washington, DC: October 1999), tables 74 and 93. 1999-2002: Ibid., *Traffic Safety Facts 2002*, DOT HS 809 615 (Washington, DC: December 2003).

⁷ Ibid., Fatality Analysis Reporting System (FARS) Query, Internet site, <http://www-fars.nhtsa.dot.gov> as of June 2004.

Transit Profile

FINANCIAL	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	(P) 2002
Passenger operating revenues¹, total (\$ millions)	1,407	1,707	6,510	16,053	17,968	18,241	19,151	19,515	21,062	22,220	24,243	25,288	26,632
Operating revenues, total	1,407	1,707	2,805	6,786	9,027	9,613	10,345	10,854	11,654	11,930	12,963	12,471	13,251
Passenger fares, total	1,335	1,639	2,556	5,891	6,756	6,801	7,416	7,546	7,970	8,282	8,746	8,891	8,649
Motor bus	N	N	N	2,967	3,250	3,287	3,515	3,558	3,991	4,175	4,376	4,357	4,106
Heavy rail	N	N	N	1,741	1,976	2,018	2,322	2,351	2,297	2,323	2,483	2,533	2,493
Light rail	N	N	N	83	135	127	144	139	150	164	181	204	226
Trolley bus	N	N	N	46	55	54	55	57	55	60	60	60	59
Demand responsive	N	N	N	41	171	146	157	170	142	159	172	182	194
Ferryboat ^a	N	N	N	56	41	60	54	51	41	48	60	71	78
Commuter rail	N	N	N	952	1,083	1,078	1,146	1,178	1,255	1,309	1,375	1,439	1,447
Other ^b	N	N	N	26	45	46	24	42	38	46	41	47	46
Other operating revenue	72	68	248	895	2,271	2,812	2,928	3,308	3,685	3,648	4,217	3,580	4,602
Operating assistance ^c , total	N	N	3,705	9,267	8,941	8,628	8,807	8,661	9,408	10,290	11,280	12,817	13,382
State and local	N	N	2,611	8,297	8,026	7,811	8,210	8,014	8,656	9,418	10,286	11,688	12,063
Federal	N	N	1,093	970	916	817	596	647	751	872	994	1,130	1,319
Operating expenses², total (\$ millions)	1,377	1,996	6,711	17,979	21,653	21,540	22,260	23,159	24,318	25,538	28,194	29,279	30,918
Operating expenses, total	N	N	6,247	15,742	17,920	17,849	18,341	18,936	19,739	20,512	22,646	23,517	24,834
Motor bus	N	N	N	8,903	10,144	10,321	10,575	10,944	11,429	11,714	12,966	13,335	14,066
Heavy rail	N	N	N	3,825	3,786	3,523	3,402	3,474	3,530	3,693	3,931	4,180	4,268
Light rail	N	N	N	237	413	376	442	473	500	546	606	682	778
Trolley bus	N	N	N	109	133	139	135	140	147	167	178	172	187
Demand responsive	N	N	N	518	943	1,000	1,187	1,285	1,405	1,419	1,805	1,754	1,949
Ferryboat ^a	N	N	N	171	200	210	183	221	214	238	268	324	354
Commuter rail	N	N	N	1,939	2,228	2,211	2,294	2,278	2,361	2,575	2,685	2,861	3,003
Other ^b	N	N	N	41	73	67	124	122	154	160	206	208	229.4
Depreciation and amortization	N	N	278	1,593	2,769	2,601	2,885	3,106	3,435	3,692	4,076	4,233	4,470
Other reconciling items	N	N	186	644	964	1,091	1,034	1,117	1,145	1,333	1,472	1,529	1,614
Average passenger revenue per passenger-mile³, all modes (\$)	N	N	N	0.14	0.17	0.17	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Motor bus	N	N	N	0.14	0.17	0.17	0.18	0.18	0.20	0.20	0.21	0.20	0.19
Heavy rail	N	N	N	0.15	0.19	0.19	0.20	0.20	0.19	0.18	0.18	0.18	0.18
Light rail	N	N	N	0.15	0.18	0.15	0.15	0.13	0.13	0.14	0.13	0.14	0.16
Trolley bus	N	N	N	0.24	0.29	0.29	0.30	0.30	0.30	0.32	0.31	0.32	0.32
Demand responsive	N	N	N	0.10	0.30	0.29	0.24	0.23	0.19	0.20	0.21	0.21	0.23
Ferryboat ^a	N	N	N	0.20	0.14	0.23	0.21	0.17	0.14	0.16	0.18	0.22	0.23
Commuter rail	N	N	N	0.14	0.14	0.13	0.14	0.15	0.14	0.15	0.15	0.15	0.15
Other ^b	N	N	N	0.21	0.23	0.17	0.07	0.11	0.09	0.10	0.09	0.09	0.09
Average passenger fare, per unlinked trip⁴, all modes (\$)	0.14	0.22	0.30	0.67	0.85	0.87	0.93	0.89	0.91	0.90	0.93	0.92	0.89
Motor bus	N	N	N	0.52	0.62	0.66	0.70	0.70	0.74	0.74	0.77	0.74	0.70
Heavy rail	N	N	N	0.74	0.90	0.99	1.08	0.97	0.96	0.92	0.94	0.93	0.93
Light rail	N	N	N	0.47	0.66	0.50	0.55	0.53	0.54	0.56	0.57	0.61	0.67
Trolley bus	N	N	N	0.36	0.47	0.45	0.47	0.47	0.47	0.50	0.49	0.50	0.46
Demand responsive	N	N	N	0.60	2.04	2.26	2.21	1.83	1.49	1.59	1.64	1.73	1.87
Ferryboat ^a	N	N	N	1.11	0.87	1.31	1.12	0.99	0.80	0.91	1.13	1.32	1.36
Commuter rail	N	N	N	2.90	3.19	3.13	3.24	3.30	3.29	3.31	3.32	3.44	3.49
Other ^b	N	N	N	0.90	1.28	1.57	1.33	0.66	1.02	0.76	0.66	0.75	0.77
INVENTORY													
Number of systems^{5, 5}, total	1,286	1,096	1,055	5,078	5,973	5,973	5,973	5,975	6,000	6,000	6,000	6,000	6,000
Motor bus	1,236	1,075	1,022	2,685	2,250	2,250	2,250	2,250	2,262	2,262	2,262	2,264	2,264
Heavy rail	31	15	11	12	14	14	14	14	14	14	14	14	14
Light rail	-	-	9	17	22	22	22	22	23	24	25	26	27
Trolley bus	19	6	5	5	5	5	5	5	5	5	5	5	5
Demand responsive	N	N	N	3,193	5,214	5,214	5,214	5,214	5,254	5,252	5,252	5,251	5,251
Ferryboat ^a	N	N	16	27	25	25	25	25	28	30	33	42	42
Commuter rail	N	N	18	14	16	16	16	18	18	20	19	21	20
Other ^b	N	N	5	35	69	69	69	70	72	81	81	82	82
Number of vehicles⁶, total	65,292	61,298	75,388	92,961	115,943	115,874	122,362	126,360	123,855	128,516	131,493	134,271	135,282
Motor bus	49,600	49,700	59,411	58,714	68,123	67,107	71,678	72,770	72,142	74,228	75,013	76,075	76,190
Heavy rail	9,010	9,286	9,641	10,419	10,138	10,157	10,201	10,242	10,301	10,306	10,591	10,718	10,718
Light rail	2,856	1,262	1,013	913	1,054	999	1,140	1,229	1,220	1,297	1,577	1,366	1,445
Trolley bus	3,826	1,050	823	832	877	885	871	859	880	859	951	600	600
Demand responsive	N	N	N	16,471	28,729	29,352	30,804	32,509	29,646	31,884	33,080	34,661	34,699
Ferryboat ^a	N	N	N	108	110	110	109	134	113	112	119	125	125
Commuter rail	N	N	4,500	4,415	4,517	4,565	4,665	4,943	4,963	4,883	5,073	5,124	5,300
Other ^b	N	N	N	1,089	2,395	2,699	2,894	3,674	4,590	4,947	5,089	5,602	6,205
Number of employees^{6, 7}, total	156,400	138,040	189,300	262,176	294,087	300,491	314,944	320,759	327,752	337,885	347,841	357,266	360,722
Motor bus	121,300	101,598	N	162,189	174,373	181,973	190,152	196,861	198,644	204,179	211,095	214,674	214,825
Heavy rail	35,100	36,442	N	46,102	51,062	45,644	45,793	45,935	45,163	46,311	47,087	47,865	48,464
Light rail	+	+	N	4,066	5,140	4,935	5,728	5,940	6,024	6,058	6,572	7,021	7,598
Trolley bus	+	+	N	1,925	1,848	1,871	2,084	2,037	2,053	2,140	2,223	2,008	2,027
Demand responsive	N	N	N	22,740	35,450	39,882	44,667	44,029	48,406	51,186	52,021	55,846	56,746
Ferryboat ^a	N	N	N	2,813	2,764	2,697	2,830	3,166	3,894	4,024	2,682	4,731	5,336
Commuter rail	N	N	N	21,443	22,596	22,320	22,604	21,651	22,488	22,896	23,518	23,851	24,391
Other ^b	N	N	N	898	854	1,169	1,086	1,140	1,080	1,091	2,643	1,270	1,335

PERFORMANCE

Vehicle-miles⁸, total (millions)	2,143	1,883	2,287	3,242	3,468	3,550	3,650	3,746	3,794	3,972	4,081	4,196	4,277
Motor bus	1,576	1,409	1,677	2,130	2,162	2,184	2,221	2,245	2,175	2,276	2,315	2,377	2,411
Heavy rail	391	407	385	537	532	537	543	558	566	578	595	608	621
Light rail	75	34	18	24	34	35	38	41	44	49	53	54	61
Trolley bus	101	33	13	14	14	14	14	14	14	14	15	13	14
Demand responsive	N	N	N	306	464	507	548	585	671	718	759	789	803
Ferryboat ⁸	N	N	2	2	2	3	3	3	3	3	3	3	3
Commuter rail	N	N	179	213	231	238	242	251	260	266	271	277	284
Other ⁸	N	N	13	16	30	33	43	50	63	69	71	75	80
Unlinked passenger trips⁹, total (millions)	N	7,332	8,567	8,799	7,949	7,763	7,948	8,374	8,750	9,168	9,363	9,653	9,623
Motor bus	N	5,034	5,837	5,677	4,871	4,848	4,887	5,013	5,399	5,648	5,678	5,849	5,868
Heavy rail	N	1,881	2,108	2,346	2,169	2,033	2,157	2,430	2,393	2,521	2,632	2,728	2,688
Light rail	N	124	133	175	284	251	261	262	276	292	320	336	337
Trolley bus	N	182	142	126	118	119	117	121	117	120	122	119	116
Demand responsive	N	N	N	68	88	88	93	99	95	100	105	105	103
Ferryboat ⁹	N	N	63	50	47	47	48	51	52	53	53	54	57
Commuter rail	N	N	280	328	339	344	352	357	381	396	413	419	414
Other ⁹	N	N	4	29	33	33	33	41	37	38	40	43	40
Passenger-miles¹⁰, total (millions)	N	N	39,854	41,143	39,585	39,808	41,378	42,339	44,128	45,857	47,666	49,070	48,324
Motor bus	N	N	21,790	20,981	18,832	18,818	19,096	19,604	20,360	21,205	21,241	22,022	21,841
Heavy rail	N	N	10,558	11,475	10,668	10,559	11,530	12,056	12,284	12,902	13,844	14,178	13,663
Light rail	N	N	381	571	833	860	957	1,035	1,128	1,206	1,356	1,437	1,432
Trolley bus	N	N	219	193	187	187	184	189	182	186	192	187	188
Demand responsive	N	N	N	431	577	607	656	754	735	813	839	855	853
Ferryboat ¹⁰	N	N	N	286	260	260	256	294	294	310	330	325	333
Commuter rail	N	N	6,516	7,082	7,996	8,244	8,351	8,038	8,704	8,766	9,402	9,548	9,504
Other ¹⁰	N	N	390	124	232	273	348	369	441	469	462	518	510
Average trip length¹¹, all modes (miles)	N	N	N	N	5	5	5	5	5	5	5	5	5
Motor bus	N	N	N	N	4	4	4	4	4	4	4	4	4
Heavy rail	N	N	N	N	5	5	5	5	5	5	5	5	5
Light rail	N	N	N	N	4	3	4	4	4	4	4	4	4
Trolley bus	N	N	N	N	2	2	2	2	2	2	2	2	2
Demand responsive	N	N	N	N	7	8	9	10	8	8	8	8	8
Ferryboat ¹¹	N	N	N	N	6	6	5	6	6	6	6	6	6
Commuter rail	N	N	N	N	24	24	24	23	23	22	23	23	23
Vanpool	N	N	N	N	32	35	34	33	36	34	35	33	37
Other ¹¹	N	N	N	N	1	1	1	1	1	1	1	1	1
Average vehicle speed¹², all modes (miles per hour)	N	N	N	N	15	15	15	15	15	15	15	15	15
Motor bus	N	N	N	N	13	13	13	13	13	13	13	13	13
Heavy rail	N	N	N	N	21	21	21	21	21	21	21	20	20
Light rail	N	N	N	N	14	14	14	16	16	15	15	15	15
Trolley bus	N	N	N	N	8	8	8	8	8	7	7	7	7
Demand responsive	N	N	N	N	14	15	15	15	17	15	15	15	15
Ferryboat ¹²	N	N	N	N	8	6	7	7	8	8	8	8	8
Commuter rail	N	N	N	N	34	34	33	34	32	33	29	32	32
Vanpool	N	N	N	N	33	35	37	36	37	38	31	39	38
Other ¹²	N	N	N	N	6	6	7	7	7	7	8	8	8
Energy consumption, diesel¹³, total (million gallons)	208	271	431	651	678	678	693	717	740	763	786	745	725
Motor bus	N	N	N	563	565	564	578	598	607	618	635	587	559
Heavy rail	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Light rail	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trolley bus	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Demand responsive	N	N	N	15	30	29	31	32	38	43	48	55	62
Ferryboat ¹³	N	N	N	20	21	22	22	24	25	29	32	30	31
Commuter rail	N	N	N	53	62	63	62	63	69	73	71	72	73
Other ¹³	N	N	N	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Energy consumption, other¹⁴, total (million gallons)	192	69	11	34	65	71	76	83	90	93	103	112	138
Gasoline and other nondiesel fuels ⁹	192	68	11	33	60	61	61	59	53	49	48	46	57
Compressed natural gas	U	U	U	U	5	11	15	24	37	44	55	66	81
Energy consumption, electric power¹⁵, total (million kWh)	2,908	2,561	2,446	4,837	5,081	5,068	5,007	4,988	5,073	5,237	5,510	5,610	5,649
Motor bus	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heavy rail	N	N	N	3,284	3,431	3,401	3,332	3,253	3,280	3,385	3,549	3,646	3,683
Light rail	N	N	N	239	282	288	321	361	381	416	463	487	510
Trolley bus	N	N	N	69	103	100	69	78	74	75	77	74	73
Demand responsive	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ferryboat ¹⁵	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Commuter rail	N	N	N	1,226	1,244	1,253	1,255	1,270	1,299	1,322	1,370	1,354	1,334
Other ¹⁵	N	N	N	19	21	26	30	26	39	39	51	49	49
SAFETY													
Fatalities, all modes¹⁶	N	N	N	339	320	274	264	275	286	299	295	267	260
Injured persons, all modes^{h,17}	N	N	N	54,556	58,193	57,196	55,288	56,132	55,990	55,325	56,697	53,945	21,304
Incidents, all modes¹⁶	N	N	N	90,163	70,693	62,471	59,392	61,561	60,094	58,703	59,898	58,149	U
Major incidents ^l	N	N	N	N	N	N	N	N	N	N	N	N	2,126

KEY: ~ = included in heavy rail figure; + = included in motor bus figure; kWh = kilowatt hours; N = data do not exist; NA = not applicable; P = preliminary; U = data are not available.

^a Excludes international, rural, rural interstate, island and urban park ferries.

^b Includes cable car, inclined plane, aerial tramway, monorail, vanpool, and automated guideway.

^c Beginning in 1992, local operating assistance and other revenue declined by about \$500 million due to change in accounting procedures at the New York City Transit Authority. Beginning in 1992, total operating expense declined by about \$400 million due to a change in accounting procedures at the New York City Transit Authority.

^d The total figure represents the number of transit agencies. It is not the sum of all modes since many agencies operate more than one mode.

^e Based on employee equivalents of 2,080 hours equals one employee; beginning in 1993, based on number of actual employees.

^f Includes cable car, inclined plane, aerial tramway, monorail, and automated guideway.

^g Liquefied natural gas, liquefied petroleum gas, methanol, propane, and other nondiesel fuels, except compressed natural gas.

^h Beginning in 2002, the Federal Transit Administration changed the reporting threshold for injuries. Before 2002, essentially all injuries had to be reported to the National Transit Database. Beginning in 2002, only those injuries requiring immediate medical attention away from the scene of the incident are required to be reported.

ⁱ In 2002, the Federal Transit Administration defined major incidents as safety and/or security incidents resulting in: a fatality, two or more injuries transported for immediate medical treatment, property damage exceeding \$25,000 (all property), main-line derailments, evacuations due to life safety, grade crossing collisions with injury or \$7,500 damage, or rail transit vehicle collisions resulting in one or more injuries.

SOURCES

Unless otherwise noted, refer to chapter tables for sources.

¹ American Public Transit Association, *Public Transportation Fact Book 2004*, (Washington, DC: 2004), tables 64, 65, 103, and similar tables in earlier years.

² *Ibid.*, tables 58, 61, 103 and similar tables in earlier years.

³ *Ibid.*, tables 8, 64, 65, 103, and similar tables in earlier years.

⁴ *Ibid.*, table 63 and similar tables in earlier years.

⁵ *Ibid.*, table 2 and similar tables for prior years.

⁶ *Ibid.*, tables 24, 103, and similar tables in earlier years.

⁷ *Ibid.*, tables 30, 103, and similar tables in earlier years.

⁸ *Ibid.*, tables 18, 103, and similar tables in earlier years.

⁹ *Ibid.*, tables 5, 103, and similar tables in earlier years.

¹⁰ *Ibid.*, tables 8, 103, and similar tables in earlier years.

¹¹ *Ibid.*, table 7 and similar tables in earlier years.

¹² *Ibid.*, 20 and similar tables in earlier years.

¹³ *Ibid.*, table 34 and similar tables in earlier years.

¹⁴ *Ibid.*, table 35 and similar tables in earlier years.

¹⁵ *Ibid.*, table 33 and similar tables in earlier years.

¹⁶ 1960-2001: U.S. Department of Transportation, Federal Transit Administration, *Transit Safety and Security Statistics and Analysis Annual Report* (previously Safety Management Information Statistics - SAMIS), personal communication on July 28, 2003. 2002: *Ibid.*, National Transit Database, *Safety and Security Newsletter*, Spring 2003, Volume 1, Issue 1, Internet site <http://www.ntdprogram.com> as of June 16, 2004.

¹⁷ 1960-2001: U.S. Department of Transportation, Federal Transit Administration, *Transit Safety and Security Statistics and Analysis Annual Report* (previously Safety Management Information Statistics - SAMIS), personal communication on July 28, 2003. 2002: *Ibid.*, National Transit Database, *Safety and Security Newsletter*, Fall 2003, Volume 1, Issue 2, Internet site <http://www.ntdprogram.com> as of June 16, 2004.

Rail Profile

FINANCIAL	1960	1970 ^e	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001
Class I^{a,1}												
Operating revenues, total (\$ millions)	9,514	11,992	28,258	28,370	30,809	32,280	32,693	33,118	33,151	33,521	34,102	34,576
Passenger	640	421	446	94	88	89	59	60	61	61	62	62
Freight	8,025	10,922	26,350	27,471	29,931	31,356	31,889	32,322	32,247	32,680	33,083	33,533
Other	849	649	1,462	805	790	835	745	736	843	780	957	981
Operating expenses (\$ millions) ^b	8,775	11,478	26,355	24,652	25,511	27,897	26,331	27,291	27,916	28,011	29,040	29,164
Amtrak²												
Total revenue (\$ millions)	N	162	429	1,308	1,413	1,490	1,550	1,669	2,244	2,011	2,111	2,109
Total expenses (\$ millions)	N	301	1,103	2,012	2,246	2,257	2,258	2,359	2,548	2,660	2,876	3,288
INVENTORY												
Class I^{a,1}												
Number of vehicles, total	1,965,486	1,784,181	1,710,827	1,212,261	1,192,412	1,218,927	1,240,573	1,270,419	1,315,667	1,368,836	1,380,796	1,314,136
Class I freight cars	1,658,292	1,423,921	1,168,114	658,902	590,930	583,486	570,865	568,493	575,604	579,140	560,154	499,860
Other nonclass I freight cars	307,194	360,260	542,713	553,359	601,482	635,441	669,708	701,926	740,063	789,696	820,642	814,276
Number of Locomotives	29,031	27,077	28,094	18,835	18,505	18,812	19,269	19,684	20,261	20,256	20,028	19,745
Number of companies	106	71	38	14	12	11	10	9	9	9	8	8
Number of employees	780,494	566,282	458,994	216,424	189,962	188,215	181,809	177,981	178,222	177,557	168,360	162,155
Miles of road owned	207,334	196,479	164,822	119,758	109,332	108,264	105,779	102,128	100,570	99,430	99,250	97,631
Amtrak												
Number of passenger vehicles ³												
Train-cars	N	1,569	2,128	1,863	1,852	1,722	1,730	1,728	1,962	1,992	1,894	2,084
Locomotives	N	185	419	318	338	313	299	332	345	329	378	401
Number of employees ⁴	N	1,500	21,416	24,000	25,049	23,646	23,278	23,555	24,528	25,291	25,624	27,316
System route mileage ⁵	N	N	24,000	24,000	25,000	24,000	25,000	25,000	22,000	23,000	23,000	23,000
PERFORMANCE												
Class I^a												
Car mileage, freight (thousands) ¹	28,170,000	29,890,000	29,277,000	26,159,000	28,485,000	30,383,000	31,715,000	31,660,000	32,657,000	33,851,000	34,590,000	34,243,000
Train mileage, freight (thousands) ¹	404,464	427,065	428,498	379,582	440,896	458,271	468,792	474,954	474,947	490,442	504,001	499,546
Locomotive mileage, total (thousands) ⁶	N	N	1,531,050	1,280,365	1,404,706	1,444,691	1,465,149	1,423,229	1,439,703	1,503,947	1,502,819	1,477,546
Freight	421,900	1,278,200	1,319,010	1,144,559	1,261,482	1,293,851	1,311,351	1,281,768	1,285,706	1,349,580	1,354,590	1,327,669
Train and yard switching	N	N	212,040	135,806	143,224	150,840	153,798	141,461	153,997	154,367	148,229	149,876
Revenue ton-miles of freight (millions) ¹	572,309	764,809	918,958	1,033,969	1,200,701	1,305,688	1,355,975	1,348,926	1,376,802	1,433,461	1,465,960	1,495,472
Average length of haul, freight (miles) ¹	461	515	616	726	817	843	842	851	835	835	843	859
Fuel consumed in freight service (million gallons) ¹	3,463	3,545	3,904	3,115	3,334	3,480	3,579	3,575	3,583	3,715	3,700	3,710
Average miles traveled per vehicle												
Locomotive	N	N	54,497	67,978	75,910	76,796	76,037	72,304	71,058	74,247	75,036	74,831
Car	14,332	16,753	17,113	21,579	23,889	24,926	25,565	24,921	24,822	24,730	25,051	26,057
Average miles traveled per gallon												
Train	0.12	0.12	0.11	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.14	0.13
Car	8.13	8.43	7.50	8.40	8.54	8.73	8.86	8.86	9.11	9.11	9.35	9.23

Amtrak

Passenger train car-miles (millions) ⁷	N	213	235	301	304	292	276	288	312	342	371	378
Passenger train-miles (millions) ²	N	26	30	33	34	32	30	32	33	34	35	36
Passenger locomotive-miles (millions) ²	N	N	41	49	51	48	U	U	U	U	U	U
Revenue passengers carried (millions) ²	N	17	21	22	21	21	20	20	21	22	23	24
Revenue passenger-miles (millions) ²	N	3,039	4,503	6,057	5,921	5,545	5,050	5,166	5,304	5,330	5,498	5,559
Average passenger fare (dollars) ²	N	8.3	17.7	38.5	R ³⁹ 10	R ³⁹ 9.2	R ⁴³ 3.1	R ⁴⁵ 2.6	R ⁴⁴ 7.5	R ⁴⁶ 8.5	49.61	51.58
Average passenger revenue / passenger-mile (cents) ²	N	4.5	8.2	14.1	13.7	14.6	16.6	17.3	17.5	18.4	23.2	24.9
Average passenger trip length (miles) ²	N	182.6	217.0	273.0	279.3	267.9	256.3	255.7	251.4	247.9	244.4	236.6
Locomotive fuel consumed ⁸												
Diesel (million gallons)	N	N	64	82	75	66	71	75	75	74	U	U
Electric kWh (millions)	N	N	254	330	309	304	293	282	275	283	U	U

SAFETY^{c,9}

Number of fatalities, railroads and grade crossings, total	2,345	2,331	1,424	1,300	1,226	1,146	1,039	R ¹ 063	R ¹ 008	R ⁹ 32	R ⁹ 37	969
Passengers on trains	34	10	4	3	5	0	12	6	4	14	4	3
Employees on duty	215	179	97	40	31	34	33	37	27	31	24	22
Employees not on duty	N	N	4	0	0	2	0	0	2	0	1	0
Trespassers	637	607	566	700	682	660	620	646	644	570	570	671
Nontrespassers	1,459	1,535	746	554	505	443	365	362	324	304	332	269
Contractor employees	N	N	7	3	3	7	9	11	5	12	3	4
Grade crossing only	1,421	1,440	772	698	615	579	488	461	431	402	425	421
Railroad only^d	924	785	645	599	611	567	551	602	577	530	512	548

KEY: kWh = kilowatt-hour; N = data do not exist; R = revised; U = data are not available.

^a Excluding Amtrak and all non-Class I railroads, except for Section IV.

^b Operating expenses include equipment, joint facility rents, leased roads and equipment, and all taxes except Federal income.

^c Safety figures from U.S. Department of Transportation, Federal Railroad Administration are for all railroads.

^d Figures may not appear directly in data source.

^e Amtrak data in this column are for 1972, Amtrak's first full year of operation.

NOTE

Amtrak figures are based on Amtrak fiscal year (October 1-September 30).

SOURCES

Unless otherwise noted, refer to chapter tables for sources.

¹ Association of American Railroads, *Railroad Facts*, Annual issues, pp. 3, 10, 27, 33, 34, 36, 40, 49, 51, 77, and similar pages in earlier issues.

² Amtrak, *National Railroad Passenger Corporation Annual Report, Statistical Appendix to Amtrak Annual Report* Annual issues.

³ 1970-1980: Amtrak, *National Railroad Passenger Corporation Annual Report* 1972, 1980, 1990, and 1993-95. 1990-2000: Ibid., *National Railroad Passenger Corporation Annual Report, Statistical Appendix to Amtrak Annual Report* Annual issues. 2001:

Association of American Railroads, *Railroad Facts 2002* (Washington, DC: 2002), p. 77.

⁴ 1970-1990: Amtrak, Public Affairs, personal communication. 1994-1997: Ibid. *National Railroad Passenger Corporation Annual Report*, 1972, 1980, 1990, and 1993-95. 1998-2001: Association of American Railroads *Railroad Facts*, Annual Issues, p. 77 and similar pages in earlier issues.

⁵ 1980-1990: Amtrak, Route Miles by Railroad, Corp. Planning & Development. 1994-2001: Amtrak *National Railroad Passenger Corporation Annual Report, Statistical Appendix to Amtrak Annual Report* Annual issues.

⁶ Association of American Railroads, *Analysis of Class 1 Railroads*, Annual issues.

⁷ 1970-1990: Amtrak, *Train Information System Reports*. 1994-1999: Amtrak Corporate Reporting, Route Profitability System, Washington DC, personal communication, August 2001. 2000-2001: Association of American Railroads *Railroad Facts*, Annual Issues, p. 77 and similar pages in earlier issues.

⁸ Amtrak General Accounting, Pennsylvania, personal communication, June 1999.

⁹ 1960-1980: U.S. Department of Transportation, Federal Railroad Administration, Systems Support Division, RRS-22, personal communication. 1990-1994: Ibid., *Accident / Incident Bulletin*, Annual issues, tables 7 and 9. 1995-2001: Ibid., *Railroad Safety Statistics, Annual Report 2001*, table 1-3.

Water Transport Profile

FINANCIAL	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001
Operating revenues (\$ millions)¹												
Domestic freight, total	1,722	2,070	7,219	7,940	7,745	7,712	7,283	6,940	6,824	6,795	6,930	6,235
Coastal waterways	747	834	3,155	3,066	2,929	2,774	2,571	2,169	1,952	1,828	1,817	1,784
Inland waterways	461	621	2,395	2,956	2,868	2,964	2,861	2,899	2,904	2,811	2,960	2,894
Great Lakes	227	239	513	615	577	585	572	615	610	549	556	486
Locks, channels	287	376	1,156	1,303	1,371	1,389	1,279	1,257	1,358	1,607	1,597	1,071
International freight ^a	1,765	3,187	8,279	12,181	13,405	14,997	17,281	14,091	15,679	17,699	21,740	21,397
Passenger, total	281	287	310	1,391	1,564	1,716	1,843	1,974	2,029	2,088	4,663	4,187
Domestic passenger, intercity	14	12	27	100	121	129	140	141	146	152	156	144
International passenger ^b	267	275	283	1,291	1,443	^R 2,026	1,703	1,833	1,883	1,936	4,507	4,043
Revenues of U.S. commercial fishing fleet-domestic landings (\$ millions)²	354	613	2,237	3,522	3,809	3,770	3,487	3,448	3,128	3,467	3,549	3,228
INVENTORY												
Number of domestic inland vessel operators^{c,3}	228	380	403	565	555	557	554	U	U	U	U	U
Number of employees⁴												
Ships, boat building, and repairing	141,200	171,800	220,500	187,700	158,200	159,600	158,800	158,300	166,600	167,400	167,900	161,100
Water transportation ^d	N	212,300	211,200	176,600	172,400	174,500	174,100	178,700	181,300	185,500	193,900	192,400
Number of employees^{e,f}, total⁵	49,281	35,000	19,218	12,132	11,324	10,303	9,250	8,937	8,956	9,036	U	U
Passenger / combo	8,560	2,178	618	642	642	642	321	321	321	321	U	U
Cargo	28,668	22,257	9,878	7,019	6,056	5,400	4,964	4,831	4,924	4,757	U	U
Tankers	12,053	10,567	8,722	4,471	4,626	4,261	3,965	3,785	3,711	3,958	U	U
Mileage of commercially navigable channels¹	25,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000
Number of vessels⁶												
Total nonself-propelled	16,777	19,377	31,662	31,017	30,723	31,360	32,811	33,011	33,509	33,387	33,152	33,042
Dry cargo barges and scows	14,025	15,890	27,426	27,091	26,723	27,342	28,743	29,006	29,526	29,383	29,107	28,888
Tankers	2,429	3,281	4,166	3,913	3,966	3,985	4,036	3,971	3,952	3,973	4,011	4,122
Railroad car floats	323	206	70	13	34	33	32	34	31	31	34	32
Total self-propelled	6,519	6,447	7,126	8,236	8,334	8,281	8,293	8,408	8,523	8,379	8,202	8,546
Dry cargo / passenger	1,796	1,761	2,036	2,678	2,785	2,804	2,782	2,905	2,938	2,910	2,780	2,697
Ferries, railroad car	31	17	67	135	175	172	173	183	213	229	292	579
Tankers	489	421	330	213	195	178	161	147	135	142	135	120
Towboats / tugs	4,203	4,248	4,693	5,210	5,179	5,127	5,177	5,173	5,237	5,098	4,995	5,150
U.S. merchant marine ships (over 1,000 gross tons)												
Total U. S. flag⁷	2,926	1,579	864	636	543	509	495	477	470	463	454	443
Passenger / cargo	309	171	65	10	13	13	15	14	12	11	11	13
Freighters	2,138	1,076	471	367	308	295	292	288	289	284	286	283
Bulk carriers	57	38	20	26	22	20	15	14	15	14	15	17
Tankers	422	294	308	233	200	181	173	161	154	154	142	130
Privately owned	1,008	U	578	408	354	319	302	285	281	277	U	U
Government owned	1,918	U	286	228	189	190	193	192	189	186	U	U
Number of recreational boats (thousands)^{9,8}	2,500	7,400	8,905	10,996	11,430	11,735	11,878	12,313	12,566	12,738	12,782	12,876

PERFORMANCE

Ton-miles (thousands)^{h,9}

Domestic water freight, total	N	596,195,000	921,835,800	833,543,800	814,919,200	807,727,700	764,686,500	707,409,900	672,795,300	655,861,500	645,799,300	621,686,200
Coastwise	N	359,784,000	631,149,200	479,133,600	457,600,700	440,345,100	408,086,100	349,843,000	314,863,900	292,730,000	283,871,600	274,558,800
Internal	N	155,816,000	227,343,000	292,393,300	297,762,400	306,329,100	296,790,600	294,023,000	294,896,400	304,724,100	302,558,400	294,860,900
Lakewise	N	79,416,000	61,747,100	60,929,900	58,263,400	59,703,800	58,335,300	62,165,900	61,654,300	57,045,200	57,879,100	50,853,500
Intraport	N	1,179,000	1,596,400	1,087,000	1,292,700	1,349,600	1,474,500	1,378,100	1,380,700	1,362,200	1,490,200	1,413,000

Tons of freight hauled (thousands)⁹

Domestic, total		760,573	950,727	1,077,483	1,122,299	1,099,011	1,093,035	1,100,679	1,112,527	1,094,112	1,061,787	1,069,798	1,042,472
Coastwise		209,197	238,440	329,609	298,637	277,029	266,612	267,389	263,146	249,633	228,802	226,938	223,606
Internal		291,057	472,123	534,979	622,595	618,409	620,324	622,081	630,558	625,028	624,575	628,445	619,784
Lakewise		155,109	157,059	115,124	110,159	114,777	116,127	114,870	122,734	122,156	113,887	114,352	100,002
Intraport		104,193	81,475	94,184	86,378	82,870	83,104	89,011	89,816	90,077	88,650	94,558	93,222
Intraterritory		1,017	1,630	3,588	4,529	5,926	6,868	7,327	6,273	7,217	5,873	5,505	5,858
Exports, total		127,961	241,629	403,883	441,586	396,246	474,700	450,794	432,313	404,708	399,996	415,042	399,011
Great Lakes ports		23,150	35,932	45,077	32,898	27,108	32,968	31,855	33,209	36,876	40,233	40,131	40,519
Coastal ports		104,810	205,698	358,806	408,688	369,138	441,732	418,940	399,104	367,831	359,763	374,911	358,491
Imports, total		211,316	339,340	517,521	599,970	719,497	672,657	732,592	788,303	840,680	860,775	^R 939,749	945,075
Great Lakes ports		12,851	26,406	15,515	17,558	23,028	18,897	24,503	24,532	25,558	22,196	^R 23,917	22,021
Coastal ports		198,466	312,934	502,006	582,412	696,469	653,760	708,090	763,771	815,122	838,579	^R 915,832	923,054

Average haul, domestic system (miles)^{h,9}

Coastwise		1,496	1,509	1,915	1,604	1,652	1,652	1,526	1,330	1,261	1,279	1,251	1,228
Internal		282	330	405	470	482	494	477	466	472	488	481	476
Lakewise		522	506	536	553	508	514	508	507	505	501	506	509

Cargo capacity (short tons)⁶

Total nonself-propelled vessels		16,355,657	24,026,024	44,875,116	48,946,785	49,708,960	51,140,530	54,086,973	54,974,961	55,999,952	56,468,065	56,493,289	57,239,090
Dry cargo barges		12,147,006	17,695,275	34,486,851	38,189,490	38,643,518	39,971,443	42,748,644	43,710,093	44,718,691	45,049,209	44,814,696	45,281,492
Tankers		4,208,651	6,330,749	10,388,265	10,757,295	11,065,442	11,169,087	11,338,329	11,264,868	11,281,261	11,418,856	11,678,593	11,957,598
Total self-propelled vessels		15,905,881	19,284,050	23,906,346	^R 19,829,011	16,867,458	15,783,399	14,850,253	14,161,739	12,970,167	13,892,574	13,458,519	12,770,889
Dry cargo / passenger		12,188,956	10,815,977	8,011,587	^R 7,147,054	7,118,193	6,484,707	6,208,011	6,685,719	6,371,425	6,928,684	6,740,153	6,544,807
Tankers		3,716,925	8,468,073	15,894,753	^R 12,681,957	9,749,265	9,298,692	8,642,242	7,476,020	6,598,742	6,963,890	6,718,366	6,226,082

Fuel consumption (thousand barrels), total¹

Diesel fuel and distillate		122,014	123,591	273,380	232,036	210,650	225,470	213,721	187,729	183,856	208,604	233,227	U
Residual fuel oil		18,730	19,503	35,201	52,310	48,260	47,098	51,848	50,180	50,609	49,157	53,843	U
Gasoline		94,084	89,850	213,131	148,764	141,544	153,125	138,214	114,044	110,480	133,301	152,616	U
		9,200	14,238	25,048	30,962	20,846	25,247	23,659	23,505	22,767	26,146	26,768	U

SAFETY
Fatalities in waterborne transport (vessel casualties

only), total^{i,10}	N	178	206	85	77	52	55	48	67	R51	45	39
Freight ship	N	30	8	0	0	0	1	2	2	0	0	1
Tank ship	N	4	4	5	3	0	0	0	1	0	0	0
Passenger vessel	N	1	5	3	4	4	8	1	3	14	0	3
Tug / towboat	N	22	14	13	1	1	1	3	0	R5	0	4
Offshore supply	N	N	N	2	1	2	2	0	6	0	2	0
Fishing vessel	N	77	60	47	48	23	37	22	33	R23	28	9
Recreational vessel	N	N	N	3	13	22	3	7	7	R5	10	12
MODU ^j	N	N	N	0	0	0	0	4	0	0	0	1
Platform	N	N	N	1	U	U	U	U	U	R0	0	0
Freight barge	N	N	N	0	2	0	0	2	1	0	1	0
Tank barge	N	N	N	0	0	0	0	0	0	1	0	1
Miscellaneous	N	44	56	11	5	0	3	7	14	3	4	0
Injuries in waterborne transport, total^{i,10}	N	105	180	175	180	152	229	119	130	R136	132	193
Freight ship	N	14	8	10	6	1	7	3	3	2	4	2
Tank ship	N	19	9	13	10	8	1	5	6	R5	3	3
Passenger vessel	N	10	10	51	43	47	142	36	39	R71	50	109
Tug / towboat	N	10	27	19	19	19	16	21	12	R13	10	18
Offshore supply	N	N	N	9	2	10	7	3	5	1	5	13
Fishing vessel	N	13	28	31	55	41	36	25	35	R19	24	15
Recreational vessel	N	N	N	2	17	20	9	6	9	R11	26	15
MODU ^j	N	N	N	13	0	0	0	3	0	2	0	3
Platform	N	N	N	9	U	U	U	U	U	R1	1	0
Freight barge	N	N	N	3	4	0	0	5	1	R0	2	0
Tank barge	N	N	N	3	3	5	2	0	0	R2	0	2
Miscellaneous	N	N	98	12	21	1	9	12	20	9	6	5
Fatalities in recreational boating (vessel casualties only), total⁸	739	1,418	1,360	865	748	829	709	821	815	734	701	681
Air thrust	N	N	N	N	N	4	1	6	11	2	4	2
Propeller	N	N	N	N	N	475	363	436	462	421	439	326
Inboard	N	119	100	50	36	N	N	N	N	50	48	34
Outboard	N	774	609	454	341	N	N	N	N	326	328	245
Inboard / outboard	N	28	47	53	49	N	N	N	N	35	49	32
Jet	N	N	10	25	58	68	61	83	82	75	70	45
Sail	N	44	43	20	13	4	8	15	5	7	14	19
Manual (oars, paddle)	N	205	272	182	140	148	109	150	151	114	137	144
Other	N	29	14	5	12	8	8	10	0	N	N	N
Propulsion unknown	N	219	265	76	135	122	159	121	104	115	37	145

KEY: N = data do not exist; R = revised; U = data are not available.

^a The international water freight operating revenues data was revised in *Transportation in America 1998* for all years except 1994 and 1996. Therefore, the international water freight data for years 1994 and 1996 may not be comparable to other years.

^b Revenues paid by American travelers to U.S. and foreign flag carriers.

^c Does not include vessel operators whose primary area of operation is fishing, towing, passenger transport, ferrying, or crew boat utility service.

^d Includes commercial port, marina, and other employees; excludes employees of not-for-hire private businesses.

^e Estimate based on established active jobs for licensed and unlicensed personnel aboard oceangoing ships of 1,000 gross-tons and over, privately owned and operated, government-owned ships under bare boat charters, ship managers and General Agency Agreement, supplemented by Military Sealift Command employment totals for ships with Civil Service crews.

^f Data is current as of January 1 of the following year with the exception of 1999 data, which is current as of Apr. 1, 1999. Due to a change in the source's periodicity, the data for 1999 is not comparable to the data from years prior to 1999.

^g The U.S. Coast Guard changed its methodology for counting the number of recreational boats. Figures cited represent number of numbered boats, not estimates as previously noted for 1960 and 1970.

^h Does not include intraterritorial traffic (traffic between ports in Puerto Rico and the Virgin Islands, which are considered a single unit).

ⁱ 1992-2001 data come from the Marine Safety Management Information System. Data for prior years may not be directly comparable. Beginning in 2000, numbers may not add to totals because data is now recorded in a new information system known as MISLE, which does not associate every fatality and injury with a specific vessel.

^j Mobile Offshore Drilling Units.

SOURCES

Unless otherwise noted, refer to chapter tables for sources.

¹ Eno Transportation Foundation Inc., *Transportation in America, 2002* (Washington, DC: 2002), pp. 38, 40, 51, and 58.

² U.S. Department of Commerce, National Marine Fisheries Services, *Fisheries of the United States* (Washington, DC: Annual issues), p. 4 and similar tables in earlier editions.

³ U.S. Department of Transportation, Maritime Administration, MAR-450, personal communication.

⁴ 1960-1990: U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours and Earnings, United States, 1909-1994* (Washington, DC: September 1994) and *1988-1996* (Washington, DC: August 1996), SICs 373 and 44. 1994-2001: *Ibid.*, Internet website <http://www.bls.gov> as of May 2003.

⁵ U.S. Department of Transportation, Maritime Administration, *U.S. Merchant Marine Data Sheet* (Washington, DC: Annual issues).

⁶ 1960-1998: U.S. Army Corps of Engineers, *Summary of U.S. Flag Passenger & Cargo Vessels* (New Orleans, LA: Annual issues). 1999-2001: *Ibid.*, *Waterborne Transportation Lines of the United States* (New Orleans, LA: Annual issues) part 1, section 1, table 1 and 2.

⁷ U.S. Department of Transportation, Maritime Administration, *Merchant Fleets of the World* (Washington, DC: Annual issues) and unpublished revisions.

⁸ U.S. Coast Guard, *Boating Statistics* (Washington, DC: Annual issues).

⁹ U.S. Army Corps of Engineers, *Waterborne Commerce of the United States* (New Orleans, LA: Annual issues), part 5, section 1, tables 2, 3, and 4.

¹⁰ 1970-1990: U.S. Coast Guard, Office of Investigations and Analysis, G-MAO-2, personal communication. 1994-2001: *Ibid.*, Data Administration Division (G-MRI-1), personal communication, Feb. 13, 2002 and July 2, 2003.

Oil Pipeline Profile

FINANCIAL	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Operating revenues, total (\$ millions) ¹	895	1,396	7,548	8,506	8,676	9,077	8,637	8,632	8,579	9,067	8,958	9,066	U	U
FERC-regulated	770	1,188	6,340	7,164	7,353	7,751	7,310	7,278	7,212	7,645	7,551	7,649	U	U
Nonregulated	125	208	1,208	1,342	1,323	1,326	1,327	1,354	1,367	1,422	1,407	1,417	U	U
INVENTORY														
Number of FERC-regulated companies ²	87	101	130	150	158	161	160	U	U	184	U	U	U	195
Number of employees, pipeline companies ^{a,3}	23,100	17,600	21,300	18,500	17,100	15,100	14,500	14,200	13,800	13,060	13,230	13,680	12,360	12,840
Miles of pipeline (statute miles) ^b , all lines ⁴	190,944	218,671	218,393	208,752	190,350	181,912	177,535	179,873	178,648	177,463	176,996	U	U	U
Crude lines	141,085	146,275	129,831	118,805	103,277	97,029	92,610	91,523	87,663	86,369	85,480	U	U	U
Product lines	49,859	72,396	88,562	89,947	87,073	84,883	84,925	88,350	90,985	91,094	91,516	U	U	U
PERFORMANCE														
Intercity ton-miles, total (millions) ⁵	229,000	431,000	588,200	584,100	591,400	601,100	619,200	616,500	619,800	623,000	635,500	622,800	U	U
Crude oil	N	N	362,600	334,800	322,600	335,900	338,300	337,400	334,100	336,200	U	U	U	U
Petroleum products	N	N	225,600	249,300	268,800	265,200	280,900	279,100	285,700	286,800	U	U	U	U
Tons transported (millions) ⁵	468.0	790.2	921.0	1,057.4	1,063.6	1,074.3	1,114.1	1,108.0	1,116.3	1,125.2	1,146.8	1,123.4	U	U
Average length of haul (statute miles)													U	U
Crude oil ⁶	325	300	871	812	778	797	779	781	767	766	U	U	U	U
Petroleum products ⁶	269	357	414	387	414	402	413	413	420	418	U	U	U	U
SAFETY⁷														
Fatalities	N	4	4	3	1	3	5	0	2	4	1	0	1	0
Injured persons	N	21	15	7	^c 7	11	13	5	6	20	4	10	0	5
Incidents	N	351	246	180	245	188	194	171	153	168	147	(R) 130	144	127

KEY: FERC = Federal Energy Regulatory Commission; N = data do not exist; U = data are not available.

^a Includes companies whose pipelines carry crude petroleum, petroleum products, and nonpetroleum pipeline liquids.

^b Regulated plus unregulated mileage of crude oil trunk and gathering lines, plus refined oil trunk lines.

^c Does not include the 1,851 injuries that required medical treatment, caused by severe flooding near Houston, Texas, reported for October, 1994.

NOTE

The Interstate Commerce Committee regulated oil pipelines in the 1960s and 1970s

SOURCES

¹ Eno Transportation Foundation, Inc., *Transportation In America 2002* (Washington, DC: 2002), pp. 38 and 39, and similar tables in earlier editions.

²1960-96: Federal Energy Regulatory Commission, personal communication.

1999: Ibid., Internet site www.ferc.fed.us/oil/oil_list.htm as of June 21, 2001.

2003: Ibid., Internet site www.ferc.gov/industries/oil/pipeline-list.asp as of Aug. 18, 2004.

³1960-80: U.S. Department of Labor, Bureau of Labor Statistics, *Employment, Hours and Earnings, United States, 1909-94* (Washington, DC: September 1994), SIC 46.

1990-1994: Ibid., *Hours and Earnings, United States, 1988-1996* (Washington, DC: July 1996), SIC 46.

1995-98: Ibid., Internet site www.bls.gov, SIC 46, as of Apr. 19, 1999.

1999-2001: Ibid., Internet site www.bls.gov/oes, SIC 46, as of June 30, 2003.

2002-03: Ibid., Internet site www.bls.gov/oes, NAICS 486100 and NAICS 486900, as of Aug.6, 2004.

⁴ Eno Transportation Foundation, Inc., *Transportation In America 2002* (Washington, DC: 2002), pp. 58 and 59, and similar tables in earlier editions.

⁵ 1960-70: Ibid., *Transportation in America, 1998* (Washington, DC: 1998), p. 44 and *Transportation in America, Supplement, 1999* (Washington, DC: 1999).

1980-2001: Ibid., *Transportation in America, 2002* (Washington, DC: 2002), p. 53, and similar tables in earlier editions.

⁶1960-70: Ibid., *Transportation In America 1999* (Washington, DC: 1999), p. 71.

1980-99: Ibid., *Transportation In America 2000* (Washington, DC: 2000), p. 51.

⁷ U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, available at Internet site ops.dot.gov/stats/lq_sum.htm as of Aug. 6, 2004, and earlier tables for 1970 and 1980 data.

Natural Gas Pipeline Profile

FINANCIAL (\$ millions)	1960	1970	1980	1990	1994	1995	1996	1997	1998	1999	2000	2001	2002
Transmission pipeline companies¹													
Total operating revenues	3,190	5,928	41,604	21,756	13,841	12,092	12,050	10,339	9,450	9,555	10,404	10,257	10,096
Total operating expenses ²	2,698	5,088	39,709	19,484	11,333	9,534	9,603	7,862	6,875	6,897	7,856	7,296	7,369
Operation and maintenance	2,095	4,203	36,480	17,058	8,389	6,680	6,802	5,381	4,260	4,148	5,172	4,198	4,294
Operation expenses	2,031	4,094	36,075	16,429	7,811	6,121	6,314	4,975	3,909	3,823	4,880	3,850	3,971
Maintenance expenses	64	109	405	629	578	558	488	406	351	325	292	347	322
Taxes (federal, state, local) ³	319	376	1,991	1,245	1,757	1,582	1,643	1,531	1,560	1,645	1,570	1,859	1,773
Federal taxes	223	202	1,327	768	1,172	1,048	1,085	1,076	1,035	1,109	1,029	1,249	1,243
State and local taxes	96	174	664	477	585	534	558	455	525	536	541	610	530
Distribution pipeline companies²													
Total operating revenues	N	N	14,013	18,750	20,911	19,421	30,407	30,864	28,182	28,135	34,696	(R) 39,179	31,210
Total operating expenses ²	N	N	13,263	17,125	19,025	17,402	27,917	27,445	25,668	24,564	32,103	(R) 36,450	28,266
Operation and maintenance	N	N	11,791	14,544	15,868	14,170	23,301	23,155	21,396	20,226	27,093	(R) 31,486	23,655
Operation expenses	N	N	11,539	14,020	15,279	13,575	22,433	22,388	20,710	18,270	26,271	(R) 30,776	22,902
Maintenance expenses	N	N	252	524	589	596	868	767	687	1,956	821	(R) 710	753
Taxes (federal, state, local) ³	N	N	1,136	1,625	1,931	1,888	2,668	2,415	2,524	2,355	2,916	(R) 2,908	2,437
Federal taxes	N	N	351	580	703	720	1,041	849	1,250	883	1,033	(R) 1,216	891
State and local taxes	N	N	785	1,045	1,228	1,168	1,627	1,566	1,274	1,472	1,883	(R) 1,692	1,546
Investor-owned, total industry^{c,3}													
Total operating revenues	N	N	85,918	66,027	63,446	58,435	63,600	62,660	57,548	59,142	72,075	(R) 79,276	68,594
Total operating expenses ²	N	N	81,789	60,137	56,789	50,594	56,695	55,422	51,075	51,331	64,961	(R) 71,011	59,839
Operation and maintenance	N	N	74,508	51,628	45,953	40,041	45,785	44,851	41,360	41,415	54,630	(R) 58,908	48,675
Operation expenses	N	N	73,288	49,718	43,879	37,998	43,742	43,258	39,971	38,752	53,138	(R) 57,184	47,037
Maintenance expenses	N	N	1,220	1,910	2,074	2,043	2,043	1,593	1,390	2,664	1,492	(R) 1,722	1,637
Taxes (federal, state, local) ³	N	N	4,847	4,957	6,603	5,981	6,362	6,384	5,293	5,605	6,106	(R) 7,201	5,870
Federal taxes	N	N	2,327	2,038	3,112	2,511	2,932	3,066	2,631	2,626	2,690	(R) 3,130	2,624
State and local taxes	N	N	2,520	2,919	3,491	3,470	3,430	3,318	2,662	2,979	3,416	(R) 4,071	3,246
INVENTORY													
Pipeline mileage, total⁴	630,950	913,267	1,051,774	(R) 1,189,200	(R) 1,288,400	(R) 1,277,600	(R) 1,323,600	(R) 1,331,800	(R) 1,351,200	(R) 1,340,300	(R) 1,369,300	(R) 1,373,500	1,411,381
Transmission	183,700	252,200	266,500	(R) 292,200	(R) 301,500	(R) 296,900	(R) 292,200	(R) 294,000	(R) 300,100	(R) 301,000	(R) 296,600	(R) 287,100	309,503
Distribution	391,400	594,800	701,800	(R) 864,600	(R) 955,600	(R) 949,800	(R) 1,001,800	(R) 1,003,100	(R) 1,022,100	(R) 1,007,500	(R) 1,045,600	(R) 1,066,300	1,079,565
Field and gathering	55,800	66,300	83,500	(R) 32,400	(R) 31,300	(R) 30,900	(R) 29,600	(R) 34,700	(R) 29,000	(R) 31,800	(R) 27,100	(R) 20,100	22,313
Number of employees⁵													
Gas utility industry totals	206,400	211,700	215,400	204,200	187,200	179,000	179,000	154,600	154,200	143,600	135,600	(R) 135,000	140,000
Investor-owned companies ^d , total	N	N	202,700	192,100	175,700	168,900	163,400	145,400	142,400	133,100	125,100	(R) 123,000	123,000
Transmission pipeline companies	31,400	32,400	45,200	37,400	31,000	28,000	32,300	27,500	28,400	29,400	26,400	26,000	26,000
Distribution pipeline companies	N	N	52,100	64,700	62,400	61,600	79,700	75,000	71,300	71,400	69,500	(R) 53,000	55,000
Integrated pipeline companies	N	N	53,200	39,900	39,400	36,400	12,700	12,300	12,000	6,200	6,000	5,000	6,000
Combination pipeline companies	N	N	52,200	50,100	42,900	42,900	38,700	30,600	30,700	26,100	23,200	(R) 39,000	36,000
Number of interstate natural gas pipeline companies^{e,6}													
	87	89	91	132	79	92	84	101	97	U	U	U	U
PERFORMANCE (million cubic ft.)⁷													
Marketed production, total	12,771,038	21,920,642	20,179,724	18,593,792	19,709,525	19,506,474	19,812,241	19,866,093	19,961,348	19,804,848	20,197,511	(R) 20,570,295	19,920,789
Delivered to consumers, total	10,382,681	19,018,462	18,216,233	16,818,882	18,898,635	19,660,161	20,005,508	20,781,554	(R) 20,437,798	(R) 20,680,843	(R) 21,539,964	(R) 20,495,108	21,236,462
Consumed, total	11,966,537	21,139,386	19,877,293	18,715,090	20,707,717	21,580,665	21,966,616	22,736,203	(R) 22,245,956	(R) 22,405,151	(R) 23,333,121	(R) 22,238,624	23,017,983
Gas used as a pipeline fuel, total	347,075	722,166	634,622	659,816	685,362	700,335	711,446	751,470	635,477	645,319	642,210	(R) 624,964	667,027
SAFETY⁸													
Fatalities	N	26	15	6	21	18	48	10	(R) 19	(R) 18	37	7	10
Injured persons	N	233	177	69	113	53	114	72	(R) 75	(R) 88	77	51	50
Incidents	N	1,077	1,524	198	222	161	187	175	236	(R) 172	234	(R) 210	184

KEY: N = data do not exist; R = revised; U = data are not available.

^a Does not add due to omission of line from source table for depreciation and other noncash expenses.

^b Figures obtained by addition / subtraction and may not appear directly in data source.

^c Industry total includes integrated and combination company totals in addition to distribution and transmission company totals.

^d Number of employees in investor-owned companies is the sum of employees in distribution, transmission, integrated and combination companies.

^e Beginning in 1991 the number of interstate natural gas pipeline companies is calculated using the Federal Energy Regulatory Commission's FASTR database, which contains a listing by year of pipeline companies that are regulated and, therefore, required to pay tariff duties to the federal government. Data for the years prior to 1991 were collected from the Energy Information Administration's discontinued publication *Statistics of Interstate Natural Gas Pipeline Companies*. Data from the two sources may not be comparable.

NOTES

Numbers may not add to totals due to rounding.

Gas utility industry totals include employees in privately owned companies.

SOURCES

¹ 1960-1970: American Gas Association, *Gas Facts, 1979* (Arlington, VA: 1980), table 134. 1980-2002: Ibid., *Gas Facts, 2003* (Washington, DC: 2004), table 11-2 and similar tables in earlier editions.

² 1980: American Gas Association, *Gas Facts, 1979* (Arlington, VA: 1980), table 134. 1990-2002: Ibid., *Gas Facts, 2003* (Washington, DC: 2004), table 11-1 and similar tables in earlier editions.

³ 1980-2002: American Gas Association, *Gas Facts, 2003* (Washington, DC: 2004), tables 11-1, 11-2, 11-3, and 11-4 and similar tables in earlier editions.

⁴ 1960-1970: American Gas Association, *Gas Facts, 1979* (Arlington, VA: 1980), table 44. 1980-2002: Ibid., *Gas Facts, 2003* (Washington, DC: 2004), tables 5-1, 5-3, and similar tables in earlier editions.

⁵ 1960-1980: American Gas Association, *Gas Facts, 1979* (Arlington, VA: 1980), table 153. 1990-2002: Ibid., *Gas Facts, 2003* (Washington, DC: 2004), table 13-2, and similar tables in earlier editions.

⁶ 1960-1990: U.S. Department of Energy, Energy Information Administration *Statistics of Interstate Natural Gas Pipeline Companies* (Washington, DC: Annual issues), preface. 1991-1998: Federal Energy Regulatory Commission *FERC Automated System for Tariff Retrieval* (FASTR database), Internet website <http://www.ferc.gov/industries/gas/gen-info/fastr/index.asp> as of Feb. 18, 2004.

⁷ 1960-1995: U.S. Department of Energy, Energy Information Administration *Natural Gas Annual, 1998* (Washington, DC: October 1999), table 98. 1996-2002: Ibid., *Natural Gas Annual, 2002*, (Washington, DC: 2004), table 1.

⁸ U.S. Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety, DPS-35, Internet website <http://ops.dot.gov/stats.htm> as of July 12, 2004.

Metric Conversion Tables

Table 1-1M: System Kilometers Within the United States (Statute kilometers)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Highway ^a	5,706,240	5,937,942	6,002,985	6,176,897	6,211,806	6,218,364	6,223,214	6,250,563	6,278,181	6,284,828	6,287,055	6,296,117	6,308,068	6,350,265	6,286,564	6,304,192	6,334,735	6,354,229	6,383,439
Class I rail ^{b,c}	333,672	321,544	316,202	308,222	265,255	234,584	192,732	187,691	181,946	177,712	175,953	174,234	170,235	164,359	161,852	160,017	159,727	157,421	161,136
Amtrak ^c	N	N	N	N	N	38,624	38,624	40,234	40,234	40,234	40,234	38,624	40,234	40,234	35,406	37,015	37,015	37,015	37,015
Transit ^d																			
Commuter rail ^e	N	N	N	N	N	5,752	6,649	6,498	6,457	6,583	6,583	6,695	5,926	7,108	8,324	8,354	8,383	8,382	7,145
Heavy rail	N	N	N	N	N	2,081	2,174	2,203	2,258	2,336	2,342	2,346	2,379	2,457	2,457	2,478	2,507	2,530	2,530
Light rail	N	N	N	N	N	618	777	887	898	865	904	913	1,027	1,061	1,088	1,291	1,343	1,444	1,518
Navigable channels ^g	40,234	40,234	41,843	41,843	41,843	41,843	41,843	41,843	41,843	41,843	41,843	41,843	41,843	41,843	41,843	41,843	41,843	41,843	41,843
Oil pipeline ^f	307,295	339,358	351,917	363,533	351,469	343,764	335,954	328,029	316,309	312,181	306,339	292,759	285,715	289,478	287,506	285,599	284,847	U	U
Gas pipeline ^g	1,015,416	1,235,204	1,469,761	1,575,971	1,692,666	1,800,655	(R) 1,913,832	(R) 1,944,409	(R) 1,957,123	(R) 2,055,454	(R) 2,073,479	(R) 2,056,098	(R) 2,130,128	(R) 2,143,324	(R) 2,174,546	(R) 2,157,004	(R) 2,203,675	(R) 2,210,434	2,271,398

KEY: N = data do not exist; R = revised; U = data are not available.

^a All public road and street mileage in the 50 states and the District of Columbia. For years prior to 1980, some miles of nonpublic roadways are included. No consistent data on private road mileage are available. Beginning in 1998, approximately 43,000 miles of Bureau of Land Management Roads are excluded.

^b Data represent miles of road owned (aggregate length of road, excluding yard tracks, sidings, and parallel lines).

^c Portions of Class I freight railroads, Amtrak, and commuter rail networks share common trackage. Amtrak data represent miles of track operated.

^d Transit system mileage is measured in directional route-miles. A directional route-mile is the mileage in each direction over which public transportation vehicles travel while in revenue service. Directional route-miles are computed with regard to direction of service, but without regard to the number of traffic lanes or rail tracks existing in the right-of-way.

^e These are estimated sums of all domestic waterways which include rivers, bays, channels, and the inner route of the Southeast Alaskan Islands, but does not include the Great Lakes or deep ocean traffic. The Waterborne Commerce Statistics Center monitored 12,612 miles as commercially significant inland shallow-draft waterways in 2001.

^f Includes trunk and gathering lines for crude-oil pipeline.

^g Excludes service pipelines. Data not adjusted to common diameter equivalent. Mileage as of the end of each year. Includes gathering, transmission, and distribution mains. Prior to 1990 data also include field lines. See table 1-10 for a more detailed breakout of oil and gas pipeline mileage. In the past, mileage data reported in *Gas Facts* was taken from the American Gas Association's member survey, the Uniform Statistical Report, supplemented with estimates for companies that did not participate. For 2002 and revised data back to 1990, *Gas Facts* mileage data is now based on information reported to the U.S. Department of Transportation on Form 7100.

NOTE

1.609344 kilometers = 1 mile.

SOURCES

Highway:

1960-95: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: Annual issues), table HM-212.

1996-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table HM-20.

Class I rail:

1960-2002: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), p. 45, and similar tables in earlier editions.

Amtrak:

1980: Amtrak, Corporate Planning and Development, personal communication (Washington, DC).

1985-2001: Amtrak, Corporate Planning and Development, *Amtrak Annual Report, Statistical Appendix* (Washington, DC: Annual issues).

2002: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), p. 77.

Transit:

1985-2002: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: Annual issues), table 23 and similar tables in earlier editions.

Navigable channels:

1960-96: U.S. Army Corps of Engineers, Ohio River Division, Huntington District, *Ohio River Navigation System Report, 1996, Commerce on the Ohio River and its Tributaries* (Fort Belvoir, VA: 1996), p. 2.

1997-99: Ibid., Waterborne Commerce Statistics Center Databases, personal communication, Aug. 3, 2001.

2000-02: Ibid., personal communication, Aug. 12, 2003 and July 23, 2004.

Oil pipeline:

1960-2000: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 58.

Gas pipeline:

1960-2002: American Gas Association, *Gas Facts* (Arlington, VA: Annual issues), tables 5-1 and 5-3 and similar tables in earlier editions.

Table 1-6M: Estimated U.S. Roadway Lane-Kilometers by Functional System^a

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	^d 1998	1999	2000	2001
TOTAL lane-kilometers	12,749,503	12,903,711	12,956,959	13,016,041	13,074,455	13,087,501	13,104,911	13,129,436	13,162,268	13,264,917	13,133,628	13,161,188	13,234,268	13,280,060
Urban, total	2,245,429	2,482,154	2,688,403	2,708,127	2,830,403	2,902,894	2,938,464	2,961,365	2,989,596	3,029,873	3,044,248	3,051,294	3,082,183	3,165,655
Interstates	77,986	92,207	100,124	101,109	108,254	111,341	113,993	114,870	115,535	116,286	117,492	117,954	118,955	119,837
Other arterials ^b	536,995	598,111	642,733	647,536	673,041	700,686	712,093	717,491	723,368	730,035	730,739	724,866	733,631	736,383
Collectors	233,561	261,320	270,000	266,005	283,465	289,123	295,078	297,780	300,823	303,925	301,805	299,876	303,471	305,032
Local	1,396,888	1,530,515	1,675,546	1,693,477	1,765,643	1,801,744	1,817,300	1,831,224	1,849,870	1,879,627	1,894,212	1,908,598	1,926,127	2,004,404
Rural, total	10,504,074	10,421,557	10,268,556	10,307,914	10,244,052	10,184,606	10,166,447	10,168,070	10,172,671	10,235,043	10,089,380	10,109,894	10,152,085	10,114,405
Interstates	210,792	212,284	218,663	219,680	214,794	212,655	211,252	212,298	213,983	214,308	214,415	215,971	216,597	216,679
Other arterials ^b	816,095	820,773	832,581	833,339	847,664	846,364	852,659	854,089	857,549	864,200	865,816	867,908	868,914	872,807
Collectors ^c	2,303,401	2,360,568	2,361,876	2,361,810	2,319,815	2,308,561	2,304,885	2,281,129	2,279,896	2,283,075	2,278,467	2,275,537	2,276,683	2,275,862
Local	7,173,786	7,027,931	6,855,435	6,893,084	6,861,779	6,817,027	6,797,650	6,820,554	6,821,243	6,873,460	6,730,682	6,750,479	6,789,892	6,749,058

^a Includes the 50 States and the District of Columbia.

^b For urban: the sum of other freeways and expressways, other principal arterials, and minor arterials. For rural: the sum of other principal arterials and minor arterials.

^c Includes minor and major collectors.

^d Beginning in 1998, approximately 138,400 lane-kilometers of Bureau of Land Management roads are excluded.

NOTES

In estimating rural and urban lane kilometers, the U.S. Department of Transportation, Federal Highway Administration assumed that rural minor collectors and urban/rural local roads are two lanes wide.

1.609344 kilometers = 1 mile.

SOURCES

1980-95: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, table HM-260 (unpublished).

1996-2001: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table HM-60. Internet address www.fhwa.dot.gov/ohim.ohimstat.htm as of December 2002.

Table 1-32M: U.S. Vehicle-Kilometers (Millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Air																			
Air carrier, large certificated, domestic, all services	1,381	1,825	3,328	3,135	4,060	4,902	6,378	6,202	6,429	6,690	7,049	7,450	7,743	7,903	8,103	8,582	9,115	(R) 9,039	9,793
General aviation ^a	2,847	4,123	5,161	6,820	8,375	7,520	7,319	7,081	5,576	5,235	5,404	6,107	5,671	6,239	N	N	N	N	N
Highway^b, total	1,156,735	1,428,795	1,785,928	2,136,668	2,457,943	2,856,306	3,451,016	3,495,576	3,616,439	3,695,662	3,794,170	3,898,951	4,000,585	4,122,648	4,235,024	4,330,835	4,420,747	(R) 4,501,797	4,595,894
Passenger car ^{b,c}	944,704	1,163,066	1,475,286	1,663,981	1,788,940	2,006,527	2,266,384	2,185,787	2,207,326	2,212,380	2,262,881	2,314,710	2,365,501	2,418,129	2,493,802	2,525,222	2,575,412	(R) 2,620,546	2,669,322
Motorcycle ^c	h	h	4,794	9,059	16,438	14,622	15,381	14,771	15,381	15,942	16,480	15,767	15,965	16,224	16,549	17,033	16,848	(R) 15,512	15,374
Other 2-axle 4-tire vehicle ^b	h	h	198,410	322,995	468,214	629,191	924,682	1,045,098	1,137,586	1,200,168	1,230,559	1,271,428	1,314,094	1,369,132	1,397,353	1,450,054	1,485,519	(R) 1,517,945	1,554,922
Truck, single-unit 2-axle 6-tire or more	158,602	207,234	43,583	55,693	64,073	73,130	83,527	85,131	86,702	91,366	98,627	100,914	103,114	107,654	109,469	113,143	113,459	(R) 116,594	122,128
Truck, combination	46,436	50,960	56,543	75,195	110,527	125,630	151,827	155,535	160,146	165,949	175,309	185,800	191,349	200,499	206,574	213,051	217,294	(R) 219,811	223,124
Bus	6,994	7,533	7,313	9,745	9,751	7,207	9,215	9,254	9,299	9,857	10,314	10,332	10,562	11,011	11,277	12,331	12,215	(R) 11,389	11,022
Transit^d, total	3,449	3,232	3,030	3,502	3,681	4,492	5,217	5,321	5,399	5,528	5,580	5,713	5,875	6,028	6,105	6,393	6,568	6,753	(P) 6,883
Motor bus ^e	2,537	2,460	2,268	2,456	2,699	2,998	3,428	3,487	3,505	3,556	3,479	3,514	3,574	3,612	3,500	3,663	3,726	3,825	(P) 3,880
Light rail	120	67	54	38	28	27	39	44	46	45	55	56	61	66	70	78	85	87	(P) 98
Heavy rail	629	636	655	681	619	725	864	848	846	840	856	865	874	898	910	930	958	979	(P) 999
Trolley bus	162	69	53	25	21	25	22	22	22	21	22	22	22	23	22	23	24	21	(P) 22
Commuter rail	N	N	N	278	288	295	342	346	352	360	371	383	389	403	418	428	436	446	(P) 457
Demand responsive ^e	N	N	N	N	N	398	492	539	585	653	746	815	882	942	1,080	1,156	1,221	1,270	(P) 1,292
Ferry boat	N	N	N	N	i	i	4	4	4	4	3	5	4	5	5	5	5	5	(P) 5
Other	N	N	N	24	25	24	26	31	39	48	47	55	69	80	101	111	114	121	(P) 129
Rail																			
Class I freight, train-kilometers	650	678	687	649	689	558	612	604	628	653	710	737	754	764	764	789	811	804	804
Class I freight, car-kilometers	45,335	47,212	48,103	44,508	47,117	40,105	42,099	41,244	42,049	43,264	45,842	48,897	51,040	50,952	52,556	54,478	55,667	55,109	55,812
Intercity/Amtrak ^f , train-kilometers	336	277	150	48	48	48	53	55	55	56	55	51	48	51	53	55	56	58	61
Intercity/Amtrak ^f , car-kilometers	3,554	2,857	1,110	407	378	404	484	504	494	488	489	470	444	463	502	550	592	608	609
Total train-kilometers^g	987	954	837	697	737	607	665	658	682	709	764	789	803	816	818	843	867	862	865

KEY: N = data do not exist; P = preliminary; R = revised.

^a All operations other than those operating under 14 CFR 121 and 14 CFR 135. Data for 1996 are estimated using new information on nonrespondents and are not comparable to earlier years. Mileage in source is multiplied by 1.151 to convert to nautical-miles for 1985-1997. These numbers were then converted to kilometers.

^b In July 1997, the FHWA published revised vehicle-kilometers data for the highway modes for many years. The major change reflected the reassignment of some vehicles from the passenger car category to the other 2-axle 4-tire vehicle category. This category was calculated prior to rounding.

^c U.S. Department of Transportation, Federal Highway Administration (FHWA), provides data separately for passenger car and motorcycle in its annual *Highway Statistics* series. However, the 1995 summary report provides updated data for passenger car and motorcycle combined. Passenger car figures in this table were computed by U.S. Department of Transportation, Bureau of Transportation Statistics, by subtracting the most current motorcycle figures from the aggregate passenger car and motorcycle figures.

^d Prior to 1985, excludes demand responsive and most rural and smaller systems funded via Sections 18 and 16(b)2, Federal Transit Act. The series is not continuous between 1980 and 1985. Transit rail modes are measured in car-kilometers. Car-kilometers measure individual vehicle-kilometers in a train. A 10-car train traveling 1 kilometer would equal 1 train-kilometer and 10 car-kilometers.

^e Motor bus and demand responsive figures are also included in the bus figure for highway.

^f Amtrak began operations in 1971.

^g Although both train-kilometers and car-kilometers are shown for rail, only train-kilometers are included in the total. A train-kilometer is the movement of a train, which can consist of multiple vehicles (cars), the distance of 1 kilometer. This differs from a vehicle-kilometer, which is the movement of 1 vehicle the distance of 1 kilometer. A 10-vehicle train traveling 1 kilometer would be measured as 1 train-kilometer and 10 vehicle-kilometers. Caution should be used when comparing train-kilometers with vehicle kilometers.

^h 1960-65, motorcycle data are included in passenger car, and other 2-axle 4-tire vehicle data included in single-unit 2-axle 6-tire or more truck.

ⁱ Ferry boat included with other.

NOTE

1.609344 kilometers = 1 mile.

SOURCES

Air:

Air carrier:

- 1960: Civil Aeronautics Board, *Handbook of Airline Statistics 1969* (Washington, DC: 1970), part III, table 2.
1965-70: *Ibid.*, *Handbook of Airline Statistics 1973* (Washington, DC: 1974), part III, table 2.
1975-80: *Ibid.*, *Air Carrier Traffic Statistics* (Washington, DC: 1976, 1981), p. 4 (December 1976) and p. 2 (December 1981).
1985-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), p. 3, line 25 plus line 46.

General aviation:

- 1960-65: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation 1972* (Washington, DC: 1973), table 9.10.
1970-75: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation 1976* (Washington, DC: 1976), table 8-5.
1980: U.S. National Transportation Safety Board estimate, personal communication, Dec. 7, 1998.
1985-92: *Ibid.*, *General Aviation Activity and Avionics Survey* (Washington, DC: Annual issues.) table 3.3.
1993-97: *Ibid.*, *General Aviation and Air Taxi Activity and Avionics Survey* (Washington, DC: Annual issues), table 3.3.

Highway:

Passenger car and motorcycle:

- 1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site <http://www.fhwa.dot.gov/ohim/summary95/index.html>, as of July 28, 2000, table VM-201A.
1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Motorcycle:

- 1970-80: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1985* (Washington, DC: 1986), table VM-201A.

- 1985-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Other 2-axle 4-tire vehicle:

- 1970-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site <http://www.fhwa.dot.gov/ohim/summary95/index.html>, as of July 28, 2000, table VM-201A.
1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Single-unit 2-axle 6-tires or more truck, combination truck, and bus:

- 1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site <http://www.fhwa.dot.gov/ohim/summary95/index.html>, as of July 28, 2000, table VM-201A.
1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Transit:

- 1960-2002: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: 2004), table 18, 103, and similar tables in earlier editions.

Rail:

Class I rail freight train- and car-miles:

- 1960-2002: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), p. 33 (train-miles) and p. 34 (car-miles).

Intercity/Amtrak train-miles:

- 1960-70: Association of American Railroads, *Yearbook of Railroad Facts* (Washington, DC: 1975), p. 39.
1975-2001: Amtrak, *Amtrak Annual Report*, Statistical Appendix (Washington, DC: Annual issues).

Intercity/Amtrak car-miles:

- 1960-75: Association of American Railroads, *Yearbook of Railroad Facts* (Washington, DC: 1975), p. 40.
1980-2000: Amtrak, Amtrak Corporate Reporting, Route Profitability System, personal communication, 2001.
2001-02: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: 2003), p. 77.

TABLE 1-33M: Roadway Vehicle-Kilometers Traveled (VKT) and VKT per Lane-Kilometer by Functional Class

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Urban VKT, total (millions)	1,376,416	1,680,313	2,052,693	2,073,635	2,193,623	2,268,647	2,332,337	2,397,173	2,452,457	2,499,240	2,567,901	2,619,397	(R) 2,677,583	2,697,870	2,780,296
Interstate	259,494	347,921	448,848	459,186	488,058	510,804	532,012	549,636	565,812	581,670	602,896	616,796	(R) 633,221	643,561	657,607
Other arterials ^a	779,227	930,635	1,125,306	1,138,640	1,199,956	1,245,597	1,284,094	1,311,889	1,343,196	1,362,514	1,388,857	1,413,250	(R) 1,449,040	1,470,499	1,508,530
Collector	133,645	144,162	171,068	172,652	186,789	189,721	193,263	204,272	208,104	209,450	212,281	211,794	(R) 217,860	221,964	228,324
Local	204,050	257,595	307,470	303,157	318,821	322,525	322,968	331,375	335,345	345,607	363,868	377,557	(R) 377,462	361,847	385,835
Rural VKT, total (millions)	1,081,527	1,175,993	1,398,324	1,421,941	1,422,816	1,427,015	1,461,833	1,501,983	1,545,282	1,608,180	1,661,693	1,710,126	(R) 1,743,164	1,778,459	1,815,598
Interstate	217,397	248,414	322,147	329,933	330,812	335,239	346,923	359,498	374,277	386,653	404,782	418,697	(R) 431,594	440,999	450,555
Other arterials ^a	422,894	455,127	532,477	538,736	553,714	562,574	575,065	593,196	609,695	630,955	649,345	665,174	(R) 676,888	687,101	698,141
Collector ^b	304,919	332,602	386,983	395,303	378,051	364,188	371,000	380,043	387,900	408,934	414,998	425,596	(R) 430,067	436,071	442,581
Local	136,318	139,850	156,716	157,968	160,239	165,014	168,844	169,245	173,410	181,639	192,568	200,659	(R) 204,615	214,287	224,320
Urban VKT per lane-kilometer, total (thousands)	987	1,089	1,229	1,233	1,247	1,259	1,278	1,304	1,320	1,327	1,358	1,382	1,398	1,372	1,386
Interstate	5,355	6,072	7,215	7,310	7,255	7,384	7,511	7,699	7,881	8,050	8,258	8,415	(R) 8,567	8,643	8,756
Other arterials ^a	2,335	2,504	2,818	2,829	2,869	2,861	2,902	2,943	2,988	3,004	3,059	3,138	(R) 3,176	3,214	3,259
Collector	921	888	1,020	1,044	1,061	1,056	1,054	1,104	1,113	1,109	1,132	1,137	1,155	1,171	1,196
Local	235	271	295	288	291	288	286	291	292	296	309	318	(R) 315	291	302
Rural VKT per lane-kilometer, total (thousands)	166	182	219	222	224	225	232	238	244	253	265	272	276	283	289
Interstate	1,660	1,883	2,371	2,417	2,478	2,536	2,643	2,725	2,815	2,904	3,038	3,120	(R) 3,207	3,275	3,348
Other arterials ^a	834	892	1,029	1,040	1,051	1,070	1,085	1,118	1,144	1,175	1,207	1,233	(R) 1,252	1,267	1,283
Collector ^b	213	227	264	269	262	254	259	268	274	288	293	301	304	308	314
Local	31	32	37	37	37	39	40	40	41	43	46	48	48	51	53

KEY: R = revised.

^a For urban: the sum of other freeways and expressways, other principal arterials, and minor arterials.

For rural: the sum of other principal arterials and minor arterials.

^b Collector is the sum of major and minor collectors (rural only).

NOTES

See table 1-6 for estimated highway lane-kilometers by functional class.

1.609344 kilometers = 1 mile.

SOURCES

1980-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-

1995-2002: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table VM-2 and VM-2A.

Lane-kilometers:

1980-95: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, unpublished data, 1997, table HM-260.

1996-2002: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table HM-60.

Table 1-35M: Average Length of Haul, Domestic Freight and Passenger Modes (Kilometers)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Freight																			
Air carrier	1,534	1,518	1,632	1,741	1,693	1,862	2,235	2,166	2,239	2,168	1,965	1,867	1,901	1,733	1,735	1,611	1,580	1,566	U
Truck ^a	438	417	423	460	584	589	629	641	660	655	631	669	686	700	711	737	761	781	U
Class I rail	742	810	829	871	991	1,070	1,168	1,209	1,228	1,278	1,315	1,357	1,355	1,370	1,344	1,344	1,357	1,382	1,373
Coastwise (water)	2,408	2,416	2,429	2,192	3,082	3,174	2,581	2,744	2,836	2,655	2,659	2,659	2,456	2,140	2,029	2,058	2,013	1,976	1,961
Lakewise (water)	840	795	814	853	863	843	890	861	835	827	818	827	818	816	813	806	814	819	851
Internal (water)	454	478	531	576	652	700	756	777	771	753	776	795	768	750	760	785	775	766	777
Intraport (water)	U	U	U	26	27	24	21	21	19	19	26	26	27	24	24	24	25	24	24
Crude (oil pipeline)	523	515	483	1,019	1,402	1,250	1,307	1,323	1,336	1,271	1,252	1,283	1,254	1,257	1,234	1,233	U	U	U
Petroleum products (oil pipeline)	433	539	575	830	666	629	623	610	610	653	666	647	665	665	676	673	U	U	U
Passenger																			
Air carrier, domestic, scheduled	938	988	1,091	1,123	1,184	1,220	1,292	1,297	1,297	1,286	1,267	1,273	1,291	1,315	1,307	1,326	1,340 (R)	1,368	1,355
Bus, intercity	127	151	171	182	201	195	227	230	219	222	222	225	230	232	232	230	230	U	U
Commuter rail	33	34	36	37	37	38	35	37	37	35	34	39	39	37	37	37	37	37	37
Amtrak ^b	N	N	N	380	348	372	439	459	460	451	449	431	412	412	404	399	393	381	U

KEY: N = data do not exist; R = revised; U = data are not available.

^a Total Class I and Class II motor carriers of freight (less-than-truckload, specialized carrier for truckload, and others).

^b Amtrak began operations in 1971. Data are reported for fiscal years.

NOTES

Average length of haul for freight is calculated by dividing ton-miles in table 1-46 by estimates of tonnage from the various data sources. The calculation of average length of haul for passenger trips varies by mode: for air carrier it is calculated by dividing revenue passenger-miles by revenue passenger enplanements; for commuter rail, intercity bus, and Amtrak it is calculated by dividing passenger-miles by number of passengers. These numbers were then converted to kilometers.

1.609344 kilometers = 1 mile.

SOURCES

Freight:

Air carrier, truck:

Eno Transportation Foundation, Inc., *Transportation In America, 2002* (Washington, DC: 2002), p. 65.

Class I rail:

Association of American Railroads, *Railroad Facts* (Washington, DC: 2003), p. 36.

Water:

U.S. Army Corps of Engineers, *Waterborne Commerce of the United States, Part 5* (New Orleans, LA: Annual issues), section 1, table 1-4.

Oil pipeline:

1960-70: Transportation Policy Associates, Washington, DC, personal communication.

1975-99: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 65.

Passenger:

Air carrier:

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues), p. 3, line 34.

Intercity bus:

Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 64.

Commuter Rail:

1960-2000: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 64.

2001-02: U.S. Department of Transportation, Federal Transit Administration, *National Transit Database* (Washington, DC: annual issues), table 19 and similar tables in earlier editions.

Amtrak:

1970-85: Amtrak, corporate communication, Jan. 26, 1999.

1990-2001: Amtrak, *Amtrak Annual Report* (Washington, DC: 2003), Statistical Appendix.

Table 1-37M: U.S. Passenger-Kilometers (Millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Air, total	53,750	92,740	189,166	237,217	352,556	466,929	577,550	563,568	588,318	598,885	640,839	667,376	718,817	745,307	766,630	^R 808,626	^R 855,091	808,469
Air carrier, certificated, domestic, all services	50,049	85,659	174,520	218,871	328,898	447,134	556,629	544,095	570,937	582,953	625,068	649,995	699,505	725,190	745,548	785,934	830,629	782,880
General aviation ^a	3,701	7,081	14,645	18,347	23,657	19,795	20,921	19,473	17,381	15,933	15,772	17,381	19,312	20,117	21,082	^R 22,692	^R 24,462	25,589
Highway, total^c	2,047,212	2,502,912	3,286,284	3,870,399	4,270,411	4,848,878	5,731,210	5,794,157	5,950,903	6,064,114	6,175,877	6,225,055	6,386,498	6,581,197	6,760,267	6,927,051	^R 7,065,142	7,133,139
Passenger car ^{b,c}	1,842,173	2,244,718	2,817,796	3,144,925	3,237,982	3,370,965	3,671,543	3,540,975	3,553,795	3,561,931	3,620,609	3,680,388	3,761,146	3,844,827	3,965,147	4,015,104	^R 4,094,907	4,143,871
Motorcycle ^{b,c}	g	g	5,274	9,965	19,725	19,009	19,995	18,759	19,226	19,609	19,940	17,344	17,561	17,846	18,203	18,736	^R 18,533	16,869
Other 2-axle 4-tire vehicle ^c	h	h	363,090	584,622	838,104	1,107,376	1,608,947	1,797,569	1,933,896	2,016,283	2,042,728	2,021,571	2,089,410	2,176,919	2,221,791	2,305,586	^R 2,361,976	2,399,796
Truck, single-unit 2-axle 6-tire or more	158,602	207,234	43,583	55,693	64,073	73,130	83,527	85,131	86,702	91,366	98,627	100,914	103,114	107,654	109,469	113,143	^R 113,459	116,333
Truck, combination	46,436	50,960	56,543	75,195	110,527	125,630	151,827	155,535	160,146	165,949	175,309	185,800	191,349	200,499	206,574	213,051	^R 217,294	217,905
Bus ^d	N	N	N	N	N	152,767	195,371	196,189	197,138	208,977	218,663	219,038	223,918	233,451	239,081	261,430	^R 258,974	238,365
Transit, total^e	ⁱ 6,754	ⁱ 6,643	ⁱ 7,390	ⁱ 7,263	ⁱ 64,139	ⁱ 63,699	ⁱ 66,213	ⁱ 65,505	ⁱ 64,762	ⁱ 63,382	ⁱ 63,706	ⁱ 64,065	ⁱ 66,591	ⁱ 68,138	ⁱ 71,017	ⁱ 73,800	ⁱ 76,711	^P 78,971
Motor bus ^d	N	N	N	N	35,068	34,055	33,766	33,941	32,728	32,584	30,307	30,285	30,732	31,550	32,766	34,126	34,184	^P 35,441
Light rail	N	N	N	N	613	563	919	1,065	1,128	1,135	1,341	1,384	1,540	1,666	1,815	1,941	2,182	^P 2,313
Heavy rail	N	N	N	N	16,991	16,781	18,467	16,943	17,280	16,465	17,168	16,993	18,556	19,402	19,769	20,764	22,280	^P 22,817
Trolley bus	N	N	N	N	352	492	311	314	320	303	301	301	296	304	293	299	309	^P 301
Commuter rail	6,754	6,643	7,390	7,263	10,486	10,515	11,397	11,819	11,780	11,169	12,868	13,267	13,440	12,936	14,008	14,108	15,131	^P 15,366
Demand responsive ^d	N	N	N	N	N	586	694	731	797	904	929	977	1,056	1,213	1,183	1,308	1,350	^P 1,376
Ferry boat	N	N	N	N	j	j	460	454	436	418	418	418	426	473	473	499	531	^P 523
Other	N	N	N	N	628	707	200	238	293	404	373	439	546	594	710	755	744	^P 834
Rail																		
Intercity / Amtrak ^f	27,462	21,340	9,944	6,326	7,247	7,765	9,748	10,095	9,803	9,976	9,529	8,924	8,127	8,314	8,536	8,578	8,848	8,946

KEY: N = data do not exist; P = preliminary; R = revised.

^a All operations other than those operating under 14 CFR 121 and 14 CFR 135.

^b U.S. Department of Transportation, Federal Highway Administration (FHWA), provides data separately for passenger car and motorcycle in its annual *Highway Statistics* series. However, the 1995 summary report provides updated data for passenger car and motorcycle combined. Passenger car figures in this table were computed by U.S. Department of Transportation, Bureau of Transportation Statistics by subtracting the most current motorcycle figures from the aggregate passenger car and motorcycle figures.

^c In July 1997, FHWA published revised passenger-kilometers data for the highway modes for a number of years. The major change reflected the reassignment of some vehicles from the passenger car category to the other 2-axle 4-tire vehicle category. Passenger-kilometers for passenger car, motorcycle, and other 2-axle 4-tire vehicles were derived by multiplying vehicle-kilometers for these vehicles by average vehicle occupancy rates, provided by the Nationwide Personal Transportation Survey, 1977, 1983, and 1995.

^d Motor bus and demand responsive figures are also included in the bus figure for highway.

^e Prior to 1985, excludes demand responsive and most rural and smaller systems funded via Sections 18 and 16(b)2, Federal Transit Act. The series is not continuous between 1980 and 1985. Transit rail modes are measured in car-kilometers. Car-kilometers measure individual vehicle-kilometers in a train. A 10-car train traveling 1 kilometer would equal 1 train-kilometer and 10 car-kilometers.

^f Amtrak began operations in 1971. Does not include contract commuter passengers.

^g Included in passenger car.

^h Included in other single-unit 2-axle 6-tire or more truck.

ⁱ Includes commuter rail figures only.

^j Ferryboat included in other.

NOTES

Air carrier passenger-kilometers are computed by summing the products of the aircraft-kilometers flown on each interairport segment multiplied by the number of passengers carried on that segment. Highway passenger-kilometers from 1960 to 1994 are calculated by multiplying vehicle-kilometers of travel as cited by FHWA by the average number of occupants for each vehicle type. Average vehicle occupancy rates are based on various sources, such as the Nationwide Personal Transportation Survey, conducted by the Federal Highway Administration, and the Truck Inventory and Use Survey, conducted by the Bureau of the Census. Transit passenger-kilometers are the cumulative sum of the distances ridden by each passenger. Rail passenger-kilometers represent the movement of 1 passenger for 1 kilometer.

1.609344 kilometers = 1 mile.

SOURCES

Air:

Air carrier, domestic, all services:

- 1960: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969* (Washington, DC: 1970), part III, table 2.
1965-70: Ibid., *Handbook of Airline Statistics, 1973* (Washington, DC: 1974), part III, table 2.
1975-80: Ibid., *Air Carrier Traffic Statistics* (Washington, DC: 1976, 1981), p. 4 (December 1976) and p. 2 (December 1981).
1985-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual December issues), page 2, line 1.

General aviation:

- 1960-2001: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), pp. 45-46.

Highway:

Passenger car and motorcycle:

- 1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site <http://www.fhwa.dot.gov/ohim/summary95/index.html> as of July 28, 2000, table VM-201A.
1995-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1 and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Motorcycle:

- 1970-80: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1985* (Washington, DC: 1986), table VM-201A.
1985-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1 and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Other 2-axle 4-tire vehicle:

- 1970-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site <http://www.fhwa.dot.gov/ohim/summary95/index.html> as of July 28, 2000, table VM-201A.
1995-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1 and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Single-unit 2-axle 6-tires or more truck, combination truck, and bus:

- 1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, Internet site <http://www.fhwa.dot.gov/ohim/summary95/index.html> as of July 28, 2000, table VM-201A.
1995-2001: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1, and Internet site www.fhwa.dot.gov/ohim/ohimstat.htm.

Transit:

Ferryboat:

- 1992: American Public Transit Association, personal communication, July 19, 2000.
1996-99: American Public Transit Association, personal communication, Aug. 13, 2001.
2000-01: Ibid., *Public Transportation Fact Book* (Washington, DC: 2003), table 100 and similar tables in earlier editions.

All other data:

- 1960-2001: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: 2002), table 6 and similar tables in earlier editions.

Rail, Intercity / Amtrak:

- 1960-80: Association of American Railroads, *Railroad Facts* (Washington, DC: Annual issues).
1985: Amtrak, *Amtrak FY95 Annual Report* Statistical Appendix (Washington, DC: 1996), p. 4.
1990-2001: Ibid., *Amtrak Annual Report* Statistical Appendix (Washington, DC: Annual issues).

Table 1-46M: U.S. Tonne-Kilometers of Freight (Millions)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	
TOTAL U.S. tonne-kilometers of freight (millions)	U	2,706,838	3,221,739	3,335,607	4,363,158	4,306,056	4,665,599	4,719,555	4,872,052	4,910,677	5,149,063	5,326,030	5,437,991	5,376,255	5,416,842	
Air carrier, domestic, all services ^a		807	1,975	3,955	5,066	6,611	7,528	13,233	12,935	14,337	15,585	17,232	18,279	18,777	19,857	20,206
Intercity truck ^b		416,092	524,130	601,508	662,827	810,284	890,583	1,073,079	1,106,659	1,189,877	1,257,036	1,325,655	1,344,634	1,419,093	1,454,132	1,499,391
Class I rail ^c		835,555	1,018,882	1,116,600	1,101,187	1,341,653	1,280,372	1,509,566	1,516,728	1,557,470	1,619,560	1,752,990	1,906,268	1,979,686	1,969,394	2,010,092
Domestic water transportation ^d	U	715,099	870,428	826,321	1,345,855	1,303,711	1,216,951	1,238,639	1,250,736	1,152,879	1,189,759	1,179,260	1,116,422	1,032,799	982,262	
Coastwise	U	441,708	525,275	461,126	921,460	892,009	699,522	733,100	733,360	654,658	668,084	642,891	595,794	510,761	459,693	
Lakewise	U	110,838	115,946	100,033	90,149	70,347	88,956	80,794	81,444	82,398	85,063	87,166	85,167	90,761	90,013	
Internal	U	160,161	227,487	263,378	331,914	339,747	426,886	423,332	434,544	414,477	434,725	447,232	433,307	429,265	430,540	
Intraport	U	2,392	1,721	1,785	2,331	1,609	1,587	1,413	1,387	1,346	1,887	1,971	2,153	2,012	2,016	
Oil pipeline ^b		334,334	446,751	629,248	740,206	858,756	823,862	852,770	844,594	859,632	865,617	863,427	877,589	904,015	900,073	904,891

KEY: P = preliminary; U = data are not available.

^a Includes freight, express, and mail revenue tonne-kilometers as reported on U.S. DOT Form 41.

^b Intercity truck and oil pipeline estimates are reported in billions. The U.S. Department of Transportation, Bureau of Transportation Statistics converted these estimates to millions.

^c Revenue tonne-kilometers.

^d Excludes intraterritorial traffic, for which tonne-kilometers were not compiled.

^e Reflects startup between 1975 and 1980 of Alaska pipeline and consequent water transportation of crude petroleum from Alaskan ports to mainland United States for refining.

NOTES

Numbers may not add to totals due to roundings.

1.459972 tonne-kilometers = 1 ton mile.

SOURCES

Air carrier, domestic, all services:

1960-65: Civil Aeronautics Board, *Handbook of Airline Statistics, 1969* (Washington, DC: 1970).

1970-80: Ibid., *Air Carrier Traffic Statistics* (Washington, DC: Annual issues), p. 2, line 3.

1985-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues), p. 3, line 3.

Intercity truck:

1960-2001: Eno Transportation Foundation, Inc., *Transportation in America, 2002* (Washington, DC: 2002), p. 42.

Class I rail:

1960-2002: Association of American Railroads, *Railroad Facts* (Washington, DC: 2001), p. 27.

Domestic water transportation:

1965-2002: U.S. Army Corps of Engineers, *Waterborne Commerce of the U.S.* (New Orleans, LA: Annual issues), part 5, section 1, table 1-4, and similar tables in earlier editions.

Oil pipeline:

1960-70: Eno Transportation Foundation, Inc., *Transportation in America, 1998* (Washington, DC: 1998), p. 44.

1975: Association of Oil Pipe Lines, *Shifts in Petroleum Transportation* (Washington, DC: Annual issues), table 4.

1980-2002: Ibid., *Shifts in Petroleum Transportation* (Washington, DC: Annual issues), table 1.

Table 1-50M: U.S. Waterborne Freight (Million metric tonnes)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL freight	997.8	1,154.8	1,389.5	1,537.7	1,813.4	1,622.4	1,963.0	1,897.9	1,934.2	1,930.7	2,009.2	2,032.5	2,072.1	2,116.6	2,122.4	2,107.0	2,199.5	(R) 2,171.2	2,123.1
Foreign	307.8	402.5	527.0	679.2	835.9	702.5	944.9	919.5	941.2	961.7	1,012.2	1,040.9	1,073.6	1,107.3	1,129.8	1,143.8	1,229.0	(R) 1,225.4	1,196.8
Imports	191.7	244.8	307.8	432.3	469.5	374.4	544.3	503.9	532.2	588.6	652.7	610.2	664.6	715.1	762.7	780.9	852.5	(R) 863.5	848.1
Exports	116.1	157.8	219.2	246.9	366.4	328.1	400.6	415.7	409.0	373.1	359.4	430.6	409.0	392.2	367.1	362.9	376.5	362.0	348.6
Domestic	690.0	752.2	862.5	858.5	977.5	920.0	1,018.1	(R) 978.4	993.0	969.0	997.0	991.6	998.5	1,009.3	992.6	963.2	970.5	945.7	926.2
Inland	264.0	335.3	428.3	457.2	485.3	485.0	564.8	544.7	563.4	550.9	561.0	562.7	564.3	572.0	567.0	566.6	570.1	562.3	551.6
Coastal	189.8	182.8	216.3	210.4	299.0	281.0	270.9	267.2	258.7	246.5	251.3	241.9	242.6	238.7	226.5	207.6	205.9	202.9	196.3
Great Lakes	140.7	139.4	142.5	117.3	104.4	83.4	99.9	93.8	97.4	99.7	104.1	105.3	104.2	111.3	110.8	103.3	103.7	90.7	92.0
Intraport	94.5	93.3	73.9	71.0	85.4	67.4	78.4	68.6	69.7	67.5	75.2	75.4	80.7	81.5	81.7	(R) 80.4	85.8	84.6	81.7
Intraterritory	0.9	1.3	1.5	2.6	3.3	3.1	4.1	4.1	3.9	4.5	5.4	6.2	6.6	5.7	6.5	5.3	5.0	5.3	4.6

KEY: R = revised.

NOTES

Beginning in 1996, shipments of fish are excluded from domestic tonnage totals.

Numbers may not add to totals due to roundings.

0.9071847 tonne = 1 ton.

SOURCE

1960-2001: U.S. Army Corps of Engineers, *Waterborne Commerce of the United States* (New Orleans, LA: February 6, 2004), part 5, tables 1-1, 1-3, and 1-6.

Table 1-55M: Crude Oil and Petroleum Products Transported in the United States by Mode (billions)

	1975		1980		1985		1990		1995		1996		1997		1998		1999		2000		2001		2002	
	Tonne-kilometers	Percent	Tonne-kilometers	Percent	Tonne-kilometers	Percent	Tonne-kilometers	Percent	Tonne-kilometers	Percent	Tonne-kilometers	Percent	Tonne-kilometers	Percent	Tonne-kilometers	Percent	Tonne-kilometers	Percent	Tonne-kilometers	Percent	Tonne-kilometers	Percent	Tonne-kilometers	Percent
Crude oil, total	484.0	100.0	1,099.4	100.0	1,147.8	100.0	917.2	100.0	855.5	100.0	793.1	100.0	710.9	100.0	663.0	100.0	617.6	100.0	548.9	100.0	549.8	100.0	560.6	100.0
Pipelines ^a	420.5	86.9	529.4	48.2	488.2	42.5	488.8	53.3	490.4	57.3	493.9	62.3	492.6	69.3	487.8	73.6	468.8	75.9	413.8	75.4	404.4	73.6	418.4	74.7
Water carriers	59.3	12.2	(c) 565.6	51.4	655.8	57.2	425.1	46.4	361.6	42.3	295.5	37.3	215.1	30.3	172.1	26.0	146.0	23.6	132.9	24.2	143.2	26.0	139.7	24.9
Motor carriers ^b	2.0	0.4	3.6	0.3	2.6	0.2	2.2	0.2	2.5	0.3	2.5	0.3	2.5	0.3	2.3	0.3	2.0	0.3	1.8	0.3	1.6	0.3	1.8	0.3
Railroads	2.2	0.5	0.7	0.1	1.2	0.1	1.0	0.1	1.2	0.1	1.2	0.1	0.7	0.1	0.7	0.1	0.7	0.1	0.6	0.1	0.6	0.1	0.7	0.1
Refined petroleum products, total	752.2	100.0	718.7	100.0	597.6	100.0	654.9	100.0	670.0	100.0	699.3	100.0	685.6	100.0	694.5	100.0	715.2	100.0	726.0	100.0	720.1	100.0	701.7	100.0
Pipelines ^a	319.7	42.5	329.4	45.8	335.6	56.2	364.0	55.6	387.2	57.8	410.1	58.6	407.5	59.4	417.1	60.1	433.0	60.5	429.1	59.1	436.7	60.6	437.4	62.3
Water carriers	375.8	50.0	336.4	46.8	206.1	34.5	230.4	35.2	223.7	33.4	225.0	32.2	216.5	31.6	214.8	30.9	215.3	30.1	224.0	30.8	213.0	29.6	192.6	27.4
Motor carriers ^b	38.3	5.1	35.5	5.0	39.3	6.6	41.2	6.3	35.9	5.3	40.9	5.9	38.0	5.5	39.0	5.6	40.3	5.6	43.9	6.1	43.4	6.0	42.9	6.1
Railroads	18.4	2.4	17.5	2.4	16.5	2.7	19.4	2.9	23.2	3.5	23.4	3.3	23.7	3.5	23.7	3.4	26.6	3.7	29.1	4.0	27.0	3.8	28.8	4.1
Combined crude and petroleum products, total	1,236.2	100.0	1,818.1	100.0	1,745.4	100.0	1,572.1	100.0	1,525.5	100.0	1,492.4	100.0	1,396.5	100.0	1,357.5	100.0	1,332.8	100.0	1,275.0	100.0	1,269.9	100.0	1,262.3	100.0
Pipelines ^a	740.2	59.9	858.8	47.2	823.9	47.2	852.8	54.2	877.6	57.5	904.0	60.6	900.1	64.5	904.9	66.7	901.8	67.7	842.8	66.1	841.1	66.2	855.8	67.8
Water carriers	435.1	35.2	(c) 902.0	49.6	862.0	49.4	655.5	41.7	585.3	38.4	520.5	34.9	431.6	30.9	386.9	28.5	361.3	27.1	356.8	28.0	356.2	28.1	332.3	26.3
Motor carriers ^b	40.3	3.3	39.1	2.2	41.9	2.4	43.4	2.8	38.4	2.5	43.4	2.9	40.4	2.9	41.3	3.0	42.3	3.2	45.7	3.6	45.0	3.5	44.7	3.5
Railroads	20.6	1.7	18.2	1.0	17.7	1.0	20.4	1.3	24.2	1.6	24.5	1.6	24.4	1.8	24.4	1.8	27.3	2.1	29.6	2.3	27.6	2.2	14.6	2.3

^a The amount carried by pipeline is based on tonne-kilometers of crude and petroleum products transported through federally regulated pipelines (84%), plus estimated tonne-kilometers of crude and petroleum products transported through nonfederally regulated pipelines (16%).

^b The amount carried by motor carriers is estimated.

^c Reflects the entrance between 1975 and 1980 of the Alaska pipeline, moving crude petroleum for water transportation to U.S. refineries.

NOTES

Numbers may not add to totals due to rounding.
1.459972 tonne-kilometers = 1 ton mile.

SOURCES

1975: Association of Oil Pipe Lines, *Shifts in Petroleum Transportation* (Washington, DC), table 6.
1980-2002: *Ibid.*, (Annual issues), tables 1, 2, and 3.

Table 4-3M: Domestic Demand for Refined Petroleum Products by Sector (Petajoules)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
TOTAL petroleum demand	21,016	24,541	31,156	34,533	36,085	32,625	(R) 35,400	34,653	35,373	35,704	36,579	36,455	37,726	38,263	38,968	40,050	40,519	40,444	(R) 40,515	41,225
Transportation	10,688	12,524	16,153	18,584	20,055	20,578	(R) 22,992	(R) 22,629	(R) 22,998	(R) 23,407	(R) 23,991	(R) 24,457	(R) 25,025	(R) 25,293	(R) 25,991	(R) 26,772	(R) 27,403	(R) 26,963	(R) 27,361	27,586
Industrial	6,067	7,164	8,219	8,595	10,049	8,235	(R) 8,762	(R) 8,490	(R) 9,090	(R) 8,860	(R) 9,276	(R) 9,023	(R) 9,484	(R) 9,721	(R) 9,513	(R) 9,795	(R) 9,554	(R) 9,728	(R) 9,759	9,936
Residential and commercial	3,682	4,083	4,547	4,015	3,203	2,661	(R) 2,296	2,270	(R) 2,239	2,253	(R) 2,195	(R) 2,180	(R) 2,355	(R) 2,270	(R) 2,084	(R) 2,204	(R) 2,355	(R) 2,407	(R) 2,382	2,431
Electric utilities	579	771	2,237	3,340	2,779	1,150	(R) 1,360	(R) 1,264	(R) 1,046	(R) 1,186	(R) 1,117	(R) 797	(R) 862	(R) 978	(R) 1,378	(R) 1,278	(R) 1,207	(R) 1,347	(R) 1,014	1,273
Transportation as percent of total petroleum demand	50.9	51.0	51.8	53.8	55.6	63.1	(R) 64.9	65.3	(R) 65.0	65.6	65.6	67.1	(R) 66.3	(R) 66.1	(R) 66.7	(R) 66.8	(R) 67.6	(R) 66.7	(R) 67.5	66.9

KEY: R = revised.

NOTE

Transportation's share of U.S. petroleum demand in this table differs slightly from table 4-1 because this table takes into account differences within sectors in the use of various grades of petroleum-based fuel that have different joule content per unit volume.
1,055.06 petajoules = 1 quadrillion British thermal unit (Btu).

SOURCES

1960-70: U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1997*, DOE/EIA-0384(97) (Washington, DC: July 1998), tables 2.1, 5.12b, and A3.
1975-2003: Ibid., *Monthly Energy Review*, DOE/EIA-0035(2004/05) (Washington, DC: June 2004), tables 1.3, 2.2, 2.3, 2.4, 2.5, 2.6, and similar tables in earlier editions.

Table 4-5M: Fuel Consumption by Mode of Transportation

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Air																			
Certificated carriers ^a																			
Jet fuel (million liters)	7,397	14,721	29,742	28,610	32,249	38,289	(R) 46,648	43,557	44,527	45,268	(R) 46,880	(R) 47,967	(R) 50,033	(R) 51,341	(R) 50,479	54,518	56,193	53,062	48.6
General aviation ^b																			
Aviation gasoline (million liters)	916	1,105	2,086	1,560	1,968	1,594	1,336	1,340	1,189	1,014	1,007	1,086	1,092	1,106	1,178	1,307	(R) 1,259	(R) 1,042	1.0
Jet fuel (million liters)	N	212	787	1,715	2,900	2,616	2,510	2,184	1,870	1,719	1,756	2,120	2,300	2,430	3,084	3,662	(R) 3,679	(R) 3,607	3.7
Highway																			
Gasoline, diesel and other fuels (million liters)																			
Passenger car and motorcycle	155,849	188,222	256,950	281,078	265,683	271,414	264,067	244,163	248,425	254,554	257,707	258,424	262,781	265,335	272,175	278,207	277,375	(R) 279,180	284.4
Other 2-axle 4-tire vehicle	N	e	46,610	72,229	90,078	103,580	134,802	144,667	154,933	162,209	166,982	172,632	179,255	186,953	191,019	200,093	200,395	(R) 202,602	207.5
Single-unit 2-axle 6-tire or more truck	N	52,420	15,021	20,517	26,206	28,008	31,635	30,934	31,180	32,131	34,190	34,887	35,617	36,249	25,805	35,477	36,200	(R) 36,595	39.0
Combination truck	N	25,203	27,815	34,739	49,350	53,015	61,070	63,629	65,170	67,183	70,609	74,865	76,437	76,850	95,233	92,884	97,155	(R) 96,573	100.1
Bus	3,131	3,312	3,104	3,986	3,854	3,157	3,388	3,271	3,324	3,517	3,649	3,663	3,747	3,886	3,937	4,347	4,210	(R) 3,883	3.7
Transit ^c																			
Electricity (million kWh)	2,908	2,584	2,561	2,646	2,446	4,216	4,837	4,853	4,716	4,865	5,081	5,068	5,007	4,988	5,073	5,237	5,510	5,610	(P) 5.6
Motor fuel (million liters)																			
Diesel	787	939	1,026	1,382	1,632	2,304	2,464	2,518	2,593	2,568	2,567	2,568	2,622	2,714	2,800	2,890	2,975	2,819	(P) 2.7
Gasoline and other nondiesel fuels ^d	727	469	257	30	42	174	129	129	141	173	227	230	232	225	199	184	183	174	(P) 2
Compressed natural gas	N	N	N	N	N	N	N	N	4	6	18	41	57	90	141	168	207	251	(P) 3
Rail, Class I (in freight service)																			
Distillate / diesel fuel (million liters)	13,109	13,597	13,419	13,843	14,778	11,773	11,792	11,000	11,375	11,689	12,621	13,173	13,548	13,533	13,563	14,063	14,006	14,044	14.1
Amtrak																			
Electricity (million kWh)	N	N	N	180	254	295	330	303	300	301	309	304	293	282	275	283	350	377	
Distillate / diesel fuel (million liters)	N	N	N	238	242	246	310	310	310	314	284	250	269	284	284	280	288	283	
Water																			
Residual fuel oil (million liters)	14,960	11,708	14,286	15,369	33,887	17,375	23,947	25,639	24,844	19,994	20,390	22,282	21,582	18,965	21,276	22,100	24,264	20,477	18.3
Distillate / diesel fuel oil (million liters)	2,979	2,468	3,100	4,156	5,595	6,431	7,817	7,745	8,398	8,157	8,288	8,854	9,429	9,743	9,823	9,158	8,560	7,738	7.8
Gasoline (million liters)	N	N	2,264	2,763	3,982	3,986	4,921	6,473	4,982	3,307	3,314	4,014	3,761	3,737	3,620	4,157	4,256	3,762	4.0
Pipeline																			
Natural gas (million cubic meters)	10,412	15,016	21,665	17,489	19,039	15,113	19,794	18,039	17,631	18,729	20,561	21,010	21,343	22,544	19,064	19,360	19,266	(R) 18,749	20.0

KEY: kWh = kilowatt-hour; N = data do not exist; P = preliminary; R = revised; U = data are unavailable.

^a Domestic operations only.

^b Includes fuel used in air taxi operations, but not commuter operations. Data for 1996 are estimated using new information on nonrespondents and are therefore not comparable to earlier years. See the accuracy statement in the appendix for more detailed information.

^c Prior to 1984, excludes commuter rail, automated guideway, ferryboat, demand responsive vehicles, and most rural and small systems.

^d Gasoline and all other nondiesel fuels such as liquefied natural gas, methanol, and propane, except compressed natural gas.

^e Included in single-unit 2-axle 6-tire or more truck category.

NOTES

3.785412 liters = 1 gallon.

0.03 cubic meters = 1 cubic foot.

SOURCES**Air:**

Certificated air carriers:

1960-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Internet site <http://www.bts.gov/oal/fuel/fueleearly.html> as of June 23, 2004.

General aviation:

1960-70: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation - 1972 edition* (Washington, DC: 1973), table 9.12.

1975-93: *Ibid.*, *General Aviation and Air Taxi Activity Survey* (Washington, DC: Annual issues), table 5.1, and similar tables in earlier editions.

1994-2002: *Ibid.*, *FAA Aerospace Forecasts Fiscal Years 2004-2015* (Washington, DC: March 2004), table 34 and similar tables in earlier editions.

Highway:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*. FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A. (Revised data obtained from Internet site <http://www.fhwa.dot.gov/ohim/ohimstat.htm> as of August 2001).

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Transit:

Electricity / motor fuel / compressed natural gas:

1960-2002: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: February 2003), tables 33, 34, 35, and similar tables in earlier editions.

Rail:

1960-2002: Association of American Railroads, *Railroad Facts* (Washington, DC: October 2003), p. 40.

Amtrak:

1975-2001: Amtrak, Energy Management Department, personal communication.

Water:

Residual and distillate / diesel fuel oil:

1960-80: American Petroleum Institute, *Basic Petroleum Data Book* (Washington, DC: Annual issues), tables 10, 10a, 12, and 12a.

1985-2002: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual issues), tables 2, 4, and similar tables in earlier editions.

Gasoline:

1970-2002: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table MF-24 and similar tables in earlier editions.

Pipeline:

1960-2002: U.S. Department of Energy, *Natural Gas Annual 2002*, DOE/EIA-0131(02) (Washington, DC: January 2004), table 15 and similar tables in earlier editions.

Table 4-6M: Energy Consumption by Mode of Transportation (Petajoules)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Air																				
Certificated carriers ^a																				
Jet fuel	278	554	1,119	1,077	1,213	1,441	(R) 1,755	1,639	1,675	1,703	(R) 1,764	(R) 1,805	(R) 1,883	(R) 1,932	(R) 1,899	2,051	2,114	1,997	1,830	
General aviation ^b																				
Aviation gasoline	31	37	70	52	66	53	45	45	40	34	34	36	37	37	39	44	(R) 42	(R) 35	35	
Jet fuel	N	8	30	65	109	98	94	82	70	65	66	80	87	91	116	138	(R) 138	(R) 136	140	
Highway																				
Gasoline, diesel and other fuels																				
Passenger car and motorcycle	5,430	6,558	8,952	9,793	9,256	9,456	9,200	8,507	8,655	8,869	8,978	9,003	9,155	9,244	9,482	9,693	9,664	(R) 9,727	9,910	
Other 2-axle 4-tire vehicle	N	e	1,624	2,516	3,138	3,609	4,696	5,040	5,398	5,651	5,818	6,014	6,245	6,513	6,655	6,971	6,982	(R) 7,059	7,233	
Single-unit 2-axle 6-tire or more truck	N	2,026	581	793	1,013	1,083	1,223	1,196	1,205	1,242	1,322	1,349	1,377	1,401	998	1,371	1,399	(R) 1,415	1,508	
Combination truck	N	974	1,075	1,343	1,908	2,049	2,361	2,460	2,519	2,597	2,730	2,894	2,955	2,971	3,682	3,591	3,756	(R) 3,733	3,871	
Bus	121	128	120	154	149	122	131	126	128	136	141	142	145	150	152	168	163	(R) 150	145	
Transit^c																				
Electricity	10	9	9	10	9	15	17	17	17	18	18	18	18	18	18	19	20	20	(P) 20	
Motor fuel																				
Diesel	30	36	40	53	63	89	95	97	100	99	99	99	101	105	108	112	115	109	(P) 106	
Gasoline and other nondiesel fuels ^d	25	16	9	1	1	6	4	4	5	6	8	8	8	8	7	6	6	6	(P) 8	
Compressed natural gas	N	N	N	N	N	N	N	N	<1	<1	1	2	2	3	5	6	8	10	(P) 12	
Rail, Class I (in freight service)																				
Distillate / diesel fuel	507	526	519	535	571	455	456	425	440	452	488	509	524	523	524	544	541	543	546	
Amtrak																				
Electricity	N	N	N	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	U	
Distillate / diesel fuel	N	N	N	9	9	10	12	12	12	12	11	10	10	11	11	11	11	11	U	
Water																				
Residual fuel oil	624	489	596	641	1,414	725	999	1,070	1,037	834	851	930	900	791	888	922	1,012	854	766	
Distillate / diesel fuel oil	115	95	120	161	216	249	302	299	325	315	320	342	364	377	380	354	331	299	304	
Gasoline	N	N	79	96	139	139	171	226	174	115	115	140	131	130	126	145	148	131	143	
Pipeline																				
Natural gas	378	544	786	634	690	548	718	654	639	679	746	762	774	817	691	702	699	(R) 680	726	

KEY: N = data do not exist; P = preliminary; R = revised; U = data are unavailable.

^a Domestic operations only.

^b Includes fuel used in air taxi operations, but not commuter operations.

^c Prior to 1984, excludes commuter rail, automated guideway, ferryboat, demand responsive vehicles, and most rural and smaller

^d Gasoline and all other nondiesel fuels such as liquefied natural gas, methanol, and propane, except compressed natural gas.

^e Included in other single-unit 2-axle 6-tire or more truck category.

NOTES

The following conversion rates were used:

Jet fuel = 37,626,700 joules/liter

Compressed natural gas = 38,657,950 joules/liter

Aviation gasoline = 33,501,698 joules/liter

Distillate fuel = 38,655,829 joules/liter

Automotive gasoline = 34,839,537 joules/liter

Residual fuel = 41,723,829 joules/liter

Diesel motor fuel = 38,657,950 joules/liter

Natural gas = 38,413,974 joules/m³

Electricity 1kWh = 3,600,000 joules/kWh, negating electrical system losses. To include approximate electrical system losses, multiply this conversion factor by 3.

1.055056 petajoules = 1 trillion British thermal unit (Btu).

SOURCES

Air:

Certificated air carriers:

1960-2002: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Internet site <http://www.bts.gov/oai/fuel/fueyearly.html> as of June 23, 2004.

General aviation:

1960-70: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation* - 1972 edition (Washington, DC: 1973), table 9.12.

1975-93: Ibid., *General Aviation and Air Taxi Activity Survey* (Washington, DC: Annual issues), table 5.1, and similar tables in earlier editions.

1994-2002: Ibid., *FAA Aerospace Forecasts Fiscal Years 2004-2015* (Washington, DC: March 2004), table 34 and similar tables in earlier editions.

Highway:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A. (Revised data obtained from Internet site <http://www.fhwa.dot.gov/ohim/ohimstat.htm> as of August 2001).

1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Transit:

Electricity / motor fuel / compressed natural gas:

1960-2002: American Public Transit Association, *Public Transportation Fact Book* (Washington, DC: February 2003), tables 33, 34, 35, and similar tables in earlier editions.

Rail:

1960-2002: Association of American Railroads, *Railroad Facts* (Washington, DC: October 2003), p. 40.

Amtrak:

1975-2001: Amtrak, Energy Management Department, personal communication.

Water:

Residual and distillate / diesel fuel oil:

1960-80: American Petroleum Institute, *Basic Petroleum Data Book* (Washington, DC: Annual issues), tables 10, 10a, 12, and 12a.

1985-2002: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual issues), tables 2, 4, and similar tables in earlier editions.

Gasoline:

1970-2002: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table MF-24 and similar tables in earlier editions.

Pipeline:

1960-2002: U.S. Department of Energy, *Natural Gas Annual 2002*, DOE/EIA-0131(02) (Washington, DC: January 2004), table 15 and similar tables in earlier editions.

Table 4-7M: Domestic Demand for Gasoline (Million liters) by Mode

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TOTAL demand	230,005	269,471	339,178	389,882	396,854	407,121	430,044	424,806	434,878	441,300	449,392	455,209	464,074	470,279	484,449	498,845	499,261	506,261	519,585
Highway	209,820	253,541	324,025	376,094	383,019	391,960	414,614	408,496	420,084	430,282	437,904	443,125	452,412	457,800	472,018	487,345	487,879	490,900	503,288
Nonhighway, total	20,185	15,930	15,152	13,788	13,834	15,160	15,430	16,310	14,795	11,018	11,488	12,083	11,662	12,479	12,431	11,500	11,382	15,361	16,297
Agriculture	8,675	7,432	7,313	5,924	4,009	4,091	2,579	2,949	3,049	3,204	3,452	3,508	3,475	3,727	3,433	2,661	2,469	3,034	3,149
Aviation ^a	5,011	1,898	1,488	1,551	1,563	1,444	1,366	1,282	1,303	1,289	1,379	1,389	1,301	1,267	1,329	1,219	1,120	1,347	1,293
Marine	230	365	2,264	2,762	3,983	3,986	4,923	6,472	4,994	3,307	3,394	4,014	3,761	3,737	3,619	4,156	4,256	3,762	4,093
Other ^b	6,270	6,235	4,087	3,551	4,280	5,639	6,562	5,608	5,448	3,218	3,263	3,172	3,124	3,749	4,050	3,464	3,537	7,218	7,762

^a Does not include aviation jet fuel.

^b Includes state, county, and municipal use, industrial and commercial use, construction use, and miscellaneous.

NOTES

All nonhighway uses of gasoline were estimated by the U.S. Department of Transportation, Federal Highway Administration.

These estimates may not be comparable to data for prior years due to revised estimation procedures.

Numbers may not add to totals due to rounding.

3.785412 liters = 1 gallon.

SOURCES

Highway:

1960-95: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics, Summary to 1995* (Washington, DC: 1996), table MF-221.

1996-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table MF-21.

Nonhighway:

1960-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table MF-24, and unpublished revisions.

Table 4-8M: Certificated Air Carrier Fuel Consumption and Travel^a

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Number of aircraft	2,135	2,125	2,679	2,495	3,808	4,678	6,083	6,054	7,320	7,297	7,370	7,411	7,478	7,616	8,111	8,228	8,055	8,497	8,194	U
Average kilometers flown per aircraft (thousands)	784	1,074	1,528	1,500	1,236	1,191	1,250	1,239	1,077	1,129	1,170	1,222	1,260	1,273	1,236	1,283	1,388	1,291	1,344	U
Aircraft-kilometers (millions)																				
Domestic operations	1,381	1,825	3,328	3,135	4,060	4,902	6,378	6,202	6,429	6,690	7,049	7,450	7,743	7,903	8,103	8,581	9,115	8,929	(R) 9,039	9,793
International operations	293	457	764	607	645	668	1,223	1,299	1,455	1,547	1,577	1,606	1,679	1,793	1,918	1,971	2,063	2,037	1,971	2,005
Fuel consumption (million liters)																				
Domestic operations	7,397	14,721	29,742	28,610	32,248	38,289	47,049	43,555	44,528	45,270	47,227	48,499	49,918	51,709	52,530	54,518	56,194	53,060	48,635	49,054
International operations	2,143	4,845	8,491	7,378	6,613	9,418	15,002	14,915	15,596	15,569	16,319	17,076	17,632	18,791	19,631	19,873	20,725	19,824	18,893	18,308
Aircraft-kilometers flown per liter																				
Domestic operations	0.19	0.12	0.11	0.11	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.15	0.16	0.15	0.15	0.16	0.16	0.17	0.19	0.20
International operations	0.14	0.09	0.09	0.08	0.10	0.07	0.08	0.09	0.09	0.10	0.10	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11

KEY: R = revised; U = data are unavailable.

^a Aircraft operating under 14 CFR 121 and 14 CFR 135.

NOTES

1.609344 kilometers = 1 mile.

3.385412 liters = 1 gallon.

SOURCES

Number of aircraft:

1960-65: U.S. Department of Transportation, Federal Aviation Administration, *FAA Statistical Handbook of Aviation, 1970 edition* (Washington, DC: 1970), table 5.3.

1970-75: Ibid., *FAA Statistical Handbook of Aviation, Calendar Year 1979* (Washington, DC: 1979), table 5.1.

1980-85: Ibid., *FAA Statistical Handbook of Aviation, Calendar Year 1986* (Washington, DC: 1986), table 5.1.

1990-97: Ibid., *FAA Statistical Handbook of Aviation, Calendar Year 1997* (Washington, DC: unpublished), personal communication.

1998-2002: Aerospace Industries Association, *Aerospace Facts and Figures* (Washington DC: Annual Issues), "Active U.S. Air Carrier Fleet."

Aircraft-miles flown:

1960: Civil Aeronautics Board, *Handbook of Airline Statistics 1969* (Washington, DC: 1970), part III, tables 2 and 13.

1965-70: Ibid., *Handbook of Airline Statistics 1973* (Washington, DC: 1974), part III, tables 2 and 13.

1975-80: Ibid., *Air Carrier Traffic Statistics* (Washington, DC: December 1976), pp. 4 and 14; and (December 1981), pp. 2 and 3.

1985-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues, December), pp. 2 and 3, line 27 plus line 50.

2002-2003: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington, DC: Annual issues, December), pp. 3 and 4, line 25 plus line 46.

Fuel consumption:

1960-2003: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Internet site <http://www.bts.gov/programs/oi/fuel/fuelyearly.html> as of June 25, 2004.

Table 4-9M: Motor Vehicle Fuel Consumption and Travel

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Vehicles registered (thousands) ^a	73,858	90,358	111,242	137,913	161,490	177,133	193,057	192,314	194,427	198,041	201,802	205,427	210,441	211,580	215,496	220,461	225,821	235,331	234,624
Vehicle-kilometers traveled (millions)	1,156,735	1,428,795	1,785,928	2,136,668	2,457,943	2,856,306	3,451,016	3,495,576	3,616,439	3,695,662	3,794,170	3,898,951	4,000,585	4,122,648	4,235,024	4,330,835	4,420,747	(R) 4,501,797	4,595,894
Fuel consumed (million liters)	219,100	269,158	349,503	412,549	435,171	459,174	494,962	486,664	503,036	519,593	533,134	544,471	557,837	569,273	588,174	611,007	615,334	(R) 618,833	634,928
Average kilometers traveled per vehicle (thousands)	15.6	15.8	16.1	15.4	15.3	16.1	17.9	18.2	18.7	18.7	18.8	19.0	19.0	19.5	19.6	19.6	19.6	(R) 19.1	19.6
Average kilometers traveled per liter	5.3	5.3	5.1	5.2	5.7	6.2	7.0	7.2	7.2	7.1	7.1	7.1	7.2	7.2	7.2	7.1	7.2	7.3	7.2
Average fuel consumed per vehicle (liters)	2,968	2,979	3,142	2,990	2,695	2,593	2,563	2,532	2,585	2,623	2,642	2,650	2,650	2,691	2,729	2,771	2,725	(R) 2,631	2,707

KEY: R = revised.

^a Includes personal passenger vehicles, buses, and trucks.

NOTES

See tables 4-11, 4-12, 4-13, 4-14, and 4-15 for individual highway vehicles.

1.609344 kilometers = 1 mile.

3.785412 liter = 1 gallon.

SOURCES

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-11M: Passenger Car and Motorcycle Fuel Consumption and Travel

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Vehicles registered (thousands)																			
Passenger cars	61,671	75,258	89,244	106,706	121,601	127,885	133,700	128,300	126,581	127,327	127,883	128,387	129,728	129,749	131,839	132,432	133,621	137,633	135,921
Motorcycles	574	1,382	2,824	4,964	5,694	5,444	4,259	4,177	4,065	3,978	3,757	3,897	3,872	3,826	3,879	4,152	4,346	4,903	5,004
Vehicle-kilometers traveled (millions)																			
Passenger cars	944,685	1,163,556	1,475,768	1,664,062	1,789,591	2,006,852	2,265,956	2,185,489	2,208,020	2,212,848	2,262,738	2,314,237	2,365,501	2,418,129	2,493,802	2,525,222	2,575,412	^R 2,620,546	2,669,322
Motorcycles	^a	^a	4,828	9,012	16,415	14,645	15,450	14,806	15,450	15,933	16,415	15,772	15,965	16,224	16,549	17,033	16,848	^R 15,512	15,374
Fuel consumed (million liters)																			
Passenger cars	155,849	188,222	256,723	280,650	264,911	270,725	263,344	243,466	247,702	253,804	256,931	257,681	262,030	264,571	271,396	277,406	276,582	^R 278,450	283,712
Motorcycles	^a	^a	227	428	772	689	723	697	723	750	776	742	751	763	779	801	793	^R 730	723
Average kilometers traveled per vehicle (thousands)																			
Passenger cars	15.3	15.5	16.5	15.6	14.7	15.7	16.9	17.0	17.4	17.4	17.7	18.0	18.2	18.6	18.9	19.1	19.3	^R 19.0	19.6
Motorcycles	^a	^a	1.7	1.8	2.9	2.7	3.6	3.5	3.8	4.0	4.4	4.0	4.1	4.2	4.3	4.1	3.9	^R 3.2	3.1
Average kilometers traveled per liter																			
Passenger cars	6.1	6.2	5.7	5.9	6.8	7.4	8.6	9.0	8.9	8.7	8.8	9.0	9.0	9.1	9.2	9.1	9.3	9.4	9.4
Motorcycles	^a	^a	21.3	21.1	21.3	21.3	21.4	21.3	21.4	21.3	21.2	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3
Average fuel consumed per vehicle (liters)																			
Passenger cars	2,527	2,501	2,877	2,630	2,179	2,117	1,970	1,898	1,957	1,993	2,009	2,007	2,020	2,039	2,059	2,095	2,070	^R 2,023	2,087
Motorcycles	^a	^a	80	86	136	127	170	167	178	188	207	190	194	199	201	193	182	149	145

KEY: R = revised.

^a Included in passenger car.**NOTES**

See table 4-12 for other 2-axle 4-tire vehicles.

1.609344 kilometers = 1 mile.

3.785412 liters = 1 gallon.

Average kilometers traveled per vehicle, average kilometers traveled per liter, average fuel consumed per vehicle: derived by calculation.

SOURCES**Passenger car:***Number registered:*1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table MV-201.1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.*All other categories:*1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A. For 1970-94, the unrevised motorcycle vehicle-kilometers and fuel consumed are subtracted from the combined passenger car and motorcycle vehicle-kilometers and fuel consumed from VM-201A.1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.**Motorcycle:***Number registered:*1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table MV-201.1995-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.*All other categories:*1970-85: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1985*, table VM-201A.1990-2002: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-13M: Single-Unit 2-Axle 6-Tire or More Truck Fuel Consumption and Travel^a

	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number registered (thousands)	3,681	4,232	4,374	4,593	4,487	4,481	4,370	4,408	4,906	5,024	5,266	5,293	5,735	5,763	5,926	5,704	5,651
Vehicle-kilometers (millions)	43,613	55,683	64,052	73,064	83,525	85,134	86,744	91,411	98,653	100,914	103,114	107,654	109,469	113,143	113,459	^R 116,594	122,128
Fuel consumed (million liters)	15,021	20,517	26,206	28,008	31,635	30,934	31,180	32,131	34,190	34,886	35,617	36,249	25,807	35,477	36,200	^R 36,595	39,010
Average kilometers traveled per vehicle (thousands)	11.8	13.2	14.6	15.9	18.6	19.0	19.9	20.7	20.1	20.1	19.6	20.3	19.1	19.6	19.1	20.4	21.6
Average kilometers traveled per liter	2.9	2.7	2.4	2.6	2.6	2.8	2.8	2.8	2.9	2.9	2.9	3.0	4.2	3.2	3.1	3.2	3.1
Average fuel consumed per vehicle (liters)	4,080	4,848	5,992	6,098	7,050	6,904	7,135	7,289	6,968	6,944	6,763	6,848	4,500	6,156	6,109	^R 6,416	6,904

KEY: R = revised.

^aBeginning in 1998, the Federal Highway Administration (FHWA) used the Census Bureau's 1997 *Vehicle Inventory and Use Survey* (VIUS) for its baseline estimate of single-unit 2-axle 6-tire or more trucks. Prior to 1998, the FHWA used the Census Bureau's 1992 *Transportation Inventory and Use Survey* (TIUS) for its baseline estimates. Therefore, post-1997 data may not be comparable to 1997 and earlier years.

NOTES: In 1995, the U.S. Department of Transportation, Federal Highway Administration revised its vehicle categories beginning with 1993 data to include passenger cars, other 2-axle 4-tire vehicles, single-unit 2-axle 6-tire or more trucks, and combination trucks. Single-unit 2-axle 6-tire or more trucks are on a single frame with at least 2 axles and 6 tires. Pre-1993 data have been reassigned to the most appropriate category.

1.609344 kilometers = 1 mile.

3.785412 liters = 1 gallon.

SOURCES: 1970-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.
1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-14M: Combination Truck Fuel Consumption and Travel^f

	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number registered (thousands)	787	905	1,131	1,417	1,403	1,709	1,691	1,675	1,680	1,682	1,696	1,747	1,790	1,997	2,029	2,097	2,154	2,277
Vehicle-kilometers traveled (millions)	51,016	56,488	75,156	110,562	125,690	151,761	155,463	160,130	165,923	175,258	185,879	191,349	200,499	206,574	213,051	217,294	^R 219,811	223,124
Fuel consumed (million liters)	25,203	27,815	34,739	49,350	53,015	61,070	63,629	65,170	67,183	70,609	74,864	76,437	76,850	95,233	92,884	97,155	^R 96,573	100,127
Average kilometers traveled per vehicle (thousands)	64.9	62.4	66.5	78.0	89.6	88.8	91.9	95.6	98.7	104.2	109.6	109.6	112.0	103.4	105.0	103.6	^R 102.0	98.0
Average kilometers traveled per liter	2.0	2.0	2.2	2.2	2.4	2.5	2.4	2.5	2.5	2.5	2.5	2.5	2.6	2.2	2.3	2.2	^R 2.3	2.2
Average fuel consumed per vehicle (liters)	32,044	30,732	30,722	34,831	37,780	35,737	37,621	38,899	39,983	41,992	44,148	43,764	42,934	47,680	45,788	46,339	^R 44,831	43,980

KEY: R = revised.

^a Beginning in 1998, the Federal Highway Administration (FHWA) used the Census Bureau's *1997 Vehicle Inventory and Use Survey* (VIUS) for its baseline estimate of combination trucks. Prior to 1998, the FHWA used the Census Bureau's *1992 Transportation Inventory and Use Survey* (TIUS) for its baseline estimates. Therefore, post-1997 data may not be comparable to 1997 and earlier years.

NOTES

1.609344 kilometers = 1 mile.
3.785412 liters = 1 gallon.

SOURCES: 1965-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.
1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-15M: Bus Fuel Consumption and Travel

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number registered (thousands)	272	314	378	462	529	593	627	631	645	654	670	686	695	698	716	729	746	750	761
Vehicle-kilometers traveled (millions)	6,920	7,564	7,242	9,817	9,817	7,242	9,173	9,334	9,334	9,817	10,300	10,300	10,562	11,011	11,277	12,331	12,215	^R 11,389	11,022
Fuel consumed (million liters)	3,131	3,312	3,104	3,986	3,854	3,157	3,388	3,271	3,324	3,517	3,649	3,664	3,747	3,886	3,938	4,347	4,210	^R 3,883	3,759
Average kilometers traveled per vehicle (thousands)	25.4	24.1	19.2	21.2	18.6	12.2	14.6	14.8	14.5	15.0	15.4	15.0	15.2	15.8	15.7	16.9	16.4	^R 15.2	14.5
Average kilometers traveled per liter	2.2	2.3	2.3	2.5	2.5	2.3	2.7	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.9	2.8	2.9	2.9	2.9
Average fuel consumed per vehicle (liters)	11,504	10,539	8,221	8,625	7,287	5,319	5,404	5,181	5,155	5,374	5,443	5,345	5,392	5,567	5,500	5,963	5,642	^R 5,181	4,942

KEY: R = revised.

NOTES

Includes both publicly and privately owned school, transit, and other commercial buses.

1.609344 kilometers = 1 mile.

3.785412 liters = 1 gallon.

SOURCES: 1960-94: U.S. Department of Transportation, Federal Highway Administration *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Table 4-16M: Transit Industry Electric Power and Primary Energy Consumption^a and Travel

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	(P) 2002
Number of vehicles (thousands)	65	62	61	62	75	94	93	96	102	107	116	116	122	126	124	129	131	134	135
Vehicle-kilometers traveled (millions)	3,449	3,232	3,030	3,502	3,681	4,492	5,217	5,320	5,399	5,528	5,580	5,713	5,874	6,029	6,106	6,392	6,567	6,753	6,883
Electric power consumed (million kWh)	2,908	2,584	2,561	2,646	2,446	4,216	4,837	4,853	4,716	4,865	5,081	5,068	5,007	4,988	5,073	5,237	5,510	5,610	5,649
Primary energy consumed (thousand liters)																			
Diesel	787,744	940,296	1,024,332	1,381,903	1,633,027	2,304,324	2,464,417	2,517,897	2,592,795	2,568,444	2,567,365	2,567,592	2,622,208	2,713,959	2,799,770	2,889,666	2,975,428	2,818,856	2,742,663
Gasoline and other nondiesel fuels ^b	726,421	470,148	258,165	28,678	43,154	173,008	128,348	130,472	140,738	172,887	227,136	229,888	231,716	225,092	199,169	184,327	182,775	173,648	216,238
Compressed natural gas	N	N	N	N	N	N	N	N	3,819	5,977	18,302	40,655	57,129	90,494	141,075	168,065	207,418	250,651	306,811

KEY: kWh = kilowatt hour; N = data do not exist; P = preliminary.

^a Prior to 1985, excludes commuter rail, automated guideway, urban ferryboat, demand responsive vehicles, and most rural and smaller systems.

^b Data for 1992-2002, includes propane, liquid petroleum gas, liquefied natural gas, kerosene, and all other nondiesel fuels except compressed natural gas. 1960 to 1991 data include propane. Series not continuous between 1991 and 1992.

NOTE

The heat equivalent factors used in joule conversions are: diesel = 38,657,950 joules/liter; electric = 3,600,000 joules/kWh, negating electrical system losses (to include electrical system losses, multiply this conversion factor by approximately three); gasoline = 34,839,537 joules/liter.

1.609344 kilometers = 1 mile.

3.785412 liters = 1 gallon.

SOURCE

American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: March 2004), tables 18, 24, 33, 34, 35, and similar tables in earlier editions.

Table 4-17M: Class I Rail Freight Fuel Consumption and Travel

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number in use																			
Locomotives ^a	29,031	27,780	27,077	27,846	28,094	22,548	18,835	18,344	18,004	18,161	18,505	18,812	19,269	19,684	20,261	20,256	20,028	19,745	20,506
Cars ^b	1,965,486	1,800,662	1,784,181	1,723,605	1,710,827	1,421,686	1,212,261	1,189,660	1,173,136	1,173,132	1,192,412	1,218,927	1,240,573	1,270,419	1,315,667	1,368,836	1,380,796	1,314,136	1,299,670
Kilometers traveled (millions)																			
Freight train-kilometers ^c	651	677	687	648	690	559	611	603	628	653	710	738	754	764	764	789	811	804	804
Locomotive unit-kilometers	N	N	N	2,380	2,464	1,976	2,060	1,992	2,057	2,124	2,261	2,326	2,358	2,290	2,317	2,420	2,419	(R) 2,378	2,323
Car-kilometers	45,335	47,212	48,103	44,508	47,117	40,105	42,099	41,244	42,049	43,264	45,842	48,897	51,040	50,952	52,556	54,478	55,667	55,109	55,812
Average kilometers traveled per vehicle (thousands)																			
Locomotives	N	N	N	85.5	87.7	87.6	109.4	108.6	114.2	117.0	122.2	123.6	122.4	116.3	114.4	119.5	120.8	(R) 120.5	113.3
Cars	23	26.2	27.0	25.8	27.5	28.2	34.7	34.7	35.8	36.9	38.4	40.1	41.1	40.1	39.9	39.8	40.3	41.9	42.9
Average kilometers traveled per liter																			
Trains	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Cars	3.46	3.47	3.58	3.22	3.19	3.41	3.57	3.75	3.70	3.70	3.63	3.71	3.77	3.77	3.87	3.87	3.97	3.92	3.95
Fuel consumed (million liters)	13,109	13,597	13,419	13,843	14,778	11,773	11,792	11,000	11,375	11,689	12,621	13,173	13,548	13,533	13,563	14,063	14,006	14,044	14,120
Average fuel consumed per locomotive^a (thousand liters)	451.5	489.5	495.6	497.1	526.0	522.1	626.0	599.7	631.8	643.7	682.0	700.3	703.1	687.5	669.4	694.3	699.3	711.3	688.6

KEY: N = data do not exist; R = revised; U = data are not available.

^a For 1960-80, the total includes a small number of steam and electric units, which are not included in the per locomotive fuel consumption figure.

^b Includes cars owned by Class I railroads, other railroads, car companies, and shippers.

^c Based on the distance run between terminals and / or stations; does not include yard or passenger train-kilometers.

NOTES

1.609344 kilometers = 1 mile.

3.785412 liters = 1 gallon.

SOURCES

All data except for locomotive unit-kilometers:

Association of American Railroads, *Railroad Facts* (Washington, DC: November 2003), pp. 33, 34, 40, 49, and 51.

Locomotive unit-kilometers:

1975-92, 2002: Ibid., *Railroad Ten-Year Trends* (Washington, DC: Annual issues).

1993-2001: Ibid., *Analysis of Class I Railroads* (Washington, DC: Annual issues).

Table 4-19M: U.S. Government Energy Consumption by Agency and Source (Petajoules)

	Petroleum					Electricity	Natural gas	Coal and other ^d	Total
	Motor gasoline	Distillate and residual fuel oil	Jet fuel and aviation gas	Other ^c	Total				
FY 1991, total	36.0	245.5	817.6	9.5	1,108.7	203.2	162.6	67.7	1,542.2
Agriculture	5.0	0.6	0.1	0.2	6.0	2.2	1.9	0.1	10.1
Defense	12.7	225.9	807.3	1.8	1,047.7	123.0	115.0	53.5	1,339.2
Energy	1.3	3.4	0.4	0.3	5.3	19.2	10.9	9.1	44.5
GSA	0.1	0.4	0.0	0.0	0.6	9.8	2.6	1.7	14.8
Health and Human Service	0.0	1.5	0.0	0.1	1.6	2.4	2.4	0.1	6.5
Interior	2.3	0.9	0.2	1.1	4.5	1.7	1.1	0.1	7.5
Justice	1.9	0.6	0.2	0.0	2.7	2.6	2.6	0.4	8.4
NASA	0.3	0.9	1.5	0.0	2.8	7.3	2.6	0.4	13.2
Postal Service	9.5	4.4	0.0	0.2	14.1	13.0	4.9	0.5	32.5
Transportation	0.7	1.5	6.8	5.7	14.6	4.4	0.9	0.1	20.0
Veterans Affairs	0.3	1.5	0.0	0.0	1.8	8.8	14.7	1.3	26.5
Other ^a	1.9	3.7	1.2	0.0	6.6	8.8	3.0	0.6	19.0
FY 2001^P, total	33.7	181.8	425.6	6.6	647.8	209.7	146.8	44.6	1,048.9
Agriculture	2.6	0.4	0.0	0.4	3.6	2.0	2.6	0.2	8.3
Defense	9.9	158.5	416.9	2.4	587.6	110.6	84.3	34.7	817.1
Energy	0.4	2.8	0.0	0.2	3.6	23.6	8.3	4.4	40.0
GSA	0.1	0.5	0.0	0.0	0.6	10.2	6.9	1.8	19.5
Health and Human Service	0.1	0.7	0.0	0.1	0.9	3.2	3.7	0.3	8.2
Interior	0.9	1.1	0.1	2.2	4.3	2.1	1.4	0.0	7.9
Justice	5.7	0.6	1.8	0.0	8.2	4.5	6.1	0.4	19.1
NASA	0.1	0.4	1.2	0.0	1.7	6.0	3.3	0.2	11.4
Postal Service	11.0	5.4	0.0	0.9	17.3	18.3	9.0	0.0	44.5
Transportation	0.1	7.6	4.4	0.1	12.1	8.3	2.1	0.0	22.6
Veterans Affairs	0.7	1.3	0.0	0.0	2.0	9.8	15.0	1.6	28.5
Other ^b	1.9	2.4	1.2	0.1	5.6	11.2	4.0	0.7	21.6

KEY: Btu = British thermal unit; FY = fiscal year; GSA = General Services Administration; NASA = National Aeronautics and Space Administration; P = preliminary.

^a Includes U.S. Department of Commerce, Panama Canal Commission, Tennessee Valley Authority, U.S. Department of Labor, U.S. Department of Housing and Urban Development, Federal Communications Commission, Office of Personnel Management, U.S. Department of State, Small Business Administration, National Science Foundation, U.S. Department of Treasury, and Environmental Protection Agency.

^b Includes National Archives and Records Administration, U.S. Department of Commerce, U.S. Department of Labor, U.S. Department of State, Environmental Protection Agency, Federal Communications Commission, Federal Trade Commission, Panama Canal Commission, Equal Employment Opportunity Commission, Nuclear Regulatory Commission, Office of Personnel Management, U.S. Department of Housing and Urban Development, U.S. Department of Treasury, Tennessee Valley Authority, Railroad Retirement Board, U.S. Information Agency, and Federal Emergency Management Agency.

^c Includes liquefied petroleum gases.

^d Includes purchased steam, coal, and other.

NOTES

Numbers may not add to totals due to rounding.

These data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. government energy use for electricity generation and uranium enrichment is excluded. Other energy used by U.S. agencies that produce electricity or enriched uranium is included. The U.S. government's fiscal year runs from October 1 through September 30.

This table uses a conversion factor for electricity of 3,600,000 joules per kilowatt-hour, and a conversion factor for purchased steam of 2,326 kilojoules per kilogram.

SOURCE

U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2001*, DOE/EIA-0384(2001) (Washington, DC: November 2002), table 1.13. Internet site <http://www.eia.doe.gov/emeu/aer/> as of January 2003.

Table 4-20M: Energy Intensity of Passenger Modes (Kilojoule per passenger-kilometer)

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Air, certificated air carrier																	
Domestic operations	5,659	6,633	6,677	5,078	3,755	3,308	3,233	3,062	2,992	2,988	2,913	2,873	2,742	2,731	2,703	2,655	^R 2,584
International operations	6,031	6,748	7,202	5,550	2,845	3,345	2,980	3,022	2,792	2,687	2,718	2,736	2,693	2,733	2,804	2,703	2,628
Highway^a																	
Passenger car	2,947	2,921	3,174	3,109	2,850	2,797	2,499	2,395	2,428	2,481	2,472	2,439	2,418	2,397	2,384	2,407	2,346
Other 2-axle 4-tire vehicle	N	N	4,465	4,308	3,743	3,259	2,918	2,804	2,790	2,803	2,849	2,975	2,977	2,992	2,995	3,024	2,947
Motorcycle	b	b	1,639	1,543	1,393	1,243	1,305	1,257	1,305	1,352	1,400	1,491	1,489	1,490	1,490	1,490	1,490
Transit motor bus	N	N	N	N	1,798	2,226	2,441	2,470	2,647	2,586	2,728	2,724	2,751	2,772	2,710	2,651	^P 2,719
Amtrak	N	N	N	1,562	1,419	1,373	1,353	1,297	1,334	1,326	1,269	1,205	1,408	1,442	1,402	1,381	1,399

KEY: N = data do not exist; P = preliminary; R = revised; U = data are not available.

^a For 1995 and subsequent years, highway passenger-miles were taken directly from *Highway Statistics* rather than derived from vehicle-miles and average occupancy, as is the case for 1960-1994. Passenger-miles were then converted to passenger-kilometers.

^b Included in passenger car.

NOTES

To calculate total joules, multiply fuel consumed (see tables 4-21, 4-22, 4-24, 4-25) by 37,626,700 joules/liter for air carrier, 34,839,537 joules/liter for passenger car, other 2-axle 4-tire vehicle, and motorcycle, and 38,657,950 joules/liter for transit motor bus and Amtrak.

1.609344 kilometers = 1 mile.

SOURCES

Air:

Certificated air carriers:

Passenger-kilometers:

Air Transport Association, Internet site <http://www.air-transport.org/public/industry> as of Aug. 30, 2002.

Fuel consumed:

U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Internet site <http://www.bts.gov/oai/fuel/fuelyearly.html> as of Aug. 30, 2002.

Highway:

Passenger car:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Other 2-axle 4-tire vehicle:

1970-94: Ibid., *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Motorcycle:

1970-85: Ibid., *Highway Statistics Summary to 1985*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1990-2000: Ibid., *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Transit motor bus:

American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: February 2002), tables 30 and 65.

Amtrak:

Amtrak, State and Local Affairs Department, personal communication.

Table 4-21M: Energy Intensity of Certificated Air Carriers, All Services^a

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	
Aircraft-kilometers (millions)																			
Domestic operations	1,381	1,825	3,328	3,135	4,060	4,902	6,378	6,202	6,429	6,690	7,049	7,450	7,743	^R 7,903	^R 8,103	^R 8,581	^R 9,115	8,932	
International operations	293	457	764	607	645	668	1,223	1,299	1,455	1,547	1,577	1,606	1,679	1,793	^R 1,918	^R 1,971	^R 2,063	2,025	
Available seat-kilometers (millions)																			
Domestic operations	84,040	152,545	343,048	388,306	556,878	717,487	906,165	874,901	897,996	919,722	942,171	971,910	1,008,075	^R 1,049,160	^R 1,065,889	^R 1,125,463	^R 1,170,046	1,134,195	
International operations	21,480	47,529	83,622	99,335	139,220	164,094	274,087	276,101	313,474	322,112	320,087	326,954	335,841	^R 368,039	^R 382,280	^R 391,040	^R 408,851	395,538	
Passenger-kilometers (millions)																			
Domestic operations	49,177	83,504	167,608	211,996	322,334	435,463	547,549	535,213	559,941	569,993	609,925	635,221	684,930	^R 725,190	^R 745,548	^R 785,934	^R 830,629	782,880	
International operations	13,367	27,019	44,358	50,022	87,489	105,925	189,412	185,701	210,216	218,079	225,937	234,881	246,337	^R 272,552	^R 277,218	^R 290,115	^R 310,278	287,078	
Fuel consumed (million liters)																			
Domestic operations	7,397	14,721	29,742	28,610	32,249	38,289	47,050	43,557	44,527	45,268	47,225	48,498	49,919	51,707	52,530	54,518	56,193	53,062	
International operations	2,143	4,845	8,491	7,378	6,614	9,418	15,002	14,913	15,596	15,571	16,318	17,078	17,633	18,791	19,629	19,875	20,724	19,826	
Seats per aircraft																			
Domestic operations	60.9	83.6	103.1	123.9	137.1	146.4	142.1	141.1	139.7	137.4	133.7	130.5	130.2	^R 132.7	^R 131.5	^R 131.1	^R 128.4	127.0	
International operations	73.3	104.0	109.4	163.7	215.7	245.7	224.1	212.6	215.5	208.7	203.0	203.6	200.1	^R 205.3	^R 199.2	^R 198.3	^R 198.2	195.4	
Seat-kilometers per liter																			
Domestic operations	11	10	12	14	17	19	19	20	20	20	20	20	20	^R 20	^R 20	^R 21	^R 21	21	
International operations	10	10	10	13	21	17	18	19	20	21	20	19	19	^R 20	^R 20	^R 20	^R 20	20	
Energy intensity (kilojoule / passenger-kilometer)^b																			
Domestic operations	5,659	6,633	6,677	5,078	3,764	3,308	3,233	3,062	2,992	2,988	2,913	2,873	2,742	^R 2,683	^R 2,651	^R 2,610	^R 2,546	2,550	
International operations	6,031	6,748	7,202	5,550	2,845	3,345	2,980	3,022	2,792	^R 2,687	^R 2,717	2,735	2,693	^R 2,594	^R 2,664	^R 2,578	^R 2,513	2,599	
Load factor (percent)																			
Domestic operations	58.5	54.7	48.9	54.6	58.0	60.7	60.4	61.2	62.4	62.0	64.7	65.4	67.9	69.1	^R 69.9	69.8	^R 71.0	69.0	
International operations	62.2	56.8	53.0	^R 50.4	62.8	64.6	69.1	67.3	67.1	67.6	70.6	71.8	73.3	74.1	^R 72.5	^R 74.2	^R 75.9	72.6	

KEY: R = revised.

^a U.S. owned carriers only. Operation of foreign-owned carriers in or out of the United States not included.

^b Calculation based on unrounded figures not shown here.

NOTES

Aircraft-kilometers includes all four air-carrier groups (majors, nationals, large regionals, and medium regionals), scheduled and charter, passenger, and all-cargo.

Fuel consumed includes majors, nationals, and large regionals, scheduled and charter, passenger, and all-cargo.

Passenger-kilometers includes all four air-carrier groups, scheduled and charter, passenger service only.

International operations include operations outside the United States, including those between the United States and foreign countries and the United States and its territories or possessions.

Heat equivalent factor used for joule conversion is 37,626,700 joules/liter.

1.609344 kilometers = 1 mile.

3.785412 liters = 1 gallon.

SOURCES

Aircraft-kilometers, available seat-kilometers, passenger-kilometers, and load factor:

1960-80: Air Transport Association, Internet site <http://www.air-transport.org/public/industry>, as of July 31, 2002.

1985-2001: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Air Carrier Traffic Statistics* (Washington DC: Annual December issues).

Fuel consumed:

1960-2000: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, Internet site <http://www.bts.gov/oai/fuel/fuelyearly.html> as of Aug. 12, 2002.

Seats per aircraft, seat-kilometers per liter, and energy intensity:

Derived by calculation.

Table 4-22M: Energy Intensity of Passenger Cars, Other 2-Axle 4-Tire Vehicles, and Motorcycles

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Vehicle-kilometers (millions)																			
Passenger car	944,685	1,163,556	1,475,768	1,664,062	1,789,591	2,006,852	2,265,956	2,185,489	2,208,020	2,212,848	2,262,738	2,314,237	2,365,736	2,418,844	2,494,483	2,525,061	2,575,412	(R) 2,620,546	2,669,322
Other 2-axle 4-tire vehicle	N	N	197,949	323,478	468,319	629,254	925,373	1,044,464	1,137,806	1,200,571	1,231,148	1,271,382	1,314,834	1,369,552	1,396,911	1,450,019	1,485,519	(R) 1,517,945	1,554,922
Motorcycle	b	b	4,828	9,012	16,415	14,645	15,450	14,806	15,450	15,933	16,415	15,772	15,933	16,254	16,576	17,059	16,848	(R) 15,512	15,374
Passenger-kilometers (millions)^a																			
Passenger car	1,842,699	2,245,035	2,817,961	3,144,658	3,238,000	3,369,966	3,672,523	3,540,557	3,553,432	3,561,478	3,621,024	3,680,570	3,761,037	3,844,723	3,965,424	4,015,313	4,094,907	(R) 4,114,257	4,190,836
Other 2-axle 4-tire vehicle	N	N	363,712	584,192	838,468	1,107,229	1,609,344	1,797,637	1,934,431	2,016,508	2,042,258	2,021,336	2,088,929	2,177,442	2,222,504	2,306,190	2,361,976	(R) 2,701,852	2,767,669
Motorcycle	b	b	4,828	9,656	19,312	19,312	19,312	19,312	19,312	19,312	19,312	17,703	17,703	17,703	17,703	19,312	18,533	(R) 18,926	18,757
Fuel consumed (million liters)																			
Passenger car	155,849	188,222	256,723	280,650	264,911	270,725	263,344	243,466	247,702	253,804	256,931	257,681	262,030	264,570	271,395	277,406	276,582	(R) 278,450	283,712
Other 2-axle 4-tire vehicle	N	N	46,610	72,229	90,078	103,580	134,802	144,667	154,933	162,209	166,982	172,634	179,254	186,954	191,019	200,093	200,395	(R) 202,602	207,595
Motorcycle	b	b	227	428	772	689	723	697	723	750	776	742	750	765	780	801	793	(R) 730	723
Energy intensity (kilojoule / passenger-kilometer)^c																			
Passenger car	2,947	2,921	3,174	3,109	2,850	2,799	2,498	2,396	2,429	2,483	2,472	2,439	2,427	2,397	2,384	2,407	2,353	(R) 2,358	2,359
Other 2-axle 4-tire vehicle	N	N	4,465	4,308	3,743	3,259	2,918	2,804	2,790	2,803	2,849	2,975	2,990	2,991	2,994	3,023	2,956	(R) 2,612	2,613
Motorcycle	a	a	1,639	1,543	1,393	1,243	1,304	1,257	1,304	1,352	1,400	1,460	1,475	1,505	1,535	1,446	1,490	(R) 1,343	1,343

KEY: N = data do not exist; R = revised.

^a Passenger-kilometers are derived by multiplying vehicle-kilometers by an average occupancy rate for that vehicle type based on data provided by the Federal Highway Administration, Nationwide Personal Transportation Survey (1977, 1983, 1995) and Federal Highway Administration and Bureau of Transportation Statistics, National Household Travel Survey (2001). Average vehicle occupancy rates are as follows:

passenger car (1960-2002): 1.95, 1.93, 1.91, 1.89, 1.81, 1.68, 1.62, 1.62, 1.61, 1.61, 1.60, 1.59, 1.59, 1.59, 1.59, 1.59, 1.57, 1.57;

other 2-axle 4-tire vehicle (1970-2002): 1.84, 1.81, 1.79, 1.76, 1.74, 1.72, 1.70, 1.68, 1.66, 1.59, 1.59, 1.59, 1.59, 1.59, 1.59, 1.78, 1.78;

motorcycle (1970-2002): 1.00, 1.07, 1.18, 1.32, 1.25, 1.30, 1.25, 1.21, 1.18, 1.12, 1.11, 1.09, 1.07, 1.13, 1.10, 1.22, 1.22.

^b Included in passenger car.

^c Energy Intensity (kilojoule/passenger-kilometer) is calculated by converting the fuel consumption in liters to the energy equivalent kilojoule and dividing by the passenger-kilometers. The heat equivalent factor used for kilojoule conversion is 34,839,537 joules/liter.

NOTES:

In 1995, the U.S. Department of Transportation, Federal Highway Administration revised its vehicle type categories for 1993 and later data.

These new categories include passenger car, other 2-axle 4-tire vehicle, single-unit 2-axle 6-tire or more truck, and combination truck.

Other 2-axle 4-tire vehicle includes vans, pickup trucks, and sport utility vehicles. In previous years, some minivans and sport utility vehicles were

included in the passenger car category. Single-unit 2-axle 6-tire or more trucks are on a single frame with at least 2 axles and 6 tires. Pre-1993

data have been reassigned to the closest available category.

1.609344 kilometers = 1 mile.

3.785412 liters = 1 gallon.

SOURCES:

Vehicle-kilometers:

Passenger car:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009

(Washington, DC: July 1997), table VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Other 2-axle 4-tire vehicle:

1960-94: *Ibid.*, *Highway Statistics, Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Motorcycle:

1970-94: *Ibid.*, *Highway Statistics, Summary to 1985* (Washington, DC: 1986), table VM-201A.

For 1970-94, the unrevised motorcycle vehicle-miles are subtracted from the combined passenger car and motorcycle vehicle-miles from VM-

201A. These numbers were then converted to kilometers.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Passenger-kilometers:

1960-97: Vehicle-miles multiplied by vehicle occupancy rates. These numbers were then converted to kilometers.

1998-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

Fuel consumed:

1960-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009

(Washington, DC: July 1997), table VM-201A.

201A.

1995-2002: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues) table VM-1.

Table 4-23M: Average Fuel Efficiency of U.S. Passenger Cars and Light Trucks

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Average U.S. passenger car fuel efficiency (kmp/l) (calendar year)														
Passenger car ^a	6.8	7.4	8.6	9.0	8.9	8.8	8.8	9.0	9.0	9.1	9.2	9.1	^R 9.3	9.4
Other 2-axle 4-tire vehicle	5.2	6.1	6.8	7.2	7.4	7.4	7.4	7.4	7.3	7.3	7.3	7.2	^R 7.4	7.5
New vehicle fuel efficiency (kmp/l) ^b (model year)														
Light-duty vehicle														
Passenger car	10.3	11.7	11.9	12.1	11.9	12.1	12.0	12.2	12.1	12.2	12.2	12.0	12.1	12.2
Domestic	9.6	11.2	11.4	11.6	11.5	11.8	11.7	11.8	11.9	11.8	12.2	11.9	^R 12.2	12.2
Imported	12.6	13.4	12.7	12.8	12.4	12.6	12.6	12.9	12.6	12.8	12.4	12.3	12.0	12.1
Light truck (<8,500 lbs GVWR) ^c	7.9	8.8	8.8	9.1	8.8	8.9	8.8	8.7	8.8	8.8	9.0	8.9	^R 9.1	8.9
CAFE standards (kmp/l) ^b (model year)														
Passenger car	8.5	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
Light truck	^d 6.8 / 6.0	8.3	8.5	8.6	8.6	8.7	8.7	8.8	8.8	8.8	8.8	8.8	8.8	8.8

KEY: CAFE = Corporate Average Fuel Economy; GVWR = gross vehicle weight rating; kmp/l = kilometers per liter; N = data do not exist; R = revised; U = data are not available.

^a From 1980 to 1994, passenger car fuel efficiency includes motorcycles.

^b Assumes 55% city and 45% highway-miles. The source calculated average miles per gallon for light-duty vehicles by taking the reciprocal of the sales-weighted average of gallons per mile. This is called the harmonic average. These data were then converted to metric units.

^c Beginning with FY 1999, the total light truck fleet ceased to be categorized by either domestic or import fleets.

^d 2 Wheel Drive/4 Wheel Drive. No combined figure available for this year.

NOTES

The fuel efficiency figures for light duty vehicles represent the sales-weighted harmonic average of the combined passenger car and light truck fuel economies.

1.609344 kilometers = 1 mile.

3.785412 liters = 1 gallon.

SOURCES

Average U.S. passenger car fuel efficiency:

1980-94: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics Summary to 1995*, FHWA-PL-97-009 (Washington, DC: July 1997), table VM-201A (Revised data obtained from Internet site <http://www.fhwa.dot.gov/ohim/ohimstat.htm> as of Aug. 2, 2001).

1995-2001: *Ibid.*, *Highway Statistics* (Washington, DC: Annual issues), table VM-1.

New vehicle fuel efficiency (based on model year production):

1980-2001: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Automotive Fuel Economy Program, Annual Update Calendar Year 2001*, table II-6, Internet site www.nhtsa.dot.gov/cars/problems/studies/fuelecon/index.html as of January 2003.

CAFE standards:

1980-2001: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Automotive Fuel Economy Program, Annual Update Calendar Year 2001*, table I-1, Internet site www.nhtsa.dot.gov/cars/problems/studies/fuelecon/index.html as of January 2003.

Table 4-24M: Energy Intensity of Transit Motor Buses

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	(P) 2002
Vehicle-kilometers (millions)	2,536	2,459	2,268	2,456	2,699	2,998	3,428	3,487	3,505	3,557	3,479	3,515	3,574	3,613	3,500	3,663	3,725	3,825	3,880
Passenger-kilometers (millions)	N	N	N	N	35,084	34,118	33,766	33,941	32,728	32,584	30,307	30,285	30,732	31,550	32,766	34,126	34,184	35,441	35,151
Fuel consumed (million liters diesel)	787	939	1,026	1,382	1,632	1,961	2,132	2,169	2,241	2,179	2,139	2,134	2,187	2,264	2,296	2,340	2,404	2,222	2,116
Energy intensity (kilojoules / passenger-kilometers)	N	N	N	N	1,798	2,222	2,441	2,470	2,647	2,586	2,729	2,724	2,751	2,772	2,710	2,651	2,719	2,424	2,894

KEY: N = data do not exist; P = preliminary.

NOTES

Heat equivalent factor used for joule conversion is 38,657,950 joules/liter.

1.609344 kilometers = 1 mile.

3.785412 liters = 1 gallon.

0.6555814 kilojoule per passenger-kilometer = 1 British thermal unit (Btu) per passenger-mile.

SOURCE

American Public Transportation Association, *Public Transportation Fact Book* (Washington, DC: February 2004), tables 38 and 70, and similar tables in earlier editions.

Table 4-25M: Energy Intensity of Class I Railroad^a Freight Service

	1960	1965	1970	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Revenue freight tonne-kilometers (millions)	835,555	1,018,882	1,116,600	1,101,187	1,341,653	1,280,372	1,509,566	1,516,728	1,557,470	1,619,560	1,752,990	1,906,268	1,979,686	1,969,394	2,010,092	2,092,813	2,140,261	2,183,347	2,200,194
Car-kilometers (millions)	45,335	47,212	48,103	44,508	47,117	40,105	42,099	41,244	42,049	43,264	45,842	48,897	51,040	50,952	52,556	54,478	55,667	55,109	55,812
Tonnes per car load	40	44	50	55	61	61	60	60	60	58	58	59	60	58	58	58	57	58	57
Fuel consumed (million liters)	13,109	13,597	13,419	13,843	14,778	11,773	11,792	11,000	11,375	11,689	12,621	13,173	13,548	13,533	13,563	14,063	14,006	14,044	14,120
Energy intensity (kilojoule / revenue freight tonne-kilometer)	606	516	465	486	426	355	302	280	282	279	278	267	265	266	261	260	253	249	248
Energy intensity (kilojoule / car-kilometer)	11,178	11,134	10,784	12,024	12,125	11,348	10,828	10,311	10,458	10,445	10,643	10,415	10,261	10,268	9,976	9,979	9,726	9,852	9,780

^a Class I railroads are those that have operating revenues of \$272 million or more.

NOTE

The heat equivalent factor used for joule conversion is 38,655,900 joules/liter.

1.459972 tonne-kilometer = 1 ton-mile.

1.609344 kilometers = 1 mile.

0.9071847 tonnes = 1 ton.

3.785412 liters = 1 gallon.

SOURCE

Association of American Railroads, *Railroad Facts* (Washington, DC: November 2003), pp. 34, 37, and 40.

Source and Accuracy Statements

Data Source and Accuracy Statements

Chapter 1 Extent, Condition, and Performance

TABLE 1-1. System Mileage Within the United States

Highway

The Highway Performance Monitoring System (HPMS) is the source of road mileage data and is considered reliable. (See box 1-1 for detailed information about the HPMS.) The Federal Highway Administration (FHWA) of the U.S. Department of Transportation (USDOT) collects and reviews state-reported HPMS data for completeness, consistency, and adherence to specifications. Some inaccuracy may arise from variations across states in their adherence to federal guidelines in the Traffic Monitoring Guide and the *Highway Performance Monitoring System Field Manual for the Continuing Analytical and Statistical Database*.

Beginning with the 1997 issue of *Highway Statistics*, FHWA instituted a new method for creating mileage-based tables derived from the HPMS. Previously, adjustments to tables developed from sample data were made using area-wide mileage information provided by states. These adjustments are now being made using universe totals from the HPMS dataset. In addition, FHWA has discontinued the process of spreading rounding and other differences across table cells. Thus, users may note minor differences in table-to-table totals. FHWA considers mileage totals from table HM-20, “Public Road Length, Miles by Functional System” to be the controlling totals should a single value be required.

Reliability may be diminished for comparisons with pre-1980 data, which were collected via different methods and special national studies. For instance, pre-1980 mileage data included some nonpublic roadways (95,000 miles in 1979) while post-1980 data reports only public road mileage

(roads or streets governed and maintained by a public authority and open to public travel).

Class I Rail

These data are from *Railroad Facts*, published annually by the Association of American Railroads (AAR). AAR data are based on 100-percent reporting by Class I railroads to the Surface Transportation Board (STB) via Schedule 700 of the *R1 Annual Report*. The STB defines Class I railroads as having operating revenues at or above a threshold indexed to a base of \$250 million (1991) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 1999, the adjusted threshold for Class I railroads was \$258.5 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for three consecutive years. Although Class I railroads encompasses only 2 percent of the number of railroads in the country, they account for over 71 percent of the industry's mileage operated.

To obtain railway mileage, AAR subtracts track-age rights from miles of rail traveled on line 57 in the Schedule 700 report. Historical reliability may vary due to changes in the railroad industry, including bankruptcies, mergers, and declassification by the STB. Small data errors may also exist because of independent rounding of this series by AAR.

Amtrak

These statistics originate from the Statistical Appendix to *Amtrak's Annual Report*. Amtrak estimates track mileage based on point-to-point city timetables that railroad companies provide for engineers. The figures are estimates, but are considered reliable.

Box 1-1.

Highway Performance Monitoring System

Sampling Frame Construction

The Highway Performance Monitoring System (HPMS) sample is a stratified simple random sample of highway links (small sections of roadway) selected from state inventory files. The 1997 sample consists of about 120,000 samples. Each state maintains an independent inventory of highway road links for those roads that the state is responsible for (in some cases this can be a low percentage of total road miles within the state). Lower jurisdictions (MPO's, counties, cities, national parks, Indian reservations, etc.) may also maintain inventories of highway links under their jurisdiction. The HPMS sample was originally selected in 1978 based on guidelines provided by the FHWA for sampling highway systems excluding those roads functionally classified as local. The sampling frame for the state systems were the state inventories. The estimates represent the highway systems of each state. The HPMS sample was designed as a fixed sample to minimize data collection costs but adjustments to maintain representativeness are carried out periodically. The HPMS also consists of universe reporting (a complete census) for the Interstate and the National Highway System, and tabular summary reporting of limited information. A small number of data items (about 30) are reported for the complete universe. The universe information contains no sampling error. There are 4 tables reported as part of the summary.

Stratification

The HPMS sample (and universe) is stratified by state, type of area (rural, urban, and individual urbanized areas), highway functional classification, and traffic (annual average daily traffic (AADT) volume groups). Complete information is provided in the HPMS *Field Manual*.

Weighting

The HPMS sample expansion factors are the ratio of universe mileage to sample mileage in each strata.

Data Collection

Data are collected independently by the 50 states, metropolitan planning organizations (MPOs), and lower jurisdictions. Many of the geometric data items rarely change, such as number of lanes. Others change frequently, such as traffic. Typically, the states maintain data inventories that are the repositories of a wide variety of data items. The HPMS data items are extracted from these inventories. For example, each State has a traffic volume counting program. Typically, equipment is installed or placed on the roads to measure traffic. The counts are then converted to annual average daily traffic (AADT) and stored in the state databases. AADT is one of the sample and universe items extracted from the inventories and reported to the HPMS. The FHWA provides guidelines for data collection in the HPMS *Field Manual*, which the states follow to varying extents depending on issues such as staff, resources, state perspective, uses of the data, state/MPO/local needs for data, etc. Traffic data collection, for example, is an expensive and dangerous undertaking, particularly in high volume urban areas.

State departments of transportation report HPMS data annually to the FHWA. There are about 80 data items reported for the sample component. The reporting deadline is June 15. Except for special cases where major problems occur, data items are reported for each sample. There is no provision for nonresponse since a number is available for each section in the state inventories; however, states do leave items blank to indicate that no data collection has taken place for a specific item (e.g., if no system to measure pavement has been implemented in the state, the pavement condition item may be left blank). The HPMS has gone through a major restructuring effort, and major data item reductions, modifications, and other changes will begin to be implemented with the 1999 data reported by June 15, 2000.

Sampling Error

The sample size is estimated based on traffic volume (AADT) within each stratum. Traffic volume is the most variable data item. Sampling error can be estimated directly based on the sample design for each stratum and aggregated by stratified random sample methods to total values. This exercise was done originally in 1980 for some of the most variable data items including vehicle-miles traveled. It has not been repeated since due to the work involved and the limited impact of sampling error as compared to nonsampling error.

Nonsampling Error

This is a major item of concern for the HPMS. For some of the most variable and important data items, such as AADT, guidelines for measurement and data collection have been produced. States have the option of using the guidelines or using their own procedures. Many data items are difficult and costly to collect and are reported as estimates not based on direct measurement. The data are collected and reported by many entities and individuals within the responsible organizations. Most do a reasonably good job, but staff turnover, cost, equipment issues, etc., can create difficulties identifying data problems. As mentioned before, a response is usually provided for each link as included in state inventories. For highway links not the responsibility of states, metropolitan planning organizations and lower jurisdictions using a wide variety of methods may collect the data. This is a major area of concern and efforts are underway within States to standardize data collection. The major effort with the HPMS is to ensure the collection and reporting of reliable annual data. The FHWA field offices in each state conduct annual verification of the data reported. Computer software is provided to build the database and conduct logic edits prior to submittal. The reported data are subjected to intense editing and comparison with previous reporting and a written annual report is provided to each state to document problems found and encourage correction. Data resubmittal is requested in cases where major problems are found. The process involves many people and substantial resources, but it provides extensive quality assurance. Complete information on data items, edits, processing, expansion, sample design, definitions, data reporting, etc., is included in the HPMS *Field Manual*.

Transit

These data are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Database (NTD). The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are generally required to report financial and operating data, including vehicle inventories and directly operated mileage. Transit operators that do not report to FTA are those that do not receive Urbanized Area Formula Funding, typically private, small, and rural operators. The data are generally considered accurate because FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret certain data definitions.

Navigable Channels

These statistics originate from a mid-1950s U.S. Army Corps of Engineers (USACE) estimate that there were approximately 25,000 miles of commercially important navigable channels in the United States. That number has been adjusted from time to time, for example, by addition of the 234-mile Tennessee-Tombigbee Waterway in the early 1980s. The 25,000 plus mile number has been universally quoted for decades, but has definitional

and methodological uncertainties. USACE is currently developing a rigorous, Global Information System (GIS)-based approach to facilitate tabulation of the lengths of shallow and deep-draft commercially navigable waterways in the United States; this calculation will be available in several years.

Oil Pipeline

The data are from *Transportation in America*, published by the Eno Transportation Foundation, Inc. (Eno). The numbers reprinted here for 1960, 1965, 1970, and 1975 are Eno estimates from the U.S. Department of Energy (DOE) *Energy Data Report* issues labeled “Crude-oil and Refined Products Mileage in the United States.” Eno estimated the 1980 number based on the assumption that refinement of old, less profitable, and smaller lines exceeded in mileage the construction of new, larger, and more profitable lines. Post-1985 data were calculated using a base figure reported in a 1982 USDOT study entitled *Liquid Pipeline Director* and then combined with data from the Association of Oil Pipe Lines and the Oil Pipeline Research Institute. Lack of additional information raises definitional and methodological uncertainties for the data’s reliability. Moreover, the three different information sources introduce data discontinuities, making time comparisons unreliable.

Gas Pipeline

These statistics originate from annual editions of *Gas Facts*, published by the American Gas Association (AGA). The data reported by the AGA are based on gas utilities participation and reporting to the *Uniform Statistical Report*. Utilities reporting represented 98 percent of gas utility industry sales while the remaining 2 percent was estimated for nonreporting companies based on recent historical experience. Varying percentages of nonreporters from year to year introduce minor reliability problems for time-series comparisons.

TABLE 1-2. Number of Air Carriers, Railroads, Interstate Motor Carriers, Marine Operators, and Pipeline Operators

Air Carriers

The data are from the *Air Carrier Financial Statistics Quarterly*, published by the Office of Airline Information of the U.S. Department of Transportation, Bureau of Transportation Statistics (BTS). The Alphabetical List of Air Carriers by Carrier Group at the beginning of each fourth quarter edition is used to determine the number of major air carriers and other air carriers in operation at the end of each calendar year. The publication draws its data from the T-100 and T-100(f) databases maintained by BTS. These databases include data obtained from a 100-percent census of BTS Form 41 schedule submissions by large certificated air carriers, which are carriers that hold a certificate issued under section 401 of the Federal Aviation Act of 1958 and that (1) operate aircraft designed to have a maximum passenger seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds or (2) that conduct international operations. Carriers are grouped as major, national, large regional, or medium regional based on their annual operating revenues. The thresholds were last adjusted July 1, 1999 and the threshold for major air carriers is currently \$1 billion. The table combines the number of national, large regional, and medium regional air carriers into the other air carrier category.

Railroads

The Association of American Railroads (AAR)'s *Railroad Ten-Year Trends* series is the source for

the number of railroads. The number of Class I railroads is based on 100-percent reporting by Class I railroads to the Surface Transportation Board (STB) via Schedule 700 of the *R1 Annual Report*. The STB defines Class I railroads as having operating revenues at or above a threshold indexed to a base of \$250 million (1991) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 2000, the adjusted threshold for Class I railroads was \$261.9 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for three consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 71 percent of the industry's mileage operated.

The Association of American Railroads determines the number of non-Class I railroads through an annual survey sent to every U.S. freight railroad. By following up with nonrespondents, the AAR obtains essentially a census of railroads. Use of the current survey instrument began in 1986.

Interstate Motor Carriers

The Motor Carrier Management Information System (MCMIS), maintained by the U.S. Department of Transportation, Federal Motor Carrier Safety Administration, contains information on the safety of all commercial interstate motor carriers and hazardous material (HM) shippers subject to the Federal Motor Carrier Safety Regulations and the Hazardous Materials Regulations. All carriers operating in interstate or foreign commerce within 90 days of beginning operations must submit a Form MCS-150, Motor Carrier Identification Report. Carriers may also use the form to update their information. The Motor Carrier Safety Improvement Act of 1999 requires that reports be periodically updated, but not more than once every two years. MCMIS is updated as soon as information is provided and verified, and periodic archives are made. Historical data are available from summary information previously prepared, including tables and reports. MCMIS began operations in 1980. Safety data since 1990 are available to the public.

Marine Vessel Operators

The U.S. Army Corps of Engineers (USACE) provides the data for marine vessel operators

through the *Waterborne Transportation Lines of the United States*. Data are collected by the USACE's Navigation Data Center (NDC) by various means, including the U.S. Coast Guard's registry, maritime service directories, and waterway sector publications. However, an annual survey of companies that operate inland waterway vessels is the principle source of data. More than 3,000 surveys are sent to these companies and response rates are typically above 90 percent. However, a USACE official did report that less than 10 percent of the total number of companies operating inland water vessels either did not receive or respond to the annual survey.

Pipeline Operators

The Office of Pipeline Safety (OPS) in the U.S. Department of Transportation's Research and Special Programs Administration collects annual report data from natural gas transmission and distribution operators as required by 49 CFR 191.17 and 191.11, respectively. Annual data must be submitted by March 15 of the following calendar year. No annual report is required for hazardous liquid pipeline operators. However, information is available through the pipeline safety program. Since 1986, the program has been funded by fees assessed to each OPS-regulated pipeline operator based on per-mile of hazardous pipeline operated. Data for each operator and each mile of pipeline are stored in the OPS user-fee database, which is revised annually as updated fees are assessed.

Totals for pipeline operators in this table will differ from those in other tables due to differences in the regulatory authority of USDOT and the Federal Energy Regulatory Commission (FERC). FERC regulates only interstate pipelines, whereas DOT regulates both interstate and intrastate pipelines, except for rural gathering lines and some offshore pipelines, which fall under jurisdiction of the U.S. Coast Guard or the U.S. Department of the Interior's Minerals Management Service. An OPS official stated that FERC regulates about two-thirds the amount of pipeline mileage that USDOT regulates.

TABLE 1-3. Number of U.S. Airports

The Federal Aviation Administration (FAA), Office of Airport Safety and Standards *Administrator's Fact Book* (annual issues) furnished the data shown in this table and includes airports certified

for air carrier operations with aircraft that seat 30 or more passengers. These airports include civil and joint civil-military use airports, heliports, STOLports (short takeoff and landing), and seaplane facilities. The FAA obtained this data via physical inspections and mail solicitations of all federally regulated landing facilities. Since this is a census of all U.S. airports, reliability should be high. Data, however, may be subject to reporting errors typical of administrative recordkeeping.

TABLE 1-4. Public Road and Street Mileage in the United States by Type of Surface

TABLE 1-5. U.S. Public Road and Street Mileage by Functional System

TABLE 1-6. Estimated U.S. Roadway Lane-Miles by Functional Class

The Highway Performance Monitoring System (HPMS) is the source of road mileage data and is considered reliable. (See box 1-1 for detailed information about the HPMS.) The U.S. Department of Transportation, Federal Highway Administration collects and reviews state-reported HPMS data for completeness, consistency, and adherence to specifications. Some inaccuracy may arise from variations across states in their adherence to federal guidelines in the Traffic Monitoring Guide and the *Highway Performance Monitoring System Field Manual for the Continuing Analytical and Statistical Database*.

Beginning with the 1997 issue of *Highway Statistics*, FHWA instituted a new method for creating mileage-based tables derived from the HPMS. Previously, adjustments to tables developed from sample data were made using area-wide mileage information provided by states. These adjustments are now being made using universe totals from the HPMS dataset. In addition, FHWA has discontinued the process of spreading rounding and other differences across table cells. Thus, users may note minor differences in table-to-table totals. FHWA considers mileage totals from table HM-20, "Public Road Length, Miles by Functional System" to be the controlling totals should a single value be required.

Lane-miles are calculated by multiplying the centerline length by the number of through lanes. Because the HPMS requires that the number of lanes be reported for all principal arterials, other National Highway System (NHS) roads, and all standard

samples, lane length can be computed for the Interstate, other principal arterials, and the NHS on a 100-percent basis. For minor arterials, rural major collectors, and urban collectors, lane length is calculated based on standard sample sections using the reported number of through lanes, length of section, and an expansion factor. FHWA uses the expanded sample to check that the centerline length of a state's functional system matches the universe functional system length. If the centerline length and functional system length do not match, FHWA may ask a state to make adjustments.

Reliability may be diminished for comparisons with pre-1980 data, which were collected via different methods and special national studies. For instance, pre-1980 mileage data included some nonpublic roadways (95,000 miles in 1979) while post-1980 data reports only public road mileage (roads or streets governed and maintained by a public authority and open to public travel).

TABLE 1-7. Number of Stations Served by Amtrak and Rail Transit, Fiscal Year

These numbers originate from Amtrak's Statistical Appendix to *Amtrak's Annual Report* and the U.S. Department of Transportation, Federal Transit Administration's National Transit Database.

Amtrak maintains a computer database with a record of every station, locomotive, and car it operates. Those records include for each vehicle the year built, its service status (operating or not on a daily basis), and location. These data should be considered very reliable.

TABLE 1-8. ADA Accessible Rail Transit Stations by Agency

TABLE 1-9. ADA Lift- or Ramp-Equipped Transit Buses

These data are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Database (NTD). The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are generally required to report financial and operating data, including certain aspects of station and vehicle accessibility. Transit operators that do not report to FTA are those that do not receive Urbanized Area Formula Funding, typically

private, small, and rural operators. The data are generally considered accurate because FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret certain data definitions.

TABLE 1-10. U.S. Oil and Gas Pipeline Mileage

Oil Pipeline

The data are from *Transportation in America*, published by the Eno Transportation Foundation, Inc. (Eno). The numbers reprinted here for 1960, 1965, 1970, and 1975 are Eno estimates from the U.S. Department of Energy's *Energy Data Report* issues labeled "Crude-oil and Refined Products Mileage in the United States." Eno estimated the 1980 number based on the assumption that refinement of old, less profitable, and smaller lines exceeded in mileage the construction of new, larger, and more-profitable lines. Figures from 1985 and later years are calculated from a base figure that Eno obtained from the 1982 U.S. Department of Transportation study *Liquid Pipeline Director* and then incorporated that figure with data from the Association of Oil Pipe Lines and the Oil Pipeline Research Institute. Lack of additional information raises definitional and methodological uncertainties for the data's reliability. Moreover, the three different information sources introduce data discontinuities making time comparisons less reliable.

Gas Pipeline

These statistics originate from annual editions of *Gas Facts* published by the American Gas Association (AGA). The data reported by AGA are based on gas utilities participation and reporting to the Uniform Statistical Report. Utilities reporting in 1991 represented 98 percent of total gas utility industry sales while the remaining 2 percent was estimated for the nonreporting companies based on recent historical experience. Varying percentages of nonreporters from year to year introduce minor reliability problems for time-series comparisons.

TABLE 1-11. Number of U.S. Aircraft, Vehicles, Vessels, and Other Conveyances**TABLE 1-12. Sales or Deliveries of New Aircraft, Vehicles, Vessels, and Other Conveyances****Civilian Aircraft**

The Aerospace Industries Association (AIA) provided this data in their annual issues *Aerospace Facts and Figures*, “Civil Aircraft Shipments.” AIA collects their data from aircraft company reports, the General Aviation Manufacturers Association (GAMA), and the U.S. Department of Commerce’s (DOC) International Trade Administration. DOC data provide total number of shipments and exports, and the difference computed by AIA equals domestic shipments. DOC collects shipments data separately for individual factories or establishments and not at the company level. A potential limitation of this approach is when a factory producing aircraft for shipment also makes aircraft parts. If the establishment has 80 percent of its production in aircraft and 20 percent in parts, all of the output is attributed to aircraft shipments.

Transport

The Aerospace Industries Association (AIA) is the source of these data. AIA obtains quarterly data from Boeing Corp., now the sole U.S. manufacturer of transport aircraft, and publicly available financial disclosure information filed with the U.S. Securities and Exchange Commission (SEC) via Form 10-k. SEC requires a publicly traded company to file an annual report 90 days after the end of the company’s fiscal year to provide an overview of that business.

Helicopters

AIA surveyed and received data from all 10 major helicopter manufacturers on their sales and deliveries.

General Aviation

The general aviation figures are taken from the *General Aviation Statistical Databook* published by the GAMA. General aviation refers usually to the small aircraft industry in the United States. GAMA collects quarterly data from the 10 to 14

manufacturers who nearly equal a census of the general aviation sector.

Passenger Car, Truck, Bus, and Recreational Vehicles

Ward’s *Motor Vehicle Facts and Figures* is the source of these data. Ward’s obtains sales data directly from manufacturers. Readers should note that automobile manufacturers have inflated sales figures in the past, but Ward’s does contact companies to verify numbers that appear too high or low.

Motorcycle

The Motorcycle Industry Council, Inc. (MIC) publishes the *Motorcycle Statistical Annual*, which is the source for these data. MIC derived the estimate for new retail motorcycle sales for each state from the *MIC Retail Sales Report*, and adjusted for total retail sales. Motorcycle company reports provided sales data. Prior to 1985, all-terrain vehicles (ATVs) were included in the motorcycle total. In 1995, the Motorcycle Industry Council revised its data for the years 1985 to present to exclude all terrain vehicles from its totals.

Bicycle

The National Bicycle Dealers Association (NBDA) reported these data, which are based on Bicycle Manufacturers Association (BMA) information through 1996. BMA stopped reporting members’ shipments in 1996. Moreover, BMA represents the largest bicycle manufacturers (Huffy, Roadmaster, and Murray), and thus the data do not reflect specialty bike makers or other manufacturers. The Bike Council estimated 1997 through 2001 figures in the table. According to a Bicycle Council representative, the estimates are a combination of domestic forecasts produced by a panel of industry experts and import data from monthly U.S. census databases.

Transit

The American Public Transit Association provided these figures, which are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Database. These data are generally considered accurate because the FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies

cannot obtain accurate information or misinterpret data. APTA conservatively adjusts FTA data to include transit operators that do not report to the database (private, very small, and rural operators).

Class I Rail

The data are from Railroad Facts, published annually by the Association of American Railroads (AAR). AAR data are based on 100-percent reporting by Class I railroads to the Surface Transportation Board (STB) via Schedule 700 of the *R1 Annual Report*. STB defines Class I railroads as having operating revenues at or above a threshold indexed to a base of \$250 million (1991) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 2000, the threshold for Class I railroads was \$261.9 million. Although Class I railroads encompasses only 2 percent of the number of railroads in the country, they account for over 71 percent of the industry's mileage operated. Historical reliability may vary due to changes in the railroad industry, including bankruptcies, mergers, and declassification by the STB. Small data errors may also have occurred because of independent rounding in this series by the AAR.

Amtrak

Amtrak maintains a computer database with a record of every locomotive and car it operates. For each vehicle, those records include the year built, its service status (operating or not on a daily basis), and location. These data should be considered very reliable.

Water Transportation

U.S. Department of Transportation, Maritime Administration (MARAD), which classifies vessels as merchant based on size and type, reports these data in annual issues of its *Merchant Fleets of the World*. MARAD compiles these figures from a data service provided by Lloyd's Maritime Information Service. The parent company, Lloyd's Register (LR), collects data from several sources: its 200 offices worldwide, data transfers and agreements with other classification societies, questionnaires to ship owners and shipbuilders, feedback from government agencies, and input from port agents. According to an LR official, consistent data gathering methods have been maintained for more than

30 years but cautioned that inconsistencies may occur in groupings of ship types over time. For example, tank barges are now included in the tanker ship-type grouping rather than the barge grouping.

TABLE 1-13. Active Air Carrier and General Aviation Fleet by Type of Aircraft

Air Carrier, Certificated, All Services

Prior to 1995, data originated from the U.S. Department of Transportation, Federal Aviation Administration (FAA), *FAA Statistical Handbook of Aviation*. Later data are from the Aerospace Industries Association (AIA), *Aerospace Facts and Figures*. However, *Aerospace Facts and Figures* is compiled from the *FAA Statistical Handbook of Aviation*. U.S. air carrier fleet data are based on reports collected by FAA field offices from carriers. The reports include information on the number of aircraft by type used in air carrier service. The FAA points out that this information is not an inventory of the aircraft owned by air carriers, but represents the aircraft reported to the FAA as being used in air carrier fleet service. The reported aircraft are all aircraft carrying passengers or cargo for compensation or hire under 14 CFR 121 and 14 CFR 135.

General Aviation

The 1960-1980 figures originated from the *FAA Statistical Handbook of Aviation*. Later data are from FAA annual issues of the *General Aviation and Air Taxi Activity (GAATA)* Survey report, table 3.1. The FAA collects both aircraft registration data and voluntary information about aircraft operation, equipment, and location. Before 1978, the FAA mandated owners to annually register their aircraft for the Aircraft Registration Master File. This was a complete enumeration of operating aircraft. Registrants were also asked to voluntarily report information on hours flown, avionics equipment, base location, and use. The FAA changed their data collection methodology in 1978. The annual registration requirement became triennial and the General Aviation Activity and Avionics Survey was initiated to sample aircraft operation and equipment data.

The General Aviation Activity and Avionics Survey was renamed the General Aviation and Air

Taxi Activity Survey in 1993 to reflect the fact that the survey includes air taxi aircraft. This survey is conducted annually and encompasses a stratified, systematic design from a random start to generate a sample of all general aviation aircraft in the United States. It is based on the FAA registry as the sampling frame. FAA established three stratification design variables in the survey: 1) the average annual hours flown per aircraft by aircraft type, 2) the aircraft manufacturer/model characteristics, and 3) the state of aircraft registration.

Data Reliability

Because of the change in 1978, the reliability of comparisons over time will be affected. The FAA asserted that the change to a triennial registration deteriorated the Aircraft Registration Master File in two ways. First, the resulting lag in registration updates caused the number of undeliverable questionnaires to steadily increase over the three-year period. Second, inactive aircraft would remain in the registry, inflating the general aviation fleet count. In addition, a new regulation added two categories of aircraft to the general aviation fleet. However, FAA concluded that these changes resulted in no more than a five-percent error in the fleet population estimate.

The reliability of the GAATA survey can be impacted by two factors: sampling and nonsampling error. A measure, called the standard error, is used to indicate the magnitude of sampling error. Standard errors can be converted for comparability by dividing the standard error value by the estimate (derived from sample survey results) and multiplying it by 100. This quantity, referred to as the percent standard error, totaled seven-tenths of a percent in 1997 for the general aviation fleet. A large standard error relative to an estimate indicates lack of precision and, inversely, a small standard error indicates precision.

Nonsampling errors could include problems such as nonresponse, respondent's inability or unwillingness to provide correct information, differences in interpretation of questions, and data-entry mistakes. Readers should note that nonresponse bias might be a component of reliability errors in the data from 1980 to 1990. The FAA conducted telephone surveys of nonrespondents in 1977, 1978, and 1979 and found no significant differences or inconsistencies in respondents' and

nonrespondents' replies. The FAA discontinued the telephone survey of nonrespondents in 1980 to save costs. Nonresponse surveys were resumed in 1990, and the FAA found notable differences and thus adjusted its fleet estimates. The 1991 through 1996 data have been revised to reflect nonresponse bias. In 1997, a sample of 29,954 aircraft was identified and surveyed from an approximate population of 251,571 registered general aviation aircraft. Just over 65 percent of the sample responded to the survey.

Highway, Total (registered vehicles)

The 1960 to 1980 figures are from the U.S. Department of Transportation, Federal Highway Administration (FHWA) document, *Highway Statistics, Summary to 1985*, table MV-201 and related tables. Data quality and consistency will be less reliable for these years because of a diversity of registration practices from state to state. Users should recognize that motor vehicle statistical information is not necessarily comparable across all states or within a state from year to year. For instance, the FHWA reported that separate data on single-unit trucks and combinations was unobtainable from all states in 1990.

After 1980, the FHWA began to use the Highway Performance Monitoring System (HPMS) database, which improved data reliability. FHWA reviews state-reported HPMS data for completeness, consistency, and adherence to these specifications. Some inaccuracy may arise from variations across states in their adherence to federal guidelines in the *Highway Performance Monitoring System Field Manual for the Continuing Analytical and Statistical Database*.

If choosing to compare state data, the FHWA recommends that users carefully select a set of peer states that have characteristics similar to the specific comparison. Improperly selected peer states are likely to yield invalid data comparisons. Characteristics that a user needs to consider in determining compatibility of a peer state include similarities and differences in urban/rural areas, population densities, degrees of urbanization, climate, geography, state laws and practices that influence data definitions, administrative controls of public road systems, state economies, traffic volumes, and degrees of centralization of state functions. The FHWA has

developed a set of variables that users may use to determine appropriate peer states.

Other 2-Axle 4-Tire Vehicle (truck)

Sources for these figures included FHWA's *Highway Statistics, Summary to 1995* (table VM-201A) and annual issues of *Highway Statistics* (table VM-1). FHWA compiles these figures from the U.S. Bureau of the Census' Truck Inventory and Use Survey (TIUS). Since 1963, Census has conducted the TIUS every five years with the last survey completed in 1997. The Census Bureau changed the name of the survey to the Vehicle Inventory and Use Survey (VIUS) in 1997. The VIUS collects data and the physical and operational characteristics of the nation's truck population. In 1997, 131,000 trucks were surveyed from an estimated universe of over 75 million trucks. Chronological reliability may be diminished due to sampling design changes in 1977, 1982, and 1992. In 1977, the sampling universe was first stratified by the number of trucks in a state: large (> 1.5 million trucks), medium (700,000 to 1.5 million), and small (< 700,000); and then by two truck sizes.

Stratification in 1982 was then based on body type rather than vehicle weight. In 1992 and 1997, the sampling universe was first subdivided geographically and then into five strata: 1) pickups, 2) vans, 3) single-unit light, 4) single-unit heavy, and 5) truck tractor. Cases were then selected randomly within each stratum.

Census delivered a mail-out/mail-back survey to the owner identified in the vehicle registration records. Data collection is staggered as state records become available. Owners report data only for the vehicles selected. In the 1992 survey, a method was employed to also collect data on new truck purchases in the latter half of the year to estimate the fleet for the calendar year. This adjustment in the sampling frame had not been done in previous surveys and may diminish chronological reliability. The sample for 1997 was some 22,500 vehicles smaller than for 1992. The 1997 VIUS had two sampling stages. For the first stage, the Census Bureau surveyed about 131,000 trucks registered as of July 1, 1997. The second stage sampled a total of 3,000 truck owners with state mailing addresses different from the state of truck registration.

The accuracy and reliability of the VIUS survey depends jointly on sampling variability and non-

sampling errors. Standard errors arising from sampling variability can be converted for comparability by dividing the standard error value by the estimate and multiplying it by 100. This quantity, referred to as the percent standard error, totaled two-tenths of a percent in 1992 and 1997 for the VIUS sample. A large standard error relative to an estimate indicates lack of precision and, inversely, a small standard error indicates precision. The 1992 TIUS achieved over 90.2 percent reporting and the 1997 response rate equaled 84.5 percent, thus reliability may have decreased in the most recent survey.

Transit

The American Public Transit Association (APTA) provided these data, which are based on the Federal Transit Administration (FTA), National Transit Database. These data are generally accurate because the FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret data. APTA conservatively adjusts FTA data to include transit operators that do not report to the database (private, very small, and rural operators).

Railroad (all categories)

The data are from *Railroad Facts*, published annually by the Association of American Railroads (AAR). AAR data are based on 100-percent reporting by Class I railroads to the Surface Transportation Board (STB) via Schedule 700 of the *R1 Annual Report*. Thus, data estimates are considered very reliable. The STB defines Class I railroads as having operating revenues at or above a threshold indexed to a base of \$250 million (1991) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 2000, the adjusted threshold for Class I railroads was \$ 261.9 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for three consecutive years. Although Class I railroads encompasses only 2 percent of the number of railroads in the country, they account for over 71 percent of the industry's mileage operated.

AAR determines the number of non-Class I railroads through an annual, comprehensive survey sent to every U.S. freight railroad. By following up with nonrespondents, the AAR obtains essentially

a 100 percent census of all railroads. Use of the current survey instrument began in 1986.

Amtrak

Amtrak maintains a computer database with a record of every locomotive and car it operates. For each vehicle, those records include the year built, service status (operating or not operating on a daily basis), and location. This data should be considered very reliable.

Water Transportation

The source for Inland Nonselved Propelled Vessels, Self-Propelled Vessels, and flag passenger and cargo vessels is the U.S. Army Corps of Engineers (USACE), *Waterborne Transportation Lines of the United States*, annual issues. Data are collected by the USACE's Navigation Data Center (NDC) by various means, including the U.S. Coast Guard's registry, maritime service directories, and waterway sector publications. However, an annual survey of companies that operate inland waterway vessels is the principle source of data. More than 3,000 surveys are sent to these companies, and response rates are typically above 90 percent. However, a USACE official did report that less than 10 percent of the total number of companies operating inland vessels either did not receive or respond to the annual survey.

Oceangoing Steam Motor Ships

Merchant Fleets of the World, published annually by the U.S. Department of Transportation, Maritime Administration (MARAD), is the source of these data. MARAD, which classifies vessels as merchant based on size and type, compiles these figures from a data service provided by Lloyd's Maritime Information Service (LMIS). The parent company, Lloyd's Register (LR), collects data from 200 offices worldwide, from data transfers and agreements with other classification societies, from questionnaires to ship owners and ship builders, from feedback from government agencies, and from input from port agents. According to an LR official, consistent data-gathering methods have been maintained for more than 30 years. The same official did caution that there are sometimes inconsistencies in groupings of ship types over time. For example, propelled tank barges are now included in the tanker ship-type grouping.

Recreational Boats

Boating Statistics, published annually by the U.S. Coast Guard (USCG), is the source. The USCG derives these figures from state and other jurisdictional reporting of the actual count of valid boat numbers issued. In accordance with federal requirements, all 55 U.S. states and territories require motor-powered vessels to be numbered. However, over half the states do not require non-powered vessels to be numbered. Accuracy can also be diminished by noncompliance of boat owners with numbering and registration laws. In 1996, the USCG estimated that approximately eight million recreational boats are not numbered and, thus, are excluded from the reported number of recreational vessels. The USCG did not provide estimates for the number of boats without numbering in their reports after 1996. Some jurisdictions fail to report by publication deadlines, and the USCG provided estimates based on the previous year's estimate.

TABLE 1-14. U.S. Automobile and Truck Fleets by Use

These statistics originate from two sources. The R.L. Polk Co. provides numbers for commercial fleet vehicles from state registrations. Bobit Publishing Co. also obtains fleet vehicle sales data from automobile manufacturers. These two sources cover nearly 100 percent of fleet vehicles in the United States. Thus, the data should be very accurate.

TABLE 1-15. Annual U.S. Motor Vehicle Production and Factory (Wholesale) Sales

TABLE 1-16. Retail New Passenger Car Sales

TABLE 1-17. New and Used Passenger Car Sales and Leases

TABLE 1-18. Retail Sales of New Cars by Sector

The U.S. Department of Commerce, Bureau of Economic Analysis, uses data from Ward's Automotive Reports. The sectoral break down is derived from registration data obtained from R.L. Polk. Ward's obtains sales data directly from manufacturers. Readers should note that automobile manufacturers have inflated sales figures in the past, but Ward's does contact companies to verify numbers that appear too high or low.

TABLES 1-19 and 1-20. Period Sales, Market Shares, and Sales-Weighted Fuel Economies of New Domestic and Imported Automobiles and Light Trucks, Selected Sales Periods

These data originate from Oak Ridge National Laboratory's (ORNL) Light-Duty MPG and Market Shares System database, which relies on information from monthly Ward's Automotive Reports. Comparisons and observations are made on sales and fuel economy trends from one model year to the next. ORNL has adopted several conventions to facilitate these comparisons, such as the use of sales-weighted average to estimate fuel economy and vehicle characteristics. For example, "sales-weighted" miles per gallon refers to a composite or average fuel economy based on the distribution of vehicle sales. ORNL's methodology for sales-weighting can be found in the Appendix of the *Highway Vehicle MPG and Market Shares Report: Model Year 1990* (the latest published report). The method was changed dramatically in 1983, and data reliability prior to that year is questionable. This information is now published annually in ORNL's *Transportation Energy Data Book*.

TABLE 1-21. Number of Trucks by Weight

These data are derived from the Vehicle Inventory and Use Survey (VIUS) conducted in 1997 by the U.S. Bureau of the Census. This survey, formerly known as the Truck Inventory and Use Survey (TIUS), has been conducted every 5 years since 1963. The VIUS collects data and the physical and operational characteristics of the nation's truck population. In 1997, 131,000 trucks were surveyed from an estimated universe of over 75 million trucks. Chronological reliability may be diminished due to sampling design changes in 1977, 1982, and 1992. In 1977, the sampling universe was first stratified by the number of trucks in a state: large (> 1.5 million trucks), medium (700,000 to 1.5 million), and small (< 700,000); and then by two truck sizes.

Stratification in 1982 was then based on body type rather than vehicle weight. In 1992 and 1997, the sampling universe was first subdivided geographically and then into five strata: 1) pickups, 2) vans, 3) single-unit light, 4) single-unit heavy, and 5) truck tractor. Cases were then selected randomly within each stratum.

Census delivered a mail-out/mail-back survey to the owner identified in the vehicle registration records. Data collection is staggered as state records become available. Owners report data only for the vehicles selected. In the 1992 survey, a method was employed to also collect data on new truck purchases in the latter half of the year to estimate the fleet for the calendar year. This adjustment in the sampling frame had not been done in previous surveys and may diminish chronological reliability. The sample for 1997 was some 22,500 vehicles smaller than for 1992. The 1997 VIUS had two sampling stages. For the first stage, the Census Bureau surveyed about 131,000 trucks registered as of July 1, 1997. The second stage sampled a total of 3,000 truck owners with state mailing addresses different from the state of truck registration.

The accuracy and reliability of the VIUS survey depends jointly on sampling variability and non-sampling errors. Standard errors arising from sampling variability can be converted for comparability by dividing the standard error value by the estimate and multiplying it by 100. This quantity, referred to as the percent standard error, totaled two-tenths of a percent in 1992 and 1997 for the VIUS sample. A large standard error relative to an estimate indicates lack of precision and, inversely, a small standard error indicates precision. The 1992 TIUS achieved over 90.2 percent reporting and the 1997 response rate equaled 84.5 percent, thus reliability may have decreased in the most recent survey.

TABLE 1-22. World Motor Vehicle Production, Selected Countries

Motor Vehicle Production, Factory Sales, and New Passenger Car Retail Sales

Ward's Motor Vehicle Facts & Figures is the source of these data. Ward's obtains sales data directly from manufacturers. Readers should note that automobile manufacturers have inflated sales figures in the past, but Ward's does contact companies to verify numbers that appear too high or low.

Used Passenger Car Sales and Leased Passenger Cars

ADT Automotive Used Car Market Report is the source of these data. The *Wall Street Journal* (WSJ) is the original source of 1999 data. According to

an ADT representative, publishing deadlines require ADT to use WSJ numbers until they can be replaced with National Automotive Dealers Association data. ADT Automotive's Market Analysis Department also gathers figures from CNW Marketing/Research and the R.L. Polk Co. CNW estimates used car sales volumes by collecting state title transfer data and determining if a transaction was made between private individuals or between a consumer and a franchised or independent dealer. This estimate is evaluated by comparing total transactions with state automobile sales revenues. Polk, an additional source of data, maintains a state vehicle registration database. For 1998, the ADT representative stated that Polk's data were within 5 percentage points of CNW estimates.

TABLE 1-23. Number and Size of the U.S. Flag Merchant Fleet and Its Share of the World Fleet

The U.S. Department of Transportation, Maritime Administration, which classifies vessels as merchant based on size and type, compiles these figures from a data service provided by Lloyd's Maritime Information Service. The parent company, Lloyd's Register (LR), collects data from several sources: its 200 offices worldwide, data transfers and agreements with other classification societies, questionnaires to ship owners and shipbuilders, feedback from government agencies, and input from port agents. According to an LR official, consistent data gathering methods have been maintained for more than 30 years, but cautioned that inconsistencies may occur in groupings of ship types over time. For example, tank barges are now included in the tanker ship-type grouping rather than the barge grouping.

TABLE 1-24. U.S. Airport Runway Pavement Conditions

These data originate from the U.S. Department of Transportation, Federal Aviation Administration (FAA), National Plan of Integrated Airport Systems (NPIAS). The NPIAS includes all commercial service airports, all reliever airports, and selected general aviation airports. It does not include more than 1,000 publicly owned public use landing areas, privately owned public use airports, and other civil landing areas not open to the general public. NPIAS airports serve 92 percent of general aviation aircraft (based on an estimated fleet of

200,000 aircraft). In 1998, the NPIAS encompassed 3,344 of the 5,357 airports with public access. Runway pavement condition is classified as follows:

Good: All cracks and joints are sealed.

Fair: Mild surface cracking, unsealed joints, and slab edge spalling.

Poor: Large open cracks, surface and edge spalling, vegetation growing through cracks and joints.

On a rotating basis, the FAA arranges annual inspections for about 2,000 of the approximately 4,700 public-use airports. The inspections are based on funding availability and not on statistical criteria, and nearly all runways are inspected every two years. Inspections are primarily made to collect information for pilots on airport conditions. The FAA relies on state and local agencies to perform inspections, so some inaccuracy may arise from variation in their adherence to federal guidelines regarding pavement condition reporting. In 1998, the U.S. General Accounting Office found that Pavement Condition Index information was available for about 35 percent of NPIAS airports (GAO/RCED-98-226).

TABLE 1-25. Median Age of Automobiles and Trucks in Operation in the United States

The R.L. Polk Co. is a private enterprise that purchases state registration data to maintain a database of operational vehicles. Its data represent a near census of registered vehicles in the United States, and the age estimate should be considered very reliable.

TABLE 1-26. Condition of U.S. Roadways by Functional System

U.S. Department of Transportation, Federal Highway Administration (FHWA) collects pavement condition data from each state through the Highway Performance Monitoring System. The FHWA uses two rating schemes—the Present Serviceability Rating (PSR) and the International Roughness Indicator (IRI). IRI is used to measure the condition of Interstates, other principal arterials, rural minor arterials, and other National Highway System roadways. PSR is used to measure the condition of rural major collectors and urban minor arterials and collectors. Rural minor collectors are not measured. Where IRI data are not reported for sampled sections, the PSR data are

collected. Using the PSR, values range from 0.1 to 5.0, where 5.0 denotes new pavement in excellent condition and 0.1 denotes pavement in extremely poor condition. On the IRI scale however, lower values indicate smoother roads (e.g., <60 for interstate pavement in very good condition to >170 for interstate pavement in poor condition).

The IRI is an objective measure of pavement roughness developed by the World Bank. The PSR is a more subjective measure of a broader range of pavement characteristics and therefore less comparable. Prior to 1993, all pavement conditions were evaluated using PSR values. Beginning with data published in *Highway Statistics 1993*, the FHWA began a transition to the IRI, which should eventually replace the PSR. The change from PSR to IRI makes comparisons between pre-1993 pavement condition data and 1993 and later pavement condition data difficult. Thus, trend comparisons should be made with care.

FHWA indicates that the protocol of measuring pavement roughness is not followed by all states, and some did not report for all required mileage. Totals only reflect those states reporting usable or partially usable data. Column percentages may not sum to 100 and may differ slightly from percentages in source tables, which were adjusted so that they would add to 100. FHWA believes that the IRI data are of “reasonably good quality.”

TABLE 1-27. Condition of U.S. Bridges

These figures are from the U. S. Department of Transportation, Federal Highway Administration (FHWA), National Bridge Inventory Database. State highway agencies are required to maintain a bridge inspection program and inspect most bridges on public roadways at a minimum of every two years. With FHWA approval, certain bridges may be inspected less frequently. A complete file of all bridges is collected and maintained, representing a very reliable assessment of bridge conditions. However, some inaccuracy may be attributable to variations in state inspector’s adherence to the National Bridge Inspection Standards.

TABLE 1-28. Average Age of Urban Transit Vehicles

These figures are based on information in the U.S. Department of Transportation, Federal Transit Administration (FTA), National Transit Database.

The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are generally required to report financial and operating data, including vehicle inventories. Transit operators that do not report to FTA are those that do not receive Urbanized Area Formula Funding, typically private, small, and rural operators. The data are generally considered accurate because FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret certain data definitions.

TABLE 1-29. Class I Railroad Locomotive Fleet by Year Built

The data are from *Railroad Facts*, published annually by the Association of American Railroads (AAR). Figures reported by AAR are based on 100-percent reporting by Class I railroads to the Surface Transportation Board (STB) via Schedule 700 of the *R1 Annual Report*. STB defines Class I railroads as having operating revenues at or above a threshold indexed to a base of \$250 million (1991) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 2000, the threshold for Class I railroads was \$261.9 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for three consecutive years. Although Class I railroads encompasses only 2 percent of the number of railroads in the country, they account for over 71 percent of the industry’s mileage operated.

TABLE 1-30. Age and Availability of Amtrak Locomotive and Car Fleets

Amtrak maintains a computer database with a record of every locomotive and car it operates. For each vehicle those records include the year built, its service status (operating or not on a daily basis), and location. These data should be considered very reliable.

TABLE 1-31. U.S. Flag Vessels by Type and Age

The data are from the U.S. Army Corps of Engineers (USACE), *Waterborne Transportation Lines of the United States* (WTLUS), annual issues. The

WTLUS database contains information on vessel operators and characteristics and descriptions for all domestic vessel operations. Data are collected by the USACE's Navigation Data Center, primarily through a survey of vessel operating companies. More than 3,000 surveys are sent to these companies and response rates are typically above 90 percent. However, a USACE official did report that less than 10 percent of the total number of companies operating inland vessel fleets either did not receive and/or did not respond to the annual survey.

TABLE 1-32. U.S. Vehicle-Miles

TABLE 1-33. Roadway Vehicle-Miles Traveled (VMT) and VMT per Lane-Mile by Functional Class

TABLE 1-34. U.S. Passenger-Miles

Air Carrier, Certificated, Domestic, All Services

The U.S. Department of Transportation (USDOT), the Bureau of Transportation Statistics, Office of Airline Information, reports aircraft revenue-miles and passenger-miles in its publication *Air Traffic Statistics*. These numbers are based on 100-percent reporting of passengers and trip length by large certificated air carriers. Minor errors arise from nonreporting but amount to less than 1 percent of all air carrier passenger-miles. The figures do not include data for all airlines, such as most scheduled commuter airlines and all nonscheduled commuter airlines. These, if added, may raise total air passenger-miles by about 5 percent.

General Aviation

Passenger-mile numbers for 1975 to present are calculated by adjusting the Interstate Commerce Commission's 1974 figure for air passenger-miles by the percentage change in annual hours flown by general aviation aircraft as published in the USDOT, Federal Aviation Administration (FAA), *FAA Statistical Handbook of Aviation*. Numbers in the handbook are based on the General Aviation and Air Taxi Survey (GAATA). In 1993, the GAATA stopped including commuter aircraft. Commuter-miles collected before 1993 by the GAATA were, according to one FAA official, woefully underreported. Therefore, problems with the estimate of general aviation aircraft include: a break in the series between 1992 and 1993, a possible outdated factor

used to calculate passenger-miles, and the classification of commuter operations.

Highway

Highway vehicle-miles of travel (vmt) are estimated using data from the Highway Performance Monitoring System (HPMS), a database maintained by FHWA that contains information on highway characteristics supplied by individual states. Annual vmt by highway functional system is calculated as the product of the annual average daily traffic (AADT) along each highway section, the centerline length of each highway section, and the number of days in the year. Also, expansion factors are used for roadways that are sampled rather than continuously monitored. Vmt by vehicle type is estimated using vehicle share estimates supplied by states.

FHWA has established methods for collecting, coding, and reporting HPMS data in two manuals: *Traffic Monitoring Guide* (TMG) and *Highway Performance Monitoring System Field Manual*. The prescribed sampling process for collecting highway volume data, which is used to estimate AADT, is based on statistical methods. However, in practice, several factors affect the ultimate quality of the data. FHWA discusses many of these issues in their annual *Highway Statistics* report and other publications. However, BTS is not aware of any study or report that has statistically quantified the accuracy of vmt estimates. Some of the primary issues related to data quality are noted here.

1. The sampling procedures suggested in the TMG and HPMS *Field Manual* are designed to produce traffic volume estimates with an average precision level of 80-percent confidence with a 10-percent allowable error at the state level. FHWA provides additional guidance to states through annual workshops and other avenues to help them follow these procedures as closely as possible. However, the actual data quality and consistency of HPMS information are dependent on the programs, actions, and maintenance of sound databases by numerous data collectors, suppliers, and analysts at the state, metropolitan, and other local area levels. Not all states follow the recommended sampling, counting, and estimating procedures contained in the *Traffic Monitoring Guide*, and the exact degree to which the states follow these guidelines overall is

unknown. However, FHWA believes that most states generally follow the guidelines.

2. Estimates for higher level roadway systems are more accurate than those for lower level ones, since traffic volumes on higher level roadways are sampled at a higher rate. The TMG recommends that traffic counts be collected for all Interstate and principal arterial sections on a three-year cycle. Under this scheme, about one-third of the traffic counts for these roadway sections in a given year are actually measured, while volumes on the remainder are factored to represent present growth. Although some States collect data at all traffic count locations every year, most use some variation of the TMG data collection guidelines. Volumes on urban and rural minor arterials, rural major collectors, and urban collectors are collected using a sampling procedure. States are not required to report volumes for rural/urban local systems and rural minor collectors, though most do so. However, the methods used to estimate travel on these roadways vary from state to state since there are no standard guidelines for calculating travel on these roadways.

3. Vmt estimates by vehicle type are less accurate than are estimates for total motor vehicle vmt for several reasons: 1) vehicle classification equipment can frequently misclassify vehicles (see B.A. Harvey et al, *Accuracy of Traffic Monitoring Equipment*, GDOT 9210, (Georgia Tech Research Institute:1995)); 2) vehicle shares are often determined by methods or by special studies that are not directly compatible with HPMS data definitions and/or purposes, and observed local-level vehicle classification counts are difficult to apply on a statewide basis; and 3) vehicle type definitions can vary among states.

4. Vmt estimates for combination trucks in HPMS differ from survey-based estimates from the Truck Inventory and Use Survey (TIUS), as much as 50 percent for some categories of combination trucks. Much of this discrepancy appears to be due to differences in truck classification definitions and biases introduced by data collection practices. See R.D. Mingo et al.1995. *Transportation Research Record*, No. 1511 (Washington, DC: National Academy Press), pp. 42-46.

5. FHWA adjusts questionable data using a variety of standard techniques and professional judgment. For example, national average temporal

adjustment factors developed from HPMS and other national highway monitoring programs are applied to state data, when necessary, to compensate for temporal deficiencies in sampling practices. Also, in estimating vmt by vehicle type, FHWA employs an iterative process to reconcile vmt, fuel economy (miles per gallon), fuel consumption, and vehicle registration estimates. Fuel consumption, total vmt by highway functional class, and registrations by vehicle group are used as control totals. This process limits the size of errors and ensures data consistency.

6. Passenger-miles of travel (pmt) are calculated by multiplying vmt estimates by vehicle loading (or occupancy) factors from various sources, such as the Nationwide Personal Transportation Survey conducted by FHWA and TIUS. Thus, pmt data are subject to the same accuracy issues as vmt, along with uncertainties associated with estimating vehicle-loading factors.

Transit

The American Public Transit Association (APTA) figures are based on information in USDOT, Federal Transit Administration (FTA), National Transit Database. Transit data are generally considered accurate because FTA reviews and validates information submitted by individual transit agencies. However, reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret data. APTA adjusts the FTA data to include transit operators that do not report to the FTA database (private, very small, and rural operators).

Class I Rail (vehicle-miles)

Data are from *Railroad Facts*, published annually by the Association of American Railroads (AAR). AAR data are based on 100-percent reporting by Class I railroads to the Surface Transportation Board (STB) via Schedule 700 of the *R1 Annual Report* required of Class I railroads. STB defines Class I railroads as having operating revenues at or above a threshold indexed to a base of \$250 million (1991) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 1999, the adjusted threshold for Class I railroads was \$258.5 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for three consecutive

years. Although Class I railroads encompasses only 2 percent of the number of railroads in the country, they account for over 71 percent of the industry's mileage operated.

Intercity Train

The AAR passenger-miles number is based on an almost 100-percent count of tickets and, therefore, is considered accurate.

TABLE 1-36. Long-Distance Travel in the United States by Selected Trip Characteristics: 1995

TABLE 1-37. Long-Distance Travel in the United States by Selected Traveler Characteristics: 1995

The data presented in these tables are estimates derived from the 1995 American Travel Survey (ATS) conducted for the U.S. Department of Transportation, Bureau of Transportation Statistics. The survey's estimation procedure inflates unweighted sample results to independent estimates of the total population of the United States. Values for missing data are estimated through imputation procedures.

Since ATS estimates come from a sample, they are subject to two possible types of error: nonsampling and sampling. Sources of nonsampling errors include inability to obtain information about all sample cases, errors made in data collection and processing, errors made in estimating values for missing data, and undercoverage.

The accuracy of an estimate depends on both types of error, but the full extent of the nonsampling error is unknown. Consequently, the user should be particularly careful when interpreting results based on a relatively small number of cases or on small differences between estimates.

Standard errors for ATS estimates that indicate the magnitude of sampling error as well as complete documentation of the source and reliability of the data may be obtained from detailed ATS reports. Because of methodological differences, users should use caution when comparing these data with data from other sources.

TABLE 1-38. U.S. Air Carrier Departures, Enplaned Revenue Passengers, and Enplaned Revenue Tons

The *Airport Activity Statistics of Certificated Air Carriers* (AAS) is the source of these data. Published annually by the U.S. Department of Trans-

portation, Bureau of Transportation Statistics, Office of Airline Information (OAI), the AAS presents traffic statistics for all scheduled and non-scheduled service by large certificated U.S. air carriers for each airport served within the 50 states, the District of Columbia, and other U.S. areas designated by the Federal Aviation Administration. The publication draws its data from the T-100 and T-3 databases maintained by OAI. These data are based on a 100-percent reporting of enplanements, departures, and tonnage information by large certificated U.S. air carriers via BTS Form 41.

Prior to 1993, the AAS included all scheduled and some nonscheduled enplanements for certificated air carriers but did not include enplanements for air carriers offering charter service only. Prior to 1990, the freight category was divided into both freight and express shipments and the mail category was divided into U.S. mail (priority and non-priority) and foreign mail. Beginning in 1990, only aggregate numbers were reported for freight and mail.

Air traffic hubs are designated as geographical areas based on the percentage of total passengers enplaned in the area. A hub may have more than one airport. This definition of hub should not be confused with the definition used by airlines in describing their "hub-and-spoke" route structures.

TABLE 1-39. Passengers Boarded at the Top 50 U.S. Airports

The *Airport Activity Statistics of Certificated Air Carriers* (AAS) is the source of these data. Published by USDOT, Bureau of Transportation Statistics, Office of Airline Information (OAI), the AAS presents traffic statistics for all scheduled and nonscheduled service by large certificated U.S. air carriers for each airport served within the 50 states, the District of Columbia, and other U.S. areas designated by the Federal Aviation Administration. The publication draws its data from the T-100 and T-3 databases maintained by OAI. These data are based on a 100-percent reporting of enplanements, departures, and tonnage information by large certificated U.S. air carriers via BTS Form 41.

Prior to 1993, the AAS included all scheduled and some nonscheduled enplanements for certificated air carriers but did not include enplanements for air carriers offering charter service only. Prior

to 1990, the freight category was divided into both freight and express shipments and the mail category was divided into U.S. mail (priority and nonpriority) and foreign mail. Beginning in 1990, only aggregate numbers were reported for freight and mail.

TABLE 1-40. Air Passenger Travel Arrivals in the United States from Selected Foreign Countries

TABLE 1-41. Air Passenger Travel Departures from the United States to Selected Foreign Countries

The International Trade Administration in the U.S. Department of Commerce publishes the *U.S. International Air Travel Statistics Report* annually. The passenger data is based on information collected by the U.S. Immigration and Naturalization Service using the INS Form I-92. All passengers on international flights must complete the I-92 form with the exception of those passengers on flights arriving or departing from Canada.

The international passenger arrivals and departures data for Canada is obtained from *Air Carrier Traffic at Canadian Airports*, which is published by Statistics Canada. Three surveys are conducted by Statistics Canada in order to collect the necessary passenger data. Since all data is not received by the time of publication and data is occasionally updated or resubmitted by the participating carriers, data should be considered preliminary for the years referenced in the source publication.

TABLE 1-44. U.S. Ton-Miles of Freight

Air Carrier

Air Carrier Traffic Statistics, published by the U.S. Department of Transportation, Bureau of Transportation Statistics (BTS), Office of Airline Information (OAI), is the source of these data. Large certificated U.S. air carriers report domestic freight activities to OAI via BTS Form 41. The information reported in the table represents transportation of freight (excluding passenger baggage), U.S. and foreign mail, and express mail within the 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. It also covers transborder traffic to Canada and Mexico by U.S. carriers. The data does not include information on small certifi-

cated air carriers, which represent less than 5 percent of freight ton-miles.

Intercity Truck

The data are estimates from *Transportation in America*, published by the Eno Transportation Foundation, Inc. (Eno). Eno's estimates of intercity truck ton-miles are based on historic data from the former Interstate Commerce Commission (ICC), estimates from the American Trucking Association, and other sources. Eno supplements its estimates by using additional information on vehicle-miles of truck travel published in Highway Statistics by the Federal Highway Administration. Users should note that truck estimates in the tables do not include local truck movements.

Class I Rail

The data are from *Railroad Facts*, published annually by the Association of American Railroads (AAR). AAR data are based on 100-percent reporting by Class I railroads to the Surface Transportation Board (STB). The data represent all revenue freight activities of the Class I railroads and are not based on information from the Rail Waybill Sample. The STB defines Class I railroads as having operating revenues at or above a threshold indexed to a base of \$250 million (1991) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 2000, the adjusted threshold for Class I railroads was \$ 261.9 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for three consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 71 percent of the industry's mileage operated.

Domestic Water Transport

The data are from *Waterborne Commerce of the United States*, published by the U.S. Army Corps of Engineers (USACE). All vessel operators of record report their domestic waterborne traffic movements to USACE via ENG Forms 3925 and 3925b. Cargo movements are reported according to points of loading and unloading. Certain cargo movements are excluded: 1) cargo carried on general ferries, 2) coal and petroleum products loaded from shore facilities directly into vessels for fuel use, 3)

military cargo moved in U.S. Department of Defense vessels, and 4) cargo weighing less than 100 tons moved on government equipment. USACE calculates ton-miles by multiplying the cargo's tonnage by the distance between the points of loading and unloading.

Oil Pipeline

The data for 1960, 1965, and 1970 are from *Transportation in America*, published by the Eno Transportation Foundation, Inc., and the data for 1975 to 1998 are from *Shifts in Petroleum Transportation*, by the Association of Oil Pipe Lines (AOPL). Eno's data are based on information from the former Interstate Commerce Commission's *Transport Economics*. Common carrier oil pipelines reported all freight activities to the ICC.

AOPL obtains barrel-miles from the Federal Energy Regulatory Commission (FERC), which requires petroleum shippers to report annual shipments. AOPL then converts barrel-miles to ton-miles using conversion figures in the American Petroleum Institute's (API's) *Basic Petroleum Data Book*. Since 16 percent of pipeline shipments are intrastate and not subject to FERC reporting requirements, AOPL makes adjustments to FERC data.

TABLE 1-45. Average Length of Haul: Domestic Freight and Passenger Modes

Freight

Air Carrier and Truck

The Eno Transportation Foundation, Inc. estimated these figures.

Class I Rail

The data are from *Railroad Facts*, published annually by the Association of American Railroads (AAR). AAR data are based on 100-percent reporting by Class I railroads to the Surface Transportation Board (STB) via Schedule 700 of the *R1 Annual Report* required of Class I railroads. The STB defined Class I railroads as having operating revenues at or above a threshold indexed to a base of \$250 million (1991) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 2000, the adjusted threshold for Class I rail-

roads was \$ 261.9 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for three consecutive years. Although Class I railroads encompasses only 1 percent of the number of railroads in the country, they account for over 71 percent of the industry's mileage operated.

Water

The data are from *Waterborne Commerce of the United States*, published by the U.S. Army Corps of Engineers (USACE). All vessel operators of record report their domestic waterborne traffic movements to USACE via ENG Forms 3925 and 3925b. Cargo movements are reported according to points of loading and unloading. Certain cargo movements are excluded: 1) cargo carried on general ferries, 2) coal and petroleum products loaded from shore facilities directly into vessels for fuel use, 3) military cargo moved in U.S. Department of Defense vessels, and 4) cargo weighing less than 100 tons moved on government equipment. USACE calculates ton-miles by multiplying the cargo's tonnage by the distance between points of loading and unloading.

Oil Pipeline

The Eno Transportation Foundation, Inc., provided these figures, which are estimates based on U.S. Department of Energy and Association of Oil Pipe Lines reports. Figures are derived by dividing estimated pipeline ton-miles by estimated crude and petroleum products tonnage.

Passenger

Air Carrier

The U.S. Department of Transportation (USDOT), the Bureau of Transportation Statistics, Office of Airline Information, reports average trip length in its publication *Air Traffic Statistics*. These numbers are based on 100-percent reporting of passengers and trip length by large certificated air carriers via BTS Form 41. The figures do not include data for all airlines, such as most scheduled commuter airlines and all nonscheduled commuter airlines.

Bus

The Eno Transportation Foundation, Inc. estimated these figures based on Class I carrier passen-

ger data and vehicle-miles data from *Highway Statistics*, an annually published report of the USDOT, Federal Highway Administration.

Commuter Rail

The American Public Transit Association (APTA) provided these data, which are based on the USDOT, Federal Transit Administration's (FTA's), National Transit Database. Transit data are generally accurate because the FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret data. APTA conservatively adjusts FTA data to include transit operators that do not report to the database (private, very small, and rural operators).

Intercity/Amtrak

The Statistical Appendix to the *Amtrak Annual Report* is the source of these data. Amtrak data are based on 100 percent of issued tickets, and thus should be accurate.

TABLE 1-46. Top U.S. Foreign Trade Freight Gateways by Value of Shipments: 2001

The value of U.S. air, maritime, and land imports and exports are captured from administrative documents required by the U.S. Departments of Commerce and Treasury. In 1990, the United States entered into a Memorandum of Understanding with Canada concerning the exchange of import data. As a consequence, each country is using the other's import data to replace its own export data. U.S. international merchandise trade statistics, therefore, are no longer derived exclusively from the administrative records of the Departments of Commerce and Treasury, but from Revenue Canada. Import value is for U.S. general imports, customs value basis. Export value is FAS (free along ship) and represents the value of exports at the U.S. port of export, including the transaction price and inland freight, insurance, and other charges. Trade levels reflect the mode of transportation as a shipment entered or exited a U.S. Customs port.

Truck, rail pipeline, mail, and miscellaneous modes are included in the total for land modes. Data present trade activity between the United States, Puerto Rico, and the U.S. Virgin Islands and Canada and Mexico. These statistics do not

include traffic between Guam, Wake Island, and American Samoa and Canada and Mexico. These statistics also exclude imports that are valued at less than \$1,250 and for exports that are valued at less than \$2,500.

TABLE 1-49. U.S. Waterborne Freight

The data are from *Waterborne Commerce of the United States*, published by the U.S. Army Corps of Engineers (USACE). All vessel operators of record report their domestic waterborne traffic movements to USACE via ENG Forms 3925 and 3925b. Cargo movements are reported according to points of loading and unloading. Certain cargo movements are excluded: 1) cargo carried on general ferries, 2) coal and petroleum products loaded from shore facilities directly into vessels for fuel use, 3) military cargo moved in U.S. Department of Defense vessels, and 4) cargo weighing less than 100 tons moved on government equipment. USACE calculates ton-miles by multiplying the cargo's tonnage by the distance between points of loading and unloading.

Foreign waterborne statistics are derived from Census Bureau and U.S. Customs data, which excludes traffic between Guam, Wake Island, and American Samoa and any other foreign country, and imports and exports used by U.S. Armed Forces abroad. Individual vessel movements with origins and destinations at U.S. ports, traveling via the Panama Canal are considered domestic traffic.

TABLE 1-50. Tonnage of Top 50 U.S. Water Ports, Ranked by Total Tons

Data on the weight of U.S. maritime imports and exports are captured from administrative documents required by the U.S. Departments of Commerce and Treasury. In 1990, the United States entered into a Memorandum of Understanding with Canada concerning the exchange of import data. As a consequence, each country is using the other's import data to replace its own export data. The United States' merchandise trade statistics, therefore, are no longer derived exclusively from U.S. government administrative records, but from Revenue Canada. Maritime weight data are initially processed and edited by the Foreign Trade Division, U.S. Census Bureau (Census) as part of the overall edits and quality checks performed on all U.S. international merchandise trade data.

After Census processing, the U.S. Army Corps of Engineers (USACE) and the Maritime Administration (MARAD) perform additional maritime-specific processing and quality edits on maritime-related data elements, including the weight of maritime imports and exports. The USACE and MARAD began performing this function in October 1998 after the Foreign Waterborne Trade data program was transferred from the Census Bureau. Prior to October 1998, the USACE historically performed additional specialized edits at the port level, including reassignment of some tonnage data to the actual waterborne port rather than the reported U.S. Customs port.

TABLE 1-46. Modal Shares of Freight Shipments within the United States by Domestic Establishments: 1993 and 1997

TABLE 1-52. Value, Tons, and Ton-Miles of Freight Shipments within the United States by Domestic Establishment, 1997

TABLE 1-55. U.S. Hazardous Materials Shipments by Mode of Transportation, 1997

TABLE 1-56. U.S. Hazardous Materials Shipments by Hazard Class, 1997

These data are collected via the 1997 Commodity Flow Survey (CFS) undertaken through a partnership between the U.S. Department of Commerce, Census Bureau (Census), and the U.S. Department of Transportation, Bureau of Transportation Statistics. For the 1997 CFS, Census conducted a sample of 100,000 domestic establishments randomly selected from a universe of about 800,000 multiestablishment companies in the mining, manufacturing, wholesale trade, and selected retail industries. It excluded establishments classified as farms, forestry, fisheries, governments, construction, transportation, foreign, services, and most retail.

Reliability of the Estimates

An estimate based on a sample survey potentially contains two types of errors—sampling and nonsampling. Sampling errors occur because the estimate is based on a sample, not on the entire universe. Nonsampling errors can be attributed to many sources in the collection and processing of

the data and occur in all data, not just those from a sample survey. The accuracy of a survey result is affected jointly by sampling and nonsampling errors.

Sampling Variability

Because the estimates are derived from a sample of the survey population, results are not expected to agree with those that might be obtained from a 100-percent census using the same enumeration procedure. However, because each establishment in the Standard Statistical Establishment List had a known probability of being selected for sampling, estimating the sampling variability of the estimates is possible. The standard error of the estimate is a measure of the variability among the values of the estimate computed from all possible samples of the same size and design. Thus, it is a measure of the precision with which an estimate from a particular sample approximates the results of a complete enumeration. The coefficient of variation is the standard error of the estimate divided by the value being estimated. It is expressed as a percent. Note that measures of sampling variability, such as the standard error or coefficient of variation, are estimated from the sample and are also subject to sampling variability. Standard errors and coefficients of variation for CFS data presented in this report are given in Appendix B of the 1997 Economic Census report, and are available online www.census.gov/econ/wwwse0700.html.

Nonsampling Errors

In the CFS, as in other surveys, nonsampling errors can be attributed to many sources, including 1) nonresponse; 2) response errors; 3) differences in the interpretation of questions; 4) mistakes in coding or recoding the data; and 5) other errors of collection, response, coverage, and estimation.

A potentially large source of nonsampling error is due to nonresponse, which is defined as the inability to obtain all intended measurements or responses from selected establishments. Nonresponse is corrected by imputation.

TABLE 1-53. Value of U.S. Land Exports to and Imports from Canada and Mexico by Mode

The Transborder Surface Freight Data (TSFD) is derived from official U.S. international merchant-

dise import and export data. (For a description of U.S. merchandise trade statistics, see www.census.gov/foreign-trade/www/index.html). As of December 1995, about 96 percent of the value of all U.S. imports has been collected electronically by the Automated Broker Interface System. About 55 percent of the value of all U.S. exports is collected electronically through the U.S./Canada Data Exchange and the Automated Export Reporting Program. The balance is collected from administrative records required by the U.S. Departments of Commerce and Treasury.

The TSFD incorporates all data, by surface mode, on shipments entering or exiting the United States from or to Canada or Mexico. Prior to January 1997, this dataset also included transshipments—shipments entering or exiting the United States by way of U.S. Customs ports on the northern or southern borders even when the actual origin or final destination of the goods was other than Canada or Mexico. (In other U.S. Bureau of the Census trade statistics, transshipments through Canada and Mexico are credited to the true country of origin or final destination.) To make this dataset more comparable to other U.S. Census Bureau trade statistics, detailed information on transshipments has been removed. The TSFD presents a summary of transshipments by country, direction of trade, and mode of transportation. Shipments that neither originate nor terminate in the United States (i.e., intransits) are beyond the scope of this dataset because they are not considered U.S. international trade shipments.

In general, the reliability of U.S. foreign trade statistics is very good. Users should be aware that trade data fields (e.g., value and commodity classification) are typically more rigorously reviewed than transportation data fields (e.g., the mode of transportation and port of entry/exit). Users should also be aware that the use of foreign trade data to describe physical transportation flows may not be accurate. For example, this dataset provides surface transportation information for individual U.S. Customs districts and ports on the northern and southern borders. However, because of filing procedures for trade documents, these ports may or may not record where goods physically cross the border. This is because the information filer may choose to file trade documents at one port while shipments actually enter or exit at another port.

The TSFD, however, is the best publicly available approximation for analyzing transborder transportation flows. Since the dataset was introduced in April 1993, it has gone through several refinements and improvements. When improbabilities and inconsistencies were found in the dataset, extensive analytical reviews were conducted and improvements made. However, accuracy varies by direction of trade and individual field. For example, import data are generally more accurate than export data. This is primarily because the U.S. Customs Bureau uses import documents for enforcement purposes while it performs no similar function for exports. For additional information on TSFD, the reader is referred to the U.S. Department of Transportation, Bureau of Transportation Statistics Internet site at www.bts.gov/transborder.

TABLE 1-54. Crude Oil and Petroleum Products Transported in the United States by Mode

Pipelines

The Association of Oil Pipelines (AOPL) obtains barrel-miles from the Federal Energy Regulatory Commission (FERC), which requires petroleum shippers to report annual shipments. AOPL then converts barrel-miles to ton-miles using conversion figures in the American Petroleum Institute's (API's) *Basic Petroleum Data Book*. Since 16 percent of pipeline shipments are intrastate and not subject to FERC reporting requirements, AOPL makes adjustments to FERC data to include intrastate shipments. AOPL also conducts periodic studies to estimate intrastate shipments.

Water Carriers

Data are from *Waterborne Commerce of the United States*, published by the U.S. Army Corps of Engineers (USACE). All vessel operators of record report domestic freight and tonnage information to USACE via ENG Forms 3925 and 3925b. Cargo movements are reported according to points of loading and unloading. Certain cargo movements are excluded: 1) cargo carried on general ferries, 2) coal and petroleum products loaded from shore facilities directly into vessels for fuel use, 3) military cargo moved in U.S. Department of Defense vessels, and 4) cargo weighing less than 100 tons moved on government equipment. USACE calculates ton-miles by

multiplying the cargo's tonnage by the distance between the points of loading and unloading.

Motor Carriers

AOPL estimates ton-miles by multiplying tons by the average length of haul. For crude, the tonnage of the prior year is projected by using a growth rate established by data from the U.S. Department of Energy, Energy Information Administration's *Petroleum Supply Annual*, vol. 1, table 37. For products, the same calculation is made but with a growth rate estimated by the American Trucking Association in *Financial and Operating Statistics, Class I and II, Motor Carriers*, Summary table VI-B. Average length of haul is determined from the prior six years of data for ton-miles and tonnage of crude and petroleum products moved by motor carriers.

Railroad

AOPL calculates ton-miles by multiplying tonnage by average length of haul. Tonnage data for crude and products comes from the Association of American Railroad's *Freight Commodity Statistics*, U.S. Class I Railroads. The U.S. Department of Transportation, Federal Railroad Commission provides the average length of haul for crude and products in its Carload Way Bill Statistics.

TABLE 1-57. Worldwide Commercial Space Launches

The U.S. Department of Transportation, Federal Aviation Administration, Associate Administrator for Commercial Space Transportation (AST) licenses and regulates U.S. commercial space launches as authorized by the Commercial Space Launch Act of 1984 and Executive Order 12465. Every commercial space launch must be approved and monitored by AST. Thus, data reliability is high.

TABLE 1-58. Passengers Denied Boarding by the Largest U.S. Air Carriers

TABLE 1-59. Mishandled-Baggage Reports Filed by Passengers with the Largest U.S. Air Carriers

TABLE 1-60. Flight Operations Arriving On Time for the Largest U.S. Air Carriers

These numbers are based on data filed with the U.S. Department of Transportation on a monthly

basis by the largest U.S. air carriers – those that have at least one percent of total domestic scheduled-service passenger revenues. Data cover non-stop scheduled service flights between points within the United States (including territories). The largest U.S. carriers account for more than 90 percent of domestic operating revenues. They include Alaska Airlines, America West Airlines, American Airlines, Continental Airlines, Delta Air Lines, Northwest Airlines, Trans World Airlines, Southwest Airlines, United Airlines, and US Airways. However, there are other carriers offering domestic scheduled passenger service that are not required to report. In some cases, major airlines sell tickets for flights that are actually operated by a smaller airline that is not subject to the reporting requirement.

TABLE 1-61. U.S. Air Carrier Delays Greater than 15 Minutes by Cause

The source of these data, the U.S. Department of Transportation (USDOT), Federal Aviation Administration (FAA), counts a flight as delayed if it departed or arrived more than 15 minutes after its scheduled gate departure and arrival times. FAA calculates delayed departures based on the difference between the time a pilot requests FAA clearance to taxi and the time an aircraft's wheels lift off the runway, minus the airport's standard unimpeded taxi-out time. Users should note that taxi-out time varies by airport due to differences in configurations. The cause of delay is also recorded, e.g., weather, terminal volume, closed runways, etc.

USDOT guidance defines departure as the time the aircraft parking brake is released and gate arrival as the time the brake is set. According to the USDOT's Office of the Inspector General (OIG), FAA's omission of part of a plane's ground movement compromises the data's validity. A recent OIG report noted that the FAA tracks ground time only after a pilot requests clearance and fails to track a plane's time in the ramp area. OIG found that ramp time comprised 28.7 percent to 40.5 percent of the average taxi-out time at the three major New York area airports (OIG Audit Report CR-2000-112), and would not be counted as an FAA delay.

Reliability

Several data collection changes complicate comparisons over time. For example, FAA modified its

method for calculating volume-related delays that resulted in a 17 percent drop in such delays. Decreases in volume-related delays from 1998 to 1999 totaled less than one percent. Moreover, prior to 1999, USDOT did not provide a clear definition of what a departure was. An OIG Audit (CE-1999-054) report noted that air carriers used four different departure events: 1) rolling of aircraft wheels; 2) release of parking brake; 3) closure of passenger and/or cargo doors; and 4) a combination of door closures and release of the parking break. The same report also noted errors in the reporting of departure times by the air carriers.

Data are now manually entered in FAA's Operations Network (OSPNET) database, and reporting errors may arise and decrease reliability. The FAA monitors data quality assurance by spot checking the reported delay data and requesting that discrepancies be reviewed by the responsible facility. According to an OIG Audit (CR-2000-112), however, mistakes are not reliably corrected and many air traffic controllers suggested that delays are underreported sometimes by as much as 30 percent.

TABLE 1-62. Major U.S. Air Carrier Delays, Cancellations, and Diversions

A second data source for air-carrier delay is the USDOT, Bureau of Transportation Statistics, Office of Airline Information (OAI). This information originates from the Airline Service Quality Performance data. These figures are collected from the largest airlines—those that have at least one percent or more of total domestic scheduled service passenger revenues. Delays are categorized by phase of flight (i.e., gate-hold, taxi-out, airborne, or taxi-in delays). These data differ from FAA's OSPNET information due to differences in definition of delay.

While the FAA tracks delays on the taxiway, runway, and in the air, BTS tracks delays at the departure and arrival gates. OAI calculates delays as the difference between scheduled and actual gate departure. If a flight leaves the gate within 15 minutes of its scheduled time, then OAI would record it as departed on-time even if it sat for several hours on the ramp or runway, in which case the delay would be accounted for as a late arrival.

TABLE 1-63. Annual Person-Hours of Delay Per Person

TABLE 1-64. Roadway Congestion Index

TABLE 1-65. Congestion Index and Cost Values

The Texas Transportation Institute's (TTI) *Urban Roadway Congestion Annual Report* provided figures for tables 1-60 through 62. TTI relies on data from the U.S. Department of Transportation, Federal Highway Administration, Highway Performance Monitoring System database (HPMS). TTI utilizes these data as inputs to its congestion estimation model. Detailed documentation for the TTI model and estimations can be found at this website <http://mobility.tamu.edu>.

Structure, Assumptions, and Parameters

Urban roadway congestion levels are estimated using a formula measuring traffic density. Average travel volume per lane on freeways and principal arterial streets are estimated using area wide estimates of vehicle-miles of travel (vmt) and lane miles of roadway. The resulting ratios are combined using the amount of travel on each portion of the system so that the combined index measures conditions on the freeway and principal arterial street systems. Values greater than one are indicative of undesirable congestion levels. Readers seeking the algorithm for the congestion index should examine this website <http://mobility.tamu.edu>.

Annual person-hours of delay results from the multiplication of daily vehicle-hours of incident and recurring delay times 250 working days per year times 1.25 persons per vehicle. Two types of costs are incurred due to congestion: time delay and fuel consumption. Delay costs are the product of passenger vehicle hours of delay times \$12.85 per hour person time value times 1.25 occupants per vehicle. Fuel costs are calculated for passenger and commercial vehicles from the multiplication of peak period congestion speeds, the average fuel economy, fuel costs, and vehicle-hours of delay.

In previous reports, the TTI methodology assumed that 45 percent of all traffic, regardless of the urban location, occurred in congested conditions. TTI indicated that this assumption overestimated travel in congested periods. Thus, their 2002 estimates now vary by urban area anywhere from 18 percent to 50 percent of travel that occurs

in congestion. TTI's model structure applies to two types of roads: freeways and principal arterial streets. The model derives estimates of vehicle traffic per lane and traffic speed for an entire urban area. Based on variation in these amounts, travel is then classified under 5 categories: uncongested, moderately congested, heavily congested, severely congested, and extremely congested (a new category in 1999). The threshold between uncongested and congested was changed in 2002. Previous editions classified congested travel when areawide traffic levels reached 14,000 vehicles per lane per day on highways and 5,500 vehicles per lane per day on principal arterial streets. For the current edition, these values are 15,500 and 5,500 vehicles per lane per day, respectively. Previous years values have been re-estimated based on these new assumptions. Readers should refer to the TTI Internet site for more detailed algorithms and estimation procedures at <http://mobility.tamu.edu>.

TTI reviews and adjusts the data used in their models. State and local officials also review the

TTI data and estimations. Some of the limitations acknowledged in the TTI report include the macroscopic character of the index. Thus, it does not account for local variations in travel patterns that may affect travel times. The index also does not account for local improvements, such as ramp metering or travel speed advantages obtained with transit or carpool lanes.

TABLE 1-66. Amtrak On-Time Performance Trends and Hours of Delay by Cause

Amtrak determines on-time performance through its computer system maintained at the National Operations Center (NOPS) in Wilmington, Delaware. If a train is delayed, a call is made to the NOPS for recordkeeping. These data can be supplemented with computer entries made for locomotive or car malfunctions that cause delays. These data should be considered reliable.

Chapter 2 Safety

AIR DATA

TABLE 2-1. Transportation Fatalities by Mode

TABLE 2-2. Injured Persons by Transportation Mode

TABLE 2-3. Transportation Accidents by Mode

TABLE 2-4. Distribution of Transportation Fatalities by Mode

TABLE 2-7. Transportation-Related Occupational Fatalities

TABLE 2-9. U.S. Air Carrier Safety Data

TABLE 2-10. U.S. Commuter Air Carrier Safety Data

TABLE 2-11. U.S. Air Carrier Fatal Accidents by First Phase of Operation

TABLE 2-12. U.S. Commuter Air Carrier Fatal Accidents by First Phase of Operation

TABLE 2-13. U.S. On-Demand Air Taxi Safety Data

TABLE 2-14. U.S. General Aviation Safety Data

National Transportation Safety Board investigators perform onsite and offsite investigations of all accidents involving U.S. registered air carriers operating under 14 CFR 121, 14 CFR 135, and general aviation U.S. Department of Transportation (USDOT), Federal Aviation Administration (FAA) regulations. The investigators compile information on fatalities and injuries for all accidents. The counts for fatalities and serious injuries are expected to be extremely accurate. (See glossary for serious injury definition.)

Exposure data (aircraft-miles, aircraft-hours, and aircraft-departures) are obtained from the FAA, which in turn gets some of its exposure data from the USDOT, Bureau of Transportation Statistics, Office of Airline Information (OAI) and other exposure data from its own General Aviation and Air Taxi Activity and Avionics (GAATAA) Survey. The OAI data represent 100 percent reporting by airlines. Tables that include air carriers (14 CFR 121, scheduled and nonscheduled service) and commuter air carriers (14 CFR 135, scheduled service only) use OAI exposure data. Tables that include on-demand air taxi (14 CFR 135, non-

scheduled service) and general aviation use GAATAA Survey results. For information about the GAATA Survey, please refer to the chapter 1 data accuracy statement for table 1-9.

The coefficients of variation for aircraft-hours vary by year, but are usually in the 9 to 10 percent range for on-demand air taxi and are approximately 2 percent for general aviation.

TABLE 2-15. Number of Pilot-Reported Near Midair Collisions by Degree of Hazard

Near Midair Collision reports are provided voluntarily by air carriers, general aviation companies, and the military, and this information is added to the Near Midair Collisions System database. Factors that may influence whether or not a near mid-air collision is reported include the pilot's or other crew member's perception of whether a reportable near midair collision occurred, which in turn can depend on factors such as visibility conditions; the reporter's flying experience; or the size of the aircraft involved. A reportable incident is one in which an aircraft is within 500 feet of another aircraft and a possibility of collision existed.

TABLE 2-16. Airline Passenger Screening Results by Type of Weapons Detected, Persons Arrested, and Bomb Threats Received

Federal Aviation Regulations (FARs) mandate that passenger screening be performed by each air carrier required to implement an approved security program. The USDOT, Federal Aviation Administration, monitors the records of passenger screening in accordance with FAR, and oversees compliance with the carriers' security programs through, for example, scheduled and unscheduled inspections. FAR requires the reporting of information on bomb threats.

HIGHWAY DATA

TABLE 2-1. Transportation Fatalities by Mode

TABLE 2-2. Transportation Injuries by Mode

TABLE 2-3. Transportation Accidents by Mode

TABLE 2-4. Distribution of Transportation Fatalities by Mode**TABLE 2-5. Highway-Rail Grade-Crossing Safety Data and Property Damage****TABLE 2-7. Transportation-Related Occupational Fatalities****TABLE 2-17. Motor Vehicle Safety Data****TABLE 2-18. Motor Vehicle Fatalities, Vehicle-Miles, and Associated Rates by Highway Functional System****TABLE 2-19. Occupant Fatalities by Vehicle Type and Nonoccupant Fatalities****TABLE 2-21. Passenger Car Occupant Safety Data****TABLE 2-22. Motorcycle Ride Safety Data****TABLE 2-23. Truck Occupant Safety Data****TABLE 2-24. Bus Occupant Safety Data****TABLE 2-25. Fatalities by Highest Blood Alcohol Concentration in Highway Crashes****TABLE 2-27. Motor Vehicle Fatal Crashes by Day of Week, Time of Day, and Weather and Light Conditions****TABLE 2-28. Motor Vehicle Fatal Crashes by Posted Speed Limit****TABLE 2-20. Occupant and Nonmotorist Fatalities in Crashes by Number of Vehicles and Alcohol Involvement****Fatalities**

Highway fatality data come from the Fatality Analysis Reporting System (FARS), which is compiled by trained FARS analysts at USDOT, National Highway Traffic Safety Administration (NHTSA) regional offices. Data are gathered from a census of police accident reports (PARs), state vehicle registration files, state drivers licensing files, state highway department data, vital statistics, death certificates, coroner/medical examiner reports, hospital medical reports, and emergency medical service reports. A separate form is completed for each fatal crash. Blood alcohol concentration (BAC) is estimated when not known.

Statistical procedures used for unknown data in FARS can be found in the NHTSA report: *Transitioning to Multiple Imputation - A New Method to Impute Missing Blood Alcohol Concentration (BAC) Values in FARS*, DOT HS 809 403 (Washington, DC: January 2002).

Data are collected from relevant state agencies and electronically submitted for inclusion in the FARS database on a continuous basis. Cross-verification of PARs with death certificates ensures that undercounting is rare. Moreover, when data are entered, they are checked automatically for acceptable range values and consistency, enabling quick corrections when necessary. Several programs continually monitor the data for completeness and accuracy. Periodically, sample cases are analyzed for accuracy and consistency.

Note that the FARS data do not include motor vehicle fatalities on nonpublic roads. However, previous NHTSA analysis found that these fatalities account for 2 percent or fewer of the total motor vehicle fatalities per year. (See glossary for highway fatality definition.)

Injuries and Crashes

NHTSA's General Estimates System (GES) data are a nationally representative sample of police-reported crashes that contributed to an injury or fatality or resulted in property damage, and involved at least one motor vehicle traveling on a trafficway. Trained GES data collectors randomly sample PARs and forward copies to a central contractor for coding into a standard GES system format. Documents such as police diagrams or supporting text provided by the officers may be further reviewed to complete a data entry.

NHTSA suggests that about half of motor vehicle crashes in the United States are not reported to police and that the majority of these unreported crashes involve minor property damage and no significant personal injury. A NHTSA study of injuries from motor vehicle crashes estimated the total count of nonfatal injuries at over 5 million compared with the GES's estimate of 3.2 million in 1998. (See glossary for highway crash and injury definitions.)

(See U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts*, 2000, DOT HS 809 337 (Washington, DC: December 2001), appendices B

and C for further information on GES, including a table of standard errors applicable to GES data.)

TABLE 2-29. Safety Belt and Motorcycle Helmet Use

The National Occupant Protection Use Survey (NOPUS), conducted biennially between 1994 and 2000 by the U.S. Department of Transportation, National Highway Traffic Safety Administration is the source for these data.

In 1994 and 1996, NOPUS consisted of three separate studies: 1) the Moving Traffic Study, which provides information on overall shoulder belt use, 2) the Controlled Intersection Study, which provides more detailed information about shoulder belt use by type of vehicle, characteristics of the belt users, and child restraint use, and 3) the Shopping Center Study, which provides information on rear-seat belt use and shoulder belt misuse. In 1998, the Shopping Center Study was dropped from the survey. The Controlled Intersection Study includes the collection of license plate information to link seat belt use to vehicle type. As the results of the Controlled Intersection Study for 2000 were not available prior to publication, only the Moving Traffic Study data were used in this table.

In 1998, NOPUS separated pickups from the light truck category, thereby creating three categories of passenger vehicles: passenger cars, pickup trucks, and other passenger vehicles. Other passenger vehicles include vans, minivans, and sport utility vehicles. In this table, 1998 and 2000 data for pickup trucks and other passenger vehicles are combined into the light truck category to allow comparison to data from the earlier surveys.

In 1994, operators and riders wearing any type of helmet were counted as helmeted. In 1996, 1998, and 2000, motorcycle helmets that meet USDOT standards are counted as valid protection, whereas those that do not meet USDOT standards were treated as if the operator/rider were not wearing a helmet.

Data collection from the Moving Traffic Study was conducted at 2,063 sites across the country. Shoulder belt use was obtained for drivers and right-front passengers only. Three observers (two observers in 1994 and 1996) were stationed for 30 minutes at interstate/highway exit ramps, controlled (intersections with stop signs or traffic signals), and uncontrolled intersections. Every day of

the week and all daylight hours (8 a.m. to 6 p.m.) were covered in each survey. Commercial and emergency vehicles were excluded.

NOPUS was designed as a multistage probability sample to ensure that the results would represent occupant protection use in the country. In the first stage, counties were grouped by regions (northeast, midwest, south, west), level of urbanization (metropolitan or not), and level of belt use (high, medium, or low). Fifty counties or groups of counties were selected based on vehicle miles of travel in those locations. In the next stage, roadways were selected from two categories: major roads and local roads. Of the originally selected sites, some were found to be ineligible during mapping and data collection, and at some sites no vehicles were observed. In 2000, a total of 157,694 passenger vehicles were observed: 93,916 passenger cars and 63,778 light trucks (of which 24,747 were pickup trucks and 39,031 were other passenger vehicles). 645 motorcycles were also observed during the 2000 NOPUS.

Each reported estimate has been statistically weighted according to the sample design. Two kinds of error can be attributed to all survey research: sampling and nonsampling. A measure, called the standard error, is used to indicate the magnitude of sampling error. The source information provides two standard errors along with each estimate. Nonsampling errors could include problems such as vehicles not counted, incorrect determination of restraint use, and data entry mistakes, among others.

TABLE 2-30. Estimated Number of Lives Saved by Use of Restraints

The U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA) uses data obtained from the Fatality Analysis Reporting System to calculate the number of lives saved by the use of restraints. The methodology used is outlined in a NHTSA report, *Research Note, Estimating Lives Saved by Restraint Use in Potentially Fatal Crashes* (Washington, DC: June 1995). The general approach is to adjust the observed number of fatalities by a determined effectiveness rate for each type of restraint. This equates to subtracting the actual fatalities from the potential fatalities to determine the number of lives saved. This method is more

accurate than earlier estimation methods since all calculations are derived from NHTSA's count of fatalities in which restraints were used. Reported restraint use is believed to be accurate for fatalities.

The key to NHTSA's calculations is the effectiveness estimate for preventing fatalities for each type of restraint. With the exception of an adjustment in the effectiveness estimate for front outboard air bag-only restraint use in passenger cars (NHTSA, *Fourth Report to Congress, Effectiveness of Occupant Protection Systems and Their Use*, Washington, DC, May 1999), a list of effectiveness estimates can be found in a NHTSA report, *Estimating Alcohol Involvement in Fatal Crashes in Light of Increases in Restraint Use*, published in March 1998. This report also includes additional references describing the determination of these effectiveness estimates.

TRANSIT DATA

TABLE 2-1. Transportation Fatalities by Mode

TABLE 2-2. Transportation Injuries by Mode

TABLE 2-3. Transportation Accidents by Mode

TABLE 2-4. Distribution of Transportation Fatalities by Mode

TABLE 2-31. Transit Safety and Property Damage Data

TABLE 2-32. Transit Safety Data by Mode for All Reported Accidents

TABLE 2-33. Transit Safety Data by Mode for All Reported Incidents

TABLE 2-34. Reports of Violent Crime, Property Crime, and Arrests by Transit Mode

The data for this report are obtained from the U.S. Department of Transportation, Federal Transit Administration's (FTA's) National Transit Database (NTD) Reporting System. Transit agencies are required to file an NTD report at regular intervals if they are recipients of Urbanized Area Formula Funds. In 2000, 592 agencies reported to the NTD. Of that total, 67 transit agencies received exemptions from detailed reporting because they operated 9 or fewer vehicles, and 7 were deleted because their data were incomplete. Thus, 518

individual reporters were included in the NTD, accounting for 90 to 95 percent of passenger-miles traveled on transit. Of the transit agencies reporting, 23.7 percent contract for some or all of their transportation from private or public companies or organizations.

Transit operators report fatalities, injuries, accidents, incidents, and property damage in excess of \$1,000. Electronic reporting has recently been implemented for the NTD. Certification from a company's Chief Executive Officer must accompany all NTD reports along with an independent auditor's statement. Upon receipt, an NTD report is reviewed and outstanding items noted in writing to the agency that submitted the form. (See glossary for transit fatality, injury, and accident definitions.)

Four major categories of transit safety are collected: 1) collisions, 2) derailments/buses going off the road, 3) personal casualties, and 4) fires. These major categories are divided into subcategories. The collisions category comprises collisions with vehicles, objects, and people (except suicides). Of the four major categories, only the first two are included in the definition of transit accidents adopted in this report (see glossary). Understanding this definition of accident is relevant to understanding how double counting is removed in the grand total of U.S. transportation fatalities and injuries. (See cross modal comments in box 2-1.)

Transit data submitted to the NTD are generally considered accurate because the FTA reviews and validates information submitted by individual transit agencies. However, reliability may vary because some transit agencies cannot obtain accurate information or misinterpret data.

Security

FTA collects security data from transit agencies serving urbanized areas of over 200,000 in population, using Form 405, and manages it in the National Transit Database (NTD). The reporting of security data follows the FBI *Uniform Crime Reporting Handbook* (Washington, DC: 1984) and is divided into two categories: 1) Reported Offenses, including violent and property crime, and 2) Arrests, consisting of less serious crimes. The figures for violent and property crime are based on records of calls for service, complaints, and/or investigations. They do not reflect the findings of a

court, coroner, jury, or decision of a prosecutor. Security data were first reported in 1995 and were not compiled for earlier years.

In 2000, the number of agencies reporting to this database was 592. Of that, 67 transit agencies received exemptions from detailed reporting because they operated nine or fewer vehicles, and seven were deleted because their data were incomplete. Thus, 518 individual reporters are included in the full database in 2000. Of the transit agencies reporting, 23.7 percent contract for some or all of their transportation from private or public companies or organizations.

RAILROAD DATA

TABLE 2-1. Transportation Fatalities by Mode

TABLE 2-2. Transportation Injuries by Mode

TABLE 2-3. Transportation Accidents by Mode

TABLE 2-4. Distribution of Transportation Fatalities by Mode

TABLE 2-5. Highway-Rail Grade-Crossing Safety Data and Property Damage

TABLE 2-7. Transportation-Related Occupational Fatalities

TABLE 2-35. Railroad and Grade-Crossing Fatalities by Victim Class

TABLE 2-36. Railroad and Grade-Crossing Injured Persons by Victim Class

TABLE 2-37. Train Fatalities, Injuries, and Accidents by Type of Accident

TABLE 2-38. Railroad Passenger Safety Data

TABLE 2-39. Railroad System Safety and Property Damage Data

TABLE 2-40. Fatalities and Injuries of On-Duty Railroad Employees

Railroads are required to file a report for each train accident resulting in property damage in excess of \$6,600, each highway-rail accident, and each incident involving the operation of a railroad resulting in a fatality or a reportable injury. (See

glossary for reportable injury, train accident and incident, and nontrain incident definitions.)

Reporting requirements, which are fixed in law, are very broad and encompass events not strictly related to transportation. For example, if a passenger falls on a staircase and breaks a leg in the station while going to a train, the injury would be reported and appear in the data as a rail injury.

Box 2-1.

Cross-Modal Comparisons

Caution must be exercised in comparing fatalities (and injuries) across modes because different definitions for reportable events are used among the modes. In particular, rail and transit facilities and injuries include deaths and injuries that are not, strictly speaking, caused by transportation accidents, but are caused by such events as a fall on a transit station escalator; or for railroad employees, a fire in a workshop. Similar fatalities for the air and highway modes (death at airports not caused by moving aircraft, or fatalities from accidents in automobile repair shops) are not counted towards the totals for these modes.

Total fatalities (injuries) in the tables are less than the sum of the modal totals because some deaths (injuries) are reported and counted in more than one mode. To avoid double counting, adjustments have been made to fatality totals (see table 2-4).

WATERBORNE TRANSPORTATION DATA

TABLE 2-1. Transportation Fatalities by Mode

TABLE 2-2. Transportation Injuries by Mode

TABLE 2-3. Transportation Accidents by Mode

TABLE 2-4. Distribution of Transportation Fatalities by Mode

TABLE 2-7. Transportation-Related Occupational Fatalities

TABLE 2-41. Waterborne Transportation Safety Data and Property Damage Related to Vessel Casualties

TABLE 2-42. Waterborne Transportation Safety Data Not Related to Vessel Casualties

U.S. waterborne fatality and injury data are based on reports required by CFR Part 4.05-10. This code requires that the owner, agent, master,

operator, or person in charge file a written report of any marine casualty or accident within five days of the accident. Reports must be delivered to Investigative Officers (IOs) at a U.S. Coast Guard Marine Safety Office or Marine Inspection Office at the U.S. Department of Transportation, who use these reports as guides to investigate the marine casualty or accident. The IO ensures that all the entries on the forms are filled out and errors are corrected. Regulations require IO notification of marine casualties for certain circumstances, including loss of life; injuries that require medical treatment beyond first aid; and, for individuals engaged or employed onboard a vessel in commercial service, injuries that render a person unfit to perform routine duties.

Incidents requiring an investigation include death, injury resulting in substantial impairment, and other incidents determined important to promoting the safety of life or property or to protect the marine environment. These incidents are investigated in accordance with procedures set forth in the regulations. Furthermore, the Federal Water Pollution Control Act mandates that certain incidents be reported to the U.S. Coast Guard. The reports are entered into the Marine Safety Information System, which is later analyzed and transferred to the Marine Safety Management System maintained in Washington, DC.

RECREATIONAL BOATING DATA

TABLE 2-1. Transportation Fatalities by Mode

TABLE 2-2. Transportation Injuries by Mode

TABLE 2-3. Transportation Accidents by Mode

TABLE 2-4. Distribution of Transportation Fatalities by Mode

TABLE 2-43. Recreational Boating Safety, Alcohol Involvement, and Property Damage Data

TABLE 2-44. Personal Watercraft Safety Data

TABLE 2-45. U.S. Coast Guard Search and Rescue Statistics, Fiscal Years

Operators of boats involved in an accident resulting in 1) a fatality, 2) an injury requiring medical treatment beyond first aid, 3) damage to the

vessel or other property greater than \$500 or complete loss of vessel, or 4) the disappearance of a person from the vessel under circumstances indicating death or injury are required to file a report with the U.S. Coast Guard. If a person dies within 24 hours of the occurrence, requires medical treatment beyond first aid, or disappears from the vessel, reports must be made within 48 hours of the occurrence. In cases involving only damage to the vessel and/or property, reports are to be submitted within 10 days of the occurrence. Although there is no quantitative estimate of the response rate, there may be considerable underreporting, especially of nonfatal accidents, because of the difficulty of enforcing the requirement and because boat operators may not always be aware of the law.

NATURAL GAS AND LIQUID PIPELINE DATA

TABLE 2-1. Transportation Fatalities by Mode

TABLE 2-2. Transportation Injuries by Mode

TABLE 2-3. Transportation Accidents by Mode

TABLE 2-4. Distribution of Transportation Fatalities by Mode

TABLE 2-46. Hazardous Liquid and Natural Gas Pipeline Safety and Property Damage Data

U.S. fatality and injury data for natural gas pipelines are based on reports filed with the U.S. Department of Transportation (USDOT), Office of Pipeline Safety (OPS). Accidents must be reported as soon as possible, but no later than 30 days after discovery. Reports are sent to the Information Systems Manager at the OPS. Possible sources of error include a release going undetected; even if subsequently detected and reported, it may not be possible to accurately reconstruct the accident. Property damage figures are estimates. (See glossary for gas and liquid pipeline fatality data and injury definitions.)

TABLE 2-6. Hazardous Materials Safety Data and Property Damage Data

Incidents resulting in certain unintentional releases of hazardous materials must be reported under 49 CFR 171.16. Each carrier must submit a

report to the U.S. Department of Transportation, Research and Special Programs Administration (RSPA) within 30 days of the incident, including information on the mode of transportation involved, results of the incident, and a narrative description of the accident. These reports are made available on the incident database within 60 days of receipt.

Fatalities and injuries are counted only if they are directly due to a hazardous material. For example, a truck operator killed by impact forces during a motor vehicle crash would not be counted as a hazardous-material fatality. RSPA verifies all reported fatalities and injuries by telephone with the carrier submitting the report.

Possible sources of error include a release going undetected; even if subsequently detected and

reported, it may not be possible to accurately reconstruct the accident. Although RSPA acknowledges that there is some level of underreporting, it believes that the underreporting is limited to small, nonserious incidents. As incident severity increases, it is more likely that the incident will come to RSPA's attention and will ultimately be reported. Additionally, the reporting requirements were extended to intrastate highway carriers on October 1, 1998, and the response rate from this new group is expected to increase over time. Property damage figures are estimates determined by the carrier prior to the 30-day reporting deadline and are generally not subsequently updated. Property damage figures, therefore, may underestimate actual damages.

Chapter 3 Transportation and the Economy

TABLE 3-1a & 3-1b. U.S. Gross Domestic Product Attributed to For-Hire Transportation Services (Current and chained 1996 dollars)

TABLE 3-2a & 3-2b. U.S. Gross Domestic Product Attributed to Transportation-Related Final Demand (Current and chained 1996 dollars)

TABLE 3-3a & 3.3b. U.S. Gross Domestic Demand Attributed to Transportation-Related Final Demand (Current and chained 1996 dollars)

TABLE 3-4a & 3-4b. Contributions to Gross Domestic Product: Selected Industries (Current and chained 1996 dollars)

TABLE 3-5. Gross Domestic Product by Major Social Function

Tables 3-1 through 3-5 present data on transportation's contributions to the economy through consumption (or the money spent on transportation activity). The *Survey of Current Business* (SCB) published by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). The SCB is a monthly journal that contains estimates of U.S. economic activity, including industry contributions to the Gross Domestic Product (GDP). GDP is defined as the net value of the output of goods and services produced by labor and property located in the United States. BEA constructs two complementary measures of GDP—one based on income and the other on expenditures (product). Together, they represent the National Income and Product Accounts (NIPA), our nation's principle framework for macroeconomic estimates. The product side results from the addition of labor, capital, and taxes for producing output. Consumption derives from household, business, and government expenditures and net foreign purchases.

Table 3-3 presents transportation's economic impact in a different form, Gross Domestic Demand (GDD). Also derived from the national accounts, GDD is the sum of personal consumption, gross private domestic investment, and government purchases. GDD includes imports, but excludes exports, thus counting only what is consumed, purchased, or invested in the United States.

GDP Methodology

The 1960 through 1985 data in table 3-1 are from the November 1993 issue of the SCB. The 1990 through 1991 data and 1992 through 1996 data are from an August 1996 and November 1997 SCB issue respectively. The October 1999 issue introduced a revised methodology for GDP estimates (Yuskavage 1996). This section describes BEA's methodology for estimating transportation's share of GDP.

BEA's current-dollar estimates of GDP by industry rely on several sources, including the Bureau of Labor Statistics (BLS), the Health Care Financing Administration, and the Internal Revenue Service (IRS). Some of the tables in this chapter report chained-dollar figures. BEA derived chained dollars by using the Fisher Ideal Quantity Index to calculate changes between adjacent years (Parker and Triplett 1996; Landerfeld and Parker 1997). Annual changes are then chained to form a time series that incorporates the effects of relative price and output composition changes. Please refer to page 142 of the August 1996 issue of the *Survey of Current Business* for the mathematical formulas (Yuskavage 1996). This method produced separate estimates of gross output and intermediate inputs for a sector's GDP calculation. BEA updated the reference year for the chained-dollar estimates from 1992 to 1996.

Transportation GDP in chained dollars was estimated using the double-deflation method, which relies on a chain-type quantity index formula, and requires gross output and intermediate input information. Principal source data for the transportation categories include: 1) operating revenues of air carriers and Federal Express from the U.S. Department of Transportation and public sources (air); 2) operating revenues for Class I motor carriers from historical records of the Interstate Commerce Commission and Census Bureau annual surveys (trucking and warehousing); 3) BEA personal consumption expenditures (PCE), BLS, and trade sources (local and interurban passenger transit); 4) operating revenues for Class I railroads and Amtrak (rail); and 5) other trade sources (pipelines). Data sources for water were not provided (Yuskavage, 1996).

Table 3-1 reported current dollar estimates from various SCB issues. BEA derived the 1991 data and subsequent years in four steps:

1. BEA's benchmark input-output (I-O) tables produced input compositions for 1977, 1982, and 1987.

2. BEA estimated 1978 through 1981 and 1983 through 1986 input compositions by interpolating the 1977, 1982, and 1987 figures.

3. BEA estimates the 1977 through 1987 imported and domestically imported shares of each detailed input.

4. BEA estimates the 1988 through 1994 input compositions based on the 1987 figures and the Economic Censuses of 1992.

For intermediate input estimations, BEA deflates each of the current-dollar inputs. (BEA deflates import and domestic production separately.) For deflation, quantities are approximated by real values (expressed at present with 1996 as the base period) that are calculated by dividing the current-dollar value of the component by its price index. BEA develops estimates for import prices with data from a variety of sources, but primarily from the BLS import price series.

Reliability and Accuracy

BEA views GDP as a reliable measure of output because of the source data underlying the estimates. The following reliability comments are based on the Valliant (1993) SCB article and Ritter (2000). GDP data originate from three types of sources. The foundational data come first from the economic censuses conducted every five years. These approach complete enumerations of sectoral activity in state and local governments, manufacturing, services, retail trade, wholesale trade, construction, transportation, communications and utilities, mining, finance, insurance, and real estate. Annual estimates from the second tier of GDP data and emanate from sources such as IRS tax returns and smaller surveys of establishments. The Annual Retail Trade Survey, for instance, forms one of the major components of the annual estimates. The U.S. Census Bureau collects sales and end-of-year inventory data from about 22,000 retail firms totaling \$2 trillion of the \$8.8 trillion GDP amount. While considered reliable by many economists, sampling variability may introduce errors into these annual estimates. Moreover, the Census

Bureau imputes (substitutes estimates for missing or clearly incorrect data) about 11 percent of reported national annual retail sales because of accounting inconsistencies or raw survey data errors. The third component of the GDP flows from quarterly estimates.

In the October 1993 SCB, Valliant described the reliability and accuracy of the quarterly estimates of GDP, providing insights into the pre-1985 data in terms of dispersion and bias. BEA followed a schedule that produced three successive "current" estimates; advanced, preliminary, and final. BEA analysts developed a dispersion and bias measure based on the difference between these three estimates.

Dispersion is the average of the absolute values of the revisions, or, the difference between P , representing the percentage change in the current estimates, and L representing the percentage change in the latest available estimates, divided by n , representing the number of quarterly changes. Bias is the average of the revisions. According to the October 1993 SCB, dispersion averaged 1.6 percent from 1958 to 63 and dropped to 1.1 percent for 1968 to 1972. BEA stated that these declines in dispersion correspond with more accurate initial and final estimates subsequent to the late 1950s. For years after 1973 until 1991, the BEA concluded that more accurate source data for preliminary and final estimates did not improve reliability by much. BEA also determined that bias was not large enough from 1978 to 1991 to be significant under normality assumptions at the five-percent confidence level. Overall, for the period beginning in 1978 and covering the 1985 data from table 3-1, the BEA concluded there was no evidence of reliability increases. BEA also questioned its own estimating procedures and, in particular, the use of disparate sources of data, which may explain why reliability levels have not increased.

The NIPA framework also undergoes major updates referred to as comprehensive, or benchmark revisions. Eleven of these have been completed including one in 1996 and most recently on October 28, 1999 that provided the data for tables 3-1 through 3-5. The major change encompassed a definitional change reflecting our evolving economic system. Software became a business investment rather than just a "purchased input," or the equivalent of raw material. Unless the company increased the price of its product to cover software

purchases, no impact registered in the GDP. With this benchmark revision, the Census Bureau increased the 1996 estimate by \$115 billion, or 1.5 percent—the amount of software investments made in that year. Another change involved the Census Bureau's interpretation of the value of “unpriced” banking services such as ATM (automatic teller machine) contributions to an establishment's productivity. Previously, banking service productivity relied only on an index constructed from labor input. Economists argued that this ignored productivity gains from technological improvements such as ATMs and electronic banking. The BLS developed a productivity based instead of bank transactions, and this was used in the 1999 revision. For more detail, readers should refer to Moulton and Seskin (1999).

Sources of Error for GDP Estimates

The GDP estimates can contain several kinds of error. One source of error arises from estimates based on preliminary or incomplete tabulations of source data or BEA judgment in the absence of data. Errors may also arise because of sampling errors and biases in monthly, quarterly, annual, or periodic tabulations. Another source of potential error may arise when data are seasonally adjusted. Readers should refer to the October 1993 SCB issue for more detail (Young 1993).

NIPA and Transportation-Related Final Demand

For table 3-2, transportation-related final demand (TRFD) is from NIPA reported in the SCB. It represents the sum of all consumer and government expenditures for transportation purposes, plus the value of goods and services purchased by business as investment for transportation purposes. Since TRFD includes only expenditures on the final products of the economy, it is comparable to GDP and provides a measure of transportation's importance from a consumption perspective.

NIPA tables report the composition of production and the distribution of incomes earned in production. The totals of these produce a GDP estimate that should theoretically be equal, but there is always a difference referred to as the “statistical discrepancy.” NIPA is based on four subaccounts of national economic activity. These include 1) the personal income and outlay account, 2) the gross savings and investment account, 3) the

government receipts and expenditures account, and 4) the foreign transactions account.

Personal Consumption Expenditures (PCE) for transportation include 1) road motor vehicles, such as new and used automobiles, and motorcycles; 2) motor vehicle parts, such as tires, tubes, accessories; 3) motor fuels and lubricants; and 4) transportation services, such as repair, greasing, washing, parking, storage, rental, leasing, tolls, insurance, and purchased local and intercity transportation services. Motor vehicles used primarily for recreation, boats, noncommercial trailers, and aircraft are excluded.

Gross private domestic fixed investment in transportation includes private purchases of transportation structures and equipment. Transportation structures include railroads and petroleum pipelines. Transportation equipment consists of automobiles, trucks, buses, truck trailers, aircraft, ships and boats, and railroad equipment.

Goods and services that are counted as part of transportation-related exports include 1) civilian aircraft, engines, and parts; 2) road motor vehicles, engines, and parts; 3) passenger fares, including receipts of U.S. air and ocean/cruise carriers for transporting non-U.S. residents between the United States and foreign countries or between two foreign points; and 4) other transportation. The total for road motor vehicles, engines and parts excludes boats, aircraft, and noncommercial trailers. Other transportation includes 1) the freight revenues of U.S.-operated ocean, air, and other carriers (e.g., rail, pipeline, and Great Lakes shipping) for international transport of U.S. exports and for transporting foreign freight between foreign points; 2) port expenditure receipts (representing payments for goods and services purchased in the United States by foreign-operated carriers); and 3) receipts of U.S. owners from foreign operators for the charter of vessels and rental of freight cars and containers.

Goods and services that are counted as part of transportation-related imports include 1) civilian aircraft, engines, and parts; 2) road motor vehicles, engines, and parts; 3) passenger fares, including payments to foreign air and ocean/cruise carriers for the transportation of U.S. residents between the United States and foreign countries or between two foreign points; and 4) other transportation. The total for road motor vehicle, engines and parts excludes boats, aircraft, and noncommercial trail-

ers. Other transportation includes 1) freight revenues of foreign-operated ocean, air, and other carriers (e.g., rail, pipeline, and Great Lakes shipping) for international transport of U.S. imports and for the transportation of foreign freight between foreign points; 2) port expenditure receipts (representing payments for goods and services purchased in foreign countries by U.S.-operated carriers); and 3) payments to foreign owners from U.S. operators for the charter of vessels and rental of freight cars and containers.

Transportation-related government purchases include federal, state, and local purchases of transportation services, and government expenditures on transportation-related structures and equipment. Federal, state, and local purchases represent the sum of consumption expenditures and gross inventory. Defense-related purchases include expenditures on the transportation of materials (care and movement of goods by water, rail, truck, and air); the rental of trucks and other transportation equipment and warehousing fees; and travel of persons (care and movement of Department of Defense military civilian employees), including tickets for all modes of travel, per diem, taxi fares, automobile rental, and mileage allowances for privately owned vehicles.

Further References

This data source and accuracy statement is based on several papers that have appeared in the SCB. Data users who desire more methodological detail can refer to the list of references at the end of this chapter.

TABLE 3-6. National Transportation and Economic Trends

The *Statistical Abstract of the United States* published by the U.S. Department of Commerce, Census Bureau, is the source of the population data. The *Current Population Reports* are the source of the *Abstract's* data that are collected through the *Current Population Survey* (CPS). This is a monthly survey administered by the Census Bureau of a scientifically selected sample representative of the noninstitutional civilian population in 754 areas covering every state and the District of Columbia. Like other surveys, the CPS is subject to sampling error. Readers should note that estimates based on the CPS may not agree with census

counts because different procedures are used. Changes in the CPS also mean that annual comparisons must be made with caution. For instance, in 1994, the CPS methodology was dramatically changed, and the estimates began to incorporate 1990 census population controls, adjusted for the estimated undercount.

Industrial production data come from the Industrial Production Index, produced by the Board of Governors of the Federal Reserve System and published in the *Economic Report of the President*. For annual figures, individual industrial production (IP) indexes are constructed from a variety of sources, including the quinquennial Censuses of Manufactures and Mineral Industries; the Annual Survey of Manufactures, prepared by the Census Bureau; the Minerals Yearbook, prepared by the U.S. Department of the Interior; and publications of the U.S. Department of Energy. The Federal Reserve Board (FRB) uses these data in a modeling framework to produce estimates of industrial production. Below are brief discussions on three major sources for the IP indexes; the survey of manufactures, the census of manufactures, and the electric utility survey.

Annual Survey of Manufacturers

The Census Bureau conducts a mail survey of approximately 55,000 manufactures with three different sample strata. The sampling frame is based on previously surveyed firms and is updated annually based partially on IRS administrative records and other sources. Large manufactures (shipments > \$500 million, and > 250 employees), some computer manufacturing firms, and all remaining firms with at least 250 employees are selected. Establishments with employment generally ranging from 20 to 250 employees are sampled with a probability proportional to a composite measure of establishment size. Approximately 5,000 of the smallest firms (5 to 20 employees) are also sampled and receive a shorter survey instrument. Additional information on the survey, readers should refer to www.census.gov/econ/www/ma0300.html.

Census of Manufacturers

The Census of Manufactures collects data through mail surveys from approximately 237,000 multiunit and single-unit firms with a minimum payroll figure. This census is supplemented by IRS

administrative data from over 142,000 firms not contacted by mail. For additional information on the census, readers should refer to www.census.gov/econ/www/ma0100.html.

Electric Utility Survey

Since 1971, the FRB has conducted the *Monthly Survey of Industrial Electricity Use* based on responses from utilities and manufacturing and mining firms that are cogenerators. This survey is the basis for estimates of the amount of electricity power used by 120 industrial sectors. More than 40 industrial production series estimates are based on data from this survey and compose 28 percent of the Industrial Production Index in 1994 value-added proportions.

Survey responses are voluntary and are gathered from a panel of 175 utilities and 186 cogenerating companies with a monthly response rate near 95 percent. In 1992, an additional 71 new cogenerators joined the panel. This resulted, according to an FRB statistical analysis, in a decrease of the standard deviation of errors for electricity growth rates from 3.0 to 1.9 percentage points. Overall, the estimates for total power use produce a standard error of about 0.5 percentage points. The panel accounts for approximately 73 percent of industrial electric power use in the United States.

The *Survey of Current Business*, published by the U.S. Department of Commerce, Bureau of Economic Analysis, is the source of GDP estimates. Readers should refer to the source and accuracy statement for tables 3-1 through 3-5 for information on GDP estimates.

TABLE 3-7. Passenger and Freight Transportation Expenditures

Detailed information from the source was not available at the time of publication. Readers should contact the Eno Transportation Foundation, Inc. directly for information about methodologies and reliability.

TABLE 3-8. Sales Price of Transportation Fuel to End-Users

The U.S. Department of Energy, Energy Information Administration's (EIA's) *Monthly Energy Review*, tables 9.4 and 9.7, provided price data, except for railroad fuel. Pre-1981 data were

reported by the EIA from Bureau of Labor Statistics reports. Beginning in 1983, the EIA administered a series of surveys to collect data on petroleum prices, market distribution, supply, and demand. The EIA-782 series encompasses three surveys: 1) Form EIA-782A, Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report; 2) Form EIA-782B, Resellers'/Retailers' Monthly Petroleum Product Sales Report; and 3) Form EIA-782C, Monthly Report of Prime Supplier Sales of Petroleum Products Sold for Local Consumption.

EIA developed a method for comparing data from the new surveys with older information gathered by various methods. As a result, a number of adjustment factors were developed and used to "backcast" price estimates. Readers who require a more detailed description of this methodology should refer to EIA's petroleum data publications web page (www.eia.doe.gov/oil_gas/petroleum/pet_frame.html) and the explanatory notes section.

Changes in sample elements or collection methods may affect data continuity. Two regulatory changes affected data collection in October 1993. The Clean Air Act Amendments of 1990 required that oxygenated gasoline be sold in the winter months in ozone nonattainment areas. Thus, the EIA-782 forms were modified to collect information on fuels divided among conventional, oxygenated, and reformulated categories. Second, requirements for the production and selling of low-sulfur diesel were required and necessitated the separation of diesel fuel into high- and low-sulfur categories. Moreover, surveys prior to October 1993 did not include propane. The EIA followed several different sampling designs during two periods in the 1980s and thus, there may be some price estimate discontinuity for periods between December 1983 and January 1984 as well as between August and September of 1988.

Data Collection

The 782 series occurs on a monthly schedule via mail. The 782A and 782C surveys reflect a census of about 115 and 190 firms, respectively. The 782B samples about 2,000 firms. The EIA first stratifies by sales volume for the form 782B survey to ensure that dealers with 5 percent or more of the market are captured with certainty. The remaining elements of the frame were assigned a probability of selection to form a 2,200 firm survey. These

“noncertainty” companies were poststratified by geographic area and type of sales category.

Data Reliability

EIA has studied its sampling effects on reliability and determined that the sample size of 2,000 should yield a less than 1-percent price coefficient of variation in its estimates. Errors can arise because of non-response, but an EIA official indicated that the response rates for the 1997-1999 782A, B, and C surveys averaged 95 percent, 86 percent, and 96 percent, respectively. Because survey data invariably contain incomplete data (because of reporting errors or non-response), EIA estimates or “imputes” missing data. Readers requiring imputation algorithms should refer to the 782 series explanatory notes referred to above.

TABLE 3-9. Price Trend of Gasoline v. Other Consumer Goods and Services

Data in this table were reproduced from the American Petroleum Institute's (API) *Basic Petroleum Data Book*. API noted that data reported prior to 1981 was obtained from Platt's *Oil Price Handbook and Oilmanac*. Platt's is part of Standard and Poor's, and an independent third party organization that tracks the petroleum industry. Platt's reported the retail price of gasoline based on telephone interviews with gas stations in 55 cities. More detailed historical information on their data collection methods could not be ascertained and the data's reliability is uncertain. API reported the Bureau of Labor Statistics (BLS) as its data source for 1981 to 2001 retail gasoline prices. The remainder of this section discusses the BLS Consumer Price Index (CPI) data collection and estimation methods used to derive the average retail price of gasoline.

BLS uses the CPI as a measure of average price changes paid by urban consumers for a fixed basket of goods and services. BLS estimates the CPI with a survey-based approach. Survey results define a categorization of goods and services, a representative sample of items to track, and weights according to the consumption of an average consumer during a base period.

Sample Design

BLS relies on two sampling frames for their CPI estimates. One represents the universe of retail outlets from which households may purchase

defined groups of commodities and services including gasoline. A second represents households across urban areas. Moreover, the household frame is based on an “urban-consumer” population and consists of households in Metropolitan Statistical Areas (MSA's) and in urban places with more than 2,500 inhabitants. This “all urban” CPI (CPI-U) provides the estimates for retail gasoline prices shown in table 3-9. Thus, this frame does not represent non-urban consumers.

For the retail outlet sampling frame, BLS relies on the Point-of-Purchase Survey (CPOPS) conducted by the Census Bureau in 94 Primary Sampling Units (PSUs) identified by BLS. PSUs are based on urban counties, groups of contiguous urban counties, or MSAs. For the household sample, a noncompact clustering procedure was employed which dispersed households evenly within a Census enumeration district (ED). More detailed sampling design information can be found in BLS's *Handbook of Methods* at <http://stats.bls.gov/pub/hom/homhome.htm>.

Prices for the goods and services used to calculate the CPI are collected in 91 PSUs located in 85 urban areas throughout the country. The sample size for the CPOPS totals about 21,000 retail and service establishments—supermarkets, department stores, gasoline stations, hospitals, etc. Food, fuels, and a few other items are priced monthly in all 85 locations. BLS field representatives collect all price information through visits or telephone calls in the household surveys. Price changes are computed based on a sample of outlets selected from locations identified by consumers. Specific sample items are then selected from each sample outlet to ensure that the market basket is representative of where households shop.

Estimation

BLS routinely updates its price estimates for specific items among the collection of goods and services, for example, a new car model year. BLS employs three techniques to produce new price estimates. First, an item that is directly comparable to the previous discontinued good will be used to provide a price estimate. However, a substitute item may be inappropriate when goods change slightly in their characteristics. BLS relies on Hedonic regression modeling as a second “quality adjustment” for price estimates. This statistical technique can model

the importance of various quality characteristics that add value to a particular good (the fiber content and construction of apparel products for instance). A researcher can estimate a Hedonic regression model that identifies the factors most important in determining the price of a good, and BLS field representatives will note these in their data collection. Imputation is a third quality adjustment used for “noncomparable” substitutions where BLS estimates the price change from previous averages. Detailed algorithms can be found in chapter 17 of the BLS *Handbook of Methods* at <http://stats.bls.gov/pub/hom/homhome.htm>.

Effective January 1999, BLS began using a new formula for calculating the basic components of the Consumer Price Index for all Urban Consumers (CPI-U) and the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W). The new formula, the geometric mean estimator, is used in index categories that comprise approximately 61 percent of total consumer spending represented by the CPI-U. Based on BLS research, it is expected that use of the new formula will reduce the annual rate of increase in the CPI by approximately 0.2 percentage points per year. Additional information on this change was published in the April 1998 CPI Detailed Report and is available on the Internet at <http://stats.bls.gov/cpihome.htm>.

Accuracy

One of the CPI's limitations is that it represents price movements for urban residents and may not correctly represent nonurban consumption patterns. The CPI may also contain sampling error because it is estimated from a sample of consumer purchases. Nonsampling error may occur if respondents provide BLS field representatives with inaccurate or incomplete information. Another potential source of error identified by BLS may occur because of a time lag between the Point-of-Purchase Survey and the initiation of price collection for commodities and services at resampled outlets. Because of the time lag, the products offered by the outlet at the time pricing is initiated may not coincide with the set from which the CPOPS respondents were purchasing.

The CPI is also subject to response error when data are not collected because of nonresponse. BLS established a nonresponse auditing program in 1986. It reported that response rates in 1990 for

transportation commodities and services were above 90 percent.

Bias

Four categories of bias were identified in the BLS report, *Measurement Issues in the Consumer Price Index*, published in 1997. First, because of the fixed-weight nature of the index, the CPI creates substitution bias by placing too much weight on items measured in previous surveys from which consumers may have shifted away. Second, the study found that the index did not account for consumers switching to discount stores. Third, a quality change bias was also identified when the differences between goods priced in two different periods cannot be accurately measured nor deduced from the accompanying price difference between the goods. Finally, the report noted that the CPI also had a new product bias because the index inadequately reflected consumer value of products introduced into the market. The commission concluded that the CPI overstated the true cost-of-living change by 1.1 percentage points per year.

TABLE 3-10. Producer Price Indices for Transportation Services

TABLE 3-11. Producer Price Indices for Transportation Equipment

Data shown in these tables are drawn from annual issues of *The Supplement to Producer Price Indexes* published by the Bureau of Labor Statistics (BLS) in the U.S. Department of Labor. These indexes represent a measure of outputs in all goods-producing American industries as well as partial coverage of service industries including transportation. BLS defines a price as the net revenue accrued to a specified production establishment from a specified kind of buyer for a specific product shipped under specific transaction terms on a specified day of the month. BLS collects this data series through surveys of a sample of establishments that report their prices from economic transactions.

Data Collection

A BLS field economist visits an establishment or cluster of establishments selected for price sampling. The economist uses a disaggregation proce-

cedure to select a sample of transactions from all the establishment's revenue-producing activities. This disaggregation procedure assigns a probability of selection to each shipping or receipt category proportionate to its value within a reporting unit. In most cases, the final price index produced by the BLS requires that 1) there are at least three different respondents to a survey, 2) at least two reporting units provide price information in a given month, and 3) no single respondent accounts for 50 percent or more of the weight for a given item.

BLS regional offices review field data for consistency and completeness. The national office then conducts a final review and a survey is then tailored specifically to establishments or clusters of establishments. BLS refers to these as repricing schedules and sends them to reporting establishments on a regular basis. Most prices refer to a reporting schedule on a particular day of the month, usually, the first Tuesday or the 13th of a month.

Estimation

BLS collects prices for over 100,000 items. It utilizes several different weighting schemes for the numerous indexes produced because some products will have a greater effect on the movement of groupings of individual products. BLS utilizes the net output of shipment values as weights for the 4-digit SIC industries. Net output values include only shipments from establishments in one industry to other industry establishments and, thus, differ from gross shipment values. The latter would include shipments among establishments in the same industry, even if those establishments are separate firms. BLS also makes seasonal adjustments if statistical tests and economic rationale justify them, and computes data when a participating company does not deliver a price report. BLS bases the missing price estimation on the average of price changes for similar products reported by other establishments.

Accuracy

As in all surveys, the accuracy of producer price indexes depends on the quality of information voluntarily provided by participating establishments. One of the accuracy concerns of BLS revolves around the preferred use of realistic transaction prices (including discounts, premiums, rebates,

allowances, etc.) rather than list or book prices. Before BLS fully changed its data collection method in 1986, a survey indicated that about 20 percent of traditional commodity indexes were based on list prices. The newer and more systematic methodology decreased the use of list prices. BLS documentation (available at <http://stats.bls.gov/opub/hom>) provided no more details on sampling error, response rates, or the availability of generalized variance parameters or techniques for estimating them.

TABLE 3-12. Personal Expenditures by Category

TABLE 3-13. Personal Consumption Expenditures on Transportation by Subcategory

Data used in these tables are from the Bureau of Labor Statistics, *Annual Report of Consumer Expenditure Survey*. The Consumer Expenditure Survey (CEX) collects information from U.S. households and families on their buying habits (expenditures), income, and consumer characteristics. The strength of the survey is that it allows data users to relate the expenditures and income of consumers to the characteristics of those consumers. BLS uses 11 standard characteristics to classify consumers, including income, before-tax income class, age, size of the consumer unit, composition of the consumer unit, number of earners, housing tenure, race, type of area (urban or rural), region, and occupation.

The CEX is a national probability sample of households. The sampling frame (i.e., the list from which housing units are chosen) for this survey is generated from the 1990 census 100-percent detail file, which is augmented by a sample drawn from new construction permits. Coverage improvement techniques are also utilized to eliminate recognized deficiencies in the census.

Data Collection

The current survey consists of two separate surveys (Interview and Diary), each utilizing a different data collection technique and sample. Data is collected for each survey from approximately 5,000 households. In the Interview survey, each consumer unit (CU) in the sample is interviewed every three months over five calendar quarters. The interviewer uses a structured questionnaire to

collect both the demographic and expenditure data in the Interview survey. The interviewer collects the demographic data in the Diary survey whereas the respondent enters the expenditure data on the diary form. Both surveys accept proxy responses from any eligible household member who is at least 16 years old if an adult is not available after a few attempts to contact that person. The respondent family completes the Diary (or recordkeeping) survey at home for two consecutive one-week periods.

A reinterview program for the CEX provides quality control. The program provides a means of evaluating individual interviewer performance to determine how well the procedures are being carried out in the field. A member of the supervisory staff conducts the reinterview. Subsamples of approximately 6 percent of households in the Interview survey and 17 percent in the Diary survey are reinterviewed on an ongoing basis. A new diary form with more categories and expanded use of cues for respondents was introduced in 1991, based on results from earlier field and laboratory studies.

Estimation

Missing or invalid data on demographic or work experience are imputed. No imputation is done for missing data on expenditures or income. Selected portions of the Diary data are also adjusted by automated imputation and allocation routines when respondents report insufficient detail to meet publication requirements. These procedures are performed annually on the data. The imputation routines assign qualifying information to data items when there is clear evidence of invalid nonresponse.

The statistical estimation of the population quantities of interest, such as the average expenditure on a particular item by a CU or the total number of CUs in a particular demographic group, is conducted via a weighting scheme. Each CU included in the survey is assigned a weight that is interpreted as representing the number of similar families in the universe of interest, the U.S. civilian noninstitutional population. Readers should refer to http://stats.bls.gov/opub/hom/homch16_c.htm for the detailed weighting method.

Beginning with 1997 data, BLS introduced a new calibration method to compute weights in the Consumer Expenditure Survey. The weights are calculated using a model-assisted, design-based regression estimator.

Accuracy

The Consumer Expenditures Survey is a sample survey and hence is subject to two types of errors, nonsampling and sampling. Nonsampling errors can be attributed to many sources, such as differences in the interpretation of questions, inability or unwillingness of the respondent to provide correct information, mistakes in recording or coding the data obtained, and other errors of collection, response, processing, coverage, and estimation for missing data. The full extent of nonsampling error is unknown. Sampling errors occur because the survey data are collected from a sample and not from the entire population. Tables with coefficients of variation and other reliability statistics are available on request from the national office. However, because the statistics are shown at the detailed item level, the tables are extensive.

TABLE 3-14. Cost of Owning and Operating an Automobile

Your Driving Costs produced by the American Automobile Association (AAA) provided the data for this table. Prior to 1985, the cost figures are for a mid-sized, current model, American car equipped with a variety of standard and optional accessories. After 1985, the cost figures are for a composite of three current model American cars:

1. A 1999 Chevrolet Cavalier LS,
2. A 1999 Ford Taurus SEL Deluxe, and
3. A 1999 Mercury Grand Marquis LS.

Thus, the estimates are not reliable estimates for all cars.

Fuel costs were based on an average price of \$1.195 per gallon of regular unleaded gasoline, weighted 20 percent full-serve and 80 percent self-serve. Insurance figures were based on personal use of vehicles driven less than 10 miles to or from work, with no young drivers. Normal depreciation costs were based on the vehicle's trade-in value at the end of four years or at 60,000 miles. American Automobile Association (AAA) analysis covers vehicles equipped with standard and optional accessories, including automatic transmission, air conditioning, power steering, power disc brakes, AM/FM stereo, driver-and passenger side air bag, anti-lock brakes, cruise control, tilt steering wheel, tinted glass, emission equipment, and rear window defogger.

TABLE 3-15a & 3-15b. Average Passenger Fare (Current and chained 1996 dollars)**TABLE 3-18. Total Operating Revenues****Air**

The U.S. Department of Transportation, Bureau of Transportation Statistics (BTS), Office of Airline Information, reports passenger fares and operating revenues in its publication *Air Carrier Financial Statistics*. These numbers are based on 100 percent reporting by large certificated air carriers. Minor errors from nonreporting may occur but amount to less than one percent of all passenger or freight activity. The figures do not include data for all airlines; such as most scheduled commuter airlines and all nonscheduled commuter airlines.

Class I Bus

Class I passenger motor carriers are required to report financial and operating information to BTS using form MP-1. (Prior to 1996, Class I carriers were required to report to the Interstate Commerce Commission.) Class I passenger motor carriers are defined as those having annual gross operating revenues, as adjusted for inflation, of \$5,000,000 or more. This table does not include Class I carriers whose data had not been received at the time of publication. Thus, these data do not represent total Class I passenger motor carrier activity.

Transit

The American Public Transit Association (APTA) reports these figures, which are based on the annual National Transit Database (NTD) report published by the USDOT, Federal Transit Administration (FTA). The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are generally required to report financial and operating data, including capital expenditures, revenues and expenses. These data are generally considered accurate because the FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or misinterpret certain data definitions. APTA conservatively adjusts FTA data to include transit operators that do not report to the

database (private and very small operators and rural operators).

Rail

Data are from *Railroad Facts* published annually by the Association of American Railroads (AAR). AAR figures are based on 100-percent reporting by all nine Class I railroads to the Surface Transportation Board (STB) via Schedule 700 of the *R1 Annual Report*. STB defines Class I railroads as having operating revenues at or above a threshold indexed to a base of \$250 million in 1991 and adjusted annually in concert with changes in the "Railroad Freight Rate Index" published by the Bureau of Labor Statistics. In 2000, the adjusted threshold for Class I railroads was \$ 261.9 million. Declassification from Class I status occurs when a railroad falls below the applicable threshold for three consecutive years. Although Class I railroads comprise only 1 percent of the number of railroads in the country, they account for over 71 percent of the industry's mileage operated, 91 percent of total freight rail revenue, and 88 percent of railroad employment.

Intercity/Amtrak

Average passenger fare data are based on 100 percent of issued tickets, and thus should be accurate. Created as a publicly-owned for-profit corporation, Amtrak collects its own financial data and reports this information in its annual report. Auditing should ensure the accuracy of the operating revenue figures.

Trucking and Courier Services (except air)

The Census Bureau's Transportation Annual Survey (formerly known as the Motor Freight Transportation and Warehousing Survey) is the source of this information. The sample survey represents all employer firms with one or more establishments engaged primarily in providing commercial motor freight transportation or public warehousing services. It excludes motor carriers that operate as auxiliary establishments to nontransportation companies, as well as independent owner-operators with no paid employees. Thus, the data do not represent the total trucking industry.

In 1999, Transportation Annual Survey was merged with the Census Bureau's Service Annual Survey (SAS) and is the source of data for years 1998 and later. SAS provides estimates of operating

revenue of taxable firms and revenue and expenses of firms exempt from federal income taxes for selected service industries. Unlike the Transportation Annual Survey, the SAS is based on the North American Industry Classification System (NAICS).

As with all sample surveys, two types of errors are possible: sampling and nonsampling. Nonsampling errors may include response errors and mistakes in coding or keying data. For additional information about the survey and data reliability, the reader is referred to the Census Bureau website at www.census.gov.

Water (Domestic)

Eno Transportation Foundation, Inc. is the source of these data. Eno estimates these figures by multiplying ton-mile figures by estimated revenue per ton-mile. The U.S. Army Corps of Engineers reports the ton-mile figures in its publication *Waterborne Commerce of the United States*, and the revenue per ton-miles figures are estimated by Eno.

Oil Pipeline

Eno Transportation Foundation, Inc., publishes these data, which are based on Federal Energy Regulatory Commission (FERC) data and reported by the Oil Pipeline Research Institute for years 1977 to the present. FERC data originates from required quarterly reports filed by pipeline companies. Prior to 1977, the data are based on the former Interstate Commerce Commission data for regulated pipelines, and estimated to be 16 percent of the total of nonregulated pipelines.

Gas Pipeline

These statistics originate from *Gas Facts*, published annually by the American Gas Association (AGA). AGA data are based on gas utilities participation and reporting to the Uniform Statistical Report and estimates for those companies not reporting based on recent historical experience. Varying percentages of nonreporters from year to year introduce minor reliability problems for time-series comparisons.

TABLE 3-19. Employment in For-Hire Transportation and Selected Transportation-Related Industries

Employment data by industry are from the National Employment, Hours, and Earnings esti-

mates published by the Bureau of Labor Statistics (BLS), U.S. Department of Labor. These estimates originate from the Current Employment Statistics (CES) survey program. The CES is a monthly survey conducted by state employment security agencies in cooperation with the BLS. The survey provides employment, hours, and earnings estimates based on payroll records of nonfarm business establishments, including government.

BLS uses a stratified sample based on a sector's employment size, or the degree of variability among its establishments, or both. This ensures that BLS captures a more representative survey from employers with large payrolls. Thus, large establishments are certain of selection while smaller ones have less of chance.

Data Collection

Data are collected electronically from about two-thirds of the respondents and by mail or fax from the remainder. The primary type of electronic reporting is touch-tone phone self-response; others are computer-assisted phone interviews and phone voice recognition technology. Increasingly, data are collected through electronic data interchange from a small but growing number of companies that have a large number of establishments across the country. Mail respondents submit Form 790 to the BLS each month. It is then edited and returned to the respondent for use again the following month. All firms with 250 employees or more are asked to participate in the survey, as well as a sample of smaller firms.

Estimation

Employment estimates are made at what is termed the basic estimating cell level and aggregated upward to broader levels of industry detail by simple addition. Basic cells are defined by industry (usually at the 3- or 4-digit SIC level) and are stratified within industry by geographic region and/or size class in the majority of cases. Within the wholesale trade, retail trade, and services divisions, most industries are stratified into three to five size classes (beginning in 1984).

Most national employment estimates are multiplied by bias adjustment factors to produce the monthly published estimates. Bias adjustment factors are used primarily to compensate for the inability to capture the entry of new firms on a

timely basis. New firms contribute a substantial amount to employment growth each year, but there is a lag between the creation of a firm and its inclusion on the sample frame (i.e., the Unemployment Insurance universe file). It is, therefore, necessary to use modeling techniques to capture this segment of the population. BLS also performs seasonal adjustments for certain SIC industries.

Accuracy

BLS does not publish data reliability information along with estimates. Instead, it provides estimation formula and the necessary parameters so that users can estimate standard errors. For additional information, see the "Explanatory Notes and Estimates of Error" in the BLS monthly publication *Employment and Earnings*.

The CES survey, which began over 50 years ago, predates the introduction of probability sampling as the internationally recognized standard for sample surveys. Instead, a quota sample has been used since its inception. Quota samples are at risk for potentially significant biases, and recently completed BLS research suggests that, despite the large CES sample size, employment estimates based on that sample at times diverge substantially from those that a more representative sample would have been expected to produce. This leads to an over-reliance on bias adjustment in the estimation procedure. Because bias adjustment is primarily based on past experience, it is limited in its ability to accurately reflect changing economic conditions on a timely basis.

Government Employment

The Office of the Secretary provides employment figures for the U.S. Department of Transportation. State and local highway department employment figures are from the *State and Local Government Employment and Payroll Estimates*, published by the U.S. Department of Commerce, Bureau of the Census. The data are for the 50 states and the District of Columbia. Employment and payroll data pertain to the month of October. At present, data are collected for one pay period that includes October 12 (regardless of the period's length) through the Public Employment Survey (PES).

Employment refers to all persons gainfully employed by and performing services for a govern-

ment. Employees include all persons paid for personal services performed from all sources of funds, including persons paid from federally funded programs, paid elected officials, persons in a paid leave status, and persons paid on a per meeting, annual, semiannual, or quarterly basis. Excluded from employment statistics are unpaid officials, pensioners, persons whose work is performed on a fee basis, and contractors and their employees.

The Census Bureau derives full-time equivalent (FTE) employment by summing the number of full-time employees reported and converting the number of hours worked by part-time employees to a full-time equivalent amount. Up until 1985 data, the method used to calculate FTEs was based solely on payroll data. Effective with 1986 data, the annual employment survey started collecting data on the number of hours worked by part-time employees in order to provide a more accurate representation of full-time equivalent employment. No October 1985 FTE employment data are available.

Beginning in 1999, the Public Employment Survey (PES) was conducted using a separate sample of approximately 11,000 government units to improve data accuracy and survey efficiency. Government units meeting any of the following criteria are included in the survey: 1) counties with populations greater than 100,000; 2) cities with populations greater than 75,000; 3) townships in New England and Mid-Atlantic with populations greater than 50,000; 4) special districts with FTEs greater than 1000; 5) independent school districts with enrollment greater than 10,000; and 6) all dependent and independent schools providing college level education. In 1999, government units were sampled to obtain a relative standard error of 3 percent or less for FTE and total payroll for each of the states by type of government groups.

Prior to 1993, the PES used a joint sample of approximately 24,000 units for both employment and finance. From 1993 to 1998, the sample size was reduced to around 14,000 units. The standard error for the PES prior to 1999 was designed to be around 3 percent for major state- or county-level estimates of finance variables (state-level for 1993-1998 and county-level prior to 1993). Employment estimates are made using regression, except when the number of noncertainty cases contributing to the estimate is less than 20, where a simple unbiased estimate is used.

TABLE 3-20. Employment in Transportation Occupations

TABLE 3-22. Median Weekly Earnings of Full-Time Wage and Salary Workers in Transportation by Detailed Occupation

Employment by detailed transportation occupation data are from the Occupational Employment Statistics (OES) survey, collected by the Bureau of Labor Statistics (BLS). The OES is a periodic mail survey of nonfarm establishments that collects occupational employment data on workers by industry. The OES program surveys approximately 725,000 establishments in 400 detailed industries. The average response rate for the last three years, according to a BLS official, averaged about 70 percent.

The sample is selected primarily from the list of business establishments reporting to the state unemployment insurance program. The OES sample initially stratifies the universe of establishments by three-digit industry code and size-class code. Establishments employing 250 employees or more are sampled with certainty. Establishments employing fewer than 250 employees but more than 4 employees are sampled with probability proportional to the size class employment within each three-digit industry. Establishments employing four or fewer employees (i.e., size class 1 establishments) are not sampled. Instead, the employment for these establishments are accounted for by assigning a larger sampling weight to establishments employing five to nine employees (i.e., size-class 2 establishments). Within each three-digit industry/size-class cell, establishments are systematically selected into the sample through a single random start.

Data Collection

Employers are the source of occupational data. Within establishments, the main source of occupational data reported by respondents is personnel records. Data are collected from respondents primarily by mail. Occasionally, visits are made to large employers and to other respondents who indicate particular difficulty in completing the questionnaires. Ordinarily, two mailings follow the initial mailing. After the third mailing, a subsample of the remaining nonrespondents is drawn and contacted by telephone. The OES survey follows a 3-year cycle. Three surveys are conducted

alternately for manufacturing, nonmanufacturing, and the balance of nonmanufacturing industries.

Estimation

During the sample selection process, each sampled establishment is assigned a sampling weight that is equal to the reciprocal of its probability of selection. For example, if an establishment on the sampling frame had a 1 in 10 chance of being selected into the sample, then its sampling weight is 10. For establishments that did not respond to the survey, a nonresponse adjustment factor is calculated and applied against the sampling weights of the responding establishments within each state/3-digit industry/size-class cell. Multiplying these adjustment factors by sampling weights increases the weight of the responding establishments so they can account for the missing employment data of the nonresponding establishments.

Accuracy

The OES survey uses a subsample replication technique to estimate variances in occupational employment at the 3-digit industry/size-class level. For additional information on occupational employment estimates and measurements of sampling error associated with the estimates, the reader is referred to <http://stats.bls.gov/oes/home.htm>.

TABLE 3-21. Average Wage and Salary Accruals per Full-Time Equivalent Employee by Transportation Industry

TABLE 3-23. Total Wage and Salary Accruals by Transportation Industry

The *Survey of Current Business* (tables 6.3c and 6.6c) published by the U.S. Department of Commerce, Bureau of Economic Analysis, is the source of transportation wage and salary data. These estimates are based on BLS tabulations of employee wages that are covered by State unemployment insurance. As a component of the income side of National Income and Product Account, wages and salaries comprise part of the GDP calculation. These data reflect the monetary remuneration of employees in terms of wage accruals less disbursements. It is defined as the difference between wages and salaries on a “when-earned” basis, or accrued, and wages and salaries on a “when-paid,” or dis-

bursed basis. This computation was instituted in 1992 because a significant portion of bonus payments were missed in previous calculations. Readers should also refer to the earlier discussion of GDP methods and reliability for more detail.

TABLE 3-24. Labor Productivity Indices for Selected Transportation Industries

The Bureau of Labor Statistic's (BLS) *Industry Productivity Measures* is the source of transportation labor productivity data. BLS develops industry productivity measures based on various data sources.

For rail, BLS uses freight ton-mile and passenger miles that are collected by the Surface Transportation Board (STB), the Association of American Railroads (AAR), and Amtrak. BLS also aggregates four different air transportation outputs to form a single productivity index: domestic passenger-miles, domestic freight ton-miles, international passenger-miles, and international freight ton-miles. Air transportation data come from *Air Carrier Traffic Statistics and Air Carrier Financial Statistics*, published by the U.S. Department of Transportation, Bureau of Transportation Statistics. For petroleum pipeline, BLS relies on data from the Association of Oil Pipelines and derived an output index based on trunkline barrel-miles. A barrel-mile is one barrel of petroleum moved through one mile of pipeline.

Estimation

BLS generally calculates labor productivity by dividing an index of output (in this case, ton-miles) by an index of hours. Output is derived with a weight adjusted Tornqvist formula that produces an output ratio for one year. BLS then combines these in a series that produces a chained output index. The hour indexes are developed from data in BLS's Current Employment Statistics (CES; see discussion above for table 3-12) and are the results of dividing the annual aggregate hours for each year by a base-period figure. Readers who need more detail, such as mathematical specifications or equations, should refer to Kunze and Jablonski (Kunze and Jablonski 1998) or call the Office of Productivity and Technology at BLS.

Accuracy

BLS provides no measures of reliability. However, BLS makes an assumption that transportation

outputs should be measured using the production of passenger-miles or freight-miles. Another school of thought might assume that many transportation firms or facilities are actually providing capacity rather than actual use. Thus, an argument can be made that productivity should be based on capacity rather than use. In fact, this is how BEA measures transportation output. To evaluate the BLS assumption, one study compared the two approaches by examining the different growth rates produced by BLS and BEA and found that in 25 of 35 service industries, the differences are within one percentage point. For transportation, differences in growth rates across BLS and BEA estimates were two percentage points or less (Kunze and Jablonski 1998).

Beginning with 1997 data, the indices for bus and petroleum pipelines did not meet BLS publication standards and are considered less reliable than those for other modes. These industries had between 14,000 and 15,000 employees, far below the 50,000-employee threshold established for transportation industries by BLS. However, they both met a basic test of variability of the annual percent changes in the output per hour measure.

GOVERNMENT REVENUES AND EXPENDITURES

TABLE 3-25a & 3-25b. Federal, State, and Local Government Transportation-Related Revenues and Expenditures, Fiscal Year (Current and constant 1996 dollars)

TABLE 3-26a & 3-26b. Federal Transportation-Related Revenues, Fiscal Years (Current dollars and constant 1996 dollars)

TABLE 3-27a & 3-27b. Federal Transportation-Related Expenditures by Mode, Fiscal Year (Current and constant 1996 dollars)

TABLE 3-28. Cash Balances of the Transportation-Related Federal Trust Funds, Fiscal Year

The main sources for federal-level data are the *Budget of the United States Government* and the *Appendix to the Budget*. These data are the actual figures as reported for the various transportation-related programs in the appendices of each year's

budget document.¹ The figures are consistent from year to year and follow the definitional structure required by the Office of Management and Budget (OMB).

Primary sources for state and local transportation-related revenues and expenditures data are censuses and surveys collected by the U.S. Census Bureau. All units of government are included in the Census of Governments, which is taken at five-year intervals for years ending in 2 or 7, and these data are full counts, which are not subject to sampling error.

State and local government data for noncensus years are obtained by annual surveys, which are subject to sampling error. For U.S. totals of local government revenues and expenditures in this report, sampling variability is less than 3 percent.

Federal figures in this report correspond to the federal fiscal year, which begins on October 1, while state and local data are for fiscal years that generally start in July. While this may create a small error in totals for any given year, the data are suitable for illustrating trends in public transportation finance. Programs terminated before 1985 are excluded from the tables. The totals for transportation revenues and expenditures in this report are the sum of the Census Bureau's state and local numbers plus the total of the federal numbers.

The source of the chained dollar deflators is *The National Income and Product Account Tables*, Bureau of Economic Analysis, table 7.1, "Quantity and Price Indexes for Gross Domestic Product." All inflation-adjusted data are for the base year 1996, instead of 1992 as in previous editions of *National Transportation Statistics*. Note that deflators used for the federal data differ from those used for state and local data. Thus, if expenditures are totaled across different levels of government in

¹ The federal budget is broken down into 20 functional categories, of which one is transportation (function 400). Function 400 is not tied to any one department or agency, but instead aggregates transportation functions wherever in the federal government they occur. Thus, the transportation function may include many activities, such as highway construction and safety, airways and airports, maritime subsidies, U.S. Coast Guard operations, railroads, and mass transit. It also covers grants-in-aid programs to support state and local activities. A good summary of the federal budget process can be found in Stanley E. Collender, *The Guide to the Federal Budget, Fiscal Year 1996* (Washington, DC: Urban Institute Press, 1995).

chained dollars before and after federal grant transfers, the totals will not match.

Transportation Revenues

Transportation revenue estimates include transportation-related user charges, taxes, or fees earmarked for transportation-related expenditures. Estimates include transit fares from systems owned and operated by state and local governments, including those systems operated under contract by a private firm under day-to-day financial oversight by government.

Federal transportation revenues generally consist of trust-fund collections from user charges, such as fuel taxes, vehicle taxes, registration and licensing fees, and air passenger ticket taxes. Damage payments made by private parties are deposited in the funds to reimburse the government for related fund expenditures.

The five transportation-related Federal trust funds are established by law:

1. Highway Trust Fund (HTF), which includes both highway and transit accounts;
2. Airport and Airway Trust Fund (AATF);
3. Harbor Maintenance Trust Fund (HMTF);
4. Inland Waterways Trust Fund (IWATF); and
5. Oil Spill Liability Trust Fund (OSLTF).

Highway Revenues

The Highway Trust Fund (HTF) was established by the Highway Revenue Act of 1956. Highway Trust Fund revenues are derived from various excise taxes on highways users (e.g., motor fuel, motor vehicles, tires, and parts and accessories for trucks and buses) and interest earned on balances. The Transportation Equity Act for the 21st Century (TEA-21), which was enacted in June 1998, made important changes to the Federal Highway Trust Fund legislations (FHWA, 1999):

- extension of deposit provisions of almost all highway user taxes through September 30, 2005;
- after September 30, 1998, the HTF can no longer earn interest on balances, and the balance in the highway account would be transferred to the general fund;
- TEA-21 keys Federal-aid highway funds to receipts of the Highway Account of the HTF; and

- the Transit Account share of fuel tax rose from 2 cents per gallon to 2.86 cents per gallon.

The Excise tax on gasoline is the most important source of the HTF revenues and has changed five times since 1985. It increased from 9 cents per gallon in 1985 to 9.1 cents per gallon on January 1, 1987; to 14.1 cents per gallon on December 1, 1990; to 18.4 cents per gallon on October 1, 1993; to 18.3 cents per gallon on January 1, 1996; and to 18.4 cents per gallon on October 1, 1997 (FHWA, 1999).

Money paid into the fund is earmarked primarily for the Federal-aid Highway program, which is apportioned to states for planning, constructing, and improving the nation's highway system, roads, and bridges. Effective April 1983, the Highway Revenue Act of 1982 created the Mass Transit Account within the HTF.

Some portion of the HTF is dedicated to budget deficit reduction and the Leaking Underground Storage Tank Trust Fund (LUSTTF). For example, 4.3 cents per gallon of the federal excise tax on gasoline has been assigned to the general fund since January 1, 1996, and 0.1 cents per gallon was apportioned to the LUSTTF since October 1, 1997 (FHWA, 1999). These funds are not considered as transportation-related in this report.

State and local highway revenues include state and local taxes on motor fuels, motor vehicle licenses, and motor vehicle operator licenses, along with state and local charges for regular toll highways and local parking charges. Regular highway charges (revenues) include reimbursements for street construction and repairs, fees for curb cuts and special traffic signs, and maintenance assessments for street lighting, snow removal, and other highway or street services unrelated to toll facilities. Local governments use special assessments and property taxes that may be commingled with other local revenue in a general fund to finance local road and street programs. Consistent with federal revenues, state and local transportation revenues in this report do not include general funds that may be allocated to transportation.

Transit Revenues

As mentioned above, the Highway Revenue Act of 1982 created the Mass Transit Account within the HTF. Effective April 1983, the act provided one cent per gallon of the federal excise tax on gasoline sales to be set-aside for the Mass Transit

Account to help finance transit capital projects. The rate was increased to 1.5 cents per gallon on December 1, 1990; to 2 cents per gallon on January 1, 1996; and to 2.86 cents per gallon on October 1, 1997 (FHWA, 1999). Although highway users pay these taxes, the funds are treated as federal transit revenues.

State and local transit revenues include revenues from operations of public mass transportation systems (rapid transit, subway, bus, railway, and commuter rail services), such as fares, charter fees, advertising income, and other operations revenues. They exclude subsidies from other governments to support either operations or capital projects.

Air Revenues

The Tax Equity and Fiscal Responsibility Act of 1982, as amended by Omnibus Budget Reconciliation Acts of 1990 and 1993, the Small Business Job Protection Act of 1996, and the Taxpayers Relief Act of 1997, provides for the transfer of receipts received in the U.S. Treasury from the passenger ticket tax and certain other taxes paid by airport and airway users to the Airport and Airways Trust Fund (AATF). Effective October 1, 1997, the Taxpayers Relief Act of 1997 extends aviation excise taxes for 10 years and includes the following major provisions (FAA, 1999):

1. retains existing freight way bill, general aviation fuel and gas taxes, and a 6-dollar departure tax on domestic flights to and from Alaska and Hawaii;
2. converts the 10 percent ad valorem tax on domestic passenger tickets to a combination of ad valorem and flight segment tax over three years beginning October 1, 1997;
3. imposes a new 7.5 percent tax on payments to airlines for frequent flyer and similar awards by banks and credit card companies, merchants, frequent flyer program partners—other airlines, hotels, or rental car companies and other businesses;
4. increases the current 6-dollar international departure tax to 12 dollars per passenger and adds a 12-dollar international arrival tax;
5. lowers tax rates on flights to certain rural airports to 7.5 percent without a flight segment component; and
6. transfers revenues from the 4.3 cents-per-gallon aviation fuel taxes currently dedicated to

reduce the national U.S. deficit from the general fund to the AATF.

Most of this trust fund is used to finance the Federal Aviation Administration's (FAA's) capital programs, namely, Facilities and Equipment; Research, Engineering, and Development; and Airport Improvement Program. Within certain limits set by Congress, some of the remaining money is used to cover FAA operation and maintenance expenses. The portion of the FAA's operation and Maintenance expenses not paid from the trust fund revenues are financed by U.S. Treasury general funds.

State and local revenues from air transportation are derived from airport charges. Beginning in 1992, local governments began collecting passenger facility charges and spending these revenues (both subject to FAA approval) to finance capital programs.

The collection of passenger facility charges was authorized by the Aviation Safety and Capacity Expansion Act of 1990.¹

Waterway and Marine Revenues

Federal water revenues come from four primary sources: the Harbor Maintenance Trust Fund (HMTF), the Inland Waterways Trust Fund (IWATF), the Oil Spill Liability Trust Fund (OSLTF), and tolls and other charges collected by the Panama Canal Commission.

The Harbor Maintenance Trust Fund was established in accordance with the Harbor Maintenance Revenue Act of 1986. Revenues for this fund are derived from receipts of a 0.125 percent ad valorem user fee imposed on commercial users of specified U.S. ports, Saint Lawrence Seaway tolls. On March 31, 1998, per a U.S. Supreme Court ruling, the tax on exports was terminated (OMB, 2000). This fund is used to finance up to 100 percent of the U.S. Army Corps of Engineers' harbor operation and maintenance (O&M) costs, including O&M costs associated with Great Lakes navigational projects, and the fund fully finances the operation and maintenance of the Saint Lawrence Seaway Development Corp.

The Inland Waterways Trust Fund was established by the Inland Waterways Revenue Act of 1978 and amended by the Water Resources Development Act of 1986. The trust fund has been in

effect since fiscal year 1981. The sources for the fund are taxes imposed on fuel for vessels engaged in commercial waterway transportation and investment interest. From this tax of 24.3 cents per gallon, 4.3 cents goes for deficit reduction, and a statutory maximum of 20 cents (raised to that level from the previous maximum of 19 cents at the beginning of 1995) goes to the Trust Fund. The funds are earmarked for financing one-half of the construction and rehabilitation costs of specified inland waterway projects.

The Oil Spill Liability Trust Fund was established by the Omnibus Budget Reconciliation Act of 1989. Revenues for this fund are raised through tax collection of 5 cents on each barrel of oil produced domestically or imported (OMB, 1999). The resources from this fund are used to finance oil pollution prevention and cleanup activities by various federal agencies. For the U.S. Coast Guard, the fund finances oil spill recovery and payment of claims. Beginning in 1997, the fund also finances the annual disbursement to the Prince William Sound Oil Spill Recovery Institute.

The Panama Canal Commission was established by the Panama Canal Act of 1979 to manage, operate, and maintain the Panama Canal under the Panama Canal Treaty of 1977. The treaty period ended on December 31, 1999, when the Republic of Panama assumed full responsibility for the canal. During the treaty period, the commission collected tolls and other revenues, which were deposited in the U.S. Treasury in an account known as the Panama Canal Revolving Fund. Money from this fund was used to finance canal operations and capital programs, which were reviewed annually by Congress. The revenues reported under this category for FY 2000 are for the first quarter (October 1999 – December 1999) of Panama Canal operations.

State and local water revenues are derived from canal tolls, rents from leases, concession rents, and other charges for use of commercial or industrial water transport and port terminal facilities and related services. Fees and rents related to water facilities provided for recreational purposes, such as marina and public docks, and toll ferries are not included.

¹ Public Law 101-508, 104 Stat. 1388 (Nov. 5, 1990).

Rail Revenues

There are no governmental transportation revenues for rail (Rail generates fuel taxes that are designated for deficit reduction and, thus, are not considered transportation revenues in these tables).

Pipeline Revenues

The Pipeline Safety Program is funded by user fees assessed on a per-mile basis. The assessments are made on each pipeline operator regulated by the Office of Pipeline Safety (OPS) of the Research and Special Programs Administration (RSPA) in the U.S. Department of Transportation. There are no state and local revenues for pipeline.

General Support Revenues

General support revenues come from the Emergency Preparedness Fund, which is generated from fees paid by registered shippers of hazardous materials. RSPA administers and distributes the revenues to states, territories, and tribes through the Hazardous Materials Emergency Preparedness (HMEP) grant program, which is authorized by Federal Hazardous Materials Transportation Law.

Transportation Expenditures

Expenditures, rather than obligations, are used in these tables because they represent the final, actual costs to the government, by year, for capital goods and operating services required by transportation programs. Obligations suggest government commitment to future transportation expenditures, but do not indicate when the funds will actually be disbursed or even if the amounts obligated will be spent.

It is important to recognize that in some accounts in the *Budget of the United States Government*, expenditures for a particular year understate total government disbursements. This is because certain offsetting collections of fees and assessments from the public are not treated as government revenues, but deducted from disbursements to determine expenditures. These collections are those mandated, by statute, to directly fund agency expenditures rather than be transferred to the U.S. Treasury. For this reason, expenditures do not necessarily indicate how much the federal government actually spends on transportation each year.

Highway Expenditures

Federal Highway Administration (FHWA) expenditures include funds for Federal Aid Highways (financed from the HTF) and the Interstate Substitution and Railroad Crossing Demonstration (financed from the general fund). The National Highway Traffic Safety Administration (NHTSA) expenditures include: operations, research, and highway traffic safety grants. Federal highway expenditures also include road construction activities managed by the Department of the Interior's National Park Service, Bureau of Indian Affairs, Bureau of Reclamation, and Bureau of Land Management; the Department of Agriculture's Forest Service; the Department of Housing and Urban Development; and other federal agencies.

State and local governments' highway expenditures reported by the Census Bureau are generally slightly lower than those reported in FHWA's *Highway Statistics* because the FHWA includes some highway expenditure data, such as law enforcement activities and patrols, and policing of streets and highways not included in the Census data. Box 3-1 outlines the major differences in Census Bureau and FHWA calculation of state and local highway transportation financial statistics.

Transit Expenditures

Federal expenditures include grants to states and local agencies for the construction, acquisition, and improvement of mass transportation facilities and equipment and for the payment of operating expenses. Several other items are also included: Federal Railroad Administration (FRA) commuter rail subsidies related to the transition of Conrail to the private sector; research and administrative expenses of the Federal Transit Administration (FTA); and Federal interest payment contribution to the Washington Metropolitan Area Transportation Authority (WMATA).

Air Expenditures

Federal expenditures reported here consist of all FAA expenditures, such as those associated with constructing, operating, and maintaining the national air traffic system; administration of the airport grant program; safety regulation; and research and development. NASA expenses related to air transportation are also included.

State and local expenditures for air include the operation and maintenance of airport facilities, as administered by local airport and port authorities quasigovernment agencies with responsibilities for promoting safe navigation and operations for air modes.

Waterway and Marine Expenditures

Federal expenditures comprise those parts of the U.S. Coast Guard's expenses that are transportation-related, such as aids to navigation, marine safety, and marine environmental protection. All expenses of the U.S. Maritime Administration are included, such as subsidies for construction and operation of vessels by U.S.-flag operators, research and development, and training of ship officers. Also included are those expenses of the U.S. Army Corps of Engineers for construction and operations and maintenance of channels, harbors, locks and dams; protection of navigation; the salaries and expenses of the Federal Maritime Commission; and the expenses of the Panama Canal Commission. Expenditures of the Panama Canal Commission for FY 2000 include outlays for the first quarter of operations, including severance pay and accumulated leave. FY 2001 expenses are for the settlement of remaining accident and contract claims against the Commission.

State and local governments incur water transportation expenditures by operating and maintaining water terminal facilities within ports and harbors.

Rail Expenditures

Federal rail transportation expenditures include:

1. expenses for rail safety enforcement;
2. inspection and program administration;
3. railroad research and development;
4. financial assistance to states for planning, acquisition, rail facility construction, and track rehabilitation with respect to low volume freight lines;
5. grants to Amtrak, including funds to upgrade the high-speed line between Boston, Massachusetts, and Washington, DC, owned by Amtrak (the Northeast Corridor Improvement Program); annual appropriations to cover operating losses; and funds to invest in new equipment and facilities;
6. the purchase of redeemable preference shares for track rehabilitation and line acquisition; and

7. loan guarantee defaults for railroad rehabilitation and improvement and Conrail labor protection.¹

The local rail freight assistance program, a program of FRA grants to state governments, has had a 70:30 percent federal-state funding share since 1982.

Pipeline Expenditures

The Office of Pipeline Safety (OPS) reimburses state agencies up to 50 percent of their costs to carry out state pipeline safety programs. Federal expenditures are for the enforcement programs, research and development, and grants for state pipeline safety programs.

General Support Expenditures

General fund expenditures include all of the expenses of the following agencies: Office of Inspector General, National Transportation Safety Board, all expenses of the Research and Special Programs Administration, (except pipeline expenditures) and the Office of the Secretary of Transportation (except for payments to Air Carriers and the Commission on Aircraft Safety).

Limitations of the Source Data Sets

The database covers civilian transportation-related activities of government agencies including those of the U.S. Army Corps of Engineers and U.S. Coast Guard.

As mention earlier, federal government data are compiled for the federal fiscal year, which begins on October 1, while state and local data are for fiscal years that generally start in July except for four states with other starting dates (Alabama and Michigan in October, New York in April, and Texas in September). While this may create a small error in totals for any given year, the data are suitable for illustrating trends in public transportation finance.

Readers should note that state and local governments data for census years are full counts and not subject to sampling errors, whereas the data for

¹ Funds in the Conrail Labor Protection Program were provided for benefits to Conrail employees deprived of employment because of work force reductions and other actions. This program no longer exists since Conrail has been returned to the private sector. In 1988, the unobligated balances available from this program were transferred to the USCG, and in 1990 they were returned to the U.S. Treasury.

Box 3-1.

U.S. Census Bureau and Federal Highway Administration Calculations of State and Local Transportation Financial Statistics Differ in the Following Ways:

Item	Census	FHWA
Motor fuel tax revenues	Includes state and local tax revenues on any fuel used in motor vehicles and on gasoline used by aircraft.	Includes state and local fuel tax revenues attributed to highway use of fuels, including diesel fuel, gasohol, and liquefied petroleum gas used by private and commercial highway use motor vehicles and transit. Does not include revenues on gasoline used by aircraft.
Motor vehicle license tax revenues	Includes vehicle mileage and weight taxes on motor carriers; highway use taxes; or off-highway fees.	Does not include vehicle mileage and weight taxes on motor carriers; highway use taxes or off-highway fees.
Local parking charges revenues	Includes local parking revenues.	Not explicitly collected.
Highway expenditures	Excludes patrols or policing of streets and highways; traffic control activities of police or public safety agencies; law enforcement and safety activities of vehicle inspection enforcement, and vehicle size and weight enforcement; street cleaning activities; and roads within parks maintained by a park agency.	Includes patrols or policing of streets and highways; traffic control activities of police or public safety agencies; law enforcement and safety activities of vehicle inspection enforcement, and vehicle size and weight enforcement; street cleaning activities; and roads within parks maintained by a park agency.

noncensus years are estimated from annual surveys of the Bureau of the Census, which are subject to sampling variability of less than three percent. The Census Bureau's database also does not include detailed modal information on interest earnings and bond issue proceeds on the revenue side nor bond retirement and interest payments on the expenditure side

Revenues

Transportation-related revenues like local government property taxes on vehicles, equipment, and streets, and state income taxes to support rail and intercity bus services are not covered because they are not shown in the source materials used to compile the database. In addition, taxes collected from users of the transportation system that go into the general fund are not included. For example, rail generates fuel taxes that are designated for deficit reduction and hence are not considered as

transportation revenues. The portion of the Highway Trust Fund (HTF) that goes to the general fund is not considered as transportation revenues.

Expenditures

It is important to recognize that in some accounts in the *Budget of the United States Government*, expenditures for a particular year understate total government disbursements. This is because certain offsetting collections of fees and assessments from the public are not treated as government revenues, but deducted from disbursements to determine expenditures. These collections are those mandated, by statute, to be applied directly to finance agency expenditures rather than being transferred to the Treasury.

In addition, the Census Bureau's highway expenditures data do not include highway law enforcement expenditures, which form a part of the state and local highway expenditures published in the

Highway Statistics. To maintain consistency between the different modes regarding the types of expenditures included, these additional data from the *Highway Statistics* report have not been used.

Data Adjustments

Revisions and corrections to previously published data have been made in most cases. The base year for chained dollar estimates for current data sets is 1996, while the earlier version was presented in chained 1992 dollars. Moreover, the following adjustments have been incorporated.

Revenues

Transportation-related revenues of the Aquatic Resources Fund have been added to water transportation revenues. In this case, only the excise tax charged on motor boat fuels for the Boat Safety Program is assumed to be transportation-related.

The preceding data series did not account for revenues of Pollution Fund, Off-Shore Oil Pollution Fund, and Deep Water Port Liability Fund prior to FY 1990. The current data sets includes revenues for these funds prior to FY 1990.

Expenditures

Not all expenditures for the U.S. Coast Guard (USCG), as reported by the Office of Management and Budget, are considered transportation-related. A new approach has been used to arrive at more accurate USCG transportation-related expenditures. Similar to the previous approach, the current approach includes all expenditures for Environmental Compliance and Restoration, Alteration of Bridges, and Oil Spill Recovery. Part of the expenditures for Operations, Acquisition, Construction and Improvement, Research & Development, and Test and Evaluation are considered as transportation. Within these program areas, only Aids to Navigation, Marine Safety, and Marine Environmental Protection activities are included in the earlier data sets. In the current version, more activities like Search and Rescue and Ice Operations have been included. In addition, Boat Safety Program expenditures have also been included.

Trust fund share of pipeline safety was added to the Research and Special Programs Administration expenditures since FY 1994. This item was not covered in the previously published data.

Federal Grants

Federal grants to state and local governments for the Boat Safety Program have been included. These were not included in the previously reported data.

Data for federal transit grants are obtained from the Office of Management and Budget public budget database. In the previous data series, they were estimated by deducting direct federal transit expenditures grants from the total federal transit expenditures.

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Chapter 4 Energy and the Environment

PETROLEUM SUPPLY

TABLE 4-1. Overview of U.S. Petroleum Production, Imports, Exports, and Consumption

The petroleum supply system is extremely complicated, with many different processes, products, and entities involved. Briefly, crude oil is produced or imported, transported to refineries where it is refined into various products, and then transported to markets. Imports and exports of crude oil and products must be accounted for, as must be non-petroleum components of final products, such as natural gas plant liquids and ethanol for gasoline blending.

The U.S. Department of Energy, Energy Information Administration (EIA) collects extensive data at select points in the petroleum supply system. Sixteen surveys are conducted by EIA's Petroleum Supply Reporting System to track the supply and disposition of crude oil, petroleum products, and natural gas plant liquids:

- five weekly surveys cover refineries (form EIA-800), bulk terminal stocks (form EIA-801), product pipelines (form EIA-802), crude stocks (form EIA-803), and imports (form EIA-804).
- eight monthly surveys cover the same five points plus tanker and barge movement (form EIA-817), gas processing facilities (form EIA-816), and oxygenates (form EIA-819M).
- one survey (form EIA-807) collects propane data on a monthly basis in the warmer months (April-September) and on a weekly basis in the colder months.
- one annual survey determines production capacity of oxygenates and fuel ethanol (form EIA-819A), and
- one annual survey determines refinery fuel use, capacity, and crude oil receipts by transportation mode (form EIA-820).

The five weekly surveys target key points in the petroleum supply system. They do not include all companies, but sample 90 percent of volume at each selected point in the supply system. EIA ranks the companies involved in the survey and sends surveys as it scrolls down the list, stopping when it reaches the 90 percent level. Although 100

percent coverage is sacrificed, this method keeps the level of incoming data manageable and avoids burdening the smallest companies. All data are reviewed and anomalies checked.

Monthly surveys provide data that are used in the monthly and annual reports. They are similar to the weekly surveys, but are more exhaustive in both the range of data collected and the depth of the collection. Sample sizes and response rates for several of the key points in the supply system are shown in table A. The eight monthly surveys cover the industry more accurately than the weekly surveys and provide some double-check points that the other surveys do not. EIA expends considerable effort to ensure that its data are as accurate as possible. Revisions are made throughout the year. For example, EIA's *Annual Energy Review 1996*, released in July 1997, provided a preliminary 1996 number for total petroleum production of 8.30 million barrels per day (mmbd). The *Annual Energy Review 1997*, released a year later, revised that to 8.25 mmbd, and the 1999 Review reported 8.29 mmbd.

TABLE A. Average Response Rates for Monthly Surveys, 1998

Survey Site	Average universe site	Average number of respondents	Percent
Refinery	252	243	96.3
Bulk terminal	300	287	95.6
Pipeline	81	80	99.3
Crude oil stocks	174	169	99.1
Refinery	252	243	96.3
Bulk terminal	300	287	95.6

NOTE: The average response rate is calculated by summing individual monthly response rates and dividing by 12.

SOURCE: Tammy G. Heppner and Carol L. French, Energy Information Administration, U.S. Department of Energy, Accuracy of Petroleum Supply Data (Washington, DC: 1998)

No complicated survey is likely to be 100 percent accurate. EIA lists four sources of potential systematic errors:

1. Some members of the target population are missed. EIA reports that it continually reviews the lists and searches industry periodicals and newspapers to identify new actors. Considering the nature

of the petroleum industry, it is very unlikely that companies with significant production are not surveyed.

2. Some members of the target population do not respond. EIA reports a 97 percent response rate for monthly surveys. For some points in the supply system, the average response is over 99 percent. Survey respondents are required by law to respond, but some nonresponse is inevitable, especially among small companies. EIA assumes that the nonrespondent's value for that month is the same as for the previous month except for imports. Since imports vary widely, with respondents frequently having no imports, EIA assumes a nonresponse means zero imports. It can be assumed that EIA is good at "filling in the blanks." Assuming for illustration purposes that 0.5 percent of production does not respond, and that EIA is 90 percent accurate in covering the gap, then there is a possibility of a 0.05 percent error. Applying that to total production of 8.29 mmbd in 1999 suggests that there could be an error of 0.0041 mmbd (4,100 barrels per day), which would not affect the published number.

3. The most serious problem may be response error. A company may have poor data, perhaps as a result of imperfect measurements, or it may transmit the wrong number. EIA has no control over a company's data quality. Companies have incentive to measure their inputs and products accurately. Otherwise, they may be cheating themselves or risking ill will with their customers or suppliers. However, no instrumentation is perfectly accurate. The high throughput of, say, a refinery with capacity of several hundred thousand barrels per day, with a variety of products changing density and some lost or used on site, is very complicated to measure. Instrumentation errors are likely to be systematic at any one site, although they will be more nearly random in the aggregate for all facilities. There is potential for small but significant overall errors.

Mistakes may be made in recording and transferring the data. EIA reviews the data and flags gross errors or missing data for review by the respondent. However, not all errors will be picked up by EIA and/or the respondent. Overall, response errors probably are several times as large as nonresponse errors, but it is beyond the scope of this profile to estimate them.

4. The final potential source of systematic error is in the clarity of the survey form, i.e., whether all respondents interpret it correctly. No doubt errors and ambiguities can creep into a form, but at least for petroleum supply, that does not appear to be a major risk. The supply system is not changing rapidly, and EIA should be able to keep with it and the terminology. However the final digit of EIA's published supply data is questionable.

For additional information on survey methodology and statistical reliability, the reader is referred to the EIA reference cited in the tables or the EIA Internet site at www.eia.doe.gov.

FUEL AND ENERGY CONSUMPTION

TABLE 4-1. Overview of U.S. Petroleum Production, Imports, Exports, and Consumption

TABLE 4-2. U.S. Consumption of Energy from Primary Sources by Sector

TABLE 4-3. Domestic Demand for Refined Petroleum Products by Sector

TABLE 4-4. U.S. Energy Consumption by the Transportation Sector

TABLE 4-7. Domestic Demand for Gasoline

Petroleum consumption is far more complex to measure than supply. Instead of a few hundred companies at most measuring points in the supply system, there are tens of millions of consumers. It would be impossible for any survey of individual consumers to produce the high rate of return of U.S. Department of Energy (DOE), Energy Information Administration's (EIA's) supply surveys. EIA's transportation data collection is further limited by the termination of the Residential Transportation Energy Consumption Survey (RTECS). Therefore, EIA uses surveys of sales of products (e.g., Form EIA-821: Annual Fuel Oil and Kerosene Sales Report) or tax collection data from the U.S. Department of Transportation, Federal Highway Administration (FHWA).

EIA reviewed the accuracy of its energy consumption data in a 1990 monograph *Energy Consumption by End-Use Sector, a Comparison of Measures by Consumption and Supply Surveys*. Unfortunately, this monograph does not discuss the

transportation sector because the consumption and supply surveys were not comparable. However, some of the results from other sectors indicate the discrepancies between supply and consumption surveys. Table B shows the ratio of fuel supplied to the sector to consumption reported by the sector in consumption surveys.

In most cases, supply is reported as substantially larger than consumption. Supplies of fuel oil to the commercial sector are reported at almost twice the level of consumption reported by that sector. Some of the discrepancies may be due to definition differences (e.g., fuel oil for apartment buildings is included in commercial supply surveys but not in consumption surveys). Overall, however, the differences are too large for great confidence in the accuracy of the data.

If transportation had been reviewed in the same format, it is likely that the discrepancies would have been larger. Most transportation fuel (gasoline for automobiles) is purchased in small quantities at irregular intervals and cannot be checked simply by looking at a utility bill. Hence, highway transportation energy consumption surveys must be extensive to avoid the risk of large uncertainties in the data. But, with the termination of the RTECS, EIA ceased conducting such surveys. Consumption data must be derived indirectly from sales of petroleum products and tax collection data. While petroleum supply may be accurate to one decimal place, it is likely that disaggregating by sector use may be within plus or minus several percentage points, or perhaps about half a quadrillion British thermal unit (Btu) in table 4-1.

TABLE B.
Reported Ratio of Fuel Supply to Reported Consumption

Sector	Electricity	Gas	Oil
Residential	1.05	0.92	0.92
Commercial	0.91	1.38	1.96
Industrial	1.18	1.28	1.34

SOURCE: U.S. Department of Energy, Energy Information Administration, *Energy Consumption by End-Use Sector, A Comparison of Measures by Consumption and Supply Surveys*, DOE/EIA-0533 (Washington, DC: 1990).

Motor Gasoline

Almost all gasoline is consumed in the transportation sector. Small amounts are used in the commercial sector for nonhighway use and the

industrial sector, which includes agriculture, construction, and other uses. Subtracting estimates of those uses from the known total sales yields the transportation sector's total, which is further subdivided into highway and marine use. Aviation gasoline is, of course, used entirely in the transportation sector (for a very few high-performance automobiles as well as small aircraft).

Data on actual sales is collected by the states for revenue purposes. These data are forwarded to FHWA. EIA uses the data from FHWA to allocate highway consumption of motor gasoline among the states. For 1999, FHWA reported 124.7 billion gallons of gasoline sold nationally for highway use. EIA's table 5.12c of the *Annual Energy Review 2000* lists 8.33 mmbd of gasoline supplied for the transportation sector, the same as 127.7 billion gallons.

Such close agreement between supply and demand is not totally convincing. Definitions are unique to each state (e.g., whether gasohol is counted as pure gasoline or part gasoline and part renewables), measurement points vary from state to state, and each state handles losses differently. Hence, the total of all states' sales of gasoline is not entirely consistent.

Separation of highway from nonhighway uses of gasoline is, by necessity, based in part on careful estimates. Nevertheless, overall gasoline sales are well documented, and the separation is probably fairly accurate. Refinery output of motor gasoline was 7.93 mmbd in 1999, which is probably accurate to the first decimal place and maybe a little better. The transportation sector's 8.33 mmbd would have about the same accuracy.

Diesel Fuel

Diesel fuel is used in highway vehicles, railroads, boats, and military vehicles. Sales are only about 30 percent of gasoline in the transportation sector, but uncertainties are greater. More diesel than gasoline is used for nonhighway purposes, especially agriculture and construction. In addition, there has been more potential for cheating to avoid the tax; heating oil is virtually the same as diesel fuel and can easily be transferred to a vehicle. However, this is less significant now that tracers have been added to fuel oil. After the addition of tracers, the amount of transportation diesel fuel use jumped.

To estimate diesel fuel sales by mode, EIA starts with the total supply of distillate fuel and subtracts

the small amount sold to electric utilities (the most accurately known sector, as measured by EIA Form EIA-759). The remainder is divided among the other end-use sectors according to EIA's sales surveys (Form EIA-821: Annual Fuel Oil and Kerosene Sales Report, and Form EIA-863: Petroleum Product Sales Identification Survey).

This method introduces several potential elements of inaccuracy. First, the surveys of each sector are probably less accurate than the supply surveys noted earlier. Companies and individuals may inadvertently send incorrect data, or not respond at all. Then EIA has to determine what adjustment factor to use for each end-use sector. Since each sector will have a different response rate to the surveys, the adjustments will be different. Large adjustments can introduce large errors. EIA has not published its adjustments for the transportation sector. As shown in table 2, the adjustments in other sectors range from 5 to 96 percent of reported consumption. Even a 20 percent adjustment could introduce an error of one or two percentage points (plus or minus) for any one sector.

Overall, the accuracy of diesel fuel use in the transportation sector should be viewed with some skepticism.

Jet Fuel

Jet fuel is the only other petroleum-based fuel that is used in large quantities (over 1 million barrels/day) in the transportation sector. Virtually all of it is used by airlines. These data are accurate because airlines are required to report usage, and because there are relatively few certificated air carriers, data collection should be manageable.

NONPETROLEUM FUELS CONSUMPTION

TABLE 4-10. Estimated Consumption of Alternative and Replacement Fuels for Highway Vehicles

Collectively, oxygenates, natural gas, electricity, and various alternative fuels amount to only about 3 percent of all energy used in the transportation sector. While this may not be much greater than the error bars associated with petroleum use, it is important to track changes in these fuels accurately.

Oxygenates

Oxygenates, mostly methyl tributyl ether (MTBE), which is derived from natural gas and ethanol, are part of mainstream gasoline supply. They are measured routinely with petroleum supply (forms EIA-819A and 819M). Consumption is estimated from production, net imports, and stock changes. Refineries and other entities are required to report data on oxygenates, and EIA also monitors production capability to provide a crosscheck. Thus, oxygenates data are likely to be reasonably accurate.

Natural Gas

Natural gas is used in the transportation sector mainly as the fuel for compressor stations on natural gas transmission lines. A small but growing amount is used in compressed or liquefied form in vehicles. EIA collects data on natural gas much as it does for petroleum, but the system is much simpler. Natural gas transmission companies may not know exactly how much gas is used in compressor stations, but they have a good idea based on the size of the equipment and the load on the line. The reported numbers probably are reasonably accurate. Data on natural gas-fueled vehicles are collected by DOE via Form-886, which is sent to fuel suppliers, vehicle manufacturers, and consumers. In addition, private associations and newsletters are important sources of information on alternative vehicles and alternative fuels use. Since most groups work cooperatively with DOE, it is likely that the data reported are accurate. EIA tracks the number of natural gas vehicles and the number of refueling stations to provide a cross check on estimates of natural gas consumption.

Electricity

Electricity powers intercity trains (Amtrak) and intracity rail systems. In addition, the number of electric vehicles is growing. There is considerable uncertainty over the energy consumed by these modes. Amtrak no longer provides national totals of its electricity consumption. Data on intracity transit is based on U.S. Department of Transportation, Federal Transit Administration's (FTA's) National Transit Database (NTD). The legislative requirement for the NTD is found in Title 49 U.S.C. 5335(a). Transit agencies receiving funds through the Urbanized Area Formula Program are

generally required to report financial and operating data, including energy use. Although the data is generally considered accurate because FTA reviews and validates information submitted, reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret certain data.

If electric vehicles become important over the next decade or two, dedicated charging stations may become commonplace, which could provide accurate data. Fleet owners (e.g., electric utilities) can keep accurate records, but individuals who plug their vehicles in at home may not. Electricity use must be estimated from the number of such vehicles and the expected driving cycles. Hence, data on electric power for transportation must be viewed as an estimate.

It should also be noted that electricity is a form of work that usually is generated from heat with the loss of about two-thirds of the energy. Automobile engines are equivalent to electric generators in that they convert chemical energy to heat and then to work, losing most of the energy as waste heat. When electrical energy is compared to petroleum in transportation, the waste heat must be included for consistency. A kilowatt-hour of electricity is equivalent to 3,413 British thermal units (Btu), but about 10,000 Btu of heat are required to produce it. This factor is dropping as generators become more efficient. High efficiency gas turbines may require 8,000 Btu or less, but the average is much higher. It is usually impossible to tell where the power for a specific use is generated, so average figures for a region are used to estimate the waste energy, a factor that further reduces the accuracy of the data.

Alternative Fuels

In addition to oxygenates, natural gas, and electricity, alternative fuels include ethanol and methanol. EIA tracks the numbers of such vehicles through Form-886, state energy offices, federal demonstration programs, manufacturers, and private associations. These numbers probably are fairly accurate although it is difficult to monitor retirements. Fuel consumption is estimated from the types of vehicles in operation, vehicle miles traveled, and expected fuel efficiency. Adjustments are necessary for the relatively few flexible-fuel

vehicles. Obviously, the reported data are estimates only.

FUEL AND ENERGY CONSUMPTION BY MODE

TABLE 4-5. Fuel Consumption by Mode of Transportation

TABLE 4-6. Energy Consumption by Mode of Transportation

TABLE 4-8. Certificated Air Carrier Fuel Consumption and Travel

TABLE 4-9. Motor Vehicle Fuel Consumption and Travel

TABLE 4-11. Passenger Car and Motorcycle Fuel Consumption and Travel

TABLE 4-12. Other 2-Axle 4-Tire Vehicle Fuel Consumption and Travel

TABLE 4-13. Single-Unit 2-Axle 6-Tire or More Truck Fuel Consumption and Travel

TABLE 4-14. Combination Truck Fuel Consumption and Travel

TABLE 4-15. Bus Fuel Consumption and Travel

Fuel consumption data are collected quite differently than supply data collected by the U.S. Department of Energy, Energy Information Administration (EIA). Highway fuel consumption, for example, is based on U.S. Department of Transportation, Federal Highway Administration (FHWA) data collected from states in the course of revenue collection. EIA starts from the fuel delivered to transportation entities.

Highway

Highway fuel data (tables 4-5, 4-9, and 4-11 through 4-15) are collected mainly by FHWA. All states plus the District of Columbia report total fuel sold along with travel by highway category and vehicle registration. Data typically flows from state revenue offices to the state departments of transportation to FHWA. Even if reporting is reasonably accurate, some data are always anomalous or missing and must be modified to fit expected

patterns. In addition, as discussed earlier, there are some significant differences in methodology and definitions among the states. In particular, states differ in where the tax is applied in the fuel supply system, how gasohol is counted, how nonhighway use is treated, and how losses are handled.

Nonhighway use of gasoline and diesel fuel is a particularly large source of potential error. Some states designate nonhighway users as tax-exempt, others make the tax refundable. In either case, many people won't bother to apply if the amount of money is small. Nonhighway use of diesel fuel is especially large because many construction and agricultural vehicles are diesel powered. Thus, the fraction of petroleum attributed to transportation could be overestimated. On the other hand, some nonhighway fuel finds its way into the transportation system because heating oil can be used as diesel fuel, evading the tax. Tracers are now added to heating oil, which appears to have reduced the level of such tax evasion—if found in a truck's fuel tank, the tracer indicates diversion from a nontaxed source.

Breaking fuel use down by class of motor vehicle introduces the potential for error. FHWA must estimate the miles each class is driven and the fuel economy. Estimation of miles is based on the 1995 Nationwide Personal Transportation Survey (NPTS), administered by FHWA, and the Vehicle Inventory and Use Survey (formerly known as the Truck Inventory and Use Survey) conducted by the U.S. Census Bureau. For information about these two surveys, the reader is referred to the technical appendix of *Our Nation's Travel*, available from the FHWA, Office of Highway Information Management; and the 1997 Census of Transportation, available from the Economics and Statistics Administration within the Census Bureau. Fuel economy is based on state-supplied data, TIUS, and the National Highway Traffic Safety Administration data on new car fuel economy, which must be reduced by about 15 percent to reflect actual experience on the road. Overall, both vehicle-miles of travel and fuel economy are estimates.

Fuel consumption by buses is particularly uncertain. FHWA collects data on intercity buses, and the American Public Transit Association (APTA) covers local travel. Very little data are collected on school buses. APTA figures are based on data from the USDOT, Federal Transit Administration's

(FTA's) National Transit Database, which covers about 90 to 95 percent of total passenger-miles. These data are generally accurate because FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or may misinterpret data. APTA conservatively adjusts the FTA data to include transit operators that do not report to FTA, such as private and very small operators and rural operators. Prior to 1984, APTA did not include most rural and demand responsive systems.

Air

The U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information (OAI) is the source of these data. The numbers are based on 100-percent reporting of fuel use by large certificated air carriers (those with revenues of more than \$100 million annually) via Form 41. The data are probably reasonably accurate because the airlines report fuel use regularly, and the limited number of airlines aids data management.

Smaller airlines, such as medium size regional and commuter air carriers, are not required to report energy data. OAI estimates that about 8 percent would have to be added to the total of the larger airlines to account for this use, but that has not been done in table 4-5 or 4-8.

General aviation aircraft and air taxis are covered in the General Aviation and Air Taxi and Avionics Survey, conducted by the Federal Aviation Administration (FAA). The survey is conducted annually and encompasses a stratified, systematic design from a random start to generate a sample of all general aviation aircraft in the United States. It is based on the FAA registry as the sampling frame. For instance, in 2000, a sample of 31,039 aircraft was identified and surveyed from an approximate population of 256,927 registered general aviation aircraft.

The reliability of the GAATA survey can be impacted by two factors: sampling and nonsampling error. A measure, called the standard error, is used to indicate the magnitude of sampling error. Standard errors can be converted for comparability by dividing the standard error by the estimate (derived from the sample survey results) and multiplying it by 100. This quantity, referred to as the percent standard error, totaled two and four-tenths

of a percent in 2000 for the general aviation fleet. A large standard error relative to an estimate indicates lack of precision, and inversely, a small standard error indicates precision.

Nonsampling errors could include nonresponse, a respondent's inability or unwillingness to provide correct information, differences in interpretation of questions, and data entry mistakes. The reliability of general aviation fleet data comparisons over time would decrease because of changes implemented in 1978 and sampling errors discussed above. Readers should note that nonresponse bias may be a component of reliability errors in the data from 1980 to 1990. The FAA conducted telephone surveys of nonrespondents in 1977, 1978, and 1979 and found no significant differences or inconsistencies between respondent and nonrespondent replies. The FAA discontinued the telephone survey of nonrespondents in 1980 to save costs. Nonresponse surveys were resumed in 1990; and the FAA found notable differences and make adjustments to its data to reflect nonresponse bias.

The U.S. Government, in particular the Department of Defense (DOD), uses a large amount of jet fuel as shown in table 4-19 (see discussion on government consumption below). However, DOD reports all fuel purchased, including from foreign sources for operations abroad. While the data may be accurate, it is not comparable to EIA's overall U.S. supply and consumption figures on jet fuel.

International operations are included in table 4-8 but not table 4-5. The fuel use for international operations includes that purchased by U.S. airlines for return trips. OAI does not collect data on foreign airline purchases of fuel in the United States. Thus, a significant use of U.S. jet fuel is missed. However, these two factors approximately balance each other out. As shown in table 1-34, foreign carrier traffic is just slightly less than U.S. carrier international traffic, so presumably the fuel purchased here by foreign carriers is very close to the fuel purchased abroad by U.S. carriers.

Rail

The data are from *Railroad Facts*, published annually by the Association of American Railroads (AAR). AAR figures are based on 100 percent reporting by Class I railroads to the Surface Transportation Board (STB) via Schedule 700 of the *R1 Annual Report*. Thus, the data are considered accu-

rate. STB defines Class I railroads as having operating revenues at or above a threshold indexed to a base of \$250 million (1991) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 2001, the adjusted threshold for Class I railroads was \$266.7 million. Although Class I railroads represent only 1 percent of the number of railroads in the country, they account for over 70 percent of the industry's mileage operated and more than 90 percent of all freight revenue; energy consumption should be of the same order. For passenger travel, information is unavailable. Amtrak no longer provides data on a national basis, and the regional data appears to be inconsistent.

Transit

The APTA figures are based on information in FTA's National Transit Database. APTA conservatively adjusts FTA data to include transit operators that do not report to the FTA Database (private and very small operators and rural operators), which accounts for about 90 to 95 percent of the total passenger-miles. The data are generally accurate because the FTA reviews and validates information submitted by individual transit agencies. Reliability may vary because some transit agencies cannot obtain accurate information or misinterpret certain data definitions in federal guidelines.

Water

The EIA collects data on residual and distillate fuel oils and diesel through its *Annual Fuel Oil and Kerosene Sales Report* survey, form EIA-821. The survey targets companies that sell fuel oil and kerosene to end users. This survey commenced in 1984 and data from previous years should be used with caution.

Sampling Frame and Design

The sample's target universe includes all companies that sell fuel oil and kerosene to end users. EIA derives the sampling frame from the EIA-863 database containing identity information for approximately 22,300 fuel oil and kerosene sellers. EIA stratifies the sampling frame into two categories: companies selected with certainty and uncertainty. Those in the certainty category varied but included the end use "vessel bunkering," or sales for the fueling of commercial and private watercraft.

Sampling Error, Imputation, and Estimates

EIA reported a 92.5 percent response rate for the 2000 survey. The EIA also provides estimates of the sampling error for geographic areas and U.S. averages are 1.8 for residential distillate fuel oil, 0.8 for nonresidential retail distillate fuel oil, and 0.1 for retail residual fuel oil. Some firms inevitably ignore survey requests, causing data gaps. EIA estimates the volumes of these firm's sales by imputation; more detailed information and the algorithm can be obtained at EIA's web site in the technical notes for the Annual Fuel Oil and Kerosene Sales Report. See http://www.eia.doe.gov/oil_gas/petroleum/data_publications/fuel_oil_and_kerosene_sales/foks.html.

TABLE 4-19. U.S. Government Energy Consumption by Agency and Source

Energy consumption data are collected by DOE's Office of Federal Energy Management Programs in cooperation with most departments and agencies. DOD is by far the largest consumer, accounting for about 80 percent of the total. As discussed above, the data includes fuel purchased abroad for military bases. Since government agencies are required to report these data, they are probably accurate. However, it is possible that some consumption is missed. For example, some agencies may report only fuel supplied directly, missing consumption such as gasoline purchased by employees while on government business for which they are then reimbursed. In addition, smaller agencies were neglected. Overall, however, the data should provide a fairly good approximation of government energy consumption.

ENERGY EFFICIENCY

TABLE 4-20. Energy Intensity of Passenger Modes

TABLE 4-21. Energy Intensity of Certificated Air Carriers, All Services

TABLE 4-22. Energy Intensity of Passenger Cars, Other 2-Axle 4-Tire Vehicles, and Motorcycles

TABLE 4-24. Energy Intensity of Transit Motor Buses

TABLE 4-25. Energy Intensity of Class I Railroad Freight Service

TABLE 4-26. Energy Intensity of Amtrak Service

Total energy consumed for each mode can be estimated with reasonable accuracy. Miles traveled are known for some modes, such as air carriers, but less accurately for others, most notably automobiles. When the numbers of passengers or tons are required to calculate energy efficiency, another uncertainty is introduced. Again, air carriers and intercity buses know how many passengers are on board and how far they travel, but only estimates are available for automobiles and intracity buses.

Thus, table 4-21 should be quite accurate for certificated air carriers, though it is missing small airlines and private aircraft. Table 4-22 is based on FHWA fuel tax data, derived from state fuel tax revenues. VMT is as discussed for tables 1-9 and 1-10. Data for motorcycles must be adjusted significantly more than for automobiles because less information is collected from the states or from surveys. Transit bus data (table 4-24) are very uncertain because, unlike intercity buses, the distance each passenger travels is not measured by ticket sales.

The intermodal comparison of passenger travel in table 4-20 must be viewed with considerable caution. Data for the different modes are collected in different ways, and the preparation of the final results is based on different assumptions. As noted above, airlines accurately record passenger miles, but the data on occupancy of private automobiles must be estimated from surveys. Even relatively certain data, such as state sales of gasoline, must be modified to resolve anomalies, and transit data are even harder to make consistent. Furthermore, different groups collect the data for the various modes, and they have different needs, assumptions, and methodologies. Thus, the comparisons are only approximate.

Freight service data (table 4-25) are from *Railroad Facts*, published annually by the Association of American Railroads (AAR). AAR figures are based on 100 percent reporting by Class I railroads to the Surface Transportation Board (STB) via Schedule 700 of the *R1 Annual Report*. STB defines Class I railroads as having operating revenues at or above a threshold indexed to a base of

\$250 million (1991) and adjusted annually in concert with changes in the Railroad Freight Rate Index published by the Bureau of Labor Statistics. In 2000, the adjusted threshold for Class I railroads was \$ 261.9 million. Although Class I railroads comprise only 1 percent of the number of railroads in the country, they account for over 71 percent of the industry's mileage and 91 percent of all freight revenue; energy data should be of the same order.

TABLE 4-27. Annual Wasted Fuel Due to Congestion

TABLE 4-28. Wasted Fuel per Eligible Driver

The Texas Transportation Institute's (TTI) *Urban Roadway Congestion Annual Report* provided figures for tables 4-27 and 4-28. TTI relies on data from the U.S. Department of Transportation, Federal Highway Administration, Highway Performance Monitoring System database (HPMS). (See box 1-1 for detailed information about the HPMS.) TTI utilizes these data as inputs for its congestion estimation model. Detailed documentation for the TTI model and estimations can be found at <http://mobility.tamu.edu/>.

The sum of fuel wasted in typical congestion (recurring delay) and incident related delays equal the annual wasted fuel for an urban area. Recurring delay is the product of recurring delay (annual hours in moderate, heavy, and severe delays) and average peak period system speed divided by average fuel economy. Incident delay hours are multiplied by the average peak period system speed and divided by the average fuel economy to produce the amount of incident fuel wasted.

Structure, Assumptions, and Parameters

Urban roadway congestion levels are estimated using a formula measuring traffic density. Average daily travel volume per lane on freeways and principal arterial streets are estimated using area wide estimates of vehicle-miles of travel and lane miles of roadway. The resulting ratios are combined using the amount of travel on each portion of the system (freeway and principal arterials) so that the combined index measures conditions overall. This variable weighting factor allows comparisons between areas such as Phoenix-where principal

arterial streets carry 50 percent of the amount of travel of freeways-and cities such as Phoenix where the ratio is reversed. Values greater than one are indicative of undesirable congestion levels. Readers seeking the algorithm for the congestion index should examine <http://mobility.tamu.edu/>.

In previous reports, TTI assumed that 45 percent of all traffic, regardless of the urban location, occurred in congested conditions. TTI indicated that this presumption overestimated travel in congested periods. Its 2002 estimates now vary by urban area anywhere from 18 to 50 percent of travel that occurs in congestion. TTI's model structure applies to two types of roads: freeways and principal arterial streets. The model derives estimates of vehicle traffic per lane and traffic speed for an entire urban area. Based on variation in these amounts, travel is then classified under 5 categories: uncongested, moderately congested, heavily congested, severely congested, and extremely congested (a new category in 1999). The threshold between uncongested and congested was changed in 1999. Previous editions classified congested travel when area wide traffic levels reached 14,000 vehicles per lane per day on highways and 5,500 vehicles per lane per day on principal arterial streets. For the current edition these values are 15,500 and 5,500 vehicles per lane per day respectively. Previous years values have been re-estimated based on these new assumptions. Readers should refer to the TTI website for more detailed information on its estimation procedures <http://mobility.tamu.edu/>.

TTI reviews and adjusts the data used in its model, including statewide average fuel cost estimates (published by the American Automobile Association) and the number of eligible drivers for each urban area (taken from the Statistical Abstract of the United States, published by the U.S. Department of Commerce, Bureau of the Census). The model has some limitations because it does not include local variations (such as bottlenecks, local travel patterns, or transportation improvements) that affect travel times. TTI documentation does not provide information on peer-review, sensitivity analysis, or estimation errors for their model. Information about sensitivity analysis or external reviews of the model could not be obtained and users should interpret the data cautiously.

ENVIRONMENT

TABLE 4-38. Estimated National Average Vehicle Emissions Rates by Vehicle Type and Fuel

TABLE 4-39. National Average Vehicle Emissions Rates by Vehicle Type Using Reformulated Gasoline

The U.S. Environmental Protection Agency uses its Mobile Source Emissions Factor Model (MOBILE) to generate average emissions factors for each vehicle and fuel type. The methods used in the model are theoretically sound, the assumptions are reasonable, but the data vary in quality, and no formal analysis of the accuracy of these estimates has been performed. Emissions rate estimates for light-duty vehicles are considered more reliable than those for heavy-duty vehicles because in-use emissions tests are performed on a sample of vehicles each year. Deterioration for heavy-duty vehicles in the national fleet are based only on manufacturer's engine deterioration tests. In addition, because reformulated fuels (table 4-39) are newer than other gasoline fuels (table 4-38), in use emissions test data for reformulated fuels are not as extensive.

The estimates in the tables represent average emissions rates taking into account the characteristics of the nation's fleet, including vehicle type and age, and fuel used. The model also assumes Federal Test Procedure conditions. The model does not take into account actual travel distributions across different highway types with their associated average speeds and operating mode fractions, nor do they consider ambient local temperatures. However, fleet composition and deterioration because of age are considered. Thus, these rates illustrate only trends due to vehicle emissions control improvements and their increasing use in the national fleet and should not be used for other purposes.

TABLES 4-40, 4-41, 4-42, 4-43, 4-44, 4-45 and 4-46. Estimates of National Emissions of Carbon Monoxide, Nitrogen Oxides, Volatile Organic Compounds, Particular Matter, Sulfur Dioxide, and Lead

Emissions by sector and source are estimated using various models and calculation techniques

and are based on a number of assumptions and on data that vary in precision and reliability. The methods used are theoretically sound, the assumptions are reasonable, but the data vary in quality, and no formal analysis of the accuracy of these estimates has been performed.

Carbon Monoxide (CO), Nitrogen Oxides (NO_x), and Volatile Organic Compounds (VOCs)

Highway vehicle emissions of CO, NO_x, and VOC are generated by the U.S. Environmental Protection Agency's (EPA's) Mobile Source Emissions Factor Model (MOBILE), which uses per-mile vehicle emissions factors and vehicle travel (vehicle-miles) to calculate county-level emissions. Emissions rates are then adjusted based on fuel characteristics, vehicle fleet composition, emissions control measures, average vehicle speed, and other factors that can affect emissions. (Emissions rates used in MOBILE are based on vehicle certification tests, emissions standards, and in-use vehicle tests and are updated approximately every three years.) The U.S. Department of Transportation, Federal Highway Administration's Highway Performance Monitoring System is the source of vehicle travel estimates used in the model. Although the methodology for this survey data is sound and well documented, analyses have shown that individual states vary in how rigorously they follow the established sampling guidelines.

The nonhighway vehicle emissions are calculated annually by running EPA's NONROAD model for all categories except aircraft, commercial marine vessels, and railroads, which are calculated via emission factors and relevant activity data. Inputs to the NONROAD model include average temperatures, Reid vapor pressure, fuel usage programs and controls.

Particulate Matter Under 10 Microns (PM-10) and 2.5 Microns (PM-2.5) in Size

Highway vehicle emissions are estimated using the U.S. Environmental Protection Agency's PART model, which estimates emissions factors for exhaust emissions and brake and tire wear by vehicle type. Exhaust emissions factors are based on certification tests, while brake wear (per vehicle) and tire wear (per tire) are assumed values, which are constant over all years. Per-mile emissions factors are multiplied by vehicle travel (vehicle-miles)

and adjusted to account for other factors that effect exhaust emissions (e.g., fuel composition, weather, etc.). The U.S. Department of Transportation, Federal Highway Administration's Highway Performance Monitoring System is the source of vehicle-miles of travel (VMT) estimates used in the model. While the methodology for this survey data is sound and well documented, analyses have shown that individual states vary in how rigorously they follow the established sampling guidelines.

Fugitive dust estimates for paved and unpaved roads are calculated by multiplying VMT on each type of road by emissions factors for each vehicle type and road type.

The non-highway vehicle emissions are calculated annually by running EPA's NONROAD model for all categories except aircraft, commercial marine vessels, and railroads, which are calculated via emission factors and relevant activity data. Inputs to the NONROAD model include average temperatures, Reid vapor pressure, fuel usage programs and controls.

Sulfur Dioxide (SO₂)

Highway vehicle SO₂ emissions are estimated by multiplying vehicle travel (for each vehicle type and highway type) by an emissions factor reflecting each vehicle type and highway type. Highway SO₂ emissions factors are based on vehicle type and model year, sulfur content of fuel by type and year, fuel density by fuel type, and vehicle fuel efficiency by type and model year.

In general, estimates for nonhighway vehicles are calculated based on fuel consumption and sulfur content of fuel, though other factors may be considered.

Lead

In general, lead emissions are estimated by multiplying an activity level by an emissions factor that represents the rate at which lead is emitted for the given source category. This estimate is then adjusted by a factor that represents the assumed effectiveness of control technologies. For lead released during combustion, a top-down approach is used to share national estimates of fuel consumption by fuel type to each consumption category (e.g., motor fuel, electric utility, etc.) and, subsequently, each source (e.g., passenger cars, light-duty trucks, etc.).

TABLE 4-47. Air Pollution Trends in Selected Metropolitan Statistical Areas (MSAs)

TABLE 4-48. Areas in Nonattainment of National Ambient Air Quality Standards for Criteria Pollutants

The U.S. Environmental Protection Agency measures concentrations of pollutants in the ambient air at its air quality monitoring sites, which are operated by state and local agencies. These sites conform to uniform criteria for monitor siting, instrumentation, and quality assurance, and each site is weighted equally in calculating the composite average trend statistics. Furthermore, trend sites must have complete data for 8 of the 10 years in the trend time period to be included. However, monitoring devices are placed in areas most likely to observe significant concentrations of air pollutants rather than a random sampling of sites throughout the nation.

TABLE 4-49. U.S. Carbon Dioxide Emissions from Energy Use by Sector

The combustion of fossil fuels, such as coal, petroleum, and natural gas, is the principal anthropogenic (human caused) source of carbon dioxide (CO₂) emissions. Since fossil fuels are typically 75 percent to 90 percent carbon by weight, emissions from the combustion of these fuels can be easily measured in carbon units, as is shown in the table.

CO₂ emissions data are derived from estimates. The U.S. Department of Energy, Energy Information Administration (EIA), estimates CO₂ emissions by multiplying energy consumption for each fuel type by its carbon emissions coefficient, then subtracting carbon that is sequestered by nonfuel use of fossil fuels. Carbon emissions coefficients are values used for scaling emissions to specific activities (e.g., pounds of CO₂ emitted per barrel of oil consumed).

Emissions estimates are based on energy consumption data collected and published by EIA. Several small adjustments are made to its energy consumption data to eliminate double counting or miscounting of emissions. For example, EIA subtracts the carbon in ethanol from transportation gasoline consumption because of its biological origin.

Emissions coefficients are based on the density, carbon content, and heat content of petroleum

products. For many fuels, except liquefied petroleum gas (LPG), jet fuel, and crude oil, EIA assumed coefficients to be constant over time. For LPG, jet fuel, and crude oil, EIA annualized carbon emissions coefficients to reflect changes in chemical composition or product mix.

Since the combustion of fossil fuels is a major producer of CO₂ emissions, sources of uncertainty are related to: 1) volumes of fuel consumed; 2) characteristics of fuel consumed; 3) emissions coefficients; and 4) coverage. EIA notes that volumetric fuel data are fairly reliable in the 3 percent to 5 percent range of uncertainty. The density and energy content of fuels are usually estimated. According to EIA, the reliability of these estimates vary. For example, estimates of the energy content of natural gas are reliable to 0.5 percent, while estimates for coal and petroleum products are lower because they are more heterogeneous fuels. The reliability of emissions coefficients depends on whether the characteristics of a fuel are difficult to measure accurately. Finally, uncertainties may result because data may be excluded or unknown sources of emissions not included.

EIA's estimation methods, emissions coefficients, and the reliability of emissions estimates are discussed in detail in U.S. Department of Energy, Energy Information Administration, *Emissions of Greenhouse Gases in the United States, 1998* available on: www.eia.doe.gov/oiaf/1605/ggrpt/index.html.

TABLE 4-50. Petroleum Oil Spills Impacting U.S. Waterways

The U. S. Coast Guard's (USCG) Marine Safety Information System (MSIS) is the source of these data. It includes data on all oil spills impacting U.S. navigable waters and the Coastal Zone. The USCG learns of spills through direct observation, reports from responsible parties and third parties. Responsible parties are required by law to report spills to the National Response Center (NRC). Reports may be made to the USCG or Environmental Protection Agency predesignated On Scene Coordinator for the geographic area where the discharge occurs if direct reporting to the NRC is not practicable. There is no standard format for these reports, but responsible personnel face significant penalties for failing to do so. Most reports are made by telephone, and USCG personnel complete investigations based on the information provided.

The type and extent of an investigation conducted varies depending on the type and quantity of the material spilled. Each investigation will determine as closely as possible source of the pollutant, the quantity of the material spilled, the cause of the accident, as well as whether there is evidence that any failure of material (either physical or design) was involved or contributed to the incident. These are so financial responsibility may be properly assigned for the incidents, as well as proper recommendations for the prevention of the recurrence of similar incidents may be made.

Some spills may not be entered into MSIS because they are either not reported to or discovered by the USCG. The probability of a spill not being reported is inversely proportional to its size. Large spills impact a large area and a large number of people, resulting in numerous reports of such spills. Small spills are less likely to be reported, particularly if they occur at night or in remote areas where persons other than the responsible party are unlikely to detect them. Responsible parties are required by law to report spills and face penalties for failing to do so, providing a strong incentive to report spills that might be detected by others. Experience with harbor patrols shows that the number of spills increases as the frequency of patrols increases. However, the volume of material spilled does not increase significantly, indicating that the spills discovered through increased harbor patrols generally involved very small quantities.

Data Collection

From 1973 to 1985, data were collected on forms completed by the investigator and later entered into the Pollution Incident Reporting System (PIRS) by data entry clerks at USCG headquarters. Since 1985, data have been entered directly into MSIS by the investigator. From 1985 to 1991, data were entered into a specific electronic form that captured information on the spilled substance and pollution response actions. Since 1995, a growing number of reports of pollution incidents of 100 gallons or less of oil have been captured on a Notice of Violation ticket form, which are then entered into MSIS.

The information shown in this table comes from the USCG Spill Compendium, which contains spill data from the applications described above. The Compendium contains summary data from 1969

through 2000 and is intended to provide general information to the public, the maritime industry and other interested persons about spills in and around U.S. waterways. For more information about spill data, please refer to the USCG Internet site at <http://www.uscg.mil/hq/g-m/nmc/response/stats/aa.htm>

Nonsampling Errors

According to the USCG, nonsampling errors, such as nonreporting and mistakes made in data collection and entry, should not have a major impact on most interpretations of the data, but the impact will vary depending on the data used. The error rate for volume spilled is estimated to be less than 5 percent because larger spills, which account for most of the volume of oil spilled, are thoroughly reviewed at several levels. The error rate for the number of spills is difficult to estimate primarily due to low reporting rates for small spills. Most of the error in spill counts involves spills of less than 100 gallons.

TABLE 4-51. Leaking Underground Storage Tank Releases and Cleanups

A national inventory of reported spills and corrective actions taken for leaking underground storage tanks is compiled biannually based on state counts of leaking tanks reported by owners as required by the Resource Conservation and Recovery Act of 1976.¹ These data may be affected by general accounting errors, some of which have changed semiannual counts by as many as 2,000 actions.

TABLE 4-52. Highway Noise Barrier Construction

State highway agencies (SHAs) provide data on highway noise barrier construction, extent, and costs to the U.S. Department of Transportation, Federal Highway Administration. Individual SHA definitions of barriers and costs may differ. This could lead to nonuniformity and/or anomalies among state data, which will in turn affect national totals.

TABLE 4-53. Number of People Residing in High-Noise Areas Around U.S. Airports

The number of the people exposed to aircraft noise around airports is estimated by computer modeling rather than by actual measurements. The U.S. Department of Transportation (USDOT), Federal Aviation Administration's (FAA's) Integrated Noise Model (INM) has been the primary tool for assessing aircraft noise around airports for nearly 30 years. This model uses information on aircraft mix, average daily operations, flight tracks, and runway distribution to generate and plot contours of Day Night Sound Level (DNL). With the addition of a digitized population census database, the model can estimate the number of residents exposed to noise levels of 65 decibels (db) DNL.

The U.S. Environmental Protection Agency (EPA) produced the first estimate of airport noise exposure in 1975. It reported that 7 million residents were exposed to significant levels of aircraft noise in 1978. This number became the “anchor point” for all future estimates of the nationwide noise impacts. In 1980, FAA developed another methodology for estimating the change in the number of people impacted by noise (from the 1975 anchor value) as a function of changes in both the national fleet and in the FAA's Terminal Area Forecast (TAF). In 1990, the FAA created an improved method of estimating the change in number of people impacted (relative to the 1980 estimates).

In 1993, the FAA began using its newly developed Nationwide Airport Noise Impact Model (NANIM) to estimate the impact of airplane noise on residential communities surrounding U.S. airports that support jet operations. FAA uses this model to determine the relative changes in number of people and land area exposed to 65 db DNL as a result of changes in nationwide aircraft fleet mix and operations. NANIM uses data on air traffic patterns found in the Official Airline Guide (OAG), air traffic growth projections found in FAA's TAF, population figures from the U.S. Census Bureau, and information on noise contour areas for the top 250 U.S. civil airports with jet operations.

The methodology used in NANIM has been peer reviewed and approved. However, a formal evaluation of the model's accuracy has not been conducted. Some data used in NANIM are updated manually, thus the possibility of data entry errors

¹ Public Law 94-580, 90 Stat. 2795 (Oct. 21, 1976).

does exist. Entries are reviewed and then corrected as appropriate. The aircraft mix and operations files from FAA's TAF and OAG are updated automatically. Changes to either of the sources could introduce errors. For example, it was recently discovered that OAG redefined some aircraft codes and altered some data fields in its database. These changes make it impossible for the NANIM utility program to accurately read the current OAG database. A rewrite of the source code is necessary to eliminate this error. Also, since airport authorities are not required to produce noise exposure maps and reports unless they intend to apply for Federal grants, 14 of the 50 busiest commercial airports, including JFK and LaGuardia, have not produced (for public consumption) noise exposure maps in several years. In the absence of actual data, the NANIM database contains approximations of the noise contours areas based on airports of similar size and similar operation. Without actual airport data, it is impossible to quantify the error introduced by the approximation.

The number of people exposed to aircraft noise for 1998 through 2001 was estimated by the FAA's latest version of its MAGENTA model. This new, more accurate model is based on 2000 census data and uses input data on aircraft and operations specific to U.S. airports. This revised model also uses the FAA Terminal Forecast (TAF), which provides information on how operations will increase on an airport specific basis. Updated monthly, the TAF allows a more accurate forecast of U.S. operations.

TABLE 4-54. Motor Vehicles Scrapped

The Polk Company's Vehicles in Operation database is the source of these data. This database is a census of vehicles that are currently registered in all states within the United States. It is based on information from state department of motor vehicles. Polk updates the database quarterly (March, June, September, and December).

Scrapped vehicles are those that Polk removes from its database when: 1) States indicate registered vehicles have suffered major damage (such as a flood or accident), or 2) No renewal (reregistration) notice is received by Polk within a state's allotted time (normally one year). In the latter case, if a vehicle is subsequently reregistered, it is returned to the database. The Polk data on motor vehicles is broken down into passenger cars and

trucks, and this identification comes with the registration data from the DMV.

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Glossary

14 CFR 121 (Air): Code of Federal Regulations, Title 14, part 121. Prescribes rules governing the operation of domestic, flag, and supplemental air carriers and commercial operators of large aircraft.

14 CFR 135 (Air): Code of Federal Regulations, Title 14, part 135. Prescribes rules governing the operations of commuter air carriers (scheduled) and on-demand air taxi (unscheduled).

ACCIDENT (Aircraft): As defined by the National Transportation Safety Board, an occurrence incidental to flight in which, as a result of the operation of an aircraft, any person (occupant or nonoccupant) receives fatal or serious injury or any aircraft receives substantial damage.

ACCIDENT (Automobile): See Crash (Highway)

ACCIDENT (Gas): 1) An event that involves the release of gas from a pipeline or of liquefied natural gas (LNG) or other gas from an LNG facility resulting in personal injury necessitating inpatient hospitalization or a death; or estimated property damage of \$50,000 or more to the operator or others, or both, including the value of the gas that escaped during the accident; 2) An event that results in an emergency shutdown of an LNG facility; or 3) An event that is significant in the judgment of the operator even though it did not meet the criteria of 1) or 2).

ACCIDENT (Hazardous liquid or gas): Release of hazardous liquid or carbon dioxide while being transported, resulting in any of the following: 1) An explosion or fire not intentionally set by the operator; 2) Loss of 50 or more barrels of hazardous liquid or carbon dioxide; 3) Release to the atmosphere of more than 5 barrels a day of highly volatile liquids; 4) Death of any person; 5) Bodily harm resulting in one or more of the following: a) The loss of consciousness, b) The necessity of carrying person from the scene, c) The necessity for medical treatment, d) Disability that prevents the discharge of normal duties; and 6) Estimated damage to the property of the operators and/or others, exceeding \$50,000.

ACCIDENT (Highway-Rail Grade-Crossing): An impact between on-track railroad equipment and an automobile, bus, truck, motorcycle, bicycle, farm vehicle, or pedestrian or other highway user at a designated crossing site. Sidewalks, pathways, shoulders, and ditches associated with the crossing are considered to be part of the crossing site.

ACCIDENT (Rail): A collision, derailment, fire, explosion, act of God, or other event involving operation of railroad on-track equipment (standing or moving) that results in railroad damage exceeding an established dollar threshold.

ACCIDENT (Recreational Boating): An occurrence involving a vessel or its equipment that results in 1) A death; 2) An injury that requires medical treatment beyond first aid; 3) Damage to a vessel and other property, totaling to more than \$500 or complete loss of a vessel; or 4) The disappearance of the vessel under circumstances that indicate death or injury. Federal regulations (33 CFR 173-4) require the operator of any vessel that is numbered or used for recreational purposes to submit an accident report.

ACCIDENT (Transit): An incident involving a moving vehicle. Includes a vehicle, object, or person (except suicides) or a derailment/left roadway.

ACTIVE AIRCRAFT (General Aviation): All legally registered civil aircraft that flew one or more hours.

AERIAL APPLICATION FLYING (General Aviation): The operation of aircraft for the purposes of dispensing any substances required for agriculture, health, forestry, seeding, firefighting, and insect control purposes.

AERIAL OBSERVATION FLYING (General Aviation): Any use of an aircraft for aerial mapping and photography, surveying, patrolling, fish spotting, search and rescue, hunting, sightseeing, or highway traffic advisory not included under Federal Aviation Regulations (FAR) Part 135.

AIR CARRIER: A person who undertakes directly, by lease, or other arrangement to engage in air transportation. More specifically, the commercial system of air transportation comprising large certificated air carriers, small certificated air carriers, commuter air carriers, on-demand air taxis, supplemental air carriers, and air travel clubs.

AIR ROUTE TRAFFIC CONTROL CENTER: A facility established to provide air traffic control service to aircraft operating on an IFR (instrument flight rule) flight plan within controlled airspace and principally during the en route phase of flight.

AIR TAXI: An aircraft operator who conducts operations for hire or compensation in accordance with 14 CFR 135 (for safety purposes) or FAR Part 135 (for economic regulations/reporting purposes) in an aircraft with 30 or fewer passenger seats and a payload capacity of 7,500 pounds or less. An air taxi operates on an on-demand basis and does not meet the flight scheduled qualifications of a commuter air carrier (see below).

AIRCRAFT REVENUE HOURS: The airborne hours in revenue service, computed from the moment an aircraft leaves the ground until it lands.

AIRCRAFT REVENUE MILES: The miles (computed in airport-to-airport distances) for each interairport hop actually completed in revenue service, whether or not performed in accordance with the scheduled pattern. For this purpose, operation to a flag stop is a hop completed even if a landing is not actually made. In cases where the interairport distances are inapplicable, aircraft-miles flown are determined by multiplying the normal cruising speed for the aircraft type by the airborne hours.

AIRPORT: A landing area regularly used by aircraft for receiving or discharging passengers or cargo.

AIRPORT/AIRWAY TRUST FUND: See Trust Funds.

ALTERNATIVE FUELS: The Energy Policy Act of 1992 defines alternative fuels as methanol, denatured ethanol, and other alcohol; mixtures containing 85 percent or more (but not less than 70 percent as determined by the Secretary of Energy by rule to provide for requirements relating to cold start, safety, or vehicle functions) by

volume of methanol, denatured ethanol, and other alcohols with gasoline or other fuels. Includes compressed natural gas, liquid petroleum gas, hydrogen, coal-derived liquid fuels, fuels other than alcohols derived from biological materials, electricity, or any other fuel the Secretary of Energy determines by rule is substantially not petroleum and would yield substantial energy security and environmental benefits.

AMTRAK: Operated by the National Railroad Passenger Corporation of Washington, D.C., this rail system was created by the Rail Passenger Service Act of 1970 (P.L. 91-518, 84 Stat. 1327) and given the responsibility for the operation of intercity, as distinct from suburban, passenger trains between points designated by the Secretary of Transportation.

ARTERIAL HIGHWAY: A major highway used primarily for through traffic.

ASPHALT: A dark brown to black cement-like material containing bitumens as the predominant constituent. The definition includes crude asphalt and finished products such as cements, fluxes, the asphalt content of emulsions, and petroleum distillates blended with asphalt to make cutback asphalt. Asphalt is obtained by petroleum processing.

AVAILABLE SEAT-MILES (Air Carrier): The aircraft miles flown in each interairport hop multiplied by the number of seats available on that hop for revenue passenger service.

AVERAGE HAUL: The average distance, in miles, one ton is carried. It is computed by dividing ton-miles by tons of freight originated.

AVERAGE PASSENGER TRIP LENGTH (Bus/Rail): Calculated by dividing revenue passenger-miles by the number of revenue passengers.

AVIATION GASOLINE (General Aviation): All special grades of gasoline used in aviation reciprocating engines, as specified by American Society of Testing Materials (ASTM) Specification D910 and Military Specification MIL-G5572.

Includes refinery products within the gasoline range marketed as or blended to constitute aviation gasoline.

BARREL (oil): A unit of volume equal to 42 U.S. gallons.

BLOOD ALCOHOL CONCENTRATION (Highway): A measurement of the percentage of alcohol in the blood by grams per deciliter.

BRITISH THERMAL UNIT: The quantity of heat needed to raise the temperature of 1 pound of water by 1 °F at or near 39.2 °F.

BULK CARRIER (Water): A ship with specialized holds for carrying dry or liquid commodities, such as oil, grain, ore, and coal, in unpackaged bulk form. Bulk carriers may be designed to carry a single bulk product (crude oil tanker), or accommodate several bulk product types (ore/bulk/oil carrier) on the same voyage or on a subsequent voyage after holds are cleaned.

BUS: Large motor vehicle used to carry more than 10 passengers, includes school buses, intercity buses, and transit buses.

BUSINESS TRIP (American Travel Survey): A trip taken for business or business combined with pleasure, or for attending a convention, conference, or seminar.

CAFE STANDARDS: See Corporate Average Fuel Economy Standards.

CAR-MILE (Rail): The movement of a railroad car a distance of 1 mile. An empty or loaded car-mile refers to a mile run by a freight car with or without a load. In the case of intermodal movements, the designation of empty or loaded refers to whether the trailers/containers are moved with or without a waybill.

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY (Air Carrier): A certificate issued by the Department of Transportation to an air carrier under Section 401 of the Federal Aviation Act authorizing the carrier to engage in air transportation.

CERTIFICATED AIR CARRIER: An air carrier holding a Certificate of Public Convenience and Necessity issued by the U.S. Department of Transportation (DOT) to conduct scheduled services interstate. These carriers may also conduct non-scheduled or charter operations. Certificated air carriers operate large aircraft (30 seats or more or a maximum load of 7,500 pounds or more) in accordance with FAR Part 121. See also Large Certificated Air Carrier.

CERTIFICATED AIRPORTS: Airports that service air carrier operations with aircraft seating more than 30 passengers.

CHAINED DOLLARS: A measure used to express real prices, defined as prices that are adjusted to remove the effect of changes in the purchasing power of the dollar. Real prices usually reflect buying power relative to a reference year. The “chained-dollar” measure is based on the average weights of goods and services in successive pairs of years. It is “chained” because the second year in each pair, with its weights, becomes the first year of the next pair. Prior to 1996, real prices were expressed in constant dollars, a weighted measure of goods and services in a single year. See also Constant Dollars and Current Dollars.

CLASS I RAILROAD: A carrier that has an annual operating revenue of \$250 million or more after applying the railroad revenue deflator formula, which is based on the Railroad Freight Price Index developed by the U.S. Department of Labor, Bureau of Labor Statistics. The formula is the current year's revenues x 1991 average index/current year's average index.

COASTWISE TRAFFIC (Water): Domestic traffic receiving a carriage over the ocean, or the Gulf of Mexico (e.g., between New Orleans and Baltimore, New York and Puerto Rico, San Francisco and Hawaii, Alaska and Hawaii). Traffic between Great Lakes ports and seacoast ports, when having a carriage over the ocean, is also considered coastwise.

COEFFICIENT OF VARIATION: Ratio of the sampling error (or standard error) of a statistic to the value of that statistic. Also referred to as relative standard error.

COLLECTOR (Highway): In rural areas, routes that serve intracounty rather than statewide travel. In urban areas, streets that provide direct access to neighborhoods and arterials.

COLLISION WITH OBJECT (Transit): An incident in which a transit vehicle strikes an obstacle other than a vehicle or person (e.g., building, utility pole). Reports are made if the accident results in a death, injury, or property damage over \$1,000.

COLLISION WITH PEOPLE (Transit): An incident in which a transit vehicle strikes a person. Excludes suicides and suicide attempts. Reports are made if the incident results in death, injury, or property damage over \$1,000.

COLLISION WITH VEHICLE (Transit): An incident in which a transit vehicle strikes or is struck by another vehicle. Reports are made if the incident results in a death, injury, or property damage over \$1,000.

COMBINATION TRUCK: A power unit (truck tractor) and one or more trailing units (a semi-trailer or trailer).

COMMERCIAL BUS: Any bus used to carry passengers at rates specified in tariffs; charges may be computed per passenger (as in regular route service) or per vehicle (as in charter service).

COMMERCIAL SERVICE AIRPORT: Airport receiving scheduled passenger service and having 2,500 or more enplaned passengers per year.

COMMUTER AIR CARRIER: Different definitions are used for safety purposes and for economic regulations and reporting. For safety analysis, commuter carriers are defined as air carriers operating under 14 CFR 135 that carry passengers for hire or compensation on at least five round trips per week on at least one route between two or more points according to published flight schedules, which specify the times, days of the week, and points of service. On March 20, 1997, the size of the aircraft subject to 14 CFR 135 was reduced from 30 to fewer than 10 passenger seats. (Larger aircraft are subject to the more stringent regulations of 14 CFR 121.) Helicopters carrying passengers or cargo for hire, however, are regulated under CFR 135 whatever their size. Although, in practice, most commuter air carriers operate aircraft that are regulated for *safety purposes* under 14 CFR 135 and most aircraft that are regulated under 14 CFR 135 are operated by commuter air carriers, this is not necessarily the case.

For economic regulations and reporting requirements, commuter air carriers are those carriers that operate aircraft of 60 or fewer seats or a maximum payload capacity of 18,000 pounds or less. These carriers hold a certificate issued under section 298C of the Federal Aviation Act of 1958, as amended.

COMMUTER RAIL (Transit): Urban passenger train service for short-distance travel between a central city and adjacent suburb. Does not include rapid rail transit or light rail service.

COMPACT CAR: An automobile industry designation usually consisting of cars with a wheelbase between 100 and 104 inches.

COMPRESSED NATURAL GAS: Natural gas compressed to a volume and density that is practical as a portable fuel supply. It is used as a fuel for natural gas-powered vehicles.

CONSTANT DOLLAR: Dollar value adjusted for changes in the average price level by dividing a current dollar amount by a price index. See also Chained Dollar and Current Dollar.

CORPORATE AVERAGE FUEL ECONOMY STANDARDS (CAFÉ): Originally established by Congress for new automobiles and later for light trucks. Under CAFE, automobile manufacturers are required by law to produce vehicle fleets with a composite sales-weighted fuel economy not lower than the CAFE standards in a given year. For every vehicle that does not meet the standard, a fine is paid for every one-tenth of a mile per gallon that vehicle falls below the standard.

CORPORATE FLYING (General Aviation): Corporate aircraft piloted by a professional crew.

CRASH (Highway): An event that produces injury and/or property damage, involves a motor vehicle in transport, and occurs on a trafficway or while the vehicle is still in motion after running off the trafficway.

CRUDE OIL: A mixture of hydrocarbons that exists in the liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface-separating facilities.

CURRENT DOLLAR: Dollar value of a good or service in terms of prices current at the time the good or service is sold. See also Chained Dollar and Current Dollar.

DEADWEIGHT TONNAGE (Water): The carrying capacity of a vessel in long tons (2,240 pounds). It is the difference between the number of tons of water a vessel displaces “light” and the number of tons it displaces when submerged to the “load line.”

DEMAND-RESPONSIVE VEHICLE (Transit): A nonfixed-route, a nonfixed-schedule vehicle that operates in response to calls from passengers or their agents to the transit operator or dispatcher.

DERAILMENT/LEFT ROADWAY (Transit): A noncollision incident in which a transit vehicle leaves the rails or road on which it travels. This also includes rollovers. Reports are made for all occurrences.

DESTINATION OF TRIP (American Travel Survey): The place the survey respondent names as the destination of the trip. If more than one location is visited on the same trip, the farthest point from the origin is considered the destination.

DIESEL FUEL: A complex mixture of hydrocarbons with a boiling range between approximately 350 and 650 °F. Diesel fuel is composed primarily of paraffins and naphthenic compounds that auto-ignite from the heat of compression in a diesel engine. Diesel is used primarily by heavy-duty road vehicles, construction equipment, locomotives, and by marine and stationary engines.

DISTILLATE FUEL OIL: A general classification for one of the petroleum fractions produced in conventional distillation operations. Included are No. 1, No. 2 and No. 4 fuel oils and No. 1, No. 2, and No. 4 diesel fuels. Distillate fuel oil is used primarily for space heating, on- and off-highway diesel engine fuel (including railroad engine fuel and fuel for agricultural machinery), and electric power generation.

DISTRIBUTION MAINS (Gas): A network of pipelines, services, and equipment that carry or control the supply of gas from the point of local supply to, and including, the sales meters.

DOMESTIC FREIGHT (Water): All waterborne commercial movements between points in the United States, Puerto Rico, and the Virgin Islands, excluding traffic with the Panama Canal Zone. Cargo moved for the military in commercial vessels is reported as ordinary commercial cargo; military cargo moved in military vessels is omitted.

DOMESTIC OPERATIONS (Air Carrier): All air carrier operations having destinations within the 50 United States, the District of Columbia, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands.

DOMESTIC PASSENGER (Water): Any person traveling on a public conveyance by water between points in the United States, Puerto Rico, and the Virgin Islands.

DRY CARGO BARGES (Water): Large flat-bottomed, nonself-propelled vessels used to transport dry-bulk materials such as coal and ore.

EMERGENCY PREPAREDNESS TRUST FUND: See Trust Funds.

ENERGY EFFICIENCY: The ratio of energy inputs to the outputs from a process; for example, miles traveled per gallon of fuel (mpg).

ENPLANED PASSENGERS (Air Carrier): See Revenue Passenger Enplanements.

ETHANOL: A clear, colorless, flammable oxygenated hydrocarbon with a boiling point of 78.5 °C. in the anhydrous state. It is used in the United States as a gasoline octane enhancer and oxygenate (10-percent concentration). Ethanol can be used in high concentrations in vehicles optimized for its use. Otherwise known as ethyl alcohol, alcohol, or grain-spirit.

FATAL CRASH (Highway): A police-reported crash involving a motor vehicle in transport on a trafficway in which at least one person dies within 30 days of the crash as a result of that crash.

FATAL INJURY (Air): Any injury that results in death within thirty days of the accident.

FATALITY: For purposes of statistical reporting on transportation safety, a fatality shall be considered a death due to injuries in a transportation crash, accident, or incident that occurs within 30 days of that occurrence.

FATALITY (Rail): 1) Death of any person from an injury within 30 days of the accident/incident (may include nontrain accidents/incidents); or 2) Death of a railroad employee from an occupational illness within 365 days after the occupational illness was diagnosed by a physician.

FATALITY (Recreational Boating): All deaths (other than deaths by natural causes) and missing persons resulting from an occurrence that involves a vessel or its equipment.

FATALITY (Transit): A transit-caused death confirmed within 30 days of a transit incident. Incidents include collisions, derailments, personal casualties, and fires associated with transit agency revenue vehicles, transit facilities on transit property, service vehicles, maintenance areas, and rights of way.

FATALITY (Water): All deaths and missing persons resulting from a vessel casualty.

FEDERAL ENERGY REGULATORY COMMISSION (FERC): The Federal agency with jurisdiction over, among other things, gas pricing, oil pipeline rates, and gas pipeline certification.

FERRY BOAT (Transit): Vessels that carry passengers and/or vehicles over a body of water. Generally steam or diesel-powered, ferry boats may also be hovercraft, hydrofoil, and other high-speed vessels. The vessel is limited in its use to the carriage of deck passengers or vehicles or both, operates on a short run on a frequent schedule between two points over the most direct water routes other than in ocean or coastwise service, and is offered as a public service of a type normally attributed to a bridge or tunnel.

FIELD AND GATHERING GAS PIPELINES: A network of pipelines (mains) transporting natural gas from individual wells to a compressor station, processing point, or main trunk pipeline.

FLAG STOP (Air): A drop-off or pick-up point along a predetermined route that is visited only by request or if a signal to stop is given.

FOSSIL FUELS: Any naturally occurring organic fuel formed in the Earth's crust, such as petroleum, coal, and natural gas.

FREIGHT REVENUE (Rail): Revenue from the transportation of freight and from the exercise of transit, stopoff, diversion, and reconsignment privileges as provided for in tariffs.

FREIGHTERS (Water): General cargo carriers, full containerships, partial containerships, roll-on/rolloff ships, and barge carriers.

FULL-SIZE CAR: As designated by the automobile industry, cars with a wheelbase between 110 and 114 inches.

GAS TRANSMISSION PIPELINES: Pipelines installed for the purpose of transmitting gas from a source or sources of supply to one or more distribution centers, or to one or more large volume customers; or a pipeline installed to interconnect sources of supply. Typically, transmission lines differ from gas mains in that they operate at higher pressures and the distance between connections is greater.

GASOHOL: A blend of finished motor gasoline (leaded or unleaded) and alcohol (generally ethanol but sometimes methanol) limited to 10 percent by volume of alcohol.

GASOLINE: A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives that have been blended to produce a fuel suitable for use in spark ignition engines. Motor gasoline includes both leaded or unleaded grades of finished motor gasoline, blending components, and gasohol. Leaded gasoline is no longer used in highway motor vehicles in the United States.

GENERAL AVIATION: 1) All facets of civil aviation, except facets of those air carriers holding a Certificate of Public Convenience and Necessity. 2) All civil aviation activity except that of air carriers certificated in accordance with Federal Aviation Regulations (FAR) Parts 121, 123, 127, and 135. The types of aircraft used in general aviation range from corporate multiengine jet aircraft piloted by professional crews to amateur-built single-engine piston-driven acrobatic planes to balloons and dirigibles. 3) All civil aviation operations other than scheduled air services and nonscheduled air transport operations for taxis, commuter air carriers, and air travel clubs that do not hold Certificates of Public Convenience and Necessity.

GENERAL ESTIMATES SYSTEM: A data collection system that uses a nationally representative probability sample selected from all police-reported highway crashes. It began operation in 1988.

GROSS DOMESTIC PRODUCT: The total output of goods and services produced by labor and property located in the United States, valued at market prices. As long as the labor and property are located in the United States, the suppliers (workers and owners) may be either U.S. residents or residents of foreign countries.

GROSS VEHICLE WEIGHT RATING (gvwr) (Truck): The maximum rated capacity of a vehicle, including the weight of the base vehicle, all added equipment, driver and passengers, and all cargo.

HARBOR MAINTENANCE TRUST FUND: See Trust Funds.

HAZARDOUS MATERIAL: Any toxic substance or explosive, corrosive, combustible, poisonous, or radioactive material that poses a risk to the public's health, safety, or property-particularly when transported in commerce.

HEAVY RAIL (Transit): An electric railway with the capacity to transport a heavy volume of passenger traffic and characterized by exclusive rights-of-way, multicar trains, high speed, rapid acceleration, sophisticated signaling, and high-platform loading. Also known as “subway,” “elevated (railway),” or “metropolitan railway (metro).”

HIGHWAY-RAIL GRADE CROSSING (Rail): A location where one or more railroad tracks are crossed by a public highway, road, or street or a private roadway at grade, including sidewalks and pathways at or associated with the crossing.

HIGHWAY TRUST FUND: A grant-in-aid type fund administered by the U.S. Department of Transportation, Federal Highway Administration. Most funds for highway improvements are apportioned to States according to formulas that give weight to population, area, and mileage.

HOUSEHOLD TRIP (American Travel Survey): A trip in which one or more members of a household travel together.

HIGHWAY-USER TAX: A charge levied on persons or organizations based on their use of public roads. Funds collected are usually applied toward highway construction, reconstruction, and maintenance.

INCIDENT (Hazmat): Any unintentional release of hazardous material while in transit or storage.

INCIDENT (Train): Any event involving the movement of a train or railcars on track equipment that results in a death, a reportable injury, or illness, but in which railroad property damage does not exceed the reporting threshold.

INCIDENT (Transit): Collisions, derailments, personal casualties, fires, and property damage in excess of \$1,000 associated with transit agency revenue vehicles; all other facilities on the transit property; and service vehicles, maintenance areas, and rights-of-way.

INJURY (Air): See SERIOUS INJURY (air and general aviation).

INJURY (Gas): Described in DOT Forms 7100.1 or 7100.2 as an injury requiring “in-patient hospitalization” (admission and confinement in a hospital beyond treatment administered in an emergency room or out-patient clinic in which confinement does not occur).

INJURY (Hazardous Liquid Pipeline): An injury resulting from a hazardous liquid pipeline accident that results in one or more of the following: 1) Loss of consciousness, 2) A need to be carried from the scene, 3) A need for medical treatment, and/or 4) A disability that prevents the discharge of normal duties or the pursuit of normal duties beyond the day of the accident.

INJURY (Highway): Police-reported highway injuries are classified as follows:

Incapacitating Injury: Any injury, other than a fatal injury, that prevents the injured person from walking, driving, or normally continuing the activities the person was capable of performing before the injury occurred. Includes severe lacerations, broken or distorted limbs, skull or chest injuries, abdominal injuries, unconsciousness at or when taken from the accident scene, and inability to leave the accident scene without assistance. Exclusions include momentary unconsciousness.

Nonincapacitating Evident Injury: Any injury, other than a fatal injury or an incapacitating injury, evident to observers at the scene of the accident. Includes lumps on head, abrasions, bruises, minor lacerations, and others. Excludes limping.

Possible Injury: Any injury reported or claimed that is not evident. Includes momentary unconsciousness, claim of injuries not obvious, limping, complaint of pain, nausea, hysteria, and others.

INJURY (Highway-Rail Grade Crossing): 1) An injury to one or more persons other than railroad employees that requires medical treatment; 2) An injury to one or more employees that requires medical treatment or that results in restriction of work or motion for one or more days, or one or more lost work days, transfer to another job, termination of employment, or loss of consciousness; 3) Any occupational illness affecting one or more railroad employees that is diagnosed by a physician.

INJURY (Rail): 1) Injury to any person other than a railroad employee that requires medical treatment, or 2) Injury to a railroad employee that requires medical treatment or results in restriction of work or motion for one or more workdays, one or more lost workdays, termination of employment, transfer to another job, loss of consciousness, or any occupational illness of a railroad employee diagnosed by a physician.

INJURY (Recreational Boating): Injury requiring medical treatment beyond first aid as a result of an occurrence that involves a vessel or its equipment.

INJURY (Transit): Any physical damage or harm to a person requiring medical treatment or any physical damage or harm to a person reported at the time and place of occurrence. For employees, an injury includes incidents resulting in time lost from duty or any definition consistent with a transit agency's current employee injury reporting practice.

INJURY (Water): All personal injuries resulting from a vessel casualty that require medical treatment beyond first aid.

INLAND AND COASTAL CHANNELS: Includes the Atlantic Coast Waterways, the Atlantic Intracoastal Waterway, the New York State Barge Canal System, the Gulf Coast Waterways, the Gulf Intracoastal Waterway, the Mississippi River System (including the Illinois Waterway), Pacific Coast Waterways, the Great Lakes, and all other channels (waterways) of the United States, exclusive of Alaska, that are usable for commercial navigation.

INSTRUCTIONAL FLYING: Flying under the supervision of a flight instructor (excludes proficiency flying).

INTERCITY CLASS BUS I: As defined by the Bureau of Transportation Statistics, an interstate motor carrier of passengers with an average annual gross revenue of at least \$1 million.

INTERCITY TRUCK: Truck that carries freight beyond local areas and commercial zones.

INTERMEDIATE -SIZE CAR: As designated by the automobile industry, a car with a wheelbase between 105 and 109 inches.

INTERNAL TRAFFIC (Water): Vessel movements (origin and destination) that take place solely on inland waterways located within the boundaries of the contiguous 48 states or within the state of Alaska. The term "internal traffic" also applies to carriage on both inland waterways and the water of the Great Lakes; carriage between offshore areas and inland waterways; and carriage occurring within the Delaware Bay, Chesapeake Bay, Puget Sound, and the San Francisco Bay, which are considered internal bodies of water rather than arms of the ocean.

INTERSTATE HIGHWAY: Limited access, divided highway of at least four lanes designated by the Federal Highway Administration as part of the Interstate System.

INTRAPORT (Water): Movement of freight within the confines of a port whether the port has one or several channels included in the port definition. Does not include car-ferries and general ferries moving within a port.

INTRATERRITORY TRAFFIC (Water): Traffic between ports in Puerto Rico and the U.S. Virgin Islands, which are considered a single unit.

JET FUEL: The term includes kerosene-type jet fuel and naphtha-type jet fuel. Kerosene-type jet fuel is used primarily for commercial turbojet and turboprop aircraft engines. Naphtha-type jet fuel is used primarily for military turbojet and turboprop aircraft engines.

LAKELIKE OR GREAT LAKES TRAFFIC: Waterborne traffic between U.S. ports on the Great Lakes system. The Great Lakes system is treated as a separate waterways system rather than as a part of the inland system.

LARGE CERTIFICATED AIR CARRIERS: An air carrier holding a certificate issued under section 401 of the Federal Aviation Act of 1958, as amended, that: 1) Operates aircraft designed to have a maximum passenger capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds, or 2) Conducts operations where one or both terminals of a flight stage are outside the 50 states of the United States, the District of Columbia, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands. Large certificated air carriers are grouped by annual operating revenues: 1) Majors (more than \$1 billion in annual operating revenues), 2) Nationals (between \$100 million and \$1 billion in annual

operating revenues), Large regionals (\$20 million and \$99,999,999 in annual operating revenues), and 4) Medium regionals (less than \$20 million in annual operating revenues).

LARGE REGIONALS (Air): Air carrier groups with annual operating revenues between \$20 million and \$99,999,999.

LARGE CAR: As designated by the automobile industry, a car with a wheelbase greater than 114 inches.

LARGE TRUCK: Trucks over 10,000 pounds gross vehicle weight rating, including single-unit trucks and truck tractors.

LEASE CONDENSATE: A mixture consisting primarily of pentanes and heavier hydrocarbons, which are recovered as a liquid from natural gas in lease or field separation facilities. This category excludes natural gas liquids, such as butane and propane, which are recovered at natural gas processing plants or facilities.

LIGHT-DUTY VEHICLE: A vehicle category that combines light automobiles and trucks.

LIGHT RAIL: A streetcar-type vehicle operated on city streets, semiexclusive rights-of-way, or exclusive rights-of-way. Service may be provided by step-entry vehicles or by level boarding.

LIGHT TRUCK: Trucks of 10,000 pounds gross vehicle weight rating or less, including pickups, vans, truck-based station wagons, and sport utility vehicles.

LIQUEFIED NATURAL GAS (LNG): Natural gas, primarily methane, that has been liquefied by reducing its temperature to -260 °F. at atmospheric pressure.

LIQUEFIED PETROLEUM GAS (LPG): Propane, propylene, normal butane, butylene, isobutane, and isobutylene produced at refineries or natural gas processing plants, including plants that fractionate new natural gas plant liquids.

LOCOMOTIVE: Railroad vehicle equipped with flanged wheels for use on railroad tracks, powered directly by electricity, steam, or fossil fuel, and used to move other railroad rolling equipment.

LOCOMOTIVE-MILE: The movement of a locomotive unit, under its own power, the distance of 1 mile.

MAINS (Gas): A network of pipelines that serves as a common source of supply for more than one gas service line.

MAJORS (Air): Air carrier groups with annual operating revenues exceeding \$1 billion.

MEDIUM REGIONALS (Air): Air carrier groups with annual operating revenues less than \$20 million.

MERCHANDISE TRADE EXPORTS: Merchandise transported out of the United States to foreign countries whether such merchandise is exported from within the U.S. Customs territory, from a U.S. Customs bonded warehouse, or from a U.S. Foreign Trade Zone. (Foreign Trade Zones are areas, operated as public utilities, under the control of U.S. Customs with facilities for handling, storing, manipulating, manufacturing, and exhibiting goods.)

MERCHANDISE TRADE IMPORTS: Commodities of foreign origin as well as goods of domestic origin returned to the United States with no change in condition or after having been processed and/or assembled in other countries. Puerto Rico is a Customs district within the U.S. Customs territory, and its trade with foreign countries is included in U.S. import statistics. U.S. import statistics also include merchandise trade between the U. S. Virgin Islands and foreign countries even though the Islands are not officially a part of the U.S. Customs territory.

METHANOL: A light, volatile alcohol produced commercially by the catalyzed reaction of hydrogen and carbon monoxide. Methanol is blended with gasoline to improve its operational efficiency.

METHYL TERTIARY BUTYL ETHER (MTBE): A colorless, flammable, liquid oxygenated hydrocarbon that contains 18.15 percent oxygen. It is a fuel oxygenate produced by reacting methanol with isobutylene.

MID-SIZE CAR: See Intermediate-Size Car.

MINI-COMPACT CAR: An automobile industry designation usually consisting of cars with a wheelbase of less than 95 inches.

MINOR ARTERIALS (Highway): Streets and highways linking cities and larger towns in rural areas, in distributing trips to small geographic areas in urban areas (not penetrating identifiable neighborhoods).

MOTOR BUS (Transit): A rubber-tired, self-propelled, manually steered bus with fuel supply onboard the vehicle. Motor bus types include: intercity, school, and transit.

MOTORCYCLE: A two- or three-wheeled motor vehicle designed to transport one or two people, including motor scooters, minibikes, and mopeds.

NATIONALS (Air): Air carrier groups with annual operating revenues between \$100 million and \$1 billion.

NATURAL GAS: A naturally occurring mixture of hydrocarbon and nonhydrocarbon gases found in porous geologic formations beneath the Earth's surface, often in association with petroleum. The principal constituent is methane.

NATURAL GAS PLANT LIQUIDS: Liquids recovered from natural gas in processing plants or field facilities, or extracted by fractionators. They include ethane, propane, normal butane, isobutane, pentanes plus, and other products, such as finished motor gasoline, finished aviation gasoline, special naphthas, kerosene, and distillate fuel oil produced at natural gas processing plants.

NEAR MIDAIR COLLISION (Air): An incident in which the possibility of a collision occurred as a result of aircraft flying with less than 500 feet of separation, or a report received from a pilot or flight crew member stating that a collision hazard existed between two or more aircraft.

NONOCCUPANT (Automobile): Any person who is not an occupant of a motor vehicle in transport (e.g., bystanders, pedestrians, pedalcyclists, or an occupant of a parked motor vehicle).

NONRESPONSE ERROR: Error that results from some members of the sample or census not providing information. Nonresponse bias results from a systematic difference between those who do and those who do not respond to the measurement instrument.

NONSAMPLING ERROR: All sources of bias or inaccuracy in a study other than sampling error. Examples of nonsampling errors include processing, recording, or dataentry errors; nonresponse error; and response error.

NONSCHEDULED SERVICE (Air): Revenue flights not operated as regular scheduled service, such as charter flights, and all nonrevenue flights incident to such flight.

NONSELF-PROPELLED VESSEL (Water): A vessel without the means for self-propulsion. Includes dry cargo and tanker barges.

NONTRAIN INCIDENT: An event that results in a reportable casualty, but does not involve the movement of ontrack equipment, and does not cause reportable damage above the threshold established for train accidents.

NONTRESPASSERS (Rail): A person lawfully on any part of railroad property used in railroad operations, or a person adjacent to railroad premises when injured as the result of railroad operations.

NONVESSEL-CASUALTY-RELATED DEATH: A death that occurs onboard a commercial vessel but not as a result of a vessel casualty, such as a collision, fire, or explosion.

OCCUPANT: Any person in or on a motor vehicle in transport. Includes the driver, passengers, and persons riding on the exterior of a motor vehicle (e.g., a skateboard rider holding onto a moving vehicle). Excludes occupants of parked cars unless they are double parked or motionless on the roadway.

OCCUPATIONAL FATALITY: Death resulting from a job-related injury.

OPERATING EXPENSES (Air): Expenses incurred in the performance of air transportation, based on overall operating revenues and expenses. Does not include nonoperating income and expenses, nonrecurring items, or income taxes.

OPERATING EXPENSES (Rail): Expenses of furnishing transportation services, including maintenance and depreciation of the plant used in the service.

OPERATING EXPENSES (Transit): The total of all expenses associated with operation of an individual mode by a given operator. Includes distributions of "joint expenses" to individual modes and excludes "reconciling items," such as interest expenses and depreciation. Should not be confused with "vehicle operating expenses."

OPERATING EXPENSES (Truck): Includes expenditures for equipment maintenance, supervision, wages, fuel, equipment rental, terminal operations, insurance, safety, and administrative and general functions.

OPERATING REVENUES (Air): Revenues from the performance of air transportation and related incidental services. Includes 1) Transportation revenues from the carriage of all classes of traffic in scheduled and nonscheduled services, and 2) Non-transportation revenues consisting of federal subsidies (where applicable) and services related to air transportation.

OTHER FREEWAYS AND EXPRESSWAYS (Highway): All urban principal arterials with limited access but not part of the Interstate system.

OTHER PRINCIPAL ARTERIAL (Highway): Major streets or highways, many of multilane or freeway design, serving high-volume traffic corridor movements that connect major generators of travel.

OTHER RAIL REVENUE: This includes revenues from miscellaneous operations (i.e., dining-and bar-car services), income from lease of road and equipment, miscellaneous rental income, income from nonoperating property, profit from separately operated properties, dividend income, interest income, income from sinking and other reserve funds, release or premium on funded debt, contributions from other companies, and other miscellaneous income.

OTHER REVENUE VEHICLES (Transit): Other revenue-generating modes of transit service, such as cable cars, personal rapid transit systems, monorail vehicles, inclined railway cars, etc., not covered otherwise.

OTHER 2-AXLE 4-TIRE VEHICLES (Truck): Includes vans, pickup trucks, and sport utility vehicles.

OTHER WORK (General Aviation): Construction work (not Federal Aviation Regulations, Part 135), helicopter hoist, parachuting, aerial advertising, and towing gliders.

OXYGENATES: Any substance that when added to motor gasoline increases the amount of oxygen in that gasoline blend. Includes oxygen-bearing compounds such as ethanol, methanol, and methyl tertiary butyl ether. Oxygenated fuel tends to give a more complete combustion of carbon into carbon dioxide (rather than monoxide), thereby reducing air pollution from exhaust emissions.

PASSENGER CAR: A motor vehicle designed primarily for carrying passengers on ordinary roads, includes convertibles, sedans, and station wagons.

PASSENGER-MILE: 1) Air: One passenger transported 1 mile; passenger-miles for one interairport flight are calculated by multiplying aircraft miles flown by the number of passengers carried on the flight. The total passenger-miles for all flights is the sum of passenger-miles for all interairport flights. 2) Auto: One passenger traveling 1 mile; e.g., one car transporting two passengers 4 miles results in eight passenger-miles. 3) Transit: The total number of miles traveled by transit passengers; e.g., one bus transporting five passengers 3 miles results in 15 passenger-miles.

PASSENGER REVENUE: 1) Rail: Revenue from the sale of tickets. 2) Air: Revenues from the transport of passengers by air. 3) Transit: Fares, transfer, zone, and park-and-ride parking charges paid by transit passengers. Prior to 1984, fare revenues collected by contractors operating transit services are not included.

PASSENGER VESSELS: A vessel designed for the commercial transport of passengers.

PEDALCYCLIST: A person on a vehicle that is powered solely by pedals.

PEDESTRIAN: Any person not in or on a motor vehicle or other vehicle. Excludes people in buildings or sitting at a sidewalk cafe. The National Highway Traffic Safety Administration also uses an "other pedestrian" category to refer to pedestrians using conveyances and people in buildings. Examples of pedestrian conveyances include skateboards, nonmotorized wheelchairs, roller-skates, sleds, and transport devices used as equipment.

PERSON-MILES (American Travel Survey): An estimate of the aggregate distances traveled by all persons on a given trip based on the estimated transportation-network-miles traveled on that trip.

PERSON TRIP (American Travel Survey): A trip taken by an individual. For example, if three persons from the same household travel together, the trip is counted as one household trip and three person trips.

PERSONAL BUSINESS TRIP (American Travel Survey): A trip taken for a school-related activity or for personal or family business, including weddings and funerals.

PERSONAL-USE VEHICLE TRIP (American Travel Survey): A trip in which the principle means of transportation is a car, pickup truck, or van; other truck; rental car, truck, or van; recreational vehicle or motor home; or motorcycle or moped.

PLEASURE TRIP (American Travel Survey): A trip taken to visit friends or relatives or for leisure.

PERSONAL CASUALTY (Transit): 1) An incident in which a person is hurt while getting on or off a transit vehicle (e.g., falls or door incidents), but not as a result of a collision, derailment/left roadway, or fire. 2) An incident in which a person is hurt while using a lift to get on or off a transit vehicle, but not as a result of a collision, derailment/left roadway, or fire. 3) An incident in which a person is injured on a transit vehicle, but not as a result of a collision, derailment/left roadway, or fire. 4) An incident in which a person is hurt while using a transit facility. This includes anyone on transit property (e.g., patrons, transit employees, trespassers), but does not include incidents resulting from illness or criminal activity.

PERSONAL WATERCRAFT: Craft less than 13 feet in length designed to be operated by a person or persons sitting, standing, or kneeling on the craft rather than within the confines of a hull.

PETROLEUM (Oil): A generic term applied to oil and oil products in all forms, such as crude oil, lease condensate, unfinished oils, petroleum products, natural gas plant liquids, and nonhydrocarbon compounds blended into finished petroleum products.

PROPERTY DAMAGE (Transit): The dollar amount required to repair or replace transit property (including stations, right of way, bus stops, and maintenance facilities) damaged during an incident.

PUBLIC ROAD: Any road under the jurisdiction of and maintained by a public authority (federal, state, county, town, or township, local government, or instrumentality thereof) and open to public travel.

RAIL MOTOR CARS: Self-propelled passenger rail cars that are driven by electric motors energized from an electrified roadway or by a generator driven by a diesel or gas turbine engine.

RAPID RAIL TRANSIT: Transit service using rail cars driven by electricity usually drawn from a third rail, configured for passenger traffic, and usually operated on exclusive rights-of-way. It generally uses longer trains and has longer station spacing than light rail.

REFORMULATED GASOLINE: Gasoline whose composition has been changed to meet performance specifications regarding ozone-forming tendencies and release of toxic substances into the air from both evaporation and tailpipe emissions. Reformulated gasoline includes oxygenates and, compared with gasoline sold in 1990, has a lower content of olefins, aromatics, volatile components, and heavy hydrocarbons.

RESIDUAL FUEL OIL: The heavier oils that remain after the distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations and that conform to American Society for Testing and Materials (ASTM) Specifications D396 and 976. Includes, among others, Navy Special oil used in steam-powered vessels in government service and No. 6 oil used to power ships. Imports of residual fuel oil include imported crude oil burned as fuel.

RESPONSE ERROR: Error that results from the tendency of people to answer a question falsely, deliberate misrepresentation, unconscious falsification, or misunderstanding of what is required.

REVENUE: Remuneration received by carriers for transportation activities.

REVENUE PASSENGER: 1) Air: Person receiving air transportation from an air carrier for which remuneration is received by the carrier. Air carrier employees or others, except ministers of religion, elderly individuals, and handicapped individuals, receiving reduced rate charges (less than the applicable tariff) are considered nonrevenue passengers. Infants, for whom a token fare is charged, are not counted as passengers. 2) Transit: Single-vehicle transit rides by initial-board (first-ride) transit passengers only. Excludes all transfer rides and all nonrevenue rides. 3) Rail: Number of one-way trips made by persons holding tickets.

REVENUE PASSENGER ENPLANEMENTS (Air): The total number of passengers boarding aircraft. Includes both originating and connecting passengers.

REVENUE PASSENGER LOAD FACTOR (Air): Revenue passenger-miles as a percent of available seat-miles in revenue passenger services. The term is used to represent the proportion of aircraft seating capacity that is actually sold and utilized.

REVENUE PASSENGER-MILE: One revenue passenger transported 1 mile.

REVENUE PASSENGER TON-MILE (Air): One ton of revenue passenger weight (including all baggage) transported 1 mile. The passenger weight standard for both domestic and international operations is 200 pounds.

REVENUE TON-MILE: One short ton of freight transported 1 mile.

REVENUE VEHICLE-MILES (Transit): One vehicle (bus, trolley bus, streetcar) traveling 1 mile while revenue passengers are on board generates one revenue vehicle-mile. Revenue vehicle-miles reported represent the total mileage traveled by vehicles in scheduled or unscheduled revenue-producing services.

ROAD OIL: Any heavy petroleum oil, including residual asphaltic oil, that is used as a dust palliative and surface treatment on roads and highways. It is generally produced in 6 grades from 0, the most liquid, to 5, the most viscous.

ROLL ON/ROLL OFF VESSEL: Ships that are designed to carry wheeled containers or other wheeled cargo and use the roll on/roll off method for loading and unloading.

ROUND-TRIP DISTANCE (American Travel Survey): The estimated transportation network-miles traveled at the time of the trip from the household residence to the destination and back.

RURAL HIGHWAY: Any highway, road, or street that is not an urban highway.

RURAL MILEAGE (Highway): Roads outside city, municipal district, or urban boundaries.

SAMPLING ERROR: The estimated inaccuracy of the results of a study when a population sample, rather than a census, is used to explain the behavior of the total population. (Also referred to as margin of error and standard error.)

SCHEDULED SERVICE (Air): Transport service operated pursuant to published flight schedules.

SCHOOL BUS: A passenger motor vehicle that is designed or used to carry more than 10 passengers, in addition to the driver, and, as determined by the Secretary of Transportation, is likely to be significantly used for the purpose of transporting pre-primary, primary, or secondary school students between home and school.

SCHOOL-BUS-RELATED CRASH: Any crash in which a vehicle, regardless of body design, used as a school bus is directly or indirectly involved, such as a crash involving school children alighting from a vehicle.

SCOW (Water): Any flat-bottomed, nonself-propelled, rectangular vessel with sloping ends. Large scows are used to transport sand, gravel, or refuse.

SELF-PROPELLED VESSEL: A vessel that has its own means of propulsion. Includes tankers, containerships, dry bulk cargo ships, and general cargo vessels.

SERIOUS INJURY (Air Carrier/General Aviation): An injury that requires hospitalization for more than 48 hours, commencing within 7 days from the date when the injury was received; results in a bone fracture (except simple fractures of fingers, toes, or nose); involves lacerations that cause severe hemorrhages, nerve, muscle, or tendon damage; involves injury to any internal organ; or involves second- or third-degree burns or any burns affecting more than 5 percent of the body surface.

SMALL CERTIFICATED AIR CARRIER: An air carrier holding a certificate issued under section 401 of the Federal Aviation Act of 1958, as amended, that operates aircraft designed to have a maximum seating capacity of 60 seats or fewer or a maximum payload of 18,000 pounds or less.

STATE AND LOCAL HIGHWAY EXPENDITURES: Disbursements for capital outlay, maintenance and traffic surfaces, administration and research, highway law enforcement and safety, and interest on debt.

STREETCARS: Relatively lightweight passenger rail cars operating singly or in short trains, or fixed rails in right-of-way that are not always separated from other traffic for much of the way. Streetcars do not necessarily have the right-of-way at grade crossings with other traffic.

SUBCOMPACT CAR: As designated by the automobile industry, a car with a wheelbase between 95 and 99 inches.

SUPPLEMENTAL AIR CARRIER: An air carrier authorized to perform passenger and cargo charter services.

TANKER: An oceangoing ship designed to haul liquid bulk cargo in world trade.

TON-MILE (Truck): The movement of 1 ton of cargo the distance of 1 mile. Ton-miles are calculated by multiplying the weight in tons of each shipment transported by the miles hauled.

TON-MILE (Water): The movement of 1 ton of cargo the distance of 1 statute mile. Domestic ton-miles are calculated by multiplying tons moved by the number of statute miles moved on the water (e.g., 50 short tons moving 200 miles on a waterway would yield 10,000 ton-miles for that waterway). Ton-miles are not computed for ports. For coastwise traffic, the shortest route that safe navigation permits between the port of origin and destination is used to calculate ton-miles.

TRAFFICWAY (Highway): Any right-of-way open to the public as a matter of right or custom for moving persons or property from one place to another, including the entire width between property lines or other boundaries.

TRAIN LINE MILEAGE: The aggregate length of all line-haul railroads. It does not include the mileage of yard tracks or sidings, nor does it reflect the fact that a mile of railroad may include two or more parallel tracks. Jointly-used track is counted only once.

TRAIN-MILE: A train-mile is the movement of a train, which can consist of many cars, the distance of 1 mile. A train-mile differs from a vehicle-mile, which is the movement of one car (vehicle) the distance of 1 mile. A 10-car (vehicle) train traveling 1 mile is measured as 1 train-mile and 10 vehicle-miles. Caution should be used when comparing train-miles to vehicle-miles.

TRANSIT VEHICLE: Includes light, heavy, and commuter rail; motor bus; trolley bus; van pools; automated guideway; and demand-responsive vehicles.

TRANSSHIPMENTS: Shipments that enter or exit the United States by way of a U.S. Customs port on the northern or southern border, but whose origin or destination was a country other than Canada or Mexico.

TRAVEL PARTY (American Travel Survey): Household and nonhousehold members traveling together on a trip.

TRESPASSER (Rail): Any person whose presence on railroad property used in railroad operations is prohibited, forbidden, or unlawful.

TRIP (American Travel Survey): Roundtrip travel to a destination at least 100 miles from home. The following types of trips are excluded: 1) travel as part of an operating crew on a train, airplane, truck, bus, or ship; 2) regular commuting to work or school; 3) one-way trips to move to a new destination; and 4) trips by members of the Armed Forces while on active duty.

TROLLEY BUS: Rubber-tired electric transit vehicle, manually steered and propelled by a motor drawing current, normally through overhead wires, from a central power source.

TRUST FUNDS: Accounts that are specifically designated by law to carry out specific purposes and programs. Trust Funds are usually financed with earmarked tax collections.

TUG BOAT: A powered vessel designed for the towing or pushing of ships, dumb barges, pushed-towed barges, and rafts, but not for the carriage of goods.

U.S. FLAG CARRIER OR AMERICAN FLAG CARRIER (Air): One of a class of air carriers holding a Certificate of Public Convenience and Necessity issued by the U.S. Department of Transportation and approved by the President, authorizing scheduled operations over specified routes between the United States (and/or its territories) and one or more foreign countries.

UNLEADED GASOLINE: See Gasoline.

UNLINKED PASSENGER TRIPS (Transit): The number of passengers who board public transportation vehicles. A passenger is counted each time he/she boards a vehicle even if on the same journey from origin to destination.

URBAN HIGHWAY: Any road or street within the boundaries of an urban area. An urban area is an area including and adjacent to a municipality or urban place with a population of 5,000 or

more. The boundaries of urban areas are fixed by state highway departments, subject to the approval of the Federal Highway Administration, for purposes of the Federal-Aid highway program.

VANPOOL (Transit): Public-sponsored commuter service operating under prearranged schedules for previously formed groups of riders in 8- to 18-seat vehicles. Drivers are also commuters who receive little or no compensation besides the free ride.

VEHICLE MAINTENANCE (Transit): All activities associated with revenue and nonrevenue (service) vehicle maintenance, including administration, inspection and maintenance, and servicing (cleaning, fueling, etc.) vehicles. In addition, it includes repairs due to vandalism or to revenue vehicle accidents.

VEHICLE-MILES (Highway): Miles of travel by all types of motor vehicles as determined by the states on the basis of actual traffic counts and established estimating procedures.

VEHICLE-MILES (Transit): The total number of miles traveled by transit vehicles. Commuter rail, heavy rail, and light rail report individual car-miles, rather than train-miles for vehicle-miles.

VEHICLE OPERATIONS (Transit): All activities associated with transportation administration, including the control of revenue vehicle movements, scheduling, ticketing and fare collection, system security, and revenue vehicle operation.

VESSEL CASUALTY (Water): An occurrence involving commercial vessels that results in 1) Actual physical damage to property in excess of \$25,000; 2) Material damage affecting the seaworthiness or efficiency of a vessel; 3) Stranding or grounding; 4) Loss of life; or 5) Injury causing any person to remain incapacitated for a period in excess of 72 hours, except injury to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

VESSEL-CASUALTY-RELATED DEATH: Fatality that occurs as a result of an incident that involves a vessel or its equipment, such as a collision, fire, or explosion. Includes drowning deaths.

WATERBORNE TRANSPORTATION: Transport of freight and/or people by commercial vessels under U.S. Coast Guard jurisdiction.

WAYBILL: A document that lists goods and shipping instructions relative to a shipment.

WEEKEND TRIP (American Travel Survey): Travel by persons who stay one or two nights away, including a Friday and/or Saturday night. Travel over three to five nights including a Friday and/or Saturday night stay is defined as a long-weekend trip.

Acronyms and Initialisms

AAA	American Automobile Association	FERC	Federal Energy Regulatory Commission
AADT	Annual Average Daily Traffic	FHWA	Federal Highway Administration
AAMA	American Automobile Manufacturers Association	FRA	Federal Railway Administration
AAR	Association of American Railroads	FTA	Federal Transit Administration
AAS	Air Activity Statistics of Certificated Air Carriers	FTP	Federal Test Procedure
AGA	American Gas Association	FTZ	Foreign Trade Zone
AI	Alcohol Involvement	GAATA	General Aviation and Air Taxi Activity
AIA	Aerospace Industries Association	GAMA	General Aviation Manufacturers Association
ALVW	Adjusted Loaded Vehicle Weight	GES	General Estimates System
AMIO	Alien Migrant Interdiction Operations	GIS	Geographic Information System
AOPL	Association of Oil Pipelines	g/mi	Grams Per Mile
APTA	American Public Transit Association	GVWR	Gross Vehicle Weight Rating
ATS	American Travel Survey		
ATV	All-Terrain Vehicle		
BAC	Blood Alcohol Concentration	HC	Hydrocarbon
BEA	Bureau of Economic Analysis	HPMS	Highway Performance Monitoring System
BMA	Bicycle Manufacturer's Association		
BTS	Bureau of Transportation Statistics	ICC	Interstate Commerce Commission
Btu	British Thermal Unit	INM	Integrated Noise Model
CFR	U.S. Code of Federal Regulation	IO	Investigative Officer
CFS	Commodity Flow Survey	IRI	International Roughness Index
CNG	Compressed Natural Gas		
CO	Carbon Monoxide	LDT	Light-Duty Truck
CVS	Certification Vehicle Standard	LMIS	Lloyd's Maritime Information System
dB	Decibels	LPG	Liquefied Petroleum Gas
DNL	Day Night Sound Level	LR	Lloyd's Register
dwt	Deadweight Tons	LVW	Loaded Vehicle Weight
EPA	U.S. Environmental Protection Agency	MARAD	Maritime Administration
EIA	Energy Information Administration	MCMIS	Motor Carrier Management Information System
FAA	Federal Aviation Administration	MIC	Motorcycle Industry Council, Inc.
FARS	Fatality Analysis Reporting System Database	mmbd	Million Barrels Per Day
		MOBILE	Mobile Source Emissions Factor Model

MDPV	Medium-Duty Passenger Vehicles	PMT	Passenger Miles of Travel
mpg	Miles Per Gallon	PSI	Pollutant Standard Index
MSIS	Marine Safety Information System	PSR	Present Serviceability Rating
MTBE	Methyl Tributyl Ether	RFG	Reformulated Gasoline
MVMA	Motor Vehicle Manufacturers Association	RO/RO	Roll-On/Roll-Off
		RSPA	Research and Special Programs Administration
NANIM	Nationwide Airport Noise Impact Model	RTECS	Residential Transportation Energy Consumption Survey
NBDA	National Bicycle Dealers Association	RVP	Reid Vapor Pressure
NDC	Navigation Data Center		
NHS	National Highway System	SAMIS	Safety Management Information Statistics
NHTSA	National Highway Traffic Safety Administration	SEC	Securities and Exchange Commission
NMAC	Near Mid-Air Collision	SHA	State Highway Agencies
NO_x	Nitrogen Oxides	SO₂	Sodium Dioxide
NOPS	National Operations Center	STB	Surface Transportation Board
NOPUS	National Occupant Protection Use Survey		
NPIAS	National Plan of Integrated Airport Systems	TMG	Traffic Monitoring Guide
NPTS	Nationwide Personal Transportation Survey	TIUS	Truck Inventory and Use Survey
		TSFD	Transborder Surface Freight Data
NTD	National Transit Database	USACE	U.S. Army Corps of Engineers
NTS	National Transportation Statistics	USCG	U.S. Coast Guard
NTSB	National Transportation Safety Board	USDOC	U.S. Department of Commerce
		USDOD	U.S. Department of Defense
OAI	Office of Airline Information	USDOT	U.S. Department of Transportation
OAG	Official Airline Guide	USSR	Union of Soviet Social Republic
OIG	Office of the Inspector General		
OPS	Office of Pipeline Safety	TAF	Terminal Area Forecast
ORNL	Oak Ridge National Laboratory	TIUS	Truck Inventory and Use Survey
OST	Office of the Secretary of Transportation	TMG	Traffic Monitoring Guide
		TRFD	Transportation-Related Final Demand
PAR	Police Accident Report	TTI	Texas Transportation Institute
PIRS	Pollution Incident Reporting System		

